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VENTURA COUNTY AGRICULTURAL IRRIGATED LANDS GROUP (VCAILG)

2007 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

BMP	Best Management Practice
CC	Calleguas Creek
CCWTMP	Calleguas Creek Watershed TMDL Monitoring Program
CORF	California Ornamental Research Federation
CWA	Clean Water Act
DPR	Department of Pesticide Regulation
DQO	Data Quality Objective
EPA	Environmental Protection Agency
EQIP	Environmental Quality Incentives Program
IPM	Integrated Pest Management
LARWQCB	Los Angeles Regional Water Quality Control Board (Regional Board)
MRP	Monitoring and Reporting Program
NOA	Notice of Applicability
NOI	Notice of Intent
NRCS	Natural Resources Conservation Service
OC	Organochlorine
OP	Organophosphorus
PAM	Polyacrylamide
QAPP	Quality Assurance Project Plan
RCD	Resource Conservation District
SCR	Santa Clara River
TDS	Total Dissolved Solids
TIE	Toxicity Identification Evaluation
TMDL	Total Maximum Daily Load
TSS	Total Suspended Solids
UCCE	University of California Cooperative Extension
USDA	United Stated Department of Agriculture
VCAILG	Ventura County Agricultural Irrigated Lands Group
VR	Ventura River
WQMP	Water Quality Management Plan

Introduction

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

The Conditional Waiver allows individual landowners and growers to comply with its provisions by working collectively as a Discharger Group, or as an individual. A Discharger Group is defined by the Conditional Waiver as "any group of dischargers and/or organizations that form to comply with this Conditional Waiver. Discharger Groups can be, but are not limited to, organizations formed on a geographic basis or formed with other factors in common such as commodities." The primary purpose of allowing Discharger Groups is to encourage collaboration on monitoring and reporting and to increase the effectiveness of management practices throughout a watershed to attain water quality standards. Those landowners and growers choosing to comply with the Conditional Waiver as a Discharger Group must signify by submitting a Group Notice of Intent and by developing a Discharger Group monitoring program. To assist agricultural landowners and growers that farm within the boundaries of Ventura County, various agricultural organizations, water districts and individuals joined together to form the Ventura County Agricultural Irrigated Lands Group (VCAILG), which is intended to act as one unified "Discharger Group" for those agricultural landowners and growers that wish to participate. A Notice of Intent (NOI) to comply with the Conditional Waiver was submitted to the Regional Board by the VCAILG on August 3, 2006. The NOI included the VCAILG membership roster, as well as the required Quality Assurance Project Plan (QAPP) and Monitoring and Reporting Program Plan (MRP), which detail the water quality monitoring and reporting procedures being conducted in compliance with the terms of the Conditional Waiver. The Regional Board responded by issuing the Notice of Applicability (NOA) to the VCAILG on December 18, 2006, signifying the Regional Board's approval of the VCAILG and its Monitoring Program.

The first Annual Monitoring Report was submitted by the VCAILG to the Regional Board on February 15, 2008 and provided a detailed summary of activities of the VCAILG during 2007, including administration of the VCAILG, an overview of farming in Ventura County and obstacles faced by the VCAILG members, coursework offered to Group members to fulfill the Conditional Waiver's education requirement, a list of education hours completed to date by each member, and monitoring data collected during the three monitoring events conducted. Also included in the Annual Monitoring Report was a discussion of monitoring results that exceeded water quality benchmarks.

As specified in the Conditional Waiver, if the monitoring results show that an applicable water quality benchmark has not been met, then a Water Quality Management Plan (WQMP) must be developed. As outlined in the Monitoring and Reporting Program for discharger groups, the WQMP is designed to:

1. Assess the impacts of waste discharges from irrigated lands to surface waters through source identification.
2. Determine the degree of implementation of management practices to reduce discharge of specific wastes that impact water quality.
3. Determine the effectiveness of management practices and strategies to reduce discharges of waste that impact water quality.
4. Determine concentration and load of waste in these discharges to surface waters.
5. Construct or implement management practices to alleviate the impacts of the waste discharges.
6. Evaluate compliance with existing narrative and numeric water quality objectives to determine if additional implementation of management practices are necessary to improve and/or protect water quality.
7. Construct or implement additional management practices or provide technical documentation of natural, historical, or existing conditions.

The Conditional Waiver also includes language in various sections that require the WQMP to include:

- Concrete steps with specific milestones that work toward attainment of water quality objectives with best management practices.
- Plan to implement specific management measures and management practices to improve the discharge quality, including a date-specific time line.

This document serves as the WQMP for exceedances of water quality benchmarks that occurred during the 2007 monitoring year. All of the constituents for which benchmarks were exceeded are included in 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).

In addition, for the Calleguas Creek watershed, WQMPs are also required to be developed for the TMDLs that are effective in the watershed. Where WQMPs are also required by TMDLs, this plan will serve to meet the TMDL requirement as well.

The WQMP contains four major sections. The first section provides a discussion of the VCAILG monitoring sites and monitoring results detailing benchmark exceedances. Constituent-specific information is provided in the second section to summarize the currently available information on sources of the constituents, discuss the water quality problems associated with the benchmark exceedances, and where feasible, the degree to which agriculture is contributing to the water quality problem. The third section discusses the process by which priority areas will be targeted to implement management practices, and how implementation will be tracked and used to evaluate management practice effectiveness through future water quality monitoring efforts. The final section provides references and resource agency contact information to assist growers in implementing specific management measures to improve water quality.

Identification of Benchmark Exceedances

This section provides a summary of information that was included in the VCAILG 2007 Annual Monitoring Report. For more detailed information about monitoring sites, locations and water quality monitoring results, please refer to that report.

MONITORING OBJECTIVES

The objectives of the VCAILG Monitoring Program are as follows:

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

SAMPLING SITE DESCRIPTIONS AND LOCATIONS

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

Additional site selection criteria included the following:

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

Appendix C includes drainage area maps for each of the VCAILG monitoring sites. These maps will be used in mailings and outreach materials to assist growers in identifying where their property drains and if they are contributing to any water quality benchmark exceedances.

Monitoring site selection in the Calleguas Creek Watershed was coordinated with monitoring sites identified in the Calleguas Creek Watershed TMDL Monitoring Program (CCWTMP).

Data collected at these coordinated sites are designed to augment TMDL implementation monitoring in that watershed by establishing loadings from agricultural inputs.
The format for the monitoring site ID/code is XXXA_YYYYY_ZZZZZ, where:

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

Examples:

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

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

Table 1 contains a detailed list of monitoring sites selected for the VCAILG Monitoring Program. Monitoring site IDs in bold type indicate CCW TMDL monitoring sites that will be monitored through that program starting in August 2008.

Maps of monitoring sites located in the Calleguas Creek / Oxnard Coastal, Santa Clara River and Ventura River watersheds are presented in Figure 1, Figure 2, Figure 3, respectively.

Table 2 provides estimates of irrigated acreage by crop type represented by each monitoring site selected.

Maps of crops grown in the vicinity of each monitoring site in the Calleguas Creek / Oxnard Coastal, Santa Clara River and Ventura River watersheds are presented in Figure 4, Figure 5, Figure 6, respectively.

Table 1. VCAILG Monitoring Program Monitoring Site Locations

Watershed / Subwatershed	Station ID [1]	Reach	Water-body Type [2]	Station Location	GPS Coordinates [3]	
					Latitude	Longitude
Calleguas Creek / Mugu Lagoon	**01T_ODD2_DCH**	1	T	Duck Pond/Oxnard Drain #2/Mugu Drain S. of Hueneme Rd.	34.139514	-119.118330
	01T_ODD3_ARN	1	T	Rio de Santa Clara/Oxnard Drain #3 at Arnold Rd.	34.123564	-119.156514
Calleguas Creek / Calleguas Creek	02D_BROOM	2	D	Discharge to Calleguas Creek at Broome Ranch Rd.	34.143353	-119.071306
	02D_CSUCI	2	B	02D_BROOM background site near CSUCI	34.159860	-119.049375
Calleguas Creek / Revolon Slough	04D_ETTG	4	D	Discharge to Revolon Slough at Etting Rd.	34.161797	-119.091419
	04D_LAS	4	D	Discharge to Revolon Slough at S. Las Posas Rd.	34.134208	-119.079767
Calleguas Creek / Beardsley Channel	**05D_SANT_VCWPD**	5	D	Santa Clara Drain at VCWPD Gage #781	34.242667	-119.113736
	05D_SANT_BKGD	5	B	05D_SANT_VCWPD background site near the golf course	34.263213	-119.111314
	05D_LAVD	5	T	La Vista Drain at La Vista Ave.	34.265950	-119.093589
	05T_HONDO	5	T	Hondo Barranca at Hwy. 118	34.263608	-119.057431
Calleguas Creek / Arroyo Las Posas	**06T_FC_BR**	6	T	Fox Canyon at Bradley Rd.	34.264653	-119.011128
	06T_LONG	6	T	Long Canyon at Hwy. 118	34.270083	-118.958664
Calleguas Creek / Conejo Creek	**9BD_GERRY**	9B	D	Drain Crossing Santa Rosa Rd. at Gerry Rd.	34.235847	-118.944675
Oxnard Coastal	OXD_CENTR	--	D	Central Ditch at Harbor Blvd.	34.220555	-119.254983
Santa Clara River	S02T_ELLS	2	T	Ellsworth Barranca at Telegraph Rd.	34.306805	-119.141275
	S02T_TODD	2	T	Todd Barranca at Hwy. 126	34.313584	-119.117095
	S03T_TIMB	3	T	Timber Canyon at Hwy. 126	34.370172	-119.020939
	S03T_ BOULD	3	T	Boulder Creek at Hwy. 126	34.389578	-118.958738
	S03D_BARDS	3	D	Discharge along Bardsdale Ave. upstream of confluence with Santa Clara River	34.371535	-118.964470
	S04T_HOPP	4	T	Hopper Creek at Hwy. 126	34.401616	-118.826799
	S04T_TAPO	4	T	Tapo Canyon Creek	34.401717	-118.723706
	S04T_TAPO_BKGD	4	B	S04T_TAPO background site upstream of agricultural operations	34.387316	-118.7204509
Ventura River	VRT_THACH	--	T	Thacher Creek at Ojai Avenue	34.446719	-119.210893
	VRT_SANTO	--	T	San Antonio Creek at Grand Avenue	34.454455	-119.221723

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

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

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

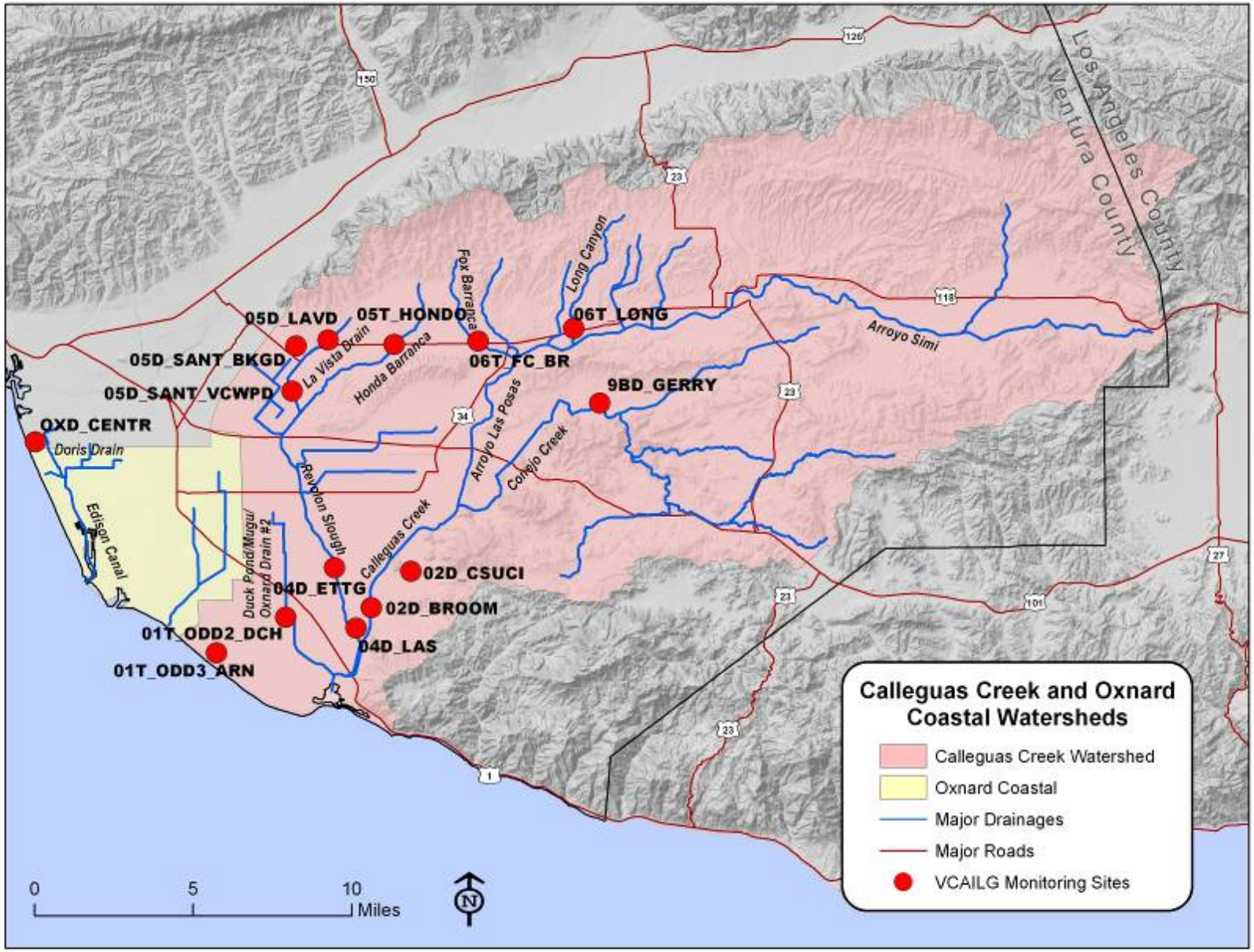

Figure 1. VCAILG Monitoring Sites Located in the Calleguas Creek / Oxnard Coastal Watersheds

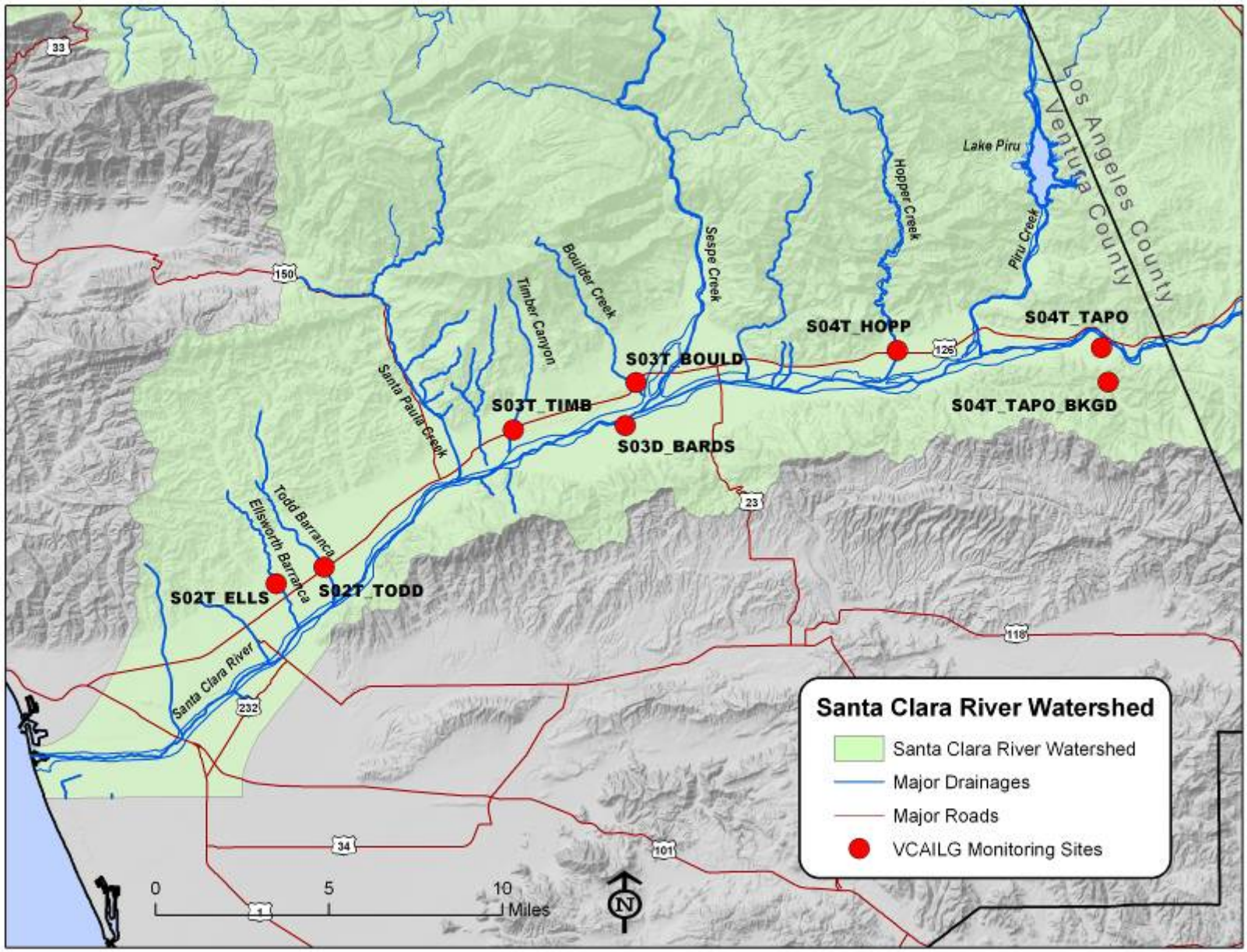

Figure 2. VCAILG Monitoring Sites Located in the Santa Clara River Watershed

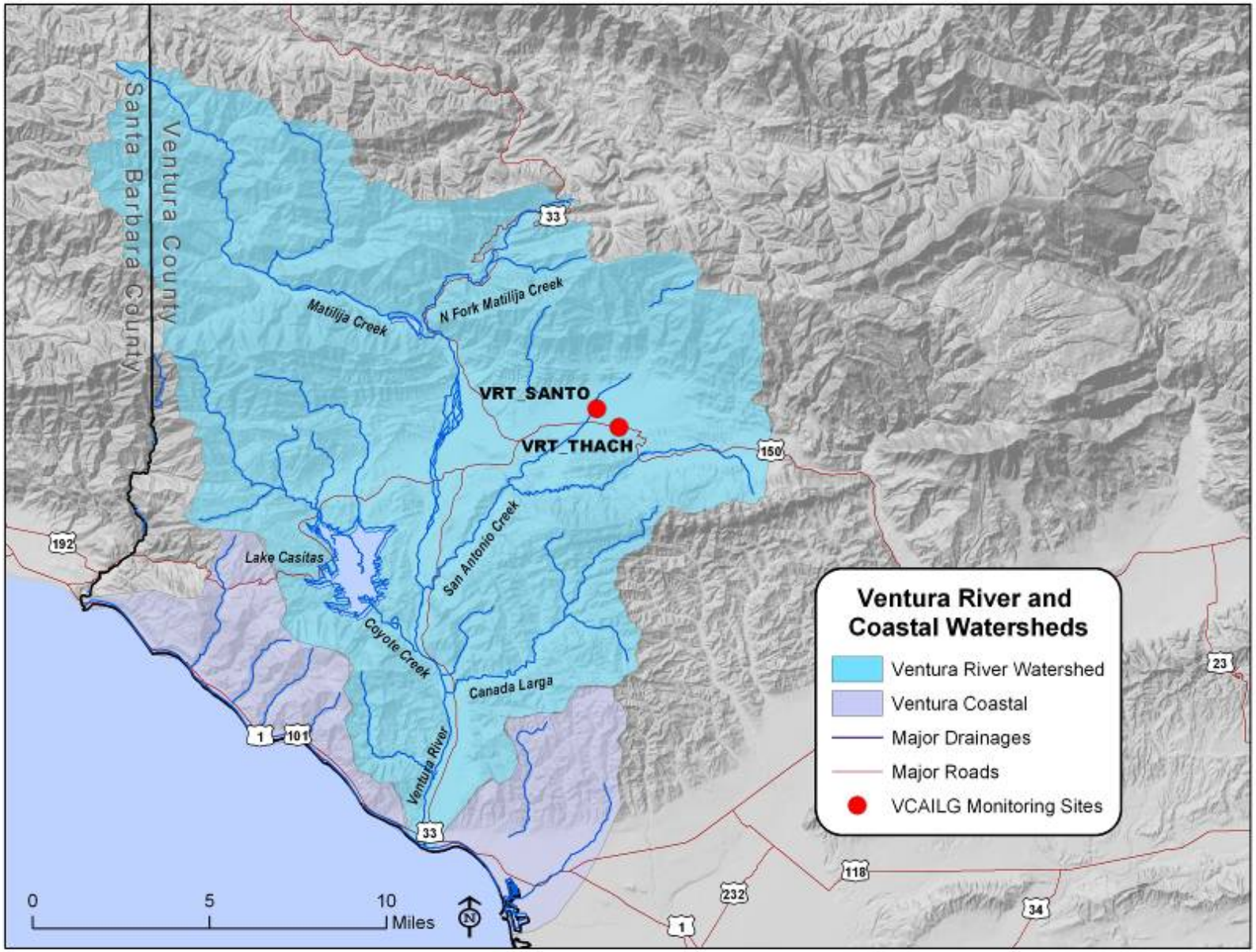

Figure 3. VCAILG Monitoring Sites Located in the Ventura River Watershed

Table 2. Estimated Irrigated Acreage Represented at Each VCAILG Monitoring Site

Station ID [1]	Estimated Irrigated Agricultural Acreage							Estimated Total Acres Drained
	Strawberries	Nursery Stock	Citrus	Avocado	Row Crops	Berries	Sod	
01T_ODD2_DCH	825	70	250	110	1895			3150
01T_ODD3_ARN					470		500	970
02D_BROOM		15	40	60	1065	20		1200
04D_ETTG					1650			1650
04D_LAS	200	55			945		300	1500
05D_SANT_VCWPD			460	210	100	550		1320
05D_LAVD			345	200	40	65		655
05T_HONDO			1400	800	200			2400
06T_FC_BR		70	900	160	70			1200
06T_LONG		100	1000	1000	200			2300
9BD_GERRY			175	100		25		300
OXD_CENTR	500		80		395			975
S02T_ELLS			600	450		100		1150
S02T_TODD			945	235	120			1300
S03T_TIMB			300	300				600
S03T_ BOULD		140	290	620				1050
S03D_BARDS			340	20	40			400
S04T_HOPP		100	210		70			380
S04T_TAPO			80		240			320
VRT_THACH			800	100				900
VRT_SANTO			700	200				900

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

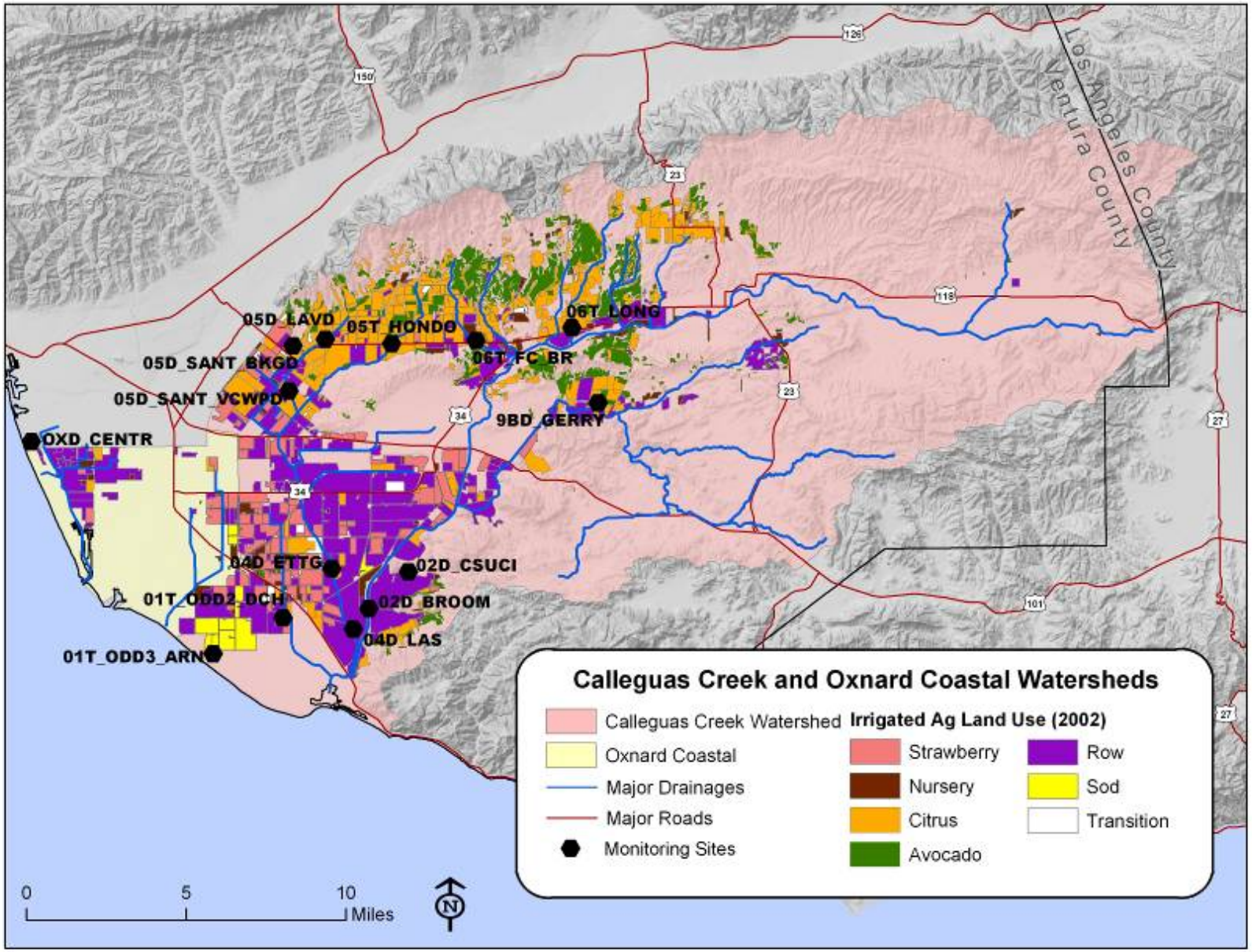

Figure 4. Calleguas Creek Watershed Monitoring Sites and Agricultural Land Use

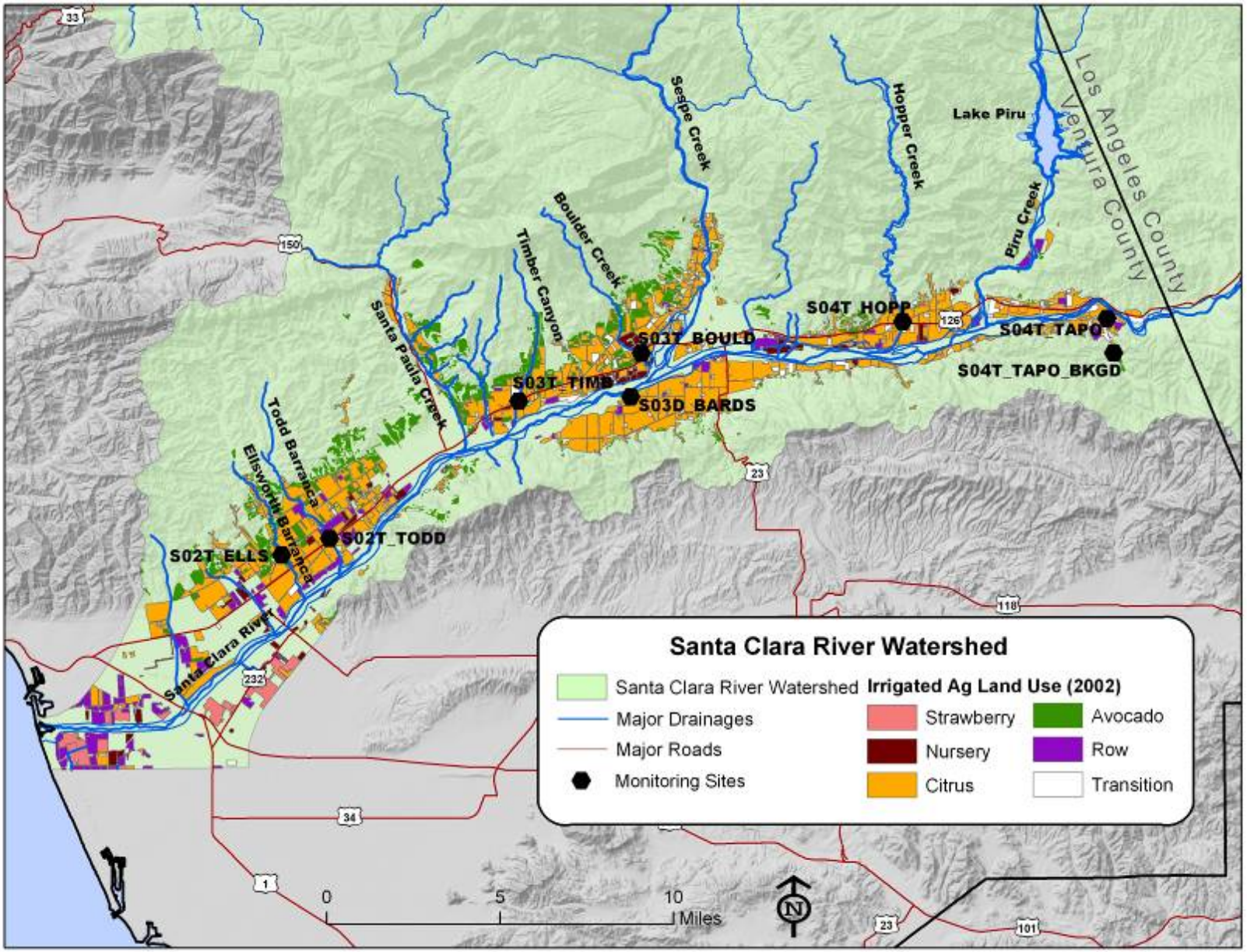

Figure 5. Santa Clara River Watershed Monitoring Sites and Agricultural Land Use

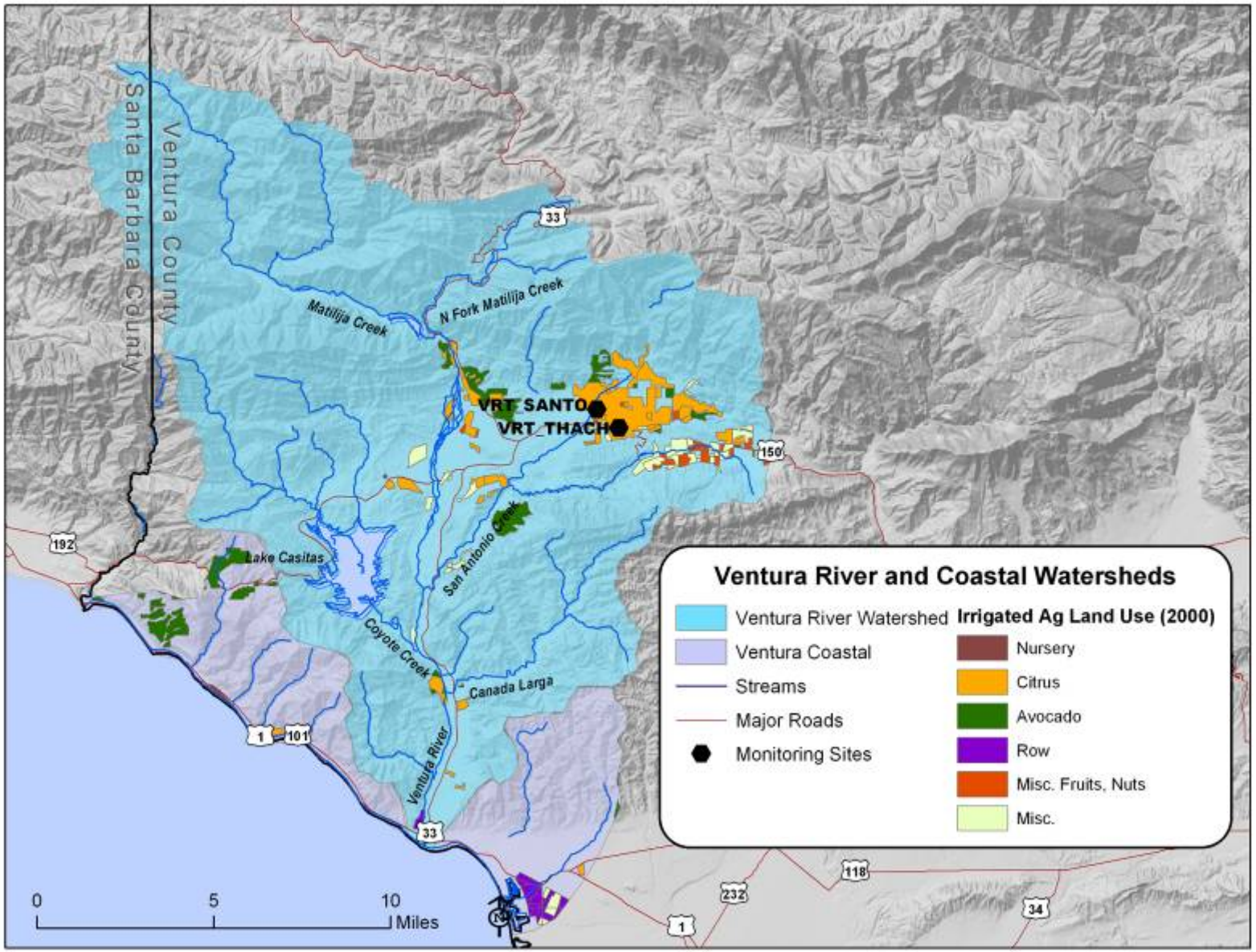

Figure 6. Ventura River Watershed Monitoring Sites and Agricultural Land Use

WATER QUALITY BENCHMARKS

This section presents the water quality benchmarks used to evaluate monitoring data collected at the VCAILG monitoring sites in 2007. Benchmarks used for this purpose include numeric and narrative water quality objectives contained in Appendix 1 and Appendix 2 in the Conditional Waiver, which includes narrative and numeric Basin Plan objectives and water quality standards from the California Toxics Rule (CTR). TMDL load allocations were not used as benchmarks to determine whether WQMPs are necessary to reduce water quality impacts from irrigated agriculture. Rather, because effective TMDLs already contain the requirement to develop WQMPs regardless of whether monitoring data exceed benchmarks identified in the Conditional Waiver, all TMDL requirements are included in this WQMP.

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 were evaluated in the AMR based on the assumption that if benchmarks are not exceeded in the agricultural drain, it is unlikely that the discharge from that drain will cause benchmark exceedances in the receiving water.

Conditional Waiver benchmarks applicable to VCAILG monitoring sites are presented in Table 3 through Table 7.

Table 3. Conditional Waiver Benchmarks Derived From Narrative Objectives and Toxicity

Constituent	Watershed [1]	Narrative Objective[2]	Applicable Benchmark
pH	CC, OXD, SCR, VR	The pH of inland surface waters shall not be depressed below 6.5 or raised above 8.5 as a result of waste discharges. Ambient pH levels shall not be changed by more than 0.5 pH units from natural conditions as a result of waste discharges.	$6.5 \leq pH \leq 8.5$ Changes to ambient receiving water conditions are not assessed; "ambient" or "natural" conditions have not been established
Temperature	CC, OXD, SCR, VR	For waters designated WARM, water temperature shall not be altered by more than 5°F above the natural temperature. At no time shall WARM-designated waters be raised above 80°F as a result of waste discharges.	WARM: $\leq$ 80°F Changes to ambient receiving water conditions are not assessed; "ambient" or "natural" conditions have not been established
	SCR, VR	For waters designated COLD, water temperature shall not be altered by more than 5°F above the natural temperature.	COLD: No numeric benchmark. Changes to ambient receiving water conditions are not assessed; "ambient" or "natural" conditions have not been established
Dissolved Oxygen	OXD	No single dissolved oxygen determination shall be less than 5 mg/L, except when natural conditions cause lesser concentrations.	$\geq$ 5 mg/L
	CC, SCR, VR	The dissolved oxygen content of all surface waters designated as WARM shall not be depressed below 5 mg/L as a result of waste discharges.	WARM: $\geq$ 5 mg/L
	SCR, VR	The dissolved oxygen content of all surface waters designated as COLD and SPWN shall not be depressed below 7 mg/L as a result of waste discharges.	COLD, SPWN: $\geq$ 7 mg/L
Turbidity	CC, OXD, SCR, VR	Waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses. Increases in natural turbidity attributable to controllable water quality factors shall not exceed the following limits: ▪ Where natural turbidity is between 0 and 50 NTU, increases shall not exceed 20%; ▪ Where natural turbidity is greater than 50 NTU, increases shall not exceed 10%.	No numeric benchmarks. Changes to ambient receiving water conditions are not assessed; "ambient" or "natural" conditions have not been established
Biostimulatory Substances	CC, OXD, SCR, VR	Waters shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growth causes nuisance or adversely affects beneficial uses.	No numeric benchmarks. Waterbody-specific benchmarks for nutrients are listed in Tables 12 and 13.
Total Suspended Solids (TSS)	CC, OXD, SCR, VR	Wastes shall not contain suspended material in concentrations that cause nuisance or adversely affect beneficial uses.	No numeric benchmarks.
Pesticides	CC, OXD, SCR, VR	No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses.	No numeric benchmarks. Applicable benchmarks for specific pesticides are listed in Tables 14,15, and 16
Toxicity	CC, OXD, SCR, VR	All waters shall be free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal or aquatic life. There shall be no chronic toxicity in ambient waters outside mixing zones.	$\leq$ 1.0 TUc [3] Benchmarks for specific potentially toxic constituents are listed in Tables 12 through 16.

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

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

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

Table 4. Conditional Waiver Benchmarks for Salts and Nutrients (Basin Plan Table 3-8 Numeric Water Quality Objectives)

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

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

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

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

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

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

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

Table 5. Conditional Waiver Benchmarks for Organochlorine Pesticides

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

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

[1] CTR = California Toxics Rule (USEPA, May 18, 2000).
HHO = Human Health for Consumption of Organisms Only (30-day average)
HHWO = Human Health for Consumption of Water and Organisms (MUN-designation) (30-day average)
AFWC = Aquatic Life, Freshwater Chronic (4-day average)

Table 6. Conditional Waiver Benchmarks for Organophosphorus Pesticides

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

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

Table 7. Conditional Waiver Benchmarks for Pyrethroid Pesticides

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

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

SUMMARY OF BENCHMARK EXCEEDANCES

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

Table 8 contains a summary of benchmark exceedances that occurred at each site during 2007. Table 8 also identifies sites that were sampled but where no exceedances occurred, as well as sites that were not sampled. Table 9 contains the same exceedance summary organized by constituent and by watershed. Organochlorine (legacy) pesticides, primarily DDT compounds, caused the highest number of exceedances overall, followed by organophosphorus pesticides and nitrogen compounds, salts, and chronic toxicity. During Event 1 (June 2007) and Event 2 (September 2007), exceedances occurred at all sites sampled. During Event 3 (December 2007), exceedances occurred at 14 of 16 sites sampled.

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

Exceedances of salts benchmarks (TDS, chloride, sulfate, or a combination thereof) occurred at 7 sites, five of which are located in the Santa Clara River Watershed.

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

Exceedances of nitrate-N and ammonia-N occurred at 11 VCAILG sites, 7 of which are in the Calleguas Creek Watershed. The nitrate-N benchmark applicable to the Oxnard Coastal monitoring site was exceeded during all three sampling events. In the Santa Clara River Watershed, nitrogen objectives were exceeded at 3 monitoring sites.

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

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

Table 8. Water Quality Benchmark Exceedances in 2007 – by Site & Event

Site ID	Constituents that Exceeded Applicable Benchmarks		
	Event 1 – *Dry* June 4-5, 2007	**Event 2 – *Dry* Sept. 10-11, 2007**	**Event 3 – *Wet* Dec. 19, 2007**
01T_ODD2_DCH	Nitrate-N, 4,4'-DDE	Nitrate-N, 4,4'-DDE	Nitrate-N, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, Chlorpyrifos
01T_ODD3_ARN	Nitrate-N, 4,4'-DDD, 4,4'-DDE Chronic Toxicity	4,4'-DDD, 4,4'-DDE	Nitrate-N, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT
02D_BROOM	*NS*	4,4'-DDD, 4,4'-DDE	Nitrate-N, 4,4'-DDE
04D_ETTG	Nitrate-N, 4,4'-DDD, 4,4'-DDE	4,4'-DDD, 4,4'-DDE, 4,4'-DDT	Nitrate-N, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, Chlorpyrifos
04D_LAS	Nitrate-N, 4,4'-DDD, 4,4'-DDE	Nitrate-N, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT	Nitrate-N, 4,4'-DDD, 4,4'-DDE, Chlorpyrifos
05D_SANT_VCWPD	TDS, Chloride, Sulfate, Nitrate-N, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT	Temperature, TDS, Chloride, Sulfate, Nitrate-N, 4,4'-DDE	TDS, Chloride, Sulfate, Nitrate-N, 4,4'-DDE, Chlorpyrifos
05D_LAVD	TDS, Sulfate, Nitrate-N, 4,4'-DDE, Chlorpyrifos, Chronic Toxicity	TDS, Sulfate, Nitrate-N, Chlordane, 4,4'-DDD, 4,4'-DDE	*NS*
05T_HONDO	*NS*	*NS*	4,4'-DDD, 4,4'-DDE, 4,4'-DDT, Chlorpyrifos, Diazinon
06T_FC_BR	*NS*	*NS*	4,4'-DDD, 4,4'-DDE, 4,4'-DDT, Chlorpyrifos
06T_LONG	*NS*	*NS*	*NS*
9BD_GERRY	*NS*	*NS*	*NS*
OXD_CENTR	Nitrate-N, 4,4'-DDE	Nitrate-N, 4,4'-DDD, 4,4'-DDE	Nitrate-N, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, Chlorpyrifos
S02T_ELLS	*NS*	*NS*	TDS, Chloride, Sulfate, Chlorpyrifos
S02T_TODD	TDS, Sulfate, Nitrate-N Chronic Toxicity	TDS, Sulfate	Nitrate-N, TDS, Sulfate, Chlorpyrifos
S03T_TIMB	*NS*	*NS*	TDS, Chloride, Sulfate
S03T_ BOULD	TDS, Ammonia-N, Nitrate-N Chronic Toxicity	Dissolved Oxygen, TDS, Nitrate-N	*None*
S03D_BARDS	*NS*	*NS*	4,4'-DDE, Chlorpyrifos
S04T_HOPP	*NS*	*NS*	*None*
S04T_TAPO	TDS, Chloride, Sulfate, 4,4'-DDE Chronic Toxicity	TDS, Chloride, Sulfate, Nitrate-N 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, Dieldrin	TDS, Chloride, Sulfate, Total Chlordane, 4,4'-DDD, 4,4'-DDE
VRT_THACH	*NS*	*NS*	*NS*
VRT_SANTO	*NS*	*NS*	*NS*
Total Number of Sites Sampled	**10**	**11**	**16**
Total Number of Sites with Exceedances	**10**	**11**	**14**

NS = Not Sampled; insufficient or no flow.

Table 9. Water Quality Benchmark Exceedances in 2007 – by Pollutant & Watershed

Pollutant	VCAILG Monitoring Sites with Benchmark Exceedances		
	CC / OXN	SCR	VR
Salts	05D_SANT_VCWPD 05D_LAVD	S02T_ELLS S02T_TODD S03T_TIMB S03T_ BOULD S04T_TAPO	Not Sampled
Nitrogen	01T_ODD2_DCH 01T_ODD3_ARN 02D_BROOM 04D_ETTG 04D_LAS 05D_SANT_VCWPD 05D_LAVD OXD_CENTR	S02T_TODD S03T_ BOULD S04T_TAPO	Not Sampled
Chronic Toxicity	01T_ODD3_ARN 05D_LAVD	S02T_TODD S03T_ BOULD S04T_TAPO	Not Sampled
OC Pesticides	01T_ODD2_DCH 01T_ODD3_ARN 02D_BROOM 04D_ETTG 04D_LAS 05D_SANT_VCWPD 05D_LAVD 05T_HONDO 06T_FC_BR OXD_CENTR	S03D_BARDS S04T_TAPO	Not Sampled
OP Pesticides	01T_ODD2_DCH 04D_ETTG 04D_LAS 05D_SANT_VCWPD 05D_LAVD 05T_HONDO 06T_FC_BR OXD_CENTR	S02T_ELLS S02T_TODD S03D_BARDS	Not Sampled
Dissolved Oxygen	None	S03T_ BOULD	Not Sampled
Temperature	05D_SANT_VCWPD	None	Not Sampled

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

Monitoring results organized by constituent and site for each water quality benchmark exceedance can be found in Appendix B.

TMDL WATER QUALITY MANAGEMENT PLAN REQUIREMENTS

Because TMDLs require the development of WQMPs regardless of whether monitoring data exceed TMDL load allocations, all of the areas covered by a TMDL that requires a WQMP are addressed by this plan. This section discusses the TMDLs that require WQMPs, other TMDLs that are effective in Ventura County, but do not require WQMPs and provides a comparison of the TMDL WQMP requirements to the Conditional Waiver benchmark exceedances.

The process and BMPs outlined in the WQMP are designed to result in compliance with the TMDL load allocations. Like the conditional waiver benchmarks, TMDL allocations are designed to result in receiving waters achieving water quality objectives. As a result, actions taken to achieve water quality benchmarks will also help achieve TMDL load allocations.

The schedule for achieving TMDL load allocations will, in most cases, be longer than the schedule assigned to address water quality benchmark exceedances in the WQMP because TMDL implementation schedules are generally longer than the Conditional Waiver time frame. As a result, TMDL exceedances that do not correspond with prioritized Conditional Waiver benchmark exceedance locations will be addressed during future implementation phases within the time frame of the TMDL implementation schedules. TMDL exceedances within the prioritized Conditional Waiver areas will begin BMP implementation prior to November 2010 (See Table 12). All TMDL load allocations will be addressed using the process and BMPs outlined in this WQMP.

The Conditional Waiver currently does not include monitoring for metals and selenium. However, in the Calleguas Creek watershed, a Metals and Selenium TMDL is effective and requires the development of a WQMP. As a result, metals and selenium are included in this WQMP to meet the requirements of the TMDL. Due to the fact that metals and selenium are not currently monitored under the waiver program, metals and selenium will not be specifically addressed during the first phase of WQMP implementation. However, BMPs are identified in this WQMP that address metals and selenium. Growers in priority areas in the Calleguas Creek watershed will be notified that a Metals and Selenium TMDL is in place and provided with BMP information. As many BMPs address multiple pollutants, actions taken to address other constituents are likely to address discharges of metals and selenium as well. Monitoring conducted as part of the Calleguas Creek Watershed TMDL Monitoring Program will be used to assess metals and selenium discharges from agriculture.

Table 10. Effective TMDLs in Calleguas Creek Watershed Requiring WQMPs

Constituent	Arroyo Simi	Arroyo Las Posas	Conejo Creek	Calleguas Creek [1, 2]	Revolon Slough [2]	Mugu Lagoon [2]
Organochlorine Pesticides and PCBs TMDL						
Chlordane	X	X	X	X	X	X
4,4'-DDD	X	X	X	X	X	X
4,4'-DDE	X	X	X	X	X	X
4,4'-DDT	X	X	X	X	X	X
Dieldrin	X	X	X	X	X	X
PCBs	X	X	X	X	X	X
Toxaphene	X	X	X	X	X	X
Sediment						X
Toxicity TMDL						
Diazinon	X	X	X	X	X	X
Chlorpyrifos	X	X	X	X	X	X
Toxicity	X	X	X	X	X	X
Metals and Selenium TMDL						
Copper			X	X	X	X
Nickel			X	X	X	X
Mercury			X	X	X	X
Selenium					X	
Salts TMDL						
Chloride	X	X	X	X	X	
TDS	X	X	X	X	X	
Sulfate	X	X	X	X	X	
Boron	X				X	

Blanks in table indicate constituent is not included in TMDL for that subwatershed.

1. Calleguas Creek covers Camarillo and Pleasant Valley subwatersheds for Salts TMDL.
2. Salts TMDL doesn't apply to Mugu Lagoon and only applies to Calleguas Creek above Potrero Road and Revolon Slough above Laguna Road.

Table 11. Other Effective TMDLs in Ventura County Not Requiring WQMPs [1]

Constituent	Arroyo Simi	Arroyo Las Posas	Conejo Creek	Calleguas Creek	Revolon Slough	Mugu Lagoon	Santa Clara River [2]	Ventura River Estuary
Nitrogen TMDL								
Ammonia	X	X	X	X	X	X		
Nitrate	X	X	X	X	X	X		
Nitrite	X	X	X	X	X	X		
Nitrate+Nitrite	X	X	X	X	X	X		
Ammonia+Nitrate+Nitrite							X	
Chloride TMDL							[3]	
Trash TMDL					X			X

1. Although WQMPs are not required for these TMDLs, BMPs may be needed to meet the requirements of the TMDLs. This WQMP may assist with agricultural compliance with these TMDLs, but specific activities will not be outlined in this WQMP to address these TMDLs above and beyond where the TMDLs overlap with benchmark exceedances.
2. For the Nitrogen TMDL, the Santa Clara River includes Reach 3, Mint Canyon Reach 1, Wheeler Canyon/Todd Barranca, Brown Barranca/Long Canyon.
3. The Chloride TMDL is effective in the Santa Clara River Reach 3, but does not include any requirements for agricultural actions.

The following table summarizes where TMDL requirements for the development of WQMPs overlaps with agricultural waiver benchmark exceedances that trigger WQMPs. The table addresses the Calleguas Creek TMDLs that require the development of WQMPs and the nitrogen TMDLs for the Calleguas Creek and Santa Clara River watershed. Although the nitrogen TMDLs do not require the development of WQMPs, benchmark exceedances of nitrogen exist and BMP implementation in those areas will assist with TMDL implementation. This table provides a mechanism for comparing where nitrogen BMPs will be implemented as compared to TMDL requirements. As growers implement BMPs to address the water quality benchmark exceedances, they will also be implementing actions to achieve TMDL load allocations. The Santa Clara Chloride TMDL and Trash TMDLs are not addressed in this WQMP and are not included in the table.

Table 12. Comparison of Effective TMDLs to Waiver Monitoring Location Benchmark Exceedances

WQMP TMDL Subwatershed and Corresponding VCAILG Monitoring Sites	Organochlorine Pesticides	Organophosphorus Pesticides	Salts	Toxicity	Nitrogen	Metals and Selenium
Arroyo Simi	T	T	T	T	T	
None						
Arroyo Las Posas	T	T	T	T	T	
06T_FC_BR	A	A				
06T_LONG						
Conejo Creek	T	T	T	T	T	T
9BD_GERRY						
Calleguas Creek	T	T	T [1]	T	T	T
02D_BROOM	A		[3]		A	
Revolon Slough	T	T	T [2]	T	T	T
04D_ETTG	A	A	[3]		A	
04D_LAS	A	A	[3]		A	
05D_SANT_VCWPD	A	A	A		A	
05D_LAVD	A	A	A	A	A	
05T_HONDO	A	A				
Mugu Lagoon	T	T	[3]	T	T	T
01T_ODD2_DCH	A	A	[3]		A	
01T_ODD3_ARN	A		[3]	A	A	
Santa Clara Reach 3					T	
S03T_TIMB			A			
S03T_BOULD			A	A	A	
S03D_BARDS	A	A				
Mint Canyon Reach 1					T	
None						
Brown Barranca/Long Canyon					T	
None						
Wheeler Canyon/Todd Barranca					T	
S02T_TODD		A	A	A	A	
Other Santa Clara River Sites						
S02T_ELLS		A	A			
S04T_HOPP						
S04T_TAPO	A		A	A	A	

Note: VCAILG monitoring sites (except background sites and those in the Ventura River Watershed) are listed under their appropriate reach or subwatershed to allow for easy comparison with where TMDLs are in effect.

T=TMDL in effect for the corresponding reach or subwatershed

A=Ag Waiver benchmark exceedance

Blank cell=Either samples were collected and an exceedance was not found or the site has been dry and therefore not sampled

1. Salts TMDL only applies to discharges above Potrero Road.
2. Salts TMDL only applies to discharges above Laguna Road.
3. Salts objectives and TMDL do not apply to these locations because they are tidally influenced.

Constituent-Specific Water Quality Problems and Sources

The example WQMP in Appendix 7 of the Conditional Waiver includes requirements to discuss the water quality problem, including a discussion of the potential sources of the constituents. This section provides a discussion of the following aspects of the example WQMP:

- Describe the water quality problem identified by monitoring or other methods
- Describe the pollutant associated with this water quality problem
- Describe the sources of the pollutant or water quality problem

For each constituent group, characteristics of the pollutant and a summary of potential sources are discussed. Details of the monitoring sites where exceedances of benchmarks occurred are discussed in the previous section and exceedance results are summarized in Appendix B.

ORGANOCHLORINE PESTICIDES AND PCBS

Organochlorine (OC) pesticides are also referred to as legacy pesticides due to the fact that although they have been banned for agricultural use for many years, they continue to persist in the environment. As a result, these pesticides have long term environmental impacts as they remain present in sediments and bioaccumulate up the food chain. The organochlorine pesticides covered by this WQMP are chlordane, DDT, dieldrin, PCBs and toxaphene.

Benchmarks for three OC pesticides were exceeded during the 2007 VCAILG monitoring year. DDT and its derivatives were the most prevalent exceedances. One site had additional exceedances in dieldrin and chlordane. In the Calleguas Creek Watershed there is a TMDL for OC Pesticides, Polychlorinated Biphenyls and Siltation (LARWQCB Resolution 2005-010). This TMDL has been in effect since March 24, 2006 and includes agricultural load allocations for chlordane, DDT, dieldrin, PCBs and toxaphene.

DDT was first used in 1939 as an insecticide and was later banned in the US in 1972. Chlordane was first used in 1948 and may remain in the environment for over 20 years; we have approached that 20 year mark since chlordane was banned in 1988. Dieldrin came into use in the 1950s until its ban in 1970. Toxaphene is an insecticide containing over 670 chemicals that was first used in the 1940s. EPA canceled the registrations of toxaphene for most uses as a pesticide or pesticide ingredient in 1982. Commercial production of PCBs in the United States began in 1929. In the beginning, PCBs were used both for nominally closed applications (capacitors, transformers, heat transfer fluids, hydraulic fluids) and in open-end applications (flame retardants, inks, adhesives, paints, pesticide extenders, plasticizers, polyolefin catalyst carriers, surface coatings, wire insulators, metal coatings). Most domestic use of PCBs was restricted to nominally closed applications by 1974, and manufacture of PCBs was stopped in the USA by 1977 because of evidence that they build up in the environment and can cause harmful health effects. Aroclors were no longer used in the production of capacitors and transformers after 1979.

All of these OC pesticides and PCBs are similar in their tendency to strongly sorb to sediment, silt, and organic matter. As previously stated, OC pesticides can remain in our environment, predominantly attached to sediment for extended periods of time. As a result, the primary sources of these constituents are sediment discharges from areas of historic pesticide applications

or PCB release sites. PCBs are not used for agricultural applications and are not expected to be discharged significantly from agricultural fields. Monitoring results from the CCWTMP will be used to assess whether agricultural sources are exceeding TMDL allocations.

Because these pesticides are no longer available for use, BMPs to control discharges of organochlorine pesticides and PCBs from agricultural areas will need to focus on preventing sediment transport off of agricultural lands where these chemicals were applied in the past.

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 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.

All exceedances of benchmarks set for chlorpyrifos and diazinon in the Conditional Waiver occurred during the Event 3 storm event, with the exception of one site. Also, chlorpyrifos seems to be a more prevalent problem than diazinon, which only had an exceedance at one site. A TMDL for Toxicity, Chlorpyrifos, and Diazinon in the Calleguas Creek Watershed became effective on March 24, 2006 (LARWQCB Resolution 2005-009) and includes load allocations for chlorpyrifos and diazinon that limit discharges from agricultural areas.

Between 1998 and 2003 over 36,000 pounds of diazinon and 212,000 pounds of chlorpyrifos were reportedly used in the Calleguas Creek Watershed on a variety of crops. The top three crops to which diazinon was applied were beans, onions, and corn. Chlorpyrifos was most heavily applied to lemons, strawberries and broccoli. Recently some restrictions have been placed on the use of chlorpyrifos and diazinon for agricultural applications and both pesticides have been banned for non-agricultural uses. In 2001, 30% of diazinon agricultural uses were cancelled to reduce human exposure. Agricultural applications of chlorpyrifos were cancelled for apples, tomatoes, and grapes. In 2003 and 2004, both diazinon and chlorpyrifos were placed on reevaluation by the Department of Pesticide Regulation due to the potentially harmful levels being detected in waterbodies throughout California. As of 2007 chlorpyrifos is still undergoing reevaluation and DPR is working with the manufacturer on monitoring and investigating BMPs. Diazinon is on reevaluation due to detections in waterbodies linked to applications during the dormant spray season. Supplemental labeling of diazinon adds provisions to applicators such as prohibiting applications within 100 feet upslope of sensitive aquatic sites, or when a storm is likely, and prohibiting applications to orchards when the soils are at field capacity.

Like OC pesticides, chlorpyrifos tends to sorb to sediment, so BMPs to control sediment discharages should also reduce the discharge of chlorpyrifos. Additionally, since these pesticides are currently used, source control activities that minimize the potential for discharge of the pesticides to waterbodies may reduce discharges. However, because the majority of the exceedances observed occurred during wet weather, BMPs that restrict stormwater runoff may be needed to reduce discharges of these pollutants. Implementation of these BMPs can be more challenging due to the variation in the intensity, duration, and timing of storm events and the first two types of BMPs will likely be utilized first during implementation.

SALTS

Salts are dissolved ions that are transported in water. Salts primarily impact two beneficial uses, agricultural irrigation and groundwater recharge. Chloride also has the potential to impact aquatic life. Avocado, citrus, berry, strawberry, and some nursery plants are the most salt sensitive crop types typically grown in Ventura County. 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 the VCAILG.

The VCAILG monitoring program identified salts exceedances at two Calleguas Creek Watershed sites and five Santa Clara River Watershed sites. There is no apparent pattern distinguishing wet and dry event exceedances. Typically all three salts constituents were exceeded within one event. The Calleguas Creek Watershed Salts TMDL (LARWQCB Resolution 2007-016) includes load allocations for agriculture for all four previously listed salts constituents. Though this TMDL is not in effect, there are Basin Plan objectives for salts and by addressing the Conditional Waiver exceedances through the implementation of BMPs, when this TMDL is approved, agricultural discharges will be in the process of attaining compliance with their load allocations.

The primary source of all salts in agricultural discharges is the water supply. Chloride and boron and are not applied in significant amounts to crops in the form of pesticides and fertilizers since they cause adverse effects to crops. TDS is an indicator of all salts in the water sample including those that are specifically measured and other dissolved ions. Sulfate is the only salt that may be applied directly to crops. Sulfur is an essential plant nutrient and can be applied in the form of both fertilizers and pesticides. The use of irrigation water concentrates the salts in the soils as plants take up the water and leave the salts on the fields. During dry weather, salts are transported from agricultural fields as irrigation runoff. Salts are also discharged during wet weather as stormwater runoff; however these loadings 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.

Because the primary source of salts in agricultural discharges is the water supply, addressing salts discharges will need to focus on reducing irrigation runoff. Additionally, the CCW Salts TMDL provides a plan to achieve a salts balance within the watershed. Potential BMPs to address salts issues include:

- using desalted groundwater or other high quality waters for irrigation
- water conservation and irrigation upgrades to reduce the need for imported water and reduce irrigation runoff
- utilizing wellhead desalters or smaller agricultural desalters once the brine line is available to export the waste created during the desalting process (this is a project that will be implemented as part of the CCW Salts TMDL, so it will only be available to growers with access to the brine line)

CHRONIC TOXICITY

Chronic toxicity is a measure of how suitable the sample water would be in supporting aquatic life. This is determined by exposing aquatic organisms to the sample water and comparing that to a control sample. A decline in growth, reproduction, or biomass relative to that control sample indicates a toxic effect. Toxicity is a water quality problem that can be caused by numerous pollutants. As a result, once toxicity is observed, the constituent causing the toxicity must be defined in order for BMPs to be implemented to control the toxicity. During the Conditional Waiver monitoring in 2007, identification of the pollutants causing the toxicity was attempted at four sites. Multiple pollutants were identified as potentially contributing to the observed toxicity and further testing will be necessary if continued toxicity is observed to identify specific pollutants that are contributing to the toxicity. In the CCW Toxicity, Diazinon, and Chlorpyrifos TMDL, diazinon and chlorpyrifos were identified as causing some of the toxicity observed in the watershed. However, additional sites were identified where further testing is required to assess the causes of the toxicity. The characteristics and potential sources of diazinon and chlorpyrifos were discussed in the previous section.

Identification of Toxicity Test Species

Specifically for toxicity, the WQMP is also required to identify the toxicity test species that will be used for future toxicity monitoring events. This section discusses toxicity testing results and the most sensitive species for further testing as identified in the September 11, 2008 letter from the Regional Board's Executive Officer. The Calleguas Creek TMDL monitoring program includes the species that will be used for toxicity testing for the TMDL implementation.

There are 14 VCAILG tributary sites that require toxicity testing. During the 2007 monitoring year, 6 of those tributary sites were successfully tested for chronic toxicity. Samples from all but one of the remaining tributary sites were collected during a wet weather event on January 5, 2008. Since the results of the January tests enabled single species determinations to be made, the findings of those results are being included in this report. The 2008 data and lab report for chronic toxicity will also be included in the 2008 VCAILG Annual Monitoring Report.

Toxicity Results: Freshwater Sites

For ambient waters with a conductivity <3000 µS/cm, the following three species were used for Toxicity testing on samples collected on June 9-10, 2007:

Selenastrum capricornutum (algae)
Ceriodaphnia dubia (invertebrate)
Pimephales promelas (vertebrate)

Chronic toxicity tests were run on aliquots of 100 percent sample collected at the three freshwater monitoring sites. Results are therefore reported in terms of a significant difference in an endpoint (ie., growth, reproduction, biomass) relative to the control. Toxicity tests were performed on samples collected during the June 2007 dry weather event at the following monitoring sites:

- 05D_LAVD: La Vista Drain is located in the Calleguas Creek Watershed and ultimately drains into Beardsley Channel. The monitoirng site is located just upstream of La Vista Avenue.

- S02T_TODD: Todd Barranca is a tributary to Reach 2 of the Santa Clara River. The monitoring station is located upstream of Faulkner Road and Hwy 126.
- S03T_BOULD: Boulder Creek is a tributary to Reach 3 of the Santa Clara River. The monitoring station is located just upstream of Hwy 126. Duplicate samples were collected at this site for quality assurance purposes.

Samples were collected at all but one of the remaining freshwater toxicity sites during the January 2008 wet weather event as follows:

- 05T_HONDO: Hondo Barrance is a tributary to Calleguas Creek Reach 5 (Beardsley Channel). The monitoring site is located downstrem of Hwy 118.
- 06T_FC_BR: Fox Barranca is a tributary to Calleguas Creek Reach 6 (Arroyo Las Posas). The monitoring site is located upstream of Hwy 118 and west of Bradley Road.
- S02T_ELLS: Ellsworth Barranca is a tributary to Reach 2 of the Santa Clara River. The monitoring site is located at Telegraph Road. Duplicate samples were collected at this site to assess method precision.
- S03T_TIMB: Timber Canyon is a tributary to Reach 3 of the Santa Clara River. The monitoring site is located upstream of Hwy 126.
- S04T_HOPP: Hopper Creek is a tributary to Reach 4 of the Santa Clara River. The monitoring site is located upstream of Hwy 126 and the railroad bridge.
- VRT_SANTO: San Antonio Creek is a tributary to the Ventura River. The monitoring station is located upstream of Grand Avenue in Ojai.
- VRT_THACH: Thacher Creek is a tributary to San Antonio Creek and ultimately the Ventura River. The monitoring station is located upstream of Ojai Avenue in Ojai.

Samples have not been collected at site 06T_LONG. This site has been dry for every VCAILG monitoring event to date.

A summary of toxicity results for freshwater sites is presented in Table 13.

Table 13. Toxicity Results Summary – Freshwater Monitoring Sites

Site ID	*Selenastrum*	*Ceriodaphnia dubia*		*P. promelas*		TUc	TIE Triggered
	Cell Growth Toxicity	Survival Toxicity	Reprod. Toxicity	Survival Toxicity	Reprod. Toxicity		
05D_LAVD	N	N	Y	N	N	>1.0	------
S02T_TODD	Y	N	Y	N	N	>1.0	*Selenastrum*
S03T_BOULD	Y	N	Y	N	Y	>1.0	*Selenastrum*
S03T_BOULD dup	Y	N	Y	N	Y	>1.0	*Selenastrum*
05T_HONDO	N	N	Y	N	N	>1.0	------
06T_FC_BR	Y	N	Y	N	N	>1.0	------
S02T_ELLS	N	N	Y	N	N	>1.0	------
S02T_ELLS dup	N	N	Y	N	N	>1.0	------
S03T_TIMB	Y	N	Y	N	N	>1.0	------
S04T_HOPP	N	N	Y	N	N	>1.0	------
VTR_SANTO	N	N	N	N	N	<1.0	------
VTR_THACH	N	N	N	N	N	<1.0	------

Samples collected during the June 2007 dry weather event at S03T_BOULD and S02_TODD caused greater than 50% reduction in *Selenastrum* growth relative to controls, triggering the requirement to perform Toxicity Identification Evaluations (TIEs) for those samples. TIEs conducted on those samples were inconclusive, meaning that the causative agent(s) were not conclusively identified.

All but two of the freshwater samples caused reproductive toxicity to *Ceriodaphnia*, and the duplicate samples collected at S03T_BOULD caused reproductive toxicity to *P. promelas*.

The species selected for future screening at each of the freshwater sites are listed in the table below.

Table 14. Species Selected for Future Testing at Freshwater Sites

Site ID	Species
05D_LAVD	*Ceriodaphnia*
S02T_TODD	*Selenastrum*
S03T_BOULD	*Ceriodaphnia*
05T_HONDO	*Ceriodaphnia*
06T_FC_BR	*Selenastrum*
S02T_ELLS	*Ceriodaphnia*
S03T_TIMB	*Ceriodaphnia*
S04T_HOPP	*Selenastrum, Ceriodaphnia*
VTR_SANTO	*Selenastrum, Ceriodaphnia*
VTR_THACH	*Selenastrum, Ceriodaphnia*
06T_LONG	*Selenastrum, Ceriodaphnia, Pimephales*

Toxicity Results: High-Conductivity Sites

For ambient waters with a conductivity >3000 uS/cm, salt-tolerant species must be used for toxicity testing. The following species were used for toxicity tests performed on samples collected on June 9-10, 2007 at high-conductivity sites:

Thalassiosira pseudonana (algae)
Hyalella azteca (invertebrate)
Atherinops affinis (fish)

During the first toxicity sampling event, the culture of *Atherinops affinis* crashed, causing a second round of 3-species testing to be performed on samples collected at high-conductivity sites on September 10, 2007. For that round of testing, *Menidia beryllina* was chosen to replace *Atherinops affinis* because *Menidia* is more readily available (there is only one supplier of *Atherinops affinis* in the United States). *Thalassiosira* and *Hyalella* were used again for the second round of testing. The *Hyalella* test conducted during the second round of testing was deemed to be invalid due to a control failure. However, between the two rounds of testing, at least one test for each species was successful.

As with samples from freshwater sites, chronic toxicity tests were run on aliquots of 100% sample collected at the three high-conductivity monitoring sites. Results are therefore reported in terms of a significant difference in an endpoint (i.e., growth, reproduction, biomass) relative to the control. Toxicity tests were performed on samples collected at the following monitoring sites:

- 01T_ODD2_DCH: This site is a tributary to Mugu Lagoon and is located on an agricultural drain just south of Hueneme Road.
- 01T_0DD3_ARN: This site is also a tributary to Mugu Lagoon and is located near the end of Arnold Road, just west of the Arnold Road bridge.
- S04T_TAPO: Tapo Canyon Creek is a tributary to the Santa Clara River and is located on Newhall Land property just west of the Ventura / Los Angeles County line.

A summary of toxicity results for the three high-conductivity sites is presented in Table 15.

Table 15. Toxicity Results Summary – High-Conductivity Sites

Site ID	Event	*Thalassiosira*	*Hyalella* [1]	*Atherinops* [2]		*Menidia* [3]		TUc	TIE Triggered
		Cell Growth Toxicity	*Survival Toxicity*	*Survival Toxicity*	*Biomass Toxicity*	*Survival Toxicity*	*Reprod. Toxicity*		
01T_ODD2_DCH	1	N	N		NR	-----	-----	1.0	------
01T_ODD2_DCH	2	N	NR	-----	-----	N	N	1.0	------
01T_ODD3_ARN	1	Y	N	NR	NR	-----	-----	>1.0	------
01T_ODD3_ARN	2		NR	-----	-----	N	N	1.0	------
S04T_TAPO	1	Y	N	NR	NR	-----	-----	>1.0	*Thalassiosira*
S04T_TAPO	2	N	NR	-----	-----	N	N	1.0	------

[1] NR = No Results; invalid Event 2 test due to control failure. Quality of culture obtained from supplier suspected, as mortality occurred in all test treatments. Potential salt sensitivity also suspected, as demonstrated by excessive mortality in the salt control.

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

[3] Menidia beryllina was selected as a replacement species for Atherinops affinis for use in 3-species screen due to greater availability of Menidia.

Toxicity to *Thalassiosira* (algae) was detected during the first round of screening at 01T_ODD3_ARN and SO4T_TAPO.

The species selected for future screening at each of the high-conductivity sites are listed in Table 16.

Table 16. Species Selected for Future Testing at High-Conductivity Sites

Site ID	Species
01T_ODD2_DCH	*Hyalella or Ceriodaphnia* (depending on EC)
01T_ODD3_ARN	*Thalassiosira*
S04T_TAPO	*Thalassiosira*

NITROGEN

The presence of excess nitrogen in waterways has the potential to stimulate the growth of algae and other aquatic plant life. Excessive aquatic plant growth can be an aesthetic nuisance and contribute to low dissolved oxygen levels. Low DO levels can have impacts on aquatic life in waterbodies. Additionally, nitrogen found in surface waters, particularly in the form of nitrate, has the potential to leach and contaminate groundwater. High nitrate is also a drinking water concern particularly for infants who can develop methemoglobinemia (blue-baby syndrome) (Basin Plan, 1994). Nitrogen in the form of ammonia-nitrogen can be toxic to aquatic life. This WQMP covers nitrate-nitrogen, nitrite-nitrogen, ammonia-nitrogen, and the sums of all of these constituents.

Nitrogen Conditional Waiver benchmark exceedances occurred at seven Calleguas Creek, one Oxnard Plain, and three Santa Clara River Watershed sites. Nitrogen is not a seasonal exceedance issue and was present in samples year round. Additionally, there are two TMDLs in effect that address nitrogen issues in the Calleguas Creek and Santa Clara River watersheds. The seven Calleguas Creek Watershed sites that exceeded the Conditional Waiver benchmark also exceeded the TMDL load allocation. The Tapo Canyon site in the Santa Clara River Watershed met the TMDL load allocation though it exceeded its site specific Basin Plan objective. Though neither of these TMDLs requires the development of an agricultural WQMP, implementation of this plan will assist non-point source agricultural dischargers in meeting the load allocations specified in these TMDLs.

Nitrogen is an important macronutrient necessary for plant growth and is widely applied to agricultural lands as both organic and inorganic fertilizers. It is when excessive nitrogen is applied to crops and either runs off the field or leaches to groundwater that it poses a threat to water quality.

BMPs to prevent nitrogen runoff and leaching fall into two categories: source control and runoff control. Source control focuses on the appropriate amount and timing of nitrogen applications to ensure that nitrogen is available when plants need it and over-fertilization does not occur. Runoff control is the prevention of nitrogen rich irrigation water from leaving the field or leaching below the rooting zone of the crop. Eliminating irrigation runoff is the most straightforward way of achieving runoff control, however if this is not possible, installing cover crops and filter strips are two possible ways to utilize excess nitrogen.

DISSOLVED OXYGEN

Dissolved oxygen levels must be adequate to support aquatic organisms. A lack of sufficient dissolved oxygen can result in anaerobic conditions, which give off odors from decomposition or in sustained or extreme cases may lead to fish kills (Basin Plan, 1994). One site in the Santa Clara River watershed had depressed dissolved oxygen levels during the Event 2 sampling event. Additionally, the Calleguas Creek Nitrogen TMDL addresses dissolved oxygen exceedances through nitrogen control (as discussed in the previous section). As a result, this section only covers the observed Conditional Waiver exceedance.

Like toxicity, dissolved oxygen is not a specific pollutant, but rather a water quality problem that can result from a number of factors. Both elevated pollutant concentrations and physical characteristics of the site can impact dissolved oxygen levels. As a result, site specific information that provides information on this water quality problem is discussed in this section.

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.

View from sampling location upstream towards Hwy 126 bridge during Event 2.

View upstream from sampling location during Event 2.

Table 17. S03T_BOULD Dissolved Oxygen Exceedance for 2007

Constituent	Units	Benchmark	Results Event 2 9/10/2007
Field Measurements			
Flow	CFS	---	0.05
Dissolved oxygen	mg/L	≥ 5	***3.2***

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

At the Boulder Creek monitoring site (S03T_BOULD) water is collected where it flows over a concrete lip into a sandy bottomed channel that flows under Hwy 126 and eventually into the Santa Clara River. This exceedance in the dissolved oxygen benchmark occurred during the

second monitoring event that took place on September 10, 2007. The weather at the time of collection was sunny and warm with a light breeze and the dissolved oxygen was measured at 12:02. At the time of collection this sampling site was also 100 percent shaded and filamentous algae was noted as covering 30% of the concrete surface from which the dissolved oxygen was measured. The flow at the monitoring point was only 0.05 cubic feet per second (Table 17). It is likely the low flow conditions allowing the water to slow and/or stagnate caused depressed oxygen levels at that time. The presence of organic matter could be another factor causing the depressed dissolved oxygen level.

The dissolved oxygen exceedance discussed above was a localized problem, likely due to the physical conditions of the site, specific BMPs will not be implemented to address this issue. Nitrogen BMPs implemented in this drainage area should contribute to reducing any dissolved oxygen exceedances that are resulting from excessive algal growth.

TEMPERATURE

Discharges causing fluctuations or unnatural changes to receiving waters can have a negative impact on aquatic life (Basin Plan, 1994). There was only one site which during one event exceeded the appropriate benchmark for discharge temperature. As discussed for dissolved oxygen, temperature is not itself a pollutant, but rather a water quality problem that can be caused by pollutants or physical characteristics of the monitoring location. Additionally, temperature is influenced by the ambient temperature at the time of sample collection independent of any discharge contributions. Site specific information outlining the conditions during which this exceedance occurred are described below.

05D_SANT_VCWPD

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

View upstream (NW) facing the VCWPD stream gage during Event 2 exceedance.

Table 18. 05D_SANT_VCWPD Temperature Exceedance for 2007

Constituent	Units	Benchmark	Results Event 2 9/10/2007
Field Measurements			
Flow	CFS	---	1.0
Temperature	°C	≤ 26.7˚C [1]	***29.5***

Note: Concentrations in ***bold italics*** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent.
[1] The temperature limit for waterbodies designated as WARM is 80˚F (26.7˚C).

Water temperature measured at this site during Event 2 exceeded the temperature benchmark for waterbodies designated as WARM. The Event 2 sample was collected at 14:45, at the heat of the day. The outside ambient temperature was approximated at 22 degrees Celsius. Water depth at the deepest point in the channel was only ~2.4 inches, a factor which likely influenced water temperature. This concrete, rectangular channel is not shaded and the weather at this site was described as sunny and warm with a light breeze. Therefore, it is not the temperature of any agricultural discharges that are causing this exceedance but the ambient conditions when the sample was collected. It is also relevant to note that the Santa Clara Drain is a storm drain and therefore ambient, natural conditions have not been established for this site.

The temperature exceedance discussed above was a localized problem, likely due to the physical conditions of the site and the elevated ambient temperature at the time of sample collection, specific BMPs will not be implemented to address this issue.

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. Copper is most bioavailable and potentially toxic in its ionic form, which readily moves across cell membranes. Organism uptake of copper happens when it is present in surrounding waters and in food sources. This element does not tend to bioaccumulate. Nickel is most bioavailable as an ion and inorganic complexes. Accumulation of nickel also depends on uptake via water and food, however biomagnification is not an important concern. Similar to the other metals, the form of mercury is important in determining its potential for causing toxicity within the food-chain. Methlymercury is of the greatest concern since this is the form found in organisms and readily biomagnifies through predator-prey interactions. This form is highly toxic to humans and wildlife. Selenium enters the food web and is bioaccumulated after being ingested by the lower trophic levels in the form of particulate matter. Reproductive problems and other health impairments can occur from bioaccumulation of selenium (Calleguas Creek Watershed Metals and Selenium TMDL Technical Report, 2006).

Current Conditional Waiver requirements do not include monitoring for metals or selenium, however a Calleguas Creek Watershed TMDL for these constituents became effective March 26, 2007 and requires the development of an agricultural water quality management plan to address these constituents (LARWQCB Resolution 2006-012). Inclusion of these constituents in this WQMP fulfills the aforementioned TMDL requirement. Monitoring results and special study source identification analyses are necessary before areas can be targeted for education outreach and BMP implementation to reduce any excessive inputs of these trace elements.

Implementation of the metals and selenium component of this WQMP will follow the process described in the subsequent sections.

The aforementioned trace elements are naturally present in agricultural soils and may also be present in these typical inputs: groundwater used for irrigation, imported irrigation water, and local surface water irrigation sources. An additional input pathway for these elements is atmospheric deposition. Currently, copper is the only metal that has been identified as being applied as a pesticide in the CCW, though mercury was used historically. Trace levels of these elements may also be present in other pesticides and fertilizers. Losses of these elements from agricultural land can occur through plant uptake and crop removal, leaching, and volatilization. However, of concern in regards to water quality are trace element transport to surface waters from erosion and runoff, which can carry sediment bound and soluble forms of these constituents.

As stated in the Calleguas Creek Watershed Metals and Selenium TMDL Technical Report (2006), BMPs utilized to address Conditional Waiver constituent exceedances are likely to reduce discharges of metals and selenium. Since the constituents addressed in this TMDL are transported with eroding particles or in runoff, BMPs that retain soil and water on-site will also limit the movement of metals and selenium. Other management practices that may be considered by growers needing to reduce metals and selenium transport include those suggested in the Calleguas Creek Watershed Metals and Selenium TMDL Technical Report:

- Consider replacing copper containing pesticides with alternatives
- Identify irrigation water sources containing high selenium and determine if an alternative water supply is feasible.

Management Practice Identification, Implementation, and Tracking

The purpose of this section is to define the process that will be 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. The process identified in this section will address the following required elements of the WQMP (as provided in Appendix 7 to the Conditional Waiver) and include a timeline during which VCAILG and its members will carry out these steps, to be approved by the Regional Board Executive Officer:

1. Evaluation of sources and existing management practices including, but not limited to:
    a. Pesticide use evaluation
    b. Irrigation practices and discharge information
    c. Fertilizer and pesticide application and post-application practices
    d. Management practices to address other wastes (salt, sedimentation, nitrogen, etc.) where applicable
    e. Operational practices
2. Plan for identifying and implementing additional management practices with time-specific milestones

3. Methods for determining the impact of management practices with time-specific milestones
4. Schedule for revision of management practices (if appropriate)

Implementation of this WQMP will take a concerted effort between the VCAILG Steering Committee and its members with additional assistance from agricultural outreach organizations. Utilizing the relationships and experience these organizations have with local growers will enable efficient dispersal of information and should translate into more BMP implementation and compliance with water quality benchmarks.

One such relationship will be utilized to maximize the implementation of BMPs during the remaining two years of the Conditional Waiver. The University of California Cooperative Extension (UCCE) and Resource Conservation District (RCD), both of Ventura County, have a long track record of working with local growers providing BMP guidance and education outreach, researching agricultural issues and providing practical solutions. The UCCE has successfully completed two grant projects funded by the Water Board. Both projects included BMP assistance, education outreach and training, and water quality monitoring to test BMP effectiveness. To further assist local growers, UCCE and the RCD have obtained another Water Board grant under the 319h program. The objective of this grant is to assist Ventura County growers in complying with the Conditional Waiver Benchmarks and TMDL load allocations and successfully implement this WQMP. The VCAILG will be working closely with these groups to assist with WQMP implementation.

WQMP IMPLEMENTATION PROCESS

Figure 7 and Table 19 outline the WQMP implementation process, task responsibilities, and a timeline for task completion. Figure 8 provides the date-specific timeline for individual WQMP tasks as well as how and when each priority tier will be targeted. Each element of the process is then discussed in more detail in the sections following the figure.

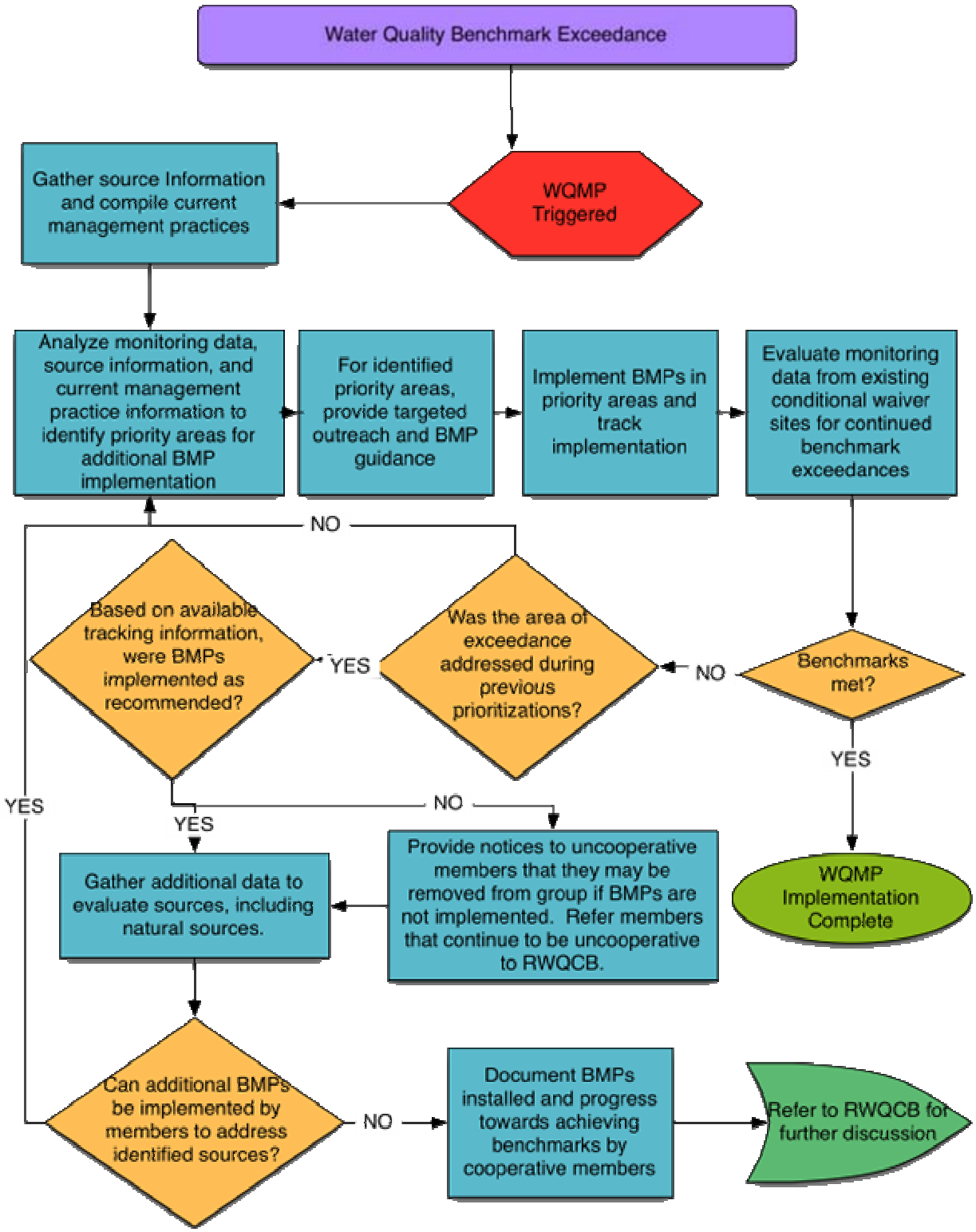

Figure 7. WQMP Implementation Process

The implementation process shown in Figure 7 summarizes the mechanisms that will be used to evaluate and implement BMPs through VCAILG over the long term. During the remaining two years of the waiver, review and implementation of BMPs will occur within the prioritized areas where exceedances have occurred. The BMP implementation will initially be targeted in the first and second tier priority areas and coordinated with existing programs and grants as they are available. The third tier priority areas will be targeted during the final months of the current Conditional Waiver. Additional BMPs may also be installed independently of these priority areas by motivated growers. A tracking system will be implemented that will allow any grower to report their BMP implementation to the VCAILG.

As stated in the Conditional Waiver (R4-2005-0080, page 9) "the Regional Board does not expect that water quality objectives will be achieved in all waters of the state in the Los Angeles Region within the term of this Order." However, this WQMP will take steps to begin addressing all benchmark exceedances observed during the 2007 monitoring. If continued exceedances are observed and with the adoption of another Conditional Waiver, the VCAILG could continue this process of monitoring, submitting technical reports, and implementing and refining management practices to achieve benchmarks where agricultural runoff is a source of non-compliance.

Table 19 provides a summary of the tasks from the flow chart that will be implemented during the term of the Conditional Waiver (through 2010). Figure 8 adds detail to Table 19 by showing the date-specific implementation milestones that will be used to carry out the WQMP. Tasks are also broken down by priority tier to show how and when each area will be targeted.

Table 19. WQMP Implementation Tasks and Timeline

Flow Chart Step	Task	Implementation Period
Gather source information and compile information on current management practices	Compile management practices from existing information sources.	Included in this report.
	Collect Pesticide Use Records	Pesticide Use Information will be gathered and reported as soon as 2007 records are available and annually thereafter.
	Collect survey data	Ongoing
Analyze information and identify priority areas	Identify priority areas	Included in this report.
	Review information using criteria and update priority areas	Updates will be made in each subsequent WQMP. August 15, 2009 August 15, 2010
Provide targeted outreach and BMP guidance for priority areas	Provide targeted outreach and BMP guidance.	2009-2010
Implement BMPs in priority areas and track implementation	Implement BMPs	2009-2010
	Track BMP implementation	2009-2010
Evaluate monitoring data for benchmark exceedances	Conduct monitoring at existing conditional waiver monitoring locations per the approved MRP	2009-2010
	Evaluate monitoring results for exceedances of benchmarks	Submitted in all Annual Monitoring Reports
Evaluate BMP implementation to determine next steps	Use BMP tracking information to assess the next steps for implementation using the flow chart above.	2010 if continued benchmark exceedances are observed.
	Revise WQMP and/or MRP as appropriate based on results of assessment	At the discretion of VCAILG Steering Committee or in the event that future monitoring events yield samples that exceed water quality objectives.

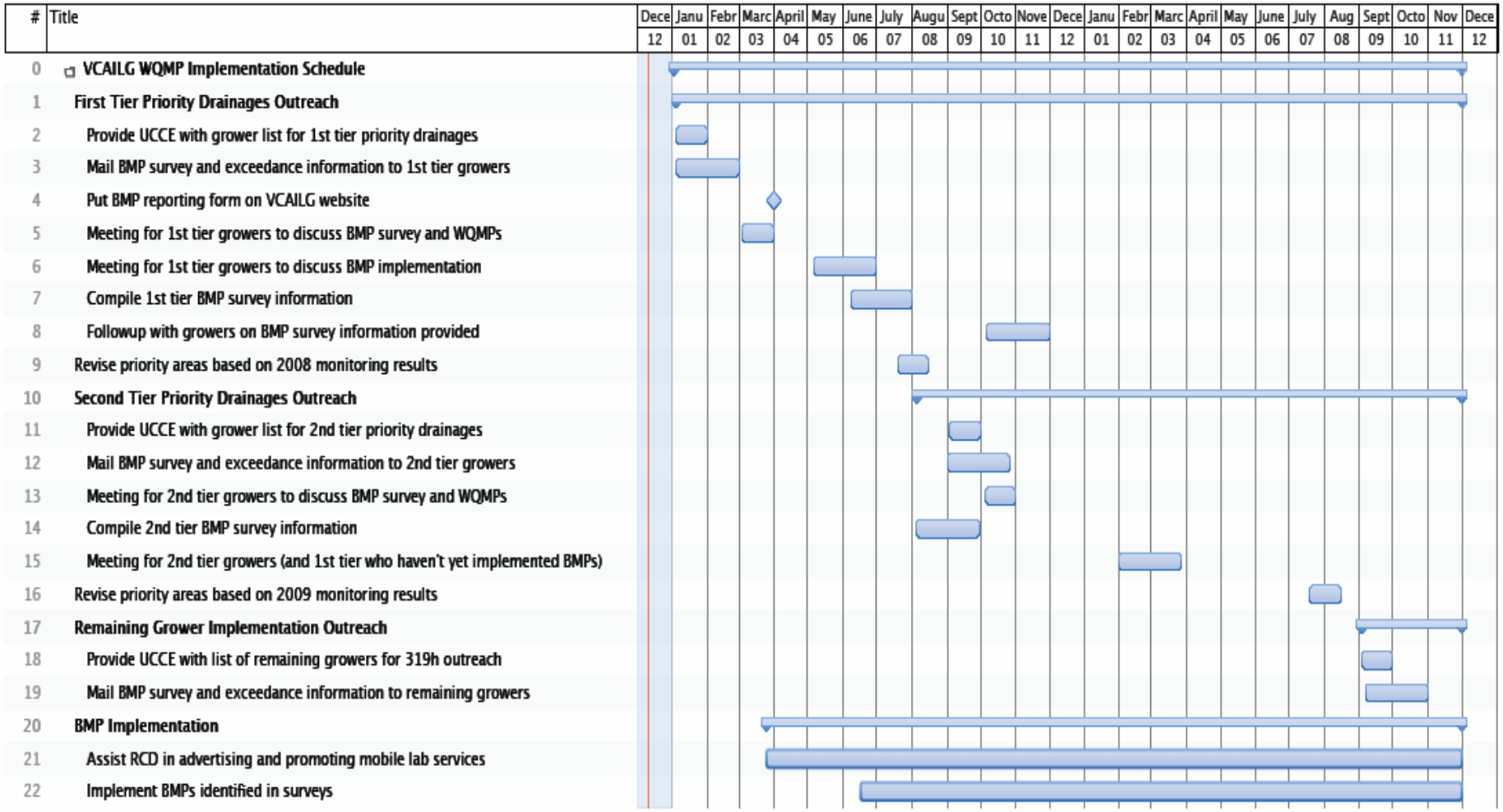

Figure 8. Task and Date-specific Implementation Timeline

GATHER SOURCE INFORMATION AND CURRENT MANAGEMENT PRACTICES

The first step of this plan is to gather information on potential sources and assess the present status of management practice implementation. Basic information on sources has been provided in previous sections of the WQMP. Further information on sources will be gathered as necessary to facilitate BMP implementation in prioritized drainage areas. Additionally, Pesticide Use Records from the County Agricultural Commissioner will be utilized to identify sources of currently used pesticides. Pesticide Use Records for 2007 are not yet available for reporting. The VCAILG has met with the Agricultural Commissioner's Office and they will be providing Pesticide Use Reports for growers draining to monitoring sites that had exceedances of currently used pesticides during 2007. Pesticide Use information on pesticides with exceedances will be compiled and included in the 2008 VCAILG Annual Monitoring Report.

At this time the greatest source of Ventura County management practice information is from the work of UCCE through its Proposition 13 and 50 grants. To date, 65 nurseries, 72 citrus orchards, and 94 avocado orchards have been surveyed regarding their management practices. These surveys account for approximately 2,831 acres of nurseries, 3,581 acres of citrus, and 4,732 acres of avocado operations. Over 11,000 acres were surveyed out of the 136,596 acres enrolled in VCAILG, or 8 percent. A thorough analysis of the nursery survey results was submitted in the report for the Prop 13 grant entitled, "Summary of Improvements: Use of Improved Technologies and Best Management Practices for the Control of Nursery Runoff into Ventura County and Los Angeles County Watersheds." To avoid a duplication of efforts, the nursery survey results by watershed, which make up Appendix A in the "Summary of Improvements" are included in this report as Appendix D. The Prop 50 grant is still in progress and therefore a thorough analysis of the avocado and citrus survey data is yet to have been completed. Of the seven categories in the avocado and citrus surveys, four of those categories relate to water quality and include questions similar to those in the management practice survey shown in Figure 12. Only results from the four relevant categories: soil management, water and nutrient management, pest management, and education, are included in the Appendix D citrus and avocado survey results summary.

The Prop 13 "Summary of Improvements" documented changes in management practice implementation between 2004 and 2006. The following statistically significant changes in nursery practices were presented in Chapter 2 of the "Summary of Improvements."

- There was an increase in regular irrigation uniformity evaluations and the use of specific methods, equipment, and personnel to determine irrigation scheduling as well as a decrease in practices such as overhead irrigation without regard for overspray onto bare areas and irrigating without timers or clocks.
- Fewer nurseries leached at every irrigation event; more nurseries used specific factors to determine when to leach and measured the amount of leaching occurring in their operations by 2006.
- Significant improvements in runoff management included an increase in the number of nurseries collecting both irrigation and storm water runoff and recycling this collected water, as well as regular monitoring and maintaining records of runoff water quality.

- An increased number of nurseries tested their growing media for water holding capacity and considering wetting agents to increase media water holding capacity. An increased number of nurseries considered nutrients already present in irrigation water and media, thoroughly incorporated compost, regularly tested fertigation water, and stored, mixed, and loaded fertilizer according to law.
- More nurseries used pest management guidelines to aid in management decision-making and used diagnostic lab or other professional services for identification of unknown pests or growth problems.
- Several operational improvements such as locating pesticide mixing and loading operations on impermeable surfaces away from waterways, regular calibration of spray equipment, annual pesticide handler training and record keeping, quarantine of plant material, and the installation and maintenance of a sediment collection structure were also documented.
- Many nurseries improved property management practices by ensuring irrigation runoff and sediment remains on the property, by preventing erosion and runoff in non-production areas, by maintaining spill cleanup equipment, by properly disposing vehicles, equipment, and storage tanks no longer in use, by locating waste containers indoors or covering those outdoors, and by training employees in runoff, spill, waste, and sanitation management.
- The number of nurseries that stencil or otherwise designate municipal storm drains on their property, with restrooms properly connected to the sanitary sewer system, and with a documentation system for water quality issues were substantially increased.

Grower responses to the avocado and citrus surveys completed through the Prop 50 grant, were similar to nursery survey questions in the following categories: soil management, water and nutrient management, pest management, and continuing education. Avocado growers had over a 60% yes response to questions regarding soil, water, and nutrient management. Citrus growers scored over 60% in management practices dealing with water, nutrient, and pest management. Both types of growers answered positively about taking opportunities for their own continuing education, however more effort should be given to training employees. Of the citrus growers surveyed, it seems that erosion control is an area that could use improvement (only a 44% positive response). The lowest scoring management practice categories for avocado growers were the use of natural enemies and erosion control, which both receiving only 50% yes responses.

The results of these surveys provide general information on BMP implementation for some crop types in Ventura County. Additional information on the current level of BMP implementation is needed and a process has been developed to obtain this information. The next three sections of this plan focus on how the VCAILG will reach out to growers in areas with benchmark exceedances, educate them about the exceedances, gather information regarding existing BMPs and plans for new BMP implementation, and track the progress that will be made towards meeting water quality benchmarks and TMDL load allocations.

IDENTIFICATION OF PRIORITY AREAS

Identifying priority areas is important for focusing outreach efforts and promoting the implementation of BMPs in the areas with water quality benchmark exceedances. Four criteria categories were used to determine first, second, and third tier priority drainage areas:

- The total number of constituent exceedances at the monitoring site. This is the exceedance total from each site as listed in Table 8.
- Number of classes of pollutants with exceedances at the monitoring site. The pollutant classes are those listed in Table 9 (salts, nitrogen, chronic toxicity, OC pesticides, OP pesticides, dissolved oxygen, and temperature).
- The number of TMDLs effective at the monitoring site as shown in Table 12.
- Percentage of agricultural acreage enrolled in VCAILG. Figure 9 through Figure 11 show the drainage areas of each VCAILG monitoring site and the location of parcels that are not currently enrolled in VCAILG. Area close-ups of VCAILG monitoring site drainages can be found in Appendix C. This fourth category will be considered when determining the feasibility of monitoring water quality improvements at current VCAILG monitoring sites. In cases where a monitoring site drainage area has a significant proportion of un-enrolled landowners or there are un-enrolled parcels adjacent to the monitoring site location, those drainages' priority level may be downgraded until enrollment in VCAILG improves.

The following table details the results of monitoring site drainage prioritization based on the above criteria.

Table 20. Monitoring Site Drainage Area Prioritizations

Site ID	Category 1 Total # Constituent Exceedances	Category 2 # of Classes of Pollutants with Exceedances	Category 3 # of Effective TMDLs	Category 4a Total Ag Acres in Drainage Area	Category 4 % Ag Acres Enrolled in VCAILG
01T_ODD2_DCH	9	3	5	1700.854	95.7%
01T_ODD3_ARN	10	3	5	690.499	100.0%
02D_BROOM	4	2	5	5867.557	99.9%
04D_ETTG	11	3	5	4060.51	99.9%
04D_LAS	11	3	5	3192.627	96.1%
05D_SANT_VCWPD	19	5	6	1633.98	90.1%
05D_LAVD	12	5	6	2003.917	100.0%
05T_HONDO	5	2	6	3208.978	97.3%
06T_FC_BR	4	2	5	2405.239	99.4%
06T_LONG	0	0	5	2628.891	96.0%
9BD_GERRY	0	0	6	1066.76	100.0%
OXD_CENTR	10	3	0	1589.22	100.0%
S02T_ELLS	4	2	0	3835.15	99.6%
S02T_TODD	10	4	1	2797.71	99.6%
S03T_TIMB	3	1	1	1632.739	100.0%
S03T_BOULD	7	4	1	2514.052	73.6%
S03D_BARDS	2	2	1	1628.879	91.6%
S04T_HOPP	0	0	0	508.22	92.3%
S04T_TAPO	19	4	0	3768.47	100.0%
VRT_THACH	0	0	0	1734.668	98.0%
VRT_SANTO	0	0	0	1208.012	91.8%

	High Priority	#1: > 10	#2: > 4	#3: > 4
	Medium Priority	#1: 5-10	#2: 2-3	#3: 2-3
	Low Priority	#1: < 5	#2: < 2	#3: < 2

	1st tier prioritized drainages
	2nd tier prioritized drainages
	3rd tier prioritized drainages

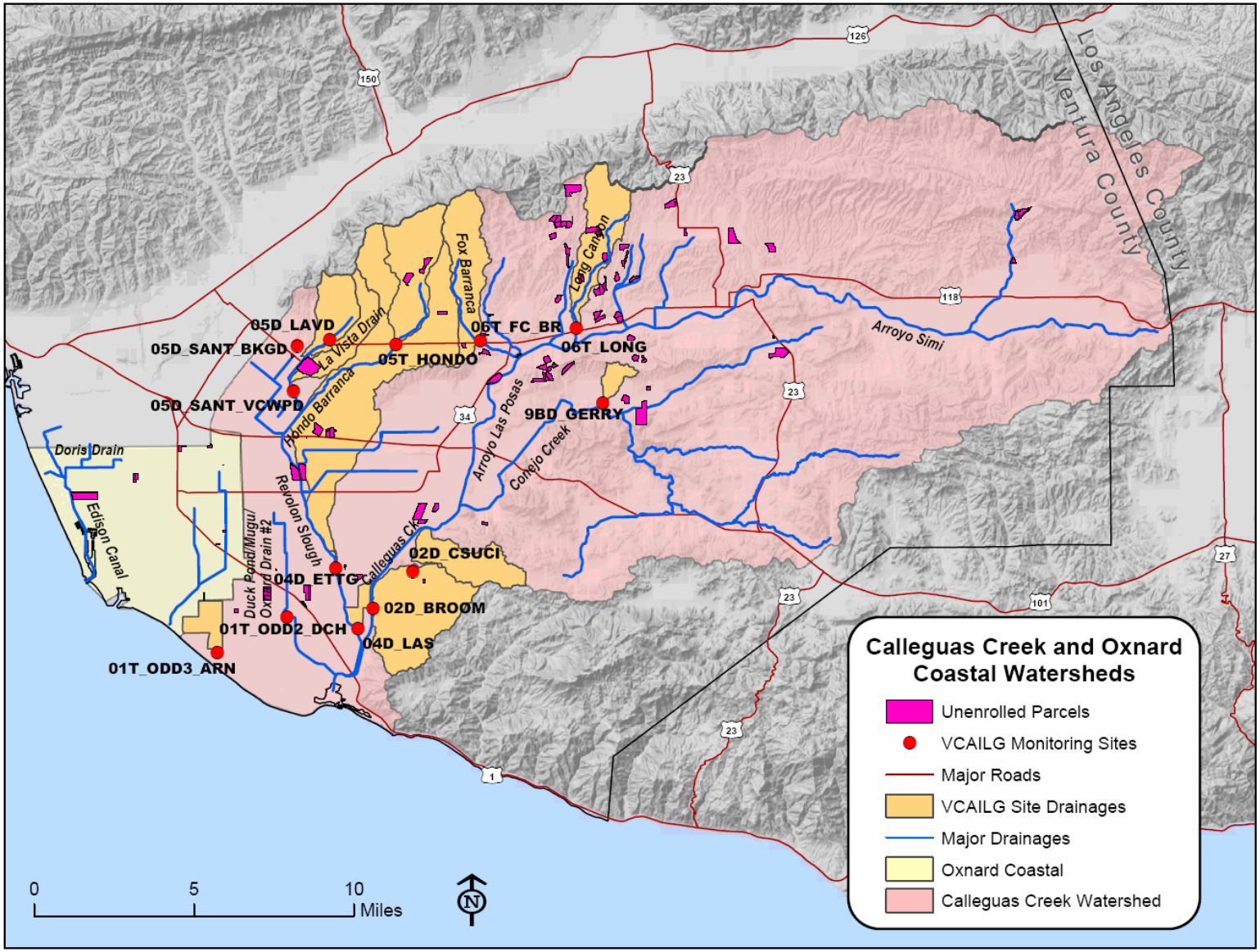

Figure 9. Calleguas Creek and Oxnard Coastal Watersheds Monitoring Site Drainages and Un-enrolled Parcels

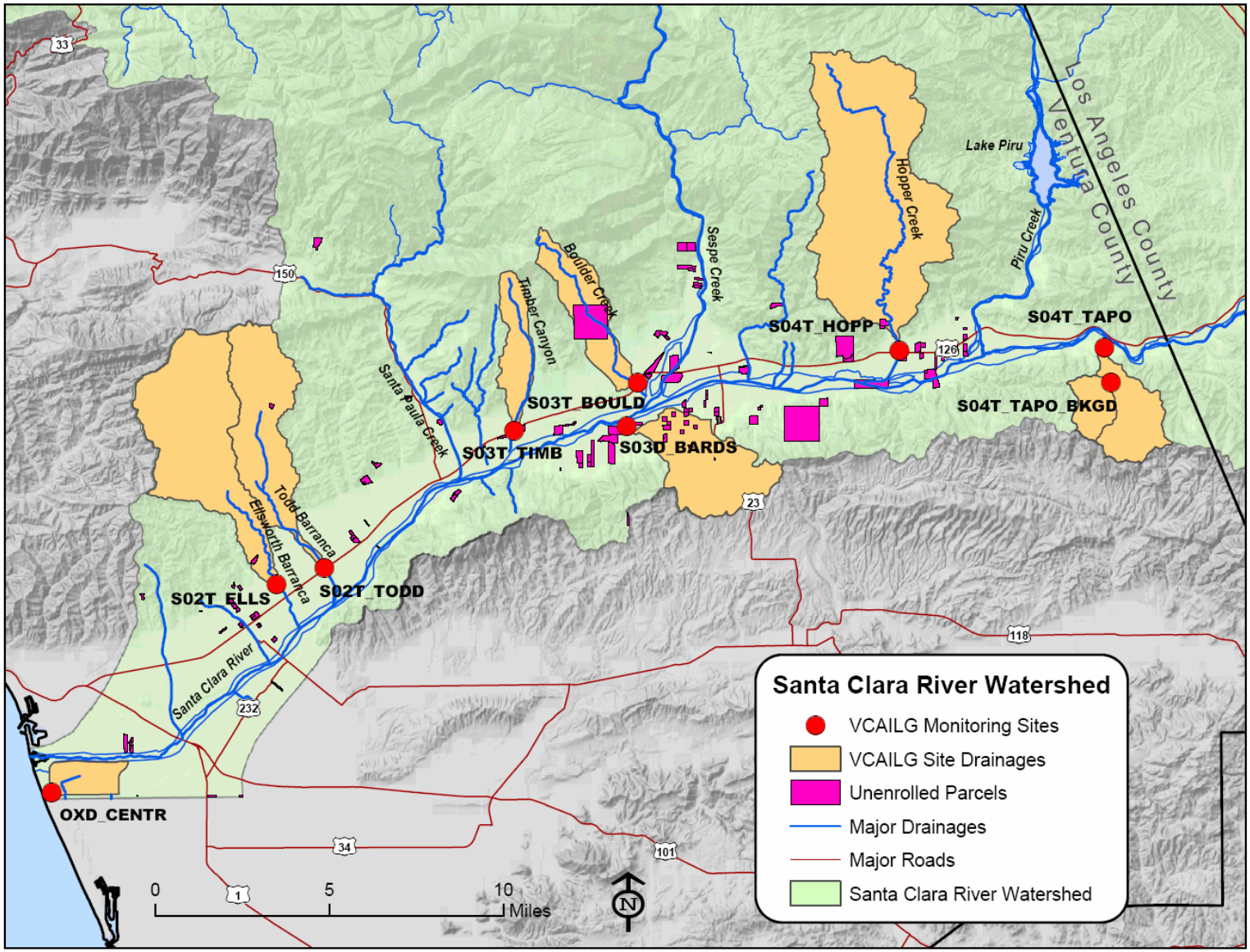

Figure 10. Santa Clara River Watershed Monitoring Site Drainages and Un-enrolled Parcels

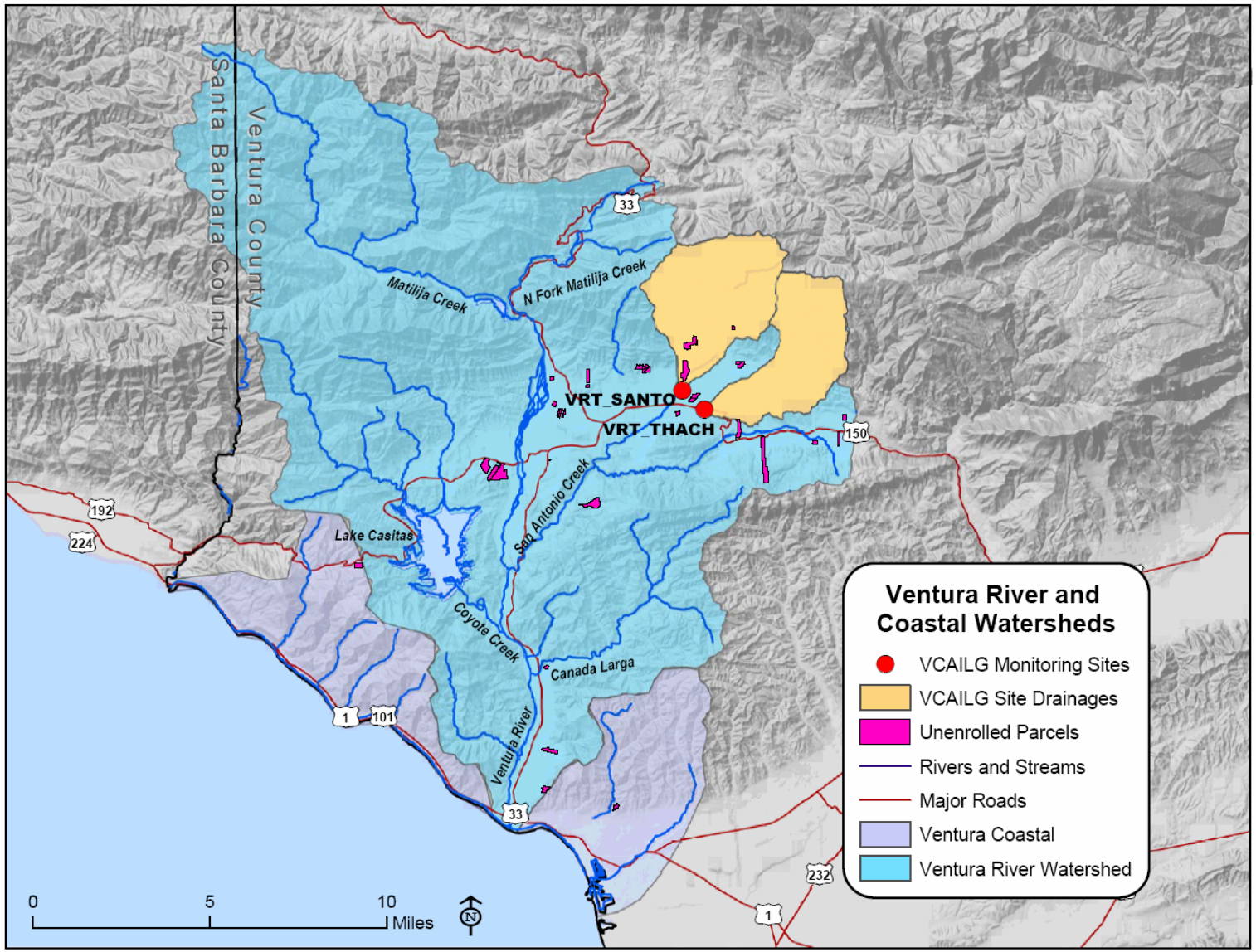

Figure 11. Ventura River Watershed Monitoring Site Drainages and Un-enrolled Parcels

Prioritized drainage areas will be targeted for BMP implementation and management practice survey reporting according to the timeline and task list in Figure 8. All priority drainages will continue to be targeted from the point of initial outreach, as listed in the timeline, until the end of the current Conditional Waiver, unless they cease to have any further water quality benchmark exceedances. Appendix C shows the drainage areas for each VCAILG monitoring site, which are also the priority area boundaries.

Growers that are not in priority areas will be notified of the need to implement management practices, provided with resources for selecting appropriate management measures, and given a mechanism for tracking BMP implementation in the VCAILG grower database. However, they will not receive targeted outreach or BMP assistance during this Conditional Waiver.

Priority areas will continue to evolve (as shown in the flow chart) as future monitoring data becomes available; sites that are currently a priority may show significant water quality improvements and areas where there has previously been no runoff could have water quality impairments that will need to be addressed. Any changes to priority tier status of a monitoring site drainage will be noted in subsequent WQMPs, including the rational for the change.

GROWER OUTREACH AND BMP IMPLEMENTATION

In order to inform VCAILG members of their obligations under the Conditional Waiver and this WQMP, continued grower outreach is imperative. Outreach will be targeted to growers according to the priority tiers and timeline described in previous sections. Methods of outreach to be carried out by the VCAILG include the following:

- Provide 319h grant team with lists of growers in each of the priority drainages according to the WQMP timeline (Figure 8). This will allow the grant team to provide on-site consultations, workshops, and demonstration tours for those growers in the areas which need the most assistance in achieving water quality benchmarks.
- Mail management practice surveys to growers in priority drainages according to the WQMP timeline (Figure 8). This will provide them with an opportunity to report their existing management practices, management practices that are newly implemented, and planned practices to address exceedances in their drainage area.
- Posting the management practice survey on the Water Quality section of the Farm Bureau website to enable any VCAILG member to report their current, new, and planned management practices.
- Host three meetings between February 2009 and the end of the current Conditional Waiver according to the WQMP timeline (Figure 8). These meetings will focus on filling out the management practice survey, informing growers of water quality exceedances in their area, and discussing the importance of new management practice implementation and reporting.
- Provide growers with Mobile Irrigation Testing Lab information (page 65).

Uncooperative growers who do not participate in outreach opportunities or provide requested information may be removed from the VCAILG and reported to the Regional Board at the discretion of the VCAILG Steering Committee.

IDENTIFICATION OF SPECIFIC MANAGEMENT PRACTICES

Though the sources and effects of the constituents covered by the WQMP are varied, many BMPs have the potential to address more than one constituent exceedance. The following is a summary of general recommendations for BMPs addressing source control and runoff management that could be implemented. Specific BMPs are listed in relation to the constituents they address in Figure 12.

Source Control

- Irrigation management (includes utilization of the Irrigation Mobile Lab)
- Nutrient and fertilizer management
- Integrated Pest Management
- Erosion and runoff management
- Maintaining a clean facility and management of non-production areas
- Proper training of workers

Runoff Control

In Field:

- Cover crops, mulch
- Terracing, contours

Edge of Field:

- Vegetated ditches and buffers

Structural BMP:

- Grassed waterway
- Detention basin
- Recycling basin
- Constructed wetland

The remainder of this section identifies specific management measures and management practices to improve discharge quality, according to the timeline presented previously in this document. Specific management practices that can be utilized by growers to achieve the water quality benchmarks have been identified in the WQMP. In order to inform growers of appropriate management practices and the constituents that they target, the management measures have been organized into a management practice survey that can be used to identify currently used management measures and track future implementation. The survey was developed through coordination between the VCAILG and UCCE (Figure 12). The recommended management practices in the survey were taken from the following reliable and industry recognized sources to ensure that the practices will reduce discharges of pollutants identified in the WQMP:

- Recommendations by UCCE Farm Advisors
- NRCS Field Office Technical Guide
- Farm Water Quality Plan, ANR Publication 9002
- Positive Points System for California Avocados, 2007
- Positive Points System for California Citrus, 2006
- Self-assessment tool for evaluation of sustainable citrus management practices, 2006

- Checklist for Assessing and Mitigating Runoff in Greenhouses and Nurseries, 2004.

The management practice survey was developed to evaluate existing practices, practices implemented since the first year of monitoring that triggered the development of this WQMP, and practices planned for implementation to address constituent exceedances. Including the "Planned for Future" category will enable the VCAILG to follow-up with growers in priority areas and ensure they are implementing appropriate BMPs to address the exceedances in their drainage area. By checking the appropriate boxes under "Practice Tracking," growers will provide the VCAILG with the information it needs to assess its members' progress towards implementing appropriate practices.

The management practice survey will also be used as an outreach and educational tool. When providing information to growers in priority areas, as described in the BMP Implementation Tracking section, the survey will be accompanied by an informative cover sheet. Appendix E contains cover sheets for the first tier priority monitoring site drainages. Each cover sheet will be specific to a particular monitoring site drainage area and will inform the grower that their property drains to that monitoring site. The cover sheet will also include the appropriate monitoring drainage map (Appendix C) and a list of the exceedances that have been reported in the Annual Monitoring Reports (Appendix B). Once the VCAILG member has filled out the management practice survey according to the practices already in place or not applicable to their operation, they can then assess which BMPs they are not implementing but are appropriate for future implementation. By comparing the information in the "Pollutants Being Controlled/Targeted" columns of the management practice survey with the exceedances in their drainage area as noted on their survey cover sheet, VCAILG members can come up with a plan for implementing appropriate BMPs on their properties. Once filled out, the surveys will provide the basis for the VCAILG tracking and reporting of BMP information and allow the VCAILG to identify areas where additional BMP implementation may be required.

Figure 12. Management Practice Survey

Management Practices		Practice Tracking					Pollutants Being Targeted/Controlled				
							Fertilization, Irrigation, & Runoff Control		Sediment Transport & Runoff Control [1]		
	Sediment and Erosion Management	**Yes, currently used**	**New Since Jan. 2008**	**No, not currently used**	**Planned for future**	**N/A**	***Nitrogen***	***Salts***	***OC Pesticides***	***OP Pesticides***	***Metals***
1	Consult with local agencies (NRCS, RCD, UCCE, or county planning) to develop a soil conservation plan.								x	x	x
2	Know your soil series and its erosion hazard rating.								x	x	x
3	Consider erosion hazard rating and prevailing winds when choosing row orientation.								x	x	x
4	Long runs of production area are broken up by access roads or buffer strips.								x	x	x
5	Riparian areas of other areas of natural vegetation were retained or expanded during site development.						x	x	x	x	x
6	Avoid bare fields using cover crops, leaving plant debris, or planting subsequent crops.						x	x	x	x	x
7	Minimize compaction by using drive rows, reducing tractor passes, reducing cultivation, and avoiding driving on or tilling wet ground.								x	x	x
8	Apply mulch, compost, or green waste to improve soil characteristics, especially for sandy or clayey soils.						x	x	x	x	x
9	Windbreaks or shelterbelts are used in areas prone to wind erosion.								x	x	x

	Sediment and Erosion Management cont.	Yes, currently used	New Since Jan. 2008	No, not currently used	Planned for future	N/A	Nitrogen	Salts	OC Pesticides	OP Pesticides	Metals
10	In sloped production areas, management practices to minimize erosion such as contour farming, contoured buffer strips, or terracing are used.						x	x	x	x	x
11	Berms, culverts, or flow channels are in place to divert water away from roads.						x	x	x	x	x
12	Road erosion is minimized by grading, using gravel or mulch on roads, or constructing water bars or drainways.								x	x	x
13	Erosion management practices such as terracing, water diversions, and critical area plantings are used for non-production areas that are sloped or hilly.						x	x	x	x	x
14	Ditch banks are protected from erosion with vegetation, rock protection, or geotextiles.						x	x	x	x	x
15	Non-cropped areas with bare soil are protected from erosion with vegetation, mulch, gravel, or by diverting water.						x	x	x	x	x
16	Irrigation runoff is captured or kept on the property.						x	x	x	x	x
17	Stormwater runoff is captured or kept on the property.						x	x	x	x	x
18	Sediment traps are used at the end of the field to retain sediments in runoff.						x	x	x	x	x
19	Devices are in place to treat runoff before it leaves the property, such as grassed waterways, vegetated filter strips, and tailwater recycling systems.						x	x	x	x	x
Irrigation Management											
20	At least annually test the irrigation system for distribution uniformity by monitoring water delivery or pressure differences within a block.						x	x	x	x	x

Irrigation Management cont.		Yes, currently used	New Since Jan. 2008	No, not currently used	Planned for future	N/A	Nitrogen	Salts	OC Pesticides	OP Pesticides	Metals
21	Utilize the services of the Irrigation Mobile Lab.						x	x	x	x	x
22	Implement appropriate improvements based on your own irrigation system test or the recommendations of the Irrigation Mobile Lab.						x	x	x	x	x
23	When drip irrigation is used, the distribution uniformity is 90% or better.						x	x	x	x	x
24	Irrigation main and lateral lines are regularly inspected for breaks, leaks, or clogs.						x	x	x	x	x
25	Filters are inspected and cleaned regularly.						x	x	x	x	x
26	Lines are maintained to prevent clogging.						x	x	x	x	x
27	Pressure regulators are used.						x	x	x	x	x
28	Sprinkler heads and drip emitters of the same gallonage are used within each block and replaced with the same heads or emitters when necessary.						x	x	x	x	x
29	Consistent riser heights are used.						x	x	x	x	x
30	Water is diverted from non-crop areas by adjusting sprinkler head arcs or using sprinkler guards.						x	x	x	x	x
31	When irrigating for frost protection, the proper timing and amount of irrigation is used.						x	x	x	x	x
32	Alternative equipment such as tunnels, air circulation, heaters, or smudge pots are used for frost protection.						x	x	x	x	x
33	The grower knows the infiltration rate of the soil, the available water holding capacity of the soil, and the crop rooting depth.						x	x	x	x	x

	Irrigation Management cont.	Yes, currently used	New Since Jan. 2008	No, not currently used	Planned for future	N/A	Nitrogen	Salts	OC Pesticides	OP Pesticides	Metals
34	Soil moisture is measured with equipment such as gypsum block soil moisture sensors (such as Watermarks), tensiometers, soil probe, or neutron probe.						x	x	x	x	x
35	Evapotranspiration (ET) values are used to determine irrigation requirements. Values are obtained from CIMIS, onsite atmometers, or other appropriate devices.						x	x	x	x	x
36	If irrigation must be based on a set schedule due to water availability, the timing or amount of irrigation is varied according to the weather.						x	x	x	x	x
37	Flow meters are used to measure actual water use.						x	x	x	x	x
38	Irrigation is halted if significant runoff occurs.						x	x	x	x	x
39	Harvested or unplanted areas are not irrigated.						x	x	x	x	x
40	Irrigation water quality is tested for parameters of interest including: pH, electrical conductivity (EC), sodium (Na), chloride (Cl), bicarbonate (HCO3), and boron (B).						x	x			
41	Well head is protected from surface contamination (located high in the landscape so that surface water drains away from well head; located away from potential contaminants; the space between the casing and sides of hole is grouted; casing regularly inspected for leaks; vermin-proof well cap with screened vent).						x	x	x	x	x

	Irrigation Management cont.	Yes, currently used	New Since Jan. 2008	No, not currently used	Planned for future	N/A	Nitrogen	Salts	OC Pesticides	OP Pesticides	Metals
42	Irrigation duties are performed only by personnel who understand and practice appropriate irrigation scheduling, application, and crop management practices related to runoff management.						x	x	x	x	x
	Pest Management										
43	Proper scouting methods are used to determine the population densities of insect pests, snails, slugs, and weeds and the incidence of diseases. Methods include yellow sticky traps, pheromone traps, plant inspection, beating, or net sweeping.									x	x
44	Use weather data or degree days to determine when to control pests.									x	x
45	Use UC IPM guidelines as a resource (www.ipm.ucdavis.edu).									x	
46	Diagnostic lab services or other professional assistance is used to identify unknown pathogens, pests, or growth problems before implementing a control measure.									x	x
47	All transplants, plugs, or plant material is inspected for pests before planting or introduction in the growing area.									x	x
48	Natural enemy populations are considered when choosing pesticides, application rates, and timing.									x	x
49	Beneficial insects or mites are released in the field.									x	x
50	Personnel are aware of the causal agents of diseases in the field and their methods of spread.									x	x

Pest Management cont.		Yes, currently used	New Since Jan. 2008	No, not currently used	Planned for future	N/A	Nitrogen	Salts	OC Pesticides	OP Pesticides	Metals
51	Personnel are familiar with methods and timing of disease control in the growing region.									x	x
52	Disease resistance or disease tolerant crop varieties are used.									x	x
53	Classes of pesticides are rotated to avoid resistance.									x	
54	The grower or pesticide applicator considers selectivity and effectiveness against the target organism before choosing a pesticide.									x	
55	Personnel are familiar with the UC online databases for comparing the risks of different pesticides moving with water and sediment and affecting non-target organisms (WaterTox or Pesticide Wise).									x	
56	Spray timing is based on economic thresholds of pest incidence.									x	x
57	Hot spots are identified and sprayed rather than treating an entire field.									x	x
58	Sprayers are routinely calibrated to ensure accurate application rates.									x	x
59	Worn nozzles and screens are replaced to ensure the best coverage of pesticide applications.									x	x
60	Treatment rate, water volume, and driving speed are optimized to attain the coverage needed for specific pests.									x	x
61	Pesticides are applied only according to the label and environmental hazards are followed.									x	x
62	Pesticides are applied at the lowest effective labeled rate.									x	x

	Pest Management cont.	Yes, currently used	New Since Jan. 2008	No, not currently used	Planned for future	N/A	Nitrogen	Salts	OC Pesticides	OP Pesticides	Metals
63	Pesticide use records are submitted monthly to the county Agricultural Commissioner.									x	x
64	Pesticides are stored where they are protected from rain and contained on an impermeable pad with curb to contain spills or leaks.									x	x
65	Pesticide mixing and loading is done on an impermeable surface and more than 100 feet down slope from any wells.									x	x
66	Pesticide disposal methods are environmentally safe.									x	x
67	Reduced risk pesticides are used.									x	
68	Choose selective pesticides for the target pest species and avoid using broad-spectrum pesticides.									x	
69	Avoid applying pesticides when wind could move them off-target as drift.									x	x
70	Avoid applying pesticides when rain or scheduled irrigation will move the pesticides as runoff and ground percolation.									x	x
71	Copper sulfate is not applied prior to extensive irrigation or expected rainfall.							x			x
72	Copper containing pesticides are replaced with alternatives.										x
	Nutrient Management										
73	Most recent nutrient recommendations for your particular crops and growing practices are used.						x	x			
74	Chemical properties of the soil, including pH and electrical conductivity (EC) are routinely measured.						x	x			

Nutrient Management cont.		Yes, currently used	New Since Jan. 2008	No, not currently used	Planned for future	N/A	Nitrogen	Salts	OC Pesticides	OP Pesticides	Metals
75	Soil fertility is routinely monitored through measurements of nitrogen, phosphorus, potassium, and micronutrients.						x	x			
76	Fertilization rates are adjusted based on the results of soil fertility measurements.						x	x			
77	Crop plants are visually assessed for signs of nutrient deficiency or toxicity.						x	x			
78	Leaf or petiole analyses are used as a guide for fertilizer application.						x	x			
79	Fertilizer applications are split into multiple smaller applications rather than applying all that is required for a crop in one large application.						x	x			
80	Fertilizer levels in fertigation water are tested to ensure that injectors are correctly calibrated.						x	x			
81	Fertilizer applications are timed to maximize plant uptake, taking into consideration the life stage of the crop, potential rain events, and irrigation timing.						x	x			
82	Slow-release fertilizers are used.						x	x			
83	Fertilizer applications are adjusted to account for other nutrient sources, such as: irrigation water, cover crops, and residuals from previous fertilizations.						x	x			
84	Fertilizers are stored where they are protected from rain and on an impermeable pad with a curb to contain spills.						x	x			

	Nutrient Management cont.	Yes, currently used	New Since Jan. 2008	No, not currently used	Planned for future	N/A	Nitrogen	Salts	OC Pesticides	OP Pesticides	Metals
85	Mixing and loading of fertilizers occurs in a covered area on an impermeable surface and more than 100 feet down slope from any wells.						x	x			
	Salinity Management and Leaching										
86	Leaching is performed only when necessary, as determined by measuring soil solution electrical conductivity (EC).						x	x			
87	Leaching is done only when fertilizer injectors are turned off.						x	x			
88	Fertilizers and amendments with a low salt index are used.							x			
89	Saline or high selenium wells are decommissioned and other sources of water are used.							x			
	Property Management										
90	Landowner, grower, or other personnel regularly attend UC Cooperative Extension, Commodity Board, or other industry meetings.						x	x	x	x	x
91	Landowner, grower, or other responsible personnel subscribe to and read farming, trade, and industry journals containing articles about water quality, fertilizer, pest and erosion management.						x	x	x	x	x
92	Employees receive training on the following: wearing protective clothing, understanding fertilizer/pesticide signage, MSDS and label information, personal hygiene and sanitation, trash disposal and recycling, use storage and disposal of fertilizers and pesticides, pest and disease scouting, spill cleanup, and irrigation.						x	x	x	x	x

Property Management cont.		Yes, currently used	New Since Jan. 2008	No, not currently used	Planned for future	N/A	Nitrogen	Salts	OC Pesticides	OP Pesticides	Metals
93	Training is provided in the employees' native language.						x	x	x	x	x
94	Fuel tanks are checked and maintained to prevent leaks.										x
95	Spill cleanup materials are readily accessible and maintained for all potential types and sizes of spills						x	x		x	x
96	All vehicles, trucks, and tractors are regularly maintained to detect and prevent fluid leaks.										x
97	Vehicles, machinery, and tanks no longer in use are drained of fluids, and those fluids properly disposed.										x
98	The property is kept clean and free of debris.										
99	The property has an adequate number of waste containers that are regularly collected to prevent overflow and are kept covered to prevent scattering of trash.										
100	Restrooms or portable toilets are available where needed and regularly maintained.										

[1] Pesticides and metals have the potential to cause toxicity. Therefore, BMPs that address these classes of constituents will also mitigate toxicity exceedances.

Mobile Irrigation Testing Lab

This year the Ventura County Resource Conservation District (RCD) secured funding from a state Prop 84 grant and also the VCAILG to provide irrigation testing services to local growers. Special attention is being paid to this program since it has the capability of providing BMP guidance to address a wide range of constituents. Irrigation assessments are an invaluable service to growers to assist them in identifying potential irrigation system performance upgrades that could lead to:

- Increased application efficiency and water distribution
- Increased yields
- Improved water quality by reducing/eliminating irrigation runoff
- Decreased nutrient leaching
- Decreased water application due to higher efficiency
- Decreased energy usage
- Decreased fertilizer and/or pesticide application

Outreach and BMP implementation that results from the testing lab will be tracked and included in the VCAILG BMP database. To ensure VCAILG members take advantage of this service and improve their existing systems based on the results of irrigation evaluations, the VCAILG will provide support to the Mobile Irrigation Testing Lab by:

- Advertising this service on the Farm Bureau website
- Advertising in the Farm Bureau newsletter
- Advertising in management practice survey mailings or other VCAILG communications with its members
- Providing sign-up forms for Mobile Lab services at VCAILG meetings

BMP IMPLEMENTATION TRACKING

One of the most important components of this plan is tracking the efforts of the VCAILG members in implementing BMPs to mitigate or eliminate the pollutant discharges from their lands. The VCAILG will maintain a master database of BMP information pertaining to its members. This information will be gathered from the following sources:

- VCAILG direct communication with grower members through mailings, meetings, and phone calls.
- VCAILG indirect communication with members using crop commission mailings and education outreach as a tool to gather management practice information.
- Management Practice Surveys for growers to submit to VCAILG for inclusion in the database. The form will be made available on the VCAILG website and mailed to growers within priority drainages.
- 319h grant communications with growers, including surveys, on-site consultations, workshops, tours, phone calls, other mailings. To enable efficient follow-up of BMP implementation, the VCAILG will provide UCCE with a list of its members who previously filled out a survey and are located within the priority drainage areas.
- Growers participating in the RCD's Irrigation Audits will be contacted in regard to changes they have made to their wells, pumps, and/or irrigation system following the recommendations outlined in their audit report.

Ground-truthing of management practices is necessary when BMPs are said to be in place, yet there are continued water quality exceedances as compared to other drainages with similar BMP implementation. Should situations arise where monitoring results are not matching up with stated management practice implementation, the VCAILG will engage in site visits to assess the extent to which reported BMPs are being implemented. The 319h grant team will also be notified of these discrepancies so they may assist in these assessments. Anyone discovered to be submitting false information may be subject to removal from the group as determined by the VCAILG Steering Committee.

MONITORING RESULTS EVALUATION AND NEXT STEPS

The WQMP implementation has been designed based on the existing Conditional Waiver monitoring location drainage areas. As a result, the existing monitoring program can be utilized to determine if BMP implementation is effective in reducing water quality benchmark exceedances. Utilizing the existing monitoring sites and their identified drainage areas to prioritize, track, and implement management practices to address water quality impairments enables the VCAILG to build the existing dataset utilizing consistent sites that have been determined to represent agricultural discharges. Comparing management practice implementation between monitoring drainages and correlating that with the monitoring data will allow BMP effectiveness to be assessed. Additional monitoring (as discussed below) will be implemented if necessary to further evaluate sources and BMP effectiveness.

In each year of the program, VCAILG will review the monitoring results from the Conditional Waiver sites and determine if water quality benchmarks are being exceeded. If water quality

benchmarks are met, then the WQMP implementation is considered complete. If additional constituents are identified that are not covered by this WQMP, revisions to the plan will be developed to address the additional constituents. If water quality benchmarks continue to be exceeded for constituents covered by this WQMP, a number of steps may be taken depending on the situation (as shown in the flow chart). Three different scenarios have been identified, each requiring different actions:

1. Drainage was not identified as a high priority during the initial phase of implementation and BMP implementation has been limited or has not occurred.
2. Drainage was targeted, but not all members in the drainage implemented BMPs or not all of the recommended BMPs were implemented.
3. Drainage was targeted and BMPs were implemented as recommended.

For the first situation, the drainage will be evaluated using the developed criteria to determine if it is a high priority area for BMP implementation during the second tier implementation period. If so, then this drainage will be added to the second tier priority list and included in that phase of the WQMP implementation process.

Under the second scenario, attempts will be made to follow up with uncooperative members and encourage implementation of BMPs. If the members continue to be uncooperative, the VCAILG Steering Committee, at their discretion, may provide notice to the member(s) that they are subject to removal from the group if BMPs are not implemented and remove them from the group if actions are not taken. Additionally, the VCAILG Steering Committee may provide notice to the RWQCB that the member is no longer participating as part of the group. Under this scenario (and also for drainages that contain growers who are not participating in VCAILG), it will be important to document the implementation of BMPs that has occurred by other members in the drainage and determine whether or not the properties that have implemented BMPs are still contributing to the benchmark exceedance. This evaluation may require additional monitoring through modifications to the Monitoring and Reporting Program (MRP) as discussed for the third scenario.

Under the third scenario, all members of VCAILG in a priority drainage area have implemented BMPs and benchmark exceedances are still occurring. In this situation, additional information will need to be gathered to identify the source of the exceedances. This could be done through a modification to MRP to pinpoint pollutant sources. The evaluation will include an assessment of the effectiveness of the implemented BMPs in controlling the constituent of concern, an assessment of other sources that could be causing the exceedance (including natural sources and agricultural sources not covered by VCAILG), and the practicability for modifications to existing BMP implementation to improve effectiveness or further BMP implementation. Depending on the extent and effectiveness of BMP implementation in the drainage, additional BMP implementation or BMP modification may or may not be practicable. The practicability of additional BMP implementation will be evaluated at a minimum by assessing the effectiveness of available BMPs to control the pollutant in agricultural discharges, evaluating the patterns of exceedance (dry or wet weather), summarizing the BMPs in place to address the exceedance and their effectiveness, determining the contribution from these sites to the load as compared to other sources, and conducting a cost analysis of the current BMPs and additional BMP implementation costs. If additional BMPs are determined practicable by the VCAILG Steering Committee then growers in the impacted areas will be contacted to make additional improvements. If additional

BMPs are impractical or other sources have been identified as the primary cause of the benchmark exceedances, documentation of implemented BMPs and their effectiveness will be provided to the Regional Board and VCAILG will await further discussion and instruction from the Regional Board.

With the participation of its members in this WQMP, the VCAILG will be able to document the efforts and progress towards improving water quality in Ventura County.

SUBMITTAL OF VCAILG MEMBER INFORMATION

Information regarding existing and newly installed BMPs, as well as other operational information relevant to water quality obtained from VCAILG members will be compiled on a monitoring site drainage or subwatershed basis for submittal to the Regional Board. All member information will be maintained should an inspection of the records be requested by Regional Board staff as required by the Conditional Waiver.

BMP References

VCAILG members will be responsible for implementing BMPs that are the most appropriate for their site conditions, operations, and water quality benchmark exceedances occurring in their drainage area. In addition to the management practice checklist, the following is a list of resources for finding more detailed information on implementing BMPs, resource agency contact information, and how to report existing and future BMP implementation to the VCAILG in order to be in compliance with this WQMP.

BMP REPORTING SHEET

Farm Bureau of Ventura County Website
http://www.farmbureauvc.com

FARM WATER QUALITY PLANNING

The complete Farm Water Quality Series is available through http://anrcatalog.ucdavis.edu
click on FREE PUBLICATIONS
click on FARM WATER QUALITY PLANNING
If you would like to learn more about a particular environmental issue or management practices relevant to a specific crop, use the labeled links below.

General Information

NRCS Field Office Technical Guide for Ventura County
http://efotg.nrcs.usda.gov/treemenuFS.aspx
US EPA Agricultural Management Practices for Water Quality Protection
http://www.epa.gov/watertrain/agmodule/index.htm
Nonpoint Sources of Pollution in Agriculture
http://anrcatalog.ucdavis.edu/pdf/8055.pdf
Developing a Nonpoint Source Pollution Program
http://anrcatalog.ucdavis.edu/pdf/8087/pdf
Evaluating Water Quality
http://anrcatalog.ucdavis.edu/pdf/8118.pdf
Soil Erosion in Agriculture

http://anrcatalog.ucdavis.edu/pdf/8196.pdf
Vegetated Filter Strips
http://anrcatalog.ucdavis.edu/pdf/8195.pdf

Pesticide Information

PesticideWise (toxicity, leaching, runoff potential)
http://www.pw.ucr.edu/
Pesticide Selection
http://anrcatalog.ucdavis.edu/pdf/8119.pdf
http://www.ipm.ucdavis.edu/
UCCE Pesticide Runoff and Mitigation Education
http://groups.ucanr.org/PesticideMitigation/

Nursery, Floriculture, Greenhouse

Nutrient Management Goals for Nursery and Floriculture
http://anrcatalog.ucdavis.edu/pdf/8122.pdf
Nutrient Management in Nursery and Floriculture
http://anrcatalog.ucdavis.edu/pdf/8221.pdf
Sediment Management Goals for Nursery and Floriculture
http://anrcalalog.ucdavis.edu/pdf/8124.pdf

Strawberries

Sediment Management Goals for Strawberries
http://anrcatalog.ucdavis.edu/pdf/8071.pdf
Nutrient Management for Vegetables
http://anrcatalog.ucdavis.edu/pdf/8123.pdf

Vegetables

Nutrient Management Goals for Vegetables
http://anrcatalog.ucdavis.edu/pdf/8097.pdf
Nutrient Management for Vegetables
http://anrcatalog.ucdavis.edu/pdf/8098.pdf

Orchards

Avocado Handbook: Diseases, Economics, Fertilization, Fire, Frost Control, Harvesting, Horticulture, Irrigation, Pest Control
http://ceventura.ucdavis.edu/Agriculture265/Avocado_Handbook.htm
Citrus Website: Disease, Insects, Weeds:
http://ceventura.ucdavis.edu/Agriculture265/Citrus.htm
Sediment Management Goals for Orchards
http://anrcatalog.ucdavis.edu/pdf/8219.pdf
Orchard Water Requirements
http://anrcatalog.ucdavis.edu/pdf/8212.pdf
Pest Management-Avocado
http://www.ipm.ucdavis.edu/PMG/selectnewpest.avocado.html
Pest Management-Citrus
http://www.ipm.ucdavis.edu/PMG/selectnewpest.citrus.html

Cover Crops in Orchards
http://www.sarep.ucdavis.edu/ccrop/CCPubs/CCSelectionAnManagement.html
Cover Crops to Scavenge Nitrogen in Orchards
http://www.sarep.ucdavis.edu/newsltr/v5n3/sa-4.htm

IRRIGATION SCHEDULING

CIMIS (California Irrigation Management Information System)
http://www.cimis.water.ca.gov/cimis/welcome.jsp
CA Avocado Commission Irrigation Calculator
*Useful for any micro-sprinkler irrigation system
http://www.avocado.org/growers/irrigcalc.php

ASSISTANCE AGENCIES

University of California Cooperative Extension – Ventura County

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http://ceventura.ucdavis.edu/
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Vegetable or Strawberry: Farm Advisor Oleg Daugovish *(Habla Español!)*
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3380 Somis Rd.
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805-386-4489
District Conservationist: Brooks Engelhardt
brooks.engelhardt@ca.usda.gov

Ventura County Resource Conservation District / Irrigation Mobile Lab

3380 Somis Rd.
Somis, CA 93066
805-386-4489
http://www.vcrcd.org/Index.cfm
District Manager: Marty Melvin
marty.melvin@vcrcd.org

RECURSOS EN ESPAÑOL

Manejo intregrado de plagas de fresa
Insectos y arañas, enfermedades, nemátodos, malezas, precauciones para el uso de pesticidas, 70 paginas. Disponible para descarga gratis:
http://anrcatalog.ucdavis.edu/PestManagementGuidelines/3473.aspx

Notes breves sobre insectos dañinos en la agricultura, el hogar, y el jardin
http://www.ipm.ucdavis.edu/QT/qtindexsp.html

Guias, videos, y otros materiales de varios temas: identificación y monitoreo de la chicharrita de alas cristalinas,
http://anrcatalog.ucdavis.edu/EnEspa%c3%b1ol/

Guia para el manejo de las plagas: fresas
http://www.ipm.ucdavis.edu/PDF/PMG/pmgstrawberry_espanol.pdf

University of California Cooperative Extension – Ventura County

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Conclusions and Recommendations

This WQMP addresses exceedances of numerous constituents observed during the 2007 VCAILG Conditional Waiver Monitoring Program and requirements to develop WQMPs for effective TMDLs in Ventura County. The WQMP provides a discussion of the impacts of the identified constituents and potential agricultural sources. Additionally, the WQMP identifies a process through which BMPs will be implemented in Ventura County by the VCAILG members, a schedule for the phased approach of targeting priority areas, and methods for evaluating the performance of the implementation program and making changes if necessary. Additionally, existing programs will be utilized to provide additional outreach and BMP implementation assistance during the WQMP implementation.

Given that only one year of monitoring has been completed and this document represents the first WQMP under the Conditional Waiver, changes to the VCAILG Conditional Waiver Monitoring Program and/or WQMP are not recommended at this time. Modifications to this plan and the monitoring program will be proposed as necessary in the future based on the process outlined in this plan.

Appendix A

Photos of Sites When Exceedances Occurred During 2007

CALLEGUAS CREEK WATERSHED
01T_ODD2_DCH

Event 1

View upstream

View downstream

Event 2

View upstream

View downstream

Event 3

View upstream

View downstream

01T_ODD3_ARN

Event 1

View upstream

View downstream

Event 2

View upstream

View downstream

Event 3

View upstream

View downstream

02D_BROOM

Event 2

Pipe discharge at site

Event 3

View upstream

Pipe with drain water flowing

04D_ETTG

Event 1

View upstream

View downstream

Event 2

View upstream

View downstream

Event 3

View upstream

View downstream

04D_LAS

Event 1

View upstream

View downstream

Event 2

View upstream

View downstream

Event 3

Measuring flow at site

View of culvert and pipe inlets

05D_SANT_VCWPD

Event 1

View upstream

Channel cleaning on sampling date

Event 2

View upstream

View downstream

Event 3

View upstream

View downstream

05D_LAVD

Event 1

View upstream

View downstream

Event 2

View upstream

View downstream

05T_HONDO

Event 3

View upstream

View downstream

06T_FC_BR

Event 3

View upstream

View downstream

OXNARD COASTAL WATERSHED
OXD_CENTR

Event 1

View upstream

View downstream

Event 2

View upstream

View downstream

Event 3

View upstream

SANTA CLARA RIVER WATERSHED
S02T_ELLS

Event 3

Upstream view

Downstream view

S02T_TODD

Event 1

View upstream

View downstream

Event 2

View upstream

View downstream

Event 3

View upstream from monitoring point

View downstream of monitoring point

S03T_TIMB

Event 3

Close-up of sampling point

View looking downstream

S03T_BOULD

Event 1

View upstream

View downstream

Event 2

View upstream

View downstream

S03D_BARDS

Event 3

View Upstream

View Downstream

S04T_TAPO

Event 1

View upstream

View downstream

Event 2

Upstream view

Downstream view

Event 3

Upstream view

Downstream view

Appendix B

Benchmark Exceedance Data by Constituent and Site

ORGANOCHLORINE PESTICIDES EXCEEDANCES

Calleguas Creek Watershed

01T_ODD2_DCH

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

Table 21. 01T_ODD2_DCH Organochlorine Pesticides Exceedances for 2007

			Results		
Constituent	Units	Benchmark	Event 1 6/4/2007	Event 2 9/10/2007	Event 3 12/19/2007
4,4'-DDD	µg/L	0.00084	ND	ND	***0.027***
4,4'-DDE	µg/L	0.00059	***0.007***	***0.0069***	***0.0933***
4,4'-DDT	µg/L	0.00059	ND	ND	***0.0138***

ND = Not Detected

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 our after low tide.

Table 22. 01T_ODD3_ARN Organochlorine Pesticides Exceedances for 2007

			Results		
Constituent	Units	Benchmark	Event 1 6/4/2007	Event 2 9/10/2007	Event 3 12/19/2007
4,4'-DDD	µg/L	0.00084	***0.0181***	***0.0244***	***0.0185***
4,4'-DDE	µg/L	0.00059	***0.0437***	***0.0454***	***0.0744***
4,4'-DDT	µg/L	0.00059	ND	ND	***0.0056***

ND = Not Detected

02D_BROOM

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

Table 23. 02D_BROOM Organochlorine Pesticides Exceedances for 2007

			Results	
Constituent	Units	Benchmark	Event 2 9/11/2007	Event 3 12/19/2007
4,4'-DDD	µg/L	0.00084	***0.04***	ND
4,4'-DDE	µg/L	0.00059	***0.0702***	***0.029***

ND = Not Detected

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).

Table 24. 04D_ETTG Organochlorine Pesticides Exceedances for 2007

			Results		
Constituent	Units	Benchmark	Event 1 6/5/2007	Event 2 9/11/2007	Event 3 12/19/2007
4,4'-DDD	µg/L	0.00084	***0.0124***	***0.0108***	***0.0463***
4,4'-DDE	µg/L	0.00059	***0.0447***	***0.0248***	***0.4055***
4,4'-DDT	µg/L	0.00059	ND	***0.0059***	***0.0639***

ND = Not Detected

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).

Table 25. 04D_LAS Organochlorine Pesticides Exceedances for 2007

			Results		
Constituent	Units	Benchmark	Event 1 6/5/2007	Event 2 9/11/2007	Event 3 12/19/2007
4,4'-DDD	µg/L	0.00084	***0.0107***	***0.0267***	***0.0103***
4,4'-DDE	µg/L	0.00059	***0.0585***	***0.0585***	***0.0645***
4,4'-DDT	µg/L	0.00059	ND	***0.0187***	ND

ND = Not Detected

05D_SANT_VCWPD

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

Table 26. 05D_SANT_VCWPD Organochlorine Pesticides Exceedances for 2007

			Results		
Constituent	Units	Benchmark	Event 1 [1] 6/5/2007	Event 2 9/10/2007	Event 3 12/19/2007
4,4'-DDD	µg/L	0.00084	***0.2034***	ND	ND
4,4'-DDE	µg/L	0.00059	***0.7361***	***0.0101***	***0.0228***
4,4'-DDT	µg/L	0.00059	***0.4522***	ND	ND

ND = Not Detected

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

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.

Table 27. 05D_LAVD Organochlorine Pesticides Exceedances for 2007

			Results	
			Event 1	Event 2
Constituent	Units	Benchmark	6/5/2007	9/11/2007
Total Chlordane	µg/L	0.00059	ND	***0.0055***
4,4'-DDD	µg/L	0.00084	ND	***0.111***
4,4'-DDE	µg/L	0.00059	***0.0171***	***0.6817***

ND = Not Detected

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).

Table 28. 05T_HONDO Organochlorine Pesticides Exceedances for 2007

			Results
			Event 3
Constituent	Units	Benchmark	12/19/2007
4,4'-DDD	µg/L	0.00084	***0.0118***
4,4'-DDE	µg/L	0.00059	***0.1467***
4,4'-DDT	µg/L	0.00059	***0.0308***

06T_FC_BR

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

Table 29. 06T_FC_BR Organochlorine Pesticides Exceedances for 2007

			Results
			Event 3
Constituent	Units	Benchmark	12/19/2007
4,4'-DDD	µg/L	0.00084	***0.0086***
4,4'-DDE	µg/L	0.00059	***0.0599***
4,4'-DDT	µg/L	0.00059	***0.0051***

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 Blvd and into McGrath Lake. Water from McGrath Lake is pumped periodically into the ocean to prevent the Central Ditch from backing up and flooding Harbor Blvd.

Table 30. OXD_CENTR Organochlorine Pesticides Exceedances in 2007

			Results		
Constituent	Units	Benchmark	Event 1 6/5/2007	Event 2 9/11/2007	Event 3 12/19/2007
4,4'-DDD	µg/L	0.00084	ND	***0.0147***	***0.0096***
4,4'-DDE	µg/L	0.00059	***0.0083***	***0.0167***	***0.0311***
4,4'-DDT	µg/L	0.00059	ND	ND	***0.0201***

ND = Not Detected

Santa Clara River Watershed

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.

Table 31. S03D_BARDS Organochlorine Pesticides Exceedances in 2007

			Results
Constituent	Units	Benchmark	Event 3 12/19/2007
4,4'-DDE	µg/L	0.00059	***0.0072***

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.

Table 32. S04T_TAPO Organochlorine Pesticides Exceedances in 2007

			Results		
Constituent	Units	Benchmark	Event 1 6/4/2007	Event 2 9/10/2007	Event 3 12/19/2007
Total Chlordane	µg/L	0.00059	ND	ND	*0.0189*
4,4'-DDD	µg/L	0.00084	ND	*0.0372*	*0.0457*
4,4'-DDE	µg/L	0.00059	*0.0123*	*0.0588*	*0.1517*
4,4'-DDT	µg/L	0.00059	ND	*0.0202*	ND
Dieldrin	µg/L	0.00014	ND	*0.009*	ND

ND = Not Detected

ORGANOPHOSPHORUS PESTICIDES EXCEEDANCES

Calleguas Creek Watershed

01T_ODD2_DCH

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

Table 33. 01T_ODD2_DCH Organophosphorus Pesticides Exceedances for 2007

			Results
			Event 3
Constituent	Units	Benchmark	12/19/2007
Chlorpyrifos	µg/L	0.025	***2.146***

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).

Table 34. 04D_ETTG Organophosphorus Pesticides Exceedances for 2007

			Results
			Event 3
Constituent	Units	Benchmark	12/19/2007
Chlorpyrifos	µg/L	0.025	***1.38***

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).

Table 35. 04D_LAS Organophosphorus Pesticides Exceedances for 2007

			Results
			Event 3
Constituent	Units	Benchmark	12/19/2007
Chlorpyrifos	µg/L	0.025	***0.033***

05D_SANT_VCWPD

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

Table 36. 05D_SANT_VCWPD Organophosphorus Pesticides Exceedances for 2007

			Results
			Event 3
Constituent	Units	Benchmark	12/19/2007
Chlorpyrifos	µg/L	0.025	***0.292***

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.

Table 37. 05D_LAVD Organophosphorus Pesticides Exceedances for 2007

			Results
			Event 1
Constituent	Units	Benchmark	6/5/2007
Chlorpyrifos (9:00 AM sample)	µg/L	0.025	***0.1094***
Chlorpyrifos (11:00 AM sample)	µg/L	0.025	***0.0775***

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).

Table 38. 05T_HONDO Organophosphorus Pesticides Exceedances for 2007

			Results
			Event 3
Constituent	Units	Benchmark	12/19/2007
Chlorpyrifos	µg/L	0.025	***0.192***
Diazinon	µg/L	0.10	***0.125***

06T_FC_BR

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

Table 39. 06T_FC_BR Organophosphorus Pesticides Exceedances for 2007

			Results
Constituent	Units	Benchmark	Event 3 12/19/2007
Chlorpyrifos	µg/L	0.025	***0.054***

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 Blvd and into McGrath Lake. Water from McGrath Lake is pumped periodically into the ocean to prevent the Central Ditch from backing up and flooding Harbor Blvd.

Table 40. OXD_CENTR Organophosphorus Pesticides Exceedances for 2007

			Results
Constituent	Units	Benchmark	Event 3 12/19/2007
Chlorpyrifos	µg/L	0.025	***1.452***

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.

Table 41. S02T_ELLS Organophosphorus Pesticides Exceedances for 2007

			Results
Constituent	Units	Benchmark	Event 3 12/19/2007
Chlorpyrifos	µg/L	0.025	***0.038***

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.

Table 42. S02T_TODD Organophosphorus Pesticides Exceedances for 2007

			Results
Constituent	Units	Benchmark	Event 3 12/19/2007
Chlorpyrifos	µg/L	0.025	***0.16***

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.

Table 43. S03D_BARDS Organophosphorus Pesticides Exceedances for 2007

			Results
Constituent	Units	Benchmark	Event 3 12/19/2007
Chlorpyrifos	µg/L	0.025	***0.322***

SALTS EXCEEDANCES

Calleguas Creek Watershed

05D_SANT_VCWPD

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

Table 44. 05D_SANT_VCWPD Salts Exceedances for 2007

			Results		
Constituent	Units	Benchmark	Event 1 6/5/2007	Event 2 9/10/2007	Event 3 12/19/2007
Total Dissolved Solids (TDS)	mg/L	850	***2130***	***2000***	***3290***
Chloride	mg/L	150	***218***	***200***	***250***
Sulfate	mg/L	250	***940***	***894***	***1550***

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.

Table 45. 05D_LAVD Salts Exceedances for 2007

			Results	
Constituent	Units	Benchmark	Event 1 6/5/2007	Event 2 9/11/2007
Total Dissolved Solids (TDS)	mg/L	850	***1650***	***1830***
Sulfate	mg/L	250	***760***	***802***

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.

Table 46. S02T_ELLS Salts Exceedances in 2007

			Results
			Event 3
Constituent	Units	Benchmark	12/19/2007
Total Dissolved Solids (TDS)	mg/L	1200	***1720***
Chloride	mg/L	150	***260***
Sulfate	mg/L	600	***710***

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.

Table 47. S02T_TODD Salts Exceedances in 2007

			Results		
			Event 1	Event 2	Event 3
Constituent	Units	Benchmark	6/4/2007	9/10/2007	12/19/2007
Total Dissolved Solids (TDS)	mg/L	1200	***2150***	***2030***	***2530***
Sulfate	mg/L	600	***960***	***901***	***1160***

S03T_TIMB

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

Table 48. S03T_TIMB Salts Exceedances for 2007

			Results
			Event 3
Constituent	Units	Benchmark	12/19/2007
Total Dissolved Solids (TDS)	mg/L	1300	***2750***
Chloride	mg/L	100	***220***
Sulfate	mg/L	650	***1510***

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.

Table 49. S03T_BOULD Salts Exceedances for 2007

			Results	
Constituent	Units	Benchmark	Event 1 6/4/2007	Event 2 9/10/2007
Total Dissolved Solids (TDS)	mg/L	1300	***1630***	***1410***

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.

Table 50. S04T_TAPO Salts Exceedances for 2007

			Results		
Constituent	Units	Benchmark	Event 1 6/4/2007	Event 2 9/10/2007	Event 3 12/19/2007
Total Dissolved Solids (TDS)	mg/L	1300	*3320*	*3340*	*2590*
Chloride	mg/L	100	*204*	*196*	*128*
Sulfate	mg/L	600	*1890*	*1720*	*1290*

NITROGEN EXCEEDANCES

Calleguas Creek Watershed

01T_ODD2_DCH

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

Table 51. 01T_ODD2_DCH Nitrogen Exceedances for 2007

			Results		
Constituent	Units	Benchmark	Event 1 6/4/2007	Event 2 9/10/2007	Event 3 12/19/2007
Nitrate-N	mg/L	10 [1]	***63.25***	***12.28***	***30.23***
Nitrate-N	mg/L	9 [2]	***63.25***	***12.28***	***30.23***

[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 + Nitrite-N was used for comparison with VCAILG data collected at monitoring sites in this reach.

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

01T_ODD3_ARN

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

Table 52. 01T_ODD3_ARN Nitrogen Exceedances for 2007

			Results	
Constituent	Units	Benchmark	Event 1 6/4/2007	Event 3 12/19/2007
Nitrate-N	mg/L	10 [1]	***16.44***	***31.45***
Nitrate-N	mg/L	9 [2]	***16.44***	***31.45***

[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 + Nitrite-N was used for comparison with VCAILG data collected at monitoring sites in this reach.

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

02D_BROOM

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

Table 53. 02D_BROOM Nitrogen Exceedances for 2007

			Results
Constituent	Units	Benchmark	Event 3 12/19/2007
Nitrate-N	mg/L	10 [1]	***644***
Nitrate-N	mg/L	9 [2]	***644***

[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 + Nitrite-N was used for comparison with VCAILG data collected at monitoring sites in this reach.

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

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).

Table 54. 04D_ETTG Nitrogen Exceedances for 2007

			Results		
Constituent	Units	Benchmark	Event 1 6/5/2007	Event 2 9/11/2007	Event 3 12/19/2007
Nitrate-N	mg/L	10 [1]	***77.25***	No exceedance	***67.08***
Nitrate-N	mg/L	9 [2]	***77.25***	***9.58***	***67.08***

[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 + Nitrite-N was used for comparison with VCAILG data collected at monitoring sites in this reach.

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

04D_LAS

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

Table 55. 04D_LAS Nitrogen Exceedances for 2007

			Results		
Constituent	Units	Benchmark	Event 1 6/5/2007	Event 2 9/11/2007	Event 3 12/19/2007
Nitrate-N	mg/L	10	***25.12***	***11.61***	***32.46***
Nitrate-N	mg/L	9 [1]	***25.12***	***11.61***	***32.46***

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

05D_SANT_VCWPD

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

Table 56. 05D_SANT_VCWPD Nitrogen Exceedances for 2007

			Results		
Constituent	Units	Benchmark	Event 1 6/5/2007	Event 2 9/10/2007	Event 3 12/19/2007
Nitrate-N	mg/L	10 [1]	***16.99***	***14.55***	***38.78***
Nitrate-N	mg/L	9 [2]	***16.99***	***14.55***	***38.78***

[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 + Nitrite-N was used for comparison with VCAILG data collected at monitoring sites in this reach.

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

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.

Table 57. 05D_LAVD Nitrogen Exceedances for 2007

			Results	
Constituent	Units	Benchmark	Event 1 6/5/2007	Event 2 9/11/2007
Nitrate-N	mg/L	10 [1]	***16.99***	***14.44***
Nitrate-N	mg/L	9 [2]	***16.99***	***14.44***

[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 + Nitrite-N was used for comparison with VCAILG data collected at monitoring sites in this reach.

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

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 Blvd and into McGrath Lake. Water from McGrath Lake is pumped periodically into the ocean to prevent the Central Ditch from backing up and flooding Harbor Blvd.

Table 58. OXD_CENTR Nitrogen Exceedances for 2007

			Results		
Constituent	Units	Benchmark	Event 1 6/5/2007	Event 2 9/11/2007	Event 3 12/19/2007
Nitrate-N	mg/L	10 [1]	***16.17***	***12.23***	***30.59***

[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 + Nitrite-N was used for comparison with VCAILG data collected at monitoring sites in this reach.

Santa Clara River Watershed

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.

Table 59. S02T_TODD Nitrogen Exceedances for 2007

			Results	
			Event 1	Event 3
Constituent	Units	Benchmark	6/4/2007	12/19/2007
Nitrate-N	mg/L	10 [1]	***11.48***	***14.04***
Ammonia-N + Nitrate-N	mg/L	10 [2]	***11.58***	***14.24***

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

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

S03T_BOULD

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

Table 60. S03T_BOULD Nitrogen Exceedances for 2007

			Results	
			Event 1	Event 2
Constituent	Units	Benchmark	6/4/2007	9/10/2007
Total Ammonia-N	mg/L	1.3 [1]	***10.1***	No exceedance
Nitrate-N	mg/L	5	***107.6***	***14.59***
Ammonia-N + Nitrate-N	mg/L	10 [2]	***117.7***	***14.89***

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

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

S04T_ TAPO

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

Table 61. S04T_TAPO Nitrogen Exceedances for 2007

			Results
			Event 2
Constituent	Units	Benchmark	9/10/2007
Nitrate-N	mg/L	5	*6.93*

Appendix C

Drainage Areas for VCAILG Monitoring Sites

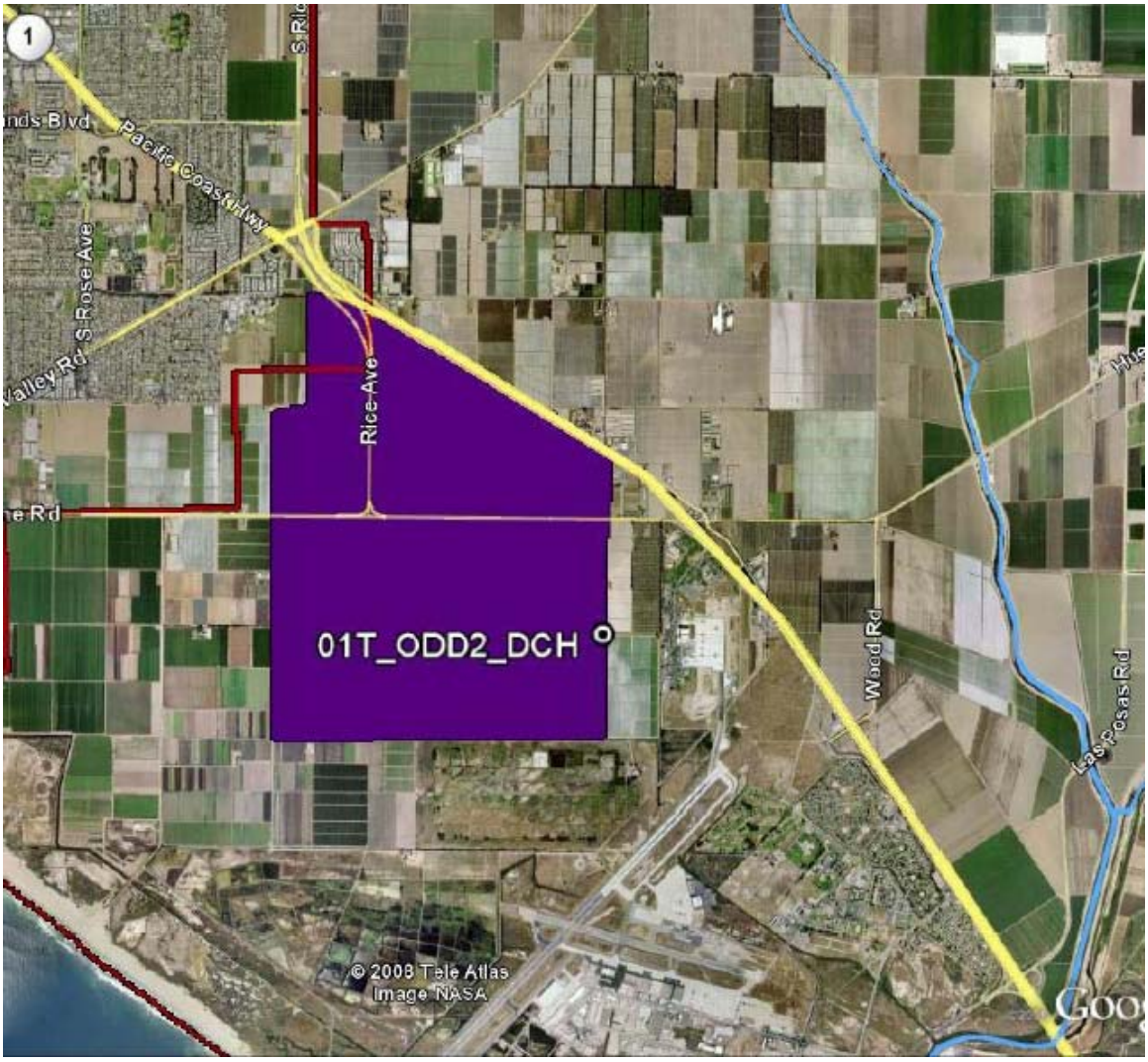

Figure 13. 01T_ODD2_DCH Drainage Area

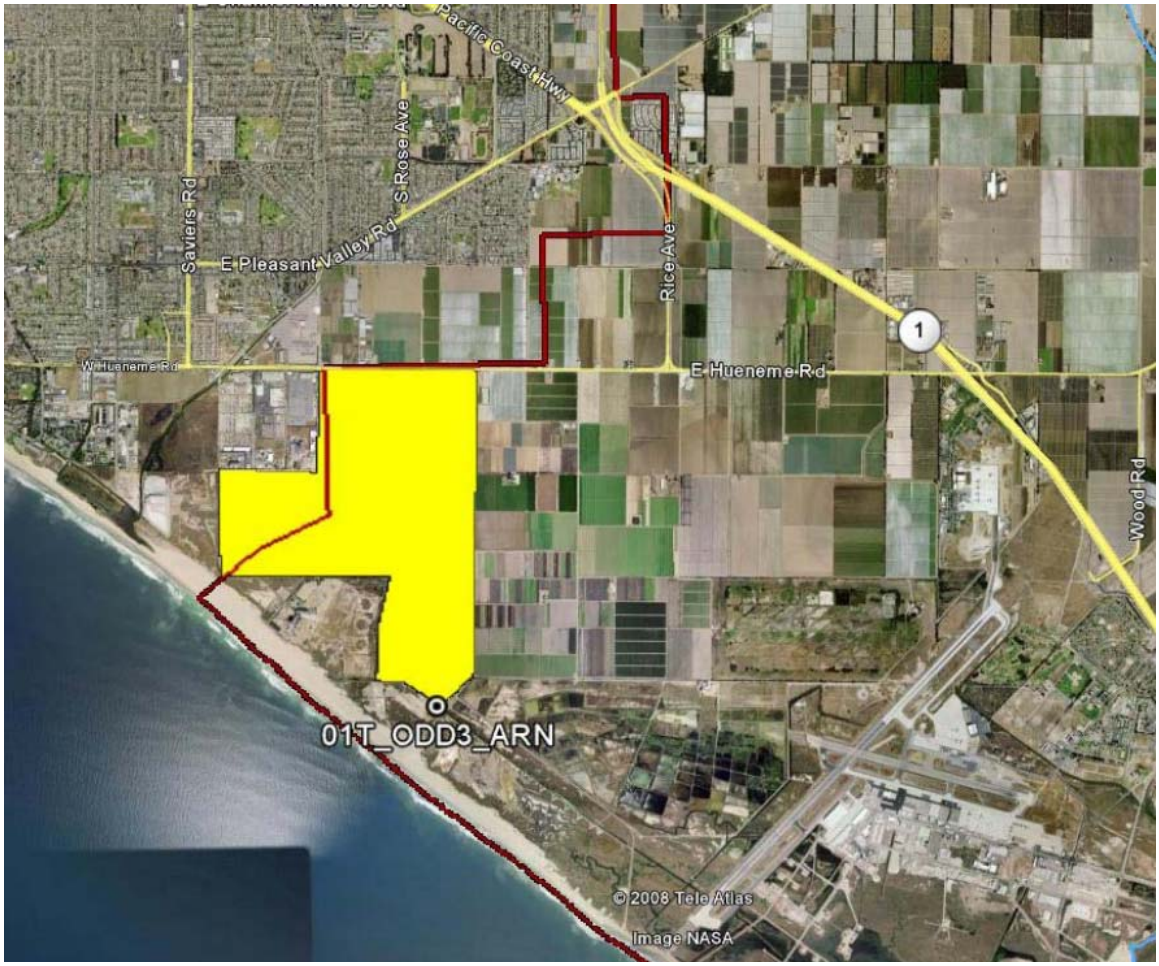

Figure 14. 01T_ODD3_ARN Drainage Area

Figure 15.. 02D_BROOM and 02D_CSUCI Drainage Areas

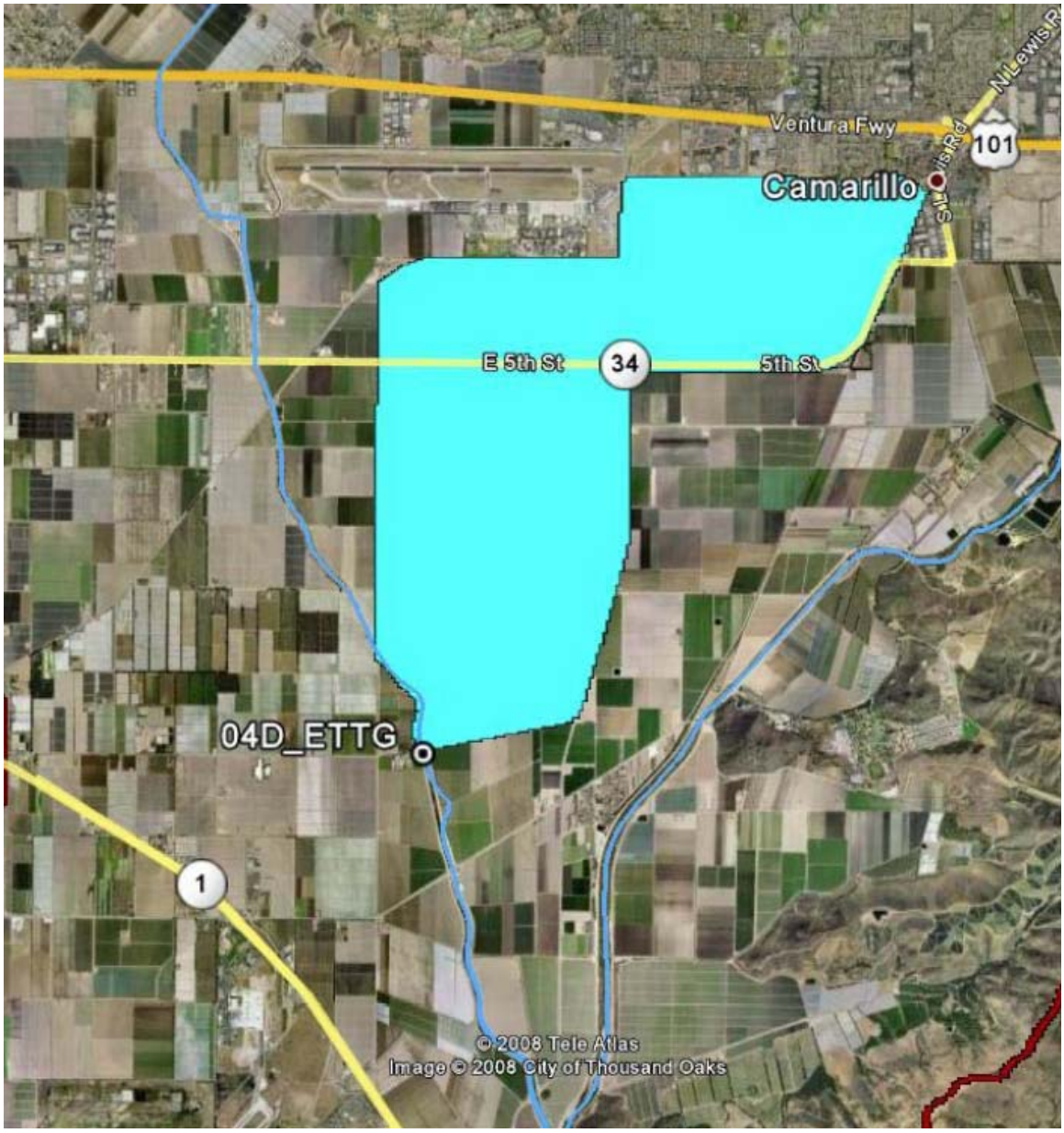

Figure 16.. 04D_ETTG Drainage Area

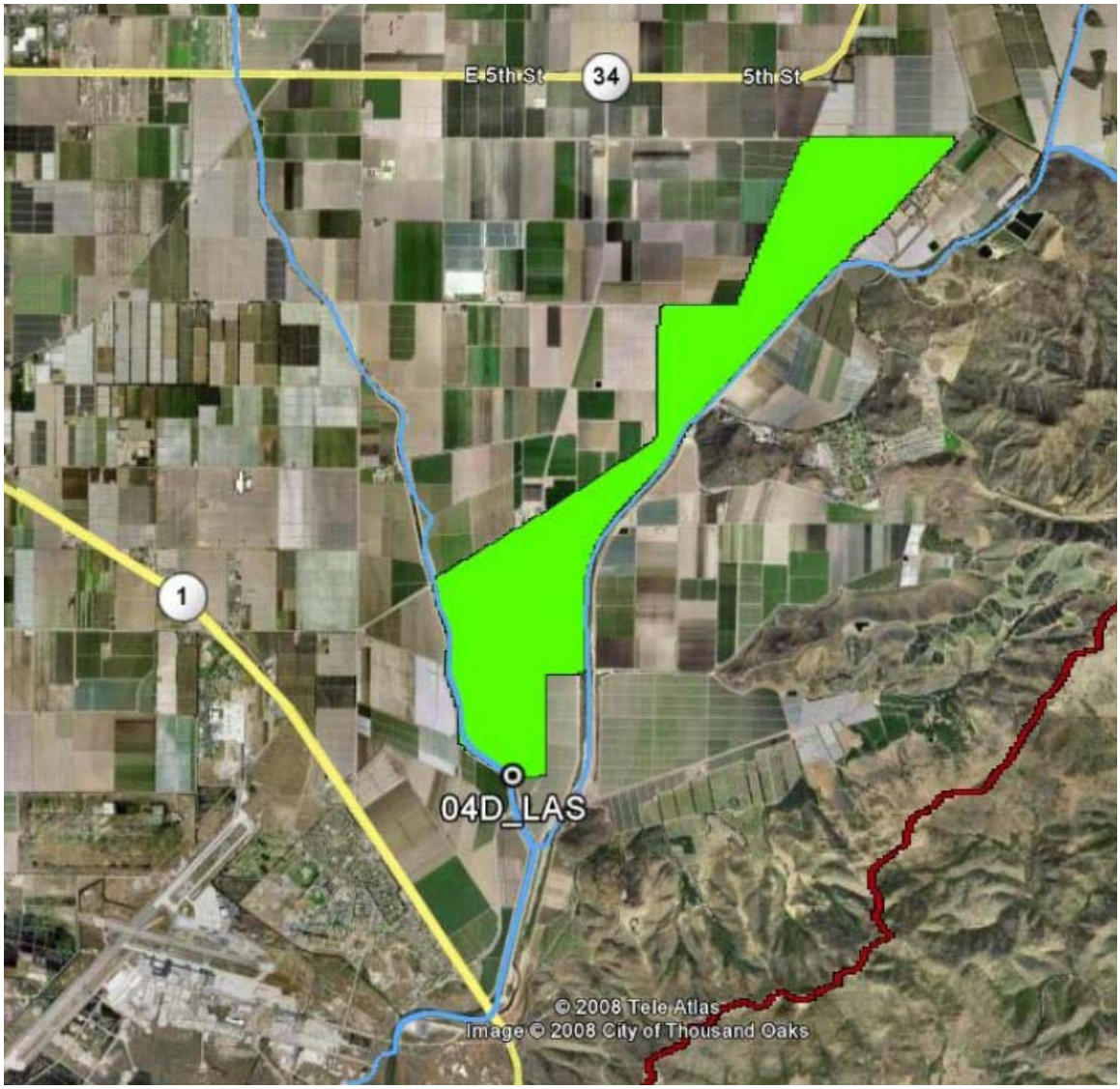

Figure 17. 04D_LAS Drainage Area

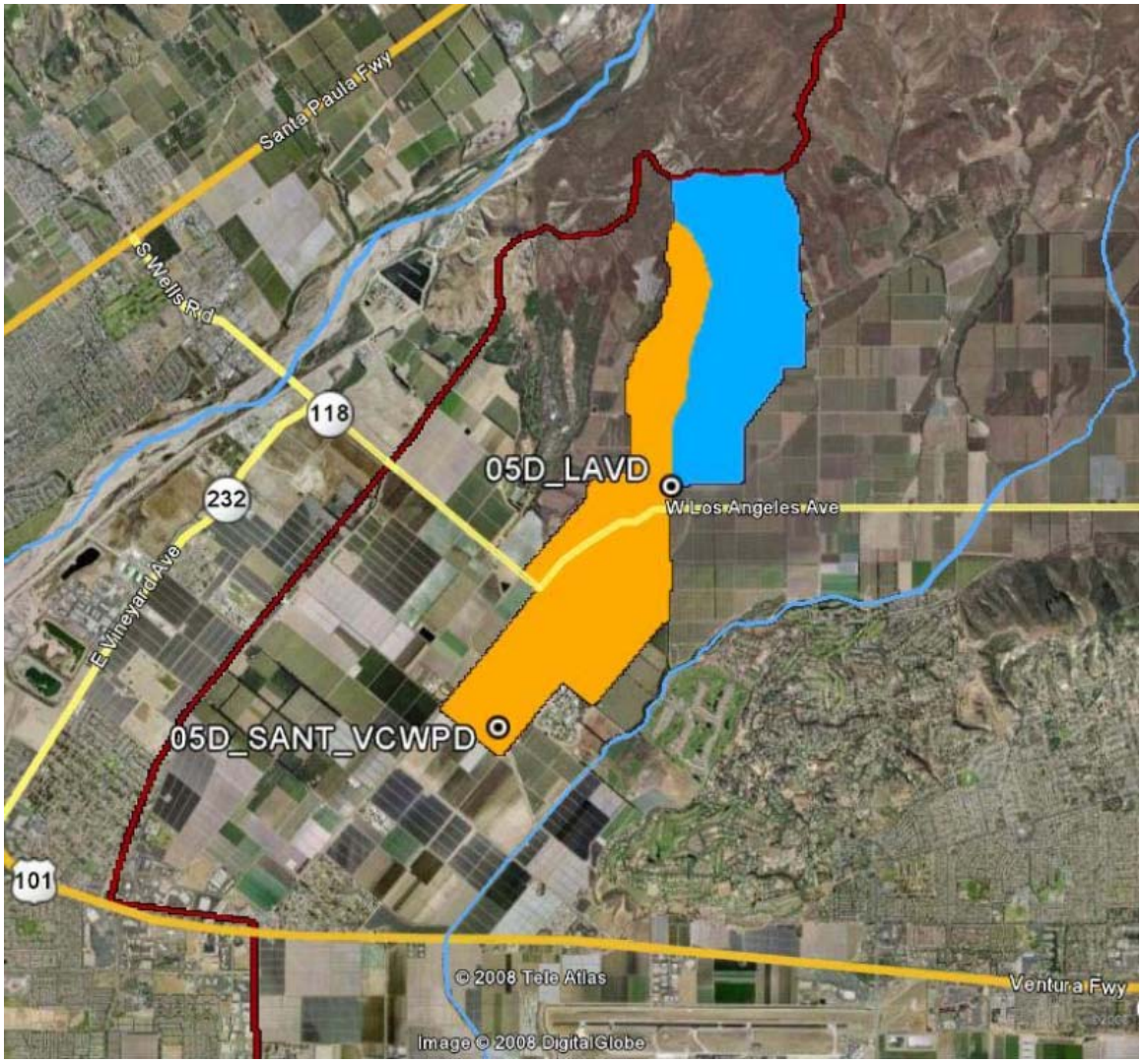

Figure 18.. 05D_SANT_VCWPD and 05D_LAVD Drainage Areas

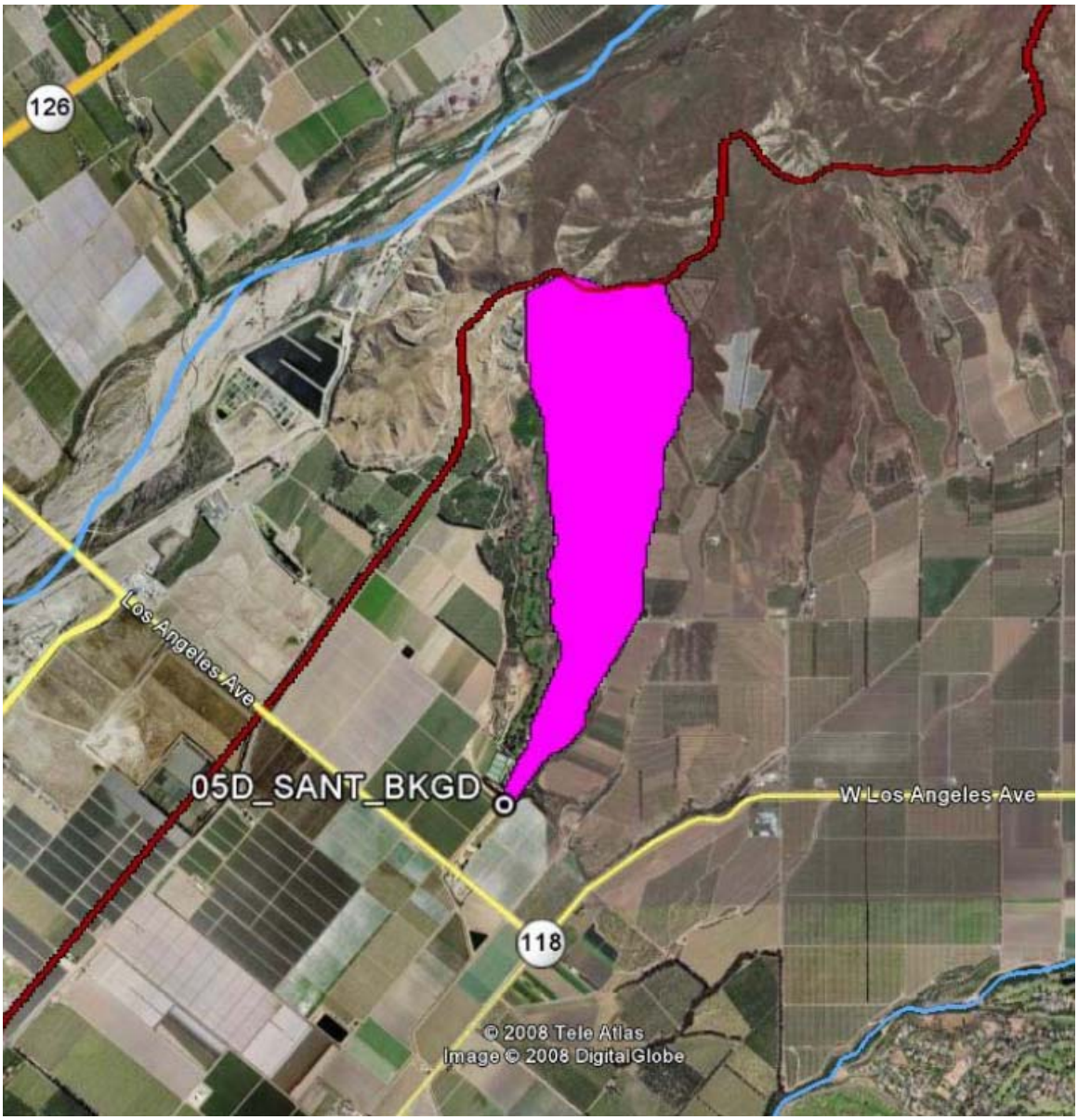

Figure 19.. 05D_SANT_BKGD Drainage Area

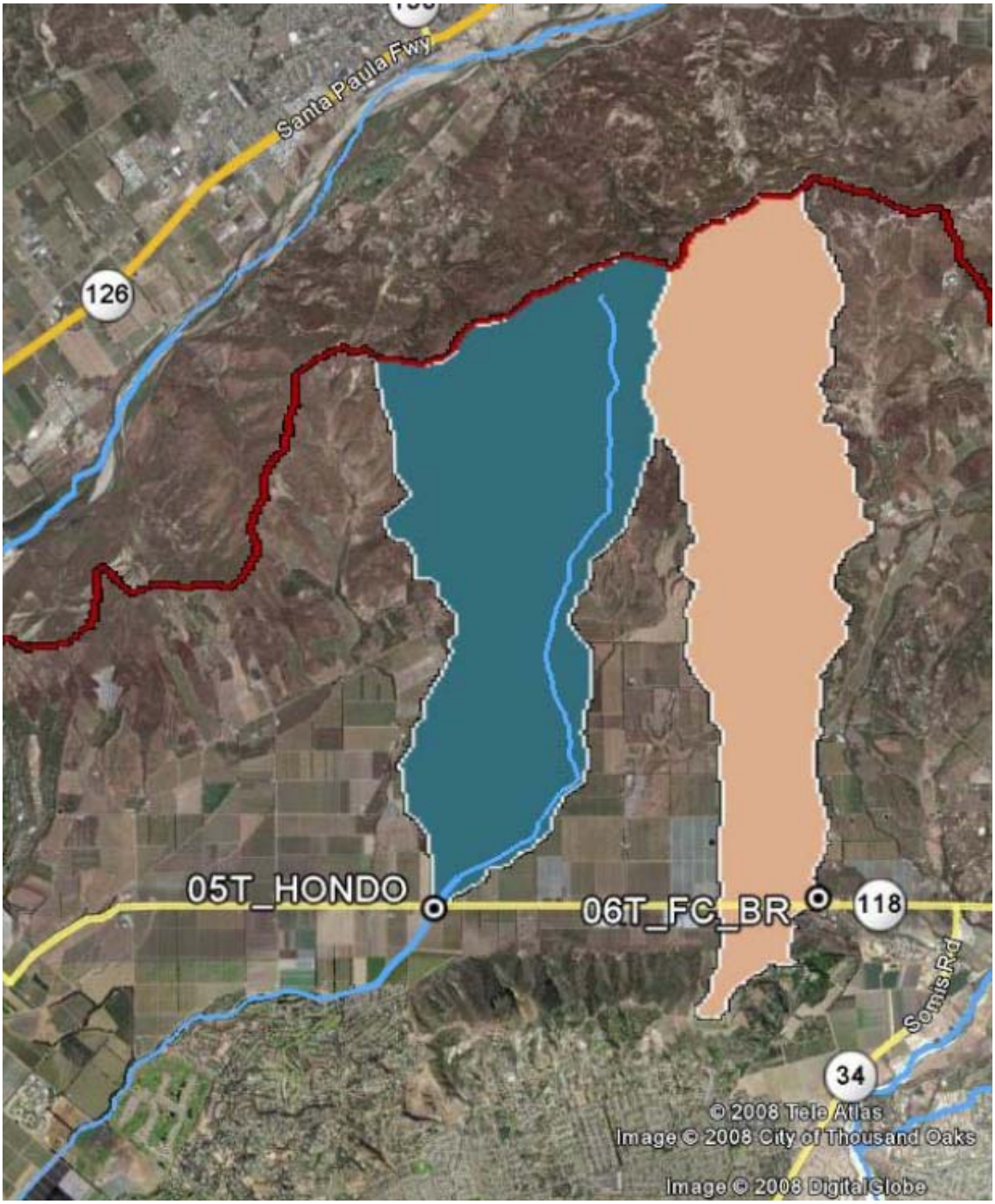

Figure 20. 05T_HONDO and 06T_FC_BR Drainage Areas

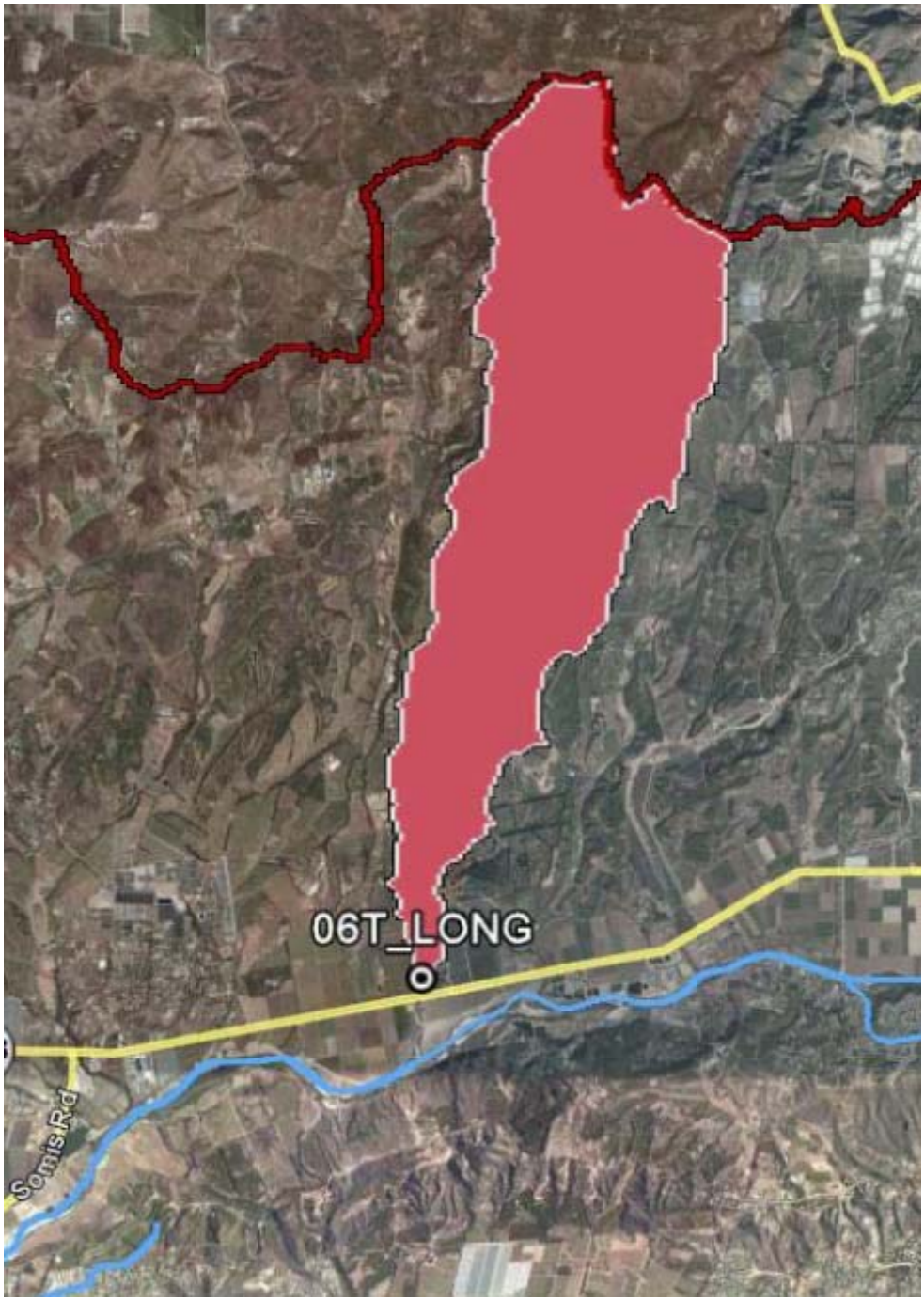

Figure 21. 06T_LONG Drainage Area

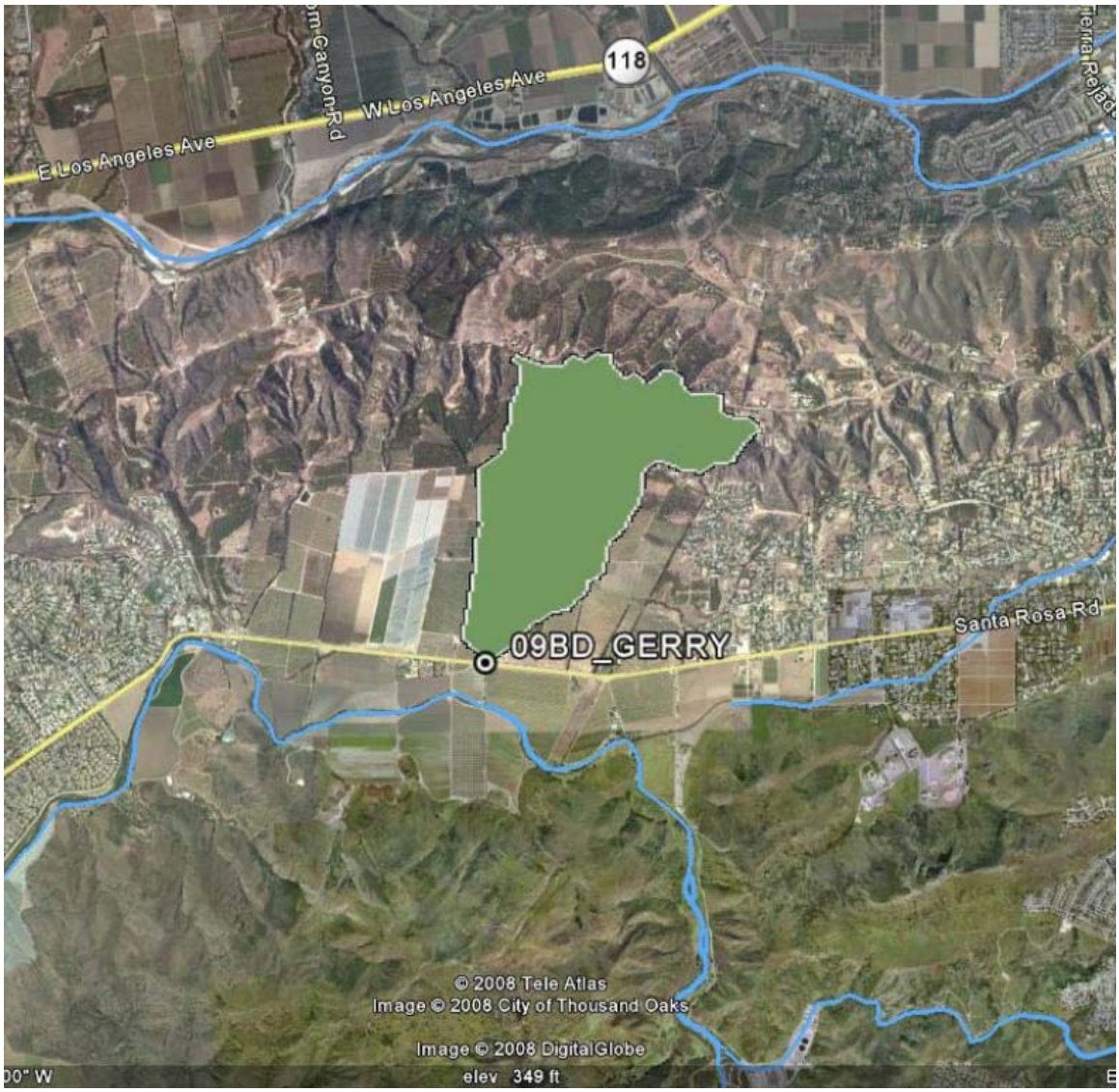

Figure 22. 09BD_GERRY Drainage Area

Figure 23. OXD_CENTR Drainage Area

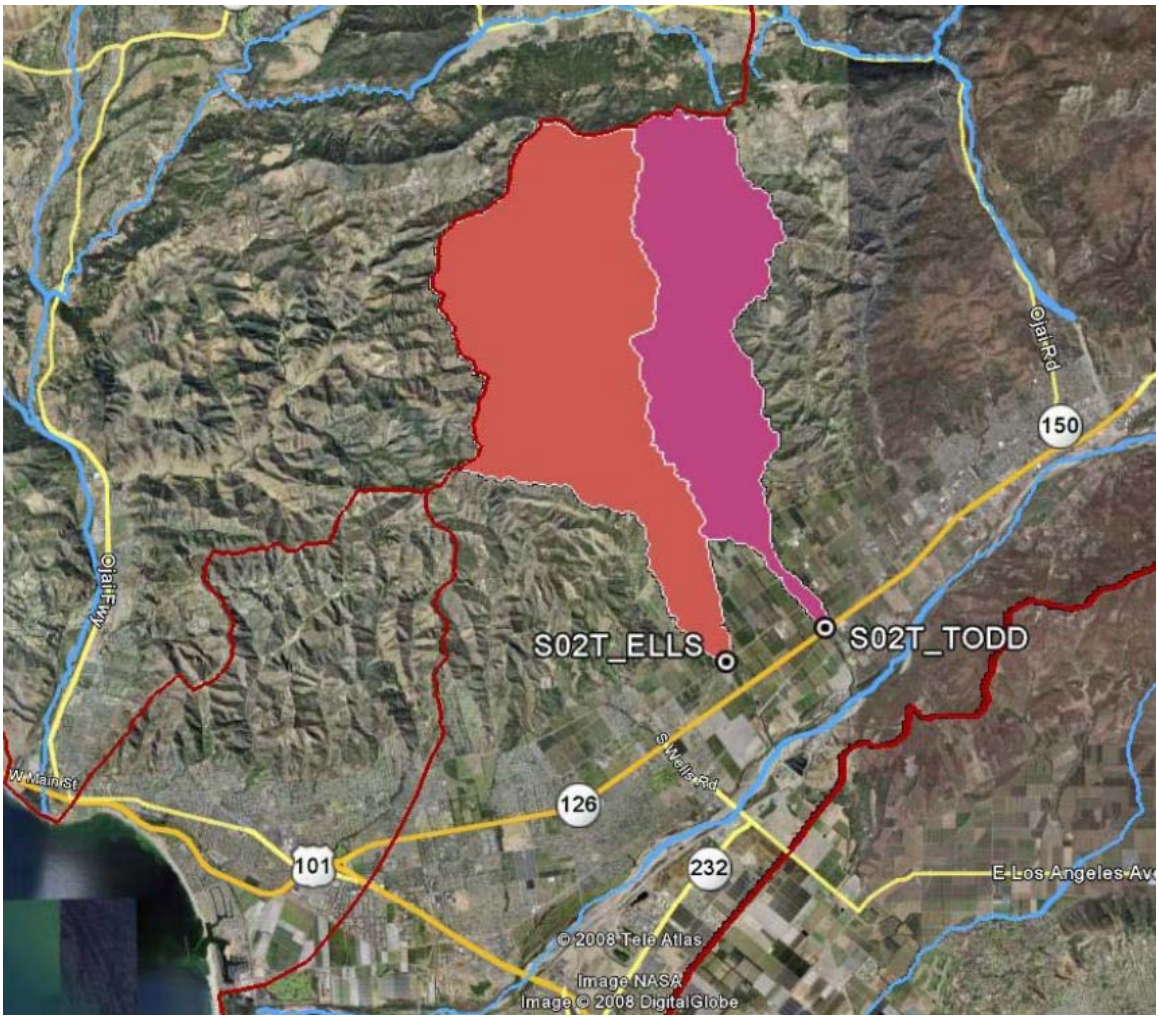

Figure 24. S02T_ELLS and S02T_TODD Drainage Areas

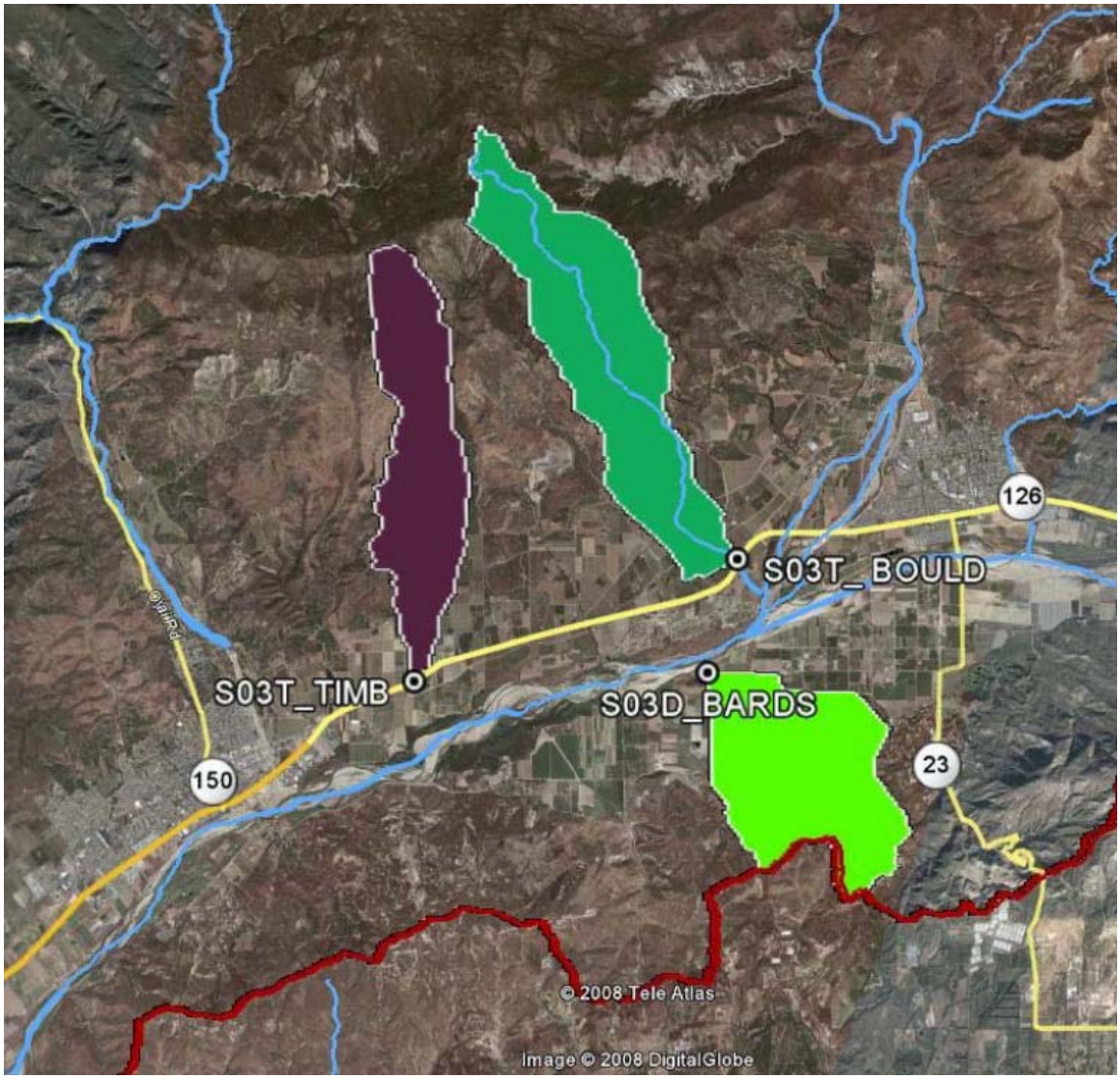

Figure 25. S03T_TIMB, S03T_BOULD, and S03D_BARDS Drainage Areas

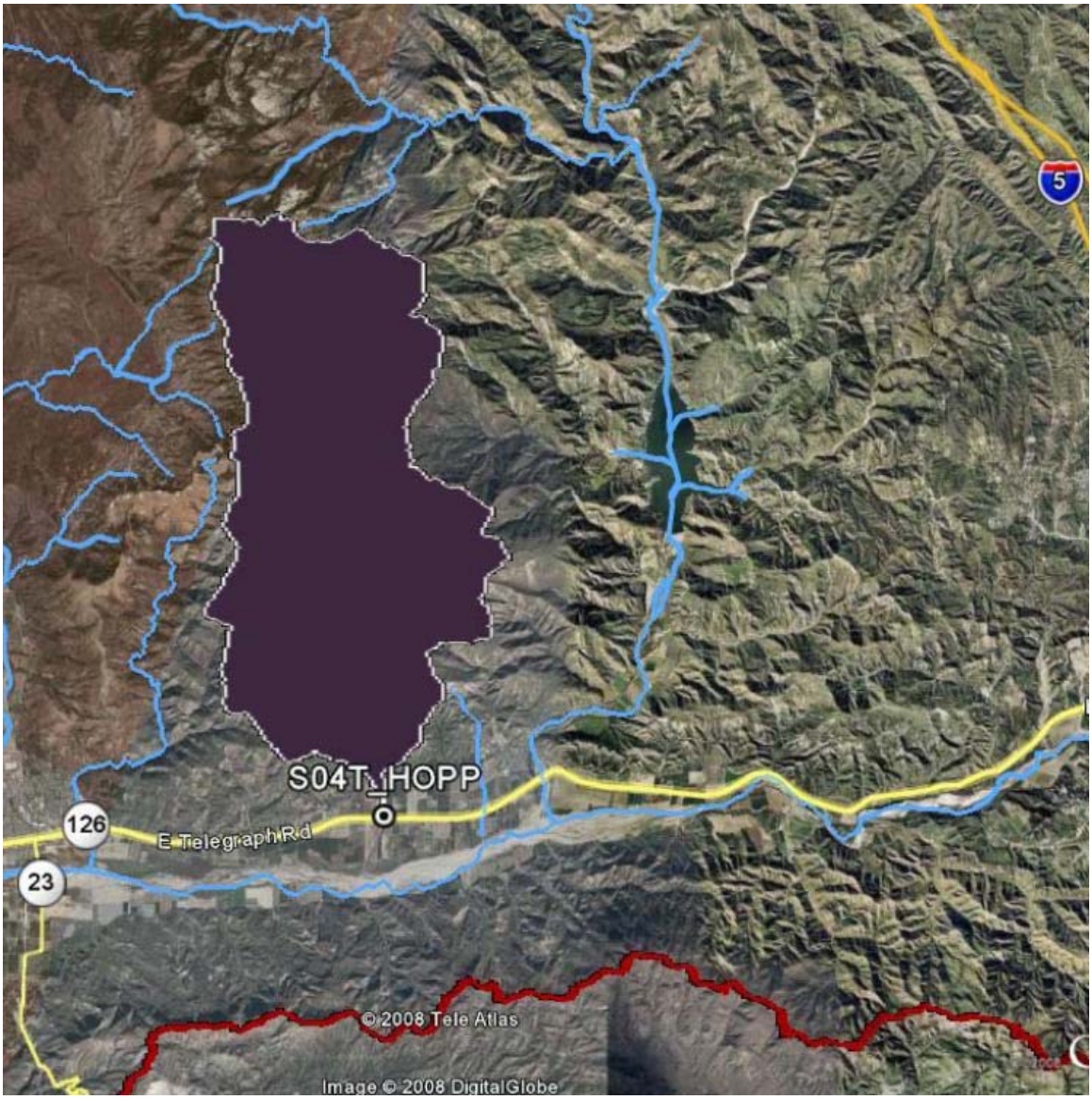

Figure 26. S04T_HOPP Drainage Area

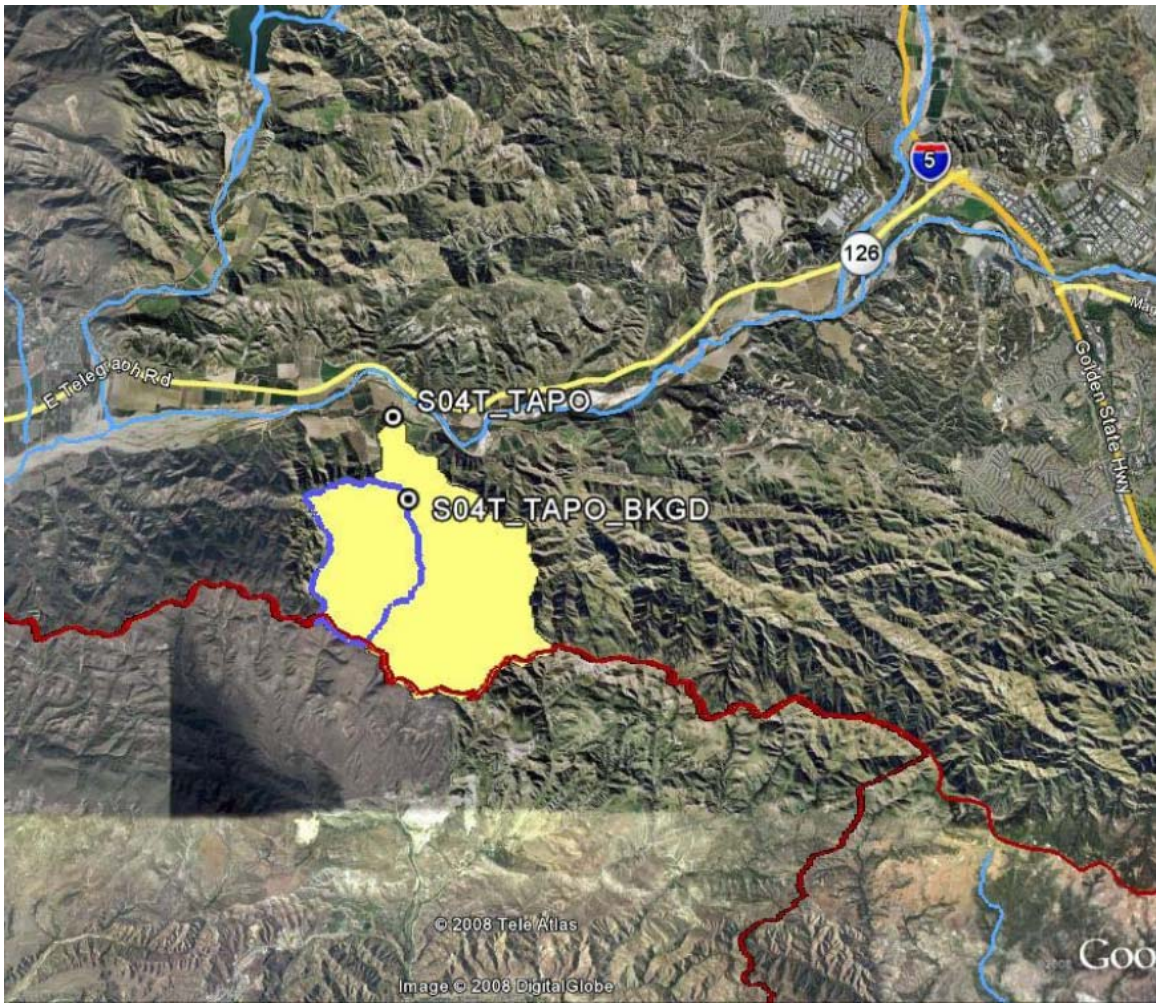

Figure 27. S04T_TAPO and S04T_TAPO_BKGD Drainage Areas

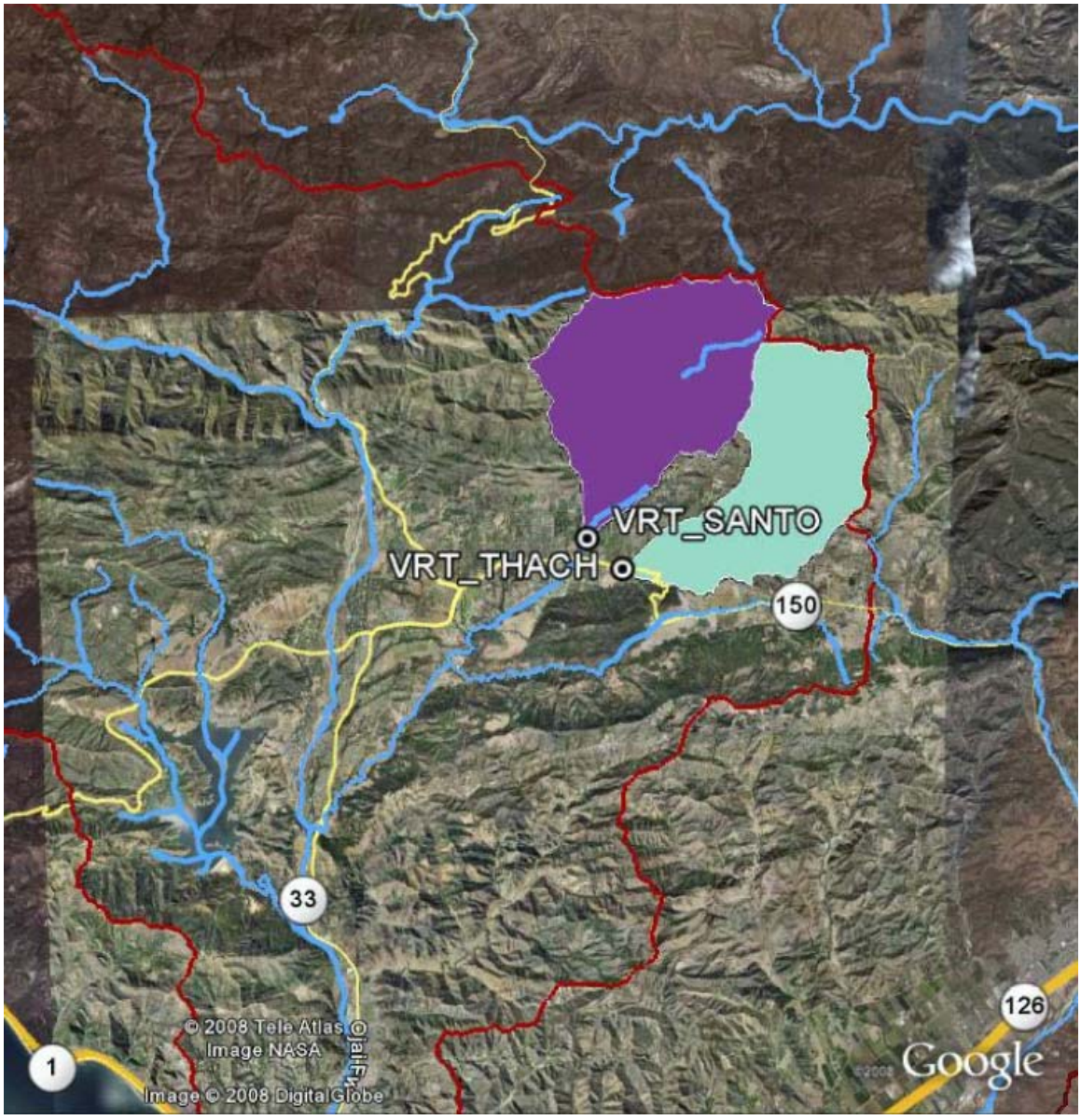

Figure 28. VRT_THACH and VRT_SANTO Drainage Areas

Appendix D

Survey Results

Appendix A. Responses from 65 Ventura County nurseries to a survey entitled, "Checklist for assessing and mitigating runoff for greenhouses and nurseries," conducted in 2004 and repeated in 2006.

		Calleguas Creek Watershed Nurseries (n=42)			Miscellaneous Coastal Watershed Nurseries (n=4)			Santa Clara River Watershed Nurseries (n=17)			Ventura River Watershed Nurseries (n=2)		
Question		**% Yes**	**% No**	**% Not Applicable**	**% Yes**	**% No**	**% Not Applicable**	**% Yes**	**% No**	**% Not Applicable**	**% Yes**	**% No**	**% Not Applicable**
10. Is the irrigation/well water quality regularly monitored?	2004	57%	40%	2%	75%	25%	0%	82%	18%	0%	50%	50%	0%
	2006	69%	31%	0%	50%	50%	0%	88%	12%	0%	50%	50%	0%
11. Are irrigation water quality records maintained?	2004	38%	50%	12%	50%	50%	0%	82%	12%	6%	0%	50%	50%
	2006	50%	38%	12%	25%	75%	0%	88%	12%	0%	0%	50%	50%
12. Is a uniformity evaluation regularly performed on your irrigation system?	2004	31%	43%	26%	25%	50%	25%	29%	59%	12%	0%	0%	100%
	2006	48%	33%	19%	50%	50%	0%	53%	29%	18%	0%	0%	100%
13. Do you regularly maintain your irrigation system?	2004	98%	2%	0%	100%	0%	0%	94%	0%	6%	100%	0%	0%
	2006	100%	0%	0%	100%	0%	0%	94%	0%	6%	100%	0%	0%
14. Do you regularly inspect for leaks?	2004	98%	2%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%
	2006	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%
15. Do you flush and unclog lines/emitters?	2004	74%	10%	17%	75%	25%	0%	94%	6%	0%	0%	0%	100%
	2006	83%	2%	14%	100%	0%	0%	100%	0%	0%	0%	0%	100%
16. Do you regularly clean filters?	2004	74%	2%	24%	75%	0%	25%	94%	0%	6%	0%	0%	100%
	2006	79%	0%	21%	100%	0%	0%	100%	0%	0%	0%	0%	100%
17. Do you maintain regular pressure in your irrigation system?	2004	83%	14%	2%	100%	0%	0%	100%	0%	0%	100%	0%	0%
	2006	86%	12%	2%	100%	0%	0%	100%	0%	0%	100%	0%	0%
18. Do you use pressure regulators?	2004	62%	26%	12%	75%	25%	0%	88%	12%	0%	50%	0%	50%
	2006	60%	29%	12%	75%	25%	0%	88%	12%	0%	50%	0%	50%
19. Do you use emitters that minimize pressure differences or pressure compensating emitters?	2004	26%	52%	21%	25%	50%	25%	35%	47%	18%	0%	0%	100%
	2006	38%	48%	14%	50%	50%	0%	47%	41%	12%	0%	0%	100%
20. When growing on slopes do you compensate for pressure differences at the top and bottom of the slope?	2004	14%	14%	71%	0%	50%	50%	12%	18%	71%	0%	0%	100%
	2006	21%	7%	71%	0%	25%	75%	12%	12%	76%	0%	0%	100%
21. Do spray patterns of overhead irrigation systems managed to uniformly deliver water without creating overspray in walkways and edges?	2004	48%	24%	29%	25%	25%	50%	29%	41%	29%	0%	0%	100%
	2006	57%	17%	26%	25%	0%	75%	59%	6%	35%	0%	0%	100%
22. Are overhead irrigation systems used only in watering zones where pots or plants are spaced closely together to avoid runoff and groundwater contamination?	2004	45%	12%	43%	25%	0%	75%	47%	18%	35%	0%	0%	100%
	2006	69%	2%	29%	25%	0%	75%	53%	6%	41%	0%	0%	100%
23. Is hand watering performed with the use of an on/off mechanism to prevent runoff?	2004	71%	21%	7%	25%	50%	25%	59%	29%	12%	100%	0%	0%
	2006	74%	12%	14%	50%	0%	50%	71%	18%	12%	100%	0%	0%
24. Are appropriate emitter flow rates for spray stakes/ drippers utilized in each watering zone?	2004	62%	5%	33%	25%	25%	50%	65%	18%	18%	0%	0%	100%
	2006	67%	0%	33%	50%	0%	50%	76%	6%	18%	0%	0%	100%

Appendix A. Responses from 65 Ventura County nurseries to a survey entitled, "Checklist for assessing and mitigating runoff for greenhouses and nurseries," conducted in 2004 and repeated in 2006.

		Calleguas Creek Watershed Nurseries (n=42)			Miscellaneous Coastal Watershed Nurseries (n=4)			Santa Clara River Watershed Nurseries (n=17)			Ventura River Watershed Nurseries (n=2)		
		% Yes	% No	% Not Applicable	% Yes	% No	% Not Applicable	% Yes	% No	% Not Applicable	% Yes	% No	% Not Applicable
25. Are flow rates for all spray stakes/dripper emitters the same in each watering zone?	2004	60%	12%	29%	50%	0%	50%	76%	6%	18%	0%	0%	100%
	2006	62%	7%	31%	50%	0%	50%	82%	0%	18%	0%	0%	100%
26. Are spray stake/dripper systems managed to ensure every emitter is located in a plant/pot?	2004	67%	2%	31%	50%	0%	50%	82%	0%	18%	0%	0%	100%
	2006	67%	0%	33%	50%	0%	50%	82%	0%	18%	0%	0%	100%
27. Are harvest operations and retail areas managed to avoid creating watering zones with large numbers of emitters located outside of pots?	2004	31%	10%	60%	50%	0%	50%	47%	6%	47%	0%	0%	100%
	2006	45%	5%	50%	50%	0%	50%	41%	0%	59%	0%	0%	100%
28. Do you consolidate plants and shut off irrigation in unused portions?	2004	67%	2%	31%	50%	0%	50%	88%	6%	6%	0%	0%	100%
	2006	74%	2%	24%	50%	0%	50%	88%	0%	12%	0%	0%	100%
29. Are specific methods/equipment used to help determine irrigation schedules such as pot weight, evapotranspiration (ET), solar, or tensiometer?	2004	21%	79%	0%	25%	75%	0%	24%	76%	0%	0%	100%	0%
	2006	52%	45%	2%	25%	75%	0%	29%	71%	0%	0%	100%	0%
30. Are irrigation schedules constantly monitored to correlate with plant moisture requirements?	2004	86%	14%	0%	75%	25%	0%	94%	6%	0%	50%	50%	0%
	2006	93%	5%	2%	75%	25%	0%	94%	6%	0%	50%	50%	0%
31. Are irrigation duties performed only by personnel who understand and practice appropriate irrigation scheduling?	2004	98%	2%	0%	75%	25%	0%	100%	0%	0%	100%	0%	0%
	2006	100%	0%	0%	75%	25%	0%	100%	0%	0%	100%	0%	0%
32. Are pot sizes and/or plant types grouped in watering zones according to moisture requirements?	2004	83%	17%	0%	75%	25%	0%	94%	6%	0%	0%	100%	0%
	2006	93%	7%	0%	100%	0%	0%	100%	0%	0%	50%	50%	0%
33. Is pulse irrigation used?	2004	5%	95%	0%	0%	100%	0%	18%	82%	0%	0%	100%	0%
	2006	33%	67%	0%	50%	50%	0%	35%	65%	0%	0%	100%	0%
34. Does the irrigation system operate with automatic timers/clocks?	2004	45%	55%	0%	25%	75%	0%	53%	47%	0%	0%	100%	0%
	2006	52%	45%	2%	0%	75%	25%	53%	47%	0%	0%	100%	0%
35. Are timers/clocks regularly checked and adjusted to correlate schedules with environmental conditions and plant growth stage?	2004	40%	2%	57%	50%	0%	50%	53%	6%	41%	0%	0%	100%
	2006	52%	0%	48%	0%	0%	100%	53%	6%	41%	0%	0%	100%
36. Are specific factors, such as EC of root media or leachates, used to determine leaching practices (i.e. deliberately overwatering to flush salts) as part of the irrigation schedule?	2004	36%	36%	29%	50%	25%	25%	59%	24%	18%	0%	50%	50%
	2006	40%	19%	40%	25%	50%	25%	59%	6%	35%	0%	50%	50%
37. Are irrigation schedules set to perform leaching at specific irrigation events, rather than every time irrigation is performed?	2004	29%	29%	43%	50%	25%	25%	35%	53%	12%	0%	0%	100%
	2006	33%	14%	52%	25%	50%	25%	47%	12%	41%	0%	0%	100%

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		Calleguas Creek Watershed Nurseries (n=42)			Miscellaneous Coastal Watershed Nurseries (n=4)			Santa Clara River Watershed Nurseries (n=17)			Ventura River Watershed Nurseries (n=2)		
		% Yes	% No	% Not Applicable	% Yes	% No	% Not Applicable	% Yes	% No	% Not Applicable	% Yes	% No	% Not Applicable
38. Is leaching performed only with fertilizer injectors turned off?	2004	33%	19%	48%	50%	0%	50%	53%	18%	29%	0%	0%	100%
	2006	29%	14%	57%	25%	25%	50%	59%	6%	35%	0%	0%	100%
39. Has the amount of leaching that occurs been measured?	2004	12%	45%	43%	25%	50%	25%	29%	47%	24%	0%	0%	100%
	2006	26%	26%	48%	0%	75%	25%	24%	47%	29%	0%	0%	100%
40. Is irrigation runoff collected from production areas?	2004	10%	67%	24%	0%	75%	25%	18%	71%	12%	0%	0%	100%
	2006	19%	48%	33%	25%	50%	25%	29%	29%	41%	0%	0%	100%
41. Is collected irrigation water recycled?	2004	5%	48%	48%	0%	50%	50%	12%	29%	59%	0%	0%	100%
	2006	17%	31%	52%	0%	50%	50%	12%	24%	65%	0%	0%	100%
42. Are collection reservoirs/tanks managed to avoid overflow during both dry and wet weather?	2004	12%	24%	64%	0%	25%	75%	0%	29%	71%	0%	0%	100%
	2006	24%	14%	62%	25%	0%	75%	24%	12%	65%	0%	0%	100%
43. Is runoff water quality regularly monitored, either by growing operation personnel or professionally by a lab?	2004	7%	67%	26%	0%	75%	25%	29%	47%	24%	0%	0%	100%
	2006	12%	50%	38%	25%	25%	50%	29%	24%	47%	0%	0%	100%
44. Are runoff water quality records maintained?	2004	5%	60%	36%	0%	75%	25%	18%	41%	41%	0%	50%	50%
	2006	14%	38%	48%	25%	25%	50%	24%	24%	53%	0%	50%	50%
45. Is stormwater collected?	2004	19%	79%	2%	0%	75%	25%	12%	76%	12%	0%	100%	0%
	2006	29%	67%	5%	25%	25%	50%	24%	71%	6%	0%	100%	0%
46. Are erosion management practices utilized in areas that are hilly and sloping, and subject to runoff and erosion?	2004	36%	2%	62%	50%	0%	50%	29%	0%	71%	100%	0%	0%
	2006	38%	2%	60%	50%	0%	50%	29%	0%	71%	100%	0%	0%
47. Are amendments used in areas located on sandy soil to improve water holding capacity and prevent excessive leaching?	2004	5%	17%	79%	25%	25%	50%	18%	12%	71%	0%	0%	100%
	2006	10%	14%	76%	50%	0%	50%	24%	12%	65%	0%	0%	100%
48. Are amendments used in areas located on clayey soil to improve infiltration and reduce runoff?	2004	19%	12%	69%	100%	0%	0%	12%	12%	76%	0%	50%	50%
	2006	26%	10%	64%	50%	25%	25%	24%	6%	71%	0%	0%	100%
49. Are mulches or cover crops used on bare soil?	2004	31%	17%	52%	50%	0%	50%	18%	24%	59%	50%	50%	0%
	2006	31%	19%	50%	50%	0%	50%	24%	18%	59%	50%	0%	50%
50. Are other erosion control practices used on bare soil to reduce runoff (e.g. proper irrigation management techniques, use of polyacrylamide (PAM), field borders, etc.)?	2004	33%	19%	48%	25%	25%	50%	24%	41%	35%	50%	50%	0%
	2006	40%	14%	45%	75%	0%	25%	47%	12%	41%	50%	50%	0%
51. Are windbreaks or shelterbelts used in areas prone to wind erosion?	2004	33%	14%	52%	25%	0%	75%	35%	35%	29%	50%	0%	50%
	2006	43%	14%	43%	25%	0%	75%	29%	35%	35%	50%	0%	50%
52. Have you tested your substrates/media used in containers to determine if they have relatively high water holding capacity while providing adequate drainage?	2004	48%	38%	14%	25%	25%	50%	65%	24%	12%	50%	50%	0%
	2006	69%	24%	7%	50%	0%	50%	82%	18%	0%	50%	50%	0%

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		% Yes	% No	% Not Applicable	% Yes	% No	% Not Applicable	% Yes	% No	% Not Applicable	% Yes	% No	% Not Applicable
53. Has the use of wetting agents been considered?	2004	33%	57%	10%	25%	25%	50%	53%	41%	6%	50%	50%	0%
	2006	55%	38%	7%	50%	0%	50%	65%	35%	0%	50%	50%	0%
54. Do you store and mix substrate/media in a location sheltered from wind and away from drainage channels?	2004	74%	17%	10%	50%	0%	50%	59%	35%	6%	50%	0%	50%
	2006	74%	14%	12%	50%	0%	50%	71%	29%	0%	50%	0%	50%
55. Are soil/media tests performed?	2004	64%	36%	0%	50%	50%	0%	94%	6%	0%	50%	50%	0%
	2006	76%	24%	0%	50%	50%	0%	94%	6%	0%	50%	50%	0%
56. Are plant tissue analyses performed?	2004	43%	57%	0%	50%	50%	0%	82%	18%	0%	0%	100%	0%
	2006	50%	50%	0%	50%	50%	0%	71%	29%	0%	0%	100%	0%
57. Is information and recommendations from soil/media tests and/or plant tissue analyses used in fertilization management?	2004	57%	40%	2%	50%	50%	0%	88%	12%	0%	50%	50%	0%
	2006	64%	29%	7%	50%	50%	0%	94%	6%	0%	50%	50%	0%
58. Are the most recent nutrient recommendations for your particular crops and growing practices used in fertilizer management?	2004	69%	17%	14%	75%	0%	25%	100%	0%	0%	50%	0%	50%
	2006	83%	5%	12%	75%	0%	25%	100%	0%	0%	50%	0%	50%
59. Do you consider nutrients already present in irrigation water, recovered runoff, and/or composts/manures from previous fertilizations in fertilizer management decision making?	2004	55%	38%	7%	25%	75%	0%	71%	29%	0%	50%	50%	0%
	2006	67%	24%	10%	100%	0%	0%	100%	0%	0%	50%	0%	50%
60. Are incorporated solid fertilizers thoroughly mixed throughout the root zone/container and at the correct rate?	2004	64%	7%	29%	50%	0%	50%	82%	0%	18%	50%	50%	0%
	2006	69%	5%	26%	75%	0%	25%	94%	0%	6%	50%	50%	0%
61. Are composts or manures thoroughly composted before application?	2004	26%	7%	67%	25%	0%	75%	41%	12%	47%	0%	50%	50%
	2006	33%	10%	57%	25%	0%	75%	41%	12%	47%	0%	50%	50%
62. Are topdressed solid fertilizers applied at the correct rate and appropriate growth stage of the plant?	2004	81%	2%	17%	75%	0%	25%	65%	18%	18%	100%	0%	0%
	2006	76%	0%	24%	75%	0%	25%	76%	0%	24%	100%	0%	0%
63. Are injected fertilizers carefully mixed and applied at correct rates?	2004	71%	0%	29%	50%	0%	50%	82%	12%	6%	0%	0%	100%
	2006	67%	0%	33%	50%	0%	50%	94%	0%	6%	0%	0%	100%
64. Are injected fertilizers applied to correlate nutrient needs with fertigation schedules?	2004	71%	0%	29%	50%	0%	50%	88%	6%	6%	0%	0%	100%
	2006	67%	0%	33%	50%	0%	50%	94%	0%	6%	0%	0%	100%
65.Are injectors calibrated to accurately deliver liquid fertilizer through the irrigation system?	2004	69%	2%	29%	50%	0%	50%	94%	0%	6%	0%	0%	100%
	2006	67%	2%	31%	50%	0%	50%	94%	0%	6%	0%	0%	100%
66. Do you regularly test fertigation water to monitor fertilizer levels and ensure injectors are properly operating?	2004	55%	17%	29%	50%	0%	50%	94%	0%	6%	0%	0%	100%
	2006	62%	5%	33%	50%	0%	50%	94%	0%	6%	0%	0%	100%

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		% Yes	% No	% Not Applicable	% Yes	% No	% Not Applicable	% Yes	% No	% Not Applicable	% Yes	% No	% Not Applicable
67. Are slow-release or controlled-release fertilizers utilized?	2004	81%	14%	5%	75%	0%	25%	76%	18%	6%	100%	0%	0%
	2006	83%	12%	5%	75%	0%	25%	88%	12%	0%	100%	0%	0%
68. Is fertilization management varied with environmental parameters and growth stage of the plants?	2004	90%	10%	0%	75%	25%	0%	94%	6%	0%	100%	0%	0%
	2006	86%	14%	0%	75%	0%	25%	94%	6%	0%	100%	0%	0%
69. Does the fertilizer storage facility include a concrete pad and curb to contain spills and leaks, and is it protected from rain?	2004	55%	43%	2%	50%	50%	0%	65%	35%	0%	100%	0%	0%
	2006	67%	31%	2%	75%	0%	25%	82%	18%	0%	100%	0%	0%
70. Are mixing and loading operations conducted on an impermeable surface in areas with low runoff potential hazard, and are operations performed over 100 feet downslope of a well?	2004	62%	36%	2%	25%	75%	0%	53%	47%	0%	50%	50%	0%
	2006	64%	33%	2%	50%	25%	25%	82%	18%	0%	100%	0%	0%
71. Are plants regularly monitored for pests with proper scouting/monitoring methods including traps, plant inspection, beating, and/or net sweeping?	2004	86%	14%	0%	75%	25%	0%	100%	0%	0%	100%	0%	0%
	2006	93%	7%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%
72. Does the decision to use chemical pesticides include scouting/monitoring information?	2004	86%	2%	12%	75%	0%	25%	100%	0%	0%	0%	0%	100%
	2006	90%	2%	7%	75%	0%	25%	100%	0%	0%	0%	0%	100%
73. Does the decision to use chemical pesticides include use of economic thresholds?	2004	55%	29%	17%	75%	0%	25%	94%	6%	0%	0%	0%	100%
	2006	76%	14%	10%	75%	0%	25%	71%	29%	0%	0%	0%	100%
74. If you can tolerate some pest damage (for example on lower leaves of cut flowers), do you use appropriate pest management practices to reduce pesticide use (e.g. direct spraying)?	2004	45%	26%	29%	50%	0%	50%	35%	18%	47%	50%	0%	50%
	2006	67%	14%	19%	75%	0%	25%	47%	18%	35%	50%	0%	50%
75. Are the most recent integrated pest management recommendations for your particular crops and growing practices used in pest management decisions?	2004	57%	17%	26%	75%	0%	25%	82%	0%	18%	50%	0%	50%
	2006	86%	5%	10%	75%	0%	25%	94%	0%	6%	50%	0%	50%
76. Are weather conditions and irrigation schedules considered in scheduling pesticide applications?	2004	79%	7%	14%	75%	0%	25%	100%	0%	0%	0%	0%	100%
	2006	88%	0%	12%	75%	0%	25%	94%	0%	6%	0%	0%	100%
77. Do you typically avoid spraying pesticides when wind could move them off-target as drift?	2004	81%	5%	14%	75%	0%	25%	94%	0%	6%	0%	0%	100%
	2006	88%	2%	10%	75%	0%	25%	94%	0%	6%	0%	0%	100%

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		% Yes	% No	% Not Applicable	% Yes	% No	% Not Applicable	% Yes	% No	% Not Applicable	% Yes	% No	% Not Applicable
78. Are diagnostic lab services or other professional assistance used to determine unknown pathogens, insects, or other growth problems?	2004	64%	29%	7%	50%	25%	25%	82%	12%	6%	0%	50%	50%
	2006	79%	14%	7%	50%	25%	25%	94%	6%	0%	0%	50%	50%
79. Are low-toxicity and/or non-toxic chemicals selected for pest control when possible?	2004	90%	5%	5%	75%	0%	25%	100%	0%	0%	0%	0%	100%
	2006	93%	0%	7%	75%	0%	25%	100%	0%	0%	0%	0%	100%
80. Are pesticides selected for lower risk of runoff or leaching based upon site conditions, pesticide label and hazard warnings?	2004	69%	12%	19%	25%	25%	50%	76%	18%	6%	0%	0%	100%
	2006	79%	10%	12%	50%	25%	25%	76%	18%	6%	0%	0%	100%
81. Are pesticides applied only according to the label and are environmental hazards followed?	2004	88%	2%	10%	75%	0%	25%	100%	0%	0%	0%	0%	100%
	2006	93%	0%	7%	75%	0%	25%	100%	0%	0%	0%	0%	100%
82. Are mixing and loading operations conducted on an impermeable surface in areas with low runoff potential hazard, and are operations performed over 100 feet downslope of a well? (both are required)	2004	57%	26%	17%	50%	25%	25%	59%	41%	0%	0%	0%	100%
	2006	67%	19%	14%	75%	0%	25%	88%	12%	0%	0%	0%	100%
83. Are pesticides applied at the lowest effective labeled rate whenever possible?	2004	86%	5%	10%	75%	0%	25%	100%	0%	0%	0%	0%	100%
	2006	90%	2%	7%	75%	0%	25%	100%	0%	0%	0%	0%	100%
84. Are improved application techniques used when possible (ultra low volume application, surfactants, stickers and sticker-spreaders)?	2004	79%	12%	10%	75%	0%	25%	94%	6%	0%	0%	0%	100%
	2006	88%	2%	10%	75%	0%	25%	100%	0%	0%	0%	0%	100%
85. Is chemical spray equipment calibrated to ensure accurate application rates?	2004	71%	17%	12%	75%	0%	25%	88%	12%	0%	0%	0%	100%
	2006	83%	7%	10%	75%	0%	25%	100%	0%	0%	0%	0%	100%
86. Does the pesticide storage facility include a concrete pad and curb to contain spills and leaks?	2004	62%	21%	17%	25%	25%	50%	71%	29%	0%	0%	0%	100%
	2006	60%	31%	10%	75%	0%	25%	76%	24%	0%	0%	0%	100%
87. Do pesticide handlers and applicators receive annual training and are training records kept?	2004	69%	21%	10%	75%	0%	25%	100%	0%	0%	0%	0%	100%
	2006	71%	14%	14%	75%	0%	25%	100%	0%	0%	0%	0%	100%
88. Are pesticide disposal methods environmentally safe?	2004	88%	0%	12%	50%	0%	50%	100%	0%	0%	0%	0%	100%
	2006	90%	0%	10%	75%	0%	25%	100%	0%	0%	0%	0%	100%
89. Is the growing area treated or fumigated before establishing a new crop?	2004	26%	45%	29%	50%	25%	25%	35%	35%	29%	0%	0%	100%
	2006	40%	43%	17%	50%	50%	0%	53%	18%	29%	0%	0%	100%
90. Are weeds eliminated in the growing environment and in non-cropped areas?	2004	98%	2%	0%	75%	0%	25%	100%	0%	0%	50%	0%	50%
	2006	100%	0%	0%	100%	0%	0%	100%	0%	0%	50%	0%	50%
91. Are irrigation hose nozzles kept off the ground to avoid contaminating plants?	2004	50%	36%	14%	25%	25%	50%	41%	41%	18%	50%	50%	0%
	2006	48%	38%	14%	50%	25%	25%	53%	24%	24%	50%	50%	0%

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		% Yes	% No	% Not Applicable	% Yes	% No	% Not Applicable	% Yes	% No	% Not Applicable	% Yes	% No	% Not Applicable
106. In landscaped *non-production areas* , are irrigation, fertilization, and pest management properly managed to avoid contaminated runoff?	2004	50%	10%	40%	50%	0%	50%	59%	18%	24%	50%	0%	50%
	2006	64%	5%	31%	100%	0%	0%	76%	0%	24%	50%	0%	50%
107. Are all *non-production* areas managed to prevent erosion and runoff?	2004	64%	14%	21%	50%	25%	25%	76%	24%	0%	100%	0%	0%
	2006	81%	5%	14%	100%	0%	0%	94%	0%	6%	100%	0%	0%
108. Are indoor walkways and loading/packing areas cleaned using only "dry" methods (e.g. sweeping, dry absorbents)?	2004	45%	12%	43%	50%	25%	25%	41%	47%	12%	50%	50%	0%
	2006	48%	10%	43%	25%	25%	50%	47%	24%	29%	50%	50%	0%
109. If wet cleaned, does all runoff remain on the property?	2004	19%	12%	69%	75%	0%	25%	53%	18%	29%	100%	0%	0%
	2006	21%	10%	69%	25%	0%	75%	53%	0%	47%	100%	0%	0%
110. Are outdoor driveways, walkways, parking areas, and loading/packing areas periodically cleaned for debris, vehicle residues, and other contaminants?	2004	88%	12%	0%	50%	50%	0%	94%	6%	0%	100%	0%	0%
	2006	95%	5%	0%	100%	0%	0%	94%	6%	0%	100%	0%	0%
111. Are these areas cleaned using only "dry" methods (sweeping, dry absorbents, etc.)?	2004	79%	19%	2%	50%	25%	25%	59%	35%	6%	50%	50%	0%
	2006	83%	12%	5%	75%	25%	0%	71%	29%	0%	50%	50%	0%
112. If wet cleaned, does all runoff remain on the property?	2004	26%	10%	64%	25%	25%	50%	47%	6%	47%	50%	0%	50%
	2006	31%	7%	62%	75%	0%	25%	41%	0%	59%	50%	0%	50%
113. Are you aware of all drainage conduits/ditches on the property and know where they drain?	2004	93%	2%	5%	100%	0%	0%	100%	0%	0%	0%	0%	100%
	2006	95%	0%	5%	100%	0%	0%	88%	6%	6%	0%	0%	100%
114. Are all municipal stormwater or sewer system conduits/ditches stenciled or designated with signs?	2004	2%	57%	40%	0%	25%	75%	6%	24%	71%	0%	50%	50%
	2006	5%	31%	64%	0%	50%	50%	6%	12%	82%	0%	50%	50%
115. Do you utilized any engineered barriers or buffers such as berms, containment structures, filter vegetation, etc… between production areas and surface waters/stormwater or sewer conduits?	2004	45%	31%	24%	25%	50%	25%	18%	41%	41%	50%	0%	50%
	2006	45%	26%	29%	50%	0%	50%	24%	12%	65%	50%	0%	50%
116. Is stormwater roof runoff managed/directed to avoid flowing across areas where contaminants will be washed into the municipal stormwater or sewer system?	2004	26%	26%	48%	25%	25%	50%	29%	35%	35%	50%	0%	50%
	2006	45%	17%	38%	50%	25%	25%	29%	12%	59%	50%	0%	50%
117. Have alternatives been explored for directing roof runoff into pervious areas (gravel, landscaping, alternative absorbant or paving material, self-contained tailwater system or collection ponds)?	2004	12%	31%	57%	0%	50%	50%	18%	35%	47%	50%	0%	50%
	2006	36%	21%	43%	50%	25%	25%	24%	12%	65%	50%	0%	50%

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		Calleguas Creek Watershed Nurseries (n=42)			Miscellaneous Coastal Watershed Nurseries (n=4)			Santa Clara River Watershed Nurseries (n=17)			Ventura River Watershed Nurseries (n=2)		
		% Yes	% No	% Not Applicable	% Yes	% No	% Not Applicable	% Yes	% No	% Not Applicable	% Yes	% No	% Not Applicable
118. Are exterior greenhouse shading compounds selected that are relatively non-toxic (no latex or ethylene glycol), or alternatively, are interior shade fabric or reflective covers used for temperature control?	2004	40%	5%	55%	50%	25%	25%	35%	18%	47%	50%	0%	50%
	2006	50%	0%	50%	50%	0%	50%	41%	0%	59%	50%	0%	50%
119. Do the methods used to apply and remove exterior shading compounds produce minimal runoff and remain on the property?	2004	29%	10%	62%	50%	25%	25%	18%	18%	65%	50%	0%	50%
	2006	31%	0%	69%	50%	0%	50%	35%	0%	65%	50%	0%	50%
120. Are fuel tanks located on machinery, or above and below ground storage facilities, checked and maintained to prevent leaks?	2004	69%	2%	29%	75%	0%	25%	94%	0%	6%	0%	0%	100%
	2006	69%	0%	31%	100%	0%	0%	94%	0%	6%	0%	0%	100%
121. Are these fuel tanks located to minimize risk of spills and wet weather washing into the municipal stormwater or sewer system, or percolating into groundwater?	2004	62%	7%	31%	75%	0%	25%	82%	6%	12%	0%	0%	100%
	2006	64%	2%	33%	100%	0%	0%	88%	0%	12%	0%	0%	100%
122. Are fueling activities performed carefully to avoid overflow and spills?	2004	69%	2%	29%	75%	0%	25%	94%	0%	6%	0%	0%	100%
	2006	69%	0%	31%	100%	0%	0%	94%	0%	6%	0%	0%	100%
123. Are fuel spills immediately and properly cleaned up?	2004	64%	7%	29%	25%	25%	50%	88%	6%	6%	0%	0%	100%
	2006	69%	2%	29%	100%	0%	0%	94%	0%	6%	0%	0%	100%
124. Are spill materials/equipment maintained for all potential types and sizes of spills and readily accessible?	2004	55%	43%	2%	75%	25%	0%	76%	24%	0%	0%	100%	0%
	2006	67%	31%	2%	50%	50%	0%	100%	0%	0%	0%	100%	0%
125. Are vehicles/trucks/tractors regularly maintained to detect and prevent fluid leaks?	2004	98%	0%	2%	100%	0%	0%	100%	0%	0%	100%	0%	0%
	2006	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%
126. Does wash runoff from vehicles/trucks/tractors remain on the property and not drain into the municipal stormwater or sewer system, or leach into groundwater?	2004	62%	19%	19%	50%	25%	25%	35%	47%	18%	50%	0%	50%
	2006	69%	17%	14%	75%	0%	25%	65%	6%	29%	50%	0%	50%
127. Are collected fluids properly disposed?	2004	90%	5%	5%	100%	0%	0%	94%	6%	0%	100%	0%	0%
	2006	98%	0%	2%	100%	0%	0%	100%	0%	0%	100%	0%	0%
128. Are vehicles, equipment, and storage tanks that are no longer used drained of fluids and properly disposed?	2004	64%	10%	26%	100%	0%	0%	94%	6%	0%	0%	0%	100%
	2006	69%	2%	29%	100%	0%	0%	100%	0%	0%	0%	0%	100%
129. Are maintenance/storage areas located to minimize spills and wet weather washing into the stormwater or sewer system, or percolating into groundwater?	2004	86%	14%	0%	75%	25%	0%	76%	24%	0%	50%	50%	0%
	2006	90%	7%	2%	100%	0%	0%	100%	0%	0%	50%	50%	0%

Appendix A. Responses from 65 Ventura County nurseries to a survey entitled, "Checklist for assessing and mitigating runoff for greenhouses and nurseries," conducted in 2004 and repeated in 2006.

		Calleguas Creek Watershed Nurseries (n=42)			Miscellaneous Coastal Watershed Nurseries (n=4)			Santa Clara River Watershed Nurseries (n=17)			Ventura River Watershed Nurseries (n=2)		
		% Yes	% No	% Not Applicable	% Yes	% No	% Not Applicable	% Yes	% No	% Not Applicable	% Yes	% No	% Not Applicable
130. Are maintenance/storage areas cleaned to avoid oil/grease buildup?	2004	95%	2%	2%	100%	0%	0%	100%	0%	0%	100%	0%	0%
	2006	98%	0%	2%	100%	0%	0%	100%	0%	0%	100%	0%	0%
131. Are spills immediately and properly cleaned up?	2004	95%	5%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%
	2006	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%
133. Are adequate numbers of waste containers available where needed and regularly collected to avoid overflow?	2004	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%
	2006	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%
134. Are waste containers in good condition and kept closed?	2004	83%	17%	0%	50%	50%	0%	41%	59%	0%	100%	0%	0%
	2006	79%	21%	0%	50%	50%	0%	76%	24%	0%	100%	0%	0%
135. Are waste containers/ collection areas/ storage areas/ stockpile areas located indoors and/or covered outdoors to prevent wet weather washing into the storm sewer system?	2004	76%	24%	0%	50%	50%	0%	47%	53%	0%	100%	0%	0%
	2006	76%	24%	0%	50%	50%	0%	88%	12%	0%	100%	0%	0%
136. Are adequate restrooms and portable toilets available where needed?	2004	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%
	2006	100%	0%	0%	75%	25%	0%	100%	0%	0%	100%	0%	0%
137. Are toilets, floor, and sink drains in restrooms properly hooked up to the sanitary sewer system?	2004	57%	5%	38%	75%	0%	25%	82%	0%	18%	100%	0%	0%
	2006	60%	7%	33%	50%	0%	50%	76%	0%	24%	100%	0%	0%
138. Are portable toilets located to avoid spills and wet weather washing into the municipal stormwater or sewer system?	2004	83%	0%	17%	75%	0%	25%	76%	0%	24%	100%	0%	0%
	2006	81%	5%	14%	75%	0%	25%	71%	0%	29%	100%	0%	0%
139. Are restrooms/portable toilets regularly maintained?	2004	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%
	2006	100%	0%	0%	75%	0%	25%	100%	0%	0%	100%	0%	0%
140. Have all proper employees received training in runoff, spill, waste, and sanitation management, and all applicable regulations?	2004	36%	62%	2%	75%	25%	0%	59%	41%	0%	50%	50%	0%
	2006	64%	31%	5%	75%	25%	0%	94%	6%	0%	50%	50%	0%
141. Is documentation/records kept of employee training?	2004	50%	48%	2%	50%	50%	0%	71%	29%	0%	0%	100%	0%
	2006	60%	36%	5%	25%	75%	0%	88%	12%	0%	0%	100%	0%
142. Has a record-keeping system for documenting management practices addressing water quality issues been started and maintained?	2004	12%	88%	0%	25%	75%	0%	29%	71%	0%	0%	100%	0%
	2006	31%	69%	0%	75%	25%	0%	65%	35%	0%	0%	100%	0%

Avocado Survey Results

	Number of questions	Total	Yes Count	No Count	NA Count	Yes %	No %	NA %
Soil Management	19	1786	1072	457	257	60%	26%	14%
Post-plant	6	564	358	146	60	63%	26%	11%
Erosion Control	7	658	332	192	134	50%	29%	20%
Soil Monitoring/Plant Analysis/Amendments	6	564	382	119	63	68%	21%	11%
Water and Nutrient Management	35	3290	1997	807	486	61%	25%	15%
Offsite Water Movement	5	470	258	84	128	55%	18%	27%
Irrigation System Efficiency	10	940	626	184	130	67%	20%	14%
Irrigation Scheduling and Amount	12	1128	624	384	120	55%	34%	11%
Fertilization/Fertigation/Plant Analysis	8	752	489	155	108	65%	21%	14%
Pest Management	30	2820	1559	761	500	55%	27%	18%
Insect/Mite/Vertebrate Control	10	940	487	306	147	52%	33%	16%
Natural Enemies	10	940	469	306	165	50%	33%	18%
Spray Efficiency and Efficacy	10	940	603	149	188	64%	16%	20%
Continuing Education	17	1598	814	330	454	51%	21%	28%
Grower	7	658	444	158	56	67%	24%	9%
Employee	10	940	370	172	398	39%	18%	42%

Citrus Survey Results

	Number of questions	Total	Yes Count	No Count	NA Count	Yes %	No %	NA %
Soil Management	19	1368	771	475	122	56%	35%	9%
Post-plant Soil Management	6	432	260	151	21	60%	35%	5%
Erosion control	7	504	224	195	85	44%	39%	17%
Soil Monitoring/Plant Analysis/Amendments	6	432	287	129	16	66%	30%	4%
Water and Nutrient Management	36	2592	1585	736	271	61%	28%	10%
Offsite Water Movement	5	360	205	76	79	57%	21%	22%
Irrigation System Efficiency	10	720	496	167	57	69%	23%	8%
Irrigation Scheduling and Amount	12	864	478	317	69	55%	37%	8%
Fertilization/Fertigation/Plant Analysis	9	648	406	176	66	63%	27%	10%
Pest Management	34	2448	1538	715	195	63%	29%	8%
Insect/Mite/Nematode/Vertebrate Control	14	1008	580	376	52	58%	37%	5%
Natural Enemies	10	720	436	235	49	61%	33%	7%
Spray Efficiency and Efficacy	10	720	522	104	94	73%	14%	13%
Continuing Education	18	1296	713	287	296	55%	22%	23%
Grower	8	576	371	165	40	64%	29%	7%
Employee	10	720	342	122	256	48%	17%	36%

Appendix E

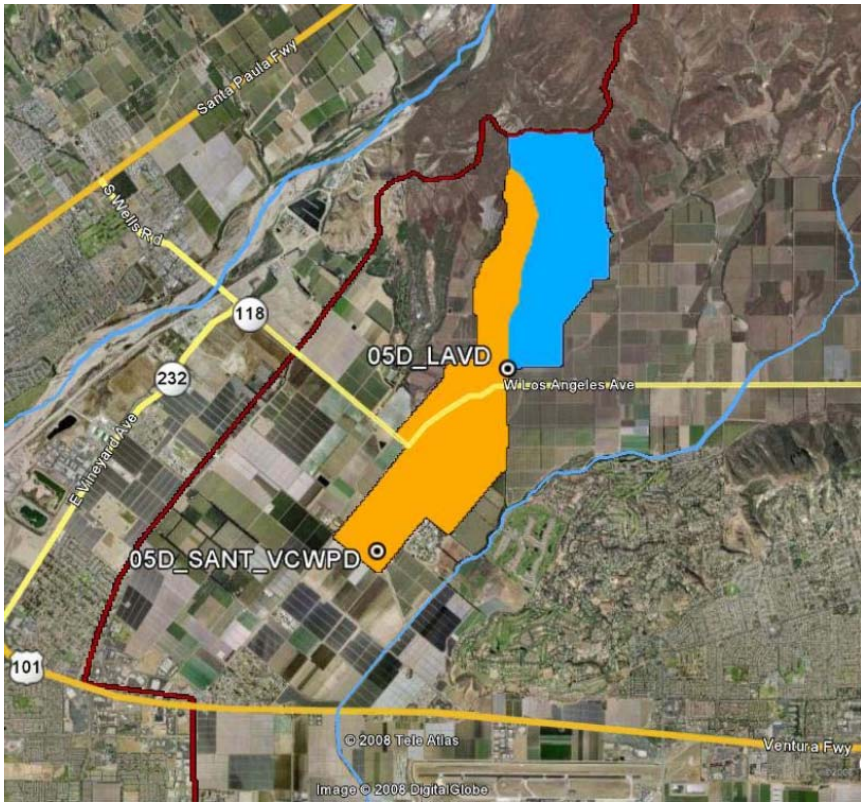
Management Practice Survey Cover Sheets

Management Practice Survey: Supplemental Information for 05D_SANT_VCWPD

The VCAILG developed a Water Quality Management Plan to address exceedances in water quality objectives found during 2007 water sampling. Because your property drains to one of the high priority areas, the VCAILG is asking that you comply with the Water Quality Management Plan by doing the following:

- Review the information on this sheet to become familiar with the water quality issues in your area.
- Complete the Management Practice Survey.
- Pay particular attention to management practices you are not currently implementing and start using new practices to address the water quality exceedances listed below.

Your property drains to the 05D_SANT_VCWPD monitoring site



These are the water quality benchmark exceedances found at 05D_SANT_VCWPD:

Dry Weather

- Salts
- Nitrogen
- OC Pesticides (ie. DDT)
- Temperature

Wet Weather

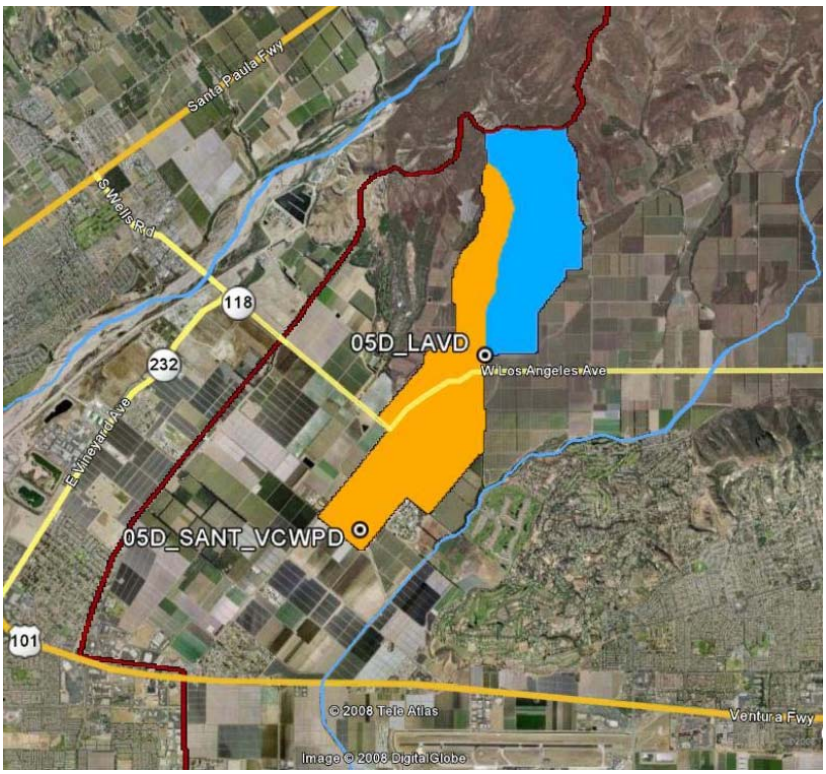
- Salts
- Nitrogen
- OC Pesticides (ie. DDT)
- OP Pesticides (chlorpyrifos)

Management Practice Survey: Supplemental Information for 05D_LAVD

The VCAILG developed a Water Quality Management Plan to address exceedances in water quality objectives found during 2007 water sampling. Because your property drains to one of the high priority areas, the VCAILG is asking that you comply with the Water Quality Management Plan by doing the following:

- Review the information on this sheet to become familiar with the water quality issues in your area.
- Complete the Management Practice Survey.
- Pay particular attention to management practices you are not currently implementing and start using new practices to address the water quality exceedances listed below.

Your property drains to the 05D_LAVD monitoring site



These are the water quality benchmark exceedances found at 05D_LAVD:

Dry Weather

- Salts
- Nitrogen
- OC Pesticides (ie. DDT)
- OP Pesticides (chlorpyrifos)
- Chronic Toxicity

Wet Weather

This site was not sampled due to insufficient flow.

Management Practice Survey: Supplemental Information for OXD_CENTR

The VCAILG developed a Water Quality Management Plan to address exceedances in water quality objectives found during 2007 water sampling. Because your property drains to one of the high priority areas, the VCAILG is asking that you comply with the Water Quality Management Plan by doing the following:

- Review the information on this sheet to become familiar with the water quality issues in your area.
- Complete the Management Practice Survey.
- Pay particular attention to management practices you are not currently implementing and start using new practices to address the water quality exceedances listed below.

Your property drains to the OXD_CENTR monitoring site

These are the water quality benchmark exceedances found at OXD_CENTR:

Dry Weather

- Nitrogen
- OC Pesticides (ie. DDT)

Wet Weather

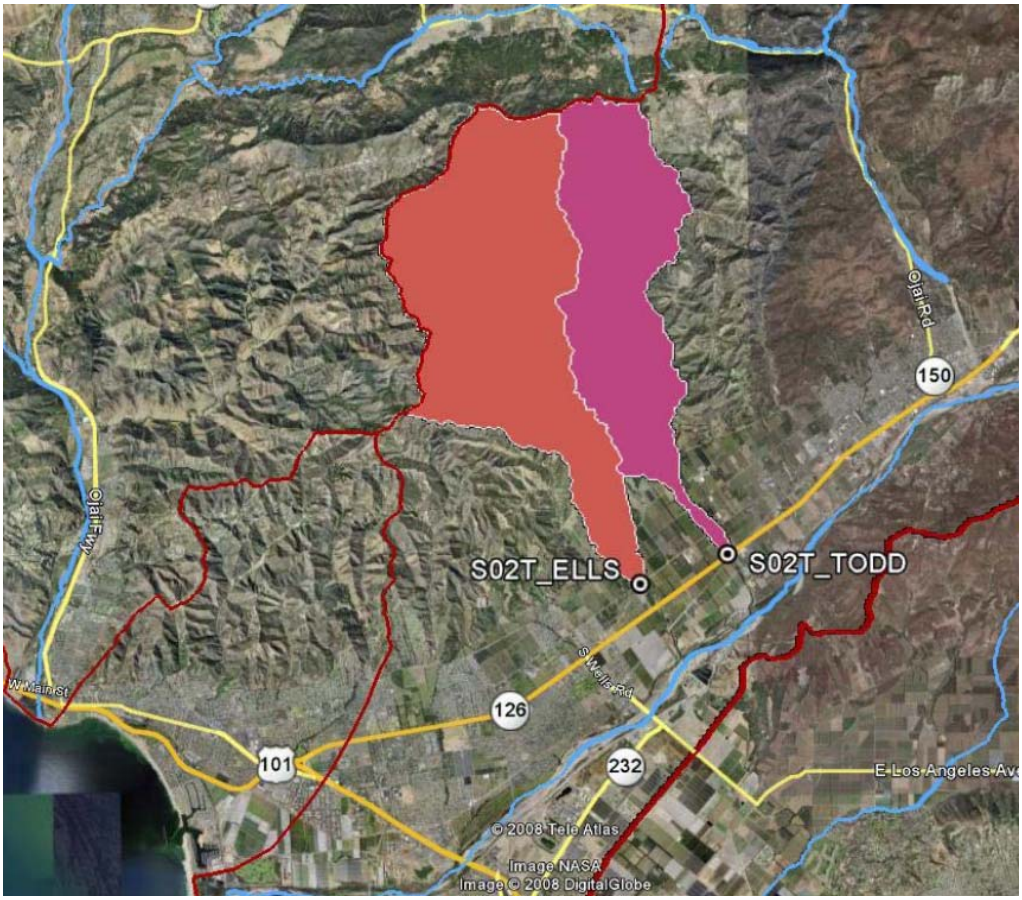
- Nitrogen
- OC Pesticides (ie. DDT)
- OP Pesticides (chlorpyrifos)

Management Practice Survey: Supplemental Information for S02T_TODD

The VCAILG developed a Water Quality Management Plan to address exceedances in water quality objectives found during 2007 water sampling. Because your property drains to one of the high priority areas, the VCAILG is asking that you comply with the Water Quality Management Plan by doing the following:

- Review the information on this sheet to become familiar with the water quality issues in your area.
- Complete the Management Practice Survey.
- Pay particular attention to management practices you are not currently implementing and start using new practices to address the water quality exceedances listed below.

Your property drains to the S02T_TODD monitoring site



These are the water quality benchmark exceedances found at S02T_TODD:

Dry Weather

- Salts
- Nitrogen
- Chronic Toxicity

Wet Weather

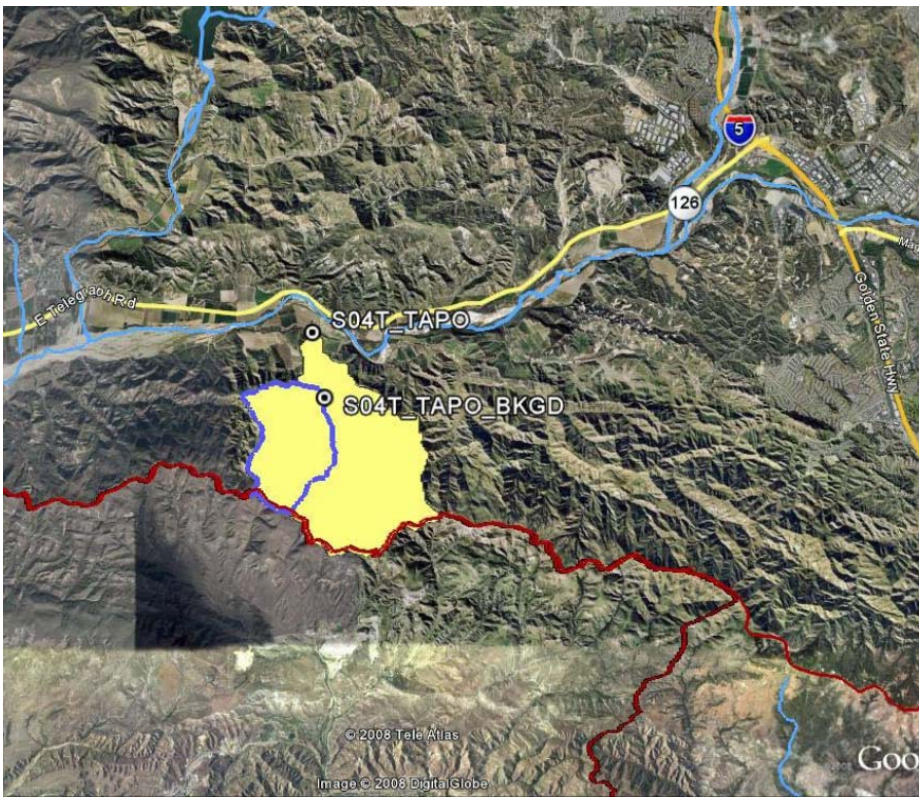
- Salts
- Nitrogen
- OP Pesticides (chlorpyrifos)

Management Practice Survey: Supplemental Information for S04T_TAPO

The VCAILG developed a Water Quality Management Plan to address exceedances in water quality objectives found during 2007 water sampling. Because your property drains to one of the high priority areas, the VCAILG is asking that you comply with the Water Quality Management Plan by doing the following:

- Review the information on this sheet to become familiar with the water quality issues in your area.
- Complete the Management Practice Survey.
- Pay particular attention to management practices you are not currently implementing and start using new practices to address the water quality exceedances listed below.

Your property drains to the S04T_TAPO monitoring site



These are the water quality benchmark exceedances found at S04T_TAPO:

Dry Weather

- Salts
- Nitrogen
- OC Pesticides (DDT, dieldrin)
- Chronic Toxicity

Wet Weather

- Salts
- OC Pesticides (DDT, chlordane)