Revised Surface Water Quality Management Plan

East San Joaquin Water Quality Coalition

May 1, 2014

Irrigated Lands Regulatory Program

Central Valley Regional Water Quality Control Board

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

LIST OF ACRONYMS

AWEP	Agricultural Water Enhancement Program
Basin Plan	*Water Quality Control Plan for the Sacramento and San Joaquin River Basins (4th Ed.)*
C	Core
CEDEN	California Environmental Data Exchange Network
COC	Constituent of Concern
CTR	California Toxics Rule
CURES	Coalition for Urban/Rural Environmental Stewardship
CVRWQCB	Central Valley Regional Water Quality Control Board
CV-SALTS	Central Valley Salinity Alternatives for Long-Term Sustainability
DDD	Dichlorodiphenyldichloroethane
DDE	Dichlorodiphenyldichloroethylene
DDT	Dichlorodiphenyltrichloroethane
DO	Dissolved Oxygen
DPR	California Department of Pesticide Regulation
DWR	California Department of Water Resources
EPA	U.S. Environmental Protection Agency
EQIP	Environmental Quality Incentives Program
ESJWQC	East San Joaquin Water Quality Coalition
F	Field
GIS	Geographic Information System
HCH	Hexachlorocyclohexane
ILRP	Irrigated Land and Regulatory Program
LSJR RTMP	Lower San Joaquin River Real Time Management Program
MLJ-LLC	Michael L. Johnson, LLC
MPUR	Management Plan Update Report
MPM	Management Plan Monitoring
MRP	Monitoring and Reporting Program Order No. R5-2008-0005
MRPP	Monitoring and Reporting Program Plan
NA	Not Applicable
NAWQA	National Water-Quality Assessment Program
NM	Normal Monitoring
NRCS	Natural Resource Conservation Service
NTR	National Toxics Rule

PAM	Polyacrylamide
PCA	Pesticide Control Adviser
pH	Power of Hydrogen
PUR	Pesticide Use Report
QAPP	Quality Assurance Project Plan
qPCR	Quantitative Polymerase Chain Reaction
SC	Specific Conductance
SNMP	Salt and Nutrient Management Plan
SQMP	Surface Water Quality Management Plan
SWAMP	Surface Water Ambient Monitoring Program
SWRCB	State Water Resources Control Board
TDS	Total Dissolved Solids
TIE	Toxicity Identification Evaluation
TMDL	Total Maximum Daily Load
US EPA	United States Environmental Protection Agency
USGS	United States Geological Survey
WDR	Waste Discharge Requirements General Order r5-2012-0116-R1
WQO	Water Quality Objective
WQP	Water Quality Portal
WQTL	Water Quality Trigger Limit
WQX	Water Quality Exchange
WY	Water Year

LIST OF UNITS

cfs	cubic feet per second
cm	centimeter
L	Liter
lbs	pounds
mg	milligram
MPN/100mL	most probable number per 100 milliliters
sec	second
µg	microgram
µS	microsiemens
µg/kg dw	microgram per kilogram of dry weight

LIST OF TERMS

Agricultural Commissioner – County Agriculture Commissioner
ArcGIS – Geographic Information Systems mapping software
Central Valley or Valley – California Central Valley
Coalition –East San Joaquin Water Quality Coalition
Coalition/ESJWQC region – The region within the Central Valley that is monitored by the East San Joaquin Water Quality Coalition
Core site monitoring – monitoring that occurs monthly at each Core site in each zone
Drainage –Water that moves horizontally across the surface or vertically into the subsurface from land
General Order –Waste Discharge General Order R5-2012-0116
Landowners – One or more persons responsible for the management of the irrigated land
Non project QA sample – Sample results from another project other than the Coalition included to meet laboratory Quality Assurance requirements.
Normal Monitoring –Refers to monitoring in the most recent MRPP
Regional Board – Central Valley Regional Water Quality Control Board
Site subwatershed – Starting from the sampling site, all waterbodies that drain, directly or indirectly, into the waterbody before the point where sampling occurs.
Special study – A study conducted outside of Normal Monitoring activities that involves monitoring specific constituents in an effort to determine the mechanism responsible for the exceedances; also includes Total Maximum Daily Load (TMDL) monitoring.
Subwatershed – The topographic perimeter of the catchment area of a stream tributary (Environmental Protection Agency (EPA) terms of environment: http://www.epa.gov/OCEPAterms/sterms.html).
Tributary Rule – Beneficial uses for Coalition monitoring sites are applied based on the most immediate downstream waterbody (not applied to constructed agricultural drains such as ones in Delta islands).
Waiver – Central Valley Regional Water Quality Control Board Coalition Group Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands, Order No. R5-2008-0005 amending Order No. R5-2006-0053.
Water body –Standing or flowing water of any size that may or may not move into a larger body of water, including lakes, reservoirs, ponds, rivers, streams, tributaries, creeks, sloughs, canals, laterals and drainage ditches.
Watershed – The land area that drains into a stream; the watershed for a major river may encompass a number of smaller watersheds that ultimately combine at a common point (EPA terms of environment: http://www.epa.gov/OCEPAterms/wterms.html).
WDR – Waste Discharge Requirements General Order for Growers within the Eastern San Joaquin River Watershed that are Members of the Third-Party Group

INTRODUCTION AND BACKGROUND

As outlined in the Waste Discharge Requirements General Order for Growers within the Eastern San Joaquin River Watershed (WDR or General Order; No. R5-2012-0116-R1), the East San Joaquin Water Quality Coalition (ESJWQC or Coalition) is submitting a revised Surface Water Quality Management Plan (SQMP). The Coalition first identified surface water locations and constituents that would require a management plan in April 2007, and developed the ESJWQC Management Plan in 2008. The revised ESJWQC SQMP identifies all site subwatersheds and constituents that have had more than one exceedance within three years or one exceedance if the constituent is subject to a TMDL. The analysis used to make this assessment includes data received through September 2013. As with the Management Plan submitted in 2008, this revised Surface Water Quality Management Plan will be updated annually in the ESJWQC Management Plan Progress Report and the Annual Report (submitted as a single document annually on May 1 to assess monitoring results and the effectiveness of management practices implemented by members. Yearly updates allow the Coalition to conduct outreach to growers, collect information about pesticide use, and obtain water quality data for both irrigation and dormant seasons when pesticide uses are highest.

The ESJWQC SQMP identifies when and where constituent-specific monitoring will occur to identify sources, evaluate effectiveness of management practices, assess performance goals and measures, and report on compliance time schedules. In addition, this document includes management plan implementation schedules and timelines for reporting to the Central Valley Regional Water Quality Control Board (CVRWQCB or Regional Board) on the effectiveness of the SQMP.

Although Management Plans are developed for individual subwatersheds and constituents of concern, the strategy employed by the Coalition in this revised SQMP is to address the same constituents across the entire Coalition region in as timely a manner as practicable. In the 2008 Management Plan, site subwatersheds were prioritized for focused outreach, implementation of management practices, and management plan monitoring (MPM). Constituents were grouped into one of five categories, A-E, which determined the amount of outreach and monitoring in the site subwatersheds where exceedances of WQTLs had occurred. Constituents in categories A, B, and C had the highest priority for Coalition action while categories D and E were the lowest priority. This strategy allowed the Coalition to allocate resources to outreach and monitoring over time while addressing the most significant problems first. The Coalition has been very successful in removing pesticides and toxicity from management plans. As a result, numerous site subwatersheds are no longer in management plans for specific constituents.

The Coalition assigns exceedances into one of several categories as enumerated below. The four categories of exceedances all require significant effort to remove from management plans, but the sourcing and management of exceedances moves from relatively easier at the top of the list to much more difficult at the bottom of the list.

- Chemicals applied by irrigated agriculture that are traceable to a source(s) (e.g. pesticides, toxicity)

- Chemicals applied by irrigated agriculture that are also applied by other entities (e.g. herbicides, pyrethroids)
- Chemicals applied by irrigated agriculture that are not traceable to a source (e.g. nitrate in fertilizers)
- Constituents with unknown sources (e.g. *E. coli*)
- Measured parameters with no direct sources whose concentration can be the result of many processes (e.g. dissolved oxygen and pH)

This revised SQMP presents the Coalition's approach to eliminating impairments of beneficial uses along with a compliance schedule for each specific constituent. Alternatively, for those constituents that are not easily tracked to a source, in place of a compliance schedule, a timetable is included for providing work plans to develop source identification studies to the Regional Board. The Management Plan approach involves source identification, outreach to all members who are potential sources of exceedances to provide recommendations about potential management practices that are known to be efficacious in managing discharges, and monitoring to evaluate the efficacy of implemented management practices.

Table 1 identifies each of the required components and the corresponding section of the Management Plan where these components can be found.

Table 1. ESJWQC Revised Management Plan Reporting Requirements and sections that address the WDR components.

REQUIRED ELEMENT (APPENDIX MRP-1)	SURFACE WATER QUALITY MANAGEMENT PLAN SECTIONS
A. Introduction and Background	**Introduction and Background**
B. Physical Setting and Information	**Physical Setting and Geographical Characteristics**
B.1.a. Land use maps	Land Use in Management Plan Watersheds, Appendix I Site Subwatershed Water Quality Data Summaries
B.1.b. Identification of potential agricultural sources of COCs	Identification of Agricultural Sources of Constituents of Concern
B.1.c. Beneficial uses	Beneficial Uses
B.1.d. Baseline of management practices	Baseline Inventory of Management Practices in Site Subwatersheds
B.1.e. Summary, discussion, and compilation of surface water quality data	Available Surface Water Quality Data
B.2. Description of watershed areas addressed by the management plan	Appendix I Site Subwatershed Water Quality Data Summaries
C. Management Plan Strategy	**Management Plan Strategy**
C.1. Description of approach	Description of Approach
C.2. Actions to meet goals and objectives	Actions to Meet Goals and Objectives
C.2.a. Compliance with receiving water limitations	Compliance
C.2.b. Educate members	Outreach – Education of Members
C.2.c. Identify, validate and implement management practices	Identification, Validation, and Implementation of Management Practices
C.3 Duties and responsibilities of individuals	Duties and Responsibilities
C.4. Strategies to implement the management plan tasks	Strategies to Implement Management Plan Tasks
C.4.a. ID entities or agencies	Agencies Contacted for Data and/or Assistance
C.4.b. ID management practices	Management Practices to Control COCs
C.4.c. ID outreach	Outreach Methods
C.4.d. Specific schedule and milestones	Specific Schedule and Milestones for Implementing Management Practices
C.4.e. Measurable performance goals with specific targets	Performance Goals and Performance Measures
D. Monitoring Methods	**Monitoring Methods**
D.2.a Locations of the monitoring site and schedule (including frequencies)	Monitoring Sites and Schedule
D.2.b. Surface water quality monitoring data electronically	Electronically submitted quarterly
E. Data Evaluation	**Data Evaluation**
F. Records and Reporting	**Records and Reporting**
G. Source Identification Study Requirements	**Source Identification Studies**

CONSTITUENTS OF CONCERN REQUIRING MANAGEMENT PLANS

As of September 2013, there are 21 constituents in management plans across 27 different site subwatersheds. All are addressed in this revision of the Management Plan with the exception of Total Dissolved Solids (TDS) which is no longer monitored under the WDR. However, any management plan for TDS will be converted to a management plan for specific conductance (SC) to capture the impairment of beneficial use due to salinity. Table 2 lists all of the sites in active management plans and the constituents approved for removal from active management plans. Table 3 includes a tally of all exceedances of WQTLs.

The constituent with the largest number of management plans is *E. coli* (24 of the 27 site subwatersheds). Molybdenum, dimethoate, DDE, and diazinon are in management plans in only one site subwatershed each (not the same site subwatershed). Two site subwatersheds are in management plans for only one constituent (Ash Slough @ Ave 21, Rodden Creek @ Rodden Rd) while Prairie Flower Drain @ Crows Landing Rd has 12 constituents in management plans. The remaining watersheds have multiple constituents in management plans but there appears to be no pattern in the suite of constituents that are in management plans across the Coalition region.

During January through September 2013 monitoring, exceedances occurred and management plans were reinstated at sites where management plans had been removed. Exceedances of the 7 mg/L WQTL for DO occurred during May and July through September 2013 at Merced River @ Santa Fe requiring the management plan for dissolved oxygen (DO) at that site to be reinstated. Exceedances of the 700 µs/cm WQTL for SC occurred in April and July 2013 at Duck Slough @ Gurr Rd requiring the management plan to be reinstated. The reinstated constituents are indicated in light grey in Tables 2 and 3.

Monitoring results for individual site subwatersheds with management plans are discussed in the Site Subwatershed Water Quality Data Summary Appendix (Appendix I). Appendix I describes specific water quality impairments for site subwatersheds with management plans, including all exceedances of WQTLs, management plan constituents, constituents that have been removed from management plans, and constituent-specific compliance schedules.

Table 2. Status of management plan constituents at ESJWQC site subwatersheds through September 2013.

Active - X, removed – dark grey cell, or reinstated – light grey cell with 'X'.

Site Subwatershed	Dissolved Oxygen (DO)*	pH*	Specific Conductance (SC)*	Total Dissolved Solids (TDS)	Ammonia	Nitrate/Nitrite	*E. coli*	Arsenic	Copper (Total & Dissolved)	Lead (Total & Dissolved)	Molybdenum	Chlorpyrifos	DDE	Diazinon	Dimethoate	Diuron	Simazine	*C. dubia* toxicity	*H. azteca toxicity*	*P. promelas toxicity*	*S. capricornutum* toxicity	Total Removed Per Site
Ash Slough @ Ave 21									X													3
Bear Creek @ Kibby Rd		X					X															4
Berenda Slough along Ave 18 1/2	X						X		X			X										1
Black Rascal Creek @ Yosemite Rd	X	X					X			X		X						X				0
Cottonwood Creek @ Rd 20	X						X		X	X												3
Deadman Creek @ Gurr Rd	X	X	X	X	X		X	X				X						X		X	X	1
Deadman Creek @ Hwy 59	X						X	X				X										1
Dry Creek @ Rd 18	X	X					X		X	X		X				X			X		X	1
Dry Creek @ Wellsford Rd	X	X		X			X					X						X	X			4
Duck Slough @ Gurr Rd**	X	X	X				X		X	X								X	X			3
Hatch Drain @ Tuolumne Rd	X		X	X		X	X	X											X		X	0
Highline Canal @ Hwy 99		X					X		X	X								X	X		X	5
Highline Canal @ Lombardy Rd		X					X		X	X									X		X	3
Hilmar Drain @ Central Ave	X	X	X	X	X	X	X		X							X			X		X	1
Howard Lateral @ Hwy 140		X	X	X			X		X			X										0
Lateral 2 ½ near Keyes Rd		X										X										1
Levee Drain @ Carpenter Rd	X		X	X	X	X	X											X				0
Livingston Drain @ Robin Ave		X					X		X			X									X	1
McCoy Lateral @ Hwy 140		X							X													0
Merced River @ Santa Fe	X						X			X		X						X				0
Miles Creek @ Reilly Rd	X						X		X	X		X		X				X	X		X	0
Mootz Drain downstream of Langworth Pond	X				X		X					X				X						0
Mustang Creek @ East Ave	X		X	X		X	X		X				X									2
Prairie Flower Drain @ Crows Landing Rd	X		X	X	X	X	X				X				X			X	X	X	X	2
Rodden Creek @ Rodden Rd							X															0
Unnamed Drain @ Hwy 140	X	X					X															0
Westport Drain @ Vivian Rd	X		X	X		X	X					X									X	0
Total Approved Management Plan Completion (Grey Cells)	**1**	**1**	**3**	**2**	**1**	**0**	**2**	**0**	**3**	**2**	**0**	**9**	**0**	**2**	**0**	**3**	**1**	**2**	**0**	**0**	**4**	**36**
Total Reinstated Management Plans (Light Grey Cells)	**1**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	
Total Management Plan Constituents Remaining (X)	**18**	**14**	**9**	**9**	**5**	**6**	**24**	**3**	**13**	**8**	**1**	**13**	**1**	**1**	**1**	**3**	**0**	**9**	**9**	**2**	**10**	

*Field parameters will continue to be monitored during Assessment, Core and Management Plan Monitoring events.

**Duck Slough @ Hwy 99 site subwatershed was removed from the Coalitions monitoring schedule; all remaining management plan constituents are monitored at the Duck Slough @ Gurr Rd location.

[1] TDS is no longer monitored at any Coalition site. All management plans for TDS will be converted to management plans for SC the alternative measure of salinity.

Table 3. ESJWQC exceedance tally based on results through September 2013.

Sites listed alphabetically by name, constituents listed alphabetically by group: field parameters (F), inorganics (I), bacteria (B), metals (M), pesticides (P) and toxicity (T). Management plan constituents are in blue, removed management plan constituents are in grey, and reinstated management plan constituents are in light grey. Field duplicate exceedances only included if no exceedance occurred in the environmental sample.

	F				I				B	M						P																			T			
MONITORING SITE	DO	pH	SC	TDS	AMMONIA	NITRATE AS N	NITRITE AS N	NITRATE + NITRITE AS N	*E. COLI*	ARSENIC	COPPER DISSOLVED†	COPPER TOTAL†	LEAD	MOLYBDENUM	ZINC	ALDICARB	CARBARYL	CARBOFURAN	CHLORPYRIFOS	CYANAZINE	DDD (P,P')	DDE (P,P')	DDT (P,P')	DIAZINON	DIELDRIN	DIMETHOATE	DIURON	HCH, DELTA	MALATHION	METHIDATHION	METHOXYCHLOR	METHYL PARATHION	THIOBENCARB	SIMAZINE	*C. DUBIA*	*P. PROMELAS*	*S. CAPRICORNUTUM*	*H. AZTECA*
Ash Slough @ Ave 21	1								3		2	5	2						4																		1	
Bear Creek @ Kibby Rd	2	5							7	1		4							2				1												3		2	2
Berenda Slough along Ave 18 ½	12	1							7		13								4								1								1		3	
Black Rascal Creek @ Yosemite Rd	21	3							11			1	2						4																5		1	1
Cottonwood Creek @ Rd 20	21	1							22		10	12	3						3	1				1			2							1		1	2	1
Deadman Creek @ Gurr Rd	28	5	6	6	5				41	11		4							4				1		1				1						4	7	3	
Deadman Creek @ Hwy 59	20	6							18	6									6		1		1				1							1			3	1
Dry Creek @ Rd 18	5	7							6		12	21	5		1				3					2			3								1		5	3
Dry Creek @ Wellsford Rd	42	7	1	1					47			3	1						9								2						1		2		4[1]	3
Duck Slough @ Gurr Rd	7	8	4	3	1			1	27		1	8	4					1	1														2		4	1	2	8
Duck Slough @ Hwy 99	2	3							12			11	11						4																1		3	2*
Hatch Drain @ Tuolumne Rd	30		29	12	1	13	1		12	12													1			1					1						10	8
Highline Canal @ Hwy 99	1	20	1	2	2				12		3	7	7						5				1				2								4		5	6
Highline Canal @ Lombardy Rd	1	8	1		1				6		5	5	8		1				6								1		1			1		1	6	2*	6	7
Hilmar Drain @ Central Ave	6	3	44	26	2	12			20			2							1		1	1					3								1		6	4
Howard Lateral @ Hwy 140	1	6	1	1				1	3		5								1																		1	
Lateral 2 ½ near Keyes Rd		7			1			1	2										3									1									1	1
Levee Drain @ Carpenter Rd	11		20	21	4			18	13																										2	1	1	1
Livingston Drain @ Robin Ave	1	17				1			2		3	9	2						4																		4	
McCoy Lateral @ Hwy 140		7							1		7																											
Merced River @ Santa Fe	8	1		1					5			1	2						3				1					1							5		1	
Miles Creek @ Reilly Rd	11	1		1					12			7	5			1			4					1					1	1					3		4	3
Mootz Drain @ Langworth Rd	10	1			1[2]				9										2								1[2]										1	
Mootz Drain downstream of Langworth Pond	15	1			1[2]				16																		1[2]											
Mustang Creek @ East Ave	12		9	6	1			2	10		5								2			3												2	2*		1	1
Prairie Flower Drain @ Crows Landing Rd	22	6	97	80	14	18	1	46	58	1				5			1		4				1			3			1						4	3[3]	13	6
Rodden Creek @ Rodden Rd	1								6														1				1											
Unnamed Drain @ Hwy 140	2	2							3		1																											
Westport Drain @ Vivian Rd	7		19	13		13			7										2																		4	1
GRAND TOTAL	**300**	**126**	**232**	**173**	**34**	**57**	**2**	**69**	**398**	**31**	**67**	**100**	**52**	**5**	**2**	**1**	**1**	**1**	**81**	**1**	**2**	**4**	**8**	**4**	**1**	**4**	**18**	**2**	**4**	**1**	**1**	**1**	**3**	**5**	**48**	**15**	**87**	**59**

Grey cells- dark grey cells indicate the constituent has been approved for management plan completion, light grey cells indicate the constituent has been reinstated into a management plan.

*Not prioritized for MPM; both toxic samples were from the same sampling event (sample and resample to test for persistence).

[1]The total toxic samples to *S. capricornutum* at Dry Creek @ Wellsford Rd was updated from 5 to 4, the previous total counted a sample that was not considered statistically different and therefore was not toxic from March 7, 2007.

[2]Exceedances from Mootz Drain @ Langworth Rd count toward management plan for Mootz Drain Downstream of Langworth Pond if within a three year period (site moved in December 2010, as approved on November 18, 2009).

[3]Two of the *P. promelas* toxic samples at Prairie Flower Drain @ Crows Landing Rd were from the same sampling event (sample and resample to test for persistence).

† Exceedances of the hardness based WQTL for dissolved and total copper are evaluated under the same management plan.

WATER QUALITY TRIGGER LIMITS AND OBJECTIVES

The ESJWQC monitors for the constituents listed in Table 4 which is reproduced from the WDR. Field parameters, physical parameters, pesticides, selected metals, bacteria (*E. coli*), water column toxicity testing with three species, and nutrients are sampled during every Core site monitoring event. Sediment is collected for toxicity testing twice per year. Some pesticides are monitored twice yearly during a high TSS storm event and a high TSS irrigation event. Measurements are collected either in the field or are generated by laboratory analyses as outlined in the ESJWQC QAPP. Each year on August 1, the Coalition submits a Monitoring Plan Update (MPU) that outlines the locations, constituents, and frequency of sample collection and analysis for the following Water Year (WY). The MPU includes the monitoring schedule for management plan constituents.

The Water Quality Trigger Limits (WQTLs) were established to preserve water quality within the Valley as defined in the Water Quality Control Plan for the Sacramento and San Joaquin River Basins (Basin Plan). The Coalition evaluates water quality data based on the WQTL table updated and disseminated by Regional Board staff on September 18, 2008 (Table 6). Objectives and limits listed in the WQTL table are based on the following beneficial uses: Agriculture, Aquatic Life (freshwater habitat, spawning, and migration), Municipal and Domestic Supply, Water Contact Recreation. Waters of the State are protected if no exceedances of specific WQTLs occur.

The WQTLs have changed over years of monitoring and therefore the Coalition may have reported exceedances in the past that are no longer considered exceedances of current WQTLs. There may also be exceedances reported in this document that have not been reported in previous documents because the WQTL has been adjusted to a lower concentration.

Table 4. Monitoring parameters.

CONSTITUENTS, PARAMETERS, AND TESTS	
Photograph of monitoring location	
WATER COLUMN SAMPLING	
Flow (field measure)	Physical Parameters and General Chemistry
pH (field measure)	
Electrical Conductivity (at 25°C, field measure)	
Dissolved Oxygen (DO, field measure)	
Temperature (field measure)	
Turbidity	
Total Suspended Solids (TSS)	
Hardness	
Total Organic Carbon (TOC)	
E. coli	Bacteria
Algae - *Selenastrum capricornutum*	Water Column Toxicity Test
Water Flea - *Ceriodaphnia dubia*	
Fathead Minnow - *Pimephales promelas*	
Toxicity Identification Evaluation (TIE)[1]	
Aldicarb	Carbamates
Carbaryl	
Carbofuran	
Methiocarb	
Methomyl	
Oxamyl	
Dichlorodiphenyldichloroethane (DDD)	Organochlorines[2]
Dichlorodiphenyldichloroethylene (DDE)	
Dichlorodiphenyltrichloroethane (DDT)	
Dicofol	
Dieldrin	
Endrin	
Methoxychlor	
Aldrin	Group A[2]
Chlordane	
Heptachlor	
Heptachlor Epoxide	
Hexachlorocyclohexane (including Lindane) (gamma-HCH)	
Hexachlorocyclohexane (alpha-HCH)	
Hexachlorocyclohexane (beta-HCH)	
Hexachlorocyclohexane (delta-HCH)	
Endosulfan I	
Endosulfan II	
Toxaphene	
Azinphos-methyl	Organophosphates
Chlorpyrifos	
Diazinon	
Dichlorvos	
Dimethoate	
Demeton-s	
Disulfoton (Disyton)	
Malathion	
Methamidophos	
Methidathion	
Parathion-methyl	
Phorate	
Phosmet	
Atrazine	Herbicides
Cyanazine	

CONSTITUENTS, PARAMETERS, AND TESTS	
Diuron	
Glyphosate[2]	
Linuron	
Paraquat[2]	
Simazine	
Trifluralin	
Arsenic (total) [2]	**Metals**
Boron (total)[2]	
Cadmium (total and dissolved) [2]	
Copper (total and dissolved)	
Lead (total and dissolved) [2]	
Nickel (total and dissolved)[2]	
Molybdenum (total) [2]	
Selenium (total) [2]	
Zinc (total and dissolved)	
Total Kjeldahl Nitrogen (TKN) [2]	**Nutrients**
Nitrate plus Nitrite as Nitrogen	
Total Ammonia	
Unionized Ammonia (calculated value)	
Total Phosphorous (as P) [2]	
Soluble Orthophosphate	
SEDIMENT SAMPLING	
Hyalella azteca	**Sediment Toxicity**
Bifenthrin	**Pesticides (as needed based on criteria described in MRP Part II.E.2)**
Cyfluthrin	
Cypermethrin	
Deltamethrin: Tralomethrin	
Esfenvalerate	
Lambda-Cyhalothrin	
Permethrin	
Fenpropathrin	
Chlorpyrifos	
Total Organic Carbon	**Other sediment parameters**
Grain Size	

[1] Specific TIE manipulations utilized in each test will be reported.

[2] Beginning in July 2011 monitoring for organochlorines (including Group A pesticides), glyphosate, and paraquat was reduced to two monitoring events per year (one storm and one irrigation event); monitoring for metals not applied by agriculture was reduced to two storm and two irrigation events per year; these constituents are monitored during high TSS events as outlined in the May 6, 2011 approval letter.

DO and SC/TDS

The Coalition has obtained measurements of salt as SC (via a meter in the field) at every site subwatershed monitored and TDS (laboratory analysis) during most monitoring events unless only MPM was occurring. With the adoption of the General Orders in December 2012, monitoring for TDS was no longer required. The Coalition has management plans for both TDS and SC in several site subwatersheds although there is not a perfect correlation between the two, i.e. there are site subwatersheds that are in a management plan for TDS but not for SC. Because the Coalition no longer monitors for TDS, it will place all site subwatersheds that were previously in a management plan for TDS into a management plan for SC.

The Coalition will not provide a specific compliance schedule for SC because it is participating in the Lower San Joaquin River Committee processes to develop a Basin Plan Amendment (Basin Plan Amendment) for Salt and Boron for the Lower San Joaquin River. As part of that process, it is likely that the Coalition will sign the Memorandum of Understanding with other stakeholders in the Basin to develop and participate in a Real Time Management Program (RTMP) that will manage salt across the entire Basin. Because of the compliance schedule in the 2004 TMDL for salt and boron, the Coalition must join the RTMP and be subject to the compliance schedule developed under the upcoming BPA, or be in compliance with load allocations provided in the 2004 TMDL which may be 2018 depending on the hydrologic WY types that occur between now and the compliance date. Also, the Coalition is participating in the Central Valley Salinity Alternatives Long Term Solutions (CV SALTS) process that will lead to the development of Salt and Nutrient Management Plans (SNMP) for subregions in the entire Central Valley. The CV SALTS SNMPs and the LSJR RTMP will dictate how the Coalition manages salt in the Coalition region over the next decades including dictating compliance schedules. The Coalition will await the outcome of those processes before specifically addressing the management of salt.

According to the Basin Plan, the lower limit for DO is used to determine exceedances based on beneficial uses assigned or applied to the waterbody (Table 5, also included in the WQTL table; Table 6). The Basin Plan identifies a DO trigger limit of 5 mg/L for waterways that have been assigned the 'warm' beneficial use and 7.0 mg/L for waterbodies assigned a 'cold' beneficial use (Basin Plan Page III-5). The Coalition has used 7.0 mg/L for all waterbodies when determining whether an exceedance has occurred. The majority of the waterbodies located in the ESJWQC region have characteristics that would permit lowering the WQTL from 7 mg/L for DO to 5 mg/L. The revised DO criteria for each ESJWQC monitoring site is outlined in Table 5. There are currently three tributary sites in the ESJWQC region that are considered waterbodies with beneficial uses of cold or spawning habitat and therefore maintain the WQTL of 7 mg/L for DO (Bear Creek @ Kibby Rd, Merced River @ Santa Fe, and Rodden Creek @ Rodden Rd). The 5.0 mg/L objective can be applied to those water bodies that are assigned the warm beneficial use in the Basin Plan, or that are assigned the warm beneficial use through application of the tributary rule. The Basin Plan language for application of the tributary rule is:

"Beneficial uses of any specifically identified water body generally apply to its tributary streams, except as provided below:

- MUN, COLD, MIGR and SPWN do not apply to Old Alamo Creek (Solano County) from its headwaters to the confluence with New Alamo Creek
- MUN and the human consumption of aquatic organisms do not apply to Sulphur Creek (Colusa County) from Schoolhouse Canyon to the confluence with Bear Creek

In some cases a beneficial use may not be applicable to the entire body of water. In these cases the Regional Water Board's judgment will be applied.

It should be noted that it is impractical to list every surface water body in the Region. For unidentified water bodies, the beneficial uses will be evaluated on a case-by-case basis."

The application of the 5.0 mg/L objective is applicable to Cottonwood Creek, Ash Slough, Berenda Slough, and Dry Creek (all Madera County) for the following reasons:

- The four water bodies in Madera County are ephemeral and only hold water for a brief period in the winter when rainfall is sufficient to generate runoff or when being used as a conveyance for irrigation water
- When water is present, it reaches the Eastside Bypass, the most immediate downstream water body, only rarely. In the history of the ILRP, there have been no flows that have moved down any of these water bodies and reached the Eastside Bypass
- The Eastside Bypass confluences with Bear Creek, downstream of Sack dam and upstream of the Merced River.
- Although there is a Cold beneficial use assigned to Reach 4 of the San Joaquin River which runs from Sack Dam to Bear Creek, this reach of the SJR is generally dry except when extremely high flow spills over Sack Dam. Water from the upstream SJR is routed to the Eastside Bypass at Sack Dam, which can then be routed to the Mariposa Bypass and if any flow remains, back to the SJR. Any flow remaining in the Eastside Bypass (after routing to Mariposa Bypass) is routed to Bear Creek and then returns to the SJR. Therefore, the Cold beneficial use assigned to Reach 4 can never be realized.
- The two major water bodies in Madera County are the Fresno River and Chowchilla River. They also confluence with the Eastside Bypass but similar to the other four water bodies, do not hold water unless there are extremely heavy storms that generate significant runoff, or are used as conveyance structures for irrigation deliveries. Both waterbodies have assigned beneficial uses in the Basin Plan and have been assigned only a Warm beneficial use, not a Cold beneficial use.

For these reasons, the Coalition will apply the 5.0 mg/L WQTL to Cottonwood Creek, Ash Slough, Berenda Slough, and Dry Creek in Madera County when determining if exceedances occur.

In addition, the Coalition monitors 12 constructed agricultural conveyance structures/drains (Table 5) that have been assigned beneficial uses through the tributary rule. Many of these structures are concrete and are not meant to be habitat for any aquatic life. The remaining structures are mud channels that are maintained to be free of aquatic vegetation that might impede flows. These structures are property of various irrigation districts and may or may not contain water as determined by demand for irrigation water. Irrigation districts can at any time, alter the channels by lining them with concrete or any other structure meant to reduce or eliminate infiltration of water. Beneficial uses should not be assigned to constructed agricultural conveyance/drain structures by the tributary rule. Neither the 5.0 mg/L nor the 7.0 mg/L objectives are appropriate to apply to these water bodies. Consequently, the Coalition will not maintain management plans for DO for Hatch Drain, Hilmar Drain, Highline Canal, Howard Lateral, McCoy Lateral, Westport Drain, Levee Drain, Lateral 2 ½, Unnamed Drain (@ Highway 140), Prairie Flower Drain, Mootz Drain, and Livingston Drain. All changes are outlined in Table 5.

Table 5. Assessment of the appropriate DO WQTL based on the beneficial use of the downstream named waterbody as defined in the Basin Plan.

Zone	Monitoring Site	Immediate Downstream Waterbody	Aquatic Life BU	Decision	DO Criteria mg/L	Justification
1	Dry Creek @ Wellsford Rd	Dry Creek (tributary to Tuolumne River at Modesto, E Stanislaus County)	COLD	2	7	Assigned COLD based on tributary rule.
1	Mootz Drain downstream of Langworth Pond	NA – Constructed Ag conveyance or drain structure	None	3	NA	Constructed conveyance structure or irrigation canal. Not habitat for aquatic life.
1	Rodden Creek @ Rodden Rd	Stanislaus River	COLD	1	7	Rodden Creek drains to Stanislaus River. COLD aquatic use assigned based on criteria used for Stanislaus River
2	Canal Creek @ West Bellevue Rd	NA – Constructed Ag conveyance or drain structure	None	3	NA	Based on Aerial photos, Canal Creek drains to a series of constructed conveyance structures and irrigation canals before reaching the SJR. Not habitat for fish.
2	Hatch Drain @ Tuolumne Rd					Constructed conveyance structure or irrigation canal. Not habitat for aquatic life.
2	Hilmar Drain @ Central Ave					
2	Lateral 2 ½ near Keyes Rd					
2	Lateral 5 1/2 @ South Blaker Rd					
2	Lateral 6 and 7 @ Central Ave					
2	Levee Drain @ Carpenter Rd					
2	Lower Stevinson @ Faith Home Rd					
2	Prairie Flower Drain @ Crows Landing Rd					
2	Unnamed Drain @ Hogin Rd					
2	Westport Drain @ Vivian Rd					
2	Westport Drain @ Vivian Rd					
3	Highline Canal @ Hwy 99	Highline Canal (from Mustang Creek to Lateral No 8, Merced and Stanislaus Counties)	None	3		Site designated as WARM Aquatic Use. Additionally, this is a constructed conveyance structure. Not a habitat for aquatic life.
3	Highline Canal @ Lombardy Rd					
3	Mustang Creek @ East Ave	Mustang Creek (Merced County)				Upstream of constructed conveyance structure, dry 11 months out of the year, and drain ends before SJR. Not habitat for aquatic life.
4	Bear Creek @ Kibby Rd	Bear Creek (from Bear Valley to San Joaquin River, Mariposa and Merced Counties)	WARM	1	5	Assigned WARM beneficial use based on tributary Rule.
4	Black Rascal Creek @ Yosemite Rd	Black Rascal Creek (Merced County)	WARM	2	5	Assigned WARM beneficial use based on tributary rule.
4	Howard Lateral @ Hwy 140	NA – Constructed Ag conveyance or drain structure	None	3	NA	Turlock Irrigation District constructed conveyance structure. Not habitat for aquatic life.
4	Livingston Drain @ Robin Ave					
4	McCoy Lateral @ Hwy 140					
4	Merced River @ Santa Fe Rd	Merced River, Lower (McSwain Reservoir to San Joaquin River)	COLD	1	7	Site designated as COLD Aquatic Use.
4	Unnamed Drain @ Hwy 140	NA – Constructed Ag conveyance or drain structure	None	3	NA	Constructed conveyance structure or irrigation canal. Not habitat for fish.

Zone	Monitoring Site	Immediate Downstream Waterbody	Aquatic Life BU	Decision	DO Criteria mg/L	Justification
5	Deadman Creek @ Gurr Rd	Deadman Creek (Merced County)	WARM	2	5	Assigned WQRM beneficial use based on tributary rule.
5	Deadman Creek @ Hwy 59	Deadman Creek (Merced County)				
5	Duck Slough @ Gurr Rd	Duck Slough (Merced County)				
5	Duck Slough @ Hwy 99	Duck Slough (Merced County)				
5	Miles Creek @ Reilly Rd	Miles Creek (Merced County)		2		Miles Creek drains to Owens Creek. WARM aquatic use based on criteria used for Owens Creek waterway. Assigned WQRM beneficial use based on tributary rule.
6	Ash Slough @ Ave 21	NA – Constructed Ag conveyance or drain structure	WARM	2		Assigned WQRM beneficial use based on tributary rule and consistency with other waterbodies in Zone 6.
6	Berenda Slough along Ave 18 ½					
6	Cottonwood Creek @ Rd 20	Cottonwood Creek (S Madera County)	WARM	2		Assigned WQRM beneficial use based on tributary rule and consistency with other waterbodies in Zone 6.
6	Dry Creek @ Rd 18	Dry Creek (Madera County)				

BU- Beneficial use
NA- Not applicable
WQTL- Water Quality Trigger Limit
1- COLD or SPAWN Aquatic Life BU (7 mg/L WQTL required)
2- WARM Aquatic Life BU (5 mg/L WQTL acceptable)
3- Waterbody is a constructed agricultural conveyance structure or drain. No DO objectives apply.

Table 6. Water Quality Trigger Limits for constituents and parameters measured during Coalition monitoring.

Constituent	Water Quality Trigger Limit (WQTL)	Standard Type	Beneficial Use (BU) with most protective limit	Reference for the Trigger Limit	Category (see footnotes)
pH	6.5 - 8.5 units	Numeric		Sacramento/San Joaquin Rivers Basin Plan (Page III.6.00)	1
Electrical Conductivity (maximum)	700 µmhos/cm	Narrative	Agricultural Supply	Water Quality for Agriculture (Ayers & Westcot)	3
Dissolved Oxygen (minimum)	7 mg/L	Numeric	Cold Freshwater Habitat, Spawning	Sacramento/San Joaquin Rivers Basin Plan. Water Quality Control Plan for the Tulare Lake Basin.	1
	5 mg/L		Warm Freshwater Habitat	Basin Plan Objective, Page III-5.00: for waters designated WARM (aquatic life). Tulare Lake Basin Plan	
Turbidity	variable	Numeric	Municipal and Domestic Supply	Basin Plan Objective - increase varies based on natural turbidity	1
Total Dissolved Solids	450 mg/L	Narrative	Agricultural Supply	Water Quality for Agriculture (Ayers & Westcott)	3
Total Suspended Solids	NA				
Temperature	variable	Numeric		Basin Plan Objective (see objectives for COLD, WARM, and Enclosed Bays and Estuaries)	1
E coli	235 MPN/100 ml	Narrative	Water Contact Recreation	EPA ambient water quality criteria, single-sample maximum	3
Fecal coliform	200 MPN/100 ml **400 MPN/100 ml**	Numeric	Water Contact Recreation	Sacramento/San Joaquin Rivers Basin Plan (Page III.3.00) Geometric mean of not less than five samples for any 30- day period, **nor shall more than 10% of the total number of samples taken during a 30 -day period.**	1
TOC	NA				
Pesticides – Carbamates					
Aldicarb	3 µg/L	Numeric	Municipal and Domestic Supply	Sacramento/San Joaquin Basin Plan Chemical Constituents Objective: United States Environmental Protection Agency (USEPA) Primary Maximum Contaminant Level (MCL) (MUN, human health)	1
Carbaryl	2.53 µg/L	Narrative	Freshwater Habitat	Sacramento/San Joaquin Basin Plan Toxicity Objective: Freshwater Aquatic Life Protection - Continuous Concentration, 4-Day Average	3
Carbofuran	ND	Numeric		Sacramento/San Joaquin Basin Plan - Basin Plan Prohibition	2
Methiocarb	0.5 µg/L	Narrative	Freshwater Habitat	Sacramento/San Joaquin Basin Plan Toxicity Objective: Handbook of Acute Toxicity of Chemicals to Fish and Aquatic Invertebrates	3
Methomyl	0.52 µg/L	Narrative	Freshwater Habitat	Sacramento/San Joaquin Basin Plan Toxicity Objective: Freshwater Aquatic Life Protection - Continuous Concentration, 4-Day Average (California Department of Fish and Game) (aquatic life)	3
Oxamyl	50 µg/L	Numeric	Municipal and Domestic Supply	Sacramento/San Joaquin Basin Plan Chemical Constituents Objective: Drinking Water Standards - Maximum Contaminant Levels (MCLs). California Dept of Health Services. Primary MCL	3
Pesticides – Organochlorines					
DDD(p,p')	0.00083 µg/L	Numeric	Municipal and Domestic Supply	Sacramento/San Joaquin Basin Plan Chemical Constituents Objective: CTR, Human Health Protection, 30-Day Average - Sources of Drinking Water (water & fish consumption)	1
DDE(p,p')	0.00059 µg/L				
DDT(p,p')	0.00059 µg/L				
Dicofol	NA				
Dieldrin	0.00014 µg/L	Numeric	Municipal and Domestic Supply	Sacramento/San Joaquin Basin Plan Chemical Constituents Objective: CTR (USEPA), Human Health Protection, 30-Day Average - Sources of Drinking Water (water & fish consumption)	1
	0.056 µg/L	Numeric	Freshwater Habitat	Sacramento/San Joaquin Basin Plan Chemical Constituents Objective: CTR (USEPA) / Continuous Concentration 4-day average (total)	1
Endrin	0.036 µg/L	Numeric	Freshwater Habitat	Sacramento/San Joaquin Basin Plan Chemical Constituents Objective: CTR (USEPA) - Continuous Concentration 4-Day Average	1

Constituent	Water Quality Trigger Limit (WQTL)	Standard Type	Beneficial Use (BU) with most protective limit	Reference for the Trigger Limit	Category (see footnotes)
	0.76 µg/L	Numeric	Municipal and Domestic Supply	Sacramento/San Joaquin Basin Plan Chemical Constituents Objective: CTR (USEPA), Human Health Protection, 30-Day Average - Sources of Drinking Water (water & fish consumption)	1
Methoxychlor	0.03 µg/L	Narrative	Freshwater Habitat	Sacramento/San Joaquin Basin Plan Toxicity Objective: USEPA National Ambient Water Quality Criteria - Freshwater Aquatic Life Protection - instantaneous maximum	3
	30 µg/L	Numeric	Municipal and Domestic Supply	Sacramento/San Joaquin Basin Plan Chemical Constituents Objective: California Primary MCL (MUN, human health)	1
Pesticides – Organophosphates					
Azinphos methyl	0.01 µg/L	Narrative	Freshwater Habitat	Sacramento/San Joaquin Basin Plan Toxicity Objective: USEPA National Ambient Water Quality Criteria - instantaneous maximum	3
Chlorpyrifos	0.015 µg/L	Numeric	Freshwater Habitat	Sacramento/San Joaquin Rivers Basin Plan: page III-6.01; San Joaquin River & Delta, Sacramento & Feather Rivers; more stringent 4-day average.	1
Diazinon	0.1 µg/L	Numeric	Freshwater Habitat	Sacramento/San Joaquin Basin Plan: San Joaquin River & Delta numeric standard. Sacramento & Feather Rivers numeric standard	1
Dichlorvos	0.085 µg/L	Narrative	Municipal and Domestic Supply	Sacramento/San Joaquin Basin Plan Toxicity Objective: Drinking Water Health Advisories or Suggested No-Adverse-Response Levels for non-cancer health effects. One-in-a-Million Incremental Cancer Risk Estimates for Drinking Water. Cal/EPA Cancer Potency Factor as a drinking water level	3
Dimethoate	1.0 µg/L	Narrative	Municipal and Domestic Supply	Sacramento/San Joaquin Basin Plan Toxicity Objective: Notification Level – DHS (MUN, human health). California Notification Levels. (Department of Health Services)	3
Demeton-s	NA				
Disulfoton	0.05 µg/L	Narrative	Freshwater Habitat	Sacramento/San Joaquin Basin Plan Toxicity Objective: USEPA National Ambient Water Quality Criteria - Freshwater Aquatic Life Protection - instantaneous maximum	3
Malathion	ND	Numeric		Sacramento/San Joaquin Basin Plan - Basin Plan Prohibition	2
Methamidophos	0.35 µg/L	Narrative	Municipal and Domestic Supply	Basin Plan Toxicity Objective, Drinking Water Health Advisories or Suggested No-Adverse-Response Levels for non-cancer health effects. USEPA IRIS Reference Dose (RfD) as a drinking water level.	3
Methidathion	0.7 µg/L	Narrative	Municipal and Domestic Supply	Sacramento/San Joaquin Basin Plan Toxicity Objective: USEPA IRIS Reference Dose (MUN, human health)	3
Parathion, Methyl	ND	Numeric		Sacramento/San Joaquin Basin Plan - Basin Plan Prohibition	2
Phorate	0.7 µg/L	Narrative	Municipal and Domestic Supply	Sacramento/San Joaquin Basin Plan Toxicity Objective: Drinking Water Health Advisories or Suggested No-Adverse-Response Levels for non-cancer health effects. USEPA IRIS Reference Dose as a drinking water level.	3
Phosmet	140 µg/L	Narrative	Municipal and Domestic Supply	Sacramento/San Joaquin Basin Plan Toxicity Objective: Drinking Water Health Advisories or Suggested No-Adverse-Response Levels for non-cancer health effects. USEPA IRIS Reference Dose as a drinking water level.	3
Group A Pesticides					
Aldrin	0.00013 µg/L	Numeric	Municipal and Domestic Supply	Sacramento/San Joaquin Basin Plan Chemical Constituents Objective: CTR (USEPA), Human Health Protection, 30-Day Average - Sources of Drinking Water (water & fish consumption)	1
	3 µg/L		Freshwater Habitat	Sacramento/San Joaquin Basin Plan Chemical Constituents Objective: CTR (USEPA) - Instantaneous maximum	

Constituent	Water Quality Trigger Limit (WQTL)	Standard Type	Beneficial Use (BU) with most protective limit	Reference for the Trigger Limit	Category (see footnotes)
Chlordane	0.00057 µg/L	Numeric	Municipal and Domestic Supply	Sacramento/San Joaquin Basin Plan Chemical Constituents Objective: CTR (USEPA), Human Health Protection, 30-Day Average - Sources of Drinking Water (water & fish consumption)	1
	0.0043 µg/L		Freshwater Habitat	Sacramento/San Joaquin Basin Plan Chemical Constituents Objective: CTR (USEPA) - Continuous Concentration 4-day average (total)	
Heptachlor	0.00021 µg/L	Numeric	Municipal and Domestic Supply	Sacramento/San Joaquin Basin Plan Chemical Constituents Objective: CTR (USEPA), Human Health Protection, 30-Day Average - Sources of Drinking Water (water & fish consumption)	1
	0.0038 µg/L		Freshwater Habitat	Sacramento/San Joaquin Basin Plan Chemical Constituents Objective: CTR (USEPA) - Continuous Concentration 4-day average (total)	
Heptachlor Epoxide	0.0001 µg/L	Numeric	Municipal and Domestic Supply	Sacramento/San Joaquin Basin Plan Chemical Constituents Objective: CTR (USEPA), Human Health Protection, 30-Day Average - Sources of Drinking Water (water & fish consumption)	1
	0.0038 µg/L		Freshwater Habitat	Sacramento/San Joaquin Basin Plan Chemical Constituents Objective: CTR (USEPA) - Continuous Concentration 4-day average (total)	
Total Hexachlorocyclohexane (including lindane)	0.0039 µg/L	Numeric	Municipal and Domestic Supply	Sacramento/San Joaquin Basin Plan Chemical Constituents Objective: CTR (USEPA), Human Health Protection, 30-Day Average - Sources of Drinking Water (water & fish consumption)	1
	0.95 µg/L		Freshwater Habitat	Sacramento/San Joaquin Basin Plan Chemical Constituents Objective: CTR (USEPA) - Maximum Concentration (1-hour Average)	
Endosulfan	110 µg/L	Numeric	Municipal and Domestic Supply	Sacramento/San Joaquin Basin Plan Chemical Constituents Objective: CTR (USEPA), Human Health Protection, 30-Day Average - Sources of Drinking Water (water & fish consumption)	1
	0.056 µg/L		Freshwater Habitat	Sacramento/San Joaquin Basin Plan Chemical Constituents Objective: NTR (USEPA) - Continuous Concentration 4-day average (total)	
Toxaphene	0.00073 µg/L	Numeric	Municipal and Domestic Supply	Sacramento/San Joaquin Basin Plan Chemical Constituents Objective: CTR (USEPA), Human Health Protection, 30-Day Average - Sources of Drinking Water (water & fish consumption)	1
	0.0002 µg/L		Cold Freshwater Habitat, Spawning	Sacramento/San Joaquin Basin Plan Chemical Constituents Objective: CTR (USEPA) - Continuous Concentration 4-day average (total)	
Pesticides – Herbicides					
Atrazine	1.0 µg/L	Narrative	Municipal and Domestic Supply	Sacramento/San Joaquin Basin Plan Chemical Constituents Objective: California Primary MCL	1
Cyanazine	1.0 µg/L	Narrative	Municipal and Domestic Supply	Sacramento/San Joaquin Basin Plan Toxicity Objective: USEPA Health Advisory (human health)	3
Diuron	2 µg/L	Narrative	Municipal and Domestic Supply	Sacramento/San Joaquin Basin Plan Toxicity Objective: One-in-a-Million Incremental Cancer Risk Estimates for Drinking Water. USEPA Health Advisory. Likely to be carcinogenic to humans (U.S. Environmental Protection Agency, 2005 Guidelines for Carcinogen Risk Assessment).	3
Glyphosate	700 µg/L	Numeric	Municipal and Domestic Supply	Sacramento/San Joaquin Basin Plan Chemical Constituents Objective: California Primary MCL (MUN, human health)	1
Linuron	1.4 µg/L	Narrative	Municipal and Domestic Supply	Sacramento/San Joaquin Basin Plan Toxicity Objective: USEPA IRIS Reference Dose as a drinking water level	3
Molinate	ND	Numeric		Sacramento/San Joaquin Basin Plan - Basin Plan Discharge Prohibition	2

Constituent	Water Quality Trigger Limit (WQTL)	Standard Type	Beneficial Use (BU) with most protective limit	Reference for the Trigger Limit	Category (see footnotes)
Paraquat	3.2 µg/L	Narrative	Municipal and Domestic Supply	Sacramento/San Joaquin Basin Plan Toxicity Objective: USEPA IRIS Reference Dose as a drinking water level	3
Simazine	4.0 µg/L	Numeric	Municipal and Domestic Supply	Sacramento/San Joaquin Basin Plan Chemical Constituents Objective: California Primary MCL (MUN, human health)	1
Thiobencarb	ND	Numeric		Sacramento/San Joaquin Basin Plan - Basin Plan Discharge Prohibition	2
Trifluralin	5 µg/L	Narrative	Municipal and Domestic Supply	Sacramento/San Joaquin Basin Plan Toxicity Objective: USEPA IRIS Cancer Risk Level. One-in-a-Million Incremental Cancer Risk Estimates for Drinking Water	3
Metals (c)					
Arsenic	10 µg/L	Narrative	Municipal and Domestic Supply	Sacramento/San Joaquin Basin Plan Chemical Constituents Objective: USEPA Primary MCL (MUN, human health)	1
Boron	700 µg/L	Narrative	Agricultural Supply	Water Quality for Agriculture (Ayers & Westcot)	3
Cadmium	for aquatic life; variable (see cadmium worksheet).	Numeric	Freshwater Habitat	Sacramento/San Joaquin Basin Plan Chemical Constituents Objective: CTR Freshwater Aquatic Life Protection - Continuous Concentration, 4-Day Average - Varies with water hardness	1
	5 µg/L	Numeric	Municipal and Domestic Supply	Sacramento/San Joaquin Basin Plan Chemical Constituents Objective: California Primary MCL (MUN, human health)	1
Copper	for aquatic life; variable (see copper worksheet).	Numeric	Freshwater Habitat	Sacramento/San Joaquin Basin Plan Chemical Constituents Objective: CTR Freshwater Aquatic Life Protection - Continuous Concentration, 4-Day Average - Varies with water hardness/	1
	1,300 µg/L	Numeric	Municipal and Domestic Supply	Sacramento/San Joaquin Basin Plan Chemical Constituents Objective: California Primary MCL (MUN, human health)	1
Lead	for aquatic life; variable (see lead worksheet).	Numeric	Freshwater Habitat	CTR Freshwater Aquatic Life Protection - Continuous Concentration, 4-Day Average - varies with water hardness	1
	15 µg/L	Numeric	Municipal and Domestic Supply	Sacramento/San Joaquin Basin Plan Chemical Constituents Objective: California Primary MCL (MUN, human health)	1
Molybdenum	15 µg/L	Numeric	Municipal and Domestic Supply	Sacramento/San Joaquin Basin Plan - San Joaquin River, Mouth of the Merced River to Vernalis	1
	50 µg/L			Sacramento/San Joaquin Basin Plan - Salt Slough, Mud Slough (north), San Joaquin River from Sack Dam to the mouth of Merced River	
	10 µg/L	Narrative	Agricultural Supply	Water Quality for Agriculture (Ayers & Westcot)	3
	35 µg/L		Municipal and Domestic Supply	Sacramento/San Joaquin Basin Plan Toxicity Objective: USEPA IRIS Reference Dose as a drinking water level.	
Nickel	For aquatic life variable (see Nickel worksheet).	Numeric	Freshwater Habitat	CTR Freshwater Aquatic Life Protection - Continuous Concentration, 4-Day Average - varies with water hardness	1
	100 µg/L	Numeric	Municipal and Domestic Supply	Sacramento/San Joaquin Basin Plan Chemical Constituents Objective: California Primary MCL (MUN, human health)	1
Selenium	50 µg/L	Numeric	Municipal and Domestic Supply	Sacramento/San Joaquin Basin Plan Chemical Constituents Objective: California Primary MCL (MUN, human health)	1
	5 µg/L (4-day average)	Numeric	Freshwater Habitat	Sacramento/San Joaquin Basin Plan Chemical Constituents Objective: NTR Freshwater Aquatic Life Protection - Continuous Concentration - 4-Day Average	

Constituent	Water Quality Trigger Limit (WQTL)	Standard Type	Beneficial Use (BU) with most protective limit	Reference for the Trigger Limit	Category (see footnotes)
Zinc	For aquatic life variable (see Zinc worksheet).	Numeric	Freshwater Habitat	Sacramento/San Joaquin Basin Plan Chemical Constituents Objective: Freshwater Aquatic Life Protection - Continuous Concentration, 4-Day Average - varies with water hardness	1
			Nutrients		
Nitrate as NO3 Nitrate as N	45,000 µg/L as NO3 10,000 µg/L as N	Numeric	Municipal and Domestic Supply	Sacramento/San Joaquin Basin Plan Chemical Constituents Objective: California Primary MCL	1
Nitrite as Nitrogen	1,000 µg/L as N	Numeric	Municipal and Domestic Supply	Sacramento/San Joaquin Basin Plan Chemical Constituents Objective: California Primary MCL	1
Ammonia	For aquatic life variable (see ammonia worksheet).	Narrative	Freshwater Habitat	Sacramento/San Joaquin Basin Plan Toxicity Objective: USEPA Freshwater Aquatic Life Criteria, Continuous Concentration	3
	1.5 mg/L (regardless of pH and Temperature values)	Narrative	Municipal and Domestic Supply	Sacramento/San Joaquin Basin Plan Toxicity Objective: Taste and Odor Threshold (Ammore and Hautala)	3
Hardness	NA				
Phosphorus, total	NA				
Orthophosphate, soluble	NA				
TKN	NA				

Category 1: Constituents that have numeric water quality objectives in the Sac-SJR Basin Plan or other Water Quality Objective (WQO) listed by reference such as MCLs (Page III-3.0)* , CTRs (Page III-10.1)*,

Category 2: Pesticides with discharge prohibitions. Prohibitions apply to any discharges not subject to board-approved management practices (Page IV-25.0)*.

Category 3: Constituent does not have numeric WQO, and does not have a primary MCL. WQTL exceedance is based on implementation of narrative objective. All detections should be tracked. None are default exceedances.

MUN-Municipal and Domestic Supply

NA-Not Available. Until completion of evaluation studies and MRP Plan submittals with site specific information on beneficial uses.

ND-Not Detected

(*)-Water Quality Control Plan for the Sacramento and San Joaquin River Basins. Revised on October 2007.

Narrative WQTLs are based on Water Quality Goals Database. Updated by Jon Marshack on July 16, 2008.

SITE SUBWATERSHEDS INCLUDED IN THE SURFACE WATER QUALITY MANAGEMENT PLAN

Site descriptions and irrigated acreages of all 27 site subwatersheds in a management plan are listed alphabetically below. Irrigated acres are included in the site subwatershed descriptions; however, tally of these acreages are subject to change due to updated GIS layers and subwatershed boundary modifications as boundaries are continually being refined. Included in Appendix I are monitoring results for each individual site subwatershed with management plans, land use maps, exceedance tables, active management plan constituents, removed management plan constituents, and specific schedules for compliance. Tables 2 and 3 list all constituents in a management plan for each site as well as constituents approved for management plan completion. In the descriptions below, site subwatersheds are identified as Core sites. If a site is not identified as a Core site, it is a Represented site by default. The Core and Represented site locations are provided in Table 7. Maps of all site subwatersheds on a zone basis are provided in Figures 1-6 below, and ArcGIS shapefiles are available on request. Individual site subwatershed maps including land use are provided in the section Physical Setting and Information below and are also available as ArcGIS shapefiles on request (Figures 8-13). The maps reflect the most recent Coalition boundaries as specified in the 2012 WDR.

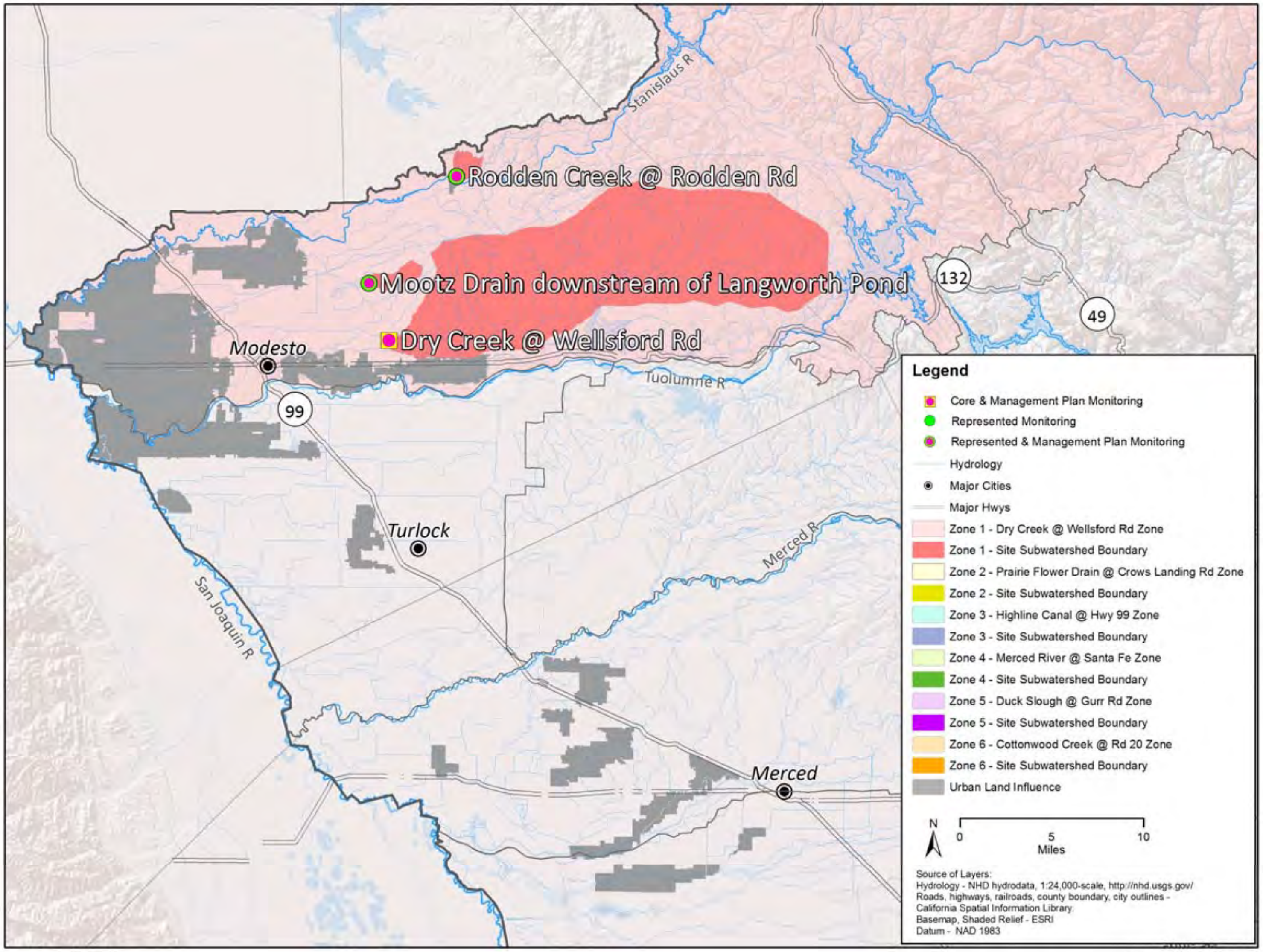
Table 7. ESJWQC Core and Represented monitoring locations including first year monitored and whether or not they are included in the SWQMP as of September 2013.

Listed by zone. Core sites in bold. Existing Management Plans refer to management plans active as of September 2013, not management plans triggered during the 2014 Water Year.

Zone	Site Type	Site Name	Latitude	Longitude	Station Code	Year first Monitored	Existing Management Plan
1	**Core**	**Dry Creek @ Wellsford Rd**	**37.66000**	**-120.87526**	**535XDCAWR**	**2005**	**X**
1	Represented	Mootz Drain downstream of Langworth Pond	37.70539	-120.89569	535XMDDLP	2009	X
1	Represented	Rodden Creek @ Rodden Rd	37.79053	-120.80886	535XRCARD	2011	X
2	**Core**	**Prairie Flower Drain @ Crows Landing Rd**	**37.44187**	**-121.00331**	**535XPFDCL**	**2005**	**X**
2	Represented	Hatch Drain @ Tuolumne Rd	37.51498	-121.01229	535XHDATR	2007	X
2	Represented	Hilmar Drain @ Central Ave	37.39058	-120.95820	535XHDACA	2005	X
2	Represented	Lateral 2 1/2 near Keyes Rd	37.54766	-121.08509	535LTHNKR	2008	X
2	Represented	Lateral 5 1/2 @ South Blaker Rd	37.45827	-120.96730	535LFHASB	2013	NA
2	Represented	Lateral 6 and 7 @ Central Ave	37.39779	-120.95960	535LSSACA	2013	NA
2	Represented	Levee Drain @ Carpenter Rd	37.48062	-121.03106	535XLDACR	2012	X
2	Represented	Lower Stevinson @ Faith Home Rd	37.37248	-120.92324	535LSAFHR	2013	NA
2	Represented	Unnamed Drain @ Hogin Rd	37.43120	-120.99475	535XUDAHR	2013	NA
2	Represented	Westport Drain @ Vivian Rd	37.53682	-121.04861	535XWDAVR	2007	X
3	**Core**	**Highline Canal @ Hwy 99**	**37.41254**	**-120.75941**	**535XHCHNN**	**2005**	**X**
3	Represented	Highline Canal @ Lombardy Rd	37.45547	-120.72181	535XHCALR	2005	X
3	Represented	Mustang Creek @ East Ave	37.49180	-120.68390	535XMCAEA	2006	X
4	**Core**	**Merced River @ Santa Fe**	**37.42705**	**-120.67353**	**535XMRSFD**	**2004**	**X**
4	Represented	Bear Creek @ Kibby Rd	37.31230	-120.41535	535XBCAKR	2005	X
4	Represented	Black Rascal Creek @ Yosemite Rd	37.33202	-120.39435	535BRCAYR	2006	X
4	Represented	Canal Creek @ West Bellevue Rd	37.36090	-120.54940	535CCAWBR	2013	NA
4	Represented	Howard Lateral @ Hwy 140	37.30790	-120.78200	535XHLAHO	2008	X
4	Represented	Livingston Drain @ Robin Ave	37.31693	-120.74229	535XLDARA	2007	X
4	Represented	McCoy Lateral @ Hwy 140	37.30968	-120.78771	535XMLAHO	2011	X
4	Represented	Unnamed Drain @ Hwy 140	37.31331	-120.89218	535XUDAHO	2013	X
5	**Core**	**Duck Slough @ Gurr Rd**	**37.21408**	**-120.56126**	**535XDSAGR**	**2004**	**X**
5	Represented	Deadman Creek @ Gurr Rd	37.19514	-120.56147	535XDCAGR	2004	X
5	Represented	Deadman Creek @ Hwy 59	37.19755	-120.48763	535DMCAHF	2006	X
5	Represented	Miles Creek @ Reilly Rd	37.25830	-120.47524	535XMCARR	2007	X
6	**Core**	**Cottonwood Creek @ Rd 20**	**36.86860**	**-120.18180**	**545XCCART**	**2005**	**X**
6	Represented	Ash Slough @ Ave 21	37.05448	-120.41575	545XASAAT	2005	X
6	Represented	Berenda Slough along Ave 18 1/2	37.01820	-120.32650	545XBSAAE	2006	X
6	Represented	Dry Creek @ Rd 18	36.98180	-120.22056	545XDCARE	2005	X

NA- Monitoring for this site began in the Fall of 2013, sites monitored during the 2014 WY and requiring a management plan will be reported in the ESJWQC 2015 Annual Report.

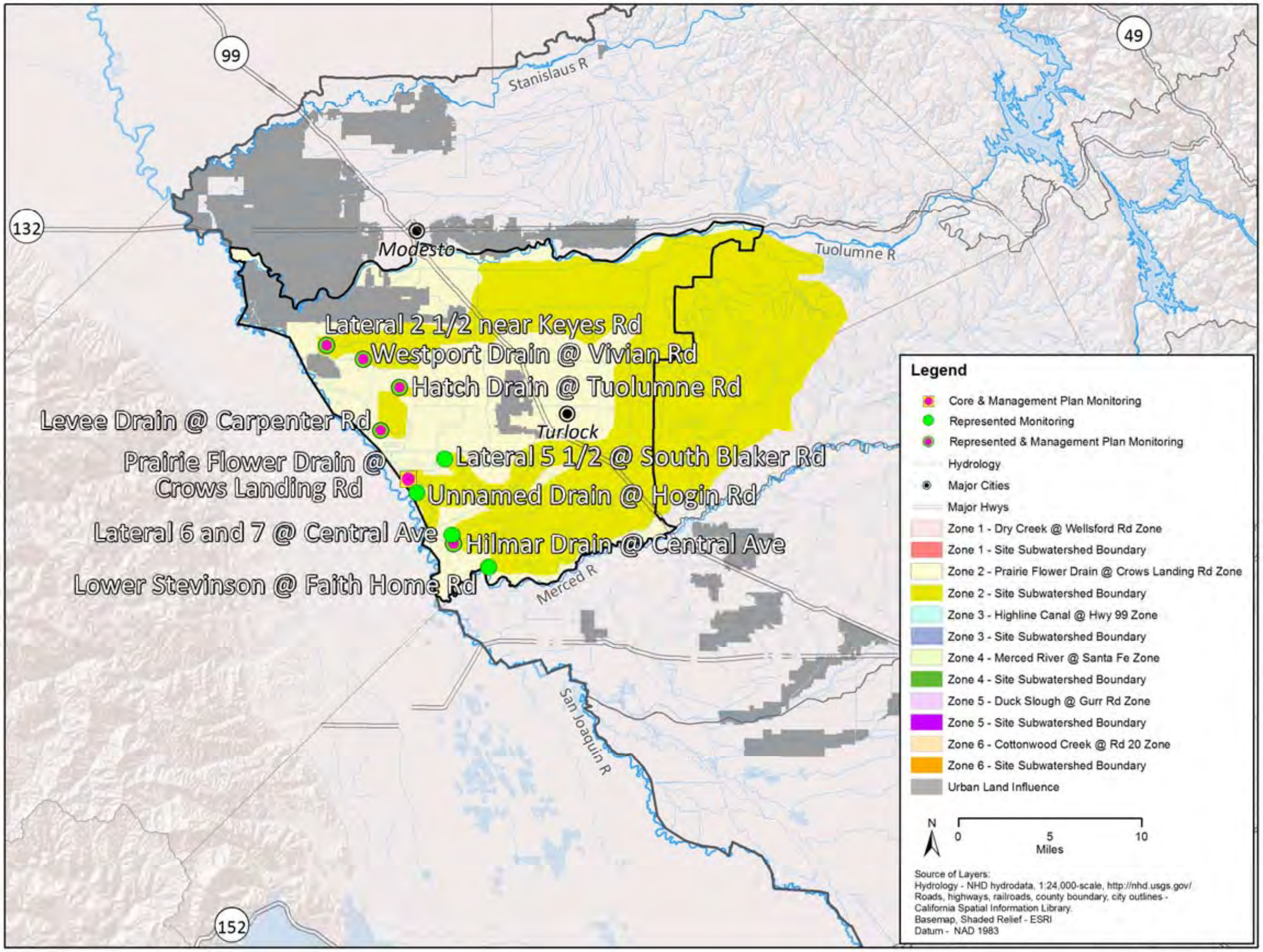
Figure 1. Dry Creek @ Wellsford Rd Zone (Zone 1) Core, Represented, and MPM sites.



ESJWQC_2014_AMR

Date Prepared: 4/23/2014

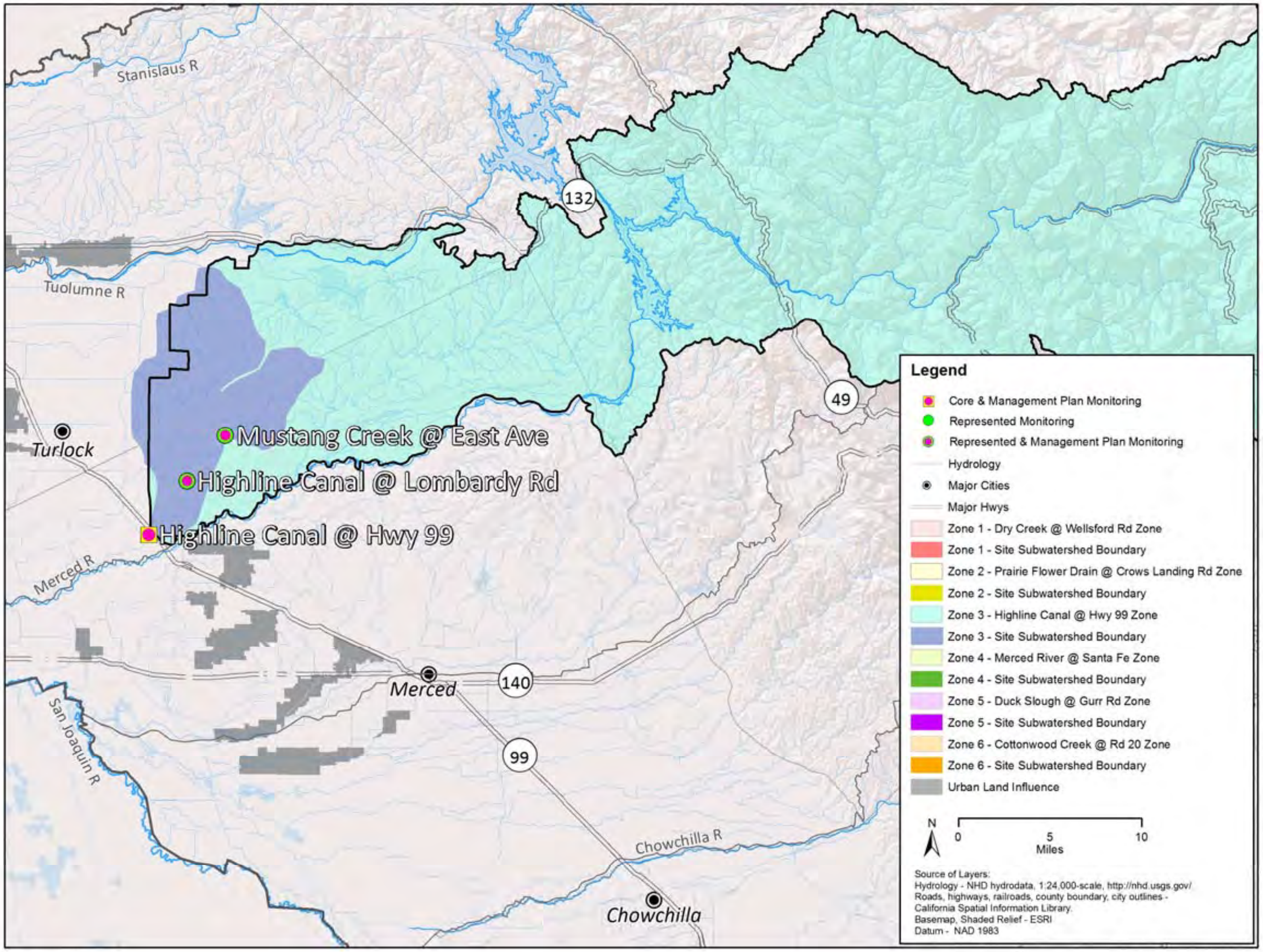
Figure 2. Prairie Flower Drain @ Crows Landing Zone (Zone 2) Core, Represented, and MPM sites.



ESJWQC_2014_AMR

Date Prepared: 4/24/2014

Figure 3. Highline Canal @ Hwy 99 Zone (Zone 3) Core, Represented, and MPM sites.



ESJWQC_2014_AMR

Date Prepared: 4/24/2014

Figure 4. Merced River @ Santa Fe Zone (Zone 4) Core, Represented, and MPM sites.

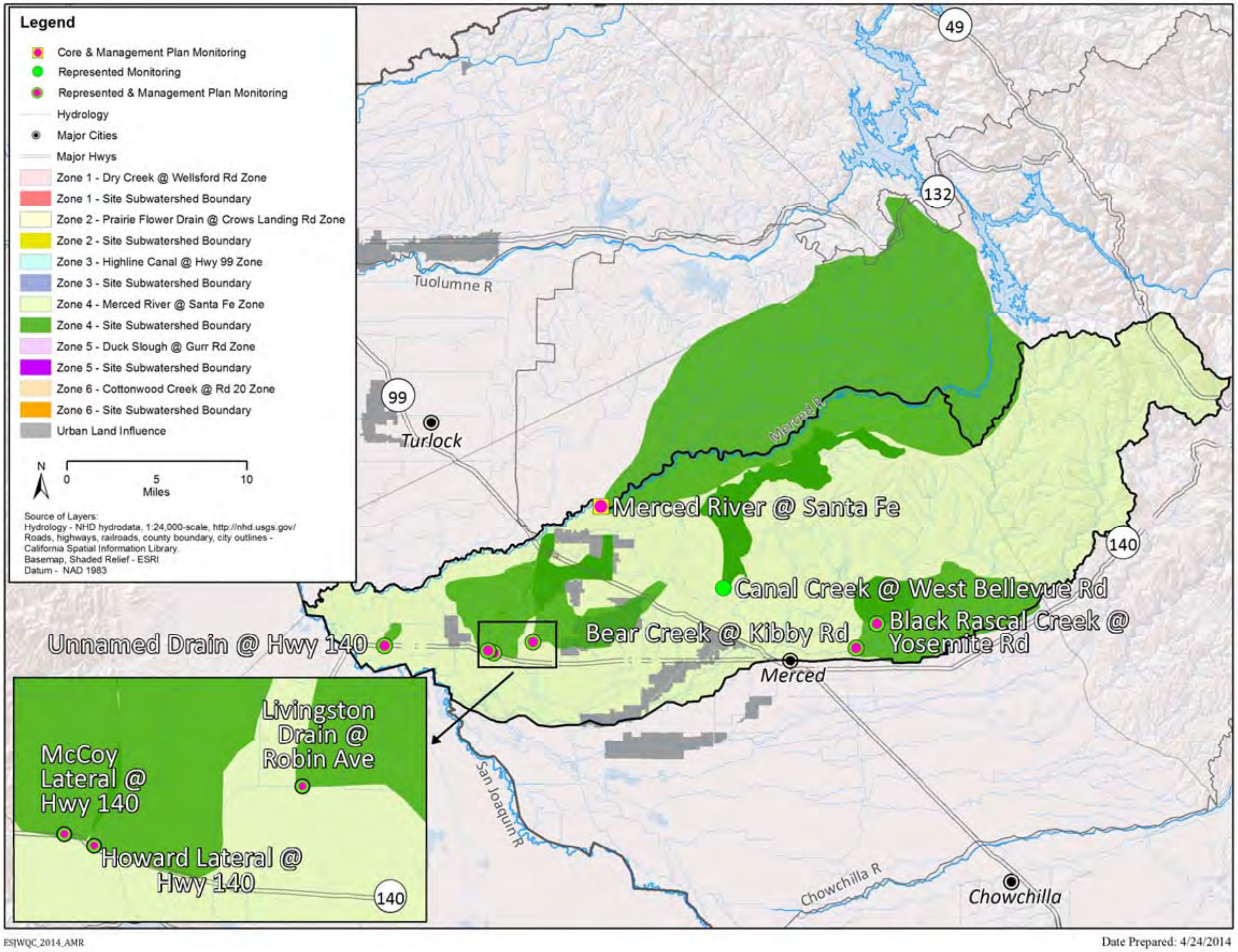


Figure 5. Duck Slough @ Gurr Rd Zone (Zone 5) Core, Represented, and MPM sites.

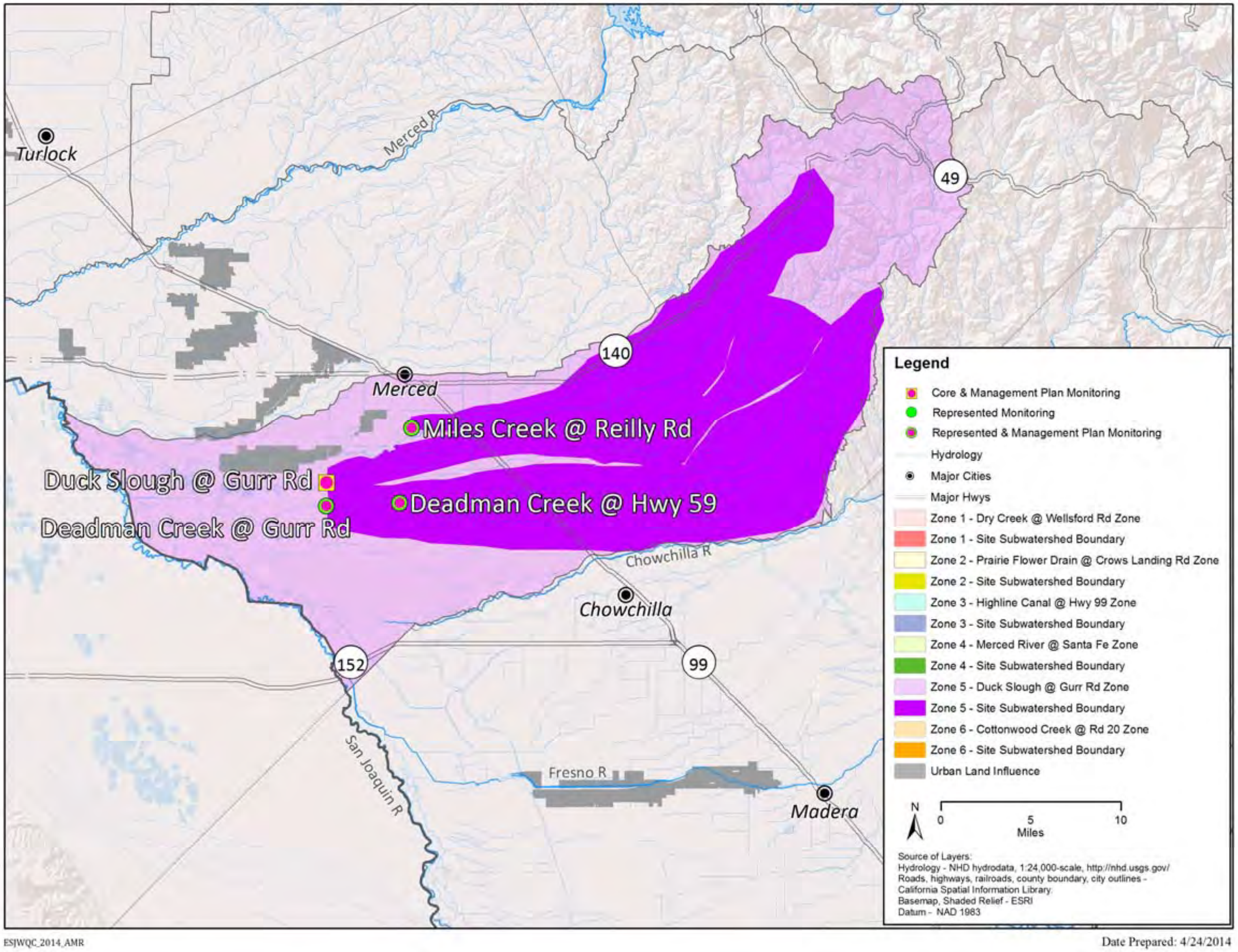
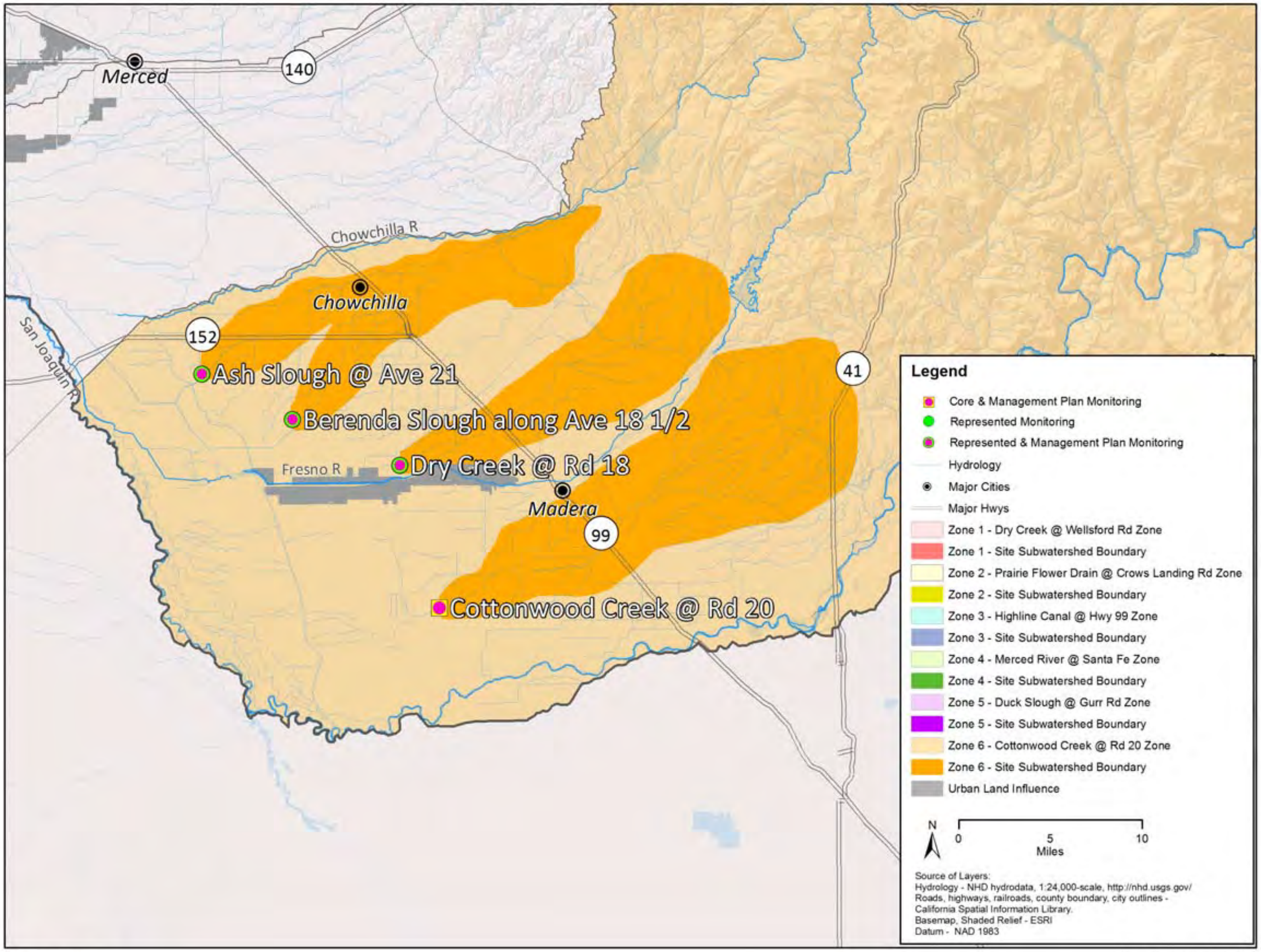


Figure 6. Cottonwood Creek @ Rd 20 Zone (Zone 6) Core, Represented, and MPM sites.

Land use for Madera County is only described for 37% of the county; therefore a portion of the county is missing from the map.



ESJWQC_2014_AMR

Date Prepared: 4/24/2014

Ash Slough @ Ave 21 (21,448 irrigated acres) – Ash Slough @ Ave 21 is located within the Cottonwood Creek @ Rd 20 Zone (Zone 6). Water for Ash Slough originates at Millerton Lake and is transported via Madera Canal to the Chowchilla River where it is immediately moved into Ash Slough. Although rare, any water not used for irrigation eventually drains into the Eastside Bypass. Ash Slough is located in the northern part of Madera County. Agriculture includes vineyards, field crops, and deciduous nuts and fruits with some dairies.

Bear Creek @ Kibby Rd (7,784 irrigated acres) – Bear Creek @ Kibby Rd is located in the Merced River @ Santa Fe Zone (Zone 4). This site subwatershed drains an eastern portion of the Coalition region in Merced County. Bear Creek originates in the foothills of the Sierras with Burn's Creek as one of the major tributaries. Bear Creek drains to the east just north of the town of Planada, through Merced and eventually to the San Joaquin River. The primary irrigated agriculture in the site subwatershed includes deciduous fruits and nuts, field crops, truck crops, and irrigated pasture.

Berenda Slough along Ave 18 ½ (24,452 irrigated acres) – Berenda Slough along Ave 18 ½ is located in the Cottonwood Creek @ Rd 20 Zone (Zone 6). This site subwatershed flows from Berenda Reservoir southwest through northern Madera County and is located southwest of the city of Chowchilla. When flows are sufficient, Berenda Slough empties into the Eastside Bypass. However, this waterway does not normally connect with the Bypass due to insufficient flow. The primary agriculture consists of deciduous fruits and nut orchards, vineyards, grain and hay, pasture and field crops.

Black Rascal Creek @ Yosemite Rd – (997 irrigated acres) – Black Rascal Creek @ Yosemite Rd is located in the Merced River @ Santa Fe Zone (Zone 4). Black Rascal Creek originates from Le Grand Canal and drains into Bear Creek. The eastern portion of this subwatershed is dominated by native vegetation with some irrigated corn and mixed pastureland in the southern and western portions.

Cottonwood Creek @ Rd 20 (36,906 irrigated acres) – Cottonwood Creek @ Rd 20 is one of the Core Sites in the Cottonwood Creek @ Rd 20 Zone (Zone 6). This site subwatershed is at the very southern edge of the Coalition region in Madera County and drains into the Eastside Bypass. The immediate upstream agriculture is vineyards with deciduous nuts farther to the east. The eastern portion of the subwatershed is dominated by wild vegetation as the subwatershed extends into the foothills.

Deadman Creek @ Gurr Rd (40,418 irrigated acres) – Deadman Creek @ Gurr Rd is located in the Duck Slough @ Gurr Rd Zone (Zone 5). This site is a downstream site from Deadman Creek @ Hwy 59. The primary agriculture in the site subwatershed includes deciduous nuts and fruits, field crops and irrigated pastureland.

Deadman Creek @ Hwy 59 (37,400 irrigated acres) – Deadman Creek @ Hwy 59 is located in the Duck Slough @ Gurr Rd Zone (Zone 5) and is upstream of Deadman Creek @ Gurr Rd. Deadman Creek flows out of the Sierra foothills and confluences with Dutchman's Creek in the vicinity of Highway 59. The primary agriculture in the site subwatershed includes orchards, irrigated pasture and field crops. A large portion of the subwatershed is wild vegetation.

Dry Creek @ Rd 18 (20,779 irrigated acres) – Dry Creek @ Rd 18 is located within the Cottonwood Creek @ Rd 20 Zone (Zone 6). This site subwatershed originates in the Sierra foothills and flows just north of the city of

Madera. Although rare, if flow is sufficient Dry Creek eventually drains into the San Joaquin River through various channels and irrigation ditches. The primary irrigated agriculture within the subwatershed is deciduous orchards and vineyards with some scattered field crops.

Dry Creek @ Wellsford Rd (23,794 irrigated acres) – Dry Creek @ Wellsford Rd is a Core Monitoring location in the Dry Creek @ Wellsford Rd Zone (Zone 1). This site subwatershed is in the northern part of the Coalition region and drains field crops, deciduous nuts, mixed pasture, and vineyards. Dry Creek originates to the east of Modesto, flows through Modesto to confluence with the Tuolumne River. Dairies are located upstream of this site and the town of Waterford may contribute an urban signal. The subwatershed extends into the foothills and is dominated in the east by wild vegetation with some rice, row crops and irrigated pasture.

Duck Slough @ Gurr Rd (20,414 irrigated acres) – Duck Slough @ Gurr Rd is a Core Site located in the Duck Slough @ Gurr Rd Zone (Zone 5). This site subwatershed is located downstream from the Duck Slough @ Hwy 99 site subwatershed. Duck Slough originates in the Sierra foothills and flows west (becoming the Duck Slough @ Gurr Rd site subwatershed) eventually joining with Deadman Creek in the western portion of the Coalition region. The slough eventually flows into the San Joaquin River via Deadman Creek and Deep Slough. Located to the southwest of Merced, this site drains field crops, deciduous nuts and pastureland. Treated wastewater from the city of Madera enters Duck Slough a few miles upstream of the Gurr Rd site.

Hatch Drain @ Tuolumne Rd (244 irrigated acres) – Hatch Drain @ Tuolumne Rd is located in the Prairie Flower Drain @ Crows Landing Rd Zone (Zone 2). This small site subwatershed is located in the western portion of the Coalition region in Stanislaus County. The two major crops are field crops and pastureland.

Highline Canal @ Hwy 99 (35,476 irrigated acres) – Highline Canal @ Hwy 99 is a Core Site located in the Highline Canal @ Hwy 99 Zone (Zone 3). The Highline Canal is a conveyance structure of the Turlock Irrigation District (TID) and carries both clean irrigation water and irrigation return flow during the summer and urban and agricultural storm water runoff during the winter. This site was selected as a downstream companion site to the Highline Canal @ Lombardy Rd site. The sampling site is located just south of Delhi as the canal crosses Highway 99. Irrigated agriculture at this location is primarily deciduous nuts with small amounts of field crops, pastureland, and vineyards.

Highline Canal @ Lombardy Rd (30,704 irrigated acres) – Highline Canal @ Lombardy Rd is located in the Highline Canal @ Hwy 99 Zone (Zone 3) and is upstream of the Highline Canal @ Hwy 99 site. The Highline Canal is a conveyance structure of the TID and carries both clean irrigation water and irrigation return flow during the summer, and storm water runoff during the winter. The Highline Canal flows west and eventually drains into the Merced River. The main upstream tributary of the Highline Canal is Mustang Creek which is a major tributary during the dormant season and passes immediately to the southeast of the Turlock Airport. The predominant crop in this site subwatershed is deciduous nuts with some dairies located upstream.

Hilmar Drain @ Central Ave (1,686 irrigated acres) – Hilmar Drain @ Central Ave is located in the Prairie Flower Drain @ Crows Landing Rd Zone (Zone 2). This site subwatershed is located toward the western edge of the Coalition region near the San Joaquin River. This is a small site subwatershed containing primarily field crops and a large number of dairies with irrigated pasture. Hilmar Drain originates at Williams Ave and

Washington Rd and eventually drains into the San Joaquin River. At this location, TID refers to the Hilmar Drain waterbody as "Reclamation Drain."

Howard Lateral @ Hwy 140 (7,317 irrigated acres) – Howard Lateral @ Hwy 140 is located in the Merced River @ Santa Fe Zone (Zone 4). The lateral is located just south and west of Livingston Drain, in the central portion of the Coalition region in Merced County. Agricultural land use is predominantly deciduous nut and fruit orchards, but also includes field crops, pastureland, grains/hay, vineyard and dairy.

Lateral 2 ½ near Keyes Rd (31,810 Irrigated acres) – Lateral 2 ½ near Keyes Rd is located in the Prairie Flower Drain @ Crows Landing Rd Zone (Zone 2). This site subwatershed is located in the western portion of the Coalition region just south of the Tuolumne River and East of the San Joaquin River. The site subwatershed extends east past the city of Modesto to Turlock Lake. The primary agriculture in this site subwatershed is deciduous fruits and nuts as well as almost all other crop types and land use found in the Coalition Region.

Levee Drain @ Carpenter Rd (1,983 irrigated acres) – Levee Drain @ Carpenter Rd is located in the Prairie Flower Drain @ Crows Landing Rd Zone (Zone 2). This site subwatershed is located north of Prairie Flower and originates at West Fulkerth Rd and South Carpenter Rd and drains into the San Joaquin River. This is a small subwatershed containing mainly deciduous nut and fruit orchards with some irrigated pastureland.

Livingston Drain @ Robin Ave (11,670 irrigated acres) – Livingston Drain @ Robin Ave is located in the Merced River @ Santa Fe Zone (Zone 4). This site subwatershed is located in the west central portion of the Coalition region in Merced County, east of Howard Lateral. It is located west of Atwater and Livingston. Water from Hammatt Lateral and Arena Canal drains into Livingston Drain. Arena Canal receives storm water from the city of Livingston as well as water from the Livingston Canal. The agriculture is almost entirely orchards with some truck crops. Several dairies are also present in the watershed.

McCoy Lateral @ Hwy 140 (10,109 irrigated acres) – McCoy Lateral @ Hwy 140 is located in the Merced River @ Santa Fe Zone (Zone 4). This site subwatershed is located immediately west of Howard Lateral. Water from Hammatt Lateral and Arena Canal drain into McCoy Lateral. Arena Canal receives storm water from the city of Livingston as well as water from Livingston Canal. The agriculture in this site subwatershed is a mixture of deciduous fruit and nut orchards, vineyards, truck/nursery/berries, and field crops.

Merced River @ Santa Fe (34,931 irrigated acres) – Merced River @ Santa Fe is a Core Site located within the Merced River @ Santa Fe Zone (Zone 4). This site subwatershed contains a major waterbody which is 303d listed. It was selected as an integrator site for several of the drains and tributaries in the vicinity. The Merced River originates in the high Sierra encountering several dams and impoundments as it flows west eventually draining into the San Joaquin River near Hatfield State Park. Upstream agriculture in the immediate vicinity of the river includes some field crops and deciduous nuts (primarily almonds). Irrigated pasture and vineyards are also present within the Merced River @ Sante Fe site subwatershed.

Miles Creek @ Reilly Rd (10,183 irrigated acres) – Miles Creek @ Reilly Rd is located in the Duck Slough @ Gurr Rd Zone (Zone 5). Miles Creek is located just north of Duck Slough and drains into Owen's Creek. The primary agriculture within the Miles Creek @ Reilly Rd site subwatershed is field crops in addition to deciduous nuts and fruit, pasture, and truck/nursery/berry production. Urban drainages, dairies and hay, and pasturelands are also present within the subwatershed.

Mootz Drain downstream of Langworth Pond (1,312 irrigated acres) – Mootz Drain downstream of Langworth Pond is located in the Dry Creek @ Wellsford Rd Zone (Zone 1). This site replaced the Mootz Drain @ Langworth Rd location starting in December 2009. This site subwatershed is located just downstream of Mootz Drain @ Langworth in the northern portion of the Coalition region. The drain originates to the east of Modesto and drains through Lateral 6 into the Stanislaus River. Land use upstream of the site is predominantly pastures and dairies. A small portion of land is allocated as field crops.

Mustang Creek @ East Ave (10,383 irrigated acres) – Mustang Creek @ East Ave is located in the Highline Canal @ Hwy 99 Zone (Zone 3). Mustang Creek is an ephemeral waterbody and it is frequently dry; flow is found primarily during winter runoff events. Mustang Creek originates in the foothills of the Sierra Nevada and during short periods when it has water, flows into the upper portion of the Highline Canal. Mustang Creek is ephemeral with flow found primarily during winter runoff events. Summer flows are rare and intermittent as the upstream orchards utilize microspray irrigation. Citrus and deciduous nut crops are the main agriculture with smaller amounts of field crops and vineyards.

Prairie Flower Drain @ Crows Landing Rd (2,714 irrigated acres) – Prairie Flower Drain @ Crows Landing Rd is a Core Site located in the Prairie Flower Drain @ Crows Landing Rd Zone (Zone 2). Relative to other drains in the western portion of the Coalition region, Prairie Flower Drain is longer and drains mostly irrigated agriculture. Dairies and feedlots are common in this part of the Coalition region and this drain receives runoff from farmland managed by dairies immediately upstream. Agriculture in the upstream vicinity is primarily field crops and pasture. The water table in this site subwatershed is very shallow and the groundwater is high in salinity; as Prairie Flower Drain intercepts this groundwater supply it moves it to Harding Drain.

Rodden Creek @ Rodden Rd (311 irrigated acres) – Rodden Creek @ Rodden Rd is located in the Dry Creek @ Wellsford Rd Zone (Zone 1). Rodden Creek, fed by Rodden Lake, is located in the northern portion of Stanislaus County and drains into the Stanislaus River. It is a small subwatershed dominated with wild vegetation but includes deciduous nut trees (mostly walnuts), irrigated and non-irrigated pasture and a few row crops. There is a small group of houses (urban area) east of the sampling location along Rodden Road.

Unnamed Drain @ Hwy 140 (416 irrigated acres) – Unnamed Drain @ Hwy 140 is located in the Merced River @ Santa Fe Zone (Zone 4). This small site subwatershed originates from the unnamed drain that originates on East Side Irrigation Canal and flows into Old Channel which flows into San Joaquin River. The irrigated agriculture is primarily mixed pastureland with a small amount of corn crops.

Westport Drain @ Vivian Rd (1,544 irrigated acres) –Westport Drain begins just west of Crows Landing Rd where it runs underground before surfacing at Carpenter Rd. The source of water for Westport Drain is water discharged from adjacent lands. The agricultural land use of this site subwatershed is for a mixture of almonds, alfalfa, corn, and grapes.

PHYSICAL SETTING AND GEOGRAPHICAL CHARACTERISTICS

COALITION REGION

The ESJWQC area includes the portions of Stanislaus and Merced Counties east of the San Joaquin River, Madera County, the portion of Fresno County that drains directly into the San Joaquin River and the portion of San Joaquin County that drains directly into the Stanislaus River. The eastern counties within the boundary include Tuolumne, Mariposa and the portions of Calaveras and Alpine Counties that drain into the Stanislaus River. Drainage is determined using the CA Watershed Boundary from the United States Geological Survey (USGS). The region that drains into the Coalition area is bordered by the crest of the Sierra Nevada on the east, the San Joaquin River on the west, the Stanislaus River and its drainage areas on the north, and the San Joaquin River and its drainage areas on the south. The additions of land north of the Stanislaus River and south of the San Joaquin River were made to provide the Coalition with responsibility for all drainage into those rivers. Similarly, portions of Calaveras and Stanislaus counties were removed from the ESJWQC region and added to the San Joaquin County and Delta Water Quality Coalition (SJCDWQC) because the area drained into French Camp Slough within the SJCDWQC region. Landholdings in the vicinity of the Lone Willow Slough drainage area (west of the Eastside Bypass) have joined the Westside Coalition because of their affiliation with irrigation districts associated with the Westside Water Quality Coalition.

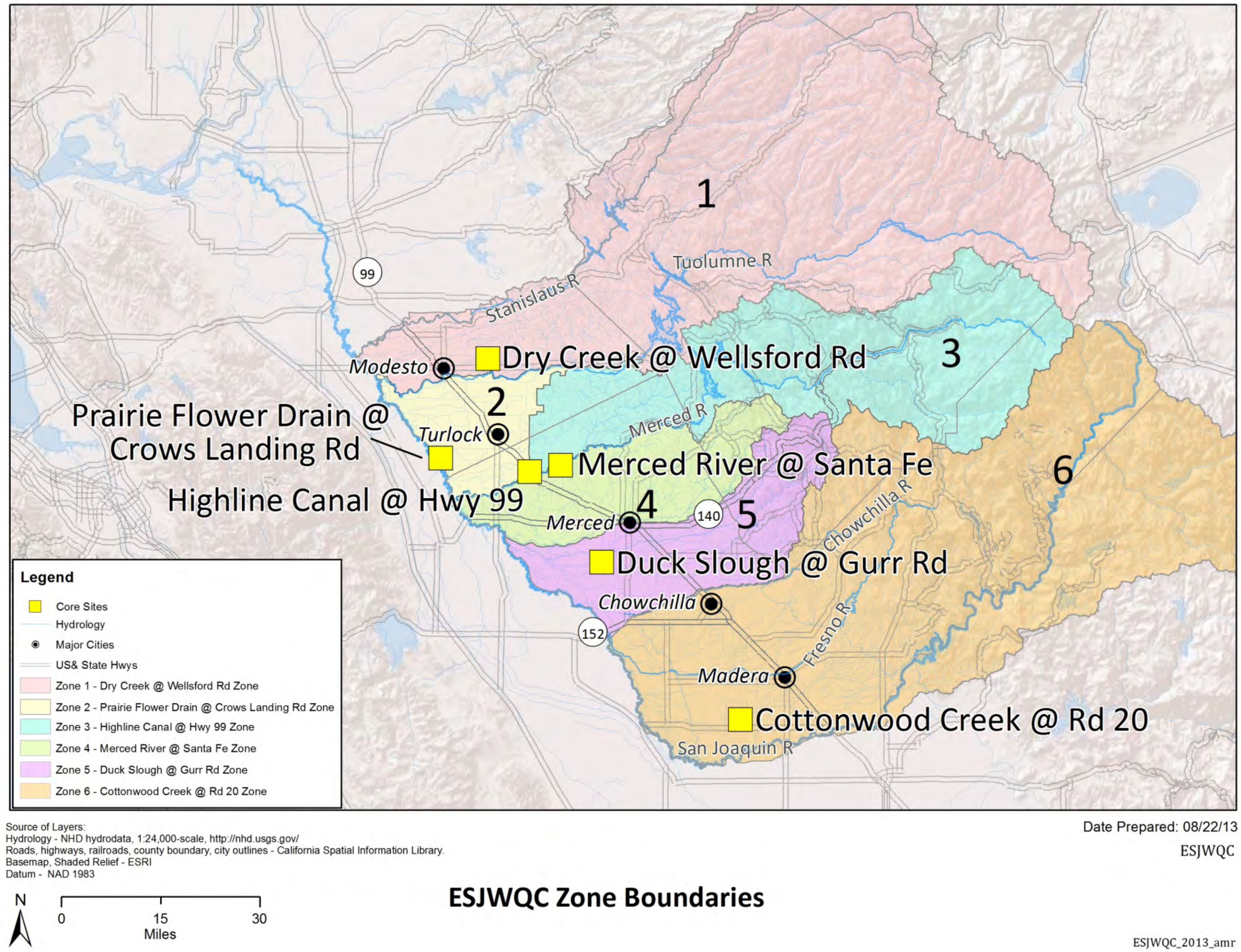
The only surface water export from the Coalition area is northward via the San Joaquin River. This river drains watersheds on the east and west side of the San Joaquin Valley, though only east side watersheds are relevant with respect to the Coalition area. San Joaquin River water is eventually either exported to the San Francisco Bay through the Delta, or conveyed southward via the State Water Project and the Delta Mendota Canal. The Coalition area also includes within its boundaries portions of six irrigation districts: Oakdale Irrigation District, Merced Irrigation District, Turlock Irrigation District, Modesto Irrigation District, Chowchilla Irrigation District and Madera Irrigation District. In addition, there are numerous federal and state water districts, municipal water companies, and sanitation districts within the Coalition area. Oakdale, Modesto, Turlock, and Merced Irrigation Districts are now members of the ESJWQC.

Apart from the San Joaquin River, there are five major rivers in the watershed: the Fresno River, Chowchilla River, Merced River, Tuolumne River and Stanislaus River. In addition, the Eastside Bypass is considered a major water body. These eastside tributaries of the San Joaquin River drain the Sierra Nevada range from east to west. Typically, only the Stanislaus, Merced, and Tuolumne Rivers maintain flows during the summer months. Flows in the Chowchilla and Fresno Rivers are intermittent to nonexistent as the irrigation season progresses into the fall and remain dry unless major storm events produce sufficient precipitation in the immediate vicinity of the rivers. Intermediate sized water bodies in the Coalition area (e.g. Dry Creek, Duck Slough, and Highline Canal) originate either in the Sierra Nevada foothills or the Valley itself and are tributaries to the major rivers. The remaining water bodies are small in size (e.g. Mustang Creek) and are primarily agricultural canals and ditches that convey water to one of the larger rivers or intermediate-sized creeks/sloughs. Many of the water bodies in the Coalition region are conveyance structures for irrigation district deliveries to their growers. For example, Highline Canal is Turlock Irrigation District's main conveyance structure that flows from Turlock Lake and not a natural water body.

Soils maps indicate a complicated mosaic of soil types in the Coalition region. Generally, the Coalition region has sandy, well-drained soils although heavier soils are located throughout the entire Coalition region. Soil type and factors such as slope, soil saturation, rainfall/irrigation water amount, and drainage patterns determine runoff. The Coalition recently submitted a Sediment and Erosion Assessment Report that provides the details of the process used to delineate areas within the Coalition region that could experience erosion and the movement of sediment to surface waters.

The Coalition area is divided into six zones to facilitate the implementation of a comprehensive monitoring program (Figure 7). Each of the Coalition's six zones have been divided to create a comprehensive monitoring program based on hydrology, crop types, land use, soil types, and rain fall. Zone acreages were determined using Land Use Survey Data (Table 8). The zone names are based on the Core Monitoring location within each zone: 1) Dry Creek @ Wellsford Rd Zone, 2) Prairie Flower Drain @ Crows Landing Rd Zone, 3) Highline Canal @ Hwy 99 Zone, 4) Merced River @ Santa Fe Zone, 5) Duck Slough @ Gurr Rd Zone, and 6) Cottonwood Creek @ Rd 20 Zone. Maps for Core and Represented sites per each zone are included in Figures 1-6.

Figure 7. ESJWQC zone boundaries and Core sites.



LAND USE IN MANAGEMENT PLAN WATERSHEDS

Although exact acreage is difficult to estimate due to rapidly changing land use, the Coalition area contains approximately 5,786,030 acres of which 994,080 acres (17%) are considered irrigated (Table 8). To obtain irrigated acreages, the Coalition uses information from two California Department of Water Resources (DWR) data sources: 1) DWR Agricultural Land and Water Use data, and 2) DWR Land Use Survey.

Agricultural Land and Water Use data (DWR, http://www.water.ca.gov/landwateruse/anaglwu.cfm) estimates the acreage of irrigated crops for the entirety of each county. Land Use Survey data (http://www.water.ca.gov/landwateruse/lusrvymain.cfm) includes more detailed information regarding specific crop uses (both irrigated and non-irrigated) than the Agricultural Land and Water Use data but is updated less often. Because Land Use Survey data are available in GIS shape files, the information was mapped to the Coalition area and used for estimates of irrigated crop acreage. The data source used depends on: 1) whether or not the entire county is within the Coalition boundary, and 2) which data were developed most recently.

For San Joaquin, Stanislaus, Merced, Madera, Fresno, Alpine and Calaveras Counties, the Coalition utilized DWR Land Use Survey data to determine irrigated land area as only portions of these counties are included in the Coalition boundary or the data were more current. For Tuolumne and Mariposa Counties, data from Agricultural Land and Water Use were used since these counties are included in their entirety within the Coalition boundary (Table 8). Although the entire county of Madera is represented by the Coalition, the DWR Land Use Survey is more current. For calculations of total acreage, measurements were made using ArcGIS.

The Coalition area is divided into six zones to facilitate the implementation of a comprehensive monitoring program (Figure 1). Each of the Coalition's six zones have been divided to create a comprehensive monitoring program based on hydrology, crop types, land use, soil types, and rain fall. Zone acreages were determined using Land Use Survey Data (Table 8). Land use maps for each zone are included for zone: 1) Dry Creek @ Wellsford Rd Zone, 2) Prairie Flower Drain @ Crows Landing Rd Zone, 3) Highline Canal @ Hwy 99 Zone, 4) Merced River @ Santa Fe Zone, 5) Duck Slough @ Gurr Rd Zone, and 6) Cottonwood Creek @ Rd 20 Zone in Figures 8-13. Table 9 includes land use for all site subwatersheds currently in a management plan. No data are available from Farm Evaluation Reports to supplement crop acreages and specific commodities grown in each site subwatershed. The Coalition received permission to submit a summary of the Farm Evaluation Reports until July 1, 2013 and will provide an addendum to the Annual Monitoring Report at that time.

Table 8. Total and irrigated acreages for Zones 1-6.

ZONES	TOTAL ACRES[1] (FROM ARCGIS)	IRRIGATED ACRES[2] (FROM LAND USE)
Zone 1: Dry Creek @ Wellsford Rd Zone	1,932,375	119,247
Zone 2: Prairie Flower Drain @ Crows Landing Rd Zone	196,166	145,476
Zone 3: Highline Canal @ Hwy 99 Zone	857,615	84,460
Zone 4: Merced River @ Santa Fe Zone	339,141	118,681
Zone 5: Duck Slough @ Gurr Rd Zone	396,764	159,834
Zone 6: Cottonwood Creek @ Rd 20 Zone	2,063,969	366,382
Total	**5,786,030**	**994,080**

[1]Total zone acreages calculated using ArcGIS.

[2]Irrigated acreage for each zone does not equal the sum of irrigated acres for all ESJWQC counties due to differences in acreage sources obtained between the county DWR Land Use layers and the Agricultural Land and Water Use estimates for 2001 .

Table 9. ESJWQC land use acreage of site subwatersheds in management plan as of September 2013.

Land uses designated as irrigated/non-irrigated (I/NI), sites listed alphabetically from Ash Slough @ Ave 21 to Westport Drain @ Vivian Rd; numbers are rounded to nearest whole number.

Land Use	I/NI	Ash Slough @ Ave	Bear Creek @ Kibby Rd	Berenda Slough along Ave 18 1/2	Black Rascal Creek @ Yosemite Rd	Cottonwood Creek @ Rd 20	Deadman Creek @ Gurr Rd	Deadman Creek @ Hwy 59	Dry Creek @ Rd 18	Dry Creek @ Wellsford Rd	Duck Slough @ Gurr Rd	Hatch Drain @ Tuolumne Rd	Highline Canal @ Hwy 99	Highline Canal @ Lombardy Rd	Hilmar Drain @ Central Ave	Howard Lateral @ Hwy 140	Lateral 2 ½ near Keyes Rd	Levee Drain @ Carpenter Rd	Livingston drain @ Robin Ave	McCoy Lateral @ Hwy 140	Merced River @ Santa Fe	Miles Creek @ Reilly Rd	Mootz Drain downstream of Langworth Pond	Mustang Creek @ East Ave	Prairie Flower Drain @ Crows Landing Rd	Rodden Creek @ Rodden Rd	Unnamed Drain @ Hwy 140	Westport Drain @ Vivian Rd
Citrus	I	8	48	58		580	7	7	418				76	76			36				45	3						
Citrus	NI									7						4	7		4	4								
Deciduous nut and fruit	I	6520	3424	13937	85	9222	10609	10598	11084	8118	7010		20941	17091		3585	23297		7647	3670	20681	2372		5625		130		456
Field crop	I	6857	1943	3046	377	3516	11876	10400	954	4674	4799	160	7152	6899	1288	440	3854	1362	773	1573	5527	4073	111	2109	1951	8	50	574
Field crop	NI					314															140							
Grain and hay	I	661	233	1855	39	837	2622	2425	439	215	603		583	583		262	100		484	524	701	461		32				
Grain and hay	NI	1	195	1414		1893	1166	1161	1212	2169	226		11	11			24			35	226	512		702		38		
Idle	I			237		1259	587	587	512	238	807		181	80		130	434		112	251	141	145				5		
Idle	NI																				292							
Riparian Vegetation	NI	230		322		22				704							102									13		
Wild vegetation	NI	3803	16142	8979	3711	35881	55864	52589	12569	57835	27490		572	499		357	2325	23	559	378	87838	35993		275		761	95	
Water surface	NI	167	70	272		717	359	335	264	316	158		184	184	22	6	435	31	13	34	671	117		8	30	32		
Pasture	I	3529	1501	1549	439	954	9958	8714	552	7599	5155	84	4949	4892	398	457	2697	621	298	335	4543	2120	1201	79	763	167	366	323
Pasture	NI						39	18		1142	53		353	353		9	12		106	9	69							
Rice	I						8			1186	340					25			25	25								
Feedlot, dairy, farmstead	NI	467	93	1018		559	839	655	412	1479	728	25	1391	1273	147	126	1352	219	316	375	1042	610		131	383	11	10	191
Truck, nursery, berry	I	376	636	141	96	73	3371	3348	119		1699		283	107			675		2082	1525	291	1010						
Urban	NI	1715		2191		10307	596	544	4538	530	406	6	678	423		892	4335	5	1330	806	3498	1649	49	5		42		10
Golf Course, cemetery, landscape	NI	146		233		29			280				1	1		38	186		90	42	203	17	124					
Vineyard	I	3497		3630		20465	1379	1321	6702	1764			1311	975		206	717		249	2206	3002			2538				190
Total acres		**27978**	**24283**	**38881**	**4747**	**86630**	**99282**	**92702**	**40054**	**87976**	**49475**	**275**	**38667**	**33447**	**1855**	**8749**	**40587**	**2260**	**14088**	**11792**	**128911**	**49081**	**1485**	**11504**	**3126**	**1207**	**521**	**1745**
Irrigated acres		**21448**	**7784**	**24452**	**997**	**36906**	**40418**	**37400**	**20779**	**23794**	**20414**	**244**	**35476**	**30704**	**1686**	**7317**	**31810**	**1983**	**11670**	**10109**	**34931**	**10183**	**1312**	**10383**	**2714**	**311**	**416**	**1544**

* Land use information obtained from data provided by DWR, http://www.water.ca.gov/landwateruse/anaglwu.cfm. Data compiled in 2001, land use in some areas of the ESJWQC may have changed since that time.

Figure 8. Dry Creek @ Wellsford Rd Zone (Zone 1) Core site and Land Use.

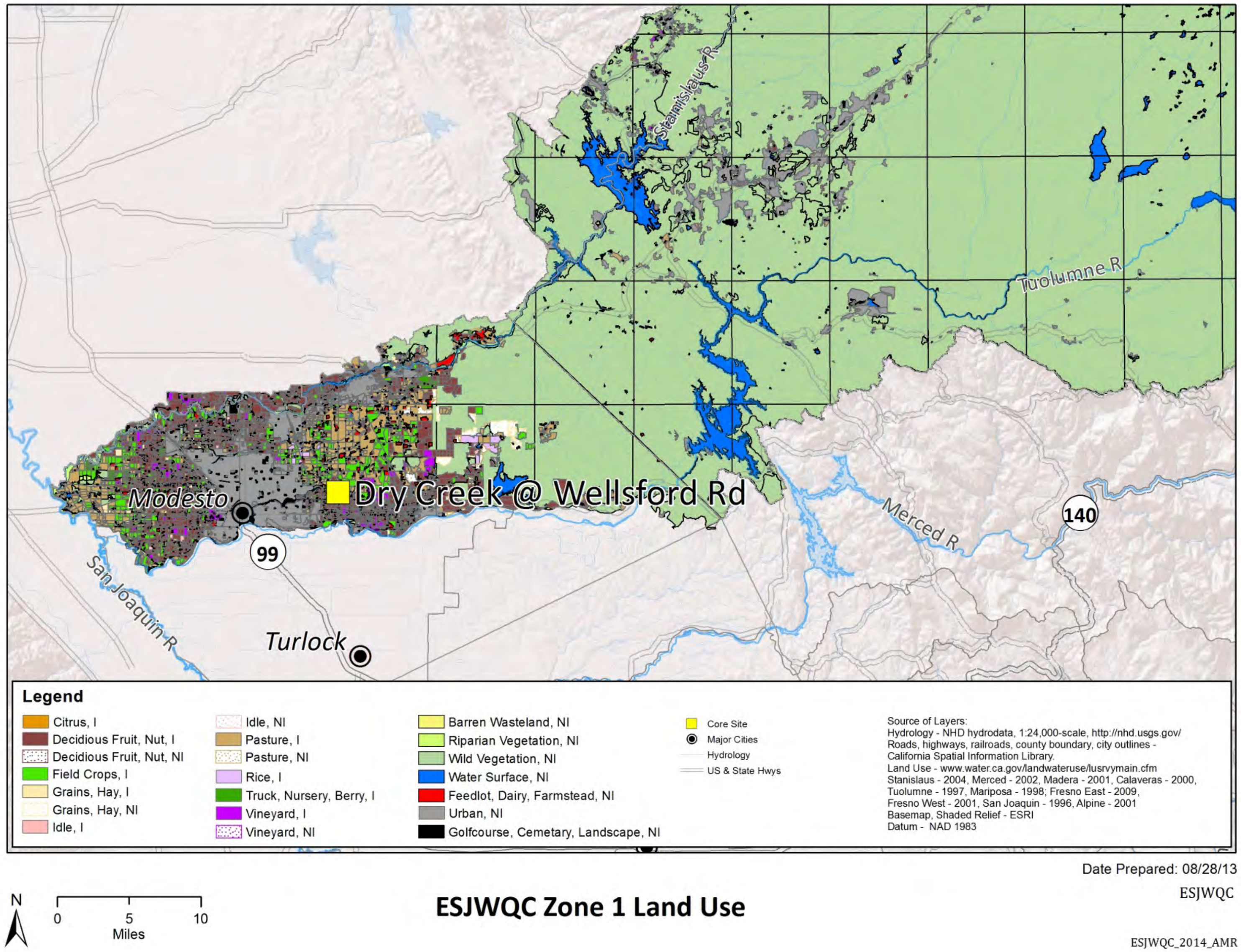


Figure 9. Prairie Flower Drain @ Crows Landing Zone (Zone 2) Core site and Land Use.

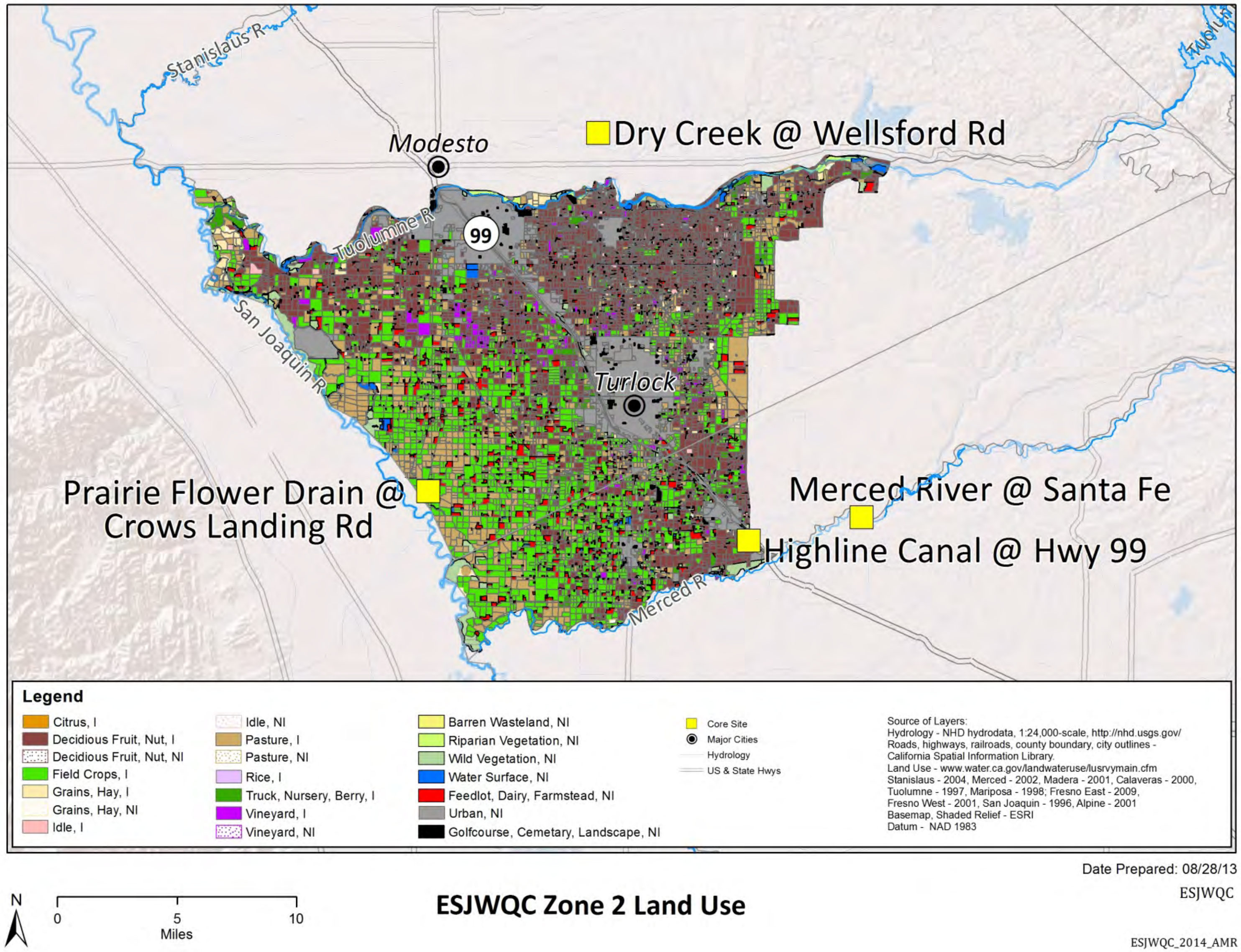


Figure 10. Highline Canal @ Hwy 99 Zone (Zone 3) Core site and Land Use.

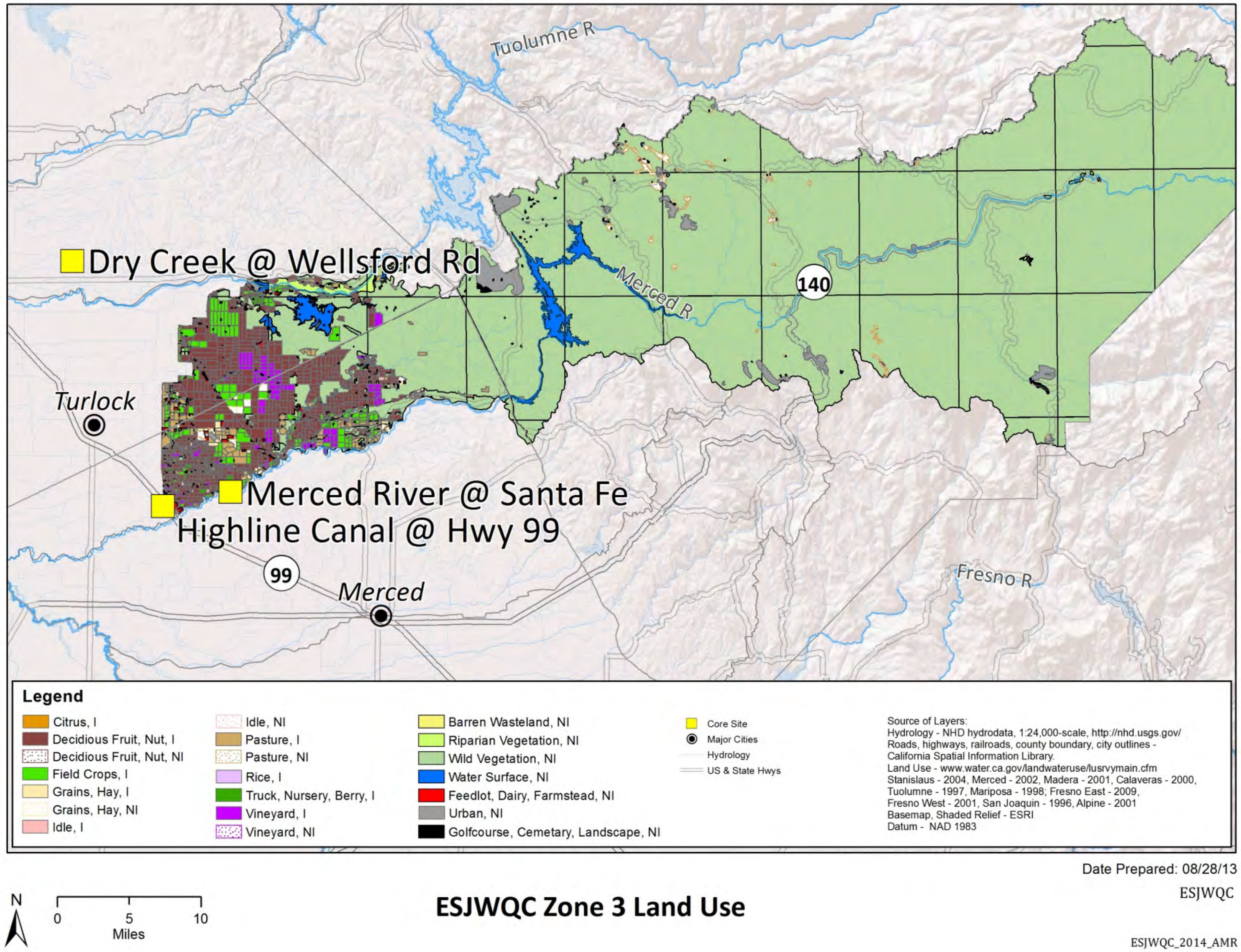


Figure 11. Merced River @ Santa Fe Zone (Zone 4) Core site and Land Use.

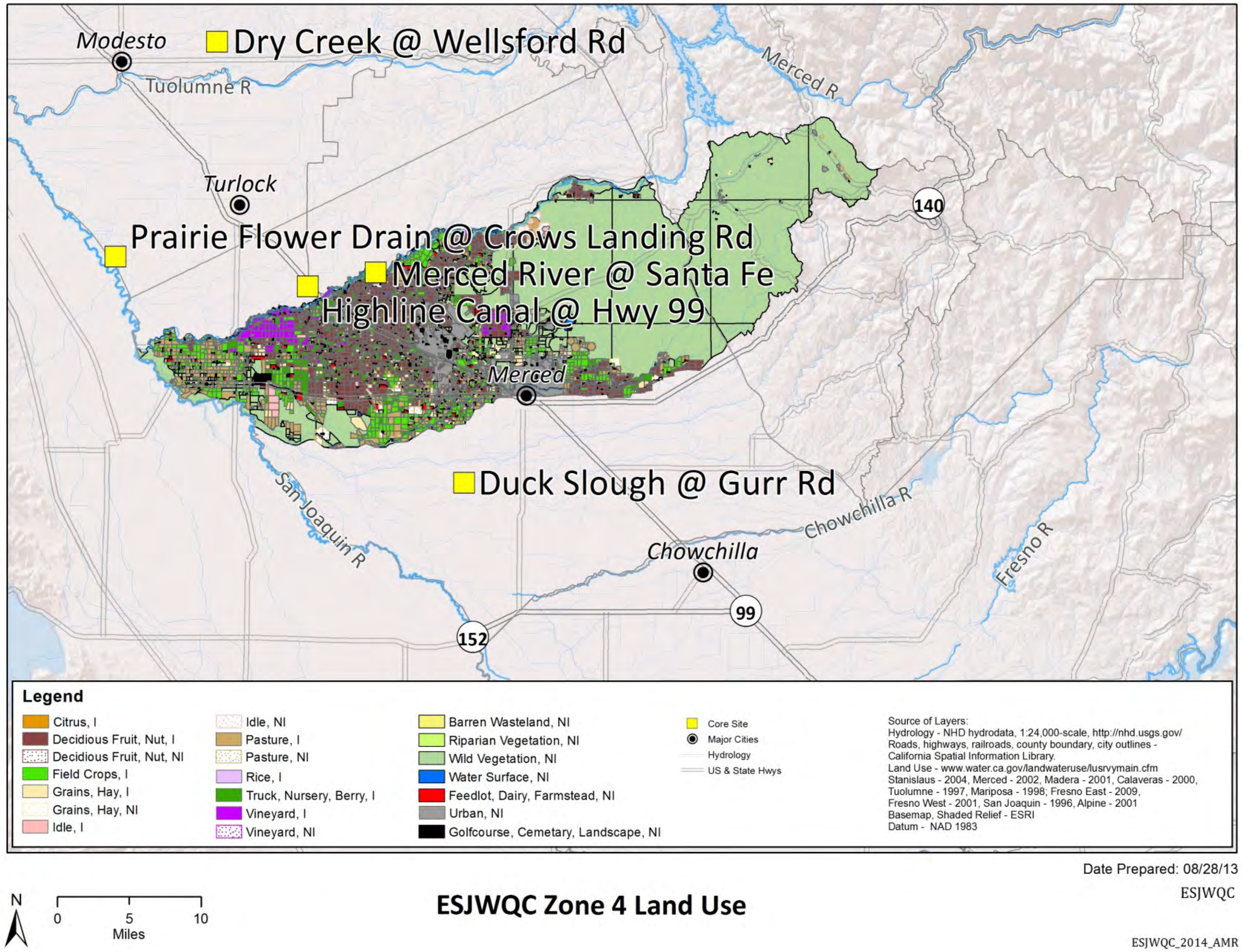


Figure 12. Duck Slough @ Gurr Rd Zone (Zone 5) Core site and Land Use.

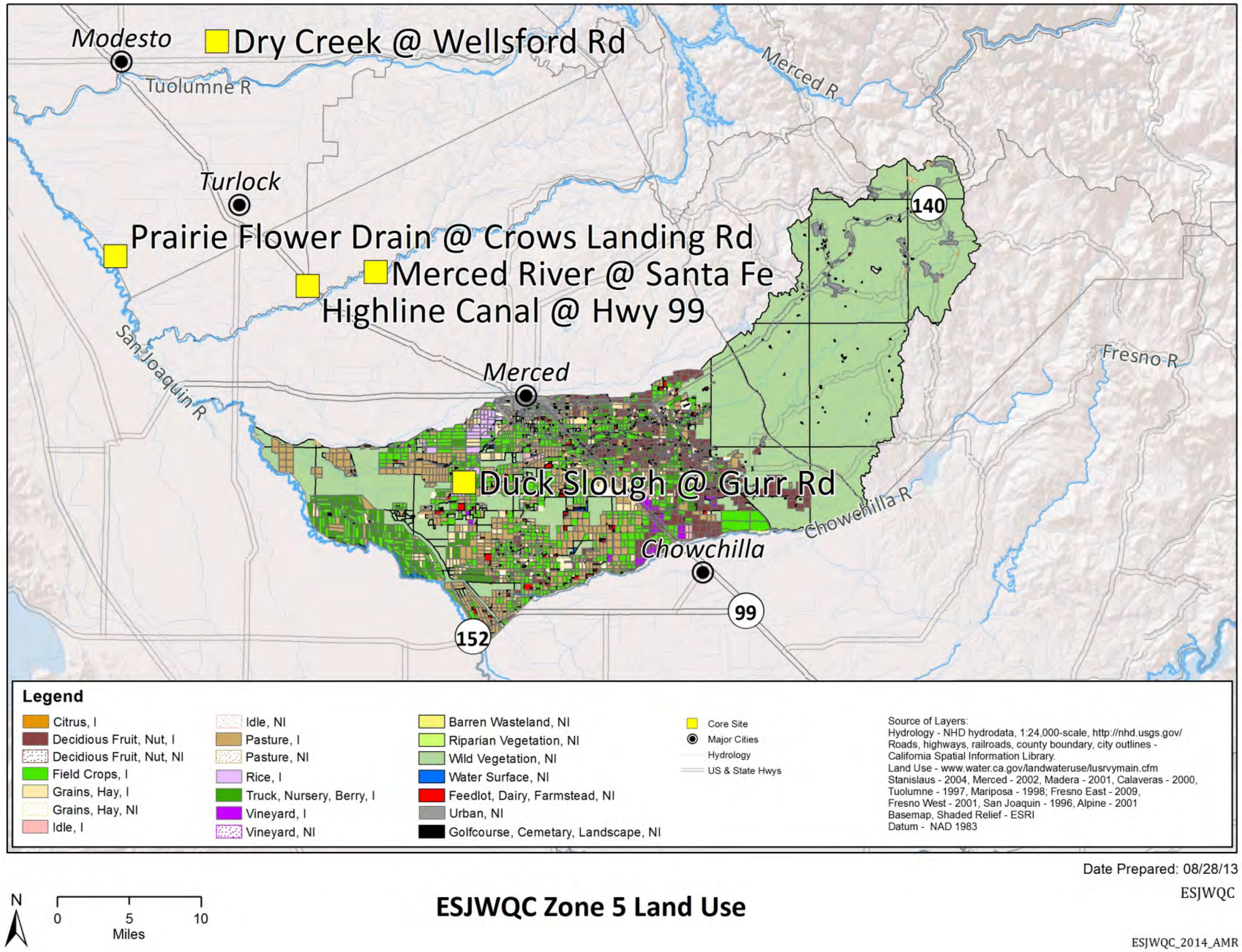
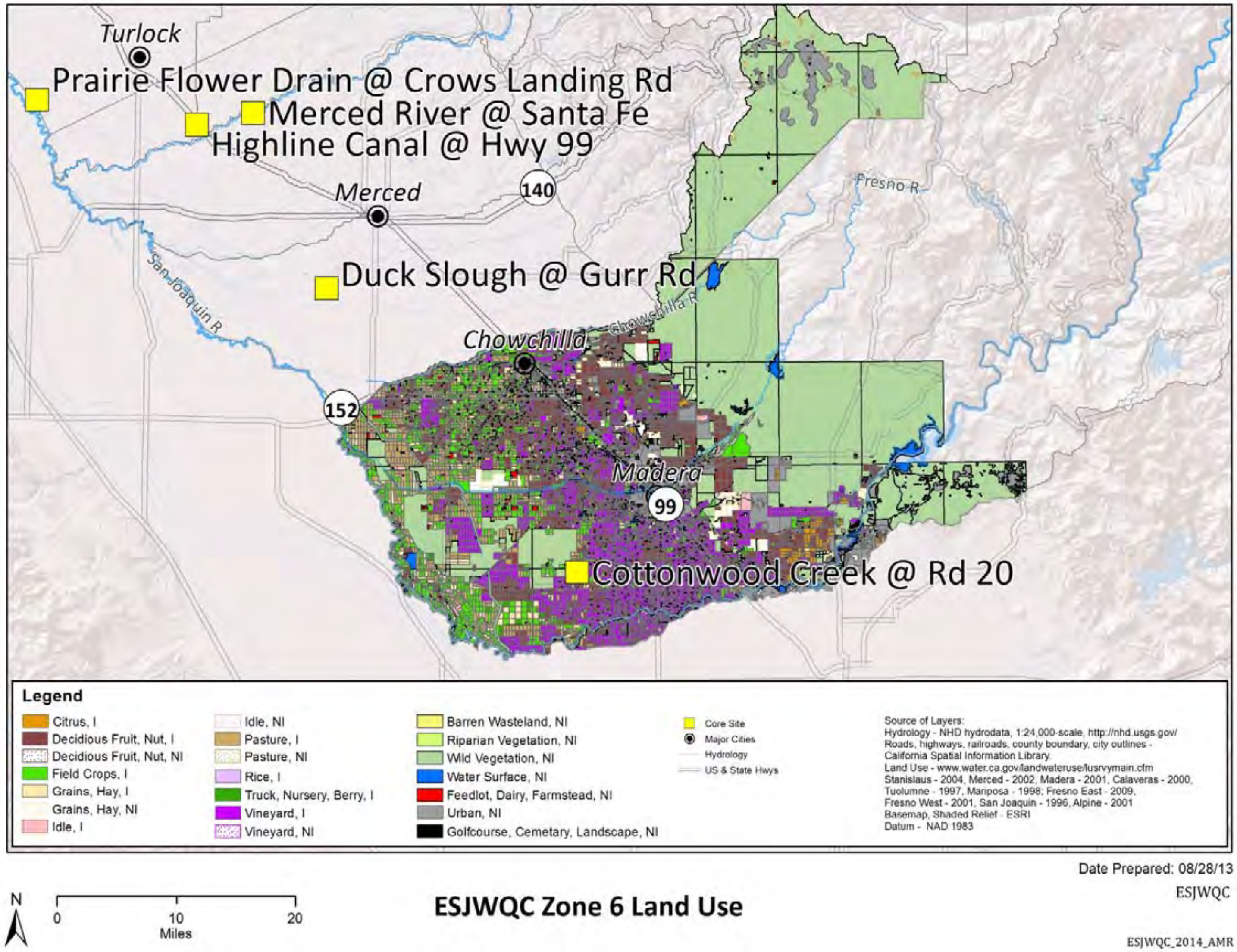


Figure 13. Cottonwood Creek @ Rd 20 Zone (Zone 6) Core site and Land Use.

Land use for Madera County is only described for 37% of the county; therefore a portion of the county is missing from the map.



IDENTIFICATION OF AGRICULTURAL SOURCES OF CONSTITUENTS OF CONCERN

Constituents of Concern: Pesticides and Toxicity

Pesticides refer to a general group of chemicals that include insecticides, herbicides, fungicides, rodenticides, acaricides, nematicides, and molluscicides (among others). Pesticides are applied to kill pests that damage agricultural commodities, dwellings, or pose public health risks, and may have impacts on non-target aquatic organisms if the chemicals are released into aquatic environments.

Pesticides are applied to agricultural commodities by a variety of methods including solid and liquid applications to soil, liquid applications to the surface of the plants by sprayers, and aerial application. Many pesticides have chemical properties that make it difficult for them to be applied effectively and they require an adjuvant to facilitate the application and the product's performance and effectiveness. Many adjuvants have some toxicity by themselves, but the ESJWQC does not analyze for any adjuvants. Pesticides may be found in the water column or sediment as a result of applications to fields that are subsequently irrigated, have runoff after rainfall events, or from spray drift to surface waters. Irrigation return flows from fields or storm water runoff can move sediment and chemicals to surface waters (see below).

Based on monitoring results through September 2013, there are management plans in place for chlorpyrifos (13), DDE (1), diazinon (1), dimethoate (1), and diuron (3) (Tables 2 and 3). Only two site subwatersheds, Mootz Drain downstream of Langworth Pond and Miles Creek @ Riley Road, are in a management plan for more than one pesticide.

The ESJWQC analyzes samples for only a small number of pesticides relative to the number of pesticides that are applied to commodities across the Coalition region. In many cases, there are no certified analytical methods available to measure the concentration of the chemicals in water, the chemical properties of the pesticide make them difficult to measure in the dissolved phase, and/or the amount of a pesticide applied within a site subwatershed is very small making chemical analysis an unlikely method to determine their impacts in surface waters. The Coalition analyzes for 45 pesticides; however, many are considered legacy pesticides since they are no longer registered for use. Some are degradation products (dieldrin, DDD, DDE). Chemical characterization of the limited number of pesticides may not adequately characterize the potential impacts of pesticides (and other constituents) on aquatic communities; consequently the ESJWQC also uses toxicity testing to measure potential impacts on aquatic communities in surface water.

Pesticides are applied, or were applied, by irrigated agriculture but many are registered for uses that allow them to be applied by numerous other entities. Some pesticides are registered for use only on irrigated agriculture, e.g. chlorpyrifos and diazinon and finding these constituents in the water or sediment indicate that the source is irrigated agriculture. Other pesticides may be registered for a variety of uses but may be used primarily by irrigated agriculture. For example, malathion is registered for use for mosquito control by vector control districts but is also used by irrigated agriculture. Some pesticides such as pyrethroids are used by irrigated agriculture but are also heavily used for structural pest control. Diuron is used by both irrigated agriculture and a variety of other entities such as cities, counties, Caltrans, railroads, and irrigation districts for weed control.   Legacy pesticides that are no longer registered for use, e.g. DDT, were applied by a wide variety of entities including irrigated agriculture, vector control districts, municipalities, and industry.

Toxicity testing is complementary to chemical analyses and can provide an independent assessment of the level of impairment in the waterbody. The objective of the Coalition is to use the results of toxicity testing along with water chemistry analysis to assess the impact of discharges from irrigated agriculture. The Coalition performs toxicity tests using three species of aquatic organisms to determine if aquatic organisms in the water column are potentially impacted by pesticides. The three species are green algae (*Selenastrum capricornutum*), water flea (*Ceriodaphnia dubia*), and fathead minnow (*Pimephales promelas*). The Coalition tests for toxicity to benthic communities using an amphipod crustacean (*Hyalella azteca*).

The primary cause of toxicity in the Coalition region is pesticides, both organic compounds and those containing cationic metals.   The Coalition performs Phase I TIEs on water column samples with mortality greater than 50% (compared to the control) and uses its analyses of samples collected for analytical chemistry to attempt to account for the Toxic Units in the sample. Consequently, based on the responses to manipulations of the sample performed during the TIE, the Coalition is able to identify causes of toxicity to broad chemical class, e.g. pyrethroids, organophosphates, nonpolar organics, or cationic metals. The Coalition does not conduct TIEs on every sample, and when performed, the samples may lose their toxicity and TIEs are not able to identify the class of compound responsible for the toxicity.

There are no sediment TIE procedures used to identify potential causes of toxicity in sediment samples. The Coalition performs chemical analyses on sediment samples that cause ≥20% mortality to the test organisms when compared to the control. Analyses are performed for selected pyrethroids and chlorpyrifos and generally are found in samples that cause significant toxicity. These pesticides are transported to surface waters either sorbed to sediments which settle in the water body, or dissolved in the water column which then bind to sediments in the water body. Chlorpyrifos is registered for use only by agriculture but many pyrethroids are used by structural pest control companies to control insects around houses, businesses, and industrial sites due to their low mammalian toxicity. Similarly, vector control districts use pyrethroids to control mosquitos. In site subwatersheds with upstream dwellings, urban areas, or wetlands, it is possible that pyrethroids are originating with applications in those areas. However, chlorpyrifos can only originate with irrigated agriculture.

Toxicity can be caused by constituents other than pesticides although pesticides are the primary source of toxicity in the water column and sediment. The methods used for performing toxicity tests eliminates factors such as DO and pH from causing toxicity because the goal of the testing is to determine if chemicals present in the water are causing toxicity. Water temperature, DO, and pH are controlled during the test eliminating them as causes of toxicity. The Coalition has collected many samples in which ammonium was identified as the cause of the toxicity. In the Coalition region, water samples have been collected with concentrations of ammonium exceeding 20 mg/L or 30 mg/L which cause toxicity to all test species. Although natural processes can convert nitrate or organic nitrogen to ammonium, the concentration of ammonium in these conditions is relatively low. Concentrations of ammonium observed in the water column can only be generated by the discharge of dairy waste or direct discharge of anhydrous ammonium into the water body. Because the toxicity due to ammonium typically occurs in months when fertilizer applications do not take place, dairy discharges are the only other potential source of the ammonium. Dairies are not allowed to discharge lagoon waste into surface waters although such discharges must take place and are assumed to be the source of the ammonium that causes toxicity.

Based on monitoring results through September 2013, there are management plans in place for *C. dubia* (9), *H. azteca* (9), *P. promelas* (2), and *S. capricornutum* (10) (Tables 2 and 3). The management plans cover 15 different site subwatersheds as some of the chemicals that cause toxicity to one test organism also cause toxicity to a second test organism.

Constituents of Concern: Nutrients and Physical Parameters

Excessive nutrients can cause eutrophication of surface waters resulting in low DO and an inability to support healthy aquatic communities. The Coalition's objective is to determine if exceedances of nutrient trigger limits are occurring and if potential sources can be identified. However, sources of nutrients and physical parameters such as organic carbon are difficult to identify. If current monitoring data are not sufficient, the Coalition may conduct further investigations to identify sources. Such investigations may include special studies if they are determined to be cost effective. By understanding the sources of nutrients responsible for the exceedances, the Coalition can properly recommend management practices to address exceedances of nutrients and physical parameters.

The ESJWQC monitors for total ammonia, nitrate + nitrite, and soluble orthophosphate, hardness (as $CaCO_3$), TSS, turbidity, and calculates unionized ammonia based on the temperature and pH of the water. Hardness is used to determine if the concentration of dissolved metals exceed the harness-based WQTLs. Measurements of TOC are taken as part of the drinking water constituent class. Based on monitoring results through September 2013, management plans are currently in place for ammonium (5), nitrate + nitrite (6), and TDS (11) site subwatersheds (Tables 2 and 3). Site subwatersheds currently in a management plan for TDS will continue to be in a management plan although the Coalition will place these sites under a management plan for SC.

The source of ammonium was addressed above during the discussion of toxicity. Briefly, the concentration of ammonium in the water column and the timing of the exceedances argue that discharges from dairies are the cause of elevated concentrations of ammonium in surface waters. In addition, there has never been an exceedance of the WQTL for ammonium in a water body that does not contain dairies in close proximity to the water body, i.e. exceedances always occur where there are upstream dairies.

Nitrate can have several sources including synthetic fertilizers applied to agricultural fields and suburban lawns and gardens, manures that are applied and incorporated into the soil by agriculture and suburban lawns and gardens, discharges from leaky septic systems, discharges from wastewater treatment plants, and discharges by dairies to surface and groundwater. Nitrate concentrations commonly exceed the WQTL in site subwatersheds that have large dairy acreage and shallow groundwater. This shallow groundwater is intercepted by drains and conveyed to larger water bodies downstream. However, the soils in these areas tend to be sandy and could result in leaching of nitrate fertilizer through the root zone and into shallow groundwater.

Constituents of Concern: Field Parameters

Monitoring results through September 2013 indicate management plans are in place for SC (9), pH (14), DO (18) (Tables 2 and 3). As is evidenced from the number of management plans, exceedances of the WQTLs for field parameters are common. Much like physical parameters, exceedances of water quality objectives for pH, DO, and SC are the result of processes that occur on the landscape as well as in the water body. Both DO and pH are non-conserved meaning that they can increase or decrease as water moves downstream. Processes affecting DO in waterways include stream flow, water temperature, the presence of submerged vegetation, emergent vegetation, and benthic and suspended algae, organic compounds in the water column (Chemical Oxygen Demand), algal respiration, and microbial physiological processes (Biological Oxygen Demand). The latter can be stimulated by the presence of excessive nutrients. Many of these factors also vary diurnally. As with nutrients and physical parameters, the Coalition's objective is to determine if exceedances are occurring and to investigate potential sources through analysis of monitoring data and special studies.

Currently, the Coalition cannot identify the specific contributions of any of the factors to determining the concentration of DO or pH in surface waters. The Coalition will use past monitoring data, landscape data, and climatic data to perform preliminary analyses to determine the relative contribution of these factors to DO concentration and pH. Once the results of these analyses are available, the Coalition will work with Regional Board staff to determine whether a work plan needs to be developed to further identify causes of low DO and elevated pH. The preliminary analyses will be provided to the Regional Board within 90 days of the date of approval of the revised SQMP.

pH measures the acidity of the water in the waterbody. The acceptable values for pH provided in the Basin Plan are 6.5 – 8.5 which means the water can be slightly acidic to moderately basic. pH values outside this range constitute an exceedance. The Coalition has recorded numerous values of pH above the upper limit resulting in exceedances of the objective. pH can vary considerably diurnally depending on the amount of suspended and benthic algae present in the system and the buffering capacity of the water determined by water chemistry which is in turn determined by the underlying geology. During the non-daylight hours, algae are respiring removing oxygen from the water and releasing carbon dioxide. During daylight hours, photosynthesis reverses that process and oxygen is produced and carbon dioxide is removed. A large amount of organic matter can also result in changes in pH as microbial breakdown of dead algae and other organic matter in the water can lead to elevated pH. In other studies (Washington Department of Ecology, Factors affecting waters with high a pH: statewide analysis, https://fortress.wa.gov/ecy/publications/publications/0203005.pdf), elevated pH in surface waters is associated with excessive nutrients. The Coalition will do a preliminary analysis to determine which, if any, factors are associated with elevated pH in Coalition surface waters. The results of the analysis will be used to determine if a source identification study is necessary or if the Coalition can move forward with recommendations for implementation of management practices that can reduce the number of exceedances of the pH objective. The Coalition will work with Regional Board staff as they complete the analysis and make a determination if a source identification study is necessary.

Constituents of Concern: *E. coli*

E. coli is a natural component of ecosystems and also occurs in the intestinal tracts of animals. Coliform bacteria are voided in fecal material which can enter surface waters. *E. coli* may persist in the presence of oxygen in the environment for periods of time after being voided, and are known to reproduce and proliferate in the environment. Any species of vertebrate that voids feces can contribute *E. coli* to surface waters, including humans, companion animals such as dogs and cats, cows, chickens, waterfowl (ducks and geese), raccoons, otters, ground squirrels, feral pigs, and in some locations deer. Furthermore, manure is applied to crops as a fertilizer and can contribute to the presence of *E. coli* bacteria if composting is not conducted appropriately. Manure application practices are intended to keep manure from reaching waterways and proliferating pathogens. Even though landowners and operators are required to follow crop specific manure application practices and guidelines, contamination may occur.

Based on monitoring results through September 2013, management plans are in place in 24 site subwatersheds for *E. coli* (Tables 2 and 3). *E. coli* refers to a large number of serotypes of the same general gram-negative species. Although most commonly found in the intestinal tracts of most organisms, they are also capable of reproduction and persistence in ecosystems.

A preliminary study performed in 2007 used an obligately anaerobic genus Bacteroides and Quantitative Polymerase Chain Reaction (qPCR) to identify sources of Fecal Indicator Bacteria. There were small contributions from bovine sources but the majority of the bacteria were of human origin. The study did not sample for *E. coli* and was conducted only during the dry season. Additional analyses are needed. The Coalition will develop a work plan for submission to the Regional Board to identify sources of *E. coli* in surface waters. The work plan will be submitted 120 days after the approval of the Management Plan.

Constituents of Concern: Metals

Nine metals are analyzed in Coalition monitoring: arsenic, boron, cadmium, copper, lead, molybdenum, nickel, selenium and zinc. Five of these metals are analyzed for both dissolved and total fractions, and four metals are analyzed for total recoverable metal only. In order to assess compliance with water quality standards the Coalition analyzes for dissolved fractions of cadmium, copper, lead, nickel and zinc. The remaining metals are analyzed for total concentrations only. Based on monitoring results through September 2013, management plans are currently in place for arsenic (3), copper (13), lead (8), and molybdenum (1) (Tables 2 and 3).

There are four general classes of metals: 1) those that are naturally present because of underlying geologic materials but not applied by agriculture (boron, selenium), 2) those that are naturally present because of underlying geologic materials and may be applied by agriculture (copper, zinc, nickel), 3) those that are naturally present because of underlying geologic materials and are legacy pesticides but also have numerous nonagricultural sources (lead, arsenic), and 4) those that are found solely as a result of nonagricultural anthropogenic sources (cadmium). These categories are not mutually exclusive and in fact, all metals belong to the first category. For example, nickel is a plant micronutrient that rarely may be incorporated into fertilizer mixes, although normally there is a sufficient quantity of nickel in soils to supply the needs of crops. As a result, although applied by agriculture, exceedances of the WQTL for nickel would be expected to primarily be a result of a high concentration of nickel in soil.

Natural weathering of geologic materials can release metals and metalloid elements such as selenium, arsenic, and boron to surface waters. Selenium salts are naturally elevated in the southwest portion of the San Joaquin Valley and are transported to surface waters during storm water runoff or irrigation tailwater discharge. These salts are so problematic that there is a prohibition of discharge of irrigation tailwater in some locations in the Valley. Arsenic appears to be naturally elevated in several locations in the San Joaquin Valley. Zinc and nickel are also found in soils and can be found in surface waters at levels that reflect background concentrations. Both of these metals can be applied during agricultural operations as well; therefore, the difference between applications and natural weathering must be understood to properly manage the amounts reaching surface waters. Understanding background levels of these elements will be an important task for the Coalition when trying to understand the impact of agricultural inputs to surface waters.

While all metals can be released as a result of the weathering of geologic materials, elevated levels of most metals are a result of anthropogenic inputs. Lead was used as a pesticide during the last century although it was applied in declining amounts over the last several decades before finally being prohibited in the 1990s. Lead was used in gasoline until the early 1980s when it was replaced by other fuel oxygenates. Lead-based paint was routinely used until the latter parts of the last century and is still present in many old buildings and structures. Lead is a component of batteries, and is the material in solder in numerous electronic devices including televisions, computers, and cell phones. Copper is routinely used by agriculture on a number of crops and could be found in surface waters as a result of these applications. Additional sources include road surfaces where wearing of brake pads can result in substantial loading to surface waters, use of copper by irrigation districts for channel maintenance, and releases from improperly closed mining operations in the Sierra Nevada Mountains.

Transport of Constituents of Concern to Surface Water

Mechanisms of transport of agricultural constituents to surface waters include 1) direct discharge of storm water and irrigation tailwater mobilizing dissolved and sediment-bound constituents, and 2) spray drift. A wide variety of irrigation practices are employed by growers in the Coalition region including flood, furrow, sprinklers, microsprinklers, above ground and below ground drip irrigation. The potential for discharge of sediment and tailwater exists with each of these practices although the potential for discharge from fields using microsprinklers or drip systems is extremely small provided the systems are managed correctly. Fields that are flood irrigated or furrow irrigated generate the greatest potential for discharge of both dissolved agricultural constituents and sediment-bound constituents.

Water bodies within the ESJWQC have been heavily engineered to move water from sources to end users, generally growers but also urban centers. A complex system of conveyances for water transfer, use, and re-use is utilized within the Coalition region. If a sufficiently large amount of water is applied using flood irrigation, some water may return to the source after being used on the field. In some cases, the volume of water applied to a field for irrigation may represent not only what is needed by the crop, but also a greater quantity used either to push the water over the field, or as a method of reducing the negative effects of evapotranspiration and consequent accumulation of salts. Many of the urban centers contribute discharge seasonally as storm water mixes with agricultural inputs especially around the cities of Modesto, Ceres, Keyes, Atwater, Livingston, and Merced. Many cities such as Turlock utilize a system of detention basins to minimize stormwater discharges to surface waters. Some irrigation supply canals accept discharges from upstream agriculture which are transferred downstream where the water may be reused. Even when supply canals do not receive tailwater discharge, these canals can receive spray drift from adjacent fields. Consequently, water bodies in the Coalition region can carry clean irrigation water exclusively, a combination of clean water and agricultural discharge, or primarily agricultural discharge depending on the season.

In sandy areas within the Coalition region, a large portion of the water not used by the crop does not create surface runoff but rather infiltrates and recharges the groundwater. In some of the zones such as the Prairie Flower Drain @ Crows Landing Zone, most of the waterways consist of irrigation district canals and delivery systems and constructed agricultural drains. These drains have the primary purpose of removing shallow groundwater from the root zone so that crops can be grown. Many of these larger drains are fed by tile drain systems in individual fields which can move chemicals such as pesticides and nitrate that leach through the root zone to downstream waterbodies.

Pesticides and metals can be transported in the dissolved phase or bound to sediment. The sorption-desorption kinetics are characterized by partitioning coefficients which indicate the relative tendency of the constituents of concern to be found dissolved in water or bound to sediments. The Coalition maintains a database of information on constituents of concern including organic carbon partitioning coefficients. When constituents of concern are detected in surface water during Coalition monitoring, understanding the primary transport mechanism allows the Coalition to recommend appropriate management practices to eliminate the discharges.

There is a tendency for increased runoff with increased slope, increased soil water saturation, and volume of water applied or falling as rain. These conditions arise primarily due to large amounts of rainfall and are more likely in the relatively greater sloped valley margins although the Sediment and Erosion Assessment performed by the Coalition found locations on the Valley floor that had highly erodible soils that could be mobilized with very slight slopes. During the winter, runoff throughout the Coalition region is moved for flood control to the west through the myriad of creeks, rivers, and drains. However, many of the drainages in the southern portion of the Coalition region do not always carry runoff even during substantial rainfall events. In addition, waterbodies throughout the Coalition region tend to be “flashy” in that water from runoff events moves through the systems very quickly leaving very little flow shortly after the storm ends. Runoff can also occur during the irrigation season if water entering the field is greater than the amount that can infiltrate into the soil. In portions of the Coalition region with sandy soils and no topographic relief, e.g. in the south of the Coalition, there is no irrigation tailwater discharge. Any irrigation water infiltrates the soils and if not used by the plants, can move to groundwater as recharge.

Source Identification

Despite the fact that the sources of constituents of concern can be identified generally, and the method of transport can be determined generally, it is very difficult to identify specific sources and specific transport mechanisms for every constituent of concern in every site subwatershed. This makes it difficult for the Coalition to determine the relative contribution, if any, of irrigated agriculture to exceedances of WQTLs. For example, nitrate in surface water in Prairie Flower Drain could originate with fertilizer applications that are transported to the drain in irrigation tailwater or from tile drains below the fields that discharge to the drain. However, there are several non-members in the site subwatershed that are enrolled in the dairy program who use synthetic fertilizer and/or apply liquid dairy waste and manure to their land. Understanding the relative contribution of these sources to the nitrate in Prairie Flower Drain is critical to the Coalition because considerable resources can be spent on outreach and monitoring with no improvement in water quality because the sources are non-member operations. The problem of understanding relative contributions to exceedances of WQTLs is common to several constituents including nitrate, copper, pesticides such as diuron, and salt. In addition, there are constituents such as molybdenum, arsenic, lead, and cadmium that are not directly applied by irrigated agriculture. These constituents may reach surface water through discharge of tailwater that is originally groundwater pumped for irrigation. Again, it is unknown if the discharge of tailwater is the primary source of these constituents in surface water or if the major source is shallow groundwater that reaches water bodies in the Coalition region. Understanding the relative contribution will be critical in determining whether these are manageable water quality problems.

The method of source identification varies depending on the constituent or process involved. Some constituents such as pesticides can be identified to source by use of Pesticide Use Reports. These PURs also provide information on commodity to which the pesticide was applied and the method of application which allows the Coalition to review the member's current management practices and if appropriate, recommend additional management practices to prevent discharges. Other elements monitored by the Coalition, e.g. water column and sediment toxicity, can be more problematic. If toxicity is accompanied by the presence of chemicals in the water, the Coalition can use PUR data to identify potential sources. If toxicity occurs and no chemicals are detected in the water, identifying the source of the toxicity becomes more difficult. The Coalition does not monitor for every chemical applied by members and the PUR data can be searched for chemicals for which the Coalition does not sample with the assumption that the toxicity is caused by a pesticide applied by growers in the watershed. However, there are instances of toxicity for which there are no recent applications of pesticides that could be the cause (e.g. *S. capricornutum* toxicity with no recent applications of herbicides or cationic metals) and these exceedances cannot be assigned to a potential source.

There are also constituents that are applied by irrigated agriculture that are impossible to source or may have multiple sources (e.g. nitrate, copper, zinc), and there are constituents/measured parameters that are not applied by irrigated agriculture (e.g. arsenic, molybdenum, cadmium, lead, DDE), or may be the result of other processes (pH, DO, SC, *E. coli*) and the Coalition cannot currently assign exceedances to a cause/source. These constituents will be the subject of source identification studies conducted by the Coalition over the next several years. If irrigated agriculture is identified as a potential source, the Coalition will then determine which management practices could be effective in reducing discharges and will conduct outreach with growers to review appropriate practices. It should be noted that since Coalition activities were initiated under the 2008 Management Plan a large number of management practices have been implemented across the Coalition region and a there has been a significant decline in the number of exceedances of WQTLs of applied pesticides and a decline in toxicity. A number of these management practices are designed to prevent discharge of all runoff and are not specific to pesticides, e.g. installation of pressurized irrigation, constructing berms between fields and surface waters, or constructing sediment/tailwater detention basins and recirculation systems. If exceedances of WQTLs for parameters such as DO are the result of discharges of tailwater from irrigated agriculture, it would be expected that the number of exceedances of WQTLs for DO and constituents such as molybdenum would similarly decline. However, that has not occurred indicating the sources of molybdenum and the processes that determine the DO concentration in surface water, or pH of the water, are most likely outside of the ability of irrigated agriculture to manage.

BENEFICIAL USES

Water Quality Trigger Limits (WQTLs) and Water Quality Objectives (WQO) are applied based on the beneficial uses assigned to a specific waterbody. Consequently, identifying appropriate beneficial uses determines the appropriate WQTLs to use in the evaluation of water quality data, which in turn determine the exceedances managed by the Coalition. The Regional Board has assigned beneficial uses to many waterbodies within the Coalition region; however there are several waterbodies monitored by the Coalition that do not have assigned beneficial uses. If a waterbody does not have an assigned BU, the waterbody is subject to the tributary rule with the exception of constructed agricultural conveyance and drain channels (see below). Based on the Basin Plan, tributaries that drain to the San Joaquin River that do not have listed beneficial uses are subjected to the beneficial uses assigned to the San Joaquin River. Upstream waterbodies that are tributaries of the major rivers in the Coalition region (the Merced, Stanislaus, and Tuolumne Rivers in addition to the San Joaquin River) are assigned the beneficial uses of the tributary rivers. Table 10 lists the beneficial uses (Agriculture, Aquatic Life (freshwater habitat, spawning, and migration), Municipal and Domestic Supply, Water Contact Recreation) as identified in the Basin Plan for surface waterbody segments of the four major rivers in the ESJWQC. Figure 14 represents the beneficial uses of the designated major rivers and tributaries of the Coalition region from the rim dams downstream to the San Joaquin Valley floor.

Table 11 includes a list of Coalition tributaries and the beneficial uses of the major rivers as listed in the Basin Plan (Table 4). Table 12 includes all ESJWQC monitoring sites with active management plans and the associated 303(d) listed constituents for the immediate downstream waterbodies. In order to protect the beneficial uses, a list of WQTLs is used to determine if and to what magnitude an exceedance of the WQO for a chemical constituent has occurred (Table 12).

There are sites in the ESJWQC region that are constructed drains (e.g. Prairie Flower Drain) and Irrigation District supply channels (e.g. Turlock Irrigation District's Highline Canal). The Irrigation District supply channels receive water deliveries to irrigate agriculture and they carry clean irrigation water and in some instances irrigation return flow. Other water bodies were constructed solely as drain channels to intercept shallow groundwater and convey it to the San Joaquin River. While many of these supply channels and drains have mud bottoms, many others are lined with concrete for a portion of the channel. All supply channels are maintained by the districts to remain free of aquatic vegetation including algae. Many of these drains and Irrigation District supply canals have been assigned beneficial uses that are not appropriate. These sites cannot support aquatic life and do not have any apparent usage for municipal drinking water supply or recreation; therefore, the Coalition believes these sites should not be assigned beneficial uses.

Table 10. Beneficial use as identified in the Basin Plan for ESJWQC surface waterbody segments of the four major rivers of the ESJWQC.

Major River	Surface Waterbody Segments	Agriculture		Freshwater Habitat[2]		Migration		Spawning		Municipal	Recreation		
		Irrigation	Stock Watering	WARM	COLD	WARM[3]	COLD[4]	WARM[3]	COLD[4]	Municipal /Domestic Supply	Contact	Canoeing and Rafting[5]	Other Non-Contact
Merced River	McSwain Reservoir to San Joaquin River		X	X	X	X	X	X	X	X	X	X	X
San Joaquin River	Mouth of Merced River to Vernalis	X	X	X		X	X	X		X[1]	X	X	X
	Friant Dam to Mendota Pool	X	X	X	X[1]	X	X	X	X[1]	X	X	X	X
	Mendota Dam to Sack Dam	X	X	X		X	X	X	X[1]	X[1]	X	X	X
	Sack Dam to Mouth of Merced River	X	X	X		X	X	X	X[1]	X[1]	X	X	X
Tuolumne River	New Don Pedro Dam to San Joaquin River	X	X	X	X		X	X	X	X[1]	X	X	X
Stanislaus River	Goodwin Dam to San Joaquin River	X	X	X	X		X	X	X	X[1]	X	X	X

[1]-Noted as 'Potential Beneficial Use' in the 1998 Fourth Edition of the Water Quality Control Plan (Basin Plan) for the Sacramento River and San Joaquin River Basin.

[2]-Resident does not include anadromous. Any segments with both COLD and WARM beneficial uses designations will be considered a COLD waterbody for the application of water quality objectives.

[3]-Striped bass, sturgeon, and shad.

[4]-Salmon and steelhead.

[5]-Shown for streams and rivers only with the implication that certain flows are required for the beneficial use.

Table 11. Primary waterbodies that drain directly into the major rivers of the ESJWQC region and the beneficial use for each of the major river reaches.

MONITORING SITE	IMMEDIATE DOWNSTREAM RIVER	BENEFICIAL USE OF IMMEDIATE DOWNSTREAM RIVER
Ash Slough @ Avenue 21**	San Joaquin River[2]	1-4, 7-9, 11-15
Bear Creek @ Kibby Rd**	San Joaquin River[2]	1-4, 7-9, 11-15
Berenda Slough along Avenue 18 ½	San Joaquin River[2]	1-4, 7-9, 11-15
Black Rascal Creek @ Yosemite Rd	San Joaquin River[2]	1-4, 7-9, 11-15
Canal Creek @ West Bellevue Rd	Merced River[5]	1, 3-15
Cottonwood Creek @ Rd 20	San Joaquin River[2]	1-4, 7-9, 11-15
Deadman Creek @ Gurr Rd	San Joaquin River[2]	1-4, 7-9, 11-15
Deadman Creek @ Hwy 59	San Joaquin River[2]	1-4, 7-9, 11-15
Dry Creek @ Rd 18**	San Joaquin River[2]	1-4, 7-9, 11-15
Dry Creek @ Wellsford Rd	Tuolumne River[4]	1-3, 7-10, 12-15
Duck Slough @ Gurr Rd	San Joaquin River[2]	1-4, 7-9, 11-15
Hatch Drain @ Tuolumne Rd	San Joaquin River[3]	1-4, 7-9, 11-13, 15
Highline Canal @ Hwy 99	Merced River[5]	1, 3-15
Highline Canal @ Hwy 99	San Joaquin River[3]	1-4, 7-9, 11-13, 15
Highline Canal @ Lombardy Rd	Merced River[5]	1, 3-15
Highline Canal @ Lombardy Rd	San Joaquin River[3]	1-4, 7-9, 11-13, 15
Hilmar Drain @ Central Ave	San Joaquin River[3]	1-4, 7-9, 11-13, 15
Howard Lateral @ Hwy 140	San Joaquin River[2]	1-4, 7-9, 11-15
Lateral 2 ½ near Keyes Rd	San Joaquin River[3]	1-4, 7-9, 11-13, 15
Lateral 5 ½ @ South Blaker Rd	San Joaquin River[3]	1-4, 7-9, 11-13, 15
Lateral 6 and 7 @ Central Ave	San Joaquin River[3]	1-4, 7-9, 11-13, 15
Levee Drain @ Carpenter Rd	San Joaquin River[3]	1-4, 7-9, 11-13, 15
Livingston Drain @ Robin Ave	San Joaquin River[2]	1-4, 7-9, 11-15
Lower Stevinson @ Faith Home Rd	Merced River[5]	1, 3-15
McCoy Lateral @ Hwy 140	San Joaquin River[2]	1-4, 7-9, 11-15
Merced River @ Santa Fe	Merced River[5]	1, 3-15
Miles Creek @ Reilly Rd	San Joaquin River[2]	1-4, 7-9, 11-15
Mootz Drain downstream of Langworth Pond	Tuolumne River[4]	1-3, 7-10, 12-15
Mustang Creek @ East Ave	Merced River[5]	1, 3-15
Mustang Creek @ East Ave	San Joaquin River[3]	1-4, 7-9, 11-13, 15
Prairie Flower Drain @ Crows Landing Rd	San Joaquin River[3]	1-4, 7-9, 11-13, 15
Rodden Creek @ Rodden Rd	Stanislaus River[7]	1-10, 12-15
Unnamed Drain @ Hogin Rd	San Joaquin River[3]	1-4, 7-9, 11-13, 15
Unnamed Drain @ Hwy 140	San Joaquin River[2]	1-4, 7-9, 11-15
Westport Drain @ Vivian Ave	San Joaquin River[3]	1-4, 7-9, 11-13, 15

[1] Friant Dam to Mendota Pool reach
[2] Sack Dam to Merced River reach (all waterbodies that drain to this reach enter via the East Side Bypass with the exception of Livingston Drain)
[3] Mouth of Merced River to Vernalis
[4] New Don Pedro Reservoir to San Joaquin River reach
[5] McSwain Reservoir to San Joaquin River reach
[6] "Beneficial uses vary throughout the Delta and will be evaluated on a case-by-case basis" (wording from the Basin Plan).
[7] Goodwin Dam to San Joaquin River
** Surface water flow in these waterbodies terminates in subterranean flow except for periods of increased runoff during large winter storms.
* Beneficial Use code list:

1 - Municipal and Domestic Supply
2 - Agriculture Supply (irrigation)
3 - Agriculture Supply (stock watering)
4 - Industrial Process Supply
5 - Industrial Service Supply
6 - Hydropower Generation
7 - Water Contact Recreation
8 - Non-contact Water Recreation
9 - Warm Freshwater Habitat
10 - Cold Freshwater Habitat
11 - Migration of Aquatic Organisms (warm)
12 - Migration of Aquatic Organisms (cold)
13 - Spawning, Reproduction, and/or Early Development (warm)
14 - Spawning, Reproduction, and/or Early Development (cold)
15 - Wildlife Habitat

Figure 14. Beneficial use designated major waterbodies and tributaries of the ESJWQC region.

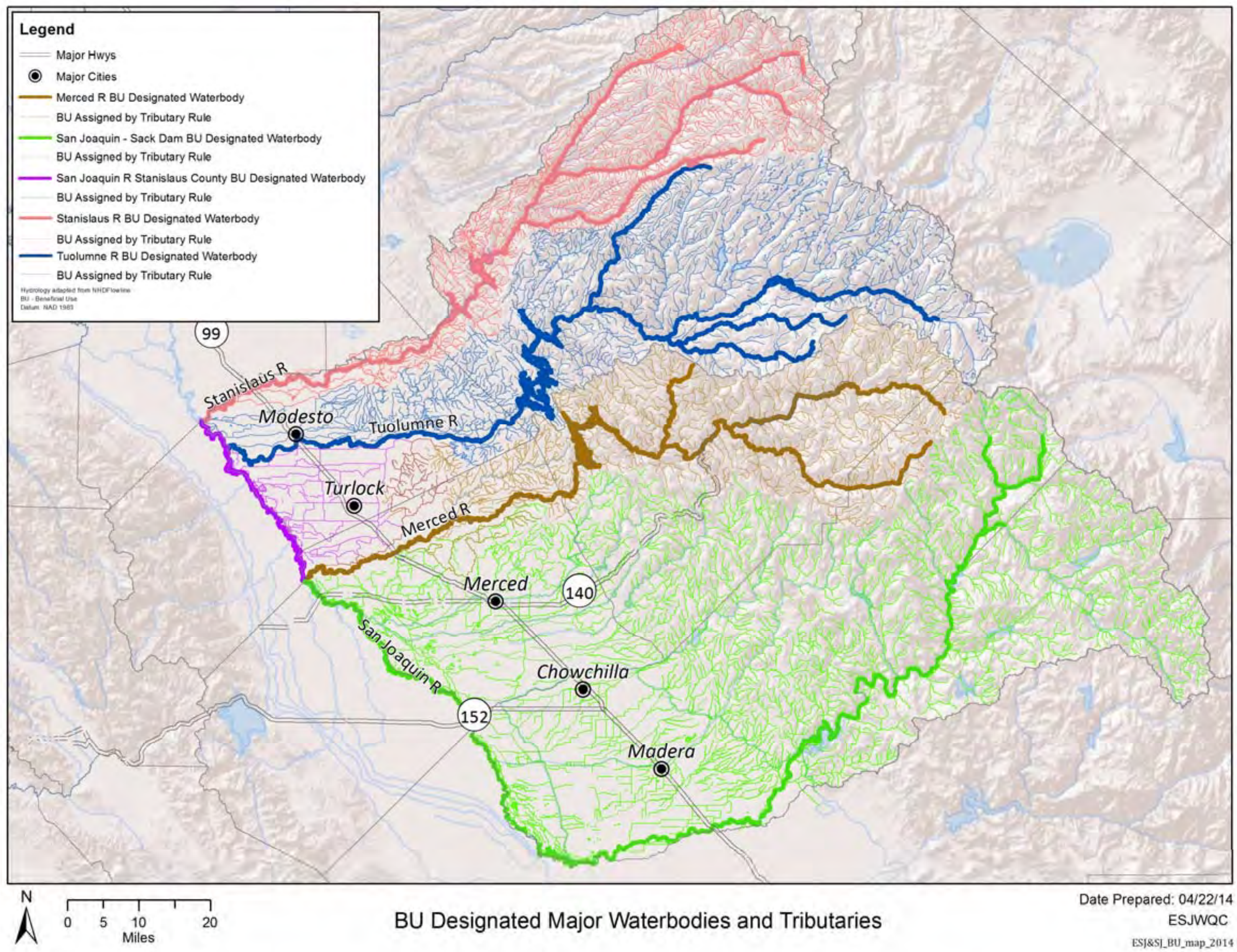


Table 12. Monitoring sites and associated 303(d) constituents for the immediate downstream waterbodies.
Core sites in bold.

Zone	Monitoring Site	Downstream Waterbody	303(d) Listed Constituents																
			E. coli	SC	Temperature	Arsenic (Total)	Boron (Total)	Mercury	Chlorpyrifos	Diazinon	DDE	DDT	HCH, alpha	Diuron	Simazine	Group A Pesticides	cis-permethrin	Sediment Toxicity	Unknown Toxicity
1	**Dry Creek @ Wellsford Rd**	Dry Creek (tributary to Tuolumne River at Modesto, east Stanislaus County)	X						X	X									X
	Mootz Drain downstream of Langworth Pond	San Joaquin River (Merced River to Tuolumne River)		X	X		X		X		X	X	X			X			X
	Rodden Creek @ Rodden Rd	Stanislaus River, Lower			X			X	X	X						X			X
2	**Prairie Flower Drain @ Crows Landing Rd**	San Joaquin River (Merced River to Tuolumne River)		X	X		X	X	X		X	X	X			X			X
	Hatch Drain @ Tuolumne Rd			X	X		X	X	X		X	X	X			X			X
	Hilmar Drain @ Central Ave			X	X		X	X	X		X	X	X			X			X
	Lateral 2 1/2 near Keyes Rd			X	X		X	X	X		X	X	X			X			X
	Levee Drain @ Carpenter Rd			X	X		X	X	X		X	X	X			X			X
	Westport Drain @ Vivian Rd			X	X		X	X	X		X	X	X			X			X
3	**Highline Canal @ Hwy 99**	Highline Canal (Mustang Creek to Lateral No 8, Merced and Stanislaus Counties)							X						X			X	X
	Highline Canal @ Lombardy Rd								X						X			X	X
	Mustang Creek @ East Ave	Mustang Creek (Merced County)							X	X					X		X		
4	**Merced River @ Santa Fe**	Merced River (McSwain Reservoir to San Joaquin River)	X		X			X	X	X						X			X
	Bear Creek @ Kibby Rd	Bear Creek (from Bear Valley to San Joaquin River, Mariposa and Merced Counties)	X																X
	Black Rascal Creek @ Yosemite Rd		X																X
	Howard Lateral @ Hwy 140		X																X
	Livingston Drain @ Robin Ave		X																X
	McCoy Lateral @ Hwy 140		X																X
	Unnamed Drain @ Hwy 140	San Joaquin River (Bear Creek to Mud Slough)	X	X		X	X	X	X			X				X			X
5	**Duck Slough @ Gurr Rd**	Duck Slough (Merced County)	X						X									X	X
	Deadman Creek @ Gurr Rd	Deadman Creek (Merced County)	X						X										
	Deadman Creek @ Hwy 59		X						X										
	Miles Creek @ Reilly Rd	Miles Creek (Merced County)												X					
6	**Cottonwood Creek @ Rd 20**	Cottonwood Creek (S Madera County)	X																X
	Ash Slough @ Ave 21	Ash Slough (Madera County)							X										
	Berenda Slough along Ave 18 1/2	Berenda Slough (Madera County)							X										
	Dry Creek @ Rd 18	San Joaquin River (Mendota Pool to Bear Creek)					X		X	X		X				X			

BASELINE INVENTORY OF EXISTING MANAGEMENT PRACTICES

Prior to the development of the Management plan in 2008, the Coalition developed a survey for growers to complete and provide information on their management practices. The surveys were sent to growers during the spring and summer of 2007 and the responses were summarized in the December 31, 2007 Semi Annual Monitoring Report. Growers were allowed to select from a list of management practices used on their operations and were also given an option to provide a written response. Many of the written responses appear to be variations of the listed options and, consequently, a complete, detailed analysis was difficult to provide. Failure of growers to provide survey responses was due to one or more of the following reasons: 1) the grower was not a member of the Coalition, 2) the grower was unable to respond (i.e. wrong address, did not receive mail, did not have enough information to respond) or 3) the grower was unwilling to respond. A review of the survey responses that were received was performed to determine the general status of the management practices in the region in 2007.

As site subwatersheds entered management plans between 2008 and 2013, the Coalition distributed management practice surveys to selected growers in the subwatersheds (both Coalition members and non-members). The surveys were sent to landowners who were identified as having fields directly adjacent or near the waterbody in a management plan.

Of the returned surveys, a large number of growers indicated that there was no discharge from their property during either the storm or irrigation season as a result of local conditions or lack of proximity to waterways. Of those who indicated discharge was a possibility, growers often indicated that several different management practices were utilized to control discharge. Drainage management systems included holding basins, bermed fields, recirculating systems, and sediment settling basins. Many growers indicated that they allowed vegetation to grow in drainage ditches in either winter or summer, or both as a means of trapping sediment. When asked about practices used to reduce storm or irrigation runoff from fields to ditches, canals, or streams, growers indicated that they used a variety of practices including grass row centers in orchards, grass waterways, gravity tailwater recapture systems, vegetated filter strips, or pressurized irrigation systems such as drip, microspray, sprinkler, or careful water management. Additionally, growers reduced discharges by implementing management practices based on information obtained in commodity-specific training sessions. Discharges of constituents were reduced by implementing practices recommended by Coalition representatives which include, 1) using information obtained from soil nutrient analyses, 2) developing and implementing a crop nutrient management plan, 3) receiving an agronomist's advice on farming practices, 4) laser leveling fields, 5) obtaining Certified Crop Advisor recommendations, and/or 6) performing sprayer calibrations to reduce the potential for drift.

In the past, the Coalition developed an inventory of management practices of growers with direct discharge to a waterbody that is in a management plan. These management practices were described and summarized in Management Plan Update Reports submitted by the Coalition each year. Currently, the Coalition is using the Farm Evaluation Plan to collect additional baseline information on management practices from all members who are farming in surface and groundwater high vulnerability areas. The information will be available from all members farming in each site subwatershed in a management plan, not just those with direct drainage to the water body. The results of the Farm Evaluation Plan will be available July 1, 2014 and will be submitted as an addendum to the Annual Monitoring Report. Below are the results from the surveys of member's management practices obtained over the last 8 years when the site subwatershed became the focus of outreach and monitoring.

Management Practices to Reduce Water Use and Waste Discharge

The list of management practices that can be used to keep pesticides out of surface waters is not large. Generally they fall into three categories:

1. practices that manage movement of irrigation tailwater,
2. practices that manage the movement of sediment, and
3. practices that manage applications of pesticides and fertilizers.

Managing the movement of surface water will manage pesticides in two categories; 1) pesticides that are soluble in water, and 2) pesticides that are bound to sediment. Managing the movement of sediment will manage pesticides with high K_{oc} that attach to sediment or organic material. Assigning pesticides to either of these two categories associates chemicals with either water column or sediment toxicity, or both, and enables the Coalition to conduct effective outreach.

One of the primary goals of the Coalition is to gather information on management practices that are demonstrated to benefit water quality and to provide information and support to growers to facilitate the implementation of these management practices. Over the last several years, the Coalition has collaborated with many groups including the University of California Cooperative Extension, the Coalition for Urban and Rural Environmental Stewardship (CURES), pesticide registrants and pest control advisors to gather information on the most up-to-date management practices to reduce the potential of pesticide runoff. Information is provided to growers regularly throughout the year by means of Coalition outreach meetings, mailings, personal communication and the Coalition website. Each management practice is viewed as one tool in a collective tool box and the management practices (tools) that are most beneficial to a particular farm will depend on factors such as the size of the farm, the drainage system, soil type, crop type and the agricultural pests that must be controlled.

Management Practice Implementation

Over the course of monitoring, when exceedances occur at a sample site more than once, the Coalition is required to formulate a Management Plan to address those exceedances. The ESJWQC Management Plan contains goals and actions that are designed to address water quality impairments specific to a site subwatershed. Outreach and implementation are important components of the plan. Management practices are recommended to growers through general outreach at county and/or subwatershed meetings and in subwatersheds in management plans, on an individual grower basis. Coalition representatives are able to conduct site visits to individual farms in order to investigate sources of exceedances and to speak with growers and/or pesticide applicators in person. After outreach or contact occurs, management practices are implemented by growers on a voluntary basis. In particular, where exceedances are experienced in a small site subwatershed, it is possible to work closely with growers to encourage the implementation of management practices at an individual ranch. Documentation of practices implemented has been done through follow-up surveys completed by members in the year after the member received recommendations to implement management practices.

In the future, the Coalition will document the implementation of management practices in the Coalition region through the use of the Farm Evaluation Plans submitted by members every year. Changing chemicals, application practices (e.g. timing of application, calibrating nozzles), or implementing structural management practices are occurring in the Coalition region and these practices can be reported to the Coalition through yearly submittals of the FEP. The Coalition has developed a database to track new management practices reported in the Farm Evaluation Plan that are implemented in the region.

The Coalition provides growers with information through mailings and meetings concerning various management practices that are designed to 1) reduce storm water runoff, 2) manage discharge of irrigation tailwater, 3) manage spray applications, and 4) avoid mobilization of sediment and that could transport to receiving waters. The Coalition identified eight general categories of management practices that are effective at reducing the impacts of agricultural discharges on water quality including:

1. Reduction in application rates,
2. Spray drift management,
3. Change to low risk products,
4. Use of polyacrylamide (PAM) in furrow irrigation,
5. Drip or microspray irrigation,
6. Recirculation/tailwater return system,
7. Retention pond/holding basin, and
8. Grass waterways or grass filter strips.

Non-structural practices (practices 1-4 above) generally can be implemented sooner than structural practices (practices 5-8) as structural practices may require that the grower secure additional resources for implementation. The Coalition makes efforts to inform growers of resources available for management practice implementation.

Baseline Inventory of Management Practices in Site Subwatersheds

The Coalition completed focused outreach in 15 site subwatersheds. Prior to outreach, individual members were targeted based on the chemicals they applied, the dates of applications, and in some cases, the method of application. Meetings with targeted members were held in all of these site subwatersheds. Information on current management practices was collected and recommended practices were documented. Follow-up surveys to assess implementation of new management practices were completed for 100% of all targeted members. The Coalition reported final results of current and recommended management practices in the 2011, 2012, and 2013 MPURs. Newly implemented practices were reported in the 2012 and 2013 MPUR (Pages 54-65). The Coalition has received and recorded 100% of the follow-up surveys for the fourth set of priority subwatersheds and a final analysis of implemented management practices is included in the 2014 Annual Report. Management plan tracking is ongoing in four site subwatersheds and has been initiated in 2014 in three site subwatersheds.

Members in all remaining site subwatersheds with management plans received FEPs to complete. Completed FEPs are being returned to the Coalition and the data are being stored in a database maintained by the Coalition. As analyses of exceedances occur in the immediate future, members will be targeted using the criteria discussed above. Once targeted members are identified, their FEPs will be reviewed to obtain an understanding of the management practices that are currently in place. Having this inventory of practices will facilitate identifying those members that should receive visits from Coalition representatives and allow the Coalition to prioritize those visits leading to greater efficiency in the Coalition's outreach program.

During initial focused outreach meetings, the Coalition documented numerous management practices currently implemented by members. The survey completed during the initial contact is organized into Checklist Sections which categorize management practices into five categories: Irrigation Water Management, Storm Drainage, Erosion and Sediment Management, Pest Management, and Dormant Spray Management. The list of practices associated with each practice is in Table 13.

Figure 15 compares the acreage associated with currently implemented practices (before outreach) to newly implemented practices (after outreach) for first through fourth priority subwatersheds. In some cases, management practices are not applicable. For example, if a grower does not need to apply dormant sprays, dormant spray management activities are not applicable. Pest Management Practices have been implemented by members across the largest amount of acreage before and after outreach (Figure 15).

As a result of focused outreach, 49% of targeted growers in 15 subwatersheds implemented new management practices. Thirty-eight growers implemented additional management practices from 2009 through 2013. Growers implemented several new practices in the Pest Management and Dormant Spray Management categories to manage spray drift. Growers took additional steps to better manage irrigation tailwater and storm drainage.

Figure 15. Targeted acreage of categories of current and newly implemented management practices in the first, second, third, and fourth priority site subwatersheds.

Targeted acreage associated with grower displayed if one or more practice(s) are implemented per category. Several practices serve multiple purposes and fall into more than one category, but practices are counted only once with their primary category.

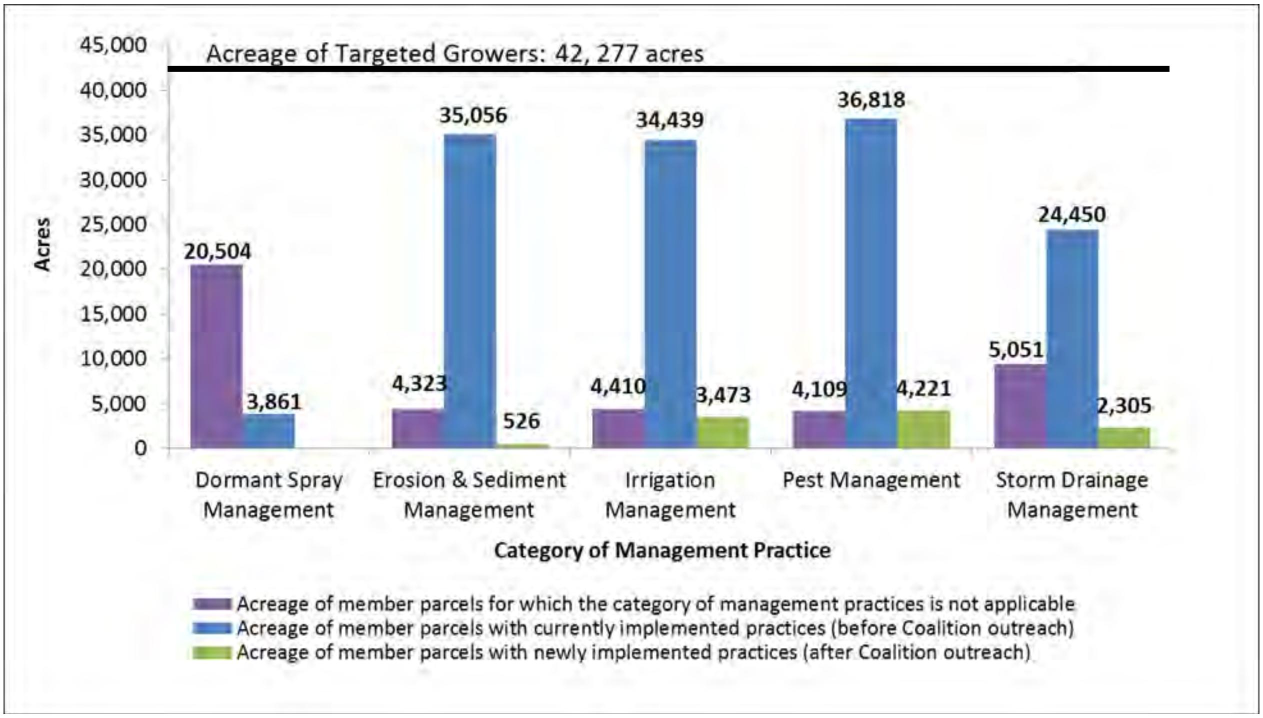


Table 13. Management practices documented in the ESJWQC region listed by Management Practice Category.

Management Practice Category	Management Practices
Irrigation Management Storm Drainage Management	Berms between field & waterway
	Drainage Basins (Sediment Ponds)
	Install device to control amount/timing of discharge to waterway
	Microirrigation system
	Recirculation - Tailwater return system
	Reduce amount of water used in surface irrigation
	Use Polyacrylamide (PAM)
Erosion & Sediment Management	Filter strips at least 10' wide around field perimeter
	Grass row centers
Pest Management Dormant Spray Management	Calibrate spray equipment prior to every application
	Shut off outside nozzles when spraying outer rows next to sensitive sites
	Spray areas close to waterbodies when the wind is blowing away from them
	Use air blast applications when wind is 3-10 mph and upwind of sensitive sites
	Use electronic controlled sprayer nozzles
	Use nozzles that provide largest effective droplet size to minimize drift

AVAILABLE SURFACE WATER QUALITY DATA

The Coalition has an extensive monitoring and reporting program which has been generating surface water quality data since 2004. All data are available on the California Environmental Data Exchange Network (CEDEN) and all data have been submitted electronically to the Regional Board on a quarterly basis.

Site monitoring history and data for sites with management plans are discussed in detail (including land use maps, table of active and removed management plan constituents, all exceedances and detections, sourcing, outreach, and evaluation of management practice effectiveness site subwatersheds that have been the focus of management plan activities) in the Site Subwatershed Water Quality Data Summaries provided in Appendix I of this report. Regional Board approval letters for management plan completion are located in Appendix II.

Table 15 includes a list of all site subwatershed management plan constituents for which the Coalition can source and the respective completion deadlines. Table 16 includes a list of all site subwatershed management plan constituents for which completion deadlines are pending given the need for further investigation (special studies, workplans, etc.).

Monitoring in the Coalition Region by Other Entities

The Coalition reviewed water quality data from SWAMP, USGS, DPR, US EPA, and CA DWR to determine if water quality data are available for waterbodies in the Coalition region. Several sources do contain surface water data, although with the exception of USGS, most of the data are available in CEDEN. The constituents for which surface water quality data are available are provided in Table 14. A summary of the data sources is provided below.

The Water Quality Portal (WQP http://www.waterqualitydata.us/ available as of 2012) is a cooperative service sponsored by the United States Geological Survey (USGS), the Environmental Protection Agency (EPA) and the National Water Quality Monitoring Council (NWQMC) that integrates publicly available water quality data from the USGS National Water Information System (NWIS) the EPA STOrage and RETrieval (STORET) Data Warehouse, and the USDA ARS Sustaining The Earth's Watersheds - Agricultural Research Database System (STEWARDS). A web service is a computer-to-computer protocol that allows for the direct sharing of information. The services provide the ability to combine data from USGS's NWIS and EPA's STORET systems. The services produce data formatted according to the Water Quality Exchange (WQX) Outbound XML schema, which has been developed collaboratively by USEPA and USGS. Applications such as internet portals can use the web services to access data from both NWIS and the STORET Warehouse without needing an authorized database connection.

The Department of Pesticide Regulation maintains a Surface Water Database containing data from a wide variety of environmental monitoring studies designed to test for the presence or absence of pesticides in California surface waters. DPR encourages submission of surface water monitoring data from any organization that conducts studies designed to monitor for the presence of pesticides in California surface water (http://www.cdpr.ca.gov/docs/emon/surfwtr/surfcont.htm).

The California Data Exchange Center (CDEC) installs, maintains, and operates an extensive hydrologic data collection network including automatic snow reporting gages for the Cooperative Snow Surveys Program and precipitation and river stage sensors for flood forecasting. CDEC includes monitoring of constituents such as pH, DO, SC, and temperature along the mainstem of the San Joaquin River. Monitoring data are provided on a real-time basis.

The Coalition reviewed these data sources but did not incorporate these data into the analysis of water quality for the Management Plan because 1) dates of monitoring were prior to the ILRP, 2) different analytical methods, 3) unknown quality assurance/quality control procedures, 3) unknown detection and reporting limits, and 4) location data that were unclear. USGS has performed a substantial amount of monitoring in the San Joaquin Valley but a majority of the monitoring locations are directly on the San Joaquin River. Some sites are located on the major tributaries and almost no data exist for any other water bodies in the Coalition region.

Table 14. Sources reviewed for water quality data. Data searches performed for Madera, Merced, and Stanislaus Counties.

These counties provide coverage for the East San Joaquin County Water Quality Coalition but also include parts of neighboring coalitions in Stanislaus and Merced Counties.

AGENCY	PROGRAM	CONSTITUENTS																																		
		OXYGEN, DISSOLVED	PH	SPECIFIC CONDUCTIVITY	TOTAL DISSOLVED SOLIDS	AMMONIA	NITRATE + NITRITE AS N	*E. COLI*	ARSENIC	COPPER TOTAL	LEAD	MOLYBDENUM	ZINC	ALDICARB	CARBARYL	CARBOFURAN	CHLORPYRIFOS	CYANAZINE	DDD (P,P')	DDE (P,P')	DDT (P,P')	DIAZINON	DIELDRIN	DIMETHOATE	DIURON	HCH, DELTA	MALATHION	METHIDATHION	METHOXYCHLOR	METHYL PARATHION	THIOBENCARB	SIMAZINE	*C. DUBIA*	*P. PROMELAS*	*S. CAPRICORNUTUM*	*H. AZTECA*
USGS[1]	NAWQA7 WQP[8]	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X				
DPR[2]	DPR CEDEN[9]																X					X		X												
ESJWQC (ILRP)[3]	CEDEN	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
EPA[4]	WQX[10] WQP CEDEN	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			
CADWR[5]	WQX WQP CEDEN	X	X																																	
SWRCB (SWAMP)[6]	SWAMP CEDEN	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

1. USGS – United States Geological Survey
2. DPR – Depart of Pesticide Regulation
3. ESJWQC (ILRP) – East San Joaquin Water Quality Coalition (Irrigated Lands Regulatory Program)
4. EPA – Environmental Protection Agency
5. CADWR – California Department of Water Resources
6. SWRCB (SWAMP) - State Water Resources Control Board (Surface Water Ambient Monitoring Program)
7. NAWQA - National Water-Quality Assessment Program
8. WQP – Water Quality Portal
9. CEDEN – California Environmental Data Exchange Network
10. WQX - Water Quality Exchange

MANAGEMENT PLAN STRATEGY

DESCRIPTION OF APPROACH

The objectives of the ESJWQC Management Plan are:

- Identification of irrigated agriculture source (general practice or specific location) that may be the cause of the water quality problem or a study design to determine the source
- Identification of management practices to be implemented to address the exceedances
- Development of a management practice implementation schedule designed to address the specific exceedances
- Development of management practice performance goals with a schedule
- Development of waste-specific monitoring schedule
- Development of a process and schedule for evaluating management practice effectiveness

The Coalition has developed an approach that involves source identification, outreach to members in management plan site subwatersheds, and monitoring of water quality to evaluate the efficacy of implemented management practices and improvements in water quality. The strategy allows the Coalition to address multiple constituents across multiple watersheds simultaneously which will facilitate compliance within the 10 year (or as soon as practicable) time period outlined in the Order. Because of limited resources and the workload involved in conducting the individual meetings with members, the Coalition will implement its strategy over the next several years (see Timetable in Table 15 below). Since 2008, the Coalition has addressed first the most severe discharges followed by watersheds with fewer exceedances. In many instances, the sources of the constituents responsible for the exceedances are not known (e.g. nitrate, copper), and the cause of exceedances of WQTLs for parameters such as DO are not well understood. For this subset of constituents, the Coalition will develop source identification work plans prior to establishing a compliance schedule, engaging in individual grower outreach, and monitoring for compliance. However, as currently conducted, outreach will continue to involve discussions of constituents for which no source is identified with certainty, but for which management practices could be effective in reducing and eliminating exceedances.

The process described above is similar although not identical to the Coalition's 2008 Management Plan strategy. Major differences include 1) the strategy proposed in the SQMP does not assign a priority level or tier to constituents that dictate the level of outreach and monitoring in site subwatersheds, 2) the strategy proposed in the SQMP involves conducting analyses of water quality data and/or source identification studies to identify the sources/processes driving the exceedances, and 3) the compliance schedule address all exceedances in as short a time as practicable but prior to the 10 year deadline required by the Order. The 2008 Management Plan process has been successful in eliminating exceedances of WQTLs of numerous agricultural chemicals and toxicity that is caused by discharges from irrigated agriculture. The proposed SQMP program eliminates two elements from the current program that resulted in addressing water quality problems over a long period of time or not addressing some water quality problems at all. Under the proposed SQMP, constituents or measured parameters for which no source has been identified will be the focus of further analyses and if appropriate, the development of work plans that propose source identification studies.

Because of the similarity of the 2008 Management Plan and proposed SQMP strategies, the 2008 program is described briefly and the proposed SQMP is discussed in more detail.

Management Plan Strategy 2008 - 2014

In 2008, the Coalition developed a prioritization process that allowed the Coalition to focus on constituents of greatest concern in management plans. That process is outlined in Figure 3 of the 2008 Management Plan and involves both tiers and priority levels. The priority level determines the amount of effort expended by the Coalition to source the cause of the exceedance, the outreach involved to encourage members to implement management practices, and the amount of monitoring involved in evaluating water quality after outreach. The tiering approach was not followed after the first few years of the management plan because of 1) the success of outreach and improvements in water quality, and 2) Coalition focus on constituents for which sources could be identified. This focus resulted in assigning the highest priority to constituents such as pesticides that were applied by agriculture regardless of the priority level determined by Figure 3 of the 2008 Management Plan.

Following the flowchart in Figure 3 of the 2008 Management Plan, a priority level was assigned to a constituent in a site subwatershed based on a series of questions about sourcing and managing such as whether or not the analyte was an applied pesticide, metal or nutrient. Assessing whether the analyte was found in association with sediment toxicity (i.e. total metals that may be bound to sediment) addressed erosion and sediment transport. If an exceedance of a TMDL constituent occurred, a management plan was required for that constituent and site subwatershed. The prioritization process resulted in a constituent being assigned to Priority Level A through Priority Level E.

Priority A/B constituents were applied metals, nutrients, and pesticides for which there are Total Maximum Daily Loads (TMDLs) established and/or associated toxicity. If at the time of an exceedance of the WQTL for a pesticide or metal there was also toxicity in the sample, then this constituent at this site subwatershed would become a priority A/B (Figure 3 of the 2008 Management Plan). Priority C constituents were applied pesticides or metals that had associated toxicity but for which there was no TMDL. For example, diuron was a priority C constituent if there are multiple exceedances in a specific site subwatershed at least one of which was associated with toxicity to *S. capricornutum*. As originally planned, priority C constituents had actions for sourcing, outreach and evaluation of management practices identical to priority A constituents but differed from priority A constituents in that there were to be no individual contacts for priority C constituents in Tier 2. However, because the Coalition could identify potential sources of priority C pesticides and metals, these were treated as priority A constituents and individual contacts were made to discuss management practices and determine if additional practices could be implemented by members.

Priority D constituents included applied pesticides and metals that caused exceedances of their respective WQTLs, but for which there are no TMDLs and which were not associated with water column or sediment toxicity. Priority E constituents include many of the physical parameters including total dissolved solids (TDS), specific conductance (SC), pH, dissolved oxygen (DO), temperature and any other constituent that is not an applied pesticide or metal. Source identification for these constituents is extremely difficult and can require expensive and sophisticated analytical tools. Water column toxicity at a site subwatershed where no priority A, B, or C constituent exceedances occurred was also be classified as priority E. Because management practices can be extremely expensive to put into place (e.g. pressurized irrigation), it is difficult to recommend that a member implement such a practice without good evidence that they could be responsible for the chemical in the water. During grower outreach meetings, priority E exceedances were addressed although no meetings were held specifically for these constituents.

Because of the large number of water quality problems that faced the Coalition in 2008, the prioritization process allowed the Coalition to schedule source identification, outreach, and monitoring activities in a phased approach that was scheduled to take place from 2008 to 2024. Each year, a group of three or four site subwatersheds was elevated to high priority status which means that source identification, focused outreach, and monitoring activities would occur. The first site subwatersheds to be elevated to high priority status were determined to have the most significant problems and the site subwatersheds scheduled for activities at the end of the period were determined to have the fewest problems. It should also be noted that as the Coalition's monitoring program expanded to include additional site subwatersheds, exceedances of various WQTLs occurred in these watersheds. Not all exceedances occurred at the same time, not all management plans were triggered at the same time, and the dates assigned to completion of management plan activities generally were in compliance with a 10 year time period. This phased approach allowed the Coalition to eventually remove 39 constituents from management plans and leaves very few site subwatersheds that must be elevated to high priority status.

2014 SQMP Strategy

As part of its regular monitoring and reporting program under the WDR, the Coalition conducts monitoring of ambient surface waters to characterize discharges from irrigated agriculture. The Coalition notifies the Regional Board of all exceedances with electronically submitted Exceedance Reports. Monitoring results are analyzed to identify constituents, agricultural lands, crops, and/or specific pesticides that need to be managed differently to reduce or eliminate discharges from agriculture to surface water. Actions taken to determine the potential sources of chemicals causing exceedances include 1) the use of PUR data to identify applications that occurred upstream of the sample site and within a specified time period prior to the sampling event, and 2) an analysis of monitoring data and toxicity results to better understand the potential sources and toxicity of detected constituents.

The Coalition also notifies members of exceedances and works with those growers to address water quality impairments. Monitoring results are disseminated to Coalition members via grower mailings, at grower outreach meetings, and by personal communication with growers. All documents associated with outreach are available in the Annual Monitoring Report each year and from the Coalition upon request. In fact, all large meetings are open to the public although meetings with individuals are not open. The Coalition encourages growers to be cognizant of water quality concerns and, when applicable, to implement management practices designed to improve water quality. Grower notification, management practice outreach and education, and management practice implementation and tracking are all additional actions taken by the Coalition to ensure that growers are aware of and take actions to address downstream water and sediment quality concerns.

Moving forward, the level of effort and the timing involved in source identification, outreach, and monitoring will be determined by the ability of the Coalition to identify the source(s) of the exceedances (e.g. member applications of pesticides or unknown sources of *E. coli* in surface waters) and recommend management practices to prevent discharges. All constituents scheduled for elevation to high priority status in the upcoming years under the previous management plan, will be elevated to active status by the 2017 WY (Table 16). This means the source identification will take place and members who are potential sources will be identified, the Farm Evaluation Plans will be reviewed for management actions, individual contacts will be made, recommendations for additional management practices will be made if appropriate, and MPM will occur. For any exceedances of WQTLs for pesticides that occur in the future, the Coalition will begin sourcing, outreach, and monitoring activities within 3 years from the need to develop a management plan. This ensures that the management plan process is complete within 5 years with the exception of the monitoring to evaluate compliance.

The Coalition is proposing to develop work plans to determine the sources of constituents or measured parameters that can't be easily sourced (e.g. *E. coli* and DO) or that have several potential non-agricultural sources (e.g. metals such as copper) (see below). In other instances, the Coalition will address constituents when other processes in the San Joaquin Valley are concluded (e.g. SC and the Lower San Joaquin River Basin Plan Amendment process and CV SALTS development of a Salt and Nitrogen Management Plan process). However, the Coalition recognizes the importance of meeting the 10 year compliance schedule as outlined in the Order. Consequently, the Coalition is proposing a process that guarantees that all constituents with known causes/sources that cause impairments of beneficial uses are addressed as soon as practicable but within the 10 year compliance time limit.

ACTIONS TO MEET GOALS AND OBJECTIVES

Compliance

Compliance will be determined in two ways 1) achieving completion of the performance goals and performance measures, and 2) monitoring to determine if discharges have been eliminated and water quality is improving.

Achieving Performance Goals and Performance Measures

Achieving completion of performance goals and performance measures involves determining which management practices are in place, and tracking recommended and implemented practices, and determining the effectiveness of the implemented practices.

One of the most difficult actions facing the Coalition is evaluating the effectiveness of management practices and outreach to growers. During the first year of Management Plan implementation the Coalition will conduct monitoring as outlined in the MPU to assess the impact of Coalition outreach. It is the goal of the Coalition that through county and subwatershed meetings and crop-specific direct mailings, Coalition efforts will have eliminated exceedances.

The individual Site Subwatershed Management Plans (Appendix I) for subwatersheds will evaluate the sources of exceedances and use that information to encourage adoption of management practices within the area that has the highest potential of eliminating exceedances. Details on how to select and implement the proper management practices will be discussed at grower group meetings and during individual contacts.

Monitoring Water Quality

The Coalition will maintain its monitoring network of Core and Represented sites, and will perform MPM at sites that are the focus of SQMP activities. The demonstration of compliance with the WDR will be monitoring results that do not have exceedances of WQTLs for management plan constituents. In site subwatersheds with sources of constituents other than irrigated agriculture, e.g. dairy operations, exceedances may continue even though management practices have been implemented by Coalition members. In this case, compliance may not rely on water quality data but will depend instead on documentation of implemented management practices by members that have the ability to discharge management plan constituents to surface waters.

Outreach – Education of Members

Once the potential sources are exceedances are identified, outreach is initiated to inform members of the exceedances and eventually meet with members to discuss implementation of management practices that will eliminate the exceedances. Outreach to Coalition members can take any of four forms; 1) large meetings at the county level that are attended by members, 2) meetings held within a smaller geographic area such as a single site subwatershed, or region where geography or farming practices can lead to exceedances, 3) meetings held with specific grower groups such as all members that grow a single commodity such as alfalfa or almonds, and 4) meetings with individual growers at their farming operation during which they review their management practices. Although the Coalition conducts large county-level and regional meetings, the largest outreach effort involves individual contacts and visits to the member's farming operation. Further discussion of outreach is provided below in the Identification, Validation, and Implementation of Management Practices section.

Identification, Validation, and Implementation of Management Practices

The Coalition will use information submitted to the Coalition through the member submissions required by the Order to understand current management practices implemented within the site subwatersheds and to evaluate changes in practices over time. The Coalition will use three types of surveys: Farm Evaluation Plans (FEP), Nutrient Management Plans (NMP), and Sediment and Erosion Control Plans (SECP). The FEP has been mailed to all members within the subwatershed area. Returned surveys have been entered into an Access database and are being linked to member information. The Coalition is currently compiling all returned surveys. A brief description of the FEP is provided below. The NMP and SECP are still under development and will not be available until mid to late 2014.

Review of FEP responses will be done prior to scheduling visits with individual growers. During visits, Coalition representatives will review FEP responses, determine whether management practices are being implemented correctly, and recommend additional practices as appropriate. Table 19 describes management practice identification, evaluation and outreach.

Table 15. Schedule for addressing each site subwatershed with a detailed, focused Management Plan approach.

Site Subwatershed Name	Initial Management Plan Activities[1]	10 Year Compliance Deadline[2]	Source is non-ag entity for one of more constituents (yes or no)
Dry Creek @ Wellsford Rd	2008-2010	2019	YES
Duck Slough @ Hwy 99	2008-2010	NA	NA
Prairie Flower Drain @ Crows Landing Rd	2008-2010	2022	YES
Bear Creek @ Kibby Rd	2010-2012	Pending Workplan[3]	YES
Cottonwood Creek @ Rd 20	2010-2012	Pending Workplan[3]	YES
Duck Slough @ Gurr Rd	2010-2012	2017	YES
Highline Canal @ Hwy 99	2010-2012	2019	YES
Berenda Slough along Ave 18 1/2	2011-2013	2017	YES
Dry Creek @ Rd 18	2011-2013	2019	YES
Lateral 2 ½ near Keyes Rd	2011-2013	2020	YES
Livingston Drain @ Robin Ave	2011-2013	2019	YES
Black Rascal Creek @ Yosemite Rd	2012-2014	2018	YES
Deadman Creek @ Hwy 59	2012-2014	2017	YES
Deadman Creek @ Gurr Rd	2012-2014	2020	YES
Hilmar Drain @ Central Ave	2012-2014	2019	YES
Hatch Drain @ Tuolumne Rd	2013-2015	2019	YES
Highline Canal @ Lombardy Rd	2013-2015	2017	YES
Merced River @ Santa Fe	2013-2015	2018	YES
Miles Creek @ Reilly Rd	2013-2015	2024	YES
Ash Slough @ Ave 21	2014-2016	Pending Workplan[3]	NO
Mustang Creek @ East Ave	2014-2016	2018	YES
Westport Drain @ Vivian Rd	2014-2016	2019	YES
Mootz Drain downstream of Langworth Pond	2015-2017	2022	YES
Howard Lateral @ Hwy 140	2015-2017	2022	YES
Levee Drain @ Carpenter Rd	2015-2017	2024	YES
McCoy Lateral @ Hwy 140	2016-2018	Pending Workplan[3]	YES
Rodden Creek @ Rodden Rd	2016-2018	Pending Workplan[3]	YES
Unnamed Drain @ Hwy 140	2016-2018	Pending Workplan[3]	YES

[1] - First date is year source identification and outreach was initiated. All constituents that can be sourced will be the focus of the SQMP activities regardless of 10 year compliance horizon. If additional exceedances occur immediate sourcing and outreach will take place for additional or current management plan constituents.
[2] – Date is the ten year compliance deadline for the most recent exceedance/constituent places in a management plan.
[3] – All constituents in a management plan are pending work plans for source identification.
NA – Site removed. All management plan constituents are addressed under Duck Slough @ Gurr Rd management plan.

Table 16. Management plan compliance timetables for constituents with irrigated agricultural as the known source in the watershed.

		Site Subwatershed Name																										
Year	Constituent	Ash Slough @ Ave 21	Bear Creek @ Kibby Rd	Berenda Slough along Ave 18 1/2	Black Rascal Creek @ Yosemite Rd	Cottonwood Creek @ Rd 20	Deadman Creek @ Gurr Rd	Deadman Creek @ Hwy 59	Dry Creek @ Rd 18	Dry Creek @ Wellsford Rd	Duck Slough @ Gurr Rd	Hatch Drain @ Tuolumne Rd	Highline Canal @ Hwy 99	Highline Canal @ Lombardy Rd	Hilmar Drain @ Central Ave	Howard Lateral @ Hwy 140	Lateral 2 1/2 near Keyes Rd	Levee Drain @ Carpenter Rd	Livingston Drain @ Robin Ave.	McCoy Lateral @ Hwy 140	Merced River @ Santa Fe	Miles Creek @ Reilly Rd	Mootz Drain downstream of Langworth Pond	Mustang Creek @ East Ave	Prairie Flower Drain @ Crows Landing Rd	Rodden Creek @ Rodden Rd	Unnamed Drain @ Hwy 140	Westport Drain @ Vivian Rd
2015	*C. dubia* water column toxicity																				X							
2016	Chlorpyrifos									X																		
	H. azteca sediment toxicity										X																	
	P. promelas water column toxicity																								X			
2017	*C. dubia* water column toxicity									X	X		X															
	Chlorpyrifos			X	X		X	X	X																			
	H. azteca sediment toxicity												X	X											X			
	S. capricornutum water column toxicity													X														
2018	*C. dubia* water column toxicity				X																				X			
	Chlorpyrifos																		X		X	X						X
	Diuron														X													
	H. azteca sediment toxicity											X																
	P. promelas water column toxicity						X																					
	S. capricornutum water column toxicity											X			X													
2019	*C. dubia* water column toxicity																					X						
	Diuron								X																			
	H. azteca sediment toxicity								X	X					X							X						
	S. capricornutum water column toxicity						X		X			x	X						X			X			X			X
2020	*C. dubia* water column toxicity						X																					
	Chlorpyrifos																X						X					
2021	Chlorpyrifos															X												
	Diuron																						X					
2022	Dimethoate																								X			
2024	*C. dubia* water column toxicity																	X										
	Diazinon																					X						

Table 17. Management plan compliance timetables for constituents requiring source identification studies or workplans.

Constituent	Ash Slough @ Ave 21	Bear Creek @ Kibby Rd	Berenda Slough along Ave 18 1/2	Black Rascal Creek @ Yosemite Rd	Cottonwood Creek @ Rd 20	Deadman Creek @ Gurr Rd	Deadman Creek @ Hwy 59	Dry Creek @ Rd 18	Dry Creek @ Wellsford Rd	Duck Slough @ Gurr Rd	Hatch Drain @ Tuolumne Rd	Highline Canal @ Hwy 99	Highline Canal @ Lombardy Rd	Hilmar Drain @ Central Ave	Howard Lateral @ Hwy 140	Lateral 2 1/2 near Keyes Rd	Levee Drain @ Carpenter Rd	Livingston Drain @ Robin Ave.	McCoy Lateral @ Hwy 140	Merced River @ Santa Fe	Miles Creek @ Reilly Rd	Mootz Drain downstream of Langworth Pond	Mustang Creek @ East Ave	Prairie Flower Drain @ Crows Landing Rd	Rodden Creek @ Rodden Rd	Unnamed Drain @ Hwy 140	Westport Drain @ Vivian Rd
DO						X																					
E. coli						X																					
DO					X				X															X			
E. coli		X			X				X	X				X										X			
pH									X				X														
SC														X										X			
TDS														X										X			
Copper	X				X			X		X																	
DO			X	X			X			X				X									X				
E. coli				X				X					X										X				
Lead								X				X	X														
Nitrate														X										X			
pH														X													
Ammonia														X													
Arsenic						X					X																
Copper												X	X	X				X			X						
DDE																							X				
DO											X																
E. coli			X				X				X	X									X						X
Lead										X																	
Nitrate											X																X
pH		X						X		X		X						X									
SC											X												X				X
TDS											X												X				X
Ammonia																								X			
Arsenic							X																				
DO								X													X						X
E. coli																		X									
Lead				X	X															X	X						
pH				X												X											
SC						X																					

Constituent	Ash Slough @ Ave 21	Bear Creek @ Kibby Rd	Berenda Slough along Ave 18 1/2	Black Rascal Creek @ Yosemite Rd	Cottonwood Creek @ Rd 20	Deadman Creek @ Gurr Rd	Deadman Creek @ Hwy 59	Dry Creek @ Rd 18	Dry Creek @ Wellsford Rd	Duck Slough @ Gurr Rd	Hatch Drain @ Tuolumne Rd	Highline Canal @ Hwy 99	Highline Canal @ Lombardy Rd	Hilmar Drain @ Central Ave	Howard Lateral @ Hwy 140	Lateral 2 1/2 near Keyes Rd	Levee Drain @ Carpenter Rd	Livingston Drain @ Robin Ave.	McCoy Lateral @ Hwy 140	Merced River @ Santa Fe	Miles Creek @ Reilly Rd	Mootz Drain downstream of Langworth Pond	Mustang Creek @ East Ave	Prairie Flower Drain @ Crows Landing Rd	Rodden Creek @ Rodden Rd	Unnamed Drain @ Hwy 140	Westport Drain @ Vivian Rd
TDS						X																					
Ammonia						X																					
Copper																							X				
DO																						X					
E. coli															X							X					
Nitrate																							X				
pH															X												
SC															X												
TDS															X												
Ammonia																						X					
Copper															X												
E. coli																				X							
Copper			X																X								
E. coli																									X		
Molybdenum																								X			
pH							X												X								
TDS									X																		
Ammonia																	X										
Copper																											
DO																	X										
E. coli																	X										
Nitrate																	X										
pH						X																					
SC																	X										
TDS																	X										
DO																				X						X	
E. coli																										X	
pH																										X	
SC										X																	
TDS																				X	X						

Table 18. Timetable for addressing constituents requiring source identification studies and workplans.

Constituent	Preliminary Analysis done after SQMP Approval	Workplan submission date
E. Coli	None	120 days after SQMP approval
SC (TDS)	None	Pending CV-SALTS
DO	90 days	TBD
pH	90 days	TBD
Arsenic	120 days	TBD
Copper	120 days	TBD
Molybdenum	120 days	TBD
Ammonia	150 days	Pending CV-SALTS
Nitrates	150 days	Pending CV-SALTS
Lead	180 days	TBD

Table 19. Management Plan source identification, outreach and evaluation schedule.

Action	Description	When
Sourcing		
Review PUR data	Request pesticide use information from County Agricultural Commissioners to identify specific problem applications.	Requests with Ag Commissioners to receive data as soon as possible.
Conduct Special Studies	Special studies will occur when additional information about potential sources needs to be obtained beyond the additional monitoring.	Will be specific to the situation.
Outreach		
County grower meetings and site subwatershed grower meetings	Hold meetings for growers in the subwatershed to discuss management practices that can be used to eliminate exceedances and to encourage implementation of new management practices. Provide general outreach including quarterly monitoring results to growers, landowners and/or stakeholders to inform them about water quality impairments.	Between each season (storm and irrigation).
Grower group meetings	Provide information and outreach materials about management practices that could be used by growers to reduce the impact of agriculture on water quality specific to a group of growers (i.e. walnut or alfalfa growers).	Between each season (storm and irrigation) and as needed.
Individual contacts	Conduct individual interviews with growers, landowners and/or stakeholders to discuss water quality impairments, current management practices, and recommended management practices to improve water quality.	Winter (November to February).
Evaluation		
Meeting participation and documentation of member actions	Assess effectiveness of Coalition meetings by tracking attendance, documenting management practice implementation and monitoring water quality. Document where and when management practices have been implemented in order to track effects on water quality at relevant monitoring sites through individual grower meetings.	Annually in Management Plan Progress Report.
Normal monitoring	Monitoring at Core and Represented sites as described in the MPU (updated annually).	Once a month, every month of the year depending on site schedules.
Additional monitoring (for compliance)	Monitoring for management plan constituents that can be sourced will occur to evaluate effectiveness of management practice implementation.	As specified in the SQMP and MPU.

DUTIES AND RESPONSIBILITIES

The responsible parties are provided in organizational chart provided below (Figure 16).

ESJWQC policy is determined by a Board of Directors. The ESJWQC Board of Directors (BOD) also oversees all Coalition business. The BOD meets monthly to set ESJWQC policy and provide oversight on financial matters. Policy and business oversight includes setting the yearly fee charged to members to support Coalition activities, review (if desired) and approval of report submissions to the Regional Board, approval of expenditures by the Coalition, and negotiating consultant contracts and rates. The BOD works closely with the Executive Director to ensure smooth management of Coalition activities.

Parry Klassen is the Executive Director of the ESJWQC and the project lead for management plan activities. Mr. Klassen is responsible for implementing policy as directed by the Board of Directors including budgeting and financial management, management of the Coalition's membership, member outreach, oversight of consultant contracts, and management of consultant work products. Mr. Klassen works closely with the technical consultants contracted by the Coalition to guarantee completions of reports submitted to the Regional Water Board. Mr. Klassen is responsible for the execution and completion of the Management Plan.

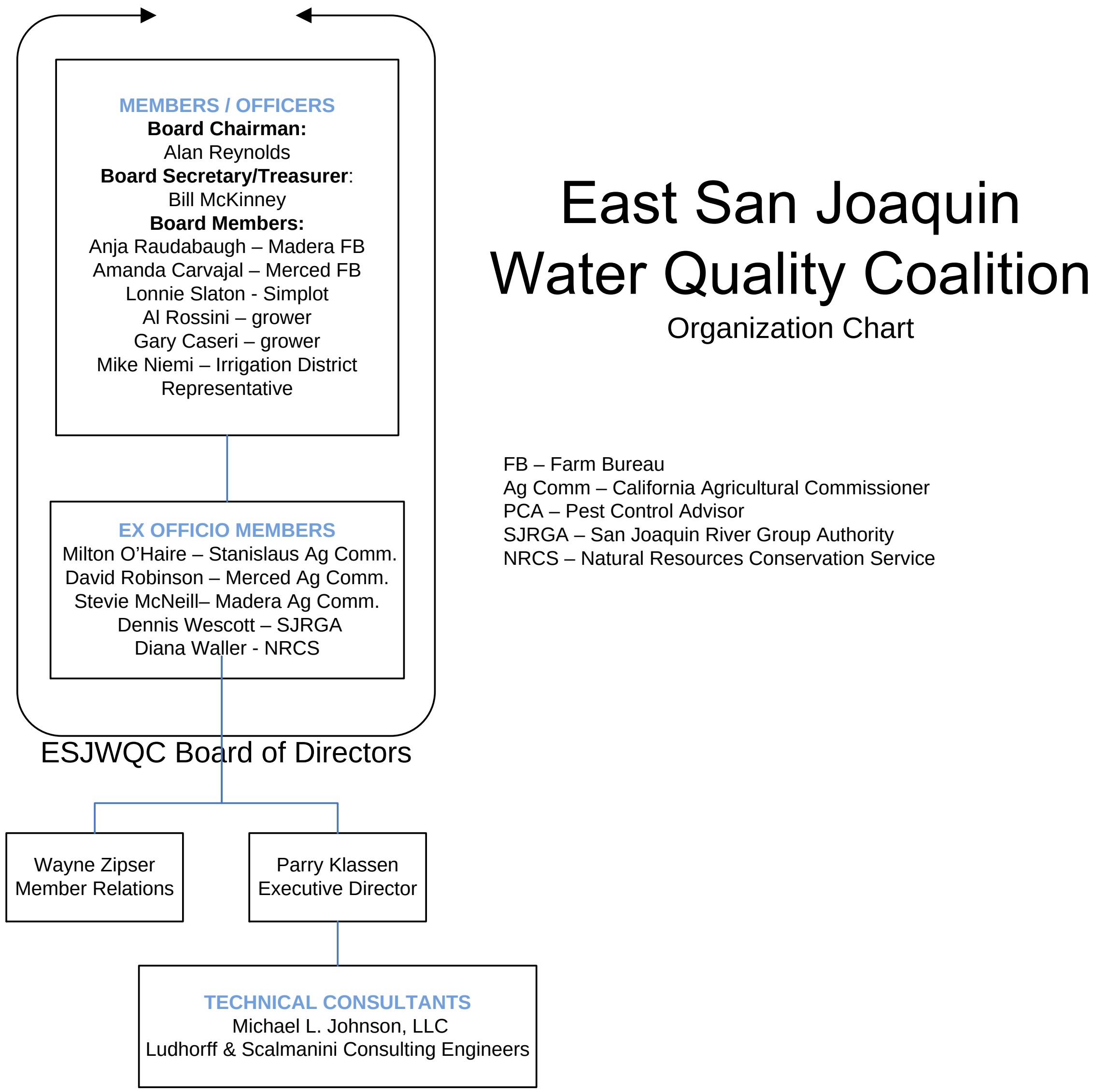
Wayne Zipser is the Coalition Manager of Member Relations. Mr. Zipser is the lead for stakeholder involvement and is responsible for outreach to members, primarily in individual meetings with growers in management plan site subwatersheds. Mr. Zipser also participates in a majority of the larger meetings held with growers such as the yearly meetings. Mr. Zipser is a grower with a long history in the Coalition region and is also the Executive Director of the Stanislaus County Farm Bureau. Coalition members respect his advice and counsel as evidenced by the improvement in water quality in site subwatersheds in which Mr. Zipser has met with individual members to discuss management practices.

Technical consultants are contracted by the Coalition as needed to complete tasks and activities required by the Regional Water Board. Currently, the technical consultants to the ESJWQC are Michael L. Johnson, LLC and Luhdorff and Scalmanini Consulting Engineers (LSCE). MLJ-LLC is responsible for conducting the surface water monitoring and reporting program, and LSCE is providing technical support for groundwater issues. The Coalition enters into additional contracts with consultants as needed.

Dr. Michael Johnson (MLJ-LLC) is the Sample Collection Lead. He is responsible for the design and implementation of the surface water monitoring program. Dr. Johnson supervises all reporting and is responsible for technical aspects of the monitoring and reporting program.

Ms. Melissa Turner (MLJ-LLC) is the Data Manager and the Quality Assurance Officer for Management Plan activities. Ms. Turner is responsible for developing and updating the QAPP, and providing oversight of all quality assurance actions associated with the Coalition's monitoring program. Ms. Turner works with the contract laboratories to assure the highest quality data are provided to the Coalition. Ms. Turner is also responsible for receiving and accepting all monitoring, management practice, and pesticide use data used in management plan activities.

Figure 16. Identification key of responsible parties involved in major aspects of the project.



Coalition Contact Information
Parry Klassen
Executive Director
East San Joaquin Water Quality Coalition
559-646-2224
559-288-8125 (cell)
pklassen@unwiredbb.com

STRATEGIES TO IMPLEMENT MANAGEMENT PLAN TASKS

Agencies Contacted for Data and/or Assistance

The Coalition utilizes data from DPR to assist with sources of applied pesticides and toxicities that occur due to applied pesticides. The Coalition works with the different County Agricultural Commissioner offices to get preliminary data approximately every quarter. These data are reviewed, analyzed and summarized in the Annual Report which includes the Management Plan Progress Report.

The Coalition does receive input from Diana Waller from NRCS in Modesto who is an *ex officio* member of the Board of Directors. Information regarding county wide NRCS assistance to growers to implement new management practices is summarized in the Management Plan Progress Report. The Coalition encourages members to apply for NRCS funds to implement structural BMPs and obtain cost-share funds.

In addition, several Coalitions are working with the California Department of Food and Agriculture to develop a nitrogen management curriculum that will allow members who successfully complete the course and certify their Nitrogen Management Plans. The Coalition may contact any public agency or private consultant to guarantee successful completion of management plan activities and assist with sourcing of management plan constituents, outreach to growers regarding water quality issues and solutions and evaluation of additional management practices.

Management Practices to Control COCs

As discussed above, technically feasible, economically feasible, and management practices that are effective in eliminating discharge from farming operations have been developed by groups such as NRCS and UC Cooperative Extension. The Coalition uses the information provided by these agencies when making recommendations to growers about how to eliminate discharges from their farming operation. These practices have been recommended by Coalition representatives over the last several years and have proven to be effective in eliminating discharge and improving water quality. The practices range from reducing the amount of pesticide applied to installation of pressurized irrigation systems which have a range of efficacy and cost to the member. Some of the management practices are not technically feasible on some crops, e.g. drip irrigation in alfalfa. Some practices may be technically feasible but for some members, the practices may be at the edge of economic feasibility, e.g. installation of subsurface drip irrigation on tomatoes. For these members, the Coalition provides information about programs that provide a cost share of the purchase and installation improving the affordability of these systems. But, visits with individual members at their farming operation allow the Coalition to discuss technical and economic feasibility, understand the unique conditions associated with each ranch, and tailor their recommendations to each grower on their own ranch (Table 13).

Outreach Methods

As indicated above, outreach provided by the Coalition to its members and other stakeholders in the region range from large annual meetings held in each county to visits with individual members.

Larger meetings

Large meetings at the county level are typically the annual meetings but additional large meetings can be called at any time during the year if circumstances warrant. At these meetings, the Coalition discusses the water quality results for the year, new management plans that are necessary, constituents that have been removed from management plans due to the success of the grower's management practices, additional management practices that are effective in reducing the discharge of constituents such as pesticides and nutrients, and any changes in requirements due to updates of the requirements from the Regional Board.

Meetings within a smaller geographic area are held infrequently, usually in response to water quality problems that cannot be traced to one or a few members, e.g. discharge of sediment. These meetings are arranged as needed and can involve the participation of individuals with specialized training, e.g. NRCS or UC Extension personnel. If the Coalition determines that meeting with a subgroup of members in a site subwatershed can be effective, the Coalition can organize a meeting with members who grow a specific crop such as alfalfa where commodity-specific management practices are discussed. The primary method of outreach when it is clear that pesticides are causing exceedances and the applications can be identified is meetings with individual growers.

Other entities within the Coalition region hold meetings in which Coalition activities are discussed as well as water quality results and management practices. Meetings are conducted by the County Agricultural Commissioner to satisfy education requirements involved in receiving a pesticide application permit. Although not the focus of these meetings, water quality and management practices are discussed specifically with respect to pesticides and pesticide applications.

Outside of a formal meeting setting, the Coalition provides information to growers throughout the year through mailings, emails, workshops, and newsletters. Through these media the Coalition presents information to members concerning the Coalition's progress in achieving water quality goals, site subwatershed specific monitoring results and management practices proven to be effective to reduce the discharge of pesticides to waterbodies. The All outreach and education activities are reported in the ESJWQC Annual Report submitted by May 1 of each year.

The Coalition also hosts a website (http://www.esjcoalition.org/home.asp), which serves as a clearing house for Coalition activities and outreach on management practices. Information provided through the website is utilized as a supplement to regular grower contacts and meetings.

Pest Control Advisors, Agricultural Commissioners, and Registrants

Agricultural Commissioners from the various counties are active participants as non-voting members of the ESJWQC Board of Directors. The Coalition collaborates with County Agricultural Commissioners, Pest Control Advisors (PCAs), and pesticide registrants to provide growers within the ESJWQC region with information on effective management practices. Throughout 2013, the Coalition collaborated with each of these entities as needed to follow-up on exceedances, provide management practice information and prepare strategies for compliance under the WDR.

Individual meetings

In the past as preparation for visits with individual members, the Coalition prepared a package of material for members that included the water quality results for the site subwatershed in which they drain, information about the exceedance(s) downstream of the member, and maps of their operation. The member was contacted and a visit by Coalition representative was arranged. The Coalition representative visited the farming operation, requested that the member complete a survey of their practices, reviewed the management practices in place, and recommended additional implementation if it was determined that the additional practices could result in improvements in water quality.

The Coalition will use the exact same process for outreach under the SQMP with the exception that the Coalition will no longer request that the member complete a survey of their farm management practices. Completed Farm Evaluation Plans from members across the Coalition region will be available by May 1, 2014, and within a year almost all members will complete Nutrient Management Plans and if appropriate, Sediment and Erosion Control Plans. These plans are required by the Order and address all management practices that were included in the surveys previously used by the Coalition to evaluate member operations. If additional information on management practices is needed, the Coalition representative will request the information when the member visit occurs.

In the future, the targeted member’s Farm Evaluation Plan will be reviewed for the practices that are in place. The member will be contacted and a visit scheduled. During the visit, the Coalition representative will review with the member the practices listed on the Farm Evaluation Plan, determine if they are being implemented appropriately, and recommend additional practices if appropriate. If the recommended practices involve the investment of substantial financial resources, the Coalition representative will direct the grower to potential sources of funding such as EQIP, AWEP, or special funds available through grant programs. The Coalition does not work with the grower to complete applications for funding from these sources. The year following the initial visit, the next year’s Farm Evaluation Plan is reviewed to determine if recommended practices were implemented. If practices were not implemented, the member will be contacted to determine the reasons for the delay.

After the Nutrient Management Plans are completed by members, they also will be used to assess compliance. Members are not required to submit NMPs to the Coalition but must keep a copy of the completed plan at the headquarters of their farming operation. For those locations in which nitrate is a surface water issue, members will be contacted and asked to produce a copy of their NMP for review by the Coalition representative at the time of the visit. In site subwatersheds in which sediment-bound chemicals are causing sediment toxicity, members will be asked to complete a Sediment and Erosion Control Plan and have that available for the Coalition representative at the time of the visit. The Coalition representative will review the plans during the visit and make recommendations about additional management practices.

The Coalition conducts individual meetings with Coalition members only, and the meetings are not open to the public. In many instances, the source identification analysis indicates that the most likely or only source of a chemical causing impairment of a beneficial use is a nonmember. When this occurs, the Coalition reports that the exceedance was tracked to a non-member but conducts no additional analyses or outreach.

Specific Schedule and Milestones for Implementing Management Practices

There are schedules and milestones involved in 1) scheduling individual site subwatersheds and constituents for implementing the management plan, i.e. which watersheds and constituents are the focus of source identification, outreach, and monitoring and when, 2) developing preliminary analyses to identify the potential causes of exceedances of the WQTLs for DO and pH, and 3) developing work plans to identify sources of constituents such as E. coli and nitrate. Completing each of these tasks determines when constituents and site subwatersheds are elevated to active status where watershed-specific source identification, outreach, and monitoring occur. The schedules for these tasks are provided in Tables 15-19.

Once the sites and constituents become the focus of management plan activities, implementation of management practices to eliminate discharges is expected to occur in the year immediately after the initial individual meeting with the member. Determining whether the management practices were implemented occurs in the year following the meeting and is performed using the information on the FEP submitted by the member. If it is unclear if the member has implemented the practice(s) or the member states that the practice was not implemented, the member is contacted by the Coalition with a request for an explanation for the delay. For recommended structural practices that are costly to put in place, it may require more than a year to obtain funding and implementation may take additional time. In these instances, growers are provided with alternative management practices that can reduce or eliminate the exceedances (e.g. change to an alternative product) until the structural practice (e.g. installing pressurized irrigation) can be put in place. While the alternative practices may not be preferred by the member due to lower efficacy or higher cost, members are expected to take the necessary steps to eliminate exceedances in both the short and long term.

Performance Goals and Performance Measures

The Coalition's Performance Goals are built on actions essential to successful completion of the Management Plan strategy. The Performance Goals reflect the steps necessary to guarantee that the objectives of the Management Plan program are met and that water quality improves in the ESJWQC region. The Performance Goals are:

1. Identify members with the potential to discharge to surface waters causing exceedances of WQTLs of constituents identified in the Order
2. Review the member's Farm Evaluation Plan from year prior to initiation of Management Plan activities (focused outreach and monitoring) to determine number/type of management practices currently in place, and determine if additional practices are necessary

3. Hold grower group meetings/individual meetings to inform members of water quality problems and recommend additional practices as necessary
4. Review the member's Farm Evaluation Plan from year following initiation of Management Plan activities to document number/type of new management practices implemented
5. Evaluate effectiveness of new management practices using water quality data

These five goals reflect the current ESJWQC management plan process and successful completion will incorporate information generated by the Farm Evaluation Plan, the Nutrient Management Plan, and the Sediment and Erosion Control Plan. A description of the process used for each goal is provided below.

Performance Goal 1. Identify members with the potential to discharge to surface waters causing exceedances of WQTLs of constituents identified in the Order.

Performance Measures

1.1 Perform source analysis, when possible, of constituents causing exceedances of WQTLs.
1.2 Identify 100% of all members that had the potential to discharge agricultural wastes to surface waters causing exceedances of WQTLs.

When there is an exceedance of a WQTL of a chemical constituent applied by irrigated agriculture (i.e. pesticide) or a sample that is toxic to one of the three species used in the toxicity testing, the Coalition attempts to find the source(s) of the discharge. Once the source(s) are identified, the Coalition can move forward with focused outreach to the members. Members are identified as being a potential source of an exceedance based on one or more factors including 1) use of the chemical causing the exceedance, 2) ability of the parcel to drain to surface water, and 3) use of pesticide in the past when exceedances occurred. For more details, see Data Evaluation section below.

Performance Goal 2. Review the member's Farm Evaluation Plan (or Nutrient Management Plan, or Sediment and Erosion Control Plan) from year prior to initiation of Management Plan activities (focused outreach and monitoring) to determine number/type of management practices currently in place, and determine if additional practices are necessary.

Performance Measures

2.1 From 100% of targeted members, review FEP (or NMP or SECP as appropriate) to determine management practices currently implemented.
2.2 Identify management practices used by members that are effective in preventing discharges to surface water.
2.3 Identify management practices not currently used by members that can be recommended to prevent discharges to surface water.

The Farm Evaluation Plan (FEP), Nitrogen Management Plan (NMP), and sediment Erosion Control Plan (SECP) are completed by all members in high vulnerability regions. These three management plans provide a record of the practices each member has in place for managing discharges to surface and groundwater. All members will complete the FEP and the NMP if they are in a high vulnerability surface or groundwater region. Members that self-identify or members identified by the Coalition as having the potential for erosion and discharge of sediment will complete a SECP and maintain the plan at their base of operations for their ranch. The Coalition will review these submissions to determine what practices are in place on member farming operations in management plan site subwatersheds.

Performance Goal 3. Hold meetings as necessary to inform members of water quality problems and recommend additional practices.

Performance Measures

3.1 Provided monitoring results at meetings with members and recommend practices that can be used to eliminate exceedances.

3.2 When available and appropriate, provide information on the results of the management practices studies.

3.3 Track attendance at meetings attended by the targeted members.

The Coalition holds several different types of meetings each year. Large annual meetings and regional meetings to discuss water quality problems and provide information on management practices do not focus on individual site subwatersheds in management plans. The Coalition does hold, and will continue to hold, meetings with single growers on their farming operations to review information generated by FEPs, NMPs, and SECPs. At these meetings, if additional management practices are necessary to prevent discharges, Coalition representatives will recommend that the member implement the practices.

Performance Goal 4. Review the member's FEP (or NMP or SECP) from the year following initiation of Management Plan activities to document number/type of new management practices implemented.

Performance Measures

4.1 If additional practices were recommended, document management practice implementation by targeted members.

Once the Coalition recommends a management practice to a grower, the grower indicates if he/she plans to implement the practice in the next year. The information provided on the FEP (or NMP or SECP) the following year should reflect that the member did implement the practice. The Coalition will review the FEPs of members contacted the previous year to determine if the practice(s) was implemented. If it appears that the practice was not implemented, the Coalition will contact the member to determine why, and if the member anticipates being able to implement the practice in the coming year. If finances prevented the implementation, the Coalition will provide the member with information on programs that can provide funds to assist with the implementation. The experience of the Coalition is that the member visits are extremely effective in improving water quality but that non-members and new farmers often discharge tailwater or generate spray drift that result in exceedances of WQTLs or toxicity. These exceedances may occur several years after outreach is complete and require that the Coalition identify new members, conduct individual meetings, and provide recommendations for implementation of specific management practices.

Performance Goal 5. Evaluate effectiveness of new management practices.

Performance Measures

5.1 Monitoring at sites with exceedances after implementation of management practices to evaluate effectiveness.

Evaluation of the effectiveness of management practices is ultimately based on water quality. MPM will occur in each site subwatershed in a management plan to determine if water quality is improving.

The following section describes the Performance Measures associated with each Performance Goal (Table 20). These Performance Measures are the actions the Coalition will perform to meet the Performance Goals. Included in the table of Performance Goals and Performance Measures are the parties responsible for performing the actions described by the Performance Measures. The performance goals and performance measures are applied individually to each site subwatershed in a management plan. Each year, the Coalition will submit a technical memo to the Regional Board outlining the site subwatersheds in which these activities will take place over the next years along with a time schedule for completion of the Performance Measures.

Table 20. High Priority Performance Goals for the ESJWQC Surface Water Quality Management Plan.

PERFORMANCE GOAL/PERFORMANCE MEASURE	OUTPUTS	WHO
Performance Goal 1: Identify members with the potential to discharge to surface waters causing exceedances of WQTLs of constituents identified in the Order.		
Performance Measure 1.1. – Perform source analysis, when possible, of constituents causing exceedances of WQTLs.	Identification of members with the potential to discharge to surface waters and cause the observed exceedance.	MLJ-LLC
Performance Measure 1.2. – Identify 100% of all members that had the potential to discharge agricultural wastes to surface waters causing exceedances of WQTLs.	Report in Management Plan Progress Report the acreage represented by members with the potential for direct discharge.	MLJ-LLC
Performance Goal 2: Review the member's Farm Evaluation Plan (FEP) (or Nutrient Management Plan [NMP] or Sediment and Erosion Control Plan [SECP] as appropriate) from year prior to initiation of Management Plan activities to determine number/type of management practices currently in place, and determine if additional practices are necessary.		
Performance Measure 2.1 – Review FEP (or NMP or SECP as appropriate) from 100% of targeted members.	Completed individual management practice evaluations recorded in an Access database.	MLJ-LLC
Performance Measure 2.2 – Identify management practices used by members that are effective in preventing discharges to surface water.	Record of management practices in place that reduce agricultural impact on water quality.	Parry Klassen/MLJ-LLC
Performance Measure 2.3 – Identify management practices not currently used by members that can be recommended to prevent discharges to surface water.	Summary in the Management Plan Progress Report of management practices recommended to members .	Parry Klassen
Performance Goal 3: Hold meetings as necessary to inform members of water quality problems and recommend additional practices.		
Performance Measure 3.1 – Provided monitoring results at meetings with members, and discuss practices that can be used to eliminate exceedances.	Agendas and/or reports of all meetings with members.	Parry Klassen/MLJ-LLC
Performance Measure 3.2 – When available and appropriate, provide information on the results of the management practices studies.	Provide reports from studies.	Parry Klassen
Performance Measure 3.3 - Track attendance at meetings attended by the targeted members.	Report of members attending meetings provided in Management Plan Progress Report.	Parry Klassen/MLJ-LLC
Performance Goal 4: Review the member's Farm Evaluation Plan from the year following initiation of Management Plan activities to document number/type of new management practices implemented.		
Performance Measure 4.1 – Document management practice implementation, if needed, by targeted members.	Summary in the Management Plan Progress Report of management practices implemented by members at site subwatershed level.	MLJ-LLC
Performance Goal 5: Evaluate effectiveness of new management practices.		
Performance Measure 5.1 – Monitoring at sites with exceedances after implementation of management practices to evaluate effectiveness.	MPM results in Monitoring Plan Progress Report.	MLJ-LLC

MONITORING METHODS

MONITORING DESIGN

The Coalition designed a monitoring program to measure improvements in water quality and the effectiveness of focused management practice outreach and tracking. The monitoring program involves three types of monitoring, Core site, Represented site, and Management Plan monitoring. Figures 1-6 are maps of the Coalition's zones and Core, Represented, and MPM sites. MPM sites are provided in Table 7.

Core Site Monitoring

Each zone has two Core sites although only one Core site is currently identified in the General Order. The second Core site will be identified after discussions with Regional Board staff during 2014 – 2015. Each Core site is monitored for two consecutive years after which the second Core site is monitored the following two years. When a water quality objective or trigger limit for a constituent is exceeded at any Core Site Monitoring location, that parameter must be monitored at that Core location for a third year. Figure 17 is a flowchart of the Core Site Monitoring strategy. Figures 1-6 are maps of the Coalition's zones and Core, Represented, and MPM sites.

Represented Site Monitoring

Represented sites are not sampled during normal monitoring activities. Whenever a water quality objective or trigger limit is exceeded at the Core site in the same zone, the Coalition must evaluate the potential for similar risks or threats to water quality associated with that constituent at each Represented site within that zone. If the evaluation indicates that there is the potential for similar risk, the Represented Site Monitoring must occur for that constituent for at least two years. If the exceedance of the WQTL for the constituent triggers a management plan at the Core site, the Represented site may or may not be placed in a management plan. The Represented site subwatershed is evaluated to determine if the exceedance could reasonably occur and if not, the Represented Site subwatershed is not placed into a management plan. If the exceedance could occur, the Coalition can initiate monitoring at the Represented site to determine if the exceedance is occurring. If two exceedances of the WQTL for the constituent occur at the Represented site, the Represented site must be placed in a management plan. Figure 18 is a flowchart of the Represented Site Monitoring strategy.

Management Plan Monitoring Sites

Management plan sites fall under the Special Project category. These are sites where monitoring occurs to further evaluate water quality, sources of identified water quality impairments, and the effectiveness of management practice implementation by growers

A monitoring schedule for the next water year is submitted annually in the Monitoring Plan Update (MPU) due August 1 of each year. In order to determine when, what and where MPM will occur, the Coalition reviews available monitoring results and PUR data. Due to the submittal of the MPU on August 1, the Coalition is only able to review data up through June of that year.

MONITORING SITES AND SCHEDULE

As described in the Monitoring and Reporting Program (MRP), Attachment B to the Order, surface water monitoring at Core sites will occur once a month based on a Water Year (October through September) and will include an assessment of field parameters, nutrients, pathogens, pesticides, metals and toxicity to water column and sediment species. The Coalition submits a Monitoring Plan Update (MPU) on August 1 of each year which details the locations monitored, the constituents monitored at each site, and the frequency of monitoring conducted at each site. Each year the MPU schedules are updated in the ESJWQC Annual Report for July through September results of the previous year.

Core Site Monitoring

For the 2014 WY, the Coalition will monitor within each of the six zones in the ESJWQC boundary for 12 months (October 2013 through September 2014) at the designated Core sites (Attachment B of the Order, page 4). The Core site in each zone will be monitored for a minimum of two consecutive years before rotating to the second Core site in the zone. If the concentration of a constituent exceeds the WQTL at a Core site, the Core site will be monitored for that constituent for an additional third consecutive year (Attachment B of the Order, page 3). If a Core site is currently in a management plan or if the monitoring results require that the Core site must be placed in a management plan, the site will be evaluated for MPM. The flowchart in Figure 17 depicts the Core Site Monitoring strategy.

Represented Site Monitoring

The Coalition will evaluate the potential risk for water quality impairments at Represented sites when an exceedance of a water quality trigger limit occurs at an associated Core site. If it is determined that monitoring at the Represented site should take place, the Coalition evaluates the pesticide use reports for the Represented site subwatershed and develops a monitoring schedule accordingly (Attachment B of the Order, page 4).

Once Represented site monitoring is initiated, the Coalition will monitor at the Represented site during the time period of highest risk of exceedance of the water quality objective (WQO) for that parameter for a minimum of two years. The flowchart in Figure 18 depicts the Represented Site Monitoring strategy.

Management Plan Monitoring

Management Plan Monitoring is conducted as part of the Coalition's management plan strategy to identify contaminant sources and evaluate effectiveness of newly implemented management practices. The annual Monitoring Plan Update (MPU) includes a schedule for monitoring management plan constituents at Core and Represented sites. This updated schedule will be followed for the next WY although some sites may have been monitored for three years with no exceedances after which the Coalition will petition to remove the constituents from the management plan and drop MPM for that constituent.

Core site MPM will be conducted on a frequency according to Attachment B, section III.A.1 of the Order. All management plan constituents will be monitored on a monthly basis at the Core sites during the 2014 Water

Year. Represented site MPM is designed to be representative of potential discharge(s) of the management plan constituent. The frequency and timing of MPM monitoring are determined by:

- Months of past exceedances for the targeted constituent(s) (e.g. applied pesticides, metals, toxicity) in the site subwatershed
- Months of high use of the targeted constituent(s) determined using PUR data for that site subwatershed

If a Management Plan is required for a Core site, all Represented sites in the zone will be evaluated to determine if monitoring should occur in those site subwatersheds. The PUR data will be analyzed to determine the extent of use of the targeted constituent(s) in the Represented site subwatersheds, the location of use, and the timing of the use. If the evaluation determines that the targeted constituents are used in Represented site subwatersheds and could potentially impair beneficial uses, monitoring will be conducted at the Represented sites for the targeted constituents. If two exceedances of the targeted constituent occur, a management plan will be triggered. The Coalition will continue to monitor at the Represented sites until no exceedances have occurred for three years.

Figure 17. ESJWQC flowchart for the Core site monitoring strategy.

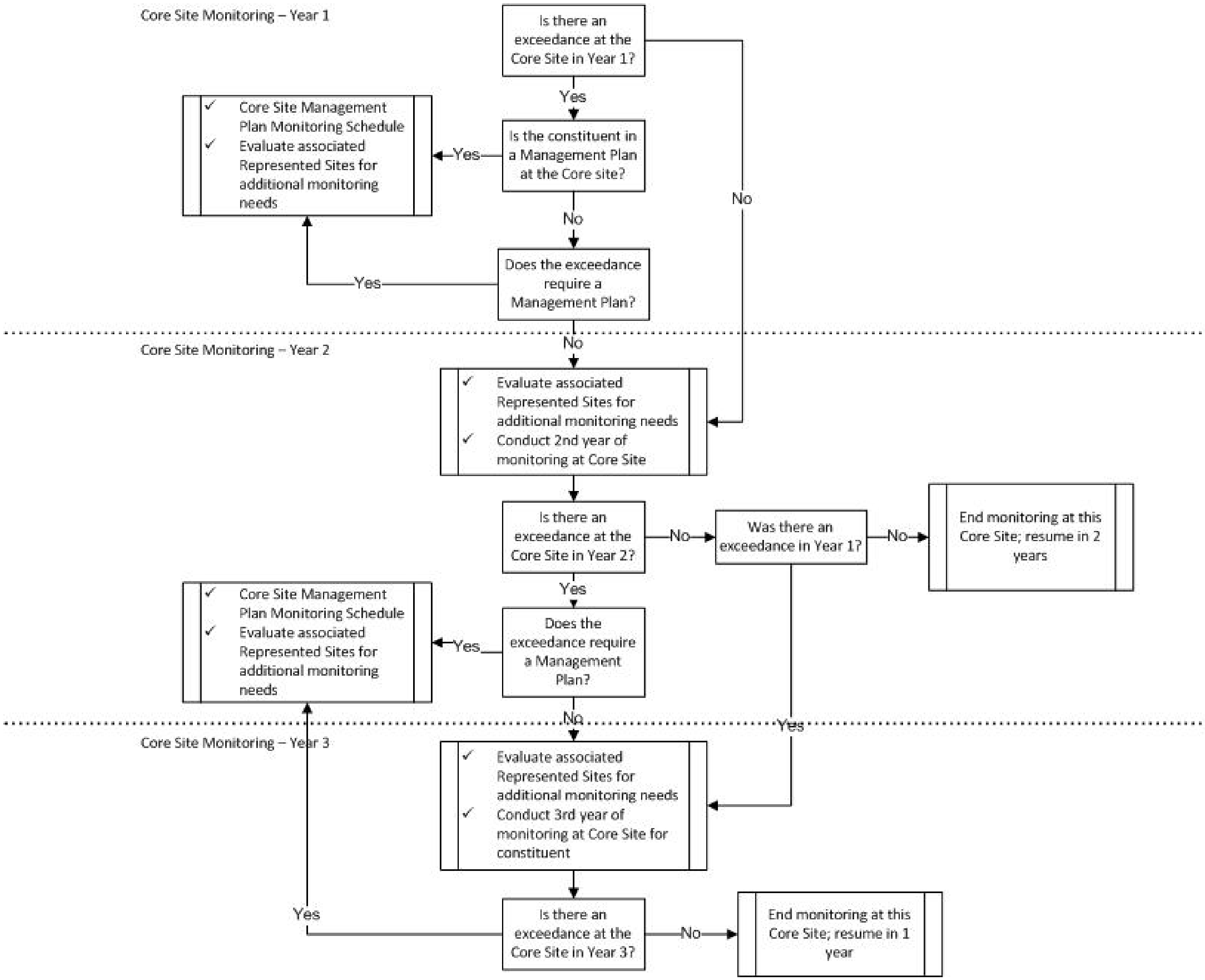
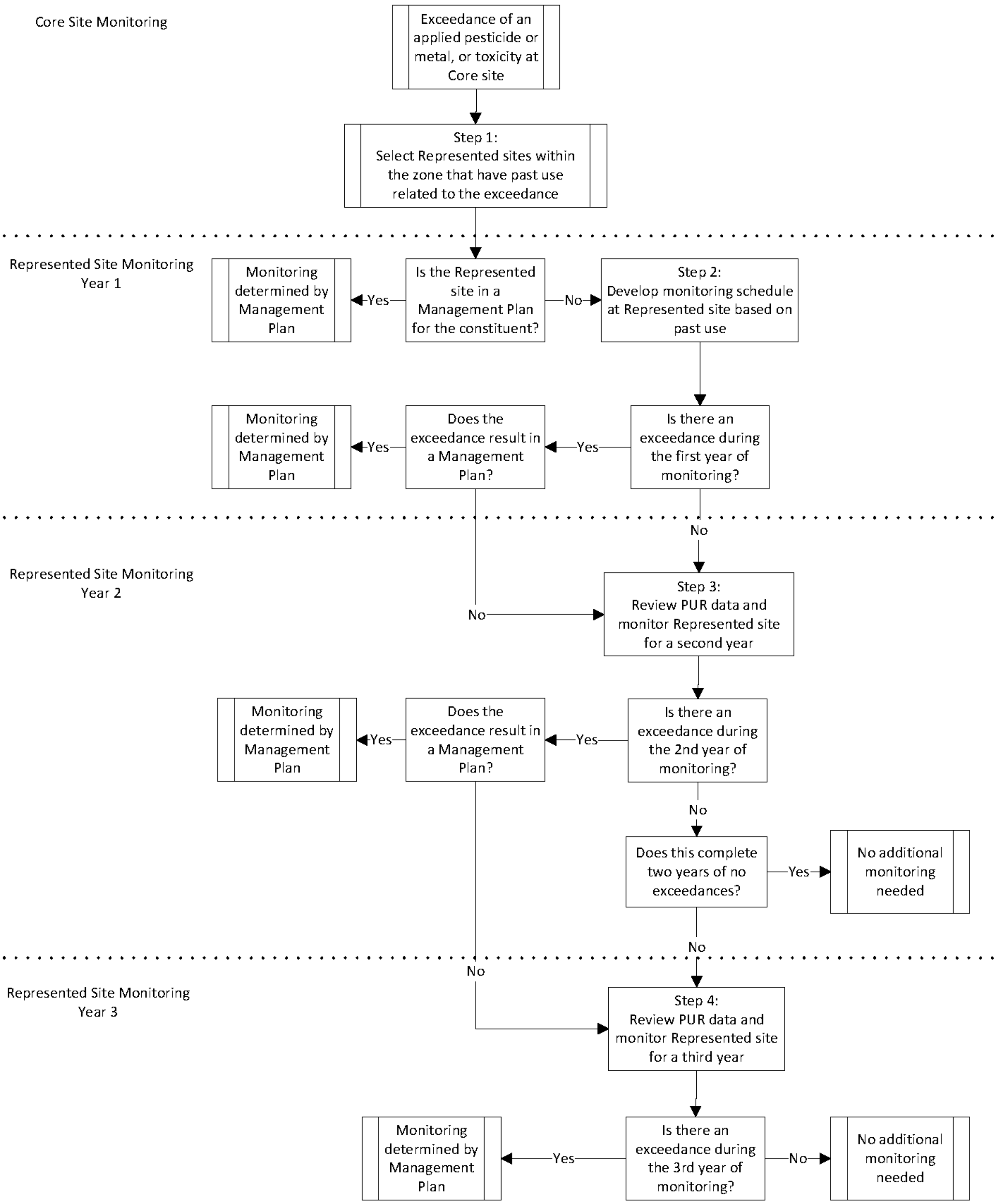


Figure 18. ESJWQC flowchart for the Represented site monitoring strategy.



DATA EVALUATION

INFORMATION NEEDED TO QUANTIFY PROGRAM EFFECTIVENESS

To quantify management plan program effectiveness, there are several types of data that will be collected by the Coalition over the next year including:

- Water quality monitoring data including concentrations of management plan constituents relative to WQTLs,
- Number of exceedances of WQTLs occurring management plan site subwatersheds in the Coalition region,
- Management practices used by members in site subwatersheds in management plans,
- Management practices recommended to growers for implementation in the future,
- Recommended management practices actually implemented by members, and
- Pesticide use data.

The Coalition currently maintains independent relational databases for water quality monitoring data, management practices reported in the Farm Evaluation Reports and practices recommended by Coalition representatives, and pesticide use information received from the office of the County Agricultural Commissioners. In addition, the Coalition maintains a database of pesticides applied in the Coalition region including physical, chemical, and toxicological information that is used to identify applications that have the potential to cause toxicity.

When toxicity or an exceedance of a WQTL for a chemical requires the development of a management plan for the constituent and site subwatershed, the Coalition contacts the County Agricultural Commissioner and requests the pesticide use reports filed by Coalition members who farm in the site subwatershed. Depending on the constituent, all members who applied the target chemical within a period of time prior to the sample collection date are identified. Although the pesticide use reports provide location information only to the section level, the Coalition has a process that uses the commodity and acreage to identify the fields to which the chemical was applied. This process has been made even easier in the 2014 WY because the FEP provides up to date information on the crops grown, the acreage, and the exact location of the field. These data are then compared to the data generated from the pesticide use database to identify exactly which members applied the target chemical, when they applied the chemical, how they applied the chemical, and what practices were used to control the discharge (see below). This information allows the Coalition representatives to develop a set of management practices that can be implemented to prevent discharges in the future. These practices can be discussed with the member during the visit to the farming operation by the Coalition.

There is a finite set of management practices that can be used to eliminate discharges from agricultural operations. These practices (e.g. planting grass filter strips) have been developed and validated by entities such as NRCS and various State Agricultural Extension Services including UC Cooperative Extension. Not all practices are appropriate for all farming operations, and the Coalition Manager of Member Services uses his experience to recommend appropriate practices during visits to the individual farms. The recommended practices are known to be effective if implemented properly, so tracking the effectiveness of the management plan involves 1) identifying growers that are potentially discharging constituents that impair water quality, 2)understanding what practices those growers currently have in place, 3) verifying that the practices are being implemented correctly, 4) recommending new practices if appropriate, 5) verifying that the recommended practices have been implemented, and 6) monitoring water quality to determine if the discharges have been eliminated.

Independent of water quality monitoring results, the Coalition maintains a relational database that holds member information including the results of the Farm Evaluation Plans. The member is requested to complete a different FEP for every field that is managed differently. All results are placed into the database and the Coalition is able to associate every response and every management practice reported with a specific parcel and field. When all growers complete their FEPs, the Coalition will have a record of all management practices implemented on every field in the Coalition region. Each year's FEP will be added to the database providing the Coalition with a record of management practices implemented over time. If growers receive a visit from a Coalition representative to receive recommendations about practices that can be implemented, the specific field/location and the recommended practices are also recorded in the database. If it is determined that the FEP does not adequately capture the practices used by members, the Coalition will request additional information be provided by the member. This information will also be placed into the database. Each year during the process of preparing the Management Plan Progress Report, the Coalition will review the practices currently used by members, the practices recommended by the Coalition to members, and the practices implemented by members. The review involves simple queries of the relational database that the technical consultants have generated while developing this practice tracking system. This system is currently used by the Coalition to track management practice implementation by members in management plan site subwatersheds under the 2008 Management Plan and is completely operational and effective. The only difference between management practice tracking efforts performed prior to the 2014 WY is the information collected prior to the 2014 WY was obtained using the Coalition's management practices survey and information collected in the 2014 WY is from the FEP.

As growers complete the yearly FEPs and submit to the Coalition, a record is developed of the practices used on their farming operation which can then be associated with water quality data. If it appears that additional practices are being implemented by the member and water quality does not improve, either the practices are not effective, or the discharge is from a non-member in the site subwatershed. There are numerous dairies in the Coalition region that do not belong to the Coalition and some growers who refuse to join the Coalition. Given the documented efficacy of the management practices recommended by the Coalition, it is likely that the discharge is from a non-member. If the Coalition believes that non-members are responsible for discharges, they will bring the information to the Regional Board during one of the quarterly meetings held with Regional Board staff.

Verification of the management practices information will be performed for those members who are identified as a potential source of a discharge to surface waters. Meetings with members at their farming operation will allow the Coalition representatives to determine if the practices listed on the FEP are actually being implemented by the member. Although verification will occur, it is the experience of the Coalition that members are extremely honest about their farming operation and the practices they employ.

Verification of the management practices information provided by members will not occur for those members in low vulnerability areas or for members who are not identified as potential dischargers.

METHODS OF DATA EVALUATION

The data to be evaluated will be entered into an Access database and associated with a member, township, range and section, crop and acreage. The Coalition expects that graphical and tabular presentations of data such as management practices in place, recommended, and implemented will be sufficient to convey results of the evaluation of the tracking of the management practices implementation. Water quality data will be summarized with simple descriptive statistics for presentation in the Management Plan Progress Report submitted as part of the Annual Report.

RECORDS AND REPORTING

The Coalition will submit each year by May 1 a Management Practice Progress Report as part of the Annual Monitoring Report, also submitted by May 1. This report will contain the 13 components listed in Appendix MRP-1 of the WDR.

SOURCE IDENTIFICATION STUDIES

As indicated above, there are several constituents and measured parameters for which source identification is not well understood and which could be attributable to both agricultural and non-agricultural sources (e.g. nitrate, copper, zinc), and there are constituents/measured parameters that are not applied by irrigated agriculture (e.g. arsenic, molybdenum, cadmium, lead, DDE), or may be the result of other processes (pH, DO, SC, *E. coli*) and the Coalition cannot currently assign exceedances to a cause/source. These constituents will be the subject of source identification studies conducted by the Coalition over the next several years. If irrigated agriculture is identified as a potential source, the Coalition will then determine which management practices could be effective in reducing discharges and will conduct outreach with growers to review appropriate practices. It should be noted that since the 2008 Management Plan was implemented, there has been a large number of management practices implemented across the Coalition region and a significant decline in the number of exceedances of WQTLs of applied pesticides and toxicity. A number of these management practices are designed to prevent discharge of all runoff and are not specific to pesticides, e.g. installation of pressurized irrigation, constructing berms between fields and surface waters, or constructing sediment/tailwater detention basins and recirculation systems. If exceedances of WQTLs for parameters such as DO are the result of discharges from irrigated agriculture, it would be expected that the number of exceedances of WQTLs for these constituents would similarly decline. However, that has not occurred indicating the processes that determine the DO concentration in surface water, or pH of the water are most likely outside of the ability of irrigated agriculture to manage.

The Coalition must have a reasonable understanding of sources before recommending management practices because of the potential cost of implementation to the grower. The Coalition will undertake a series of preliminary analyses, work plan development, and source identification studies over the next several years (see Table AA) in an effort to identify sources of discharged constituents, or understand the processes that drive the daily dynamics of DO and pH. Once these sources and processes are understood, the Coalition can determine which management practices, if any, will be effective in eliminating exceedances of the WQTLs for these constituents/parameters. The Coalition may work with other ILRP coalitions in the Valley on some work plans and studies, but if cooperation is not forthcoming, the Coalition will undertake the studies on its own and submit plans as outlined in Table 18 and according to the schedule provided in Tables 16, 17, and 19.

APPENDIX I

EAST SAN JOAQUIN WATER QUALITY COALITION

SITE SUBWATERSHED WATER QUALITY DATA SUMMARIES

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

INTRODUCTION

A summary of monitoring data is provided below for all ESJWQC site subwatersheds requiring a management plan, discussed alphabetically. Each summary includes the site's monitoring history and data (including land use maps, table of active and removed management plan constituents, all exceedances and detections, sourcing, outreach, and evaluation of management practice effectiveness for high priority site subwatersheds).

High priority site subwatershed analyses include:

- discussions of specific water quality impairments for each site subwatershed including all exceedances of Water Quality Trigger Limits (WQTLs),
- analysis of sourcing techniques,
- recommendations of management practices that can be used to improve water quality, and
- specific schedules for outreach and evaluation of management practice effectiveness.

Site Subwatershed Management Plans give an overview of the status of the water quality, including management practice effectiveness. If there are no new data to report, the section will reference the previously submitted MPUR.

UPDATES TO COALITION MONITORING PLAN

On April 17, 2012 the Coalition was approved to temporarily suspend monitoring at Core and Management Plan Monitoring (MPM) sites with the exception of Bear Creek @ Kibby Rd. Management Plan Monitoring continued at Bear Creek @ Kibby Rd as part of a cost-share for a project funded by Proposition 84. In addition, the Coalition was approved to reduce the number of constituents monitored at Assessment Monitoring sites by eliminating analyses for Group A, paraquat, glyphosate, total Kjeldahl nitrogen, total phosphorus (as P), *E. coli* and all metals except copper and zinc for the remainder of 2012. Coalition monitoring occurred as scheduled from January through March. In April 2012 schedules were modified according to the plan specifying the reduced monitoring. In addition, MPM in 2012 was conducted at high priority locations for high priority constituents requiring a management plan from January through March.

The Coalition is in the process of reevaluating all previously reported exceedances of DO and SC based on the criteria outlined in Basin Plan. The Fourth Edition of the Water Quality Control Plan (Basin Plan) for the Sacramento River and San Joaquin River Basins (Page III-5) indicates the lower DO trigger limit of 5 mg/L should be utilized for waterways that are 'warm' and/or not considered a resource for fisheries. The San Francisco Bay/Sacramento-San Joaquin Delta Basin Plan (Table 2, Page 13) indicates detections of SC from September through March are not considered exceedances when they are below 1,000 µmhos/cm. The Coalition will petition to remove sites where management plans are no longer applicable including a list of site subwatershed exceedances and management plans updates in 2014.

ASH SLOUGH @ AVE 21

Overview

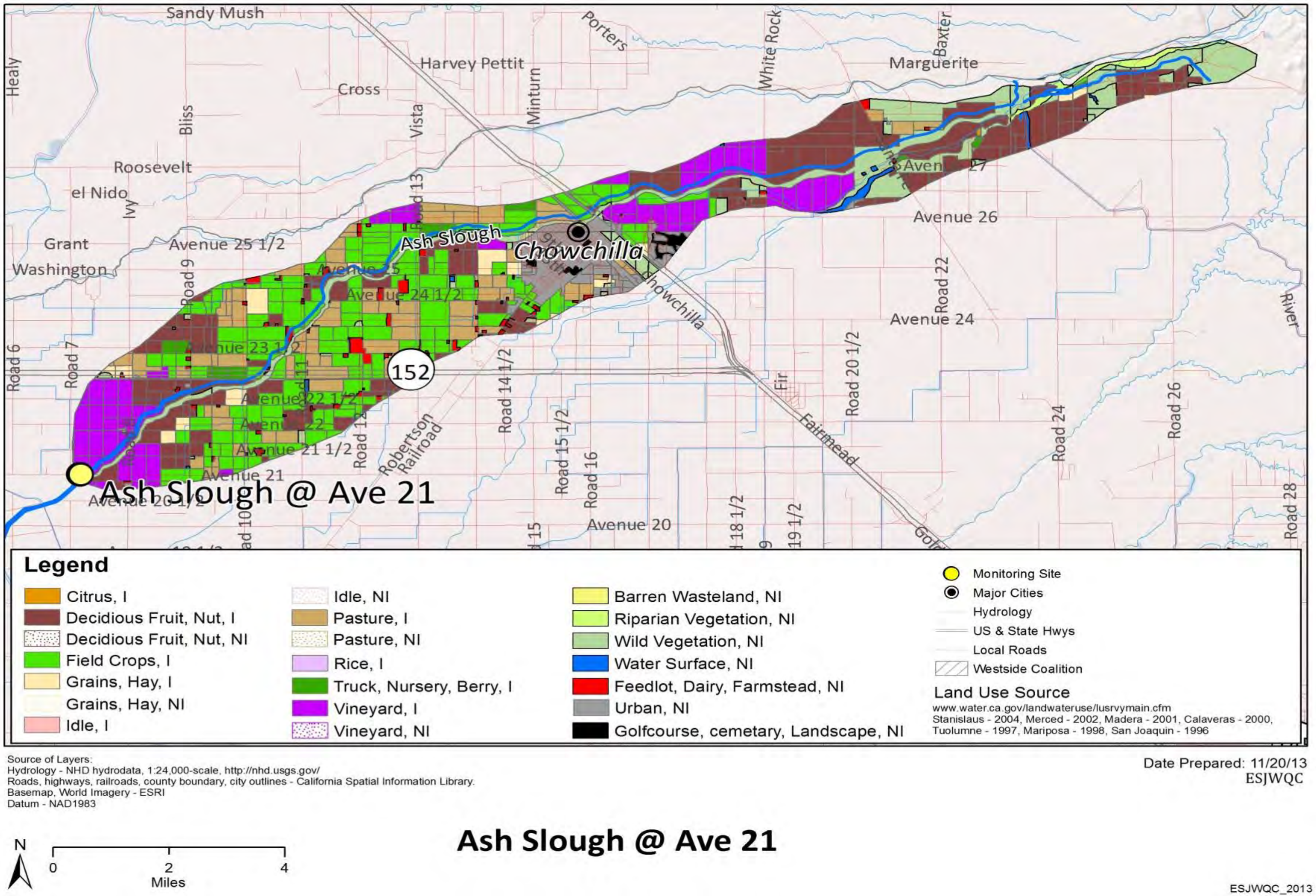
Monitoring first occurred in the Ash Slough @ Ave 21 site subwatershed in 2005 and continued through 2010. The most recent Assessment Monitoring took place in 2010, however the site was dry every month but one; April was the only month that samples were collected and the last exceedance of the WQTL for copper occurred. Chlorpyrifos was placed in the Ash Slough @ Ave 21 management plan in 2006 and copper, *E. coli,* and lead were placed in the management plan in 2007. The Coalition began conducting general outreach in the Ash Slough subwatershed in 2007 and focused outreach will be conducted from 2014 through 2016. As a result of increased water quality awareness, exceedances of the WQTLs for chlorpyrifos*, E. coli*, and lead decreased. The Coalition received approval on May 30, 2012 to remove chlorpyrifos, *E. coli*, and lead from the site's management plan. Currently, the only active management plan constituent within the Ash Slough @ Ave 21 site subwatershed is copper (Table 1).

Under the WDR, Ash Slough@ Ave 21 is a Represented Site and monitoring will occur as needed based on Core Site exceedances; land use is included in Figure 1. During the 2014 Water Year (WY), MPM for copper is scheduled January through February and April through September.

Table 1. Ash Slough @ Ave 21 management plan constituents.

Constituent	Management Plan Initiation Year	Management Plan Removal Year	10 Year Compliance Deadline
Copper	2007	Active	Pending Workplan
Constituent (Removed)			
Chlorpyrifos	2006	2012	2016
E. coli	2007	2012	Pending Workplan
Lead	2007	2012	Pending Workplan

Figure 1. Ash Slough @ Ave 21 site subwatershed land use map.



Monitoring Results

Monitoring occurred from 2005 through 2010 at Ash Slough @ Ave 21; the site was dry 48 of the 61 sampling events (2014 Annual Report Appendix I). Assessment monitoring occurred in 2009 and 2010 and the site was dry for all events except May 2009 and April 2010.

Exceedances of the chlorpyrifos WQTL occurred twice in 2005 and twice in 2006. Chlorpyrifos was added to the site's management plan in 2006 after the two exceedances of the WQTL occurred in July and August 2005. No exceedances of the WQTL for chlorpyrifos occurred since 2006 and it was approved to be removed from the site's management plan on May 30, 2012.

Copper was placed in the site's management plan in 2007 after exceedances of the WQTL for total copper occurred five times from May through September 2006. Both events where samples were collected in May 2009 and April 2010 resulted in an exceedance of the hardness based WQTL for dissolved copper.

E. coli and lead, were placed in the Ash Slough @ Ave 21 management plan in 2007. Exceedances of the WQTL for *E. coli* occurred in July 2005 and in February and July 2006. Exceedances of the WQTL for lead occurred twice in 2006. No exceedances have occurred for either constituent since 2006; both constituents were approved to be removed from the site's management plan on May 30, 2012.

Table 2 is a record of yearly exceedances of WQTLs from 2005 through 2010 for Ash Slough @ Ave 21 site subwatershed management plan constituents.

Table 2. Ash Slough @ Ave 21 exceedances of management plan constituents (2005-2010).
The WQTLs used to evaluate the data are listed in the header after the analyte.

Station Name	Season	Sample Date	*E. coli*, >235 MPN/100 mL	Copper (Dissolved), Variable[1]	Copper (Total), Variable[2] or >1300 µg/L	Lead (Total), Variable[1]	Chlorpyrifos, >0.015 µg/L
Ash Slough @ Ave 21	Irrigation	7/12/2005	500				0.018
Ash Slough @ Ave 21	Irrigation	8/16/2005					0.046
Ash Slough @ Ave 21	Storm	2/28/2006	500				0.016
Ash Slough @ Ave 21	Storm	3/15/2006					0.029
Ash Slough @ Ave 21	Irrigation	5/16/2006			4.8 (2.6)	0.68 (0.46)	
Ash Slough @ Ave 21	Irrigation	6/13/2006	770		17 (3.3)	1.6 (0.69)	
Ash Slough @ Ave 21	Irrigation	7/11/2006			6.7 (4.1)		
Ash Slough @ Ave 21	Irrigation	8/8/2006			6.3 (3.1)		
Ash Slough @ Ave 21	Irrigation	9/12/2006			9.3 (3.3)		
Ash Slough @ Ave 21	Irrigation	5/19/2009		3 (2.17)			
Ash Slough @ Ave 21	Storm	4/20/2010		3.2 (1.67)			

[1]WQTL variable based on hardness.
[2]Metal WQTL variable; based on hardness.

BEAR CREEK @ KIBBY RD

Overview

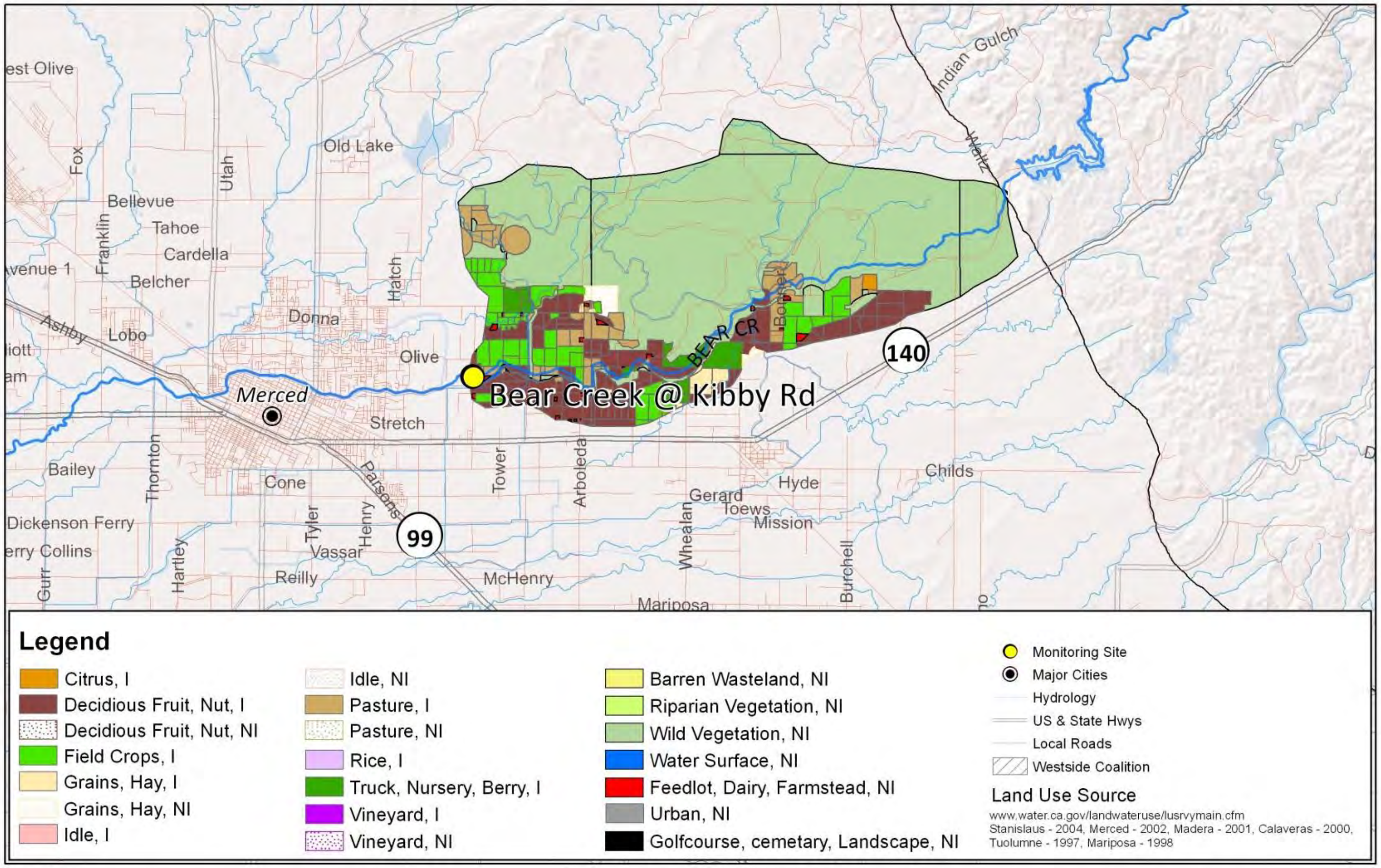
Monitoring first occurred in the Bear Creek @ Kibby Rd site subwatershed in storm season of 2005 and continued through the irrigation season of 2013, 2009 was the only year it was not monitored. The last time a full suite of constituents were collected at this site was in 2008. Management Plan Monitoring during months of past exceedances occurred from 2010 through 2013. The Coalition completed focused outreach from 2010 through 2012 and water quality improved in the site subwatershed. The Coalition received approval on May 30, 2012 to remove chlorpyrifos, DO, and toxicity to *C. dubia* from the site's management plan. The Coalition received approval on October 15, 2013 to remove copper from the site's management plan. The remaining active management plan constituents include *E. coli* and pH (Table 3).

Under the WDR, Bear Creek @ Kibby Rd is a Represented Site and monitoring will occur as needed based on Core Site exceedances; land use is included in Figure 2. No MPM is scheduled during the 2014 WY.

Table 3. Bear Creek @ Kibby Rd management plan constituents.

Constituent	Management Plan Initiation Year	Management Plan Removal Year	10 Year Compliance Deadline
E. coli	2006	Active	Pending Workplan
pH	2008	Active	Pending Workplan
Constituent (Removed)			
Chlorpyrifos	2007	2012	2017
Copper	2009	2013	Pending Workplan
C. dubia water column toxicity	2007	2012	2017
Dissolved Oxygen	2007	2012	Pending Workplan

Figure 2. Bear Creek @ Kibby Rd site subwatershed land use map.

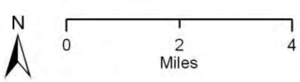


Source of Layers:
Hydrology - NHD hydrodata, 1:24,000-scale, http://nhd.usgs.gov/
Roads, highways, railroads, county boundary, city outlines - California Spatial Information Library.
TRS - Teale Public Land Survey System, Pub. date. 20090101, California Spatial Information Library.
Parcel Layer - Stanislaus 2010, Merced 2011, Madera 2011
Basemap, Shaded Relief - ESRI
Datum - NAD 1983

Date Prepared: 06/30/11

ESJWQC

Bear Creek @ Kibby Rd



Monitoring Results

During January through September 2013, MPM occurred for copper in January, February, and August prior to its removal from the management plan. MPM resulted in no exceedances of the hardness based WQTL for copper. The most recent exceedance of the hardness based WQTL for copper (total) was in August 2008. Field parameters, DO and pH, were also collected during MPM and no exceedances of the WQTLs occurred. *E. coli* was last monitored during 2008 and resulted in two exceedances during January and February.

Table 4 is a record of yearly exceedances of WQTLs from 2005 through September 2013 for Bear Creek @ Kibby Rd site subwatershed management plan constituents.

Table 4. Bear Creek @ Kibby Rd exceedances of management plan constituents (2005-September 2013). The WQTLs used to evaluate the data are listed in the header after the analyte.

Site Name	Season	Sample Date	Dissolved Oxygen, <7 mg/L	pH, <6.5 and > 8.5 units	*E. coli*, >235 MPN/100 mL	Copper (Total), Variable[1] or >1300 µg/L	Chlorpyrifos, >0.015 µg/L	*C. dubia*, (% Control)
Bear Creek @ Kibby Rd	Storm	3/21/2005	4.4		1600			
Bear Creek @ Kibby Rd	Irrigation	5/10/2005			280			5
Bear Creek @ Kibby Rd	Storm	3/15/2006			1600			
Bear Creek @ Kibby Rd	Irrigation	5/17/2006					0.52	0
Bear Creek @ Kibby Rd	Irrigation	6/13/2006	6.99	8.69				
Bear Creek @ Kibby Rd	Storm	2/12/2007			2400	12 (9.3)		
Bear Creek @ Kibby Rd	Storm	3/1/2007			1300			
Bear Creek @ Kibby Rd	Irrigation	7/24/2007					0.049	0
Bear Creek @ Kibby Rd	Irrigation	8/21/2007		8.69				
Bear Creek @ Kibby Rd	Storm	1/24/2008			2400	8.6 (7.7)		
Bear Creek @ Kibby Rd	Storm	2/25/2008			>2400	7.2 (6.4)		
Bear Creek @ Kibby Rd	Sediment	3/4/2008		8.72				
Bear Creek @ Kibby Rd	Irrigation	4/29/2008						
Bear Creek @ Kibby Rd	Irrigation RS	5/7/2008						
Bear Creek @ Kibby Rd	Irrigation	6/24/2008						
Bear Creek @ Kibby Rd	Irrigation	7/29/2008						
Bear Creek @ Kibby Rd	Irrigation	8/26/2008				7.1 (2.4)		
Bear Creek @ Kibby Rd	Sediment	8/28/2008						
Bear Creek @ Kibby Rd	Sediment RS	10/2/2008						
Bear Creek @ Kibby Rd	Winter	2/7/2012		8.59				
Bear Creek @ Kibby Rd	Irrigation	5/9/2012		9				

[1]Metal WQTL variable; based on hardness.
RS – Resampling due to toxicity.

BERENDA SLOUGH ALONG AVE 18 ½

Overview

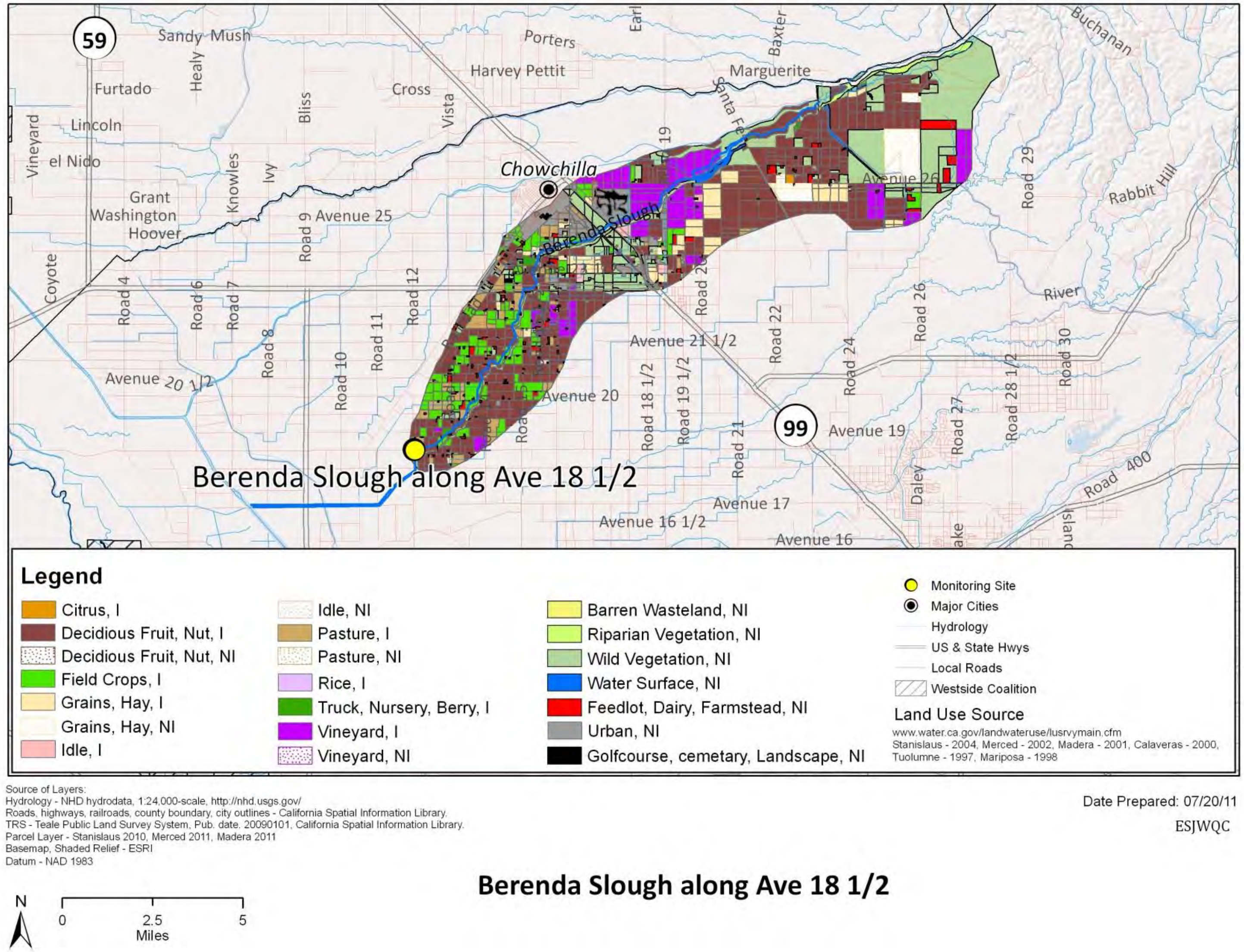
Monitoring at Berenda Slough along Ave 18 ½ began during the irrigation season of 2006 and continued through September 2013. Assessment Monitoring occurred at the site in 2011 and 2012 and MPM occurred during 2007, 2008, and 2011 through September 2013. The Coalition completed focused outreach from 2011 through 2013 and water quality improved in the site subwatershed. The Coalition received approval to remove water column toxicity to *S. capricornutum* from the management plan on October 15, 2013 (Table 5).

Under the WDR, Berenda Slough along Ave 18 ½ is a Represented Site and monitoring will occur as needed based on Core Site exceedances; land use is included in Figure 3. During the 2014 WY, MPM is scheduled for copper (October through September) and chlorpyrifos (April through September).

Table 5. Berenda Slough along Ave 18 ½ management plan constituents.

Constituent	Management Plan Initiation Year	Management Plan Removal Year	10 Year Compliance Deadline
Chlorpyrifos	2007	Active	2017
Copper	2012	Active	Pending Workplan
Dissolved Oxygen	2007	Active	Pending Workplan
E. coli	2008	Active	Pending Workplan
Constituent (Removed)			
S. capricornutum water column toxicity	2008	2013	2018

Figure 3. Berenda Slough along Ave 18 1/2 site subwatershed land use map.



Of eight scheduled monitoring events during 2013 at Berenda Slough along Ave 18 ½, the site was dry for seven events; July was the only time samples were collected. Samples collected during the July event were analyzed for chlorpyrifos, copper, and water column toxicity to *S. capricornutum* and no exceedances of the WQTLs or toxicities occurred. Dissolved oxygen was measured as a field parameter in July and an exceedance of the WQTL occurred. Even though water samples were not collected for the majority of the January through September 2013 monitoring period, dry events indicate that water cannot transport potentially toxic constituents to the waterway.

Table 6 is a record of yearly exceedances of WQTLs from 2006 to September 2013 for Berenda Slough along Ave 18 ½ management plan constituents.

Table 6. Berenda Slough along Ave 18 ½ and upstream site exceedances of management plan constituents (2006-September 2013).

The WQTLs used to evaluate the data are listed in the header after the analyte. Upstream sites are italicized.

Site Name	Season	Sample Date	Dissolved Oxygen, <7 mg/L	*E. coli*, >235 MPN/100 mL	Copper (Dissolved), Variable[1] or >1300 µg/L	Chlorpyrifos, >0.015 µg/L	*S. capricornutum*, (% Control)
Berenda Slough along Ave 18 1/2	Irrigation	5/16/2006					
Berenda Slough along Ave 18 1/2	Irrigation	6/13/2006	5.49	460			
Berenda Slough along Ave 18 1/2	Irrigation	7/11/2006	6.54			0.043	
Berenda Slough along Ave 18 1/2	Irrigation	8/8/2006					
Berenda Slough along Ave 18 1/2	Irrigation	9/12/2006				0.14	
Berenda Slough along Ave 18 1/2	Irrigation	5/29/2007	1.75				78
Berenda Slough along Ave 18 1/2	Irrigation	6/5/2007	3.07				
Berenda Slough along Ave 18 1/2	Irrigation	6/26/2007	5.20	390			
Berenda Slough along Ave 18 1/2	Irrigation	7/24/2007	6.37			0.028	12
Berenda Slough along Ave 18 1/2	Irrigation	7/31/2007	4.72				70
Berenda Slough along Ave 18 1/2	Irrigation	8/21/2007	6.13				
Berenda Slough @ Rd 19	*Irrigation*	*7/29/2008*	*1.10*				
Berenda Slough along Ave 18 1/2	Winter	1/18/2011		520	6.8 (2.65)		
Berenda Slough along Ave 18 1/2	Storm	2/17/2011		400	3.6 (1.87)		
Berenda Slough along Ave 18 1/2	Winter	3/17/2011	6.72				
Berenda Slough along Ave 18 1/2	Irrigation	4/19/2011			3.3 (1.36)	0.021	
Berenda Slough along Ave 18 1/2	Irrigation	5/17/2011			3.8 (1.57)		
Berenda Slough along Ave 18 1/2	Irrigation	6/21/2011			3.6 (1.46)		
Berenda Slough along Ave 18 1/2	Irrigation	7/19/2011			2.6 (1.03)		
Berenda Slough along Ave 18 1/2	Irrigation	8/16/2011		290	2.3 (1.25)		
Berenda Slough along Ave 18 1/2	Irrigation	9/13/2011		370	2.1 (1.46)		
Berenda Slough along Ave 18 1/2	Fall	10/11/2011	5.69	1600	4.2 (1.03)		
Berenda Slough along Ave 18 1/2	Fall	11/8/2011			3.1 (2.46)		
Berenda Slough along Ave 18 1/2	Fall	12/6/2011			3.7 (3.38)		
Berenda Slough along Ave 18 1/2	Winter	3/6/2012					
Berenda Slough along Ave 18 1/2	Irrigation	6/12/2012			5.7 (3.02)		
Berenda Slough along Ave 18 1/2	Irrigation	7/10/2012			4.8 (3.02)		

Site Name	Season	Sample Date	Dissolved Oxygen, <7 mg/L	*E. coli*, >235 MPN/100 mL	Copper (Dissolved), Variable[1] or >1300 µg/L	Chlorpyrifos, >0.015 µg/L	*S. capricornutum*, (% Control)
Berenda Slough along Ave 18 1/2	Irrigation	8/14/2012	3.72				
Berenda Slough along Ave 18 1/2	Irrigation	7/9/2013	3.66				

[1] Metal WQTL variable; based on hardness.

BLACK RASCAL CREEK @ YOSEMITE RD

Overview

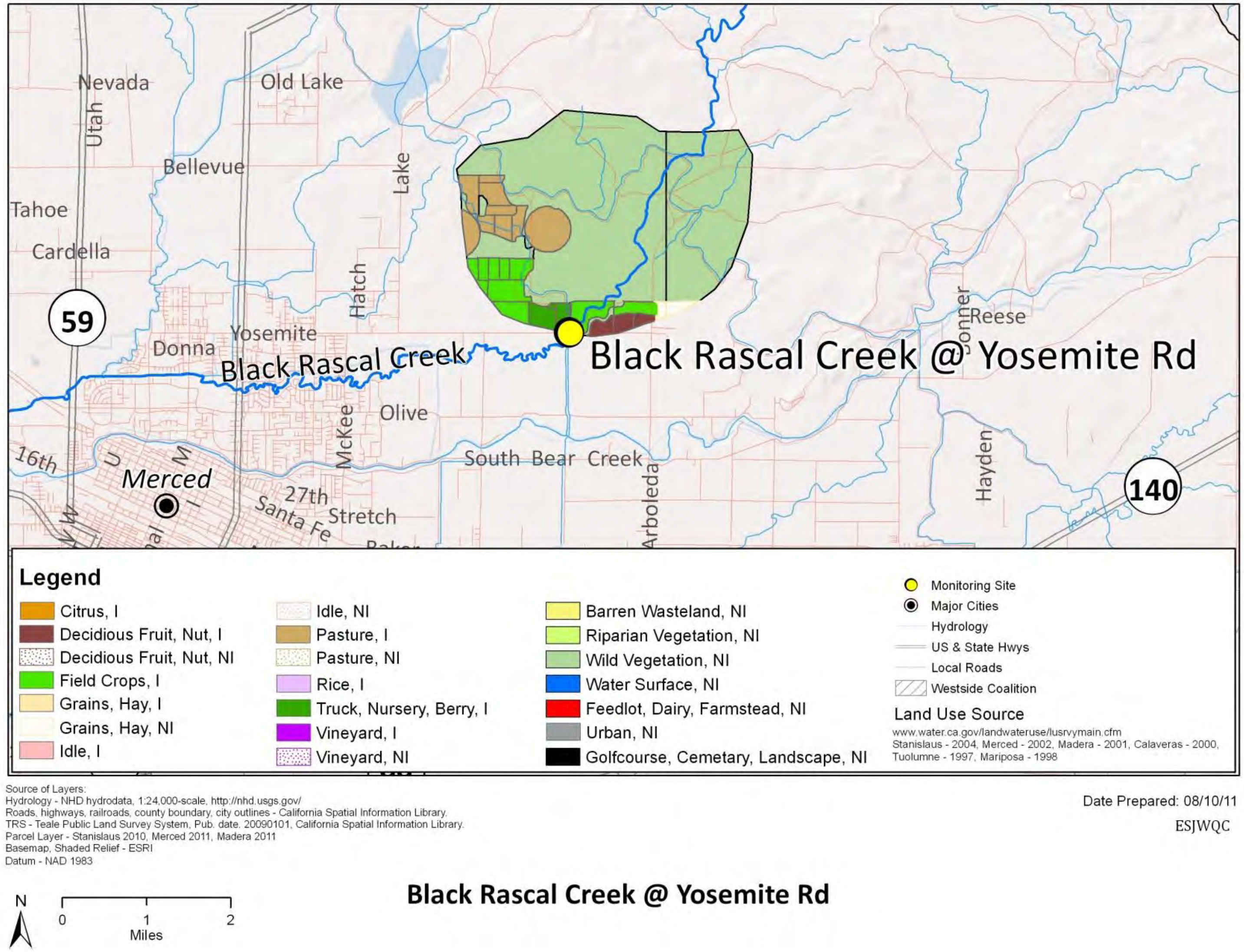
Monitoring was initiated at Black Rascal Creek @ Yosemite Rd during the irrigation season of 2006 and continued through 2008. From 2009 through 2012 monitoring did not occur at the site. The Coalition began focused outreach in 2012 and will continue through 2014. The management plan constituents for Black Rascal Creek @ Yosemite Rd are chlorpyrifos, DO, *E. coli*, lead, pH and *C. dubia* toxicity (Table 7).

Under the WDR, Black Rascal Creek @ Yosemite Rd is a Represented Site and monitoring will occur as needed based on Core Site exceedances; land use is included in Figure 4. During the 2014 WY, MPM will occur for lead (April and September), chlorpyrifos (May and July through September), and *C. dubia* toxicity (May and July through August).

Table 7. Black Rascal Creek @ Yosemite Rd management plan constituents.

Constituent	Management Plan Initiation Year	Management Plan Removal Year	10 Year Compliance Deadline
Chlorpyrifos	2007	Active	2017
C. dubia water column toxicity	2008	Active	2018
Dissolved Oxygen	2007	Active	Pending Workplan
E. coli	2007	Active	Pending Workplan
Lead	2009	Active	Pending Workplan
pH	2009	Active	Pending Workplan

Figure 4. Black Rascal Creek @ Yosemite Rd site subwatershed land use map.



During January through September 2013, MPM occurred for chlorpyrifos, water column toxicity to *C. dubia* and lead; no exceedances of the WQTL or toxicity occurred. The last exceedance of the WQTL for chlorpyrifos occurred in 2007. The last exceedance of the hardness based WQTL lead occurred in 2008 and the last toxicity to *C. dubia* occurred in 2007. During all MPM events, the field parameters, DO and pH, were measured; exceedances of the WQTL for DO (4) and pH (1) occurred.

Table 8 is record of yearly exceedances of WQTLs from 2006 through September 2013 for Black Rascal Creek @ Yosemite Rd site subwatershed management plan constituents.

Table 8. Black Rascal Creek @ Yosemite Rd exceedances of management plan constituents (2006-September 2013).

The WQTLs used to evaluate the data are listed in the header after the analyte.

Site Name	Season	Sample Date	Dissolved Oxygen, <7 mg/L	pH, <6.5 and > 8.5 units	*E. coli*, >235 MPN/100 mL	Lead (Total), Variable[1]	Chlorpyrifos, >0.015 µg/L	*C. dubia*, (% Control)
Black Rascal Creek @ Yosemite Rd	Irrigation	5/18/2006	5.41		2400		0.033	
Black Rascal Creek @ Yosemite Rd	Irrigation	6/14/2006			490			
Black Rascal Creek @ Yosemite Rd	Irrigation	7/12/2006	5.53					
Black Rascal Creek @ Yosemite Rd	Irrigation	8/9/2006	5.65					
Black Rascal Creek @ Yosemite Rd	Irrigation	9/12/2006	5.56					
Black Rascal Creek @ Yosemite Rd	Storm	2/12/2007			2400			
Black Rascal Creek @ Yosemite Rd	Storm	3/1/2007			2400			
Black Rascal Creek @ Yosemite Rd	Irrigation	5/29/2007	3.93		770			20
Black Rascal Creek @ Yosemite Rd	Irrigation	6/26/2007	6.95					
Black Rascal Creek @ Yosemite Rd	Irrigation	7/24/2007			580		3.7	0
Black Rascal Creek @ Yosemite Rd	Irrigation	7/31/2007						0
Black Rascal Creek @ Yosemite Rd	Irrigation	8/21/2007	6.42				0.12	0
Black Rascal Creek @ Yosemite Rd	Sediment	8/23/2007	5.69					
Black Rascal Creek @ Yosemite Rd	Irrigation	8/28/2007	6.18					0
Black Rascal Creek @ Yosemite Rd	Irrigation	9/18/2007					0.031	
Black Rascal Creek @ Yosemite Rd	Storm	1/24/2008			>2400			
Black Rascal Creek @ Yosemite Rd	Storm	2/25/2008			>2400			
Black Rascal Creek @ Yosemite Rd	Irrigation	4/29/2008		8.8	770	2.4 (2.39)		
Black Rascal Creek @ Yosemite Rd	Irrigation	5/27/2008			920			
Black Rascal Creek @ Yosemite Rd	Irrigation	6/24/2008			490			
Black Rascal Creek @ Yosemite Rd	Irrigation	7/8/2008	2.30					
Black Rascal Creek @ Yosemite Rd	Irrigation	7/29/2008	4.49					
Black Rascal Creek @ Yosemite Rd	Irrigation	8/5/2008	5.58					
Black Rascal Creek @ Yosemite Rd	Irrigation	8/26/2008	2.58					
Black Rascal Creek @ Yosemite Rd	Sediment	8/28/2008	2.26					
Black Rascal Creek @ Yosemite Rd	Irrigation	9/9/2008	4.18					

Site Name	Season	Sample Date	Dissolved Oxygen, <7 mg/L	pH, <6.5 and > 8.5 units	*E. coli*, >235 MPN/100 mL	Lead (Total), Variable[1]	Chlorpyrifos, >0.015 µg/L	*C. dubia*, (% Control)
Black Rascal Creek @ Yosemite Rd	Irrigation	9/30/2008	3.75	5		1.3 (0.75)		
Black Rascal Creek @ Yosemite Rd	Sediment	10/2/2008	5.05					
Black Rascal Creek @ Yosemite Rd	Irrigation	4/9/2013	6.40					
Black Rascal Creek @ Yosemite Rd	Irrigation	5/14/2013	1.68					
Black Rascal Creek @ Yosemite Rd	Irrigation	7/9/2013	2.40	6.26				
Black Rascal Creek @ Yosemite Rd	Irrigation	8/13/2013	1.92					

[1] Metal WQTL variable; based on hardness.

COTTONWOOD CREEK @ RD 20

Overview

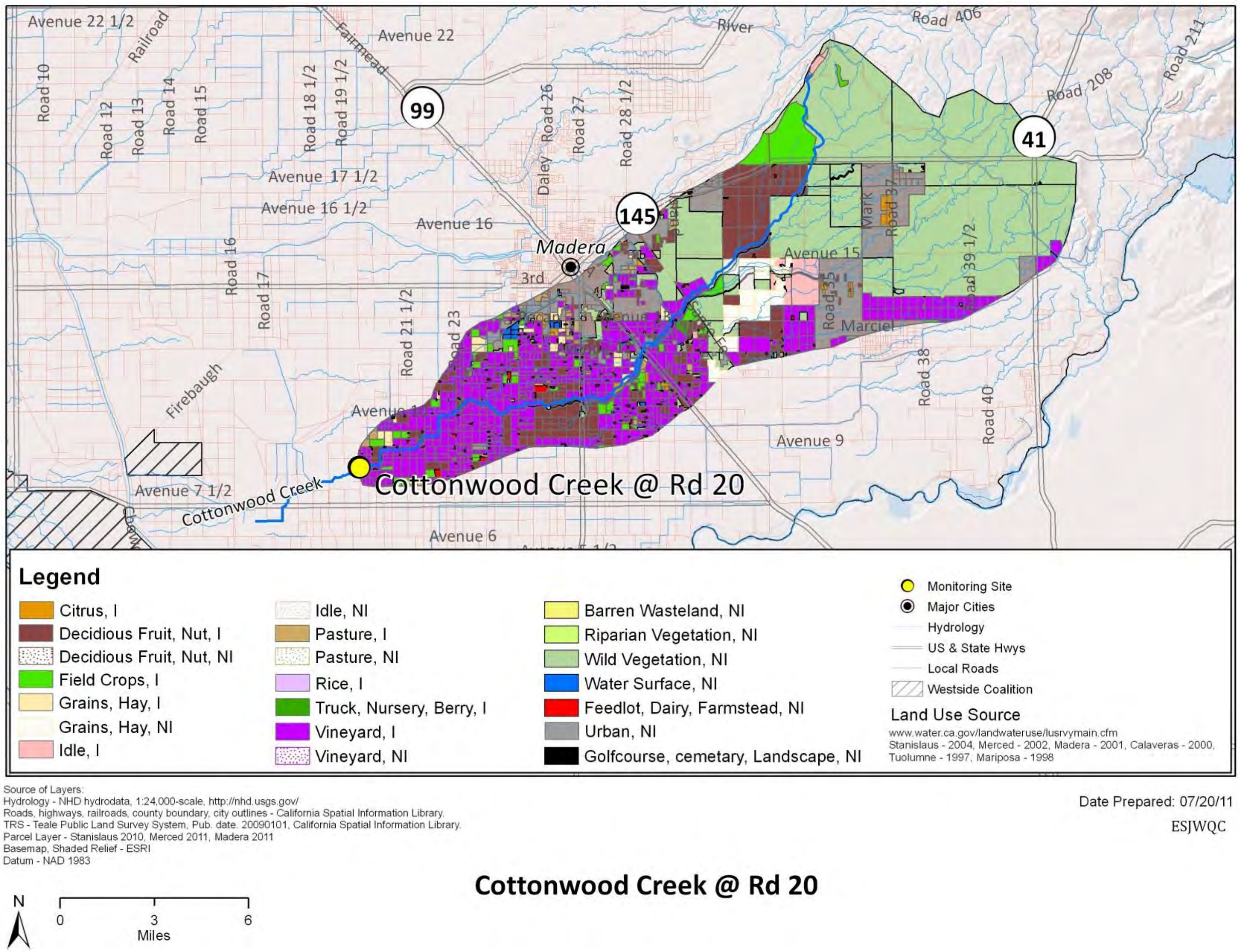
Monitoring at Cottonwood Creek @ Rd 20 began during the storm season of 2005 and continued through September 2013. Assessment Monitoring last occurred at the site in 2011. MPM during months of past exceedances occurred at the site in 2008 and continued through September 2013. The Coalition completed focused outreach from 2010 through 2012 and water quality improved in the site subwatershed. The Coalition received approval to remove diazinon and diuron on May 30, 2012 and chlorpyrifos on October 15, 2013 from the site's management plan. The remaining management plan constituents are copper, DO, *E. coli,* and lead (Table 9).

Under the WDR, Cottonwood Creek @ Rd 20 will be monitored as the Core Site; land use is included in Figure 5. During the 2014 WY, MPM is scheduled for copper (October through September) and lead (January through February and June).

Table 9. Cottonwood Creek @ Rd 20 management plan constituents.

Constituent	Management Plan Initiation Year	Management Plan Removal Year	10 Year Compliance Deadline
Copper	2007	Active	Pending Workplan
Dissolved Oxygen	2006	Active	Pending Workplan
E. coli	2006	Active	Pending Workplan
Lead	2009	Active	Pending Workplan
Constituent (Removed)			
Chlorpyrifos	2009	2013	2019
Diazinon	2009	2012	2019
Diuron	2009	2012	2019

Figure 5. Cottonwood Creek @ Rd 20 site subwatershed land use map.



During January through September 2013, MPM was scheduled for chlorpyrifos, copper, and lead. Cottonwood Creek @ Rd 20 was dry during five MPM events (February, April, May, June, August). As a result, samples were only collected for chlorpyrifos, copper, and lead during January 2013; one exceedance of the hardness based WQTL for dissolved copper occurred.

Core Monitoring occurred from January through September 2013; DO and *E. coli* were monitored monthly. There were two exceedances of the WQTL for DO in July and September and three exceedances of the WQTL for *E. coli* in February, July and September.

Table 10 is a record of yearly exceedances of WQTLs from 2005 through September 2013 for Cottonwood Creek @ Rd 20 site subwatershed management plan constituents.

Table 10. Cottonwood Creek @ Rd 20 and upstream site exceedances of management plan constituents (2005-September 2013).

The WQTLs used to evaluate the data are listed in the header after the analyte. Upstream sites are italicized.

Site Name	Season	Sample Date	Dissolved Oxygen, <7 mg/L	*E. coli*, >235 MPN/100 mL	Copper (Dissolved), Variable1	Copper (Total), Variable[1] or >1300 µg/L	Lead (Total), Variable[1]	Chlorpyrifos, >0.015 µg/L	Diazinon, >0.1 µg/L	Diuron, >2 µg/L
Cottonwood Creek @ Rd 20	Storm	2/16/2005		1600						
Cottonwood Creek @ Rd 20	Storm	3/21/2005	5.6	1600						
Cottonwood Creek @ Rd 20	Irrigation	5/10/2005		540						
Cottonwood Creek @ Rd 20	Irrigation	6/14/2005	5.7							
Cottonwood Creek @ Rd 20	Irrigation	7/12/2005	5.17							
Cottonwood Creek @ Rd 20	Irrigation	8/16/2005		300						
Cottonwood Creek @ Rd 20	Irrigation	9/20/2005	6.5							
Cottonwood Creek @ Rd 20	Storm	2/28/2006		300						
Cottonwood Creek @ Rd 20	Storm	3/15/2006		1600						
Cottonwood Creek @ Rd 20	Irrigation	5/16/2006	5.71			4.4 (3.5)				
Cottonwood Creek @ Rd 20	Irrigation	6/13/2006	6.9			8 (6.9)	0.73 (0.63)			
Cottonwood Creek @ Rd 20	Irrigation	7/11/2006	6.51							
Cottonwood Creek @ Rd 20	Irrigation	8/8/2006	6.95							
Cottonwood Creek @ Rd 20	Irrigation	9/12/2006	6.11			5.5 (4.4)				
Cottonwood Creek @ Rd 20	Irrigation	5/29/2007	6.55			6.7 (5.5)				
Cottonwood Creek @ Rd 20	Irrigation	6/19/2007				6.7 (4.1)				
Cottonwood Creek @ Rd 20	Irrigation	6/26/2007				4.3 (4.1)				
Cottonwood Creek @ Rd 20	Irrigation	7/24/2007				5.4 (4.6)				
Cottonwood Creek @ Rd 20	Irrigation	8/21/2007	6.81			5.2 (4.6)				
Cottonwood Creek @ Rd 20	Irrigation	8/23/2007	3.95							
Cottonwood Creek @ Rd 20	Storm	1/25/2008		1200		24 (3.0)	5.4 (0.6)	0.02		68
Cottonwood Creek @ Rd 20	Storm	2/25/2008				21 (6.5)	1.9 (1.9)	0.04	0.2	65
Cottonwood Creek @ Rd 20	Sediment	3/4/2008								
Cottonwood Creek @ Rd 20	Irrigation	4/29/2008		580		8 (6.9)				
Cottonwood Creek @ Rd 20	Irrigation	5/7/2008								
Cottonwood Creek @ Rd 20	Irrigation	5/27/2008		250						
Cottonwood Creek @ Hwy 145	*Irrigation*	*6/24/2008*				*39 (5.5)*				
Cottonwood Creek @ Rd 20	Irrigation	6/24/2008		1300						
Cottonwood Creek @ Rd 20	Irrigation	7/29/2008		1000						

Site Name	Season	Sample Date	Dissolved Oxygen, <7 mg/L	*E. coli*, >235 MPN/100 mL	Copper (Dissolved), Variable1	Copper (Total), Variable[1] or >1300 µg/L	Lead (Total), Variable[1]	Chlorpyrifos, >0.015 µg/L	Diazinon, >0.1 µg/L	Diuron, >2 µg/L
Cottonwood Creek @ Hwy 145	*Irrigation*	*8/26/2008*	*6.45*							
Cottonwood Creek @ Rd 20	Irrigation	8/26/2008	6.83	390		4.4 (3.7)				
Cottonwood Creek @ Rd 20	Storm	2/7/2009		>2400						
Cottonwood Creek @ Rd 20	Irrigation	5/19/2009	6.72							
Cottonwood Creek @ Rd 20	Fall	11/17/2009		770						
Cottonwood Creek @ Rd 20	Storm	1/19/2010						0.21		
Cottonwood Creek @ Rd 20	Storm	4/20/2010	6.36		3.1 (2.17)					
Cottonwood Creek @ Rd 20	Irrigation	5/18/2010			3.6 (2.36)					
Cottonwood Creek @ Rd 20	Irrigation	6/15/2010		2000						
Cottonwood Creek @ Rd 20	Irrigation	7/20/2010	6.80							
Cottonwood Creek @ Rd 20	Irrigation	8/17/2010	6.04		5.3 (4.9)					
Cottonwood Creek @ Rd 20	Irrigation	9/14/2010	6.44							
Cottonwood Creek @ Rd 20	Fall	10/19/2010		290						
Cottonwood Creek @ Rd 20	Irrigation	4/19/2011	6.7		4.6 (3.83)					
Cottonwood Creek @ Rd 20	Irrigation	5/17/2011			3.8 (3.02)					
Cottonwood Creek @ Rd 20	Irrigation	6/21/2011		550						
Cottonwood Creek @ Rd 20	Irrigation	7/19/2011			4.3 (3.56)					
Cottonwood Creek @ Rd 20	Irrigation	8/16/2011		250						
Cottonwood Creek @ Rd 20	Irrigation	9/13/2011			5.8 (3.20)					
Cottonwood Creek @ Rd 20	Fall	10/11/2011		>2400	4.1 (3.56)					
Cottonwood Creek @ Rd 20	Winter	1/8/2013		690	13 (6.84)					
Cottonwood Creek @ Rd 20	Irrigation	7/9/2013	5.28	1203.3						
Cottonwood Creek @ Rd 20	Irrigation	9/10/2013	5.34	1986.3						

[1] Metal WQTL variable; based on hardness.

DEADMAN CREEK @ GURR RD

Overview

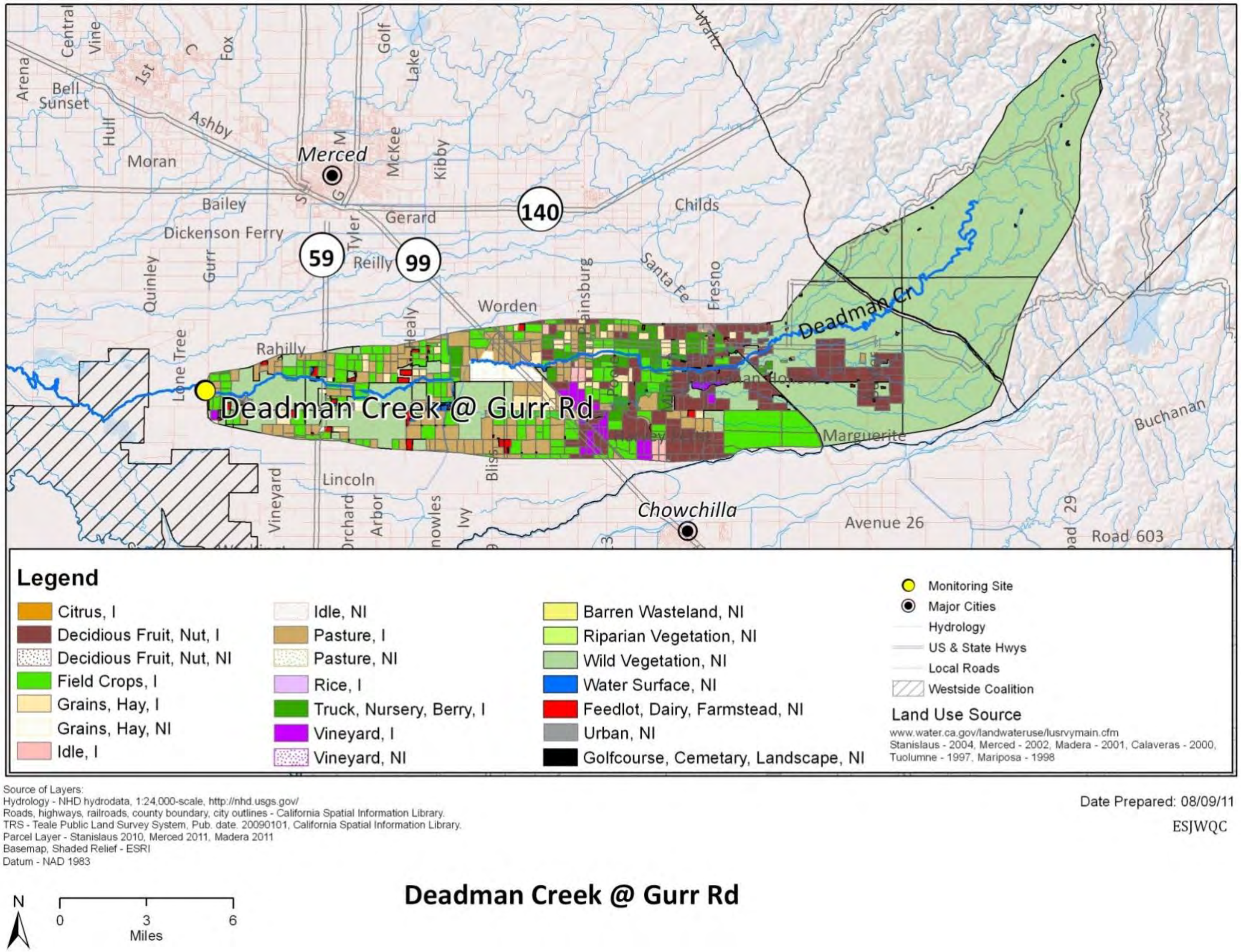
Monitoring at Deadman Creek @ Gurr Rd began in 2004 and continued through September 2013, with the exception of 2011. The site rotated into Assessment Monitoring from 2008 through 2010. MPM occurred in 2010, 2012, and 2013. Focused outreach began in 2012 and will be completed in 2014. The Coalition received approval on May 30, 2012 to remove copper from the site's management plan based on improved water quality. The remaining constituents in the Deadman Creek @ Gurr Rd management plan are ammonia, arsenic, chlorpyrifos, DO, *E. coli*, pH, SC, TDS, *C. dubia* toxicity, *P. promelas* toxicity, and *S. capricornutum* toxicity (Table 11).

Under the WDR, Deadman Creek @ Gurr Rd is a Represented Site and monitoring will occur as needed based on Core Site exceedances; land use is included in Figure 6. During the 2014 WY, MPM is scheduled for chlorpyrifos (March through April and August through September), toxicity to *C. dubia* (November and February through March), toxicity to *P. promelas* (November through March and May through June), and toxicity to *S. capricornutum* (February and July).

Table 11. Deadman Creek @ Gurr Rd management plan constituents.

Constituent	Management Plan Initiation Year	Management Plan Removal Year	10 Year Compliance Deadline
Chlorpyrifos	2007	Active	2017
C. dubia water column toxicity	2010	Active	2020
P. promelas water column toxicity	2008	Active	2018
S. capricornutum water column toxicity	2009	Active	2019
Ammonia	2010	Active	Pending Workplan
Arsenic	2008	Active	Pending Workplan
Dissolved Oxygen	2005	Active	Pending Workplan
E. coli	2005	Active	Pending Workplan
pH	2013	Active	Pending Workplan
Specific Conductivity	2009	Active	Pending Workplan
Total Dissolved Solids	2009	Active	Pending Workplan
Constituent (Removed)			
Copper	2008	2012	Pending Workplan

Figure 6. Deadman Creek @ Gurr Rd. site subwatershed land use map.



Monitoring Results

MPM occurred from January through September 2013 for chlorpyrifos and water column toxicity to *C. dubia, P. promelas*, and *S. capricornutum*; no exceedances of the WQTL or toxicities occurred. The last exceedance of the WQTL for chlorpyrifos occurred in 2010. Water column toxicity to *C. dubia* and *P. promelas* last occurred in 2010 and toxicity to *S. capricornutum* last occurred in 2009. An exceedance of the WQTL for DO occurred in August 2013 and exceedances of the WQTL for pH occurred in February and March 2013.

Table 12 is a record of yearly exceedances of WQTLs from 2004 through September 2013 for Deadman Creek @ Gurr Rd site subwatershed management plan constituents.

Table 12. Deadman Creek @ Gurr Rd exceedances of management plan constituents (2004-September 2013).

The WQTLs used to evaluate the data are listed in the header after the analyte.

Site Name	Season	Sample Date	Dissolved Oxygen, <7 mg/L	pH, <6.5 and > 8.5 units	Specific Conductivity, >700 µS/cm	Total Dissolved Solids, >450 mg/L	Ammonia, Variable[1] or >1.5 mg/L	*E. coli*, >235 MPN/100 mL	Arsenic, >10 µg/L[2]	Copper (Total), Variable[2] or >1300 µg/L	Chlorpyrifos, >0.015 µg/L	*C. .dubia*, (% Control)	*P. promelas*, (% Control)	*S. capricornutum*, (% Control)
Deadman Creek @ Gurr Rd	Irrigation	7/31/2004	6.85					1600						
Deadman Creek @ Gurr Rd	Irrigation	8/31/2004						1600						
Deadman Creek @ Gurr Rd	Irrigation	9/29/2004	6.70					500						
Deadman Creek @ Gurr Rd	Irrigation	5/17/2006						1200						
Deadman Creek @ Gurr Rd	Irrigation	6/13/2006	5.01					310					88	
Deadman Creek @ Gurr Rd	Irrigation	7/11/2006	6.50					490						
Deadman Creek @ Gurr Rd	Irrigation	8/8/2006	6.96					390						
Deadman Creek @ Gurr Rd	Irrigation	9/12/2006	6.08					2400			0.027			
Deadman Creek @ Gurr Rd	Storm	2/11/2007						2400	14	16 (15.4)				
Deadman Creek @ Gurr Rd	Storm	2/28/2007						1000	14					
Deadman Creek @ Gurr Rd	Irrigation	4/24/2007								9.2 (7.7)				
Deadman Creek @ Gurr Rd	Irrigation	5/29/2007	5.11					1400		8.8 (7.5)			87	
Deadman Creek @ Gurr Rd	Irrigation	6/26/2007						460						
Deadman Creek @ Gurr Rd	Irrigation	7/24/2007	5.38											42
Deadman Creek @ Gurr Rd	Irrigation	9/18/2007	5.88					820						
Deadman Creek @ Gurr Rd	Storm	1/25/2008						870	15	19 (11.7)				
Deadman Creek @ Gurr Rd	Storm	2/25/2008		8.51				550	13					47
Deadman Creek @ Gurr Rd	Irrigation	4/29/2008						>2400	18					
Deadman Creek @ Gurr Rd	Irrigation	5/27/2008			801	520								
Deadman Creek @ Gurr Rd	Irrigation	6/24/2008	4.85											
Deadman Creek @ Gurr Rd	Irrigation	7/29/2008	6.87											
Deadman Creek @ Gurr Rd	Irrigation	8/26/2008	5.21					330						
Deadman Creek @ Gurr Rd	Sediment	8/28/2008	5.90											
Deadman Creek @ Gurr Rd	Irrigation	9/30/2008	5.46					330						
Deadman Creek @ Gurr Rd	Fall	10/1/2108						1400	12					
Deadman Creek @ Gurr Rd	Fall	11/11/2008						370	14					
Deadman Creek @ Gurr Rd	Fall	12/16/2008						1400						
Deadman Creek @ Gurr Rd	Winter	1/20/2009	5.61		762	470	5.5 (3.93)	>2400	18				88	
Deadman Creek @ Gurr Rd	Storm	2/7/2009	1.01		1802	1100	50 (3.82)	>2400	30			0	0	7
Deadman Creek @ Gurr Rd	Winter	3/17/2009						1600	14			10		
Deadman Creek @ Gurr Rd	Irrigation	5/19/2009						490						
Deadman Creek @ Gurr Rd	Irrigation	6/16/2009						730						

Site Name	Season	Sample Date	Dissolved Oxygen, <7 mg/L	pH, <6.5 and > 8.5 units	Specific Conductivity, >700 µS/cm	Total Dissolved Solids, >450 mg/L	Ammonia, Variable[1] or >1.5 mg/L	*E. coli*, >235 MPN/100 mL	Arsenic, >10 µg/L[2]	Copper (Total), Variable[2] or >1300 µg/L	Chlorpyrifos, >0.015 µg/L	*C. dubia*, (% Control)	*P. promelas*, (% Control)	*S. capricornutum*, (% Control)
Deadman Creek @ Gurr Rd	Irrigation	7/21/2009	6.04					460						
Deadman Creek @ Gurr Rd	Irrigation	8/18/2009	6.94											
Deadman Creek @ Gurr Rd	Fall	10/20/2009	6.08					490						
Deadman Creek @ Gurr Rd	Fall	11/17/2009						2000						
Deadman Creek @ Gurr Rd	Storm, Non-contiguous	12/15/2009	5.02		995	610	15	>2400					75	
Deadman Creek @ Gurr Rd	Storm	1/19/2010						>2400						
Deadman Creek @ Gurr Rd	Storm	2/23/2010						370						
Deadman Creek @ Gurr Rd	Winter, Non-contiguous	3/23/2010	0.20		4023	2100	155.4	>2400			0.14	0	0	
Deadman Creek @ Gurr Rd	Storm	4/20/2010						280			0.018			
Deadman Creek @ Gurr Rd	Irrigation	5/18/2010						240						
Deadman Creek @ Gurr Rd	Irrigation	6/15/2010	4.56					370						
Deadman Creek @ Gurr Rd	Irrigation	7/20/2010	6.60					580						
Deadman Creek @ Gurr Rd	Irrigation	8/17/2010	6.77								0.024			
Deadman Creek @ Gurr Rd	Sediment	9/14/2010	6.82					360						
Deadman Creek @ Gurr Rd	Fall	10/19/2010						340						
Deadman Creek @ Gurr Rd	Fall	11/16/2010	6.82		1547	840	31 (2.05)	>2400	14			0	0	
Deadman Creek @ Gurr Rd	Fall, Non-contiguous	12/14/2010	5.2					>2400						
Deadman Creek @ Gurr Rd	Winter, Non-contiguous	1/10/2012		8.68										
Deadman Creek @ Gurr Rd	Winter	2/7/2012		8.57										
Deadman Creek @ Gurr Rd	Winter	2/12/2013		8.56										
Deadman Creek @ Gurr Rd	Winter	3/12/2013		8.55										
Deadman Creek @ Gurr Rd	Irrigation	8/13/2013	6.46											

[1]Ammonia WQTL variable based on pH and temperature.
[2] Metal WQTL variable; based on hardness.

DEADMAN CREEK @ HWY 59

Overview

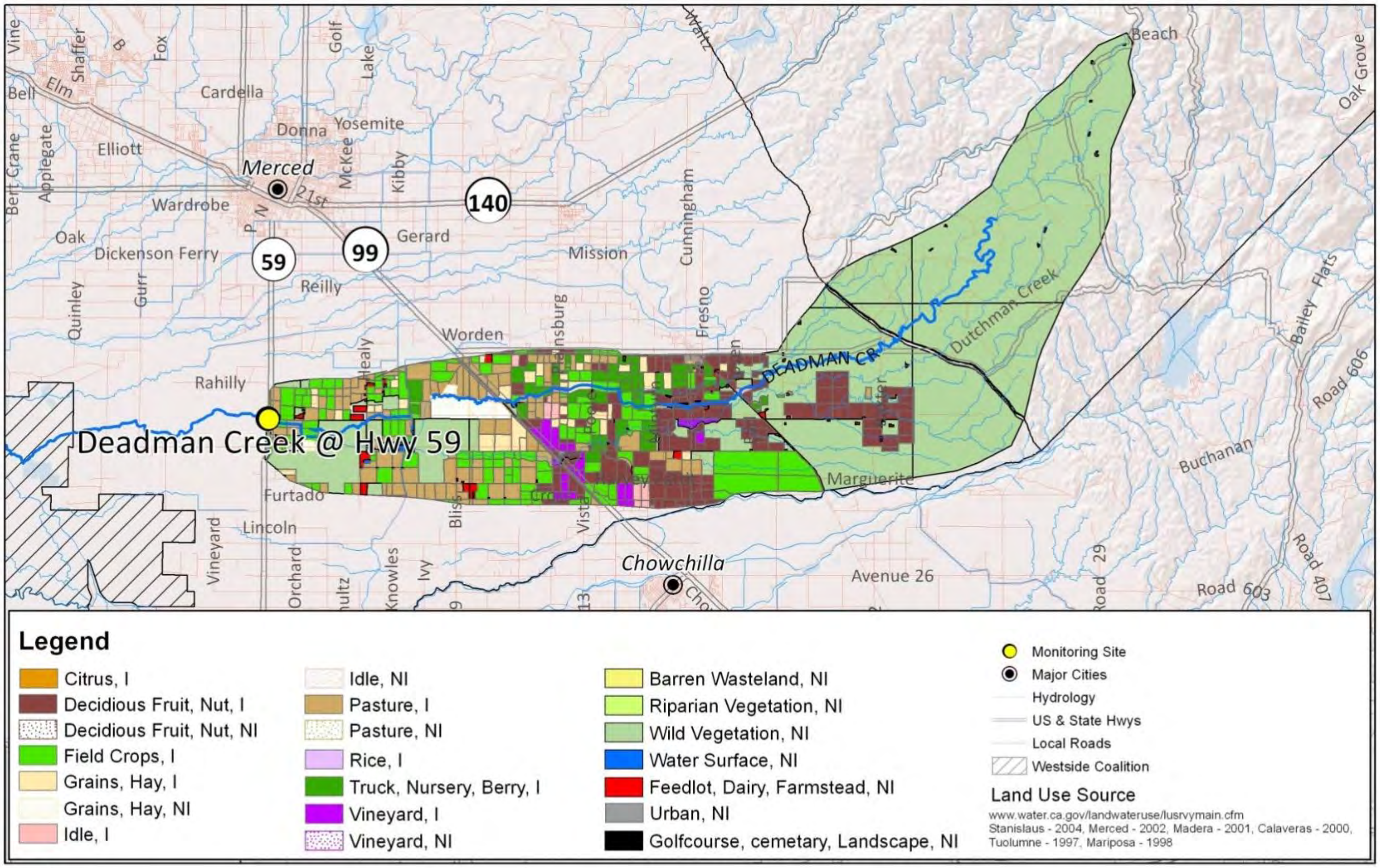
Monitoring at Deadman Creek @ Hwy 59 began in 2006 and continued through September 2013, with the site rotating into Assessment Monitoring in 2011 and 2012. During 2012 and 2013, MPM for chlorpyrifos and water column toxicity to *S. capricornutum* occurred; no exceedances of the WQTL or toxicity occurred. Focused outreach began in 2012 and will be completed in 2014. The Coalition received approval to remove *S. capricornutum* toxicity from the active management plan on October 15, 2013 due to improved water quality. The remaining management plan constituents are arsenic, chlorpyrifos, DO, *E. coli,* and pH (Table 13).

Under the WDR, Deadman Creek @ Hwy 59 is a Represented Site during and monitoring will occur as needed based on Core Site exceedances; land use is included in Figure 7. During the 2014 WY, MPM is scheduled for chlorpyrifos (March through April and August through September).

Table 13. Deadman Creek @ Hwy 59 management plan constituents.

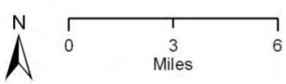
Constituent	Management Plan Initiation Year	Management Plan Removal Year	10 Year Compliance Deadline
Chlorpyrifos	2007	Active	2017
Arsenic	2009	Active	Pending Workplan
Dissolved Oxygen	2007	Active	Pending Workplan
E. coli	2008	Active	Pending Workplan
pH	2012	Active	Pending Workplan
Constituent (Removed)			
S. capricornutum water column toxicity	2009	2013	2019

Figure 7. Deadman Creek @ Hwy 59 site subwatershed land use map.



Source of Layers:
Hydrology - NHD hydrodata, 1:24,000-scale, http://nhd.usgs.gov/
Roads, highways, railroads, county boundary, city outlines - California Spatial Information Library.
TRS - Teale Public Land Survey System, Pub. date. 20090101, California Spatial Information Library.
Parcel Layer - Stanislaus 2010, Merced 2011, Madera 2011
Basemap, Shaded Relief - ESRI
Datum - NAD 1983

Date Prepared: 07/20/11
ESJWQC



Deadman Creek @ Hwy 59

Monitoring Results

During January through September 2013, MPM occurred for chlorpyrifos and toxicity to *S. capricornutum* and no exceedances or toxicity occurred. The last exceedance of the WQTL for chlorpyrifos was in 2011 and the last toxicity to *S. capricornutum* occurred in 2008. The field parameters, DO and pH, were measured during all MPM events and no exceedances of the WQTLs occurred.

Table 14 is a record of yearly exceedances of WQTLs from 2006 through September 2013 for Deadman Creek @ Hwy 59 site subwatershed management plan constituents.

Table 14. Deadman Creek @ Hwy 59 exceedances of management plan constituents (2006-September 2013)
The WQTLs used to evaluate the data are listed in the header after the analyte.

Site Name	Season	Sample Date	Dissolved Oxygen, <7 mg/L	pH, <6.5 and > 8.5 units	*E. coli*, >235 MPN/100 mL	Arsenic,[1] >10 µg/L	Chlorpyrifos, >0.015 µg/L	*S. capricornutum*, (% Control)
Deadman Creek @ Hwy 59	Irrigation	6/13/2006	5.65					
Deadman Creek @ Hwy 59	Irrigation	8/8/2006	6.55					
Deadman Creek @ Hwy 59	Irrigation	9/12/2006	6.53				0.059	
Deadman Creek @ Hwy 59	Storm	2/11/2007			400			
Deadman Creek @ Hwy 59	Storm	2/28/2007			490			
Deadman Creek @ Hwy 59	Irrigation	4/24/2007			310			
Deadman Creek @ Hwy 59	Irrigation	5/29/2007	6.13		490			
Deadman Creek @ Hwy 59	Irrigation	6/26/2007	6.78		610			
Deadman Creek @ Hwy 59	Irrigation	7/24/2007	4.31					
Deadman Creek @ Hwy 59	Irrigation	8/21/2007	4.47				0.038	
Deadman Creek @ Hwy 59	Irrigation	8/23/2007	2.65					
Deadman Creek @ Hwy 59	Irrigation	9/18/2007	5.43		330			
Deadman Creek @ Hwy 59	Storm	1/25/2008			>2400			44
Deadman Creek @ Hwy 59	Storm	2/25/2008			1200			
Deadman Creek @ Hwy 59	Irrigation	4/29/2008			610	16		71
Deadman Creek @ Hwy 59	Irrigation	5/7/2008						42
Deadman Creek @ Hwy 59	Irrigation	5/27/2008			610	12		
Deadman Creek @ Hwy 59	Irrigation	6/24/2008	3.78		310	17		
Deadman Creek @ Hwy 59	Irrigation	7/29/2008	3.08		490			
Deadman Creek @ Hwy 59	Irrigation	8/5/2008	4.51				0.14	
Deadman Creek @ Hwy 59	Irrigation	8/26/2008	1.78			11		
Deadman Creek @ Hwy 59	Sediment	8/28/2008	1.05					
Deadman Creek @ Hwy 59	Irrigation	9/9/2008	3.37				0.069	
Deadman Creek @ Hwy 59	Irrigation	9/30/2008	4.45			13		
Deadman Creek @ Hwy 59	Sediment	10/2/2008	4.22					
Deadman Creek @ Hwy 59	Winter	1/18/2011			310			

Site Name	Season	Sample Date	Dissolved Oxygen, <7 mg/L	pH, <6.5 and > 8.5 units	*E. coli*, >235 MPN/100 mL	Arsenic,[1] >10 µg/L	Chlorpyrifos, >0.015 µg/L	*S. capricornutum*, (% Control)
Deadman Creek @ Hwy 59	Storm	2/17/2011		8.58				
Deadman Creek @ Hwy 59	Winter	3/15/2011			580			
Deadman Creek @ Hwy 59	Irrigation	4/19/2011		9.09	2400		0.016	
Deadman Creek @ Hwy 59	Irrigation	5/17/2011		9.63				
Deadman Creek @ Hwy 59	Irrigation	6/21/2011			410			
Deadman Creek @ Hwy 59	Irrigation	7/19/2011		8.57	460			
Deadman Creek @ Hwy 59	Irrigation	9/13/2011					0.049	
Deadman Creek @ Hwy 59	Winter	1/10/2012		8.66				
Deadman Creek @ Hwy 59	Winter	2/7/2012		8.59				
Deadman Creek @ Hwy 59	Storm	4/12/2012			410	12		
Deadman Creek @ Hwy 59	Irrigation	6/12/2012	6.61					
Deadman Creek @ Hwy 59	Irrigation	9/11/2012	4.92					
Deadman Creek @ Hwy 59	Fall	10/9/2012	3.72					

[1] Metal WQTL variable; based on hardness.

DRY CREEK @ RD 18

Overview

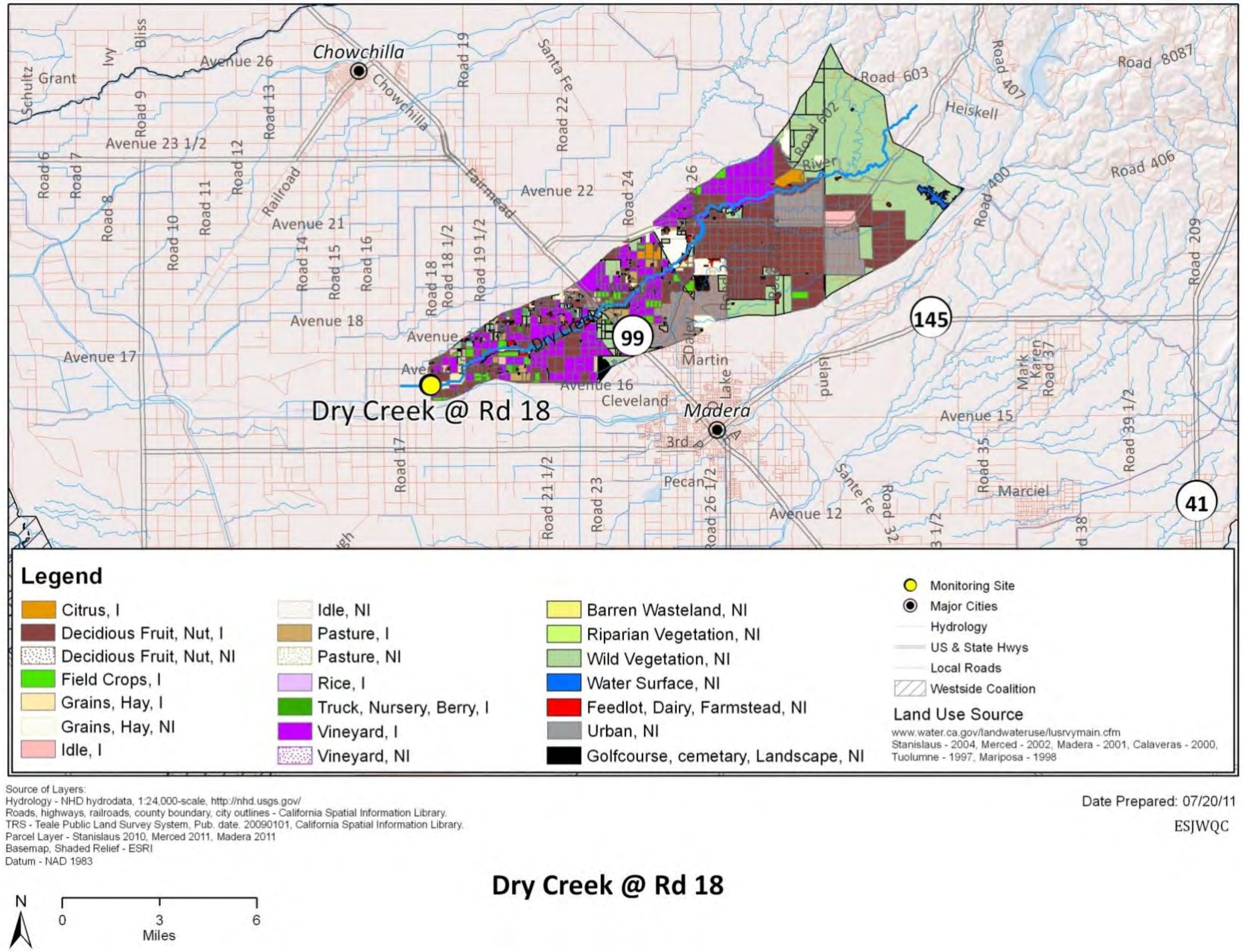
Monitoring began at Dry Creek @ Rd 18 during the 2005 irrigation season and continued through 2008; no monitoring occurred in 2009 or 2010. Monitoring resumed in 2011 through September 2013. Assessment Monitoring last occurred in site subwatershed in 2013. MPM during months of past exceedances occurred at the site in 2011 and January through September 2013. The Coalition completed focused outreach from 2011 through 2013. The Coalition received approval on October 15, 2013 to remove diazinon from the active management plan due to improved water quality. The remaining constituents in the site's management plan are chlorpyrifos, copper, diuron, DO, *E. coli,* lead, pH, sediment toxicity to *H. azteca*, and *S. capricornutum* toxicity (Table 15).

Under the WDR, Dry Creek @ Rd 18 is a Represented Site and monitoring will occur as needed based on Core Site exceedances; land use is included in Figure 8. During the 2014 WY, MPM is scheduled for copper (October through February and April through September), lead (May through June and August through September), chlorpyrifos (October through December, February, April and July through August), diuron (January through March), toxicity to *S. capricornutum* (January through February and May) and sediment toxicity to *H. azteca* (March and September).

Table 15. Dry Creek @ Rd 18 management plan constituents.

Constituent	Management Plan Initiation Year	Management Plan Removal Year	10 Year Compliance Deadline
Chlorpyrifos	2007	Active	2017
Copper	2007	Active	Pending Workplan
Diuron	2009	Active	2019
H. azteca sediment toxicity	2009	Active	2019
S. capricornutum water column toxicity	2009	Active	2019
Dissolved Oxygen	2009	Active	Pending Workplan
E. coli	2007	Active	Pending Workplan
Lead	2007	Active	Pending Workplan
pH	2008	Active	Pending Workplan
Constituent (Removed)			
Diazinon	2008	2013	2018

Figure 8. Dry Creek @ Rd 18 site subwatershed land use map.



Monitoring Results

During 2013, MPM occurred for chlorpyrifos, copper, diazinon, diuron, water column toxicity to *S. capricornutum,* and sediment toxicity to *H. azteca* during months of past exceedances. Assessment Monitoring also occurred at Dry Creek @ Rd 18 during 2013. There were no exceedances of the WQTLs for chlorpyrifos or lead; however, exceedances of the WQTLs for copper (5) and diuron (1) occurred. Water column toxicity to *S. capricornutum* occurred in February and sediment toxicity to *H. azteca* occurred in September. During Assessment Monitoring, *E. coli*, DO, and pH were monitored monthly and two exceedances of the WQTLs occurred for each constituent.

Table 16 is a record of yearly exceedances of WQTLs from 2005 through September 2013 for Dry Creek @ Rd 18 site subwatershed management plan constituents.

Table 16. Dry Creek @ Rd 18 and upstream site exceedances of management plan constituents (2005-September 2013).

The WQTLs used to evaluate the data are listed in the header after the analyte. Upstream sites are italicized.

Site Name	Season	Sample Date	Dissolved Oxygen, <7 mg/L	pH, <6.5 and > 8.5 units	*E. coli*, >235 MPN/100 mL	Copper (Dissolved), Variable[1]	Copper (Total), Variable[1] or >1300 µg/L	Lead (Total), Variable[1]	Chlorpyrifos, >0.015 µg/L	Diazinon, >0.1 µg/L	Diuron, >2 µg/L	*S. capricornutum*, (% Control)	*H. azteca*, (% Control)
Dry Creek @ Rd 18	Irrigation	8/16/2005		6.48									
Dry Creek @ Rd 18	Irrigation	9/20/2005			500								
Dry Creek @ Rd 18	Storm	5/3/2006											84
Dry Creek @ Rd 18	Irrigation	5/16/2006			1600		4.3 (1.9)	0.36 (0.31)					
Dry Creek @ Rd 18	Irrigation	6/13/2006					6.3 (1.5)	0.27 (0.21)					
Dry Creek @ Rd 18	Irrigation	7/11/2006					4.1 (2.4)		0.077				
Dry Creek @ Rd 18	Irrigation	8/8/2006					4.6 (2.2)						
Dry Creek @ Rd 18	Irrigation	9/12/2006	5.61				6.1 (1.1)	0.31 (0.13)					
Dry Creek @ Rd 18	Storm	2/11/2007					14 (3.9)			0.13			
Dry Creek @ Rd 18	Irrigation	4/24/2007			1400		17 (15.4)		0.017				
Dry Creek @ Rd 18	Irrigation	5/29/2007					4.7 (2.4)					64	
Dry Creek @ Rd 18	Irrigation	6/19/2007					4.9 (1.5)						
Dry Creek @ Rd 18	Irrigation	6/26/2007					3.6 (1.9)						
Dry Creek @ Rd 18	Irrigation	7/24/2007					5.6 (2.2)						
Dry Creek @ Rd 18	Irrigation	7/31/2007					4.5 (1.5)						
Dry Creek @ Rd 18	Irrigation	8/21/2007					5.5 (1.9)	0.34 (0.31)					
Dry Creek @ Rd 18	Irrigation	8/28/2007		8.53			4.3 (1.9)						
Dry Creek @ Rd 18	Storm	1/25/2008			>2400		20 (5.9)				21	36	
Dry Creek @ Rd 18	Storm	2/25/2008					33 (5.5)		0.034	0.24	2	77	
Dry Creek @ Rd 18	Storm, RS	3/4/2008										35	
Dry Creek @ Rd 18	Irrigation	4/29/2008					6.8 (3.0)						
Dry Creek @ Rd 18	Irrigation	5/27/2008					5 (3.5)						
Dry Creek @ Rd 18	Irrigation	6/24/2008					4 (2.6)						
Dry Creek @ Rd 18	Irrigation	7/29/2008					5.9 (1.5)						
Dry Creek @ Rd 18	Irrigation	8/26/2008	5.82				5.1 (1.3)	0.36 (0.17)					
Dry Creek @ Rd 18	Sediment	8/28/2008	5.62										89

Site Name	Season	Sample Date	Dissolved Oxygen, <7 mg/L	pH, <6.5 and > 8.5 units	*E. coli*, >235 MPN/100 mL	Copper (Dissolved), Variable[1]	Copper (Total), Variable[1] or >1300 µg/L	Lead (Total), Variable[1]	Chlorpyrifos, >0.015 µg/L	Diazinon, >0.1 µg/L	Diuron, >2 µg/L	*S. capricornutum*, (% Control)	*H. azteca*, (% Control)
Dry Creek @ Rd 22	*Irrigation*	*4/29/2008*		*8.8*			*5.2 (3.0)*						
Dry Creek @ Rd 22	*Irrigation*	*5/27/2008*					*5.7 (4.1)*						
Dry Creek @ Rd 22	*Irrigation*	*6/24/2008*					*6.5 (2.6)*						
Dry Creek @ Rd 22	*Irrigation*	*7/29/2008*					*7 (2.4)*						
Dry Creek @ Rd 28 1/2	*Irrigation*	*7/29/2008*					*5.3 (1.7)*						
Dry Creek @ Rd 22	*Irrigation*	*8/26/2008*					*6.5 (1.5)*						
Dry Creek @ Rd 22	*Irrigation*	*9/30/2008*	*3.97*				*36 (8.2)*						
Dry Creek @ Rd 18	Winter	1/18/2011				12 (8.65)							
Dry Creek @ Rd 18	Storm	2/17/2011		8.71									
Dry Creek @ Rd 18	Irrigation	4/19/2011				3.9 (3.20)							
Dry Creek @ Rd 18	Irrigation	5/17/2011				2.9 (1.36)							
Dry Creek @ Rd 18	Irrigation	6/21/2011				4.8 (1.03)							
Dry Creek @ Rd 18	Irrigation	7/19/2011		5.88		4.3 (0.81)							
Dry Creek @ Rd 18	Irrigation	8/16/2011				5.0 (0.81)							
Dry Creek @ Rd 18	Irrigation	9/13/2011				4.6 (1.03)							
Dry Creek @ Rd 18	Winter	2/7/2012		8.58									
Dry Creek @ Rd 18	Winter	1/8/2013			1700	11 (5.79)					5.2		
Dry Creek @ Rd 18	Winter	2/12/2013		9.09								4	
Dry Creek @ Rd 18	Storm	4/2/2013		8.57									
Dry Creek @ Rd 18	Irrigation	6/11/2013			307.6	6.8 (1.77)							
Dry Creek @ Rd 18	Irrigation	7/9/2013				3.7 (1.57)							
Dry Creek @ Rd 18	Irrigation	8/13/2013	6.54			3.0 (1.67)							
Dry Creek @ Rd 18	Irrigation	9/10/2013	5.17			2.3 (1.67)							92

[1] Metal WQTL variable; based on hardness.
RS-Resampling event.

DRY CREEK @ WELLSFORD RD

Overview

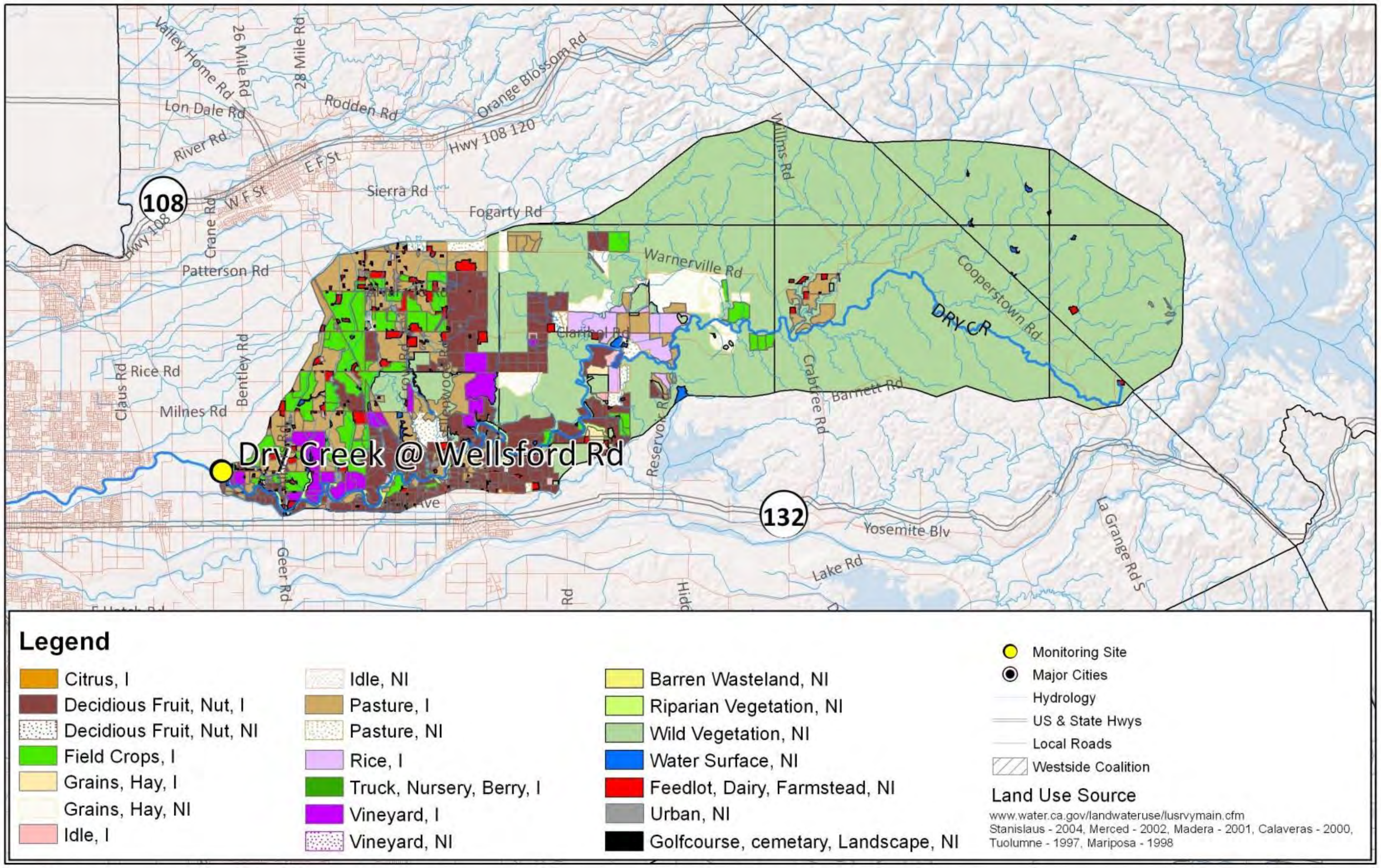
Monitoring at Dry Creek @ Wellsford Rd began during the storm season of 2005 and continued through September 2013. Assessment Monitoring last occurred at the site in 2011 and MPM occurred from 2009 through September 2013. The Coalition completed focused outreach in the site subwatershed from 2009 through 2011. The Coalition received approval on May 30, 2012 to remove copper, diuron, SC, and *S. capricornutum* toxicity from the site's management plan based on improved water quality. The remaining management plan constituents include chlorpyrifos, DO, *E. coli,* pH, TDS, *C. dubia* toxicity, and *H. azteca* toxicity (Table 17). Monitoring for toxicity to *C. dubia* last occurred in 2011 and represents the third year of monitoring with no toxicity; the Coalition will petition to remove it from the site's management plan in 2014.

Under the WDR, Dry Creek @ Wellsford Rd will be monitored as a Core Site; land use is included in Figure 9. During the 2014 WY, MPM is scheduled for chlorpyrifos (July through September) and *H. azteca* sediment toxicity (March and September).

Table 17. Dry Creek @ Wellsford Rd management plan constituents.

Constituent	Management Plan Initiation Year	Management Plan Removal Year	10 Year Compliance Deadline
Chlorpyrifos	2006	Active	2016
H. azteca sediment toxicity	2009	Active	2019
Dissolved Oxygen	2006	Active	Pending Workplan
E. coli	2006	Active	Pending Workplan
pH	2006	Active	Pending Workplan
Total Dissolved Solids	2012	Active	Pending Workplan
C. dubia water column toxicity	2007	Not active	2017
Constituent (Removed)			
Diuron	2008	2012	2018
Copper	2008	2012	Pending Workplan
S. capricornutum water column toxicity	2008	2012	2018
Specific Conductivity	2010	2012	Pending Workplan

Figure 9. Dry Creek @ Wellsford Rd site subwatershed land use map.



Source of Layers:
Hydrology - NHD hydrodata, 1:24,000-scale, http://nhd.usgs.gov/
Roads, highways, railroads, county boundary, city outlines - California Spatial Information Library.
TRS - Teale Public Land Survey System, Pub. date, 20090101, California Spatial Information Library.
Parcel Layer - Stanislaus 2010, Merced 2011, Madera 2011
Basemap, Shaded Relief - ESRI
Datum - NAD 1983

Date Prepared: 08/08/11

ESJWQC

N

0 2.5 5
Miles

Dry Creek @ Wellsford Rd

During January through September 2013, MPM occurred for chlorpyrifos from July through September and for sediment toxicity to *H. azteca* in March and September. September 2013 MPM resulted in the first exceedance of the WQTL for chlorpyrifos since July 2010. No sediment toxicity occurred during 2013 MPM; the last sediment toxicity to *H. azteca* occurred in September 2011.

Core Monitoring occurred monthly from January through September 2013 at the Dry Creek @ Wellsford Rd site subwatershed. Dissolved Oxygen, *E. coli*, pH, and TDS were monitored monthly and five exceedances of the WQTL for DO and seven exceedances of the WQTL for *E. coli* occurred.

Table 18 is a record of yearly exceedances of WQTLs from 2005 through September 2013 for Dry Creek @ Wellsford Rd site subwatershed management plan constituents.

Table 18. Dry Creek @ Wellsford Rd and upstream site exceedances of management plan constituents (2005-September 2013).

The WQTLs used to evaluate the data are listed in the header after the analyte. Upstream sites are italicized.

Site Name	Season	Sample Date	Dissolved Oxygen, <7 mg/L	pH, <6.5 and > 8.5 units	Specific Conductivity, >700 µS/cm	Total Dissolved Solids, >450 mg/L	*E. coli*, > 235 MPN/100 mL	Copper (Total), Variable[1] or >1300 µg/L	Chlorpyrifos, > 0.015 µg/L	Diuron, > 2 µg/L	*C. dubia*, (% Control)	*S. capricornutum*, (% Control)	*H. azteca*, (% Control)
Dry Creek @ Wellsford Rd	Storm	2/15/2005									80		
Dry Creek @ Wellsford Rd	Storm	3/22/2005		8.96			900						
Dry Creek @ Wellsford Rd	Irrigation	5/11/2005		6.26									
Dry Creek @ Wellsford Rd	Irrigation	6/15/2005	5.9				240						
Dry Creek @ Wellsford Rd	Irrigation	7/13/2005	5.7										
Dry Creek @ Wellsford Rd	Irrigation	8/17/2005		9.18			900		0.024				
Dry Creek @ Wellsford Rd	Irrigation	9/21/2005	6.98				500						
Dry Creek @ Wellsford Rd	Storm	3/1/2006					300						
Dry Creek @ Wellsford Rd	Storm	3/16/2006					1600						
Dry Creek @ Wellsford Rd	Irrigation	5/18/2006					280						
Dry Creek @ Wellsford Rd	Irrigation	6/15/2006	6.08										
Dry Creek @ Wellsford Rd	Irrigation	7/13/2006	6.69						0.026				
Dry Creek @ Wellsford Rd	Irrigation	8/10/2006							0.024				
Dry Creek @ Wellsford Rd	Irrigation	9/14/2006					310				70		
Dry Creek @ Wellsford Rd	Storm	2/11/2007	6.17				290			37		52	
Dry Creek @ Wellsford Rd	Storm	2/22/2007										16	
Dry Creek @ Wellsford Rd	Storm	2/28/2007					2400	8.4 (7.2)		4		32	
Dry Creek @ Wellsford Rd	Storm	3/7/2007											
Dry Creek @ Wellsford Rd	Irrigation	4/17/2007						5.1 (5.0)					
Dry Creek @ Wellsford Rd	Irrigation	6/19/2007	5.77										
Dry Creek @ Wellsford Rd	Irrigation	7/17/2007	6.64						0.021				
Dry Creek @ Wellsford Rd	Irrigation	7/31/2007	6.91										

Site Name	Season	Sample Date	Dissolved Oxygen, <7 mg/L	pH, <6.5 and > 8.5 units	Specific Conductivity, >700 µS/cm	Total Dissolved Solids, >450 mg/L	*E. coli*, > 235 MPN/100 mL	Copper (Total), Variable[1] or >1300 µg/L	Chlorpyrifos, > 0.015 µg/L	Diuron, > 2 µg/L	*C. dubia*, (% Control)	*S. capricornutum*, (% Control)	*H. azteca*, (% Control)
Dry Creek @ Wellsford Rd	Irrigation	8/14/2007	6.58				440						
Dry Creek @ Wellsford Rd	Irrigation	9/11/2007	6.5				420		0.043				
Dry Creek @ Wellsford Rd	Storm	1/24/2008					>2400						
Dry Creek @ Wellsford Rd	Storm	2/26/2008					>2400	11 (6.0)				33	
Dry Creek @ Wellsford Rd	Sediment	3/4/2008											88
Dry Creek @ Wellsford Rd	Irrigation	4/22/2008					>2400						
Dry Creek @ Wellsford Rd	Irrigation	5/20/2008	5.67				330						
Dry Creek @ Wellsford Rd	Irrigation	6/17/2008	6.31				>2400						
Dry Creek @ Waterford Rd	*Irrigation*	*7/22/2008*	*6.08*						*0.02*				
Dry Creek @ Wellsford Rd	Irrigation	7/22/2008	6.67				>2400		0.03				
Dry Creek @ Waterford Rd	*Irrigation*	*8/19/2008*	*5.93*						*0.023*				
Dry Creek @ Wellsford Rd	Irrigation	8/19/2008	6.85				580						
Dry Creek @ Wellsford Rd	Sediment	8/28/2008	6.64										73
Dry Creek @ Wellsford Rd	Irrigation	9/23/2008					290						
Dry Creek @ Wellsford Rd	Irrigation	10/2/2008	5.83										
Dry Creek @ Wellsford Rd	Fall	10/21/2008	4.91				550						
Dry Creek @ Wellsford Rd	Fall	12/16/2008	2.77	8.68									
Dry Creek @ Wellsford Rd	Winter	1/20/2009	5.1		707								
Dry Creek @ Wellsford Rd	Winter	3/17/2009					250						
Dry Creek @ Wellsford Rd	Irrigation	5/19/2009	6.24				260						
Dry Creek @ Wellsford Rd	Irrigation	6/16/2009					1600						
Dry Creek @ Waterford Rd	*Irrigation*	*7/21/2009*	*6.89*										
Dry Creek @ Wellsford Rd	Irrigation	7/21/2009	5.9				270						
Dry Creek @ Wellsford Rd	Irrigation	8/18/2009					410		0.027				
Dry Creek @ Wellsford Rd	Fall	10/20/2009	4.04				490						
Dry Creek @ Wellsford Rd	Fall	11/17/2009	3.04				730						
Dry Creek @ Wellsford Rd	Storm	12/15/2009	6.65				820						
Dry Creek @ Wellsford Rd	Storm	1/19/2010	2.05										
Dry Creek @ Wellsford Rd	Storm	4/20/2010	6.99				2000						
Dry Creek @ Wellsford Rd	Irrigation	5/18/2010					370						
Dry Creek @ Wellsford Rd	Irrigation	6/15/2010	5.77										
Dry Creek @ Wellsford Rd	Irrigation	7/20/2010	6.30				490		0.067				
Dry Creek @ Wellsford Rd	Irrigation	8/17/2010	6.91				490						
Dry Creek @ Wellsford Rd	Fall	10/19/2010	6.01				370						
Dry Creek @ Wellsford Rd	Fall	11/16/2010	5.36	6.14			390						
Dry Creek @ Wellsford Rd	Winter	1/18/2011				660							
Dry Creek @ Wellsford Rd	Winter	3/17/2011		8.68									
Dry Creek @ Wellsford Rd	Irrigation	4/19/2011					2000						
Dry Creek @ Wellsford Rd	Irrigation	5/10/2011					340						
Dry Creek @ Wellsford Rd	Irrigation	6/14/2011	6.36				280						
Dry Creek @ Wellsford Rd	Irrigation	7/12/2011	6.82										
Dry Creek @ Wellsford Rd	Irrigation	8/9/2011	6.52										

Site Name	Season	Sample Date	Dissolved Oxygen, <7 mg/L	pH, <6.5 and > 8.5 units	Specific Conductivity, >700 µS/cm	Total Dissolved Solids, >450 mg/L	*E. coli*, > 235 MPN/100 mL	Copper (Total), Variable[1] or >1300 µg/L	Chlorpyrifos, > 0.015 µg/L	Diuron, > 2 µg/L	*C. dubia*, (% Control)	*S. capricornutum*, (% Control)	*H. azteca*, (% Control)
Dry Creek @ Wellsford Rd	Irrigation	9/6/2011					240						76
Dry Creek @ Wellsford Rd	Fall	12/6/2011	6.7				330						
Dry Creek @ Wellsford Rd	Winter	1/10/2012	6.07										
Dry Creek @ Wellsford Rd	Winter	3/6/2012		8.63									
Dry Creek @ Wellsford Rd	Winter	1/8/2013					>2400						
Dry Creek @ Wellsford Rd	Storm	2/20/2013					440						
Dry Creek @ Wellsford Rd	Winter	3/12/2013					920						
Dry Creek @ Wellsford Rd	Storm	4/2/2013	6.96										
Dry Creek @ Wellsford Rd	Irrigation	5/14/2013	5.99				307.6						
Dry Creek @ Wellsford Rd	Irrigation	6/11/2013	6.10				344.8						
Dry Creek @ Wellsford Rd	Irrigation	7/9/2013	5.61				261.3						
Dry Creek @ Wellsford Rd	Irrigation	8/13/2013					461.1						
Dry Creek @ Wellsford Rd	Irrigation	9/10/2013	6.93						0.14				

[1] Metal WQTL variable; based on hardness.

DUCK SLOUGH @ GURR RD

Overview

Monitoring at Duck Slough @ Gurr Rd began during the irrigation season of 2004 and continued through September 2013. Assessment Monitoring last occurred in 2011 and MPM occurred from 2010 through September 2013. The Coalition completed focused outreach in the site subwatershed from 2010 through 2012 and water quality improved. The Coalition received approval on May 30, 2012 to remove chlorpyrifos, SC, TDS, and *S. capricornutum* toxicity from the site's management plan. The remaining management plan constituents are copper, DO, *E. coli*, lead, pH, SC (SC was reinstated after April and July 2013 exceedances), toxicity to *C. dubia* and sediment toxicity to *H. azteca* (Table 19).

The Coalition received approval on April 26, 2012 to remove the Duck Slough @ Hwy 99 site from its monitoring program and move the site's remaining constituents (copper, *E. coli*, lead, and pH) into the Duck Slough @ Gurr Rd site subwatershed Management Plan.

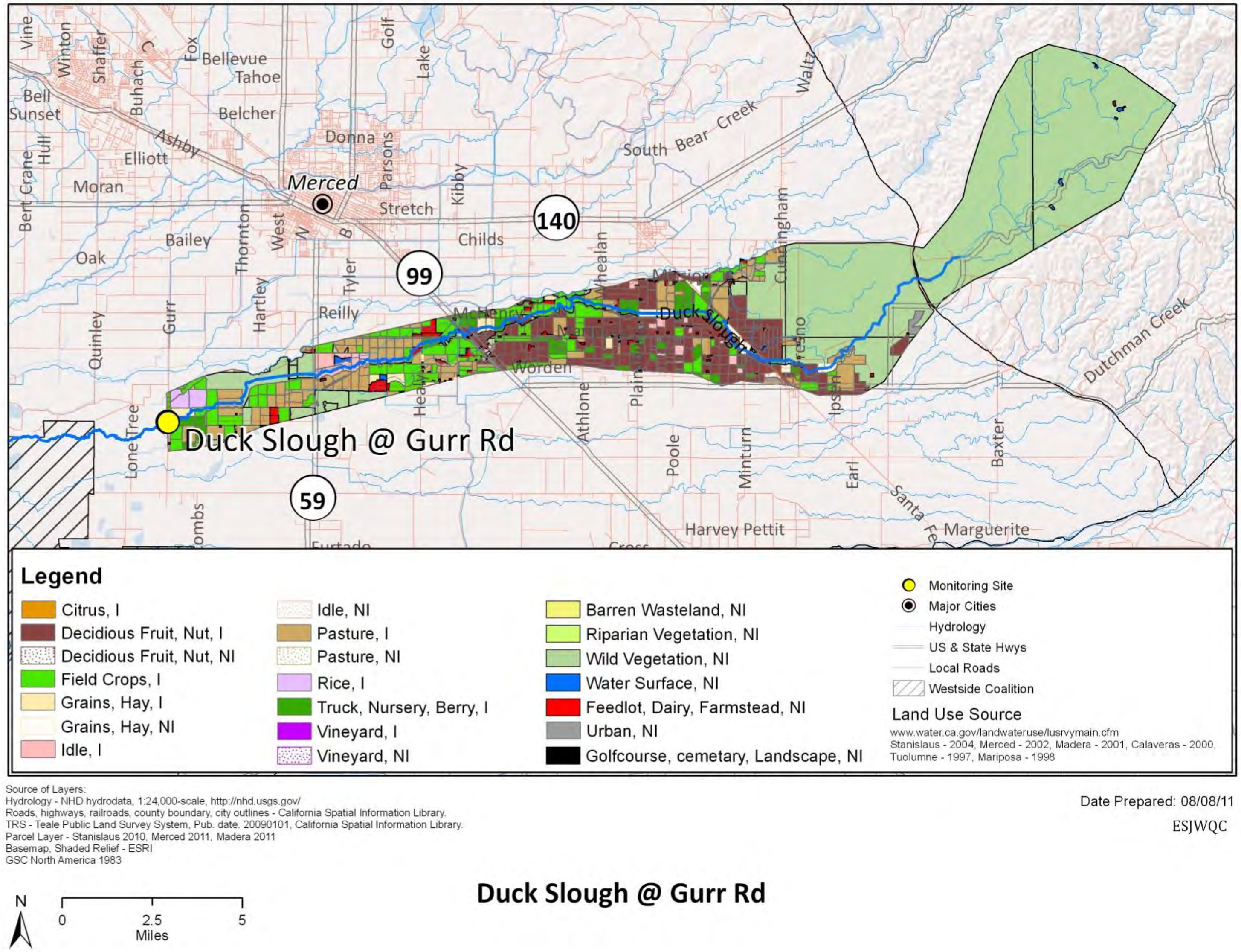
Under the WDR, Duck Slough @ Gurr Rd will be monitored as a Core Site; land use is included in Figure 10. During the 2014 WY, MPM is scheduled for copper (December through February and April through September), lead (January through February and April through September), toxicity to *C. dubia* (February through March) and sediment toxicity to *H. azteca* (September).

Table 19. Duck Slough @ Gurr Rd management plan constituents.

Constituent	Management Plan Initiation Year	Management Plan Removal Year	10 Year Compliance Deadline
Copper	2007	Active	Pending Workplan
C. dubia water column toxicity	2007	Active	2017
H. azteca sediment toxicity	2006	Active	2016
Dissolved Oxygen	2007	Active	Pending Workplan
E. coli	2006	Active	Pending Workplan
Lead	2008	Active	Pending Workplan
pH	2008	Active	Pending Workplan
Specific Conductivity[1]	2005, 2014	Active	Pending Workplan
Constituent (Removed)			
Chlorpyrifos	2005	2012	2015
S. capricornutum water column toxicity	2008	2012	2018
Total Dissolved Solids	2007	2012	Pending Workplan

[1] SC was approved for removal on May 30, 2012; however, SC will be reinstated into a management plan during 2014 as a result of exceedances of the WQTL for SC which occurred during 2013.

Figure 10. Duck Slough @ Gurr Rd site subwatershed land use map.



Monitoring Results

During 2013, MPM occurred for copper, lead, water column toxicity to *C. dubia,* and sediment toxicity to *H. azteca*. Copper and lead were monitored seven times from January through September and resulted in no exceedances of the WQTLs. The most recent exceedance of the WQTL for copper was in 2009 and the most recent exceedance of the lead WQTL occurred during 2008. Instantaneous loads of copper (total and dissolved) have varied through time mostly due to changes in flows; loading rates for copper were particularly low during 2013 and are attributed to low flow conditions. MPM for water column toxicity to *C. dubia* and sediment toxicity to *H. azteca* resulted in one toxicity to *C. dubia* (March) and one sediment toxicity to *H. azteca* (September). Prior to the March, toxicity to *C. dubia* had not occurred since 2006. Sediment toxicity to *H. azteca* has occurred consistently during the irrigation months in the Duck Slough @ Gurr Rd site subwatershed since 2008.

Field parameters including, DO, SC, and pH, were collected during each monitoring event in 2013; all three parameters resulted in exceedances of constituent specific WQTLs. Three exceedances of the WQTL for DO (July through September), two exceedances of the WQTL for SC (April and July), and one exceedance of the WQTL for pH (May) occurred.

Core Monitoring during 2013 resulted in four exceedances of the WQTL for *E. coli* (July through September) and two exceedances of the WQTL for TDS (March and July).

Table 20 is a record of yearly exceedances of WQTLs from 2004 through September 2013 for Duck Slough @ Gurr Rd site subwatershed management plan constituents.

Table 20. Duck Slough @ Gurr Rd and upstream site exceedances of management plan constituents (2004-September 2013).

The WQTLs used to evaluate the data are listed in the header after the analyte. Upstream sites are italicized.

Site Name	Season	Sample Date	Dissolved Oxygen, <7 mg/L	pH, <6.5 and > 8.5 units	Specific Conductivity, >700 µS/cm	Total Dissolved Solids, >450 mg/L	*E. coli*, > 235 MPN/100 mL	Copper (Dissolved), Variable[1]	Copper (Total), Variable[1] or >1300 µg/L	Lead (Total), Variable[1]	Chlorpyrifos, > 0.015 µg/L	*C. dubia*, (% Control)	*H. azteca*, (% Control)	*S. capricornutum*, (% Control)
Duck Slough @ Gurr Rd	Irrigation	7/31/2004					350				0.045			
Duck Slough @ Gurr Rd	Irrigation	8/31/2004											35	
Duck Slough @ Gurr Rd	Irrigation	9/29/2004			701	540								73
Duck Slough @ Gurr Rd	Storm	2/16/2005					1600							
Duck Slough @ Gurr Rd	Storm	3/21/2005					1600							
Duck Slough @ Gurr Rd	Irrigation	5/10/2005					1600							
Duck Slough @ Gurr Rd	Irrigation	6/14/2005					300							
Duck Slough @ Gurr Rd	Irrigation	7/12/2005					300						64	
Duck Slough @ Gurr Rd	Irrigation	8/16/2005					240							
Duck Slough @ Gurr Rd	Irrigation	9/20/2005											3	
Duck Slough @ Gurr Rd	Storm	2/28/2006										36		
Duck Slough @ Gurr Rd	Storm	3/10/2006										35		
Duck Slough @ Gurr Rd	Storm	3/15/2006					300					42		
Duck Slough @ Gurr Rd	Irrigation	5/17/2006		8.60			2000							
Duck Slough @ Gurr Rd	Irrigation	6/14/2006					690		120 (10.9)					
Duck Slough @ Gurr Rd	Irrigation	7/12/2006	6.18						14 (9.3)					
Duck Slough @ Gurr Rd	Irrigation	9/13/2006	5.53											
Duck Slough @ Gurr Rd	Storm	2/12/2007					2400		47 (12.4)	13 (4.88)				
Duck Slough @ Gurr Rd	Storm	2/28/2007					2000		11 (8.8)					
Duck Slough @ Gurr Rd	Storm	3/7/2007		9.17										
Duck Slough @ Gurr Rd	Irrigation	5/29/2007					820							
Duck Slough @ Gurr Rd	Irrigation	6/19/2007	5.85						5.4 (3)					
Duck Slough @ Gurr Rd	Irrigation	6/26/2007							4.6 (3.7)	1 (0.81)				
Duck Slough @ Gurr Rd	Irrigation	7/24/2007												74
Duck Slough @ Gurr Rd	Irrigation	9/18/2007					370							

Site Name	Season	Sample Date	Dissolved Oxygen, <7 mg/L	pH, <6.5 and > 8.5 units	Specific Conductivity, >700 µS/cm	Total Dissolved Solids, >450 mg/L	*E. coli*, > 235 MPN/100 mL	Copper (Dissolved), Variable[1]	Copper (Total), Variable[1] or >1300 µg/L	Lead (Total), Variable[1]	Chlorpyrifos, > 0.015 µg/L	*C. dubia*, (% Control)	*H. azteca*, (% Control)	*S. capricornutum*, (% Control)
Duck Slough @ Gurr Rd	Storm	1/25/2008					>2400		13 (9.0)	2.7 (2.4)				
Duck Slough @ Gurr Rd	Storm	2/25/2008					>2400		17 (9.3)	3.7 (3.2)				
Duck Slough @ Gurr Rd	Irrigation	4/29/2008												
Duck Slough @ Gurr Rd	Irrigation	5/27/2008												
Duck Slough @ Gurr Rd	Irrigation	6/24/2008												
Duck Slough @ Hwy 59	*Irrigation*	*6/24/2008*	*4.22*		*841*									
Duck Slough @ Gurr Rd	Irrigation	7/29/2008												
Duck Slough @ Hwy 59	*Irrigation*	*7/29/2008*	*4.83*											
Duck Slough @ Gurr Rd	Irrigation	8/26/2008												
Duck Slough @ Gurr Rd	Sediment	8/28/2008											63	
Duck Slough @ Hwy 59	*Irrigation*	*9/30/2008*	*3.33*											
Duck Slough @ Gurr Rd	Sediment	10/2/2008											93	
Duck Slough @ Gurr Rd	Storm	2/7/2009												
Duck Slough @ Gurr Rd	Winter	3/17/2009		9.70										
Duck Slough @ Gurr Rd	Irrigation	5/19/2009					>2400	7.3 (6.12)						
Duck Slough @ Gurr Rd	Irrigation	9/22/2009		9.03										
Duck Slough @ Gurr Rd	Fall	10/20/2009												
Duck Slough @ Gurr Rd	Fall	11/17/2009			1215		340							
Duck Slough @ Gurr Rd	Storm	12/15/2009					>2400							
Duck Slough @ Gurr Rd	Irrigation	7/20/2010		5.41										
Duck Slough @ Gurr Rd	Sediment	9/14/2010											70	
Duck Slough @ Gurr Rd	Fall	10/19/2010					250							
Duck Slough @ Gurr Rd	Storm	2/17/2011		8.65										
Duck Slough @ Gurr Rd	Winter	3/15/2011	6.78											
Duck Slough @ Gurr Rd	Irrigation	6/21/2011					240							
Duck Slough @ Gurr Rd	Irrigation	8/16/2011					580							
Duck Slough @ Gurr Rd	Irrigation	9/13/2011											90	

Site Name	Season	Sample Date	Dissolved Oxygen, <7 mg/L	pH, <6.5 and > 8.5 units	Specific Conductivity, >700 µS/cm	Total Dissolved Solids, >450 mg/L	*E. coli*, > 235 MPN/100 mL	Copper (Dissolved), Variable[1]	Copper (Total), Variable[1] or >1300 µg/L	Lead (Total), Variable[1]	Chlorpyrifos, > 0.015 µg/L	*C. dubia*, (% Control)	*H. azteca*, (% Control)	*S. capricornutum*, (% Control)
Duck Slough @ Gurr Rd	Fall	10/11/2011												
Duck Slough @ Gurr Rd	Winter	3/6/2012		8.75			260							
Duck Slough @ Gurr Rd	Winter	1/8/2013					>2400							
Duck Slough @ Gurr Rd	Winter	3/12/2013				460						0		
Duck Slough @ Gurr Rd	Storm	4/2/2013			1823									
Duck Slough @ Gurr Rd	Irrigation	5/14/2013		8.73										
Duck Slough @ Gurr Rd	Irrigation	7/9/2013	6.62		871	530	325.5							
Duck Slough @ Gurr Rd	Irrigation	8/13/2013	6.56				>2419.6							
Duck Slough @ Gurr Rd	Irrigation	9/10/2013	4.29				410.6						0	

[1]Metal WQTL variable; based on hardness.

HATCH DRAIN @ TUOLUMNE RD

Overview

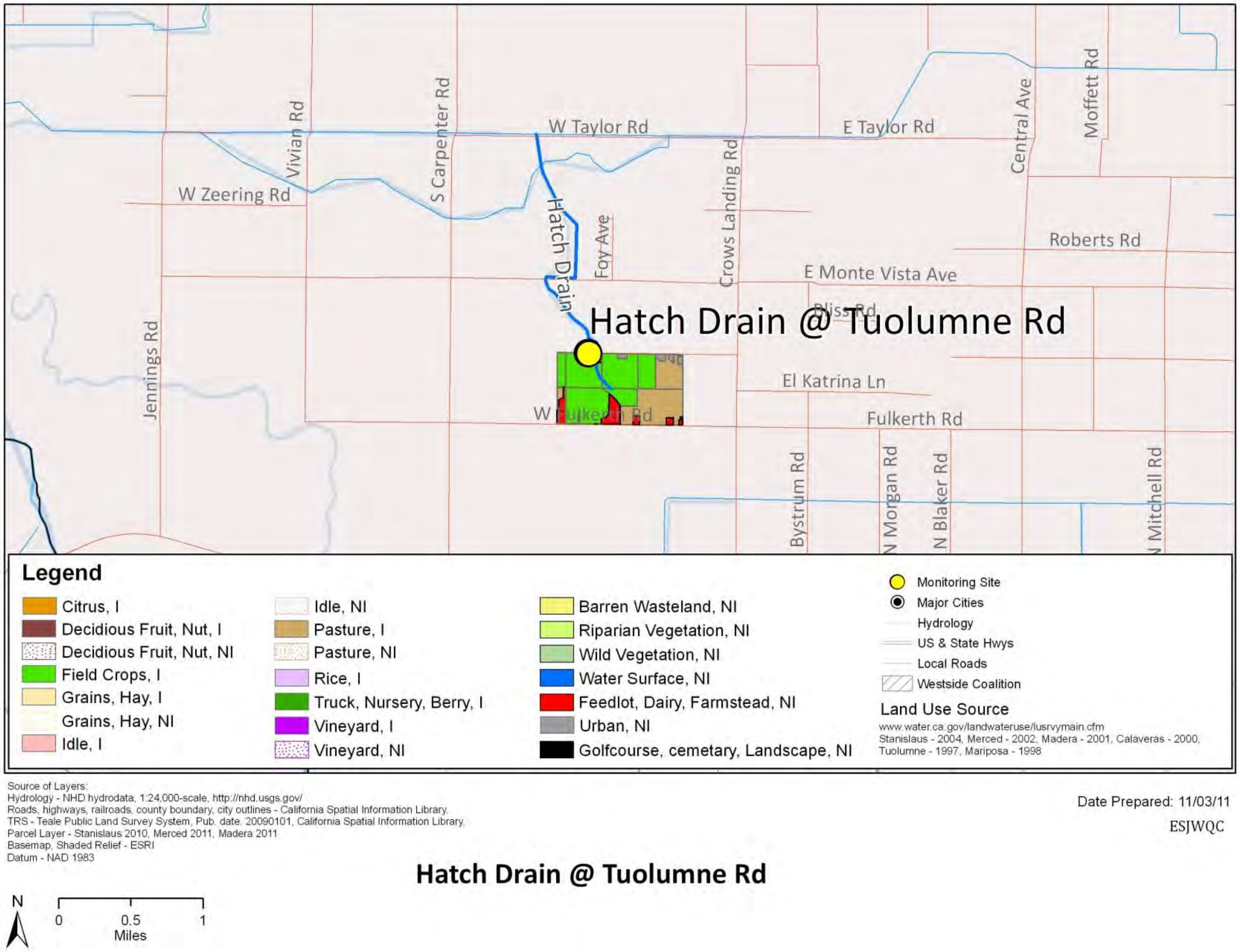
Monitoring occurred at Hatch Drain @ Tuolumne Rd from 2007 through 2008, and 2013. MPM in 2013 occurred for water column toxicity to *S. capricornutum* and sediment toxicity to *H. azteca*. The Coalition began focused outreach in the site subwatershed in 2013. The constituents in the Hatch Drain @ Tuolumne Rd site subwatershed management plan are DO, SC, TDS, *E. coli*, arsenic, nitrate, toxicity to *S. capricornutum* and sediment toxicity to *H. azteca* (Table 21).

Under the WDR, Hatch Drain @ Tuolumne Rd is a Represented Site and monitoring will occur as needed based on Core Site exceedances; land use is included in Figure 11. During the 2014 WY, Represented Site monitoring is scheduled for dimethoate (July through September) and MPM is scheduled for toxicity to *S. capricornutum* (January through February, April through May and July) and sediment toxicity to *H. azteca* (March and September).

Table 21. Hatch Drain @ Tuolumne Rd management plan constituents.

Constituent	Management Plan Initiation Year	Management Plan Removal Year	10 Year Compliance Deadline
Nitrate + Nitrite	2008	Active	Pending Workplan
H. azteca sediment toxicity	2008	Active	2018
Arsenic	2008	Active	Pending Workplan
Dissolved Oxygen	2008	Active	Pending Workplan
E. coli	2008	Active	Pending Workplan
S. capricornutum water column toxicity	2009	Active	2019
Specific Conductivity	2008	Active	Pending Workplan
Total Dissolved Solids	2008	Active	Pending Workplan

Figure 11. Hatch Drain @ Tuolumne Rd site subwatershed land use map.



Monitoring Results

During January through September 2013, MPM occurred for water column toxicity to *S. capricornutum* and sediment toxicity to *H. azteca*. No toxicity to *S. capricornutum* occurred during MPM and sediment toxicity to *H. azteca* occurred in March and September. The field parameters, DO and SC, were measured during all MPM events; exceedances of the WQTLs occurred seven times each.

Table 22 is a record of yearly exceedances of WQTLs from 2007 through September 2013 for Hatch Drain @ Tuolumne Rd site subwatershed management plan constituents.

Table 22. Hatch Drain @ Tuolumne Rd site exceedances of management plan constituents (2007-September 2013).

The WQTLs used to evaluate the data are listed in the header after the analyte.

Station Name	Season	Sample Date	Dissolved Oxygen, <7 mg/L	Specific Conductivity, >700 µS/cm	Total Dissolved Solids, >450 mg/L	Nitrate / Nitrate + Nitrite, >10 mg/L	*E. coli*, >235 MPN/100 mL	Arsenic[1], >10 µg/L	*S. capricornutum*, (% Control)	*H. azteca*, (% Control)
Hatch Drain @ Tuolumne Rd	Irrigation	5/15/2007	6.46	1105	700	13	2400	12		
Hatch Drain @ Tuolumne Rd	Irrigation	6/19/2007	5.54	1014	800	23	770	29		
Hatch Drain @ Tuolumne Rd	Irrigation	7/17/2007	3.05	1111	720	44	260	18		
Hatch Drain @ Tuolumne Rd	Irrigation	8/14/2007	4.22			18	2400			
Hatch Drain @ Tuolumne Rd	Irrigation	8/16/2007	5.85	1280						0
Hatch Drain @ Tuolumne Rd	Irrigation	9/11/2007	3.53	1817	1300	24	1600	18		0
Hatch Drain @ Tuolumne Rd	Storm	1/24/2008	4.67	1199	820	24	410	15	74	
Hatch Drain @ Tuolumne Rd	Storm	1/30/2008	5.18	1343						
Hatch Drain @ Tuolumne Rd	Storm	2/26/2008	1.90	1298	900	24	920	16	6	
Hatch Drain @ Tuolumne Rd	Storm Sed.	3/4/2008	2.12	1271					73	0
Hatch Drain @ Tuolumne Rd	Storm Sed.	3/28/2008	5.22	1373						2
Hatch Drain @ Tuolumne Rd	Irrigation	4/22/2008	2.14	1274	880	20	1300	17	64	
Hatch Drain @ Tuolumne Rd	Irrigation	4/29/2008	0.82	1323					47	
Hatch Drain @ Tuolumne Rd	Irrigation	5/20/2008	1.67	1325	960	18	2400	18	60	
Hatch Drain @ Tuolumne Rd	Irrigation	5/27/2008	0.73	1197						
Hatch Drain @ Tuolumne Rd	Irrigation	6/17/2008	0.99	1292	930	18	390	17		
Hatch Drain @ Tuolumne Rd	Irrigation	7/22/2008	0.67	1326	900	27	650	19	44	
Hatch Drain @ Tuolumne Rd	Irrigation	7/29/2008	0.90	1301					52	
Hatch Drain @ Tuolumne Rd	Irrigation	8/19/2008	1.40	1330	900	15	1400	17	43	
Hatch Drain @ Tuolumne Rd	Irrigation	8/26/2008	1.10	1493					64	
Hatch Drain @ Tuolumne Rd	Sediment	8/28/2008	1.31	1391						0
Hatch Drain @ Tuolumne Rd	Irrigation	9/23/2008	1.69	1295	920	17		15		
Hatch Drain @ Tuolumne Rd	Sediment	10/2/2008	2.14	1455						5
Hatch Drain @ Tuolumne Rd	Winter	1/8/2013		1688						
Hatch Drain @ Tuolumne Rd	Winter	2/12/2013	5.93	1152						
Hatch Drain @ Tuolumne Rd	Winter	3/12/2013	5.86	1194						72†
Hatch Drain @ Tuolumne Rd	Irrigation	4/9/2013	2.56	1296						
Hatch Drain @ Tuolumne Rd	Irrigation	5/14/2013	0.96	1283						
Hatch Drain @ Tuolumne Rd	Irrigation	7/9/2013	0.37	1156						
Hatch Drain @ Tuolumne Rd	Irrigation	8/13/2013	0.49							
Hatch Drain @ Tuolumne Rd	Irrigation	9/10/2013	2.05	1028						85

[1] Metal WQTL variable; based on hardness.

HIGHLINE CANAL @ HWY 99

Overview

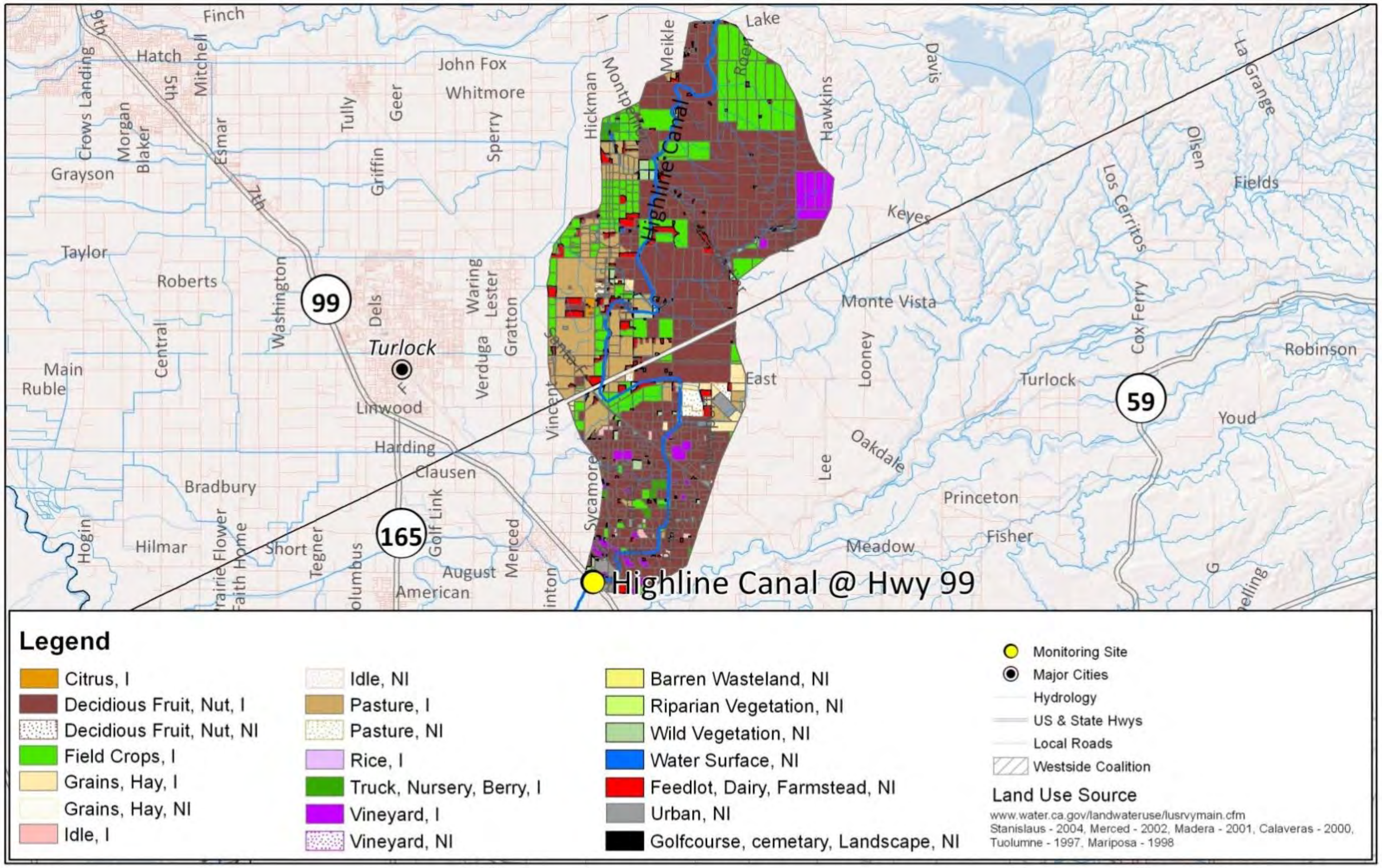
Monitoring at Highline Canal @ Hwy 99 began during the irrigation season of 2005 and continued through September 2013. Assessment Monitoring last occurred at the site in 2011. MPM during months of past exceedances occurred at the Highline Canal @ Hwy 99 from 2009 through September 2013. Focused outreach occurred from 2010 through 2012 and water quality improved in the site subwatershed. The Coalition received approval on May 30, 2012 to remove chlorpyrifos, diuron, ammonia, SC, and TDS from the management plan. The remaining management plan constituents are copper, *E. coli*, lead, pH, toxicity to *C. dubia*, *S. capricornutum*, and sediment toxicity to *H. azteca* (Table 23).

Under the WDR, Highline Canal @ Hwy 99 will be monitored as a Core Site; land use is included in Figure 12. During the 2014 WY, MPM is scheduled for copper (December through April and June through August), lead (February and April through August), and toxicity to *C. dubia* (March, May and September), *S. capricornutum* (February through May), and *H. azteca* (March and September).

Table 23. Highline Canal @ Hwy 99 management plan constituents.

Constituent	Management Plan Initiation Year	Management Plan Removal Year	10 Year Compliance Deadline
Copper	2008	Active	Pending Workplan
C. dubia water column toxicity	2007	Active	2017
H. azteca sediment toxicity	2007	Active	2017
S. capricornutum water column toxicity	2009	Active	2019
E. coli	2008	Active	Pending Workplan
Lead	2007	Active	Pending Workplan
pH	2008	Active	Pending Workplan
Constituent (Removed)			
Chlorpyrifos	2007	2012	2017
Diuron	2009	2012	2019
Ammonia	2009	2012	Pending Workplan
Specific Conductivity	2009	2012	Pending Workplan
Total Dissolved Solids	2009	2012	Pending Workplan

Figure 12. Highline Canal @ Hwy 99 site subwatershed land use map.



Source of Layers:
Hydrology - NHD hydrodata, 1:24,000-scale, http://nhd.usgs.gov/
Roads, highways, railroads, county boundary, city outlines - California Spatial Information Library.
TRS - Teale Public Land Survey System, Pub. date. 20090101, California Spatial Information Library.
Parcel Layer - Stanislaus 2010, Merced 2011, Madera 2011
Basemap, Shaded Relief - ESRI
Datum - NAD 1983

Date Prepared: 08/09/11

ESJWQC

N 0 2.5 5 Miles

Highline Canal @ Hwy 99

MPM for copper, lead, toxicity to *C. dubia, S. capricornutum*, and sediment toxicity to *H. azteca* occurred January through September 2013. There were no exceedances of the hardness based WQTL for lead and no water column toxicity to *C. dubia* or sediment toxicity to *H. azteca* . MPM for copper occurred six times during 2013 and resulted in one exceedance of the WQTL. Water column toxicity to *S. capricornutum* occurred once in February, resulting in 12% survival compared to the control. The February sample lost all toxicity prior to the initiation of the TIE, therefore, the source of toxicity could not be determined.

E. coli and pH were monitored ten times each at Highline Canal @ Hwy 99 from January through September. Monitoring resulted in one exceedance of the WQTL for *E. coli* and four exceedances of the upper WQTL for pH.

Table 24 is a record of yearly exceedances of WQTLs from 2005 through September 2013 for Highline Canal @ Hwy 99 site subwatershed management plan constituents.

Table 24. Highline Canal @ Hwy 99 exceedances of management plan constituents (2005-September 2013).

The WQTLs used to evaluate the data are listed in the header after the analyte.

Site Name	Season	Sample Date	pH, <6.5 and >8.5 units	Specific Conductivity, >700 µS/cm	*E. coli*, >235 MPN/100 mL	Total Dissolved Solids, >450 mg/L	Ammonia, Variable[1] or >1.5 mg/L	Copper (Dissolved), Variable[2]	Copper (Total), Variable[2] or >1300 µg/L	Lead (Total), Variable[2]	Chlorpyrifos, >0.015 µg/L	Diuron, >2 µg/L	*C.. dubia*, (% Control)	*S. capricornutum*, (% Control)	*H. azteca*, (% Control)
Highline Canal @ Hwy 99	Irrigation	5/10/2005											47		
Highline Canal @ Hwy 99	Irrigation	5/19/2005											0		
Highline Canal @ Hwy 99	Irrigation	9/20/2005													90
Highline Canal @ Hwy 99	Storm	3/1/2006									0.021			2	
Highline Canal @ Hwy 99	Storm	3/16/2006			300								0		
Highline Canal @ Hwy 99	Storm	5/2/2006	8.73												
Highline Canal @ Hwy 99	Irrigation	5/17/2006								0.42 (0.36)					
Highline Canal @ Hwy 99	Irrigation	8/9/2006								0.39 (0.31)					90
Highline Canal @ Hwy 99	Irrigation	9/5/2006													80
Highline Canal @ Hwy 99	Irrigation	9/13/2006											67		
Highline Canal @ Hwy 99	Storm	2/11/2007							3 (2.2)	0.52 (0.36)		25			
Highline Canal @ Hwy 99	Irrigation	4/17/2007							11 (10.1)	5.1 (3.59)					
Highline Canal @ Hwy 99	Irrigation	5/15/2007	8.56		250										
Highline Canal @ Hwy 99	Irrigation	6/19/2007			320				2.4 (1.9)	0.5 (0.31)					
Highline Canal @ Hwy 99	Irrigation	7/17/2007			440				3.2 (2.2)	1 (0.36)	0.017				
Highline Canal @ Hwy 99	Irrigation	8/14/2007	8.62						1.9 (1.7)	0.44 (0.26)					
Highline Canal @ Hwy 99	Irrigation	9/25/2007	8.73												
Highline Canal @ Hwy 99	Storm	1/24/2008			>2400	500	3.3		37 (14.7)		0.019	3.2			
Highline Canal @ Hwy 99	Storm	2/26/2008		747	>2400	520	8.3		81 (81)					72	
Highline Canal @ Hwy 99	Sediment	3/4/2008													90
Highline Canal @ Hwy 99	Storm	3/4/2008	9.32												
Highline Canal @ Hwy 99	Irrigation	4/22/2008												63	
Highline Canal @ Hwy 99	Irrigation	5/7/2008	8.69												
Highline Canal @ Hwy 99	Irrigation	5/20/2008			240									76	
Highline Canal @ Hwy 99	Irrigation	6/3/2008	8.61												
Highline Canal @ Hwy 99	Irrigation	7/22/2008									0.021				
Highline Canal @ Hwy 99	Irrigation	8/19/2008	9.24												

Site Name	Season	Sample Date	pH, <6.5 and >8.5 units	Specific Conductivity, >700 µS/cm	*E. coli*, >235 MPN/100 mL	Total Dissolved Solids, >450 mg/L	Ammonia, Variable[1] or >1.5 mg/L	Copper (Dissolved), Variable[2]	Copper (Total), Variable[2] or >1300 µg/L	Lead (Total), Variable[2]	Chlorpyrifos, >0.015 µg/L	Diuron, >2 µg/L	*C.. dubia*, (% Control)	*S. capricornutum*, (% Control)	*H. azteca*, (% Control)
Highline Canal @ Hwy 99	Sediment	8/28/2008													94
Highline Canal @ Hwy 99	Irrigation	9/9/2008	8.54												
Highline Canal @ Hwy 99	Sediment	10/2/2008													92
Highline Canal @ Hwy 99	Storm	2/7/2009	8.86												
Highline Canal @ Hwy 99	Irrigation	5/19/2009			340										
Highline Canal @ Hwy 99	Irrigation	6/16/2009	8.95												
Highline Canal @ Hwy 99	Irrigation	7/21/2009									0.093				
Highline Canal @ Hwy 99	Irrigation	8/18/2009	9.03												
Highline Canal @ Hwy 99	Irrigation	9/22/2009	8.61												
Highline Canal @ Hwy 99	Storm	12/15/2009	8.61												
Highline Canal @ Hwy 99	Storm	1/19/2010			1700										
Highline Canal @ Hwy 99	Storm	2/23/2010			790										
Highline Canal @ Hwy 99	Winter	3/15/2011			>2400										
Highline Canal @ Hwy 99	Irrigation	6/14/2011													
Highline Canal @ Hwy 99	Fall	11/8/2011	8.77												
Highline Canal @ Hwy 99	Winter	1/10/2012						4.5 (2.65)							
Highline Canal @ Hwy 99	Winter	2/7/2012	9.51					3.8 (2.07)							
Highline Canal @ Hwy 99	Winter	1/8/2013			1400			11 (8.42)							
Highline Canal @ Hwy 99	Winter	2/12/2013												12	
Highline Canal @ Hwy 99	Winter	3/12/2013	8.95												
Highline Canal @ Hwy 99	Storm	4/2/2013	9.01												
Highline Canal @ Hwy 99	Irrigation	5/14/2013	8.85												
Highline Canal @ Hwy 99	Irrigation	8/13/2013	8.53												

[1]Ammonia WQTL variable based on pH and temperature.
[2]Metal WQTL variable; based on hardness.

HIGHLINE CANAL @ LOMBARDY RD

Overview

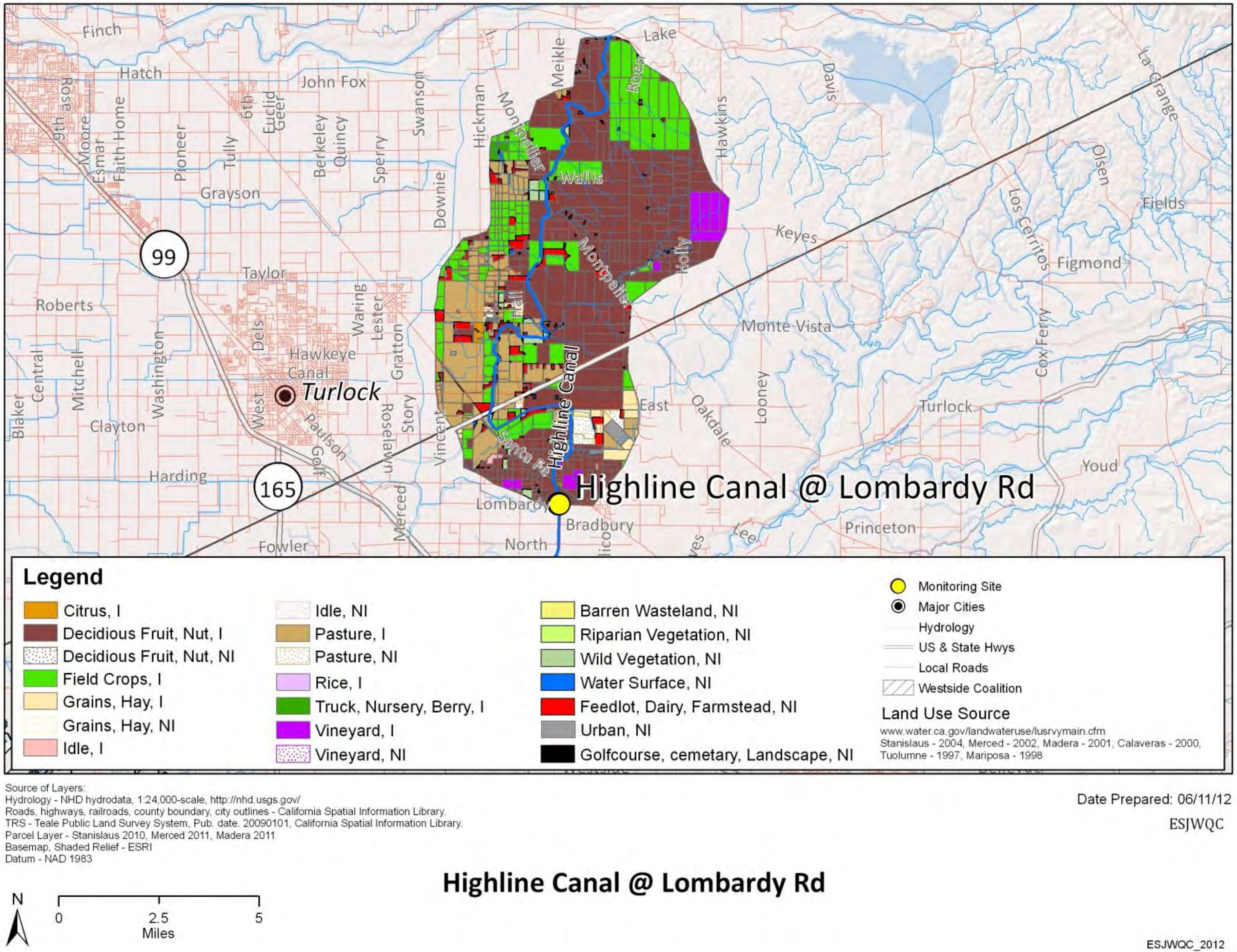
Monitoring at Highline Canal @ Lombardy Rd began in 2005 and continued through September 2013. Assessment Monitoring last occurred at the site in 2011 and MPM occurred from 2009 through 2013 during months of past exceedances. The Coalition began focused outreach in the site subwatershed in 2013. Due to improvements of the water quality, the Coalition received approval on May 30, 2012 to remove SC and chlorpyrifos and toxicity to *C. dubia* toxicity on October 15, 2013 from the site's management plan. The remaining constituents in the management plan are copper, *E. coli*, lead, pH, sediment toxicity to *H. azteca* and *S. capricornutum* toxicity (Table 25).

Under the WDR, Highline Canal @ Lombardy Rd is a Represented Site and monitoring will occur as needed based on Core Site exceedances; land use is included in Figure 13. During the 2014 WY, MPM is scheduled for copper (January through March, May, and August), lead (February, May through June, and August through September), toxicity to *S. capricornutum* (February through May and August through September) and sediment toxicity to *H. azteca* (March and September).

Table 25. Highline Canal @ Lombardy Rd management plan constituents.

Constituent	Management Plan Initiation Year	Management Plan Removal Year	10 Year Compliance Deadline
Copper	2008	Active	Pending Workplan
S. capricornutum water column toxicity	2007	Active	2017
H. azteca sediment toxicity	2007	Active	2017
E. coli	2007	Active	Pending Workplan
Lead	2007	Active	Pending Workplan
pH	2006	Active	Pending Workplan
Constituent (Removed)			
Chlorpyrifos	2007	2013	2017
C. dubia water column toxicity	2007	2013	2017
Specific Conductivity	2009	2012	Pending Workplan

Figure 13. Highline Canal @ Lombardy Rd site subwatershed land use map.



Monitoring Results

During 2013, MPM occurred at Highline Canal @ Lombardy Rd for chlorpyrifos, copper, water column toxicity to *C. dubia, S. capricornutum,* and sediment toxicity to *H. azteca*. Dissolved copper was detected above the hardness based WQTL in January 2013 (Table 26). No other exceedances or toxicities of management plan constituents occurred during the January through September 2013 monitoring period.

Table 26 is a record of yearly exceedances of WQTLs from 2005 through September 2013 for Highline Canal @ Lombardy Rd site subwatershed management plan constituents.

Table 26. Highline Canal @ Lombardy Rd exceedances of management plan constituents (2005-September 2013).

The WQTLs used to evaluate the data are listed in the header after the analyte.

Station Name	Season	Sample Date	pH, <6.5 and > 8.5 units	Specific Conductivity, >700 µS/cm	*E. coli*, >235 MPN/100 mL	Copper (Dissolved), Variable[1]	Copper (Total), Variable[1] or >1300 µg/L	Lead (Total), Variable[1]	Chlorpyrifos, >0.0.15 µg/L	*C. dubia*, (%Control)	*H. a azteca*, (%Control)	*S. capricornutum*, %(Control)
Highline Canal @ Lombardy Rd	Storm	3/21/2005	8.56									
Highline Canal @ Lombardy Rd	Irrigation	5/10/2005			240						74	
Highline Canal @ Lombardy Rd	Irrigation	8/17/2005	6.46									80
Highline Canal @ Lombardy Rd	Storm	3/1/2006							0.027			
Highline Canal @ Lombardy Rd	Storm	3/16/2006			900				0.018			30
Highline Canal @ Lombardy Rd	Storm	5/2/2006									50	
Highline Canal @ Lombardy Rd	Irrigation	5/17/2006						0.49 (0.46)				
Highline Canal @ Lombardy Rd	Irrigation	6/14/2006						0.55 (0.52)		65		
Highline Canal @ Lombardy Rd	Irrigation	8/9/2006						0.34 (0.31)				
Highline Canal @ Lombardy Rd	Irrigation	9/13/2006						0.29 (0.21)		38.9		
Highline Canal @ Lombardy Rd	Storm	2/11/2007					2.5 (2.2)	0.45 (0.36)				
Highline Canal @ Lombardy Rd	Storm	2/28/2007								55.6		70
Highline Canal @ Lombardy Rd	Storm	3/7/2007								0		
Highline Canal @ Lombardy Rd	Irrigation	5/15/2007					2.2 (1.9)	0.49 (0.31)				
Highline Canal @ Lombardy Rd	Irrigation	6/19/2007						0.49 (0.31)				
Highline Canal @ Lombardy Rd	Irrigation	7/17/2007							0.017			
Highline Canal @ Lombardy Rd	Irrigation	8/16/2007									92	
Highline Canal @ Lombardy Rd	Irrigation	9/11/2007									55	
Highline Canal @ Lombardy Rd	Storm	1/24/2008			2000		28 (13.2)		0.028	40		
Highline Canal @ Lombardy Rd	Storm	1/30/2008								30		
Highline Canal @ Lombardy Rd	Storm	2/26/2008					32 (10.1)					
Highline Canal @ Lombardy Rd	Storm, Sed, RS	3/4/2008		1402							91	
Highline Canal @ Lombardy Rd	Irrigation	4/22/2008										
Highline Canal @ Lombardy Rd	Irrigation	5/20/2008			650							53
Highline Canal @ Lombardy Rd	Irrigation	7/8/2008	8.56									
Highline Canal @ Lombardy Rd	Irrigation	8/19/2008	8.65				3.3 (1.9)	0.27 (0.26)	0.031			
Highline Canal @ Lombardy Rd	Sed.	8/28/2008									62	
Highline Canal @ Lombardy Rd	Sed, RS	10/2/2008									82	

Station Name	Season	Sample Date	pH, <6.5 and > 8.5 units	Specific Conductivity, >700 µS/cm	*E. coli*, >235 MPN/100 mL	Copper (Dissolved), Variable[1]	Copper (Total), Variable[1] or >1300 µg/L	Lead (Total), Variable[1]	Chlorpyrifos, >0.015 µg/L	*C. dubia*, (%Control)	*H. a azteca*, (%Control)	*S. capricornutum*, %(Control)
Highline Canal @ Lombardy Rd	Irrigation	1/19/2010							0.016			
Highline Canal @ Lombardy Rd	Storm	2/23/2010	9.36			16 (14.10)						
Highline Canal @ Lombardy Rd	Storm	2/17/2011			420	7.9 (6.12)						
Highline Canal @ Lombardy Rd	Irrigation	4/19/2011										8
Highline Canal @ Lombardy Rd	Irrigation	6/14/2011			310							
Highline Canal @ Lombardy Rd	Winter	2/7/2012	8.85			2.0 (1.46)						
Highline Canal @ Lombardy Rd	Winter	3/6/2012				14 (7.40)						
Highline Canal @ Lombardy Rd	Irrigation	8/14/2012	9.3									
Highline Canal @ Lombardy Rd	Irrigation	9/11/2012										45
Highline Canal @ Lombardy Rd	Fall	11/13/2012	9.24									
Highline Canal @ Lombardy Rd	Winter	1/8/2013				11 (9.72)						

[1]Metal WQTL variable; based on hardness.
RS-Resampling event.

HILMAR DRAIN @ CENTRAL AVE

Overview

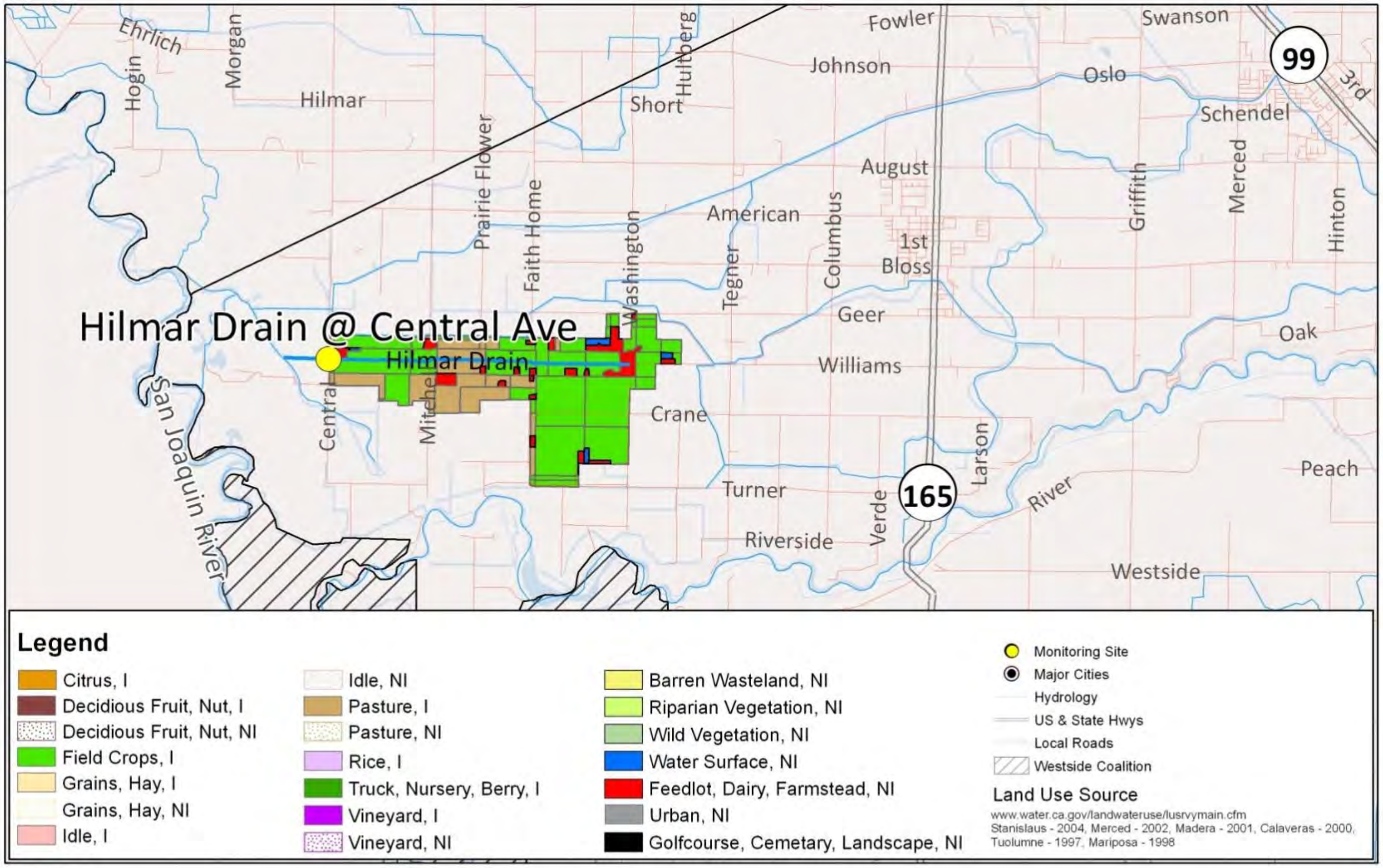
Monitoring at Hilmar Drain @ Central Ave began during the storm season of 2005 and continued through 2009. MPM occurred in 2009, 2012, and 2013. The Coalition completed two of three years of focused outreach in the Hilmar Drain @ Central Ave site subwatershed. The Coalition received approval on May 30, 2012 to remove chlorpyrifos from the site's management plan due to improved water quality. The remaining management plan constituents are ammonia, copper, diuron, DO, *E. coli*, nitrate, pH, SC, TDS, sediment toxicity to *H. azteca*, and toxicity to *S. capricornutum* (Table 27).

Under the WDR, Hilmar Drain @ Central Ave is a Represented Site and monitoring will occur as needed based on Core Site exceedances; land use is included in Figure 14. During the 2014 WY, MPM is scheduled for copper (January through March and July), diuron (December through January, April and June), toxicity to *S. capricornutum* (April, July and September), and sediment toxicity to *H. azteca* (March and September. Represented Site Monitoring is scheduled for dimethoate (July through September).

Table 27. Hilmar Drain @ Central Ave management plan constituents.

Constituent	Management Plan Initiation Year	Management Plan Removal Year	10 Year Compliance Deadline
Copper	2008	Active	Pending Workplan
Diuron	2008	Active	2018
Nitrate + Nitrite	2007	Active	Pending Workplan
H. azteca sediment toxicity	2009	Active	2019
S. capricornutum water column toxicity	2008	Active	2018
Ammonia	2008	Active	Pending Workplan
Dissolved Oxygen	2007	Active	Pending Workplan
E. coli	2006	Active	Pending Workplan
pH	2007	Active	Pending Workplan
Specific Conductivity	2006	Active	Pending Workplan
Total Dissolved Solids	2006	Active	Pending Workplan
Constituent (Removed)			
Chlorpyrifos	2007	2012	2017

Figure 14. Hilmar Drain @ Central Ave site subwatershed land use map.



Source of Layers:
Hydrology - NHD hydrodata, 1:24,000-scale, http://nhd.usgs.gov/
Roads, highways, railroads, county boundary, city outlines - California Spatial Information Library.
TRS - Teale Public Land Survey System, Pub. date. 20090101, California Spatial Information Library.
Parcel Layer - Stanislaus 2010, Merced 2011, Madera 2011
Basemap, Shaded Relief - ESRI
Datum - NAD 1983

Date Prepared: 08/10/11

ESJWQC

N

0 1 2
Miles

Hilmar Drain @ Central Ave

Monitoring Results

During January through September 2013, MPM occurred for diuron, copper, water column toxicity to *S. capricornutum* and sediment toxicity to *H. azteca*; no exceedances or toxicities occurred. The field parameters, DO, pH, and SC, were measured during all MPM events and SC exceeded the WQTL seven times.

Table 28 is a record of yearly exceedances of WQTLs from 2005 through September 2013 for Hilmar Drain @ Central Ave site subwatershed management plan constituents.

Table 28. Hilmar Drain @ Central Ave and upstream site exceedances of management plan constituents (2005-September 2013).
The WQTLs used to evaluate the data are listed in the header after the analyte. Upstream sites are italicized.

Site Name	Season	Sample Date	Dissolved Oxygen, <7 mg/L	pH, <6.5 and > 8.5 units	Specific Conductivity, >700 µS/cm	Total Dissolved Solids, >450 mg/L	Ammonia, Variable[1] or >1.5 mg/L	Nitrate as N, >10 mg/L	*E. coli*, >235 MPN/100 mL	Copper (Total), Variable[2] or >1300 µg/L	Chlorpyrifos, >0.0.15 µg/L	Diuron, >2 µg/L	*S. capricornutum*, (% Control)	*H. azteca*, (% Control)
Hilmar Drain @ Central Ave	Storm	2/15/2005			1102	740			240					
Hilmar Drain @ Central Ave	Storm	3/22/2005			1157	760			900					
Hilmar Drain @ Central Ave	Irrigation	5/11/2005			1354	740			1600					
Hilmar Drain @ Central Ave	Irrigation	5/19/2005			1214									
Hilmar Drain @ Central Ave	Irrigation	6/15/2005			855	720			500					
Hilmar Drain @ Central Ave	Irrigation	7/13/2005	6.45		826	600			1600					
Hilmar Drain @ Central Ave	Irrigation	8/16/2005			788	500			1600					
Hilmar Drain @ Central Ave	Irrigation	9/21/2005				690			430					32
Hilmar Drain @ Central Ave	Storm	3/1/2006		9.55	1058	670								
Hilmar Drain @ Central Ave	Storm	3/16/2006			1215	710								
Hilmar Drain @ Central Ave	Storm	3/24/2006			1400									
Hilmar Drain @ Central Ave	Storm	5/2/2006		8.58	794									
Hilmar Drain @ Central Ave	Irrigation	5/18/2006	6.28						2400					
Hilmar Drain @ Central Ave	Irrigation	6/15/2006	6.80					12						
Hilmar Drain @ Central Ave	Irrigation	7/13/2006			1096	610	3.8	11	2400	31 (19)	0.016		36	
Hilmar Drain @ Central Ave	Irrigation	8/10/2006						13	1000					
Hilmar Drain @ Central Ave	Irrigation	9/14/2006			773	510		20						
Hilmar Drain @ Central Ave	Storm	2/11/2007					13		2400	84 (10.1)				
Hilmar Drain @ Central Ave	Storm	3/1/2007			1396	790								
Hilmar Drain @ Central Ave	Storm	3/7/2007		8.79	1633									
Hilmar Drain @ Central Ave	Irrigation	4/17/2007			1106	700			1100			3.3	69	
Hilmar Drain @ Central Ave	Irrigation	5/15/2007			1030	640		22	440					
Hilmar Drain @ Central Ave	Irrigation	6/19/2007			869	600		21	1700			6.6		
Hilmar Drain @ Central Ave	Irrigation	7/17/2007			717	460		15	340					
Hilmar Drain @ Central Ave	Irrigation	8/21/2007			793	520		18						
Hilmar Drain @ Central Ave	Irrigation	9/11/2007			703	460		18	2400					
Hilmar Drain @ Central Ave	Storm	1/24/2008			1528	970								

Site Name	Season	Sample Date	Dissolved Oxygen, <7 mg/L	pH, <6.5 and > 8.5 units	Specific Conductivity, >700 µS/cm	Total Dissolved Solids, >450 mg/L	Ammonia, Variable[1] or >1.5 mg/L	Nitrate as N, >10 mg/L	*E. coli*, >235 MPN/100 mL	Copper (Total), Variable[2] or >1300 µg/L	Chlorpyrifos, >0.015 µg/L	Diuron, >2 µg/L	*S. capricornutum*, (% Control)	*H. azteca*, (% Control)
Hilmar Drain @ Central Ave	Storm	2/26/2008			1476	910								
Hilmar Drain @ Central Ave	Sediment	3/4/2008			1429									91
Hilmar Drain @ Central Ave	Sediment	3/28/2008	6.30		1111									
Hilmar Drain @ Central Ave	Irrigation	4/22/2008			1482	960			390				45	
Hilmar Drain @ Central Ave	Irrigation	4/29/2008										3.43	59	
Hilmar Drain @ Central Ave	Irrigation	4/29/2008	4.48		809								59	
Hilmar Drain @ Central Ave	Irrigation	5/20/2008			963	680		20	440					
Hilmar Drain @ Central Ave	Irrigation	6/17/2008			1060	650			1000					
Hilmar Drain @ Central Ave	Irrigation	7/22/2008			1074	710		21	270					
Hilmar Drain @ Central Ave	Irrigation	8/19/2008			1590	1000								
Hilmar Drain @ Mitchell Rd	Irrigation	7/22/2008	6.93		995			28					70	
Reclamation Drain @ Williams Rd	Irrigation	7/22/08			1558									
Hilmar Drain @ Mitchell Rd	Irrigation	7/29/2008	1.81		770								22	
Hilmar Drain @ Central Ave	Sediment	8/28/2008	6.32		1172									0
Hilmar Drain @ Central Ave	Irrigation	9/23/2008			943	640		26					73	
Hilmar Drain @ Central Ave	Irrigation	9/30/2008			733								75	
Hilmar Drain @ Central Ave	Sediment	10/2/2008			1241									0
Hilmar Drain @ Central Ave	Irrigation	4/21/2009			904									
Hilmar Drain @ Central Ave	Irrigation	9/22/2009			934									
Hilmar Drain @ Central Ave	Winter	2/7/2012			983									
Hilmar Drain @ Central Ave	Winter	3/6/2012			1105									
Hilmar Drain @ Central Ave	Winter	2/12/2013			1532									
Hilmar Drain @ Central Ave	Irrigation	4/9/2013			901									
Hilmar Drain @ Central Ave	Irrigation	6/11/2013			1080									
Hilmar Drain @ Central Ave	Irrigation	7/9/2013			1651									
Hilmar Drain @ Central Ave	Irrigation	9/10/2013			1175									

[1]Ammonia WQTL variable based on pH and temperature.
[2]Metal WQTL variable; based on hardness.

HOWARD LATERAL @ HWY 140

Overview

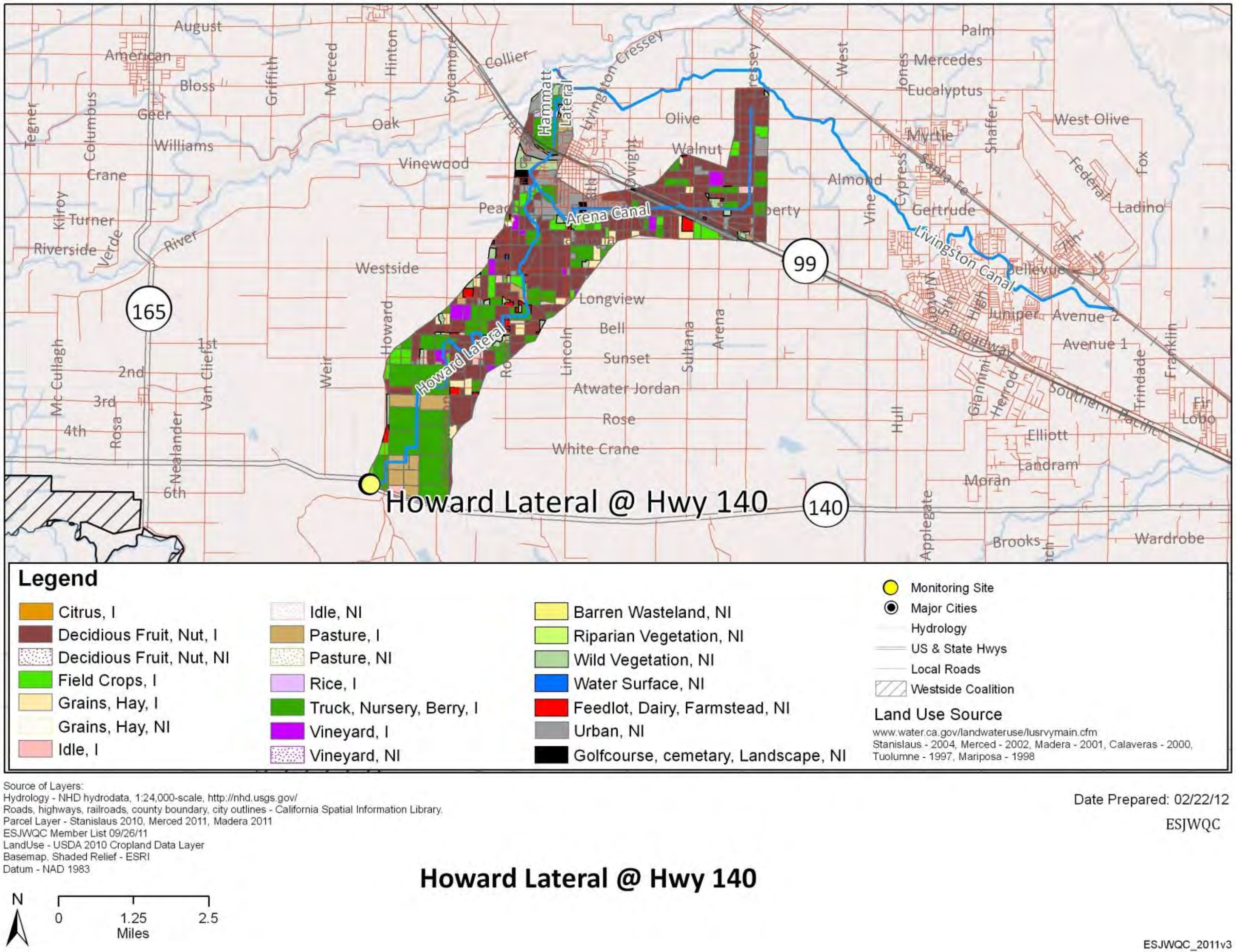
Monitoring began at Howard Lateral @ Hwy 140 in 2009 and continued through 2013. Assessment Monitoring occurred at the site in 2008 through 2010 and MPM occurred in 2011 and 2013 for chlorpyrifos and copper. The Coalition is scheduled to conduct focused outreach in the site subwatershed from 2015 through 2017. The constituents in the Howard Lateral @ Hwy 140 management plan are chlorpyrifos, copper, *E. coli,* pH, SC, and TDS (Table 29).

Under the WDR, Howard Lateral @ Hwy 140 is a Represented Site and monitoring will occur as needed based on Core Site exceedances; land use is included in Figure 15.

Table 29. Howard Lateral @ Hwy 140 management plan constituents.

Constituent	Management Plan Initiation Year	Management Plan Removal Year	10 Year Compliance Deadline
Chlorpyrifos	2011	Active	2022
Copper	2011	Active	Pending Workplan
E. coli	2010	Active	Pending Workplan
pH	2010	Active	Pending Workplan
Specific Conductivity	2010	Active	Pending Workplan
Total Dissolved Solids	2010	Active	Pending Workplan

Figure 15. Howard Lateral @ Hwy 140 site subwatershed land use map.



Assessment Monitoring occurred at Howard Lateral @ Hwy 140 in 2009 and 2010 and MPM occurred in 2011 and 2013 during months of past exceedances.

Chlorpyrifos was monitored 16 times at Howard Lateral @ Hwy 140 in 2009 through 2011 and 2013; the only exceedance of the WQTL to occur was during July 2010, all other results were below the reporting limit. Chlorpyrifos was placed into the site's management plan in 2011.

Dissolved copper exceeded the WQTL five times out of 19 sampling events and was placed in the site's management plan in 2011.

E. coli and TDS were monitored from 2009 through 2010 and field parameters, pH and SC, were measured during each sampling event. *E. coli* exceeded the WQTL twice in 2009 and once in 2010, and was placed in a management plan in 2010. Specific Conductivity and TDS exceeded the WQTLs once in May 2009 and were placed in the site's management plan in 2010. Six exceedances of the WQTL for pH occurred from 2009 through 2010; pH was placed in the site's management plan in 2010.

Table 30 is a record of yearly exceedances of WQTLs from 2009 through September 2013 for Howard Lateral @ Hwy 140 site subwatershed management plan constituents.

Table 30. Howard Lateral @ Hwy 140 exceedances of management plan constituents (2009-September 2013). The WQTLs used to evaluate the data are listed in the header after the analyte.

Station Name	Season	Sample Date	pH, <6.5 and > 8.5 units	Specific Conductivity, µS/cm	Total Dissolved Solids, >450 mg/L	*E. coli*, >235 MPN/100 mL	Copper Dissolved[1], µg/L	Chlorpyrifos, µg/L
Howard Lateral @ Hwy 140	Irrigation	4/21/2009						
Howard Lateral @ Hwy 140	Irrigation	5/19/2009		810	530			
Howard Lateral @ Hwy 140	Irrigation	7/21/2009	8.88					
Howard Lateral @ Hwy 140	Irrigation	8/18/2009	9.14					
Howard Lateral @ Hwy 140	Irrigation	9/22/2009	9.15			330		
Howard Lateral @ Hwy 140	Fall	10/20/2009				240	3.3 (1.57)	
Howard Lateral @ Hwy 140	Storm	4/20/2010					3.7 (2.65)	
Howard Lateral @ Hwy 140	Irrigation	6/15/2010						0.022
Howard Lateral @ Hwy 140	Irrigation	7/20/2010	8.93				3.1 (2.5)	
Howard Lateral @ Hwy 140	Irrigation	8/17/2010	9.05					
Howard Lateral @ Hwy 140	Sediment	9/14/2010	9.28					
Howard Lateral @ Hwy 140	Fall	10/19/2010				280		
Howard Lateral @ Hwy 140	Fall, MPM	10/11/2011					1.1 (1.03)	
Howard Lateral @ Hwy 140	Irrigation, MPM	4/9/2013					7.2 (4.95)	

[1]Metal WQTL variable; based on hardness.

LATERAL 2 ½ NEAR KEYES RD

Overview

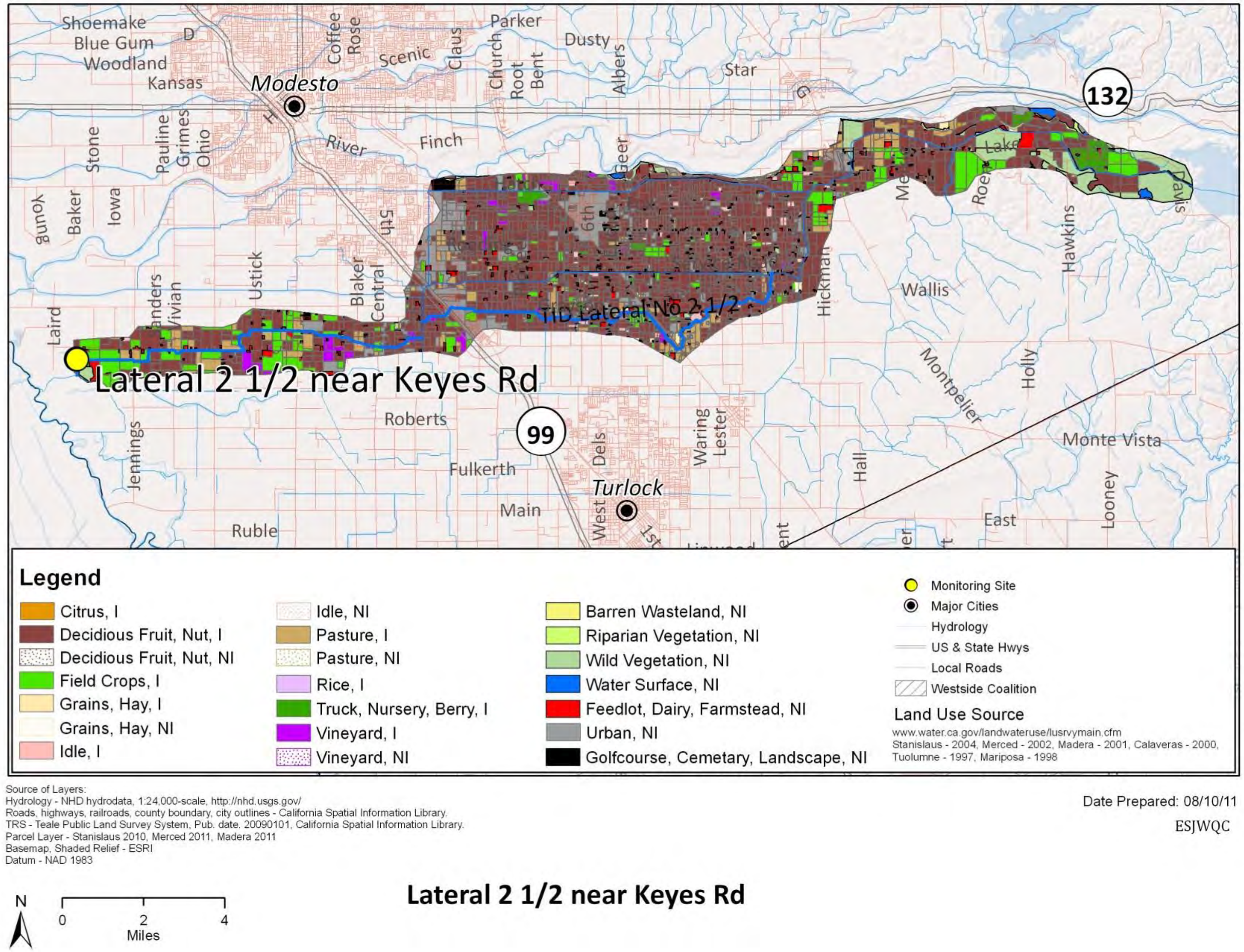
Monitoring began at Lateral 2 ½ near Keyes Rd in October 2008 and continued through 2011 and again in 2013. Assessment Monitoring at this site occurred from October 2008 through December 2010 and MPM occurred in 2013. Focused outreach began in 2011 and was completed in 2013. Results indicate improvements in the water quality in the Lateral 2 ½ near Keyes Rd site subwatershed. The Coalition received approval on May 30, 2012 to remove *E. coli* from the site's management plan. The remaining management plan constituents are chlorpyrifos and pH (Table 31).

Under the WDR, Lateral 2 ½ near Keyes Rd is a Represented Site and monitoring will occur as needed based on Core Site exceedances; land use is included in Figure 16. During the 2014 WY, MPM is scheduled for chlorpyrifos (April through August) and Represented Site Monitoring for toxicity to *S. capricornutum* (October and December through February) and sediment toxicity to *H. azteca* (March and September).

Table 31. Lateral 2 ½ near Keyes Rd management plan constituents.

Constituent	Management Plan Initiation Year	Management Plan Removal Year	10 Year Compliance Deadline
Chlorpyrifos	2010	Active	2020
pH	2009	Active	Pending Workplan
Constituent (Removed)			
E. coli	2009	2012	Pending Workplan

Figure 16. Lateral 2 ½ near Keyes Rd site subwatershed land use map.



Monitoring Results

During 2013, the Coalition conducted MPM for chlorpyrifos and no exceedances of the WQTL occurred. Chlorpyrifos has not exceeded the WQTL since 2010. The field parameter, pH, was measured during all MPM events and two exceedances of the upper WQTL for pH occurred in April and September.

Table 32 is a record of yearly exceedances of WQTLs from 2008 through September 2013 for Lateral 2 ½ near Keyes Rd site subwatershed management plan constituents.

Table 32. Lateral 2 ½ near Keyes Rd exceedances of management plan constituents (2008-September 2013). The WQTLs used to evaluate the data are listed in the header after the analyte.

Site Name	Season	Sample Date	pH, <6.5 and > 8.5 units	*E. coli*, >235 MPN/100 mL	Chlorpyrifos, >0.015 µg/L
Lateral 2 ½ near Keyes Rd	Fall	10/21/2008	9.57	280	
Lateral 2 ½ near Keyes Rd	Fall	11/11/2008	9.09	370	
Lateral 2 ½ near Keyes Rd	Irrigation	4/21/2009	9.2		
Lateral 2 ½ near Keyes Rd	Irrigation	5/19/2009			
Lateral 2 ½ near Keyes Rd	Irrigation	7/21/2009			0.049
Lateral 2 ½ near Keyes Rd	Irrigation	8/18/2009			
Lateral 2 ½ near Keyes Rd	Fall	10/20/2009	8.68		
Lateral 2 ½ near Keyes Rd	Storm	4/20/2010			0.076
Lateral 2 ½ near Keyes Rd	Irrigation	7/20/2010			0.061
Lateral 2 ½ near Keyes Rd	Irrigation	4/19/2011	8.71		
Lateral 2 ½ near Keyes Rd	Irrigation	4/9/2013	8.79		
Lateral 2 ½ near Keyes Rd	Irrigation	7/9/2013	8.54		

LEVEE DRAIN @ CARPENTER RD

Overview

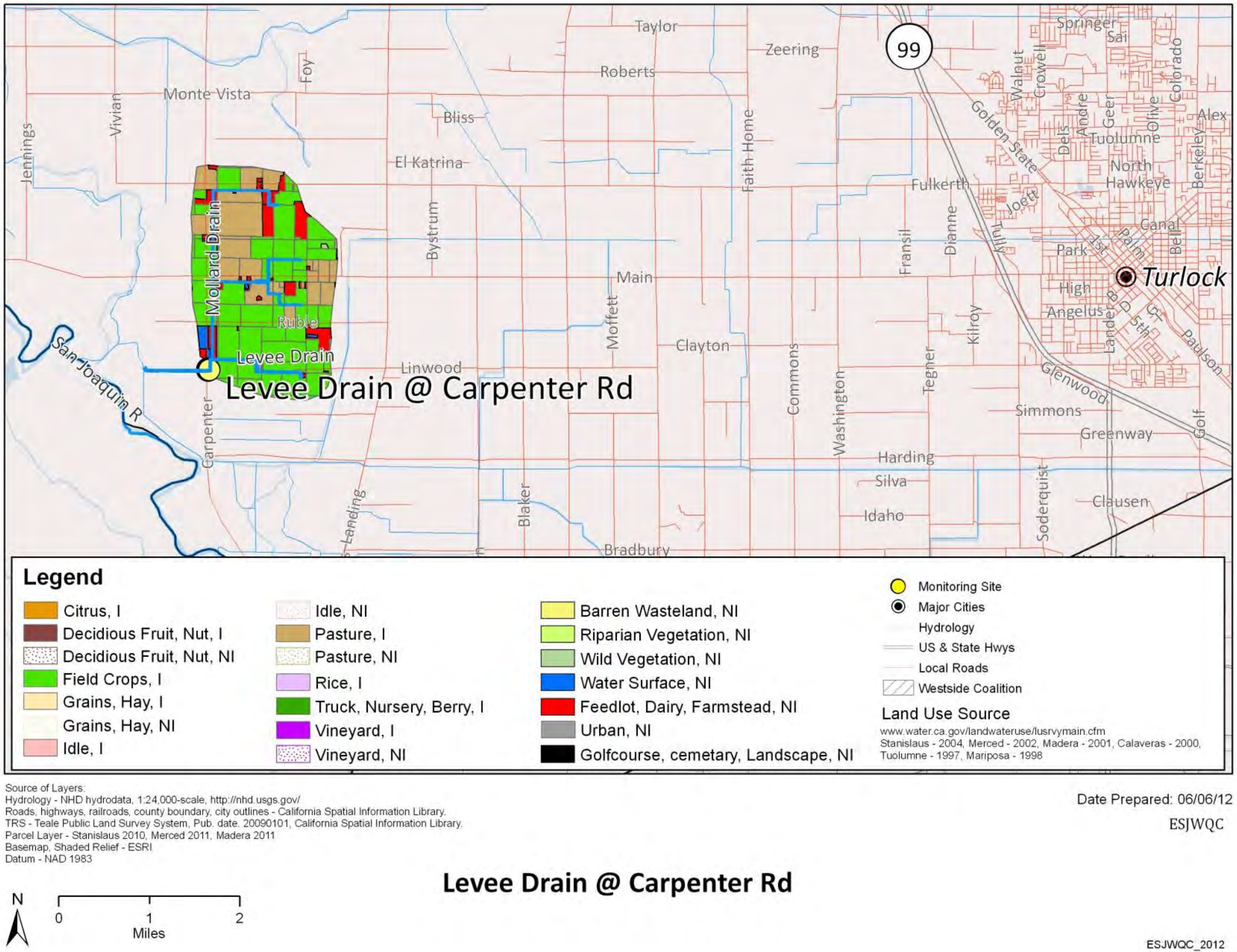
Monitoring began at Levee Drain @ Carpenter Rd in 2012 during Assessment Monitoring and continued through September 2013. The Coalition is scheduled to conduct focused outreach in the site subwatershed from 2015 through 2017. The constituents in the Levee Drain @ Carpenter Rd management plan are ammonia, *E. coli*, Nitrate as N, DO, SC, TDS and water column toxicity to *C. dubia* (Table 33).

Under the WDR, Levee Drain @ Carpenter Rd is a Represented Site and monitoring will occur as needed based on Core Site exceedances; land use is included in Figure 17. During the 2014 WY, Represented Site Monitoring is scheduled for dimethoate (July), and for toxicity to *C. dubia* and *P. promelas* (February, July), *S. capricornutum* (February, June, July), and sediment toxicity to *H. azteca* (March, September).

Table 33. Levee Drain @ Carpenter Rd management plan constituents.

Constituent	Management Plan Initiation Year	Management Plan Removal Year	10 Year Compliance Deadline
Ammonia	2013	Active	Pending Workplan
C. dubia water column toxicity	2014	Active	2024
Dissolved Oxygen	2013	Active	Pending Workplan
E. coli	2013	Active	Pending Workplan
Nitrate as N	2013	Active	Pending Workplan
Specific Conductivity	2013	Active	Pending Workplan
Total Dissolved Solids	2013	Active	Pending Workplan

Figure 17. Levee Drain @ Carpenter Rd site subwatershed land use map.



Assessment Monitoring occurred at Levee Drain @ Carpenter Rd in 2012 and through September 2013. Over the two years, exceedances of the WQTLs occurred frequently; ammonia (4), nitrate (18), DO (11), E. coli (13), SC (20), and TDS (21) were placed in the site's management plan in 2013.

Toxicity to C. dubia occurred in February and July 2013. A TIE was conducted on both toxic samples and both TIEs concluded that ammonia was the cause of toxicity in February and July; ammonia exceeded the WQTL during both events.

A record of yearly exceedances of WQTLs from 2012 through September 2013 for Levee Drain @ Carpenter Rd site subwatershed management plan constituents is included in Table 34.

Table 34. Levee Drain @ Carpenter Rd exceedances of management plan constituents (2012-September 2013). The WQTLs used to evaluate the data are listed in the header after the analyte.

Site Name	Season	Sample Date	Oxygen, Dissolved, mg/L	Specific Conductivity, µS/cm	Total Dissolved Solids, mg/L	Ammonia[1], mg/L	Nitrate + Nitrite as N, mg/L	*E. coli*, >235 MPN/100 mL	*C. dubia*, (%Control)
Levee Drain @ Carpenter Rd	Winter	1/10/2012		1851	1200		25	310	
Levee Drain @ Carpenter Rd	Winter	2/7/2012		1905	1300		23	2400	
Levee Drain @ Carpenter Rd	Winter, Sed	3/6/2012		1811	1200		24		
Levee Drain @ Carpenter Rd	Storm	4/12/2012		1672	1100		17	920	
Levee Drain @ Carpenter Rd	Irrigation	5/9/2012		1942	1300	2.6	31		
Levee Drain @ Carpenter Rd	Irrigation	6/12/2012	5.65	905	570		13		
Levee Drain @ Carpenter Rd	Irrigation	7/10/2012		1582	1000		13		
Levee Drain @ Carpenter Rd	Irrigation	8/14/2012	1.6	1051	670	3.8			
Levee Drain @ Carpenter Rd	Irrigation, Sed	9/11/2012	4.6	1864	1100		17		
Levee Drain @ Carpenter Rd	Fall	10/9/2012	3.93	1967	1300		19		
Levee Drain @ Carpenter Rd	Fall	11/13/2012		1810	1200		21		
Levee Drain @ Carpenter Rd	Storm	12/3/2012	5.22		1100		17		
Levee Drain @ Carpenter Rd	Winter	1/8/2013		1445	1100		25	250	
Levee Drain @ Carpenter Rd	Winter	2/12/2013	3.48	1988	1500	17	20	>2400	50
Levee Drain @ Carpenter Rd	Storm	2/20/2013		1704	1300		34	>2400	
Levee Drain @ Carpenter Rd	Winter	3/12/2013		1746	1200		23	>2400	
Levee Drain @ Carpenter Rd	Storm	4/2/2013						720	
Levee Drain @ Carpenter Rd	Irrigation	5/14/2013	4.99	1324	780		11	517.2	
Levee Drain @ Carpenter Rd	Irrigation	6/11/2013	4.77	1305	800		11	>2419.6	
Levee Drain @ Carpenter Rd	Irrigation, High TSS	7/9/2013	1.07	1015	640	5.4		>2419.6	35
Levee Drain @ Carpenter Rd	Irrigation, High TSS	8/13/2013	3.82	1203	720		12	517.2	
Levee Drain @ Carpenter Rd	Irrigation	9/10/2013	3.76	1583	1000			461.1	

[1]Ammonia WQTL variable based on pH and temperature.

LIVINGSTON DRAIN @ ROBIN AVE

Overview

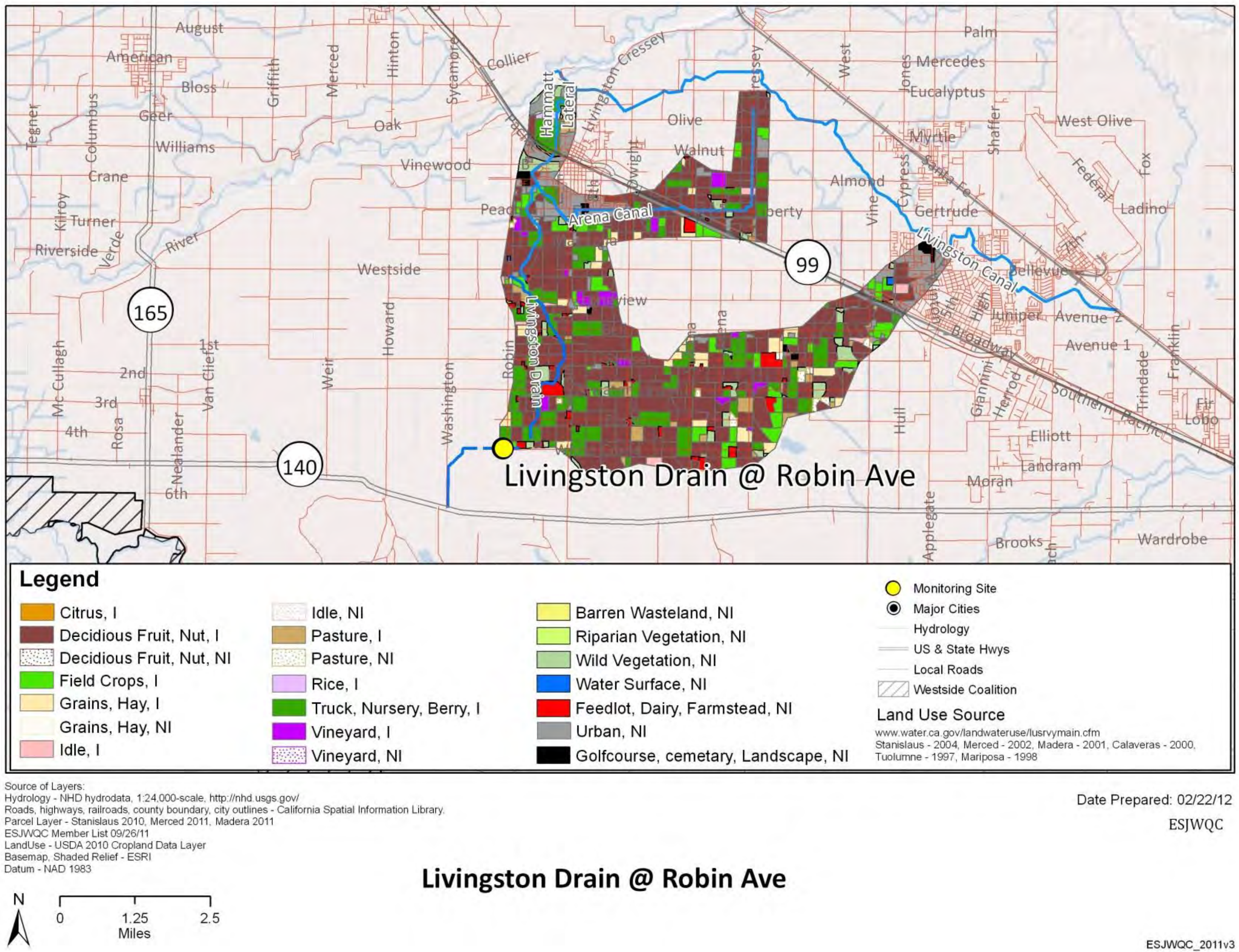
Monitoring at Livingston Drain @ Robin Ave began during the irrigation season of 2007 and continued through September 2013. The Coalition conducted focused outreach in 2011 through 2013. MPM occurred from 2011 through 2013, and results indicate improved water quality. The Coalition received approval on October 15, 2013 to remove lead from the site's management plan. The remaining management plan constituents include chlorpyrifos, copper, *E. coli*, pH, and *S. capricornutum* toxicity (Table 35).

Under the WDR, Livingston Drain @ Robin Ave is a Represented Site and monitoring will occur as needed based on Core Site exceedances; land use is included in Figure 18. During the 2014 WY, MPM is scheduled for copper (December through February, May through July and September), chlorpyrifos (January and April through August), and toxicity to *S. capricornutum* (February and April through May).

Table 35. Livingston Drain @ Robin Ave management plan constituents.

Constituent	Management Plan Initiation Year	Management Plan Removal Year	10 Year Compliance Deadline
Chlorpyrifos	2008	Active	2018
Copper	2008	Active	Pending Workplan
S. capricornutum water column toxicity	2009	Active	2019
E. coli	2009	Active	Pending Workplan
pH	2008	Active	Pending Workplan
Constituent (Removed)			
Lead	2009	2013	Pending Workplan

Figure 18. Livingston Drain @ Robin Ave site subwatershed land use map.



Monitoring Results

During January through September 2013, MPM occurred for chlorpyrifos, copper, lead, and toxicity to *S. capricornutum* and no exceedances or toxicity occurred. The field parameter, pH, was measured during all MPM events and six exceedances of the upper WQTL occurred. The most recent exceedance of the WQTL for chlorpyrifos occurred in July 2008. Copper (dissolved) most recently exceeded the hardness-based WQTL in February 2012. The last exceedance of the WQTL for lead and water column toxicity to *S. capricornutum* occurred in 2008.

Table 36 is a record of yearly exceedances of WQTLs from 2007 through September 2013 for Livingston Drain @ Robin Ave site subwatershed management plan constituents.

Table 36. Livingston Drain @ Robin Ave exceedances of management plan constituents (2007-September 2013). The WQTLs used to evaluate the data are listed in the header after the analyte.

Site Name	Season	Sample Date	pH, <6.5 and >8.5 units	*E. coli*, >235 MPN/100 mL	Copper (Dissolved), Variable[1]	Copper (Total), Variable[1] or >1300 µg/L	Lead (Total), Variable[1]	Chlorpyrifos, >0.015 µg/L	*S. capricornutum*, (% Control)
Livingston Drain @ Robin Ave	Irrigation	5/15/2007	8.95			18 (13.2)			
Livingston Drain @ Robin Ave	Irrigation	6/19/2007				16 (4.4)			
Livingston Drain @ Robin Ave	Irrigation	7/17/2007	8.82			7.8 (5.3)			
Livingston Drain @ Robin Ave	Irrigation	8/14/2007						0.016	
Livingston Drain @ Robin Ave	Irrigation	9/11/2007	8.57			14 (6.4)			
Livingston Drain @ Robin Ave	Storm	1/24/2008		1700		6.7 (3.1)	2.4 (0.6)	0.02	
Livingston Drain @ Robin Ave	Storm	2/26/2008				15 (4.1)	1.1 (0.9)		61
Livingston Drain @ Robin Ave	Irrigation	4/22/2008							58
Livingston Drain @ Robin Ave	Irrigation, RS	4/29/2008							63
Livingston Drain @ Robin Ave	Irrigation	5/20/2008	8.79						62
Livingston Drain @ Robin Ave	Irrigation, RS	5/27/2008	8.68						
Livingston Drain @ Robin Ave	Irrigation	6/3/2008	8.61						
Livingston Drain @ Robin Ave	Irrigation	6/17/2008	8.97			45 (13)		0.23	
Livingston Drain @ Robin Ave	Irrigation	7/8/2008	8.97			110 (5.7)			
Livingston Drain @ Robin Ave	Irrigation	7/22/2008		440		17 (16.9)		0.025	
Livingston Drain @ Robin Ave	Irrigation	8/19/2008							
Livingston Drain @ Robin Ave	Sediment	8/28/2008	8.67						
Livingston Drain @ Robin Ave	Irrigation	9/9/2008	8.72						
Livingston Drain @ Robin Ave	Irrigation	9/23/2008	9.02						
Livingston Drain @ Robin Ave	Irrigation	7/19/2011			2.6 (1.67)				
Livingston Drain @ Robin Ave	Irrigation	9/13/2011			1.7 (1.25)				
Livingston Drain @ Robin Ave	Winter	2/7/2012			12 (2.46)				
Livingston Drain @ Robin Ave	Winter	1/8/2013	8.85						
Livingston Drain @ Robin Ave	Irrigation	4/9/2013	8.89						
Livingston Drain @ Robin Ave	Irrigation	5/21/2013	8.54						
Livingston Drain @ Robin Ave	Irrigation	6/11/2013	8.85						
Livingston Drain @ Robin Ave	Irrigation	7/9/2013	9.44						
Livingston Drain @ Robin Ave	Irrigation	8/13/2013	8.81						

[1]Metal WQTL variable; based on hardness.
RS-Resample event.

MCCOY LATERAL @ HWY 140

Overview

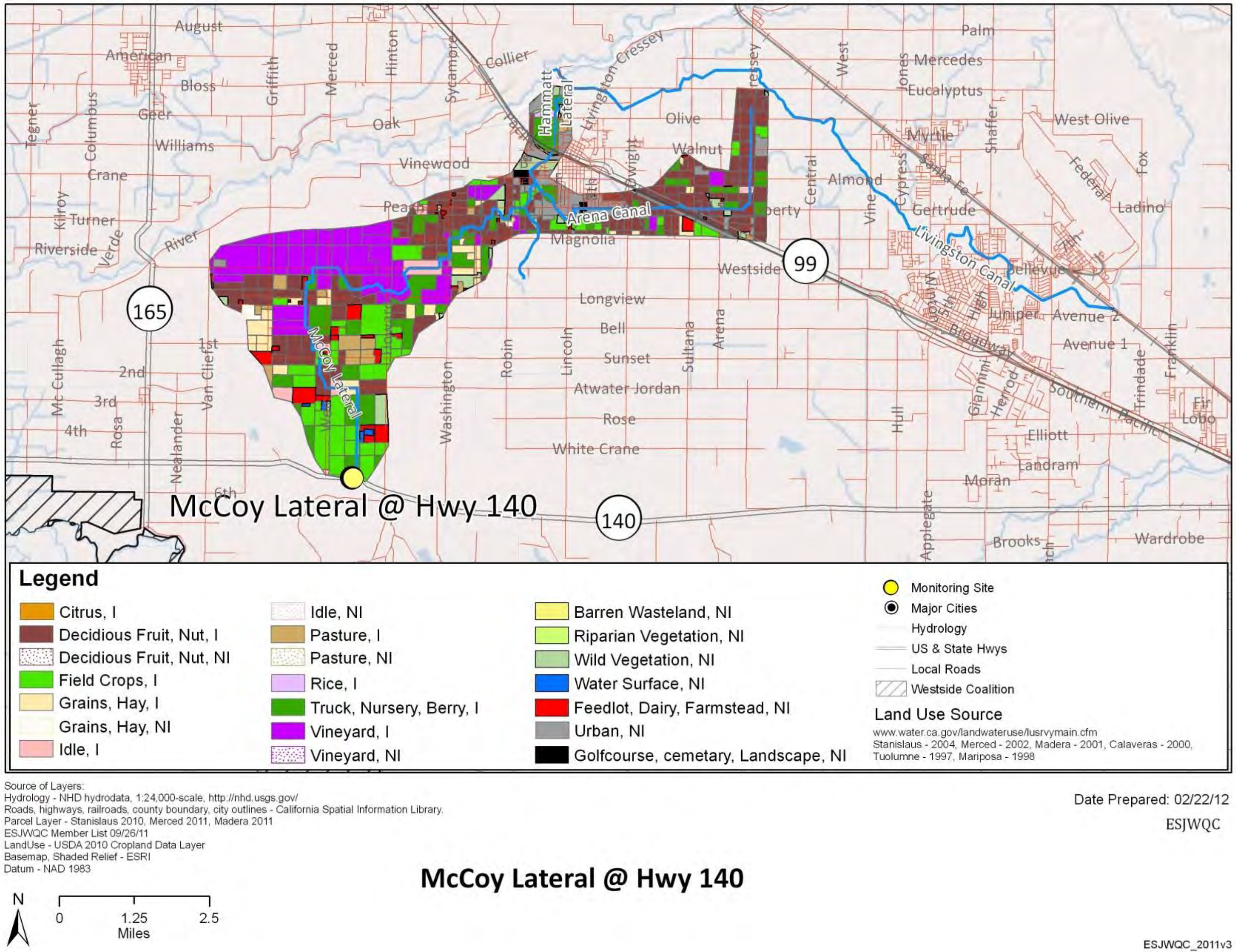
Monitoring occurred at McCoy Lateral @ Hwy 140 in 2011 and continued through 2012 during Assessment Monitoring, and MPM for copper occurred in 2013. The Coalition will conduct focused outreach in the site subwatershed in 2016 through 2018. Copper and pH were placed in the site's management plan in 2012 (Table 37).

Under the WDR, McCoy Lateral @ Hwy 140 is a Represented Site and monitoring will occur as needed based on Core Site exceedances; land use is included in Figure 19.

Table 37. McCoy Lateral @ Hwy 140 management plan constituents.

Constituent	Management Plan Initiation Year	Management Plan Removal Year	10 Year Compliance Deadline
Copper	2012	Active	Pending Workplan
pH	2012	Active	Pending Workplan

Figure 19. McCoy Lateral @ Hwy 140 site subwatershed land use map.



Monitoring Results

Monitoring occurred at McCoy Lateral @ Hwy 140 in 2011 and continued through 2012 during Assessment Monitoring. Copper was monitored 17 times at McCoy Lateral @ Hwy 140 during Assessment Monitoring; the site was dry seven times. Exceedances of the hardness based WQTL for dissolved copper occurred five times from 2011 through 2012 in January, September, October 2011 and July and December 2012. MPM occurred during January, July, and September 2013; exceedances of the hardness based WQTL occurred in January and September. Copper was added to the site's management plan in 2012.

The field parameter, pH, was measured during every sampling event at McCoy Lateral @ Hwy 140 and exceedances of the WQTL occurred seven times. In 2012, pH was added to the site's management plan.

Table 38 is a record of yearly exceedances of WQTLs from 2011 through September 2013 for McCoy Lateral @ Hwy 140 site subwatershed management plan constituents.

Table 38. McCoy Lateral @ Hwy 140 exceedances of management plan constituents (2011-September 2013). The WQTLs used to evaluate the data are listed in the header after the analyte.

Site Name	Season	Sample Date	pH, <6.5 and >8.5 units	Copper (Dissolved), Variable[1]
McCoy Lateral @ Hwy 140	Winter	1/18/2011		2.9 (1.97)
McCoy Lateral @ Hwy 140	Irrigation	4/19/2011	8.95	
McCoy Lateral @ Hwy 140	Irrigation	9/13/2011		1.2 (1.03)
McCoy Lateral @ Hwy 140	Fall	10/11/2011	8.65	1.1 (1.03)
McCoy Lateral @ Hwy 140	Storm	4/12/2012	8.87	
McCoy Lateral @ Hwy 140	Irrigation	6/12/2012		2.7 (2.07)
McCoy Lateral @ Hwy 140	Irrigation, MPM,, SED	9/11/2012	8.74	
McCoy Lateral @ Hwy 140	Storm	12/3/2012		4.40 (1.77)
McCoy Lateral @ Hwy 140	Winter, MPM	1/8/2013	8.89	3.2 (1.87)
McCoy Lateral @ Hwy 140	Irrigation, MPM	6/11/2013	9.29	
McCoy Lateral @ Hwy 140	Irrigation, MPM	9/10/2013	9.25	2.1 (1.87)

[1]Metal WQTL variable; based on hardness.

MERCED RIVER @ SANTA FE

Overview

Monitoring at Merced River @ Santa Fe began in 2004 and continued through September 2013. The site rotated into Assessment Monitoring in 2011 and Core Monitoring occurred in 2013. MPM in the site subwatershed was initiated in 2005 and continued through September 2013 for chlorpyrifos and *C. dubia* toxicity. The Coalition will conduct focused outreach in the site subwatershed from 2013 through 2015. The Coalition received approval on May 30, 2012 to remove DO from the site's management plan. The remaining management plan constituents are chlorpyrifos, DO (reinstated following exceedance in May, July, August, and September 2013), *E. coli*, lead, and *C. dubia* toxicity (Table 39).

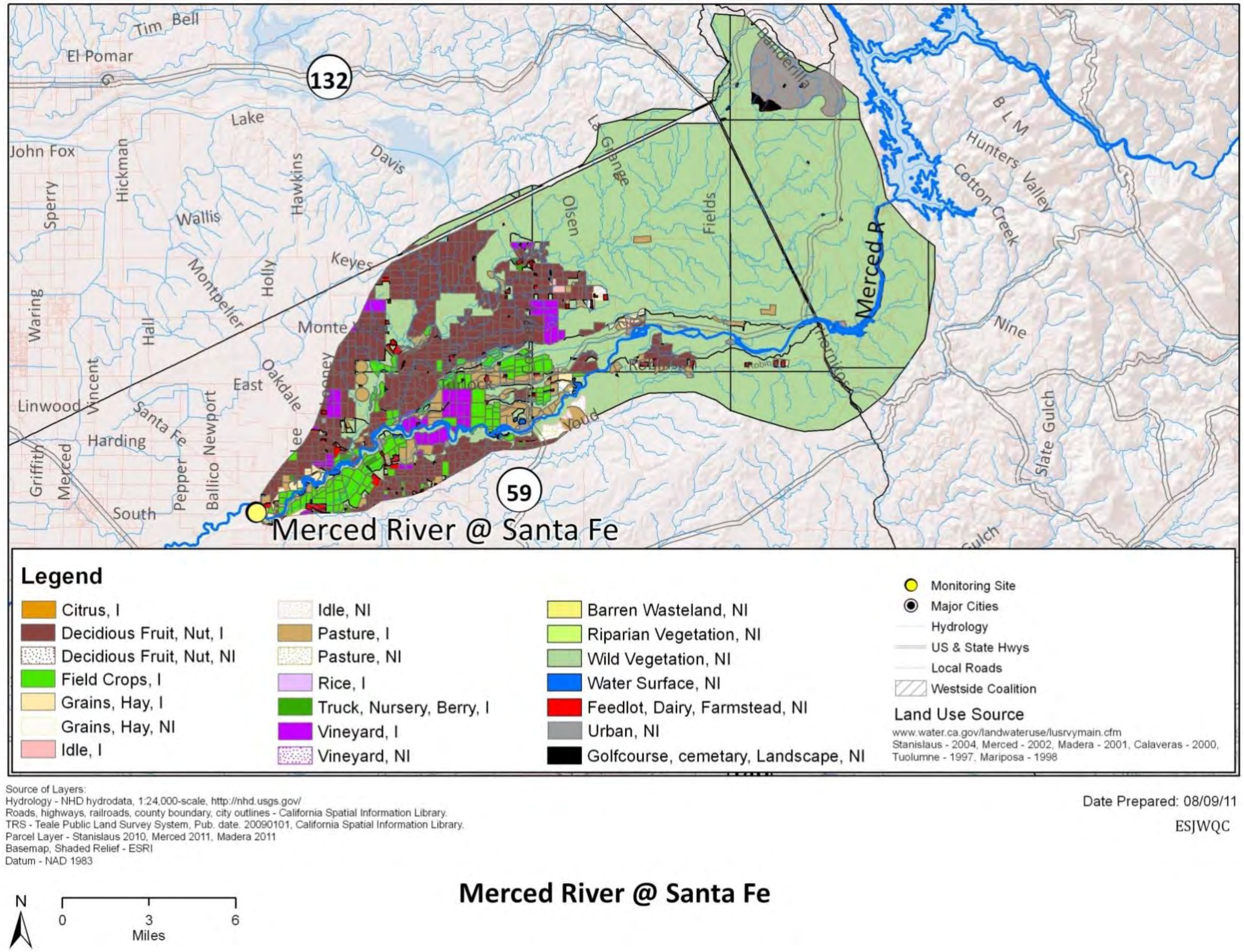
Under the WDR, Merced River @ Santa Fe will be monitored as a Core Site; land use is included in Figure 20. During the 2014 WY, MPM is scheduled for lead (January through February), chlorpyrifos (November, January, and July), and toxicity to *C. dubia* (January, March, July, and August).

Table 39. Merced River @ Santa Fe management plan constituents.

Constituent	Management Plan Initiation Year	Management Plan Removal Year	10 Year Compliance Deadline
Chlorpyrifos	2008	Active	2018
C. dubia water column toxicity	2005	Active	2015
E. coli	2011	Active	Pending Workplan
Lead	2009	Active	Pending Workplan
Dissolved Oxygen[1]	2009, 2014	Active	Pending Workplan
Total Dissolved Solids	2014	Active	Pending Workplan

[1]Dissolved Oxygen was approved for removal on May 30, 2012; however this constituent will be reinstated into a management plan in 2014 as a result of 2013 exceedances.

Figure 20. Merced River @ Santa Fe site subwatershed land use map.



Monitoring Results

During 2013, MPM for chlorpyrifos and water column toxicity to *C. dubia* occurred; no exceedances of the WQTL or toxicity occurred. The last exceedances of the WQTL for chlorpyrifos and the last toxicity to *C. dubia* occurred in 2008. Core Monitoring also occurred in 2013 and exceedances of the WQTLs for *E. coli* and TDS occurred once each. The Coalition received approval to remove DO from the management plan on May 30, 2012; however, DO was measured during all Core and MPM events during the January through September and four exceedances of the WQTL occurred; DO was reinstated in the site' management plan for 2014.

Table 40 is a record of yearly exceedances of WQTLs from 2004 through September 2013 for Merced River @ Santa Fe site subwatershed management plan constituents.

Table 40. Merced River @ Santa Fe exceedances of management plan constituents (2004-September 2013). The WQTLs used to evaluate the data are listed in the header after the analyte.

Station Name	Season	Sample Date	Dissolved Oxygen, <7 mg/L	Total Dissolved Solids, >450 Mg/L	*E. coli*, >235 MPN/100 mL	Lead (Total), Variable[1]	Chlorpyrifos, >0.015 µg/L	*C. dubia*, (%Control)
Merced River @ Santa Fe	Irrigation	7/31/2004						78.95
Merced River @ Santa Fe	Irrigation	8/31/2004						42.11
Merced River @ Santa Fe	Storm	3/21/2005						
Merced River @ Santa Fe	Irrigation	8/17/2005						
Merced River @ Santa Fe	Storm	3/1/2006			1600			
Merced River @ Santa Fe	Storm	3/16/2006						35
Merced River @ Santa Fe	Irrigation	6/14/2006	6.40					
Merced River @ Santa Fe	Storm	2/12/2007				0.82 (0.63)		
Merced River @ Santa Fe	Irrigation	7/17/2007					0.018	
Merced River @ Santa Fe	Storm	1/24/2008				5.6 (1.1)	0.59	0
Merced River @ Santa Fe	Storm, RS	1/30/2008						0
Merced River @ Santa Fe	Irrigation	4/22/2008	6.06					
Merced River @ Santa Fe	Fall	11/11/2008					0.1	
Merced River @ Santa Fe	Irrigation	7/21/2009	6.12					
Merced River @ Santa Fe	Fall	10/20/2009	4.82					
Merced River @ Santa Fe	Storm	1/19/2010			>2400			
Merced River @ Santa Fe	Storm	4/20/2010			440			
Merced River @ Santa Fe	Irrigation	6/14/2011			770			
Merced River @ Santa Fe	Winter	1/8/2013			1700			
Merced River @ Santa Fe	Winter	3/12/2013		1100				
Merced River @ Santa Fe	Irrigation	5/14/2013	6.41					
Merced River @ Santa Fe	Irrigation	7/9/2013	6.05					
Merced River @ Santa Fe	Irrigation	8/13/2013	6.20					
Merced River @ Santa Fe	Irrigation	9/10/2013	6.82					

[1]Metal WQTL variable; based on hardness..
RS – Resampling due to toxicity.

MILES CREEK @ REILLY RD

Overview

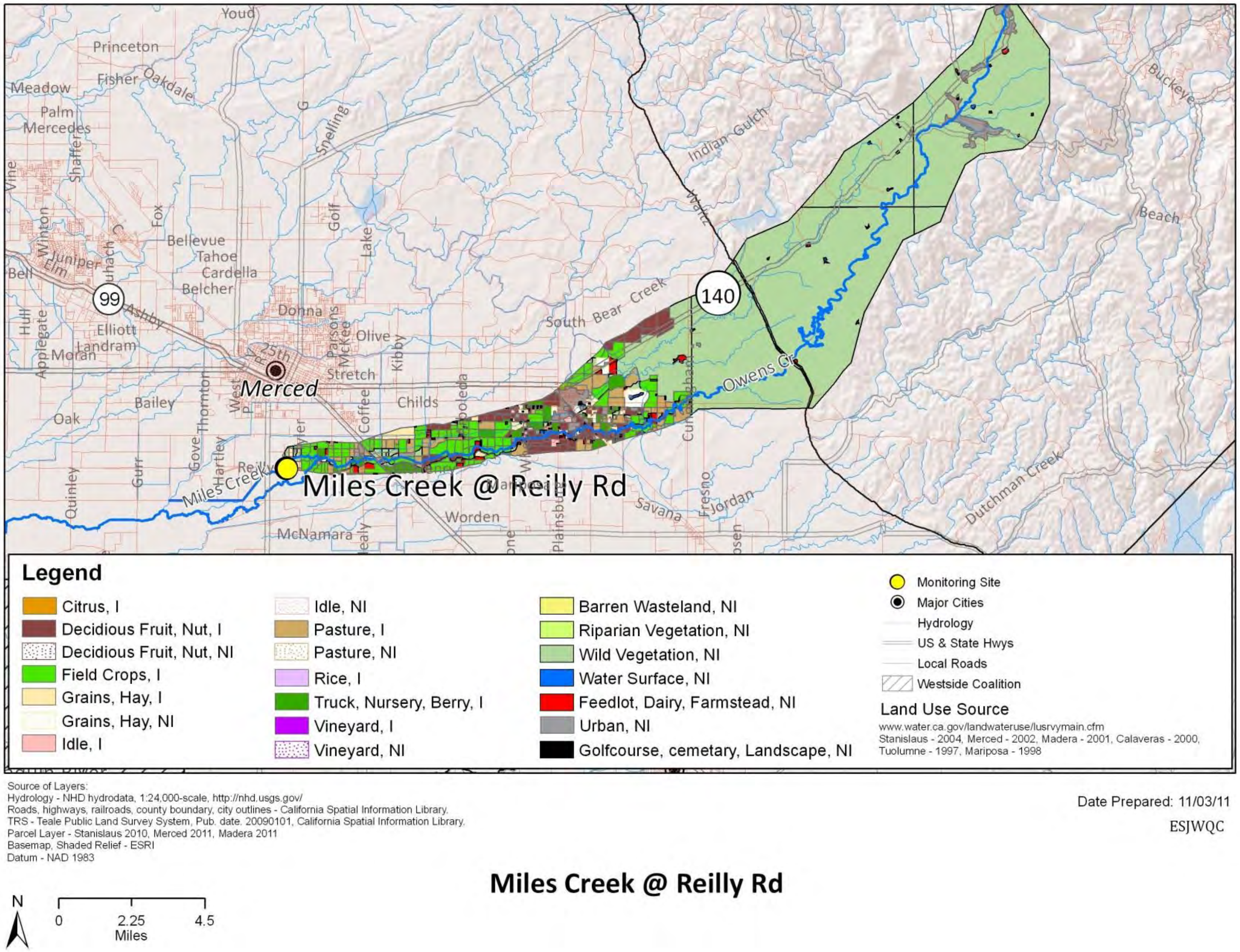
Monitoring occurred at Miles Creek @ Reilly Rd from 2007 through 2010 and Assessment Monitoring occurred in 2013. MPM occurred in 2009 and 2010 for chlorpyrifos, copper, and toxicity to *C. dubia* and *S. capricornutum,* and in 2013 for chlorpyrifos, copper, lead, toxicity to *C. dubia, S. capricornutum*, and sediment toxicity to *H. azteca*. The Coalition completed the first year of focused outreach in the site subwatershed in 2013. The management plan constituents include chlorpyrifos, copper, DO, diazinon, *E. coli*, lead, *C. dubia* toxicity, *H. azteca* toxicity, and *S. capricornutum* toxicity (Table 41).

Under the WDR, Miles Creek @ Reilly Rd is a Represented Site and monitoring will occur as needed based on Core Site exceedances; land use is included in Figure 21. During the 2014 WY, MPM is scheduled for copper (January through August), lead (January through February and June through August), chlorpyrifos (March, June through September), diazinon (February), toxicity to *C. dubia* (January and September), *S. capricornutum* (February, April and June) and sediment toxicity to *H. azteca* (September).

Table 41. Miles Creek @ Reilly Rd management plan constituents.

Constituent	Management Plan Initiation Year	Management Plan Removal Year	10 Year Compliance Deadline
Chlorpyrifos	2008	Active	2018
Diazinon	2014	Active	2024
Copper	2008	Active	Pending Workplan
C. dubia sediment toxicity	2009	Active	2019
H. azteca sediment toxicity	2009	Active	2019
S. capricornutum water column toxicity	2009	Active	2019
Dissolved Oxygen	2009	Active	Pending Workplan
E. coli	2008	Active	Pending Workplan
Lead	2009	Active	Pending Workplan
Total Dissolved Solids	2014	Active	Pending Workplan

Figure 21. Miles Creek @ Reilly Rd site subwatershed land use map.



Monitoring Results

From January through September 2013, MPM occurred for chlorpyrifos, copper, water column toxicity to *C. dubia*, *S. capricornutum*, sediment toxicity to *H. azteca*, and lead; only toxicity to *S. capricornutum* occurred (February). During Assessment Monitoring, one exceedance of the WQTL for diazinon, one exceedance of the WQTL for DO and TDS, and five exceedances of the WQTL for *E. coli* occurred. The exceedance of the WQTL for diazinon occurred in the field duplicate (the environmental samples was non-detect).

Table 42 is a tally of yearly exceedances of WQTLs from 2007 through September 2013 for Miles Creek @ Reilly Rd site subwatershed management plan constituents.

Table 42. Miles Creek @ Reilly Rd exceedances of management plan constituents (2007-September 2013). The WQTLs used to evaluate the data are listed in the header after the analyte.

Station Name	Season	Sample Date	Dissolved Oxygen, <7 mg/L	Total Dissolved Solids, >450 mg/L	*E. coli*, >235 MPN/100 mL	Copper (Total), Variable[1] or >1300 µg/L	Lead (Total), Variable[1]	Chlorpyrifos, >0.015 µg/L	Diazinon, >0.1 µg/L	*C. dubia*, (%Control)	*H. a azteca*, (%Control)	*S. capricornutum*, %(Control)
Miles Creek @ Reilly Rd	Irrigation	5/29/2007			290	4.3 (3.5)						
Miles Creek @ Reilly Rd	Irrigation	6/26/2007			310	5.8 (4.3)	1 (0.99)					54
Miles Creek @ Reilly Rd	Irrigation	7/24/2007			340							
Miles Creek @ Reilly Rd	Irrigation	8/21/2007				5.2 (4.4)						
Miles Creek @ Reilly Rd	Irrigation	8/23/2007									94	
Miles Creek @ Reilly Rd	Irrigation	9/18/2007						0.03		60		
Miles Creek @ Reilly Rd	Storm	1/25/2008			>2400	15 (6.2)	3.2 (1.7)			0		
Miles Creek @ Reilly Rd	Storm, RS	1/30/2008								19.3		
Miles Creek @ Reilly Rd	Storm	2/25/2008			2000	34 (8.0)	7.7 (2.5)					
Miles Creek @ Reilly Rd	Irrigation	4/29/2008										25
Miles Creek @ Reilly Rd	Irrigation	5/7/2008										51
Miles Creek @ Reilly Rd	Irrigation	5/27/2008			>2400							
Miles Creek @ Reilly Rd	Irrigation	6/24/2008	4.76									
Miles Creek @ Reilly Rd	Irrigation	7/29/2008	5.34		250	7.5 (4.6)	1.7 (1.1)	0.021				
Miles Creek @ Reilly Rd	Irrigation	8/5/2008	6.93									
Miles Creek @ Reilly Rd	Irrigation	8/26/2008	5.86			7.5 (6.7)	2 (1.95)	0.042				
Miles Creek @ Reilly Rd	Sediment	8/28/2008	5.33								95	
Miles Creek @ Reilly Rd	Irrigation	9/30/2008	6.34									
Miles Creek @ Reilly Rd	Sed., RS	10/2/2008									91	
Miles Creek @ Reilly Rd	Irrigation	4/21/2009	6.30									
Miles Creek @ Reilly Rd	Irrigation	7/21/2009	6.45					0.028				
Miles Creek @ Reilly Rd	Irrigation	8/18/2009	6.58									
Miles Creek @ Reilly Rd	Irrigation	9/22/2009	6.35									
Miles Creek @ Reilly Rd	Winter	1/8/2013			>2400							
Miles Creek @ Reilly Rd	Winter	2/12/2013										50
Miles Creek @ Reilly Rd	Storm	2/20/2013			440				0.18			

Station Name	Season	Sample Date	Dissolved Oxygen, <7 mg/L	Total Dissolved Solids, >450 Mg/L	E. coli, >235 MPN/100 mL	Copper (Total), Variable[1] or >1300 µg/L	Lead (Total), Variable[1]	Chlorpyrifos, >0.015 µg/L	Diazinon, >0.1 µg/L	C. dubia, (%Control)	H. a azteca, (%Control)	S. capricornutum, %(Control)
Miles Creek @ Reilly Rd	Winter	3/12/2013			>2400							
Miles Creek @ Reilly Rd	Storm	4/2/2013										
Miles Creek @ Reilly Rd	Irrigation	5/14/2013			387.3							
Miles Creek @ Reilly Rd	Irrigation	7/9/2013		1700	325.5							
Miles Creek @ Reilly Rd	Irrigation	9/10/2013	4.97									

[1]Metal WQTL variable; based on hardness..
RS – Resampling due to toxicity.

MOOTZ DRAIN DOWNSTREAM OF LANGWORTH POND

Overview

The Coalition monitored Mootz Drain @ Langworth Rd in October 2008 through November 2009 and downstream of Langworth Pond from December 2009 through 2010 during Assessment Monitoring. Mootz Drain @ Langworth Rd was approved to be moved downstream to Mootz Drain downstream of Langworth Pond on November 30, 2009. Mootz Drain downstream of Langworth Pond represents the same acreage upstream but the sample is taken downstream of the retention pond rather than upstream. Mootz Drain downstream of Langworth Pond replaced monitoring at Burnett Lateral @ 28 Mile Rd in 2013 and Assessment Monitoring occurred from April through September.

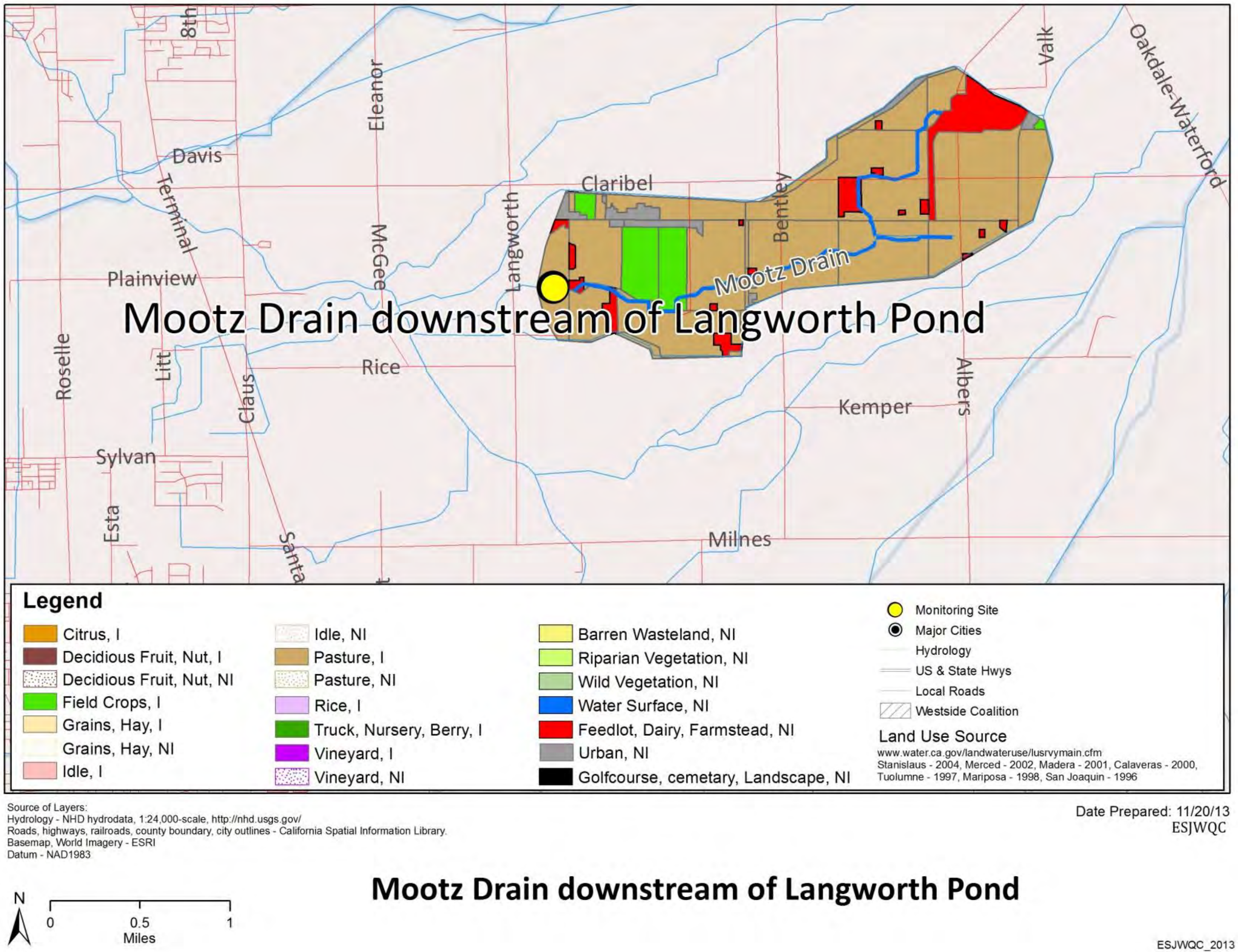
The Coalition is scheduled to conduct focused outreach in the site subwatershed from 2015 through 2017. The constituents in the Mootz Drain downstream of Langworth Pond management plan are ammonia, chlorpyrifos, diuron, DO, and *E. coli*, and pH (Table 43).

Under the WDR, Mootz Drain downstream of Langworth Pond is a Represented Site and monitoring will occur as needed based on Core Site exceedances; land use is included in Figure 22. During the 2014 WY, Represented Site Monitoring is scheduled for sediment toxicity to *H. azteca* (March, September).

Table 43. Mootz Drain downstream of Langworth Pond management plan constituents.

Constituent	Management Plan Initiation Year	Management Plan Removal Year	10 Year Compliance Deadline
Ammonia	2011	Active	Pending Workplan
Chlorpyrifos	2009	Active	2019
Diuron	2011	Active	2022
Dissolved Oxygen	2010	Active	Pending Workplan
E. coli	2010	Active	Pending Workplan
pH	2014	Active	Pending Workplan

Figure 22. Mootz Drain downstream of Langworth Pond site subwatershed land use map.



Mootz Drain @ Langworth Rd was monitored for chlorpyrifos from November 2008 through November 2009. Mootz Drain downstream of Langworth Pond was monitored for chlorpyrifos 11 times from December 2009 through 2010 and 6 times from April to September 2013. Exceedances of the WQTL for chlorpyrifos occurred at Langworth Rd once in December 2008 and again in June 2009; no applications were recorded within 30 days of the exceedance and no toxicities were associated with either exceedance. No exceedances of the WQTL for chlorpyrifos occurred in the 17 samples collected from Mootz Drain downstream of Langworth Pond; all results were non detect. Chlorpyrifos was placed in the site's management in 2010.

Diuron was monitored 29 times at Mootz Drain, 12 times at Langworth Rd from November 2008 through November 2009, and 17 times downstream of Langworth Pond from December 2009 through September 2013. One exceedance of the WQTL occurred in February 2009 at Langworth Rd and one exceedance of the WQTL occurred in December 2010 downstream of Langworth Pond. Diuron was placed in the site's management plan in 2011.

Exceedances of the WQTL for ammonia occurred twice in the Mootz Drain site subwatershed, once in November 2009 at Langworth Rd and once in December 2010 downstream of Langworth Pond. Ammonia was placed in the site's management plan in 2011.

During Assessment Monitoring from 2008 through 2010 and 2013 at Mootz Drain 25 exceedances of the WQTL for DO and *E. coli* occurred and both constituents were added to the site's management plan in 2010. Two exceedances of the WQTL for pH occurred, once at Langworth Pond in November 2008 and once downstream of Langworth Pond in July 2013; pH was added to the site's management plan in 2014.

Table 44 is a tally of yearly exceedances of WQTLs from 2008 through September 2013 for Mootz Drain downstream of Langworth Pond site subwatershed management plan constituents.

Table 44. Mootz Drain subwatershed exceedances of management plan constituents (2008 -September 2013). The WQTLs used to evaluate the data are listed in the header after the analyte.

Site Name	Season	Sample Date	Oxygen, Dissolved, mg/L	pH, none	Ammonia[1], mg/L	*E. coli*, >235 MPN/100 mL	Chlorpyrifos, µg/L	Diuron, µg/L
Mootz Drain @ Langworth Rd	Non Contiguous, Winter	3/17/2009	4.01					
Mootz Drain @ Langworth Rd	Fall	11/11/2008	3.55	4.32				
Mootz Drain @ Langworth Rd	Fall	12/16/2008				>2400	0.017	
Mootz Drain @ Langworth Rd	Non Contiguous, Storm	2/7/2009						2.1
Mootz Drain @ Langworth Rd	Irrigation	4/21/2009	3.14			>2400		
Mootz Drain @ Langworth Rd	Irrigation	5/19/2009	4.59			>2400		
Mootz Drain @ Langworth Rd	Irrigation	6/16/2009	5.40			390	0.033	
Mootz Drain @ Langworth Rd	Irrigation	7/21/2009	2.18			2000		
Mootz Drain @ Langworth Rd	Irrigation	8/18/2009	4.90			>2400		
Mootz Drain @ Langworth Rd	Irrigation	9/22/2009	5.62			1700		
Mootz Drain @ Langworth Rd	Non Contiguous, Fall	10/20/2009	6.35			240		
Mootz Drain @ Langworth Rd	Non Contiguous, Fall	11/17/2009	4.98		2.10	>2400		
Mootz Drain Downstream of Langworth Pond	Storm	12/15/2009	5.51			>2400		
Mootz Drain Downstream of Langworth Pond	Storm	1/19/2010				>2400		
Mootz Drain Downstream of Langworth Pond	Storm	2/23/2010				980		
Mootz Drain Downstream of Langworth Pond	Non Contiguous, Winter, MPM	3/23/2010	5.94			520		
Mootz Drain Downstream of Langworth Pond	Storm	4/20/2010	6.54			1200		
Mootz Drain Downstream of Langworth Pond	Irrigation	5/18/2010	6.30			>2400		
Mootz Drain Downstream of Langworth Pond	Irrigation	6/15/2010	3.80			>2400		
Mootz Drain Downstream of Langworth Pond	Irrigation	7/20/2010	4.24			>2400		
Mootz Drain Downstream of Langworth Pond	Irrigation	8/17/2010	3.35			820		
Mootz Drain Downstream of Langworth Pond	Sediment	9/14/2010	4.68			>2400		
Mootz Drain Downstream of Langworth Pond	Fall	12/14/2010	4.69		2.80			2.7
Mootz Drain downstream of Langworth Pond	Storm	4/2/2013	4.32			2000		
Mootz Drain downstream of Langworth Pond	Irrigation	5/14/2013	4.17			>2419.6		
Mootz Drain downstream of Langworth Pond	Irrigation	6/11/2013	4.28			>2419.6		
Mootz Drain downstream of Langworth Pond	Irrigation, High TSS	7/9/2013	4.35	6.42		920.8		
Mootz Drain downstream of Langworth Pond	Irrigation, High TSS	8/13/2013	5.65			>2419.6		
Mootz Drain downstream of Langworth Pond	Irrigation	9/10/2013	3.07			>2419.6		

[1]Ammonia WQTL variable based on pH and temperature.

MUSTANG CREEK @ EAST AVE

Overview

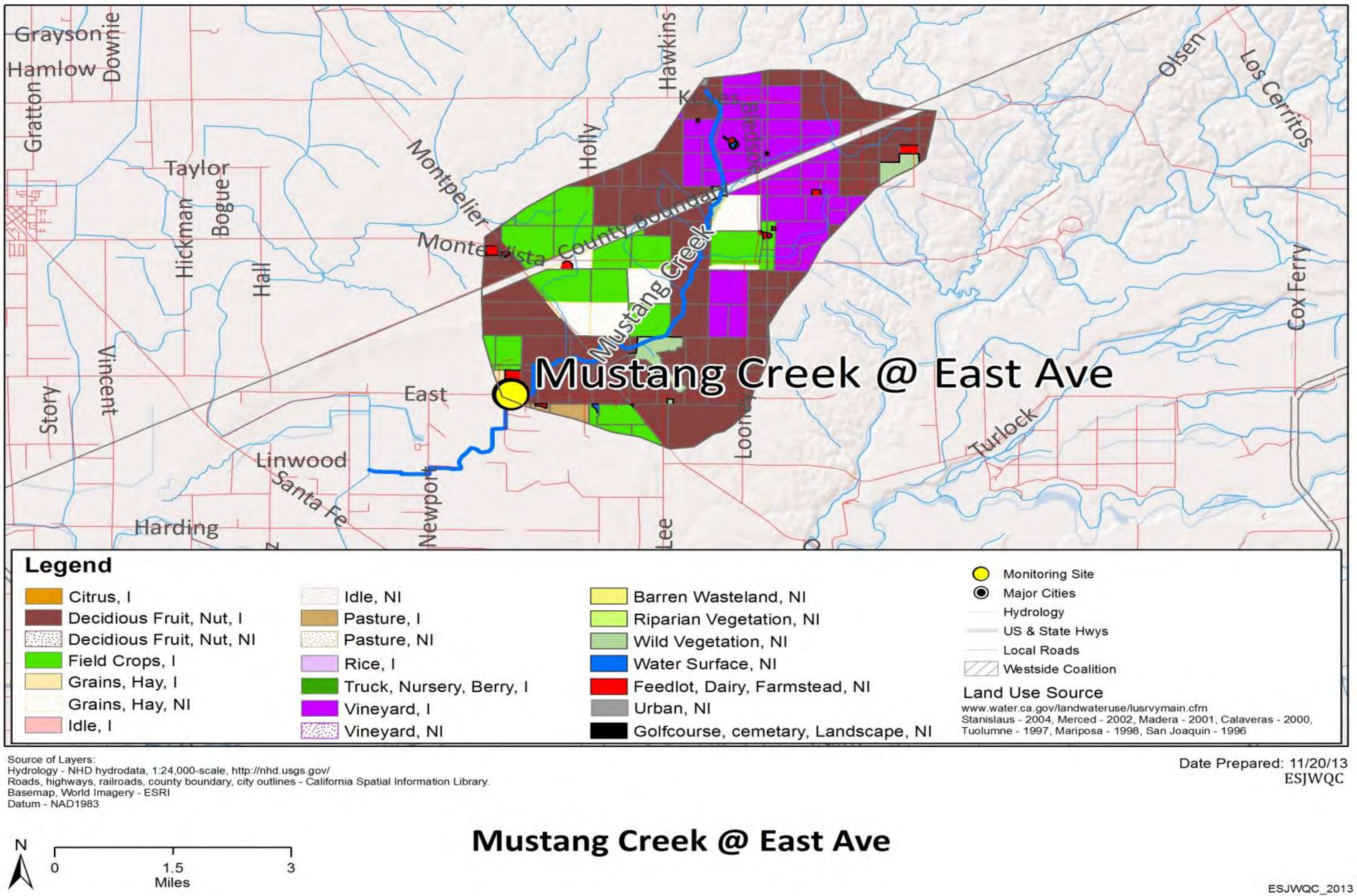
Monitoring was initiated during the irrigation season of 2006 and continued through 2010 and next during 2013. Assessment Monitoring occurred in 2009, 2010, and 2013 and MPM occurred in 2010; however, the site was dry 24 times from 2009 through September 2013. The Coalition will conduct focused outreach from 2014 through 2016. The Coalition received approval on May 30, 2012 to remove chlorpyrifos and simazine from the site's management plan due to improved water quality. The remaining management plan constituents include copper, dichlorodiphenyldichloro-ethylene (DDE), DO, *E. coli*, nitrate, SC, and TDS (Table 45).

Under the WDR, Mustang Creek @ East Ave is a Represented Site and monitoring will occur as needed based on Core Site exceedances; land use is included in Figure 23. During the 2014 WY, MPM is scheduled for copper (October through April) and Represented Site Monitoring for toxicity to *C. dubia* (March, May, and September), *S. capricornutum* (February through May), and sediment toxicity to *H. azteca* (March and September).

Table 45. Mustang Creek at East Ave management plan constituents.

Constituent	Management Plan Initiation Year	Management Plan Removal Year	10 Year Compliance Deadline
Copper	2010	Active	Pending Workplan
Nitrate as N	2010	Active	Pending Workplan
Dissolved Oxygen	2007	Active	Pending Workplan
Specific Conductivity	2008	Active	Pending Workplan
Total Dissolved Solids	2008	Active	Pending Workplan
E. Coli	2007	Active	Pending Workplan
DDE	2008	Active	2018
Constituent (Removed)			
Chlorpyrifos	2009	2012	2022
Simazine	2009	2012	2022

Figure 23. Mustang Creek @ East Ave site subwatershed land use map.



Monitoring Results

Monitoring was initiated at Mustang Creek @ East Ave in 2006 and occurred every year except for 2011 and 2012. Assessment Monitoring occurred in 2009, 2010, and 2013 and MPM occurred in 2010; however, the site was dry 24 times from 2009 through September 2013.

Chlorpyrifos and simazine were placed into a management plan in 2009 as a result of the exceedances; ten water samples were collected during these three years and resulted in no exceedances of the WQTL.

Assessment Monitoring during 2009 resulted in three exceedances of the WQTL for dissolved copper; therefore, copper was placed in a management plan in 2010. Assessment Monitoring during 2010 and 2013 resulted in one exceedance of the hardness based WQTL for dissolved copper in February 2010 and January 2013.

Nitrate as N was placed in the Mustang Creek @ East Ave management plan in 2010 after two exceedances of the WQTL occurred in 2009. Nitrate was monitored during Assessment Monitoring in 2013 and no exceedances occurred.

Dissolved Oxygen (12), DDE (3), *E. coli* (10), SC (9), and TDS (6) have exceeded the WQTLs at Mustang Creek @ East Ave from 2006 through 2010. Exceedances of the WQTLs for DO and *E. coli* in 2006 placed them in the site's management plan in 2007 and exceedances of the WQTLs for DDE, SC, and TDS in 2007 placed them in the management plan in 2008. No exceedances these constituents exceeded the WQTLs in 2013.

Table 46 is a record of yearly exceedances of WQTLs from 2006 through September 2013 for Mustang Creek @ East Ave site subwatershed management plan constituents.

Table 46. Mustang Creek @ East Ave exceedances of management plan constituents (2006-September 2013). The WQTLs used to evaluate the data are listed in the header after the analyte.

Station Name	Season	Sample Date	Dissolved Oxygen, <7 mg/L	Specific Conductivity, >700 µS/cm	Total Dissolved Solids, >450 Mg/L	Nitrate as N, >10 mg/L	*E. coli*, >235 MPN/100 mL	Copper (Dissolved), Variable[1]	Chlorpyrifos, >0.0.15 µg/L	DDE, >0.00059 µg/L
Mustang Creek @ East Ave	Irrigation	5/18/2006	5.82				2400			
Mustang Creek @ East Ave	Irrigation	6/15/2006	5.00				2400			
Mustang Creek @ East Ave	Irrigation	8/10/2006	2.61				980			
Mustang Creek @ East Ave	Storm	2/28/2007		760	460					0.0064
Mustang Creek @ East Ave	Irrigation	5/15/2007	1.16				1600			
Mustang Creek @ East Ave	Irrigation	6/19/2007	4.30				410			0.0073
Mustang Creek @ East Ave	Storm	1/24/2008					460		0.067	
Mustang Creek @ East Ave	Storm RS	1/30/2008								
Mustang Creek @ East Ave	Storm	2/26/2008	4.06						0.028	
Mustang Creek @ East Ave	Storm	3/4/2008	2.44							
Mustang Creek @ East Ave	Storm	3/28/2008	4.10	1467						
Mustang Creek @ East Ave	Storm	2/7/2009		704	560	12		25 (20.93)		
Mustang Creek @ East Ave	Winter, Non-Contiguous	3/17/2009		1042	710	33				
Mustang Creek @ East Ave	Irrigation	4/21/2009	0.98	1433						
Mustang Creek @ East Ave	Fall, Non-Contiguous	10/20/2009	2.95	870	670		250	44 (24.40)		
Mustang Creek @ East Ave	Storm	12/15/2009		892				25 (22.90)		0.022
Mustang Creek @ East Ave	Storm	1/19/2010	5.22	856	570		1000			
Mustang Creek @ East Ave	Storm	2/23/2010					360	20 (17.57)		
Mustang Creek @ East Ave	Winter	3/23/2010	3.87	877	580					
Mustang Creek @ East Ave	Storm	4/20/2010					>2400			
Mustang Creek @ East Ave	Winter	1/8/2013						11 (8.96)		

[1]WQTL variable based on hardness.

RS – Resampling due to toxicity.

PRAIRIE FLOWER DRAIN @ CROWS LANDING RD

Overview

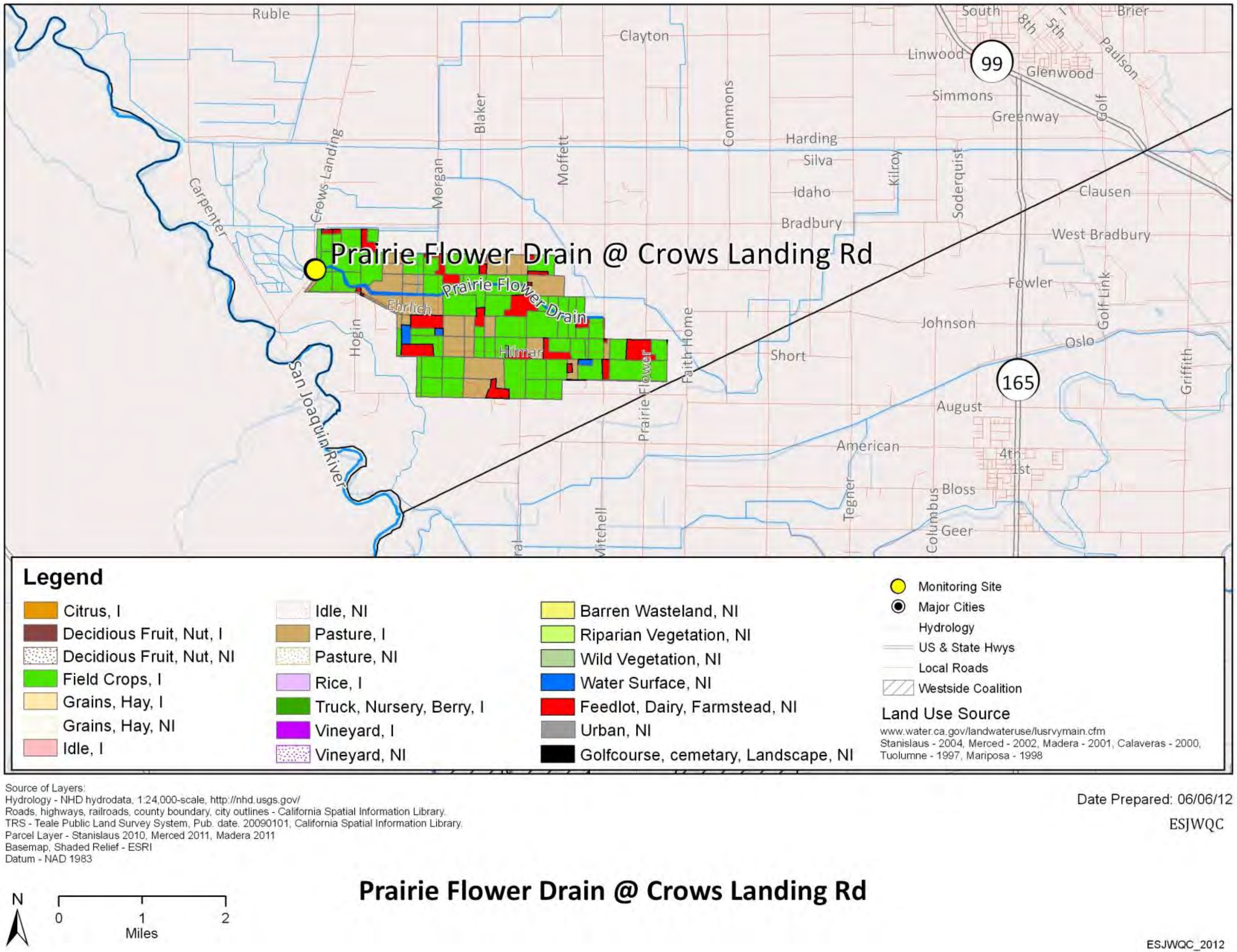
Monitoring began at Prairie Flower Drain @ Crows Landing Rd during the storm season of 2005 and continued through September 2013. Assessment Monitoring last occurred at the site in 2011. Focused outreach occurred from 2009 through 2011 and MPM results from 2009 through September 2013 indicate improved water quality. The Coalition received approval on May 30, 2012 to remove chlorpyrifos and pH from the site's management plan. The remaining management plan constituents include ammonia, dimethoate, DO, *E. coli*, molybdenum, nitrate, SC, TDS, water column toxicity to *C. dubia* toxicity, *P. promelas* and *S. capricornutum,* and sediment toxicity to *H. azteca* (Table 47).

Under the WDR, Prairie Flower Drain @ Crows Landing Rd will be monitored as a Core Site; land use is included in Figure 24. During the 2014 WY, MPM is scheduled for molybdenum (October through September), dimethoate (July through September), and toxicity to *C. dubia* (March and August through September), *P. promelas* (April and July), *S. capricornutum* (October, December through February and April through May) and sediment toxicity to *H. azteca* (March and September).

Table 47. Prairie Flower Drain @ Crows Landing Rd management plan constituents.

Constituent	Management Plan Initiation Year	Management Plan Removal Year	10 Year Compliance Deadline
Dimethoate	2012	Active	2022
Nitrate + Nitrite	2007	Active	Pending Workplan
C. dubia water column toxicity	2008	Active	2018
H. azteca sediment toxicity	2007	Active	2017
P. promelas water column toxicity	2006	Active	2016
S. capricornutum water column toxicity	2009	Active	2019
Ammonia	2009	Active	Pending Workplan
Dissolved Oxygen	2006	Active	Pending Workplan
E. coli	2006	Active	Pending Workplan
Molybdenum	2012	Active	Pending Workplan
Specific Conductivity	2006	Active	Pending Workplan
Total Dissolved Solids	2006	Active	Pending Workplan
Constituent (Removed)			
Chlorpyrifos	2006	2012	2016
pH	2007	2012	Pending Workplan

Figure 24. Prairie Flower Drain @ Crows Landing Rd site subwatershed land use map.



Monitoring Results

During January through September 2013, MPM for dimethoate, water column toxicity to *C. dubia, P. promelas, S. capricornutum,* and sediment toxicity to *H. azteca* occurred; no exceedances of the WQTL for dimethoate occurred and no toxicity to *P. promelas* or *H. azteca* occurred. The last exceedance of the WQTL for dimethoate occurred September 2011, toxicity to *P. promelas* last occurred in samples collected in April 2011, and sediment toxicity to *H. azteca* last occurred in August 2008. Toxicity to *C. dubia* occurred in August 2013, resulting in 0% survival compared to the control. The TIE concluded that OP insecticides were the cause of toxicity. Toxicity to *S. capricornutum* occurred in January 2013, resulting in 16% growth compared to the control (Table 48), however no TIE was conducted because of low DO measurements and high ammonia and suspended solids levels.

During Core Monitoring from January through September 2013, exceedances of the WQTLs for ammonia (2), *E. coli* (5), nitrate (6), TDS (10) occurred. Field parameters, DO, pH, and SC, were measured during all monitoring events. Exceedances of the WQTLs for DO and SC occurred four and 10 times, respectively and no exceedances of the WQTL for pH occurred.

Table 48 is a record of yearly exceedances of WQTLs from 2005 through September 2013 for Prairie Flower Drain @ Crows Landing Rd site subwatershed management plan constituents.

Table 48. Prairie Flower Drain @ Crows Landing Rd and upstream site exceedances of management plan constituents (2005-September 2013).
The WQTLs used to evaluate the data are listed in the header after the analyte. Upstream sites are italicized.

Site Name	Season	Sample Date	Dissolved Oxygen, <7 mg/L	pH, <6.5 and >8.5 units	Specific Conductivity, >700 µS/cm	Total Dissolved Solids, >450 mg/L	*E. coli*, >235 MPN/100 mL	Ammonia, Variable[1] or >1.5 mg/L	Nitrate + Nitrite as N, >10 mg/L	Molybdenum, >10 µg/L	Chlorpyrifos, >0.015 µg/L	Dimethoate, >1µg/L	*C. dubia*, (% control)	*P. promelas*, (% Control)	*S. capricornutum*, (% Control)	*H. azteca*, (% Control)
Prairie Flower Drain @ Crows Landing Rd	Storm	2/15/2005			2561	1600										
Prairie Flower Drain @ Crows Landing Rd	Storm	3/22/2005	6.5		2568	1600	1600									
Prairie Flower Drain @ Crows Landing Rd	Irrigation	5/11/2005			3168	1600	500									
Prairie Flower Drain @ Crows Landing Rd	Irrigation	6/15/2005			1705	1300	300									
Prairie Flower Drain @ Crows Landing Rd	Irrigation	7/13/2005	3.2		1723	1100	1600									
Prairie Flower Drain @ Crows Landing Rd	Irrigation	8/17/2005			1779	990	1600				0.029					
Prairie Flower Drain @ Crows Landing Rd	Irrigation	9/21/2005	5.22		791	460	500				0.018					86
Prairie Flower Drain @ Crows Landing Rd	Storm	3/1/2006			2419	1600	900									
Prairie Flower Drain @ Crows Landing Rd	Storm	3/16/2006		8.77	2728	1600	300						75			
Prairie Flower Drain @ Crows Landing Rd	Storm	3/24/2006			2782											
Prairie Flower Drain @ Crows Landing Rd	Storm	5/2/2006			2724											92
Prairie Flower Drain @ Crows Landing Rd	Irrigation	5/18/2006			2958	1700	550									
Prairie Flower Drain @ Crows Landing Rd	Irrigation	6/15/2006			2660	1700	1300									
Prairie Flower Drain @ Crows Landing Rd	Irrigation	7/13/2006	5.45	8.85	1560	720	790	18						8		
Prairie Flower Drain @ Crows Landing Rd	Irrigation	7/20/2006	6.41		1950									70		
Prairie Flower Drain @ Crows Landing Rd	Irrigation	8/10/2006			2302	1800	820									
Prairie Flower Drain @ Crows Landing Rd	Irrigation	9/14/2006	6.01		1276	760	2400									
Prairie Flower Drain @ Crows Landing Rd	Storm	2/11/2007		6.12	2659	1600	2400									
Prairie Flower Drain @ Crows Landing Rd	Storm	3/1/2007		8.57	2592	1500										
Prairie Flower Drain @ Crows Landing Rd	Storm	3/7/2007			4798											
Prairie Flower Drain @ Crows Landing Rd	Irrigation	4/17/2007			2127	1700										
Prairie Flower Drain @ Crows Landing Rd	Irrigation	5/15/2007	5.59		2473	1500	920								88	
Prairie Flower Drain @ Crows Landing Rd	Irrigation	5/23/2007			2390											

Site Name	Season	Sample Date	Dissolved Oxygen, <7 mg/L	pH, <6.5 and >8.5 units	Specific Conductivity, >700 µS/cm	Total Dissolved Solids, >450 mg/L	*E. coli*, >235 MPN/100 mL	Ammonia, Variable[1] or >1.5 mg/L	Nitrate + Nitrite as N, >10 mg/L	Molybdenum, >10 µg/L	Chlorpyrifos, >0.015 µg/L	Dimethoate, >1µ g/L	*C. dubia*, (% control)	*P. promelas*, (% Control)	*S. capricornutum*, (% Control)	*H. azteca*, (% Control)
Prairie Flower Drain @ Crows Landing Rd	Irrigation	6/19/2007		8.54	2304	1500										
Prairie Flower Drain @ Crows Landing Rd	Irrigation	7/17/2007	4.3		1067	730										
Prairie Flower Drain @ Crows Landing Rd	Irrigation	8/14/2007			1126	700	260									
Prairie Flower Drain @ Crows Landing Rd	Irrigation	8/16/2007			2562											59
Prairie Flower Drain @ Crows Landing Rd	Irrigation	8/28/2007	3.64		1015						0.094					
Prairie Flower Drain @ Crows Landing Rd	Irrigation	9/11/2007	7.86		1097	540	2400						0			17
Prairie Flower Drain @ Crows Landing Rd	Irrigation	9/18/2007			2262											
Prairie Flower Drain @ Crows Landing Rd	Irrigation	9/25/2007			2489											
Prairie Flower Drain @ Crows Landing Rd	Storm	1/24/2008			2371	1500	1100								71	
Prairie Flower Drain @ Crows Landing Rd	Storm	1/30/2008			2944											
Prairie Flower Drain @ Crows Landing Rd	Storm	2/26/2008			2722	1600									39	
Prairie Flower Drain @ Crows Landing Rd	Sediment	3/4/2008			2639											
Prairie Flower Drain @ Crows Landing Rd	Irrigation	4/22/2008			2548	1700	370								29	
Prairie Flower Drain @ Morgan Rd	*Irrigation*	*4/22/2008*	*3.29*		*2574*											
Prairie Flower Drain @ Crows Landing Rd	Irrigation	4/29/2008	5.44		1739										56	
Prairie Flower Drain @ Crows Landing Rd	Irrigation	5/20/2008			2526	1600	610								61	
Prairie Flower Drain @ Morgan Rd	*Irrigation*	*5/20/2008*	*1.17*		*2026*											
Prairie Flower Drain @ Crows Landing Rd	Irrigation	5/27/2008			2273										88	
Prairie Flower Drain @ Crows Landing Rd	Irrigation	6/17/2008			2049	1200	1300	2.1								
Prairie Flower Drain @ Morgan Rd	*Irrigation*	*6/17/2008*			*2893*											
Prairie Flower Drain @ Crows Landing Rd	Irrigation	7/22/2008	2.51		1012	620	250					2.7				
Prairie Flower Drain @ Morgan Rd	*Irrigation*	*7/22/2008*	*2.76*		*1417*											
Prairie Flower Drain @ Crows Landing Rd	Irrigation	8/19/2008	4.93		956	610	440				0.024					
Prairie Flower Drain @ Morgan Rd	*Irrigation*	*8/19/2008*	*3.63*		*1300*											
Prairie Flower Drain @ Crows Landing Rd	Sediment	8/28/2008			1114											90

Site Name	Season	Sample Date	Dissolved Oxygen, <7 mg/L	pH, <6.5 and >8.5 units	Specific Conductivity, >700 µS/cm	Total Dissolved Solids, >450 mg/L	*E. coli*, >235 MPN/100 mL	Ammonia, Variable[1] or >1.5 mg/L	Nitrate + Nitrite as N, >10 mg/L	Molybdenum, >10 µg/L	Chlorpyrifos, >0.015 µg/L	Dimethoate, >1µ g/L	*C. dubia*, (% Control)	*P. promelas*, (% Control)	*S. capricornutum*, (% Control)	*H. azteca*, (% Control)
Prairie Flower Drain @ Crows Landing Rd	Irrigation	9/23/2008			2525	1800										
Prairie Flower Drain @ Morgan Rd	*Irrigation*	*9/23/2008*	*3.3*		*2675*											
Prairie Flower Drain @ Crows Landing Rd	Sediment	10/2/2008			2449											86
Prairie Flower Drain @ Crows Landing Rd	Fall	10/21/2008			1742	1100	370		27							
Prairie Flower Drain @ Crows Landing Rd	Fall	11/11/2008			2151	1500			39							
Prairie Flower Drain @ Crows Landing Rd	Fall	12/16/2008			2298	2900	1300		40							
Prairie Flower Drain @ Crows Landing Rd	Winter	1/20/2009			2414	1500			43							
Prairie Flower Drain @ Crows Landing Rd	Storm	2/7/2009			2255	1300			31							
Prairie Flower Drain @ Crows Landing Rd	Winter	3/17/2009		8.74	2394	1400			34							
Prairie Flower Drain @ Crows Landing Rd	Irrigation	4/21/2009			2223	1400	410		24							
Prairie Flower Drain @ Crows Landing Rd	Irrigation	5/19/2009	4.78		2066	1200	>2400	3.2	20						30	
Prairie Flower Drain @ Crows Landing Rd	Irrigation	6/16/2009			2417	1400		1.3	22							
Prairie Flower Drain @ Crows Landing Rd	Irrigation	7/21/2009			1366	820		1.8	14							
Prairie Flower Drain @ Crows Landing Rd	Irrigation	8/18/2009			1984	1200			22							
Prairie Flower Drain @ Crows Landing Rd	Irrigation	9/22/2009			2171	1400	1300		35							
Prairie Flower Drain @ Crows Landing Rd	Fall	10/20/2009			2459	1400	1300		25							
Prairie Flower Drain @ Crows Landing Rd	Fall	11/17/2009			2415	1500	>2400	8.8	36							
Prairie Flower Drain @ Crows Landing Rd	Storm	12/15/2009			2695	1600	2000		36							
Prairie Flower Drain @ Crows Landing Rd	Storm	1/19/2010			1837	1300	2400		43						56	
Prairie Flower Drain @ Crows Landing Rd	Storm	2/23/2010			2833	1700	440		32							
Prairie Flower Drain @ Crows Landing Rd	Winter	3/23/2010			2833	1700	1400		31							
Prairie Flower Drain @ Crows Landing Rd	Storm	4/20/2010			2399	1500	1300		33							
Prairie Flower Drain @ Crows Landing Rd	Irrigation	5/18/2010			2428	1500	460		35							
Prairie Flower Drain @ Crows Landing Rd	Irrigation	6/15/2010	4.25		2703	1600	820		29							
Prairie Flower Drain @ Crows Landing Rd	Irrigation	7/20/2010			2556	1500	260		26							

Site Name	Season	Sample Date	Dissolved Oxygen, <7 mg/L	pH, <6.5 and >8.5 units	Specific Conductivity, >700 µS/cm	Total Dissolved Solids, >450 mg/L	*E. coli*, >235 MPN/100 mL	Ammonia, Variable[1] or >1.5 mg/L	Nitrate + Nitrite as N, >10 mg/L	Molybdenum, >10 µg/L	Chlorpyrifos, >0.015 µg/L	Dimethoate, >1µ g/L	*C. dubia*, (% Control)	*P. promelas*, (% Control)	*S. capricornutum*, (% Control)	*H. azteca*, (% Control)
Prairie Flower Drain @ Crows Landing Rd	Irrigation	8/17/2010			2776	1700	870		24							
Prairie Flower Drain @ Crows Landing Rd	Irrigation	9/14/2010							12							
Prairie Flower Drain @ Crows Landing Rd	Fall	10/19/2010			1795	1100	580		20							
Prairie Flower Drain @ Crows Landing Rd	Fall	11/16/2010			2710	1700	460		42							
Prairie Flower Drain @ Crows Landing Rd	Fall	12/14/2010			2688	1700	>2400		40							
Prairie Flower Drain @ Crows Landing Rd	Winter	1/18/2011	5.35		2951	1800	870	1.90	29	25						
Prairie Flower Drain @ Crows Landing Rd	Storm	2/17/2011			2647	1600			33	21					82	
Prairie Flower Drain @ Crows Landing Rd	Winter	3/15/2011			2685	1700			31	19						
Prairie Flower Drain @ Crows Landing Rd	Winter	3/17/2011			2643											
Prairie Flower Drain @ Crows Landing Rd	Irrigation	4/19/2011	2.14		1471	800	>2400	12.00						80		
Prairie Flower Drain @ Crows Landing Rd	Irrigation	5/10/2011			1775	1000	370	1.80	17	11						
Prairie Flower Drain @ Crows Landing Rd	Irrigation	6/14/2011			2035	1200			24	13						
Prairie Flower Drain @ Crows Landing Rd	Irrigation	6/15/2011			2423											
Prairie Flower Drain @ Crows Landing Rd	Irrigation	7/12/2011			1083	770	>2400	1.8	16							
Prairie Flower Drain @ Crows Landing Rd	Irrigation	8/9/2011			1141	680	1000	4.1				10	0			
Prairie Flower Drain @ Crows Landing Rd	Irrigation	9/6/2011					370		11			1.1				
Prairie Flower Drain @ Crows Landing Rd	Fall	10/11/2011	6.59		2447	1600	290		28						35	
Prairie Flower Drain @ Crows Landing Rd	Fall	11/8/2011			2206	1500	520		33							
Prairie Flower Drain @ Crows Landing Rd	Fall	12/6/2011			2095	1400	460		41						8	
Prairie Flower Drain @ Crows Landing Rd	Winter	1/10/2012			1669	1200	>2400	5	30							
Prairie Flower Drain @ Crows Landing Rd	Winter	2/7/2012			2231	1500	820		33							
Prairie Flower Drain @ Crows Landing Rd	Winter	3/6/2012			2185	1600			36							
Prairie Flower Drain @ Crows Landing Rd	Winter	1/8/2013	0.2		2145	1600	>2400	24.0							16	
Prairie Flower Drain @ Crows Landing Rd	Winter	2/12/2013			2469	1800	390		29							
Prairie Flower Drain @ Crows Landing Rd	Storm	2/20/2013			1965	1500	>2400	6	31							

Site Name	Season	Sample Date	Dissolved Oxygen, <7 mg/L	pH, <6.5 and >8.5 units	Specific Conductivity, >700 µS/cm	Total Dissolved Solids, >450 mg/L	*E. coli*, >235 MPN/100 mL	Ammonia, Variable[1] or >1.5 mg/L	Nitrate + Nitrite as N, >10 mg/L	Molybdenum, >10 µg/L	Chlorpyrifos, >0.015 µg/L	Dimethoate, >1µ g/L	*C. dubia*, (% control)	*P. promelas*, (% Control)	*S. capricornutum*, (% Control)	*H. azteca*, (% Control)
Prairie Flower Drain @ Crows Landing Rd	Winter	3/12/2013			1616	1100			16							
Prairie Flower Drain @ Crows Landing Rd	Storm	4/2/2013			2196	1400	240		28							
Prairie Flower Drain @ Crows Landing Rd	Irrigation	5/14/2013	1.58		1202	730			17							
Prairie Flower Drain @ Crows Landing Rd	Irrigation	6/11/2013			1841	1200			22							
Prairie Flower Drain @ Crows Landing Rd	Irrigation	7/9/2013			2177	1400										
Prairie Flower Drain @ Crows Landing Rd	Irrigation	8/13/2013	1.65		945	600	410.6						0			
Prairie Flower Drain @ Crows Landing Rd	Irrigation	9/10/2013	4.10		1544	920										

[1]Ammonia WQTL variable based on pH and temperature.

RODDEN CREEK @ RODDEN RD

Overview

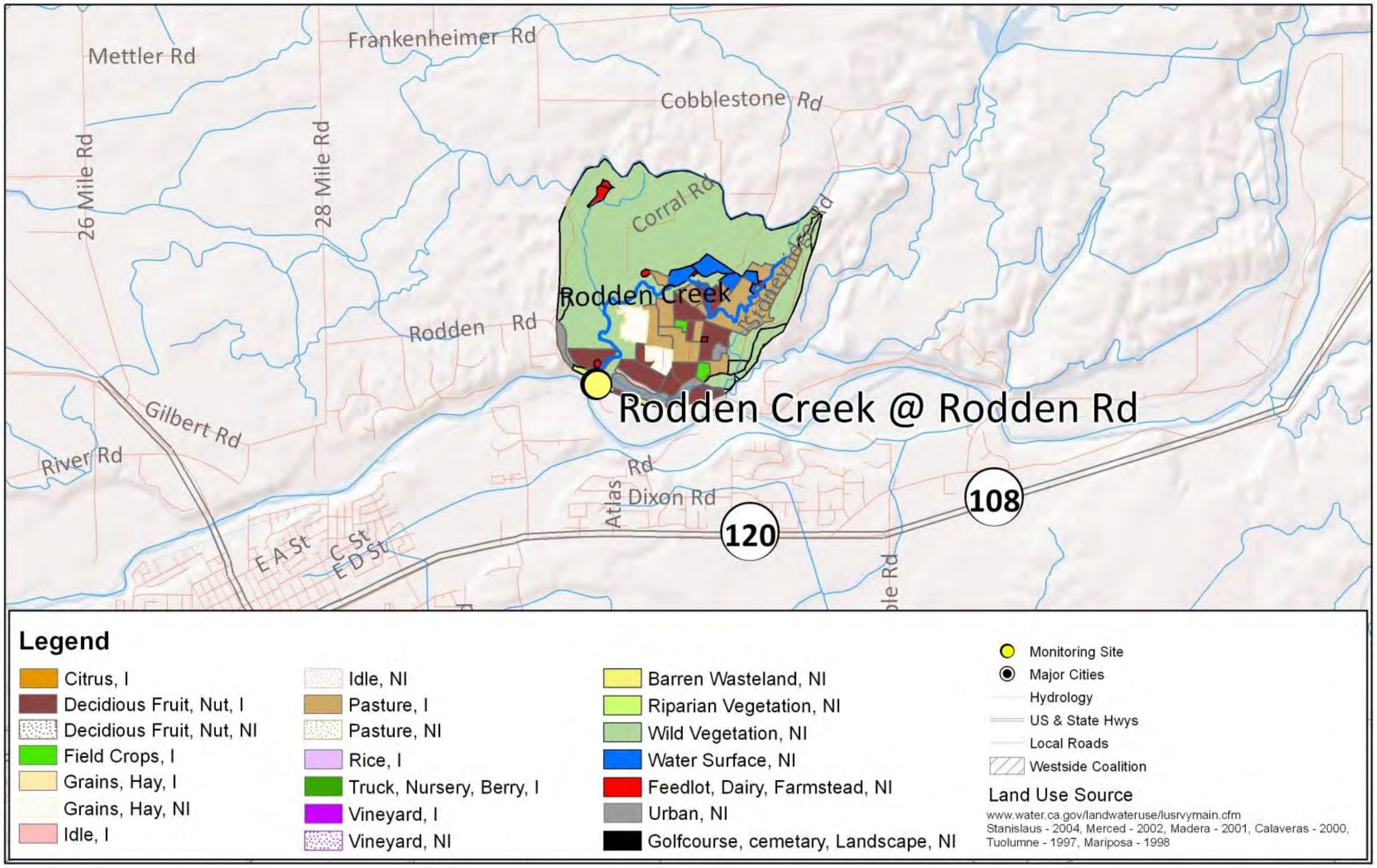
Monitoring began at Rodden Creek @ Rodden Rd in 2011 and continued through 2012 during Assessment Monitoring. The Coalition will conduct focused outreach in the site subwatershed in 2016 through 2018. The only constituent in the Rodden Creek @ Rodden Rd management plan is *E. coli* (Table 49). The Coalition is addressing *E. coli* management plans in the revised Management Plan submitted May 1, 2014.

Under the WDR, Rodden Creek @ Rodden Rd is a Represented Site and monitoring will occur as needed based on Core Site exceedances; land use is included in Figure 25.

Table 49. Rodden Creek @ Rodden Rd management plan constituent.

Constituent	Management Plan Initiation Year	Management Plan Removal Year	10 Year Compliance Deadline
E. coli	2012	Active	Pending Workplan

Figure 25. Rodden Creek @ Rodden Rd site subwatershed land use map.



Source of Layers:
Hydrology - NHD hydrodata, 1:24,000-scale, http://nhd.usgs.gov/
Roads, highways, railroads, county boundary, city outlines - California Spatial Information Library.
TRS - Teale Public Land Survey System, Pub. date. 20090101, California Spatial Information Library.
Parcel Layer - Stanislaus 2010, Merced 2011, Madera 2011
Basemap, Shaded Relief - ESRI
Datum - NAD 1983

Date Prepared: 08/09/11
ESJWQC

Rodden Creek @ Rodden Rd

N
0 0.5 1
Miles

Monitoring Results

Assessment Monitoring occurred at Rodden Creek @ Rodden Rd from 2011 through 2012. *E. coli* was measured 16 times and exceeded the WQTL in March and October through December 2011, and February and March 2012. In 2012, *E. coli* was placed in the Rodden Creek @ Rodden Rd management plan.

Table 50 is a record of yearly exceedances of WQTLs from 2011 through 2012 for the Rodden Creek @ Rodden Rd site subwatershed management plan constituent.

Table 50. Rodden Creek @ Rodden Rd exceedances of management plan constituent (2011-2012).
The WQTLs used to evaluate the data are listed in the header after the analyte.

SITE NAME	SEASON	SAMPLE DATE	*E. coli*, >235 MPN/100 mL
Rodden Creek @ Rodden Rd	Winter	3/15/2011	240
Rodden Creek @ Rodden Rd	Fall	10/11/2011	290
Rodden Creek @ Rodden Rd	Fall	11/8/2011	1400
Rodden Creek @ Rodden Rd	Fall	12/6/2011	250
Rodden Creek @ Rodden Rd	Winter	2/7/2012	240
Rodden Creek @ Rodden Rd	Winter, Sed	3/6/2012	550

UNNAMED DRAIN @ HWY 140

Overview

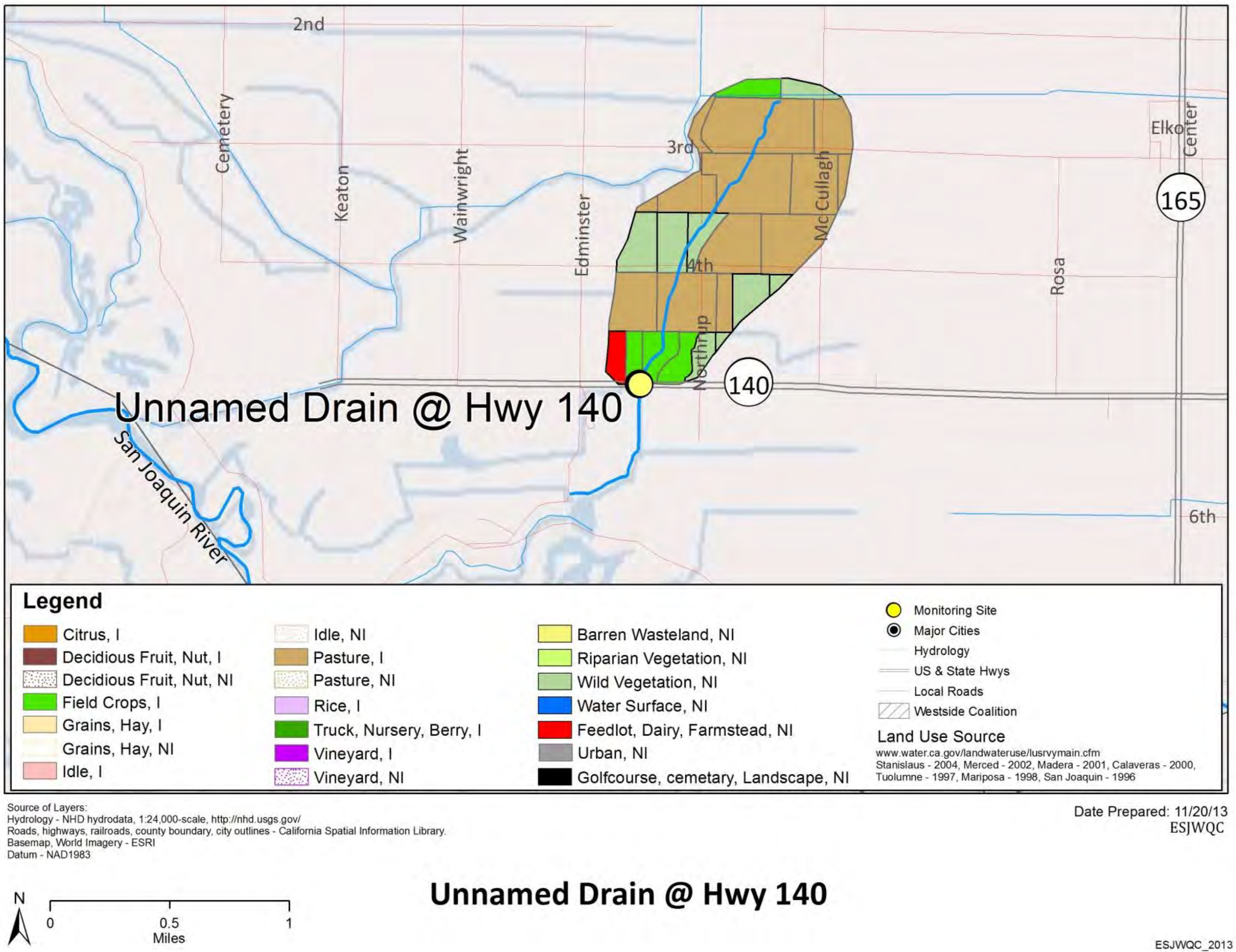
Assessment Monitoring occurred at Unnamed Drain @ Hwy 140 from January through September 2013. Exceedances of DO, pH, and *E. coli* occurred at least twice, placing them in the site's management plan for 2014 (Table 51). The Coalition will conduct focused outreach in the Unnamed Drain @ Hwy 140 from 2016 through 2018.

Under the WDR, Unnamed Drain @ Hwy 140 is a Represented Site and monitoring will occur as needed based on Core Site exceedances; land use is included in Figure 26. During the 2014 WY, Represented Site Monitoring is scheduled for chlorpyrifos (November, January, and July) and toxicity to *C. dubia* (January, March, July, and August).

Table 51. Unnamed Drain @ Hwy 140 management plan constituents.

Constituent	Management Plan Initiation Year	Management Plan Removal Year	10 Year Compliance Deadline
Dissolved Oxygen	2014	Active	Pending Workplan
E. coli	2014	Active	Pending Workplan
pH	2014	Active	Pending Workplan

Figure 26. Unnamed Drain @ Hwy 140 site subwatershed land use map.



Monitoring Results

Assessment Monitoring occurred at the site from January through September 2013. Exceedances of the WQTLs for DO (May, July, November), pH (January, March), and *E. coli* (January, April, June) occurred. The constituents will be addressed in the Unnamed Drain @ Hwy 140 management plan in 2014.

Table 52 is a record of yearly exceedances of WQTLs from January through September 2013 for the Unnamed Drain @ Hwy 140 site subwatershed management plan constituents.

Table 52. Unnamed Drain @ Hwy 140 exceedances of management plan constituents (January -September 2013).

The WQTLs used to evaluate the data are listed in the header after the analyte.

SITE NAME	SEASON	SAMPLE DATE	OXYGEN, DISSOLVED, MG/L	PH, NONE	*E. COLI*, >235 MPN/100 ML
Unnamed Drain @ Hwy 140	Winter	1/8/2013		8.94	250
Unnamed Drain @ Hwy 140	Winter	3/12/2013		9.06	
Unnamed Drain @ Hwy 140	Storm	4/2/2013			440
Unnamed Drain @ Hwy 140	Irrigation	5/14/2013	5.79		
Unnamed Drain @ Hwy 140	Irrigation	6/11/2013			261.3
Unnamed Drain @ Hwy 140	Irrigation, High TSS	7/9/2013	5.70		
Unnamed Drain @ Hwy 140	Fall	11/12/2013	6.86		

WESTPORT DRAIN @ VIVIAN RD

Overview

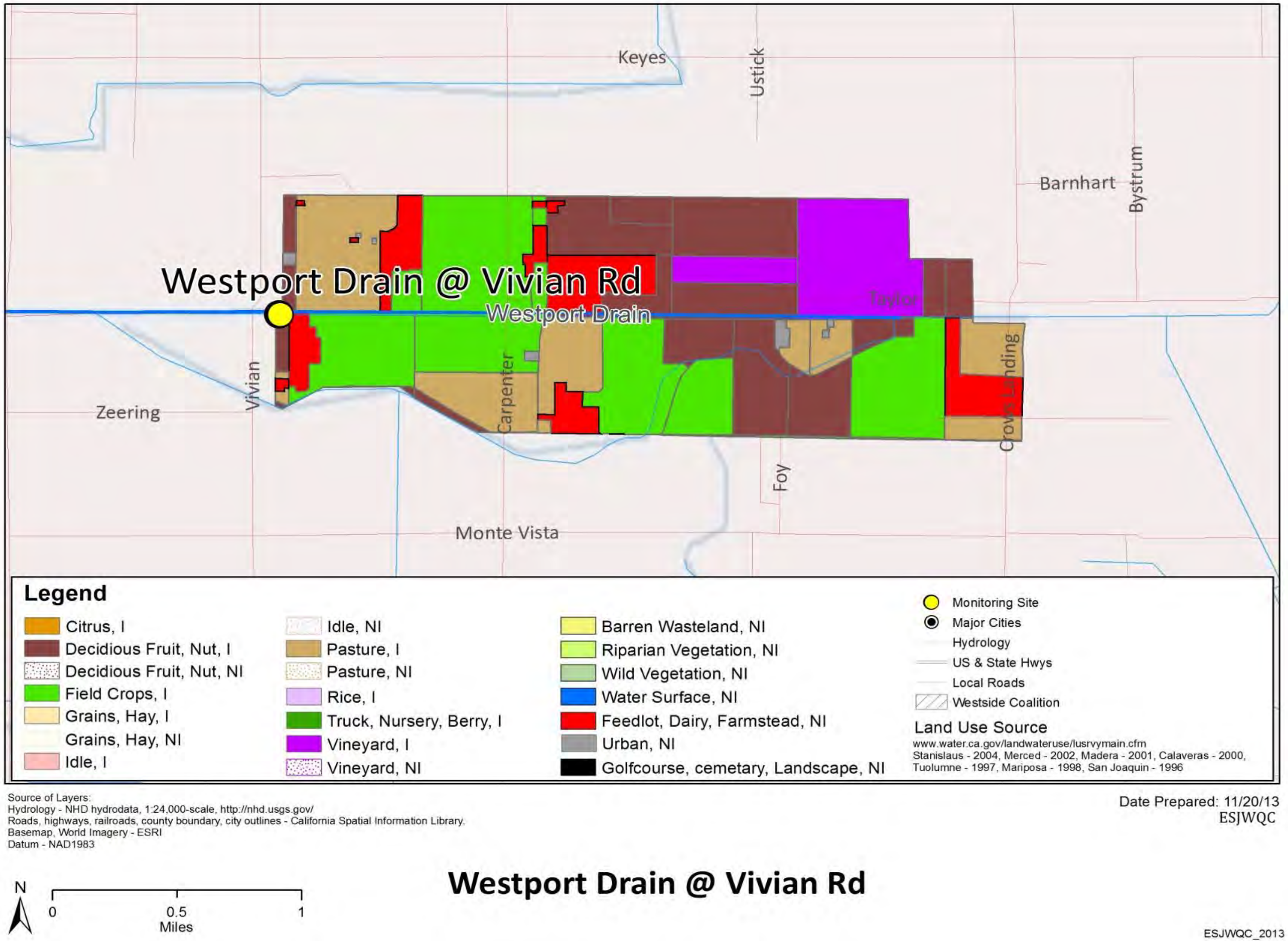
Monitoring at Westport Drain @ Vivian Rd was initiated during the irrigation season in 2007 and continued through 2008. The Coalition will conduct focused outreach from 2014 through 2016 in the site subwatershed. The Westport Drain @ Vivian Rd management plan constituents are DO, SC, TDS, nitrate, *E. coli*, chlorpyrifos, and *S. capricornutum* toxicity (Table 53).

Under the WDR, Westport Drain @ Vivian Rd is a Represented Site and monitoring will occur as needed based on Core Site exceedances; land use is included in Figure 27. During the 2014 WY, MPM is scheduled for chlorpyrifos (March and July through September) and *S. capricornutum* toxicity (February, April, and May).

Table 53. Westport Drain @ Vivian Rd management plan constituents.

Constituent	Management Plan Initiation Year	Management Plan Removal Year	10 Year Compliance Deadline
Chlorpyrifos	2008	Active	2018
Nitrate as N	2008	Active	Pending Workplan
S. capricornutum water column toxicity	2009	Active	2019
Dissolved Oxygen	2009	Active	Pending Workplan
Specific Conductivity	2008	Active	Pending Workplan
Total Dissolved Solids	2008	Active	Pending Workplan
E. coli	2008	Active	Pending Workplan

Figure 27. Westport Drain @ Vivian Rd site subwatershed land use map.



Monitoring Results

Monitoring occurred at Westport Drain @ Vivian Rd during May through September 2007 and during January through October 2008.

Chlorpyrifos was monitored five times in 2007 and nine times in 2008, one exceedance of the WQTL occurred during each year; therefore, chlorpyrifos was placed in the site's management plan in 2008. Nitrate as N was placed in the Westport Drain @ Vivian Rd management plan in 2008 after exceeding the WQTL five times in 2007. Nitrate was monitored eight times in 2008 and exceedances of the WQTL occurred during every event. Toxicity to *S. capricornutum* was added to the site's management plan in 2009 after toxicity occurred once in 2007 and three times in 2008.

Management plan constituents, DO (7), *E. coli* (7), SC (19), and TDS (13) have exceeded the WQTLs at Westport Drain @ Vivian Rd from 2007 through 2008. Exceedances of the WQTLs for *E. coli*, SC, and TDS in 2007 placed them in the site's management plan in 2008 and exceedances of the WQTLs for DO in 2008 placed it in the management plan in 2009.

Table 54 is a record of yearly exceedances of WQTLs from 2007 through 2008 for Westport Drain @ Vivian Rd site subwatershed management plan constituents.

Table 54. Westport Drain @ Vivian Rd exceedances of management plan constituents (2007-2008).
The WQTLs used to evaluate the data are listed in the header after the analyte.

Station Name	Season	Sample Date	Dissolved Oxygen, <7 mg/L	Specific Conductivity, >700 µS/cm	Total Dissolved Solids, >450 mg/L	Nitrate as N, >10 mg/L	*E. coli*, >235 MPN/100 mL	Chlorpyrifos, >0.015 µg/L	*S. capricornutum*, (%Control)
Westport Drain @ Vivian Rd	Irrigation	5/15/2007		1054	660	24			73
Westport Drain @ Vivian Rd	Irrigation	5/23/2007		1081					
Westport Drain @ Vivian Rd	Irrigation	6/19/2007		991	660	27			
Westport Drain @ Vivian Rd	Irrigation	7/17/2007		1025	680	68	330	0.018	
Westport Drain @ Vivian Rd	Irrigation	8/14/2007		1129	760	32			
Westport Drain @ Vivian Rd	Irrigation	8/16/2007		1147					
Westport Drain @ Vivian Rd	Irrigation	9/11/2007		1106	740	30	330		
Westport Drain @ Vivian Rd	Storm	1/24/2008		1086	740	28	290		
Westport Drain @ Vivian Rd	Storm	2/26/2008	5.70	1104	730	26			12
Westport Drain @ Vivian Rd	Storm Sed., RS	3/4/2008		1096					66
Westport Drain @ Vivian Rd	Irrigation	4/22/2008	4.44	1079	750	23	1000		57
Westport Drain @ Vivian Rd	Irrigation RS	4/29/2008	4.76	1106					
Westport Drain @ Vivian Rd	Irrigation	5/20/2008	6.95	1084	720	23			
Westport Drain @ Vivian Rd	Irrigation	6/17/2008	5.43	1107	750	25	260		
Westport Drain @ Vivian Rd	Irrigation	7/22/2008	5.02	1079	760	25	1000	0.016	
Westport Drain @ Vivian Rd	Irrigation	8/19/2008	3.59	1088	760	25	290		
Westport Drain @ Vivian Rd	Sediment	8/28/2008		1100					
Westport Drain @ Vivian Rd	Irrigation	9/23/2008		1097	750	27			
Westport Drain @ Vivian Rd	Sed. RS	10/2/2008		1093					

RS – Resampling due to toxicity.