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SACRAMENTO VALLEY
WATER QUALITY COALITION

Monitoring and Reporting Program Plan

Annual Monitoring Report 2009

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Executive Summary

SUMMARY OF MONITORING PROGRAM

The Sacramento Valley Water Quality Coalition (Coalition) has developed and implemented a Monitoring and Reporting Program Plan (MRPP) to meet the requirements of the *Conditional Waiver for Irrigated Lands* (hereinafter abbreviated as *ILRP* for *Irrigated Lands Regulatory Program*) and subsequent amendments to the *ILRP* requirements (WQO-2004-0003, SWRCB 2004, R5-2005-0833, R5-2008-0005). The scope of the MRPP and the sampling and analytical methods used in the Coalition and subwatershed 2009 monitoring have been approved by the Central Valley Regional Water Quality Control Board (Water Board).

In accordance with the ILRP requirements, the Coalition is achieving these objectives by implementing an MRPP that evaluates samples for the presence of statistically significant toxicity and exceedances of applicable numeric water quality objectives and ILRP trigger limits. The Coalition initiates follow-up actions designed to identify constituents causing significant toxicity when toxicity is of sufficient magnitude. Exceedances of numeric objectives and ILRP trigger limits for chemical, physical and microbiological biological parameters trigger follow-up actions designed to identify potential sources and to inform potential users of the constituents of concern. Additionally, the Coalition is evaluating the degree of implementation of current management practices in priority watersheds and recommending additional practices as water quality results indicate a need to do so. The Coalition is committed to the principle of adaptive management to control specific discharges of waste that are having an impact on water quality. This iterative approach allows for the most effective use of scarce human and fiscal resources. The 2009 monitoring effort has been conducted in coordination with the Northeastern California Water Association, the Napa County Putah Creek Watershed Group, and the Upper Feather River Watershed Group Proposition 50 Team. The Coalition is also coordinating with the California Rice Commission (CRC) under the December 2004 Coalition-CRC Memorandum of Understanding.

The parameters monitored by the Coalition to achieve these objectives are as specified in the *ILRP* and in subsequent amendments to the *ILRP* requirements (WQO-2004-0003, SWRCB 2004, R5-2005-0833, R5-2008-0005). The following environmental monitoring elements are included in the Coalition's MRPP:

- Water column and sediment toxicity
- Physical and conventional parameters in water and sediment
- Organic carbon
- Pathogen indicator organisms in water
- Trace metals in water
- Pesticides in water and sediments
- Nitrogen and phosphorus compounds in water

The MRP also requires testing for 303(d)-listed constituents identified in waterbodies downstream from Coalition sites and discharged within the watershed. Note that not all

parameters are monitored at every site for every event. Specific individual parameters measured for the 2009 Coalition monitoring effort are listed in **Table 2**.

A total of 30 regular and Special Project sampling sites were monitored by the Coalition and coordinating subwatershed monitoring programs during 2009 (**Table 3**). A map of these sites is presented in **Figure 1**. In addition, 30 sites (including some of the same regular monitoring sites) were also monitored for organochlorine pesticides in sediment (**Table 4**). A map of these sites is presented as **Figure 2**.

As required by the *ILRP*, Coalition monitoring events includes storm season monitoring and irrigation season monitoring. The sites and numbers of samples to be collected for the Coalition's 2009 monitoring are summarized in **Table 5**. This *Annual Monitoring Report 2009* (AMR) includes results for December 2008 through September 2009.

Sample collection and analysis has been performed by the following agencies and subcontractors. Pacific EcoRisk (Fairfield, California) conducts sampling and performs toxicity analyses for all sites except for the following:

- Kleinfelder (Sacramento, California) conducts sampling and perform toxicity analyses for the sites coordinated with the California Rice Commission (CRC);
- The Northeastern California Water Association conducts sampling for the Pit River subwatershed site;
- Napa County Resource Conservation District staff conducts sampling for the two Napa County sites in the Lake-Napa subwatershed.
- Caltest Analytical Laboratory (Napa, California), Basic Lab (Redding, California), and Sierra Environmental Monitoring (Reno, Nevada) conduct all conventional and microbiological analyses; and
- CRG Marine Laboratories (Torrance, California) and APPL (Fresno, California) conduct pesticide analyses.

MANAGEMENT PRACTICES AND ACTIONS TAKEN

To address specific water quality exceedances, the Coalition and its partners developed a Management Plan in 2008, subsequently approved by the Water Board. The Coalition also previously developed a *Landowner Outreach and Management Practices Implementation Communications Process for Monitoring Results (Management Practices Process)* to address exceedances. Implementation of the approved management plan is the primary mechanism for addressing exceedances observed in the Coalition's *ILRP* monitoring.

The primary activities conducted in 2009 to implement the Coalition's Management Plan were focused on addressing registered pesticides and toxicity exceedances. Implementation completed for registered pesticides included review and evaluation of pesticide application data, identification of potential sources, and determination of likely agricultural sources. Implementation completed to address toxicity exceedances included review and evaluation of pesticide application data, evaluation of monitoring results to identify potential causes of toxicity, and determination of likely agricultural sources of identified causes of toxicity. These evaluations were documented in Source Evaluation Reports for each water body and

management plan element. For registered pesticides and identified causes of toxicity, surveys of Coalition members operating on high priority parcels were conducted to determine the degree of implementation of relevant management practices. These survey results will be used to establish goals for additional management practice implementation needed to address exceedances of Basin Plan water quality objectives and *ILRP* trigger limits.

The Coalition and its subwatersheds, working with the Coalition for Urban/Rural Environmental Stewardship (CURES), stand committed to working with the Regional Water Board and its staff to implement the *Management Practices Process* and the Coalition's approved Management Plan to address water quality problems identified in the Sacramento Valley. The primary strategic approach taken by the Coalition is to notify and educate the subwatershed landowners, farm operators, and/or wetland managers about the cause(s) of toxicity and/or exceedance(s) of water quality standards. Notifications are focused on (but not limited to) growers who operate directly adjacent to or within close proximity to the waterway. The broader outreach program, which includes both grower meetings and the notifications distributed through direct mailings, encourages the adoption of BMPs and modification of the uses of specific farm and wetland inputs to prevent movement of constituents of concern into Sacramento Valley surface waters.

RESULTS AND CONCLUSIONS

The Coalition submits this *2009 Annual Monitoring Report* (AMR) as required under the Water Board's Irrigated Lands Regulatory Program (*ILRP*). The AMR provides a detailed description of our monitoring results as part of our ongoing efforts to characterize irrigated agricultural and wetlands related water quality in the Sacramento River Basin.

To summarize, the results from the ILRP monitoring in 2009 continue to indicate that there are no major water quality problems with agricultural and managed wetlands discharges in the Sacramento River Basin.

Statistically significant toxicity was observed in four of the 89 water column toxicity tests performed on 54 samples. All cases of toxicity were for *Selenastrum* algae tests – there were no cases of toxicity observed for *Ceriodaphnia* or *Pimephales* tests. These results were considered exceedances of the Basin Plan narrative objective (4.5% of all toxicity results and 7.4% of water samples). Toxicity was observed in one of the six samples tested for sediment toxicity. For the sites with observed toxicity, the Coalition and its subwatersheds took the appropriate actions to address these issues. By its nature, the AMR focuses in detail on the small number of sites and samples that exhibited toxicity and exceedances of conventional and microbiological parameters, as well as the actions taken and planned by the Coalition and its members to address these issues.

This AMR characterizes potential water quality impacts of agricultural drainage from a broad geographic area in the Sacramento Valley from December 2008 through September 2009. To date, a total of 43 Coalition storm and irrigation season events have been completed, with additional events collected by coordinating programs. For the period of record in this AMR (December 2008-September 2009), samples were collected during seven scheduled monthly events and two storm events.

Chemical results were evaluated each case of observed toxicity. In one case, the herbicide diuron was determined to have caused or contributed to the toxicity to *Selenastrum*, and diuron was also suspected in a second case. In two additional cases, the reductions of Selenastrum growth were minimal (<20%) and no specific causes of toxicity could be identified. No water samples

triggered TIE procedures or definitive serial dilution toxicity tests. In the single case of sediment toxicity observed, sediment chemistry results indicated that pyrethroid pesticides were the cause of the toxicity,

When detected, pesticides rarely exceeded applicable objectives, and were infrequently associated with toxicity. Four registered pesticides (diazinon, chlorpyrifos, diuron, and malathion) exceeded applicable water quality objectives in a total of 6 samples.

Many of the pesticides specifically required to be monitored by the *ILRP* have rarely been detected in Coalition water samples, including glyphosate, paraquat, and all of the pyrethroid pesticides. Glyphosate, one of the most widely used agricultural pesticides, has been detected in only seven (7) Coalition samples to date, and has never approached concentrations likely to cause toxicity to sensitive test species. Over 98% of all pesticide analyses performed to date for the Coalition are below detection. This indicates that monitoring for many of these pesticides in water is unlikely to provide meaningful results regarding sources or needs for changes in management practices. Based on these results, the Coalition has proposed that monitoring of ILRP pesticides be conducted based on use in the subwatersheds. Similarly, the Coalition has proposed to conduct more focused monitoring of most trace elements (arsenic, cadmium, lead, molybdenum, nickel, selenium, and zinc); the Coalition's monitoring has demonstrated that these metals do not exceed objectives and are not likely to cause adverse impacts to aquatic life or human health in waters receiving agricultural runoff in the Coalition watershed. A more focused strategy for monitoring pesticides and trace metals will be implemented with the Coalition's 2009 MRP (Order No. R5-2009-0875, CVRWQCB 2009[1]).

The majority of exceedances of adopted numeric objectives consisted of pH, conductivity, dissolved solids, and *E. coli*. Although agricultural runoff and irrigation return flows may contribute to exceedances of these objectives, all of these parameters are controlled or significantly affected by natural processes and sources that are not controllable by agricultural management practices. Follow-up strategies to evaluate causes of pH and dissolved oxygen exceedances were implemented by the Coalition in the 2006 Irrigation Season. Sources of *E. coli* exceedances have been investigated through a region-wide pilot study conducted by the Coalition. The Coalition also continues to participate in the *ILRP* Technical Issues Committee (TIC) workgroups to develop procedures and guidelines for *ILRP* monitoring and evaluation of exceedances. The TIC has worked with Water Board *ILRP* staff to develop recommendations incorporated into the revised *ILRP* Monitoring and Reporting Program requirements and procedures adopted by the Water Board in 2008 (*Order No. R5-2008-0005*) and 2009 (*Order No. R5-2009-0875*). The Coalition has also been an active participant in the Water Board's stakeholder process to develop a Long-Term *ILRP*.

The Coalition has implemented the required elements of the *ILRP* since 2004. The Coalition developed a Watershed Evaluation Report (WER) that set the priorities for development and implementation of the Monitoring and Reporting Program Plan (MRPP). The Coalition successfully developed the MRPP, QAPP, and Management Plan as required by the *ILRP* and these documents have been approved by the Water Board. Subsequent revisions requested by the

[1] CVRWQCB 2009. Monitoring and Reporting Program Order No. R5-2009-0875 for Sacramento Valley Water Quality Coalition under Amended Order No. R5-2006-0053, Coalition Group Conditional Waiver Of Waste Discharge Requirements For Discharges From Irrigated Lands. California Regional Water Quality Control Board, Central Valley Region.

Water Board have been incorporated into these documents and were implemented during the 2006 Irrigation Season monitoring, and continued through the Coalition's 2009 and 2010 *ILRP* monitoring efforts. The Coalition continues to adapt and improve elements of the monitoring program based on the knowledge gained through *ILRP* monitoring efforts.

The Coalition has implemented the approved monitoring program in coordination with its subwatershed partners, has initiated follow-up activities to address observed exceedances, and is continuing implementation of the approved Management Plan. Throughout this process, the Coalition has kept an open line of communication with the Water Board and has made every effort to fulfill the requirements of the *ILRP* in a cost-effective and scientifically defensible manner. This annual monitoring report is documentation of the success and continued progress of the Coalition in achieving these objectives.

Introduction

The primary purpose of this report is to document the monitoring efforts and results of the Sacramento Valley Water Quality Coalition (Coalition) Monitoring and Reporting Program Plan (MRPP). This Annual Monitoring Report also serves to document the Coalition's progress toward fulfilling the requirements of the Conditional Waiver for Irrigated Lands (hereinafter abbreviated as ILRP for Irrigated Lands Regulatory Program) and subsequent amendments to the ILRP requirements (WQO-2004-0003, SWRCB 2004, R5-2005-0833, R5-2008-0005).

The Annual Monitoring Report includes the following elements, as specified in the ILRP:

Table 1. ILRP Annual Monitoring Report Requirements

ILRP Annual Report Requirement	Report Section Headings	Page
1. Signed Transmittal Letter	NA	-
2. Title page	Title page	-
3. Table of contents	Table of contents	*i*
4. Executive Summary	Executive Summary	*v*
5. Description of the Coalition Group geographical area	Description of the Watershed	3
6. Monitoring objectives and design	Monitoring Objectives	4
7. Sampling site descriptions and rainfall records for the time period covered under the AMR	Sampling Site Locations and Land Uses; Summary of Sampling Conditions	7; 43
8. Location map(s) of sampling sites, crops and land uses	Appendix F: Drainage Maps	DVD
9. Tabulated results of all analyses	Appendix C: Tabulated Monitoring Results	DVD
10. Discussion of data	Data Interpretation	43
11. Electronic data submitted in a SWAMP comparable format	Submitted quarterly; Appendix C	DVD
12. Sampling and analytical methods used	Sampling and Analytical Methods	17
13. Copy of chain-of-custody forms	Appendix B: Lab Reports and Chains of Custody	DVD
14. Field data sheets, signed laboratory reports, laboratory raw data (as identified in Attachment C)	Appendix A: Field Log Copies; Appendix B: Lab Reports and Chains of Custody	DVD
15. Associated laboratory and field quality control samples results	Appendix B: Lab Reports and Chains of Custody	DVD
16. Summary of Quality Assurance Evaluation results (as identified in Attachment C for Precision, Accuracy and Completeness)	Monitoring Results	25

ILRP Annual Report Requirement	Report Section Headings	Page
17. Specify the method used to obtain flow at each monitoring site during each monitoring event	Appendix A: Field Log Copies	DVD
18. Electronic or hard copies of photos obtained from all monitoring sites, clearly labeled with site ID and date	Appendix A: Field Log Copies	DVD
19. Summary of Exceedance Reports submitted during the reporting period and related pesticide use information	Exceedances of Relevant Water Quality Objectives; Appendix D: Exceedance Reports; Appendix E: Exceedance-Related Pesticide Use Data	56; DVD
20. Actions taken to address water quality exceedances that have occurred, including but not limited to, revised or additional management practices implemented	Management Practices and Actions Taken	70
21. Status update on preparation and implementation of all Management Plans and other special projects	Management Practices and Actions Taken	70
22. Conclusions and recommendations	Conclusions and Recommendations	80

All report elements required by the ILRP or subsequently requested by the California Regional Water Quality Control Board, Central Valley Region (Water Board) are included in this report.

Description of the Watershed

The Sacramento River watershed drains over 27,000 square miles of land in the northern part of California's Central Valley into the Sacramento River. The upper watersheds of the Sacramento River region include the Pit River watershed above Lake Shasta and the Feather River above Lake Oroville. The Sacramento Valley drainages include the Colusa, Cache Creek, and Yolo Bypass watersheds on the west side of the valley, and the Feather and American River watersheds on the east side of the valley. The Coalition also monitors in the Cosumnes River watershed, which is not part of the Sacramento River watershed.

Beginning near the town of Red Bluff at its northern terminus, the Sacramento Valley stretches about 150 miles to the southeast where it merges into the Sacramento-San Joaquin River Delta south of the Sacramento metropolitan area. The valley is 30 to 45 miles wide in the southern to central parts but narrows to about 5 miles wide near Red Bluff. Its elevation decreases from 300 feet at its northern end to near sea level in the delta. The greater Sacramento River watershed includes sites from 5,000 feet in elevation to near sea level.

The Sacramento River Basin is a unique mosaic of farm lands, refuges, and managed wetlands for waterfowl habitat; spawning grounds for numerous salmon and steelhead trout; and the cities and rural communities that make up this region. This natural and working landscape between the crests of the Sierra Nevada and the Coast Range includes the following:

- More than a million acres of family farms that provide the economic engine for the region; provide a working landscape and pastoral setting; and serve as valuable habitat for waterfowl along the Pacific Flyway. The predominant crops include: rice, general grain and hay, improved pasture, corn, tomatoes, alfalfa, almonds, walnuts, prunes, safflower, and vineyards.
- Habitat for 50% of the threatened and endangered species in California, including the winter-run and spring-run salmon, steelhead, and many other fish species.
- Six National Wildlife Refuges, more than fifty state Wildlife Areas, and other privately managed wetlands that support the annual migration of waterfowl, geese, and water birds in the Pacific Flyway. These seasonal and permanent wetlands provide for 65% of the North American Waterfowl Management Plan objectives.
- The small towns and rural communities that form the backbone of the region, as well as the State Capital that serves as the center of government for the State of California.
- The forests and meadows in the numerous watersheds of the Sierra Nevada and Coast Range.

Monitoring Objectives

The Coalition's MRPP will achieve the following objectives as a condition of the *ILRP*:

1. Assess the impacts of waste discharges from irrigated lands to surface waters;
2. Determine the degree of implementation of management practices to reduce discharge of specific wastes that impact water quality;
3. Determine the effectiveness of management practices and strategies to reduce discharge of wastes that impact water quality;
4. Determine concentration and load of wastes in these discharges to surface waters; and
5. Evaluate compliance with existing narrative and/or numeric water quality objectives to determine if additional implementation of management practices is necessary to improve and/or protect water quality.

In accordance with the ILRP requirements, the Coalition is achieving these objectives by implementing an MRPP that evaluates samples for the presence of statistically significant toxicity and exceedances of applicable numeric water quality objectives and ILRP trigger limits. The Coalition initiates follow-up actions designed to identify constituents causing significant toxicity when toxicity is of sufficient magnitude. Exceedances of numeric objectives and ILRP trigger limits for chemical, physical and microbiological biological parameters trigger follow-up actions designed to identify potential sources and to inform potential users of the constituents of concern. Additionally, the Coalition is evaluating the degree of implementation of current management practices in priority watersheds and recommending additional practices as water quality results indicate a need to do so. The Coalition is committed to the principle of adaptive management to control specific discharges of waste that are having an impact on water quality. This iterative approach allows for the most effective use of scarce human and fiscal resources.

The parameters monitored by the Coalition to achieve these objectives are as specified in the *ILRP* and in subsequent amendments to the *ILRP* requirements (WQO-2004-0003, SWRCB 2004, R5-2005-0833, R5-2008-0005). The following environmental monitoring elements are included in the Coalition's MRPP:

- Water column and sediment toxicity
- Physical and conventional parameters in water and sediment
- Organic carbon
- Pathogen indicator organisms in water
- Trace metals in water
- Pesticides in water and sediment
- Nitrogen and phosphorus compounds in water

The MRP also requires testing for 303(d)-listed constituents identified in waterbodies downstream from Coalition sites and discharged within the watershed. Note that not all parameters are monitored at every site for every event. Specific individual parameters measured for the Coalition monitoring effort are listed in **Table 2**.

Table 2. Constituents Monitored, 2009

Analyte	Quantitation Limit	Reporting Unit
Physical Parameters		
Flow	NA	CFS (Ft^3/Sec)
pH	0.1 (a)	-log[H^+]
Conductivity	0.1 (a)	μmhos/cm
Dissolved Oxygen	0.1 (a)	mg/L
Temperature	0.1 (a)	˚C
Hardness, total as $CaCO_3$	10	mg/L
Turbidity	1.0	NTU
Total Dissolved Solids	3.0	mg/L
Total Suspended Solids	3.0	mg/L
Total Organic Carbon	0.5	mg/L
Grain size (in sediment)	1	% fraction
Total Organic Carbon (in toxic sediments)	200	mg/kg d.w.
Pathogen Indicators		
E. Coli bacteria	2	MPN/100 mL
Water Column Toxicity		
Ceriodaphnia, 96-h acute	NA	% Survival
Pimephales, 96-h acute	NA	% Survival
Selenastrum, 96-h short-term chronic	NA	Cell Growth
Sediment Toxicity		
Hyalella, 10-day short-term chronic	NA	% Survival
Pesticides		
Carbamates	(b)	ug/L
Organochlorine	(b)	ug/L
Organophosphorus	(b)	ug/L
Pyrethroids and chlorpyrifos (in toxic sediments)	(b)	ug/kg, d.w.
Herbicides	(b)	ug/L
Trace Elements		
Arsenic	0.5	ug/L
Boron	10	ug/L
Cadmium	0.1	ug/L
Copper	0.5	ug/L
Lead	0.25	ug/L
Molybdenum	1	ug/L
Nickel	0.5	ug/L
Selenium	1.0	ug/L
Zinc	1.0	ug/L
Nutrients		
Total Kjeldahl Nitrogen	0.1	mg/L
Phosphorus, total	0.1	mg/L
Soluble Orthophosphate	0.01	mg/L
Nitrate + Nitrite as N	0.1	mg/L
Ammonia as N	0.1	mg/L

Notes:
(a) Detection and reporting limits are not strictly defined. Value is required reporting precision.
(b) Limits are different for individual pesticides.

Sampling Site Descriptions

To successfully implement the monitoring and reporting program requirements contained in the *ILRP* adopted by the Water Board in June 2003, the Coalition worked directly with landowners in the twenty-one county watershed to identify and develop ten subwatershed groups. Representatives from each subwatershed group utilized agronomic and hydrologic data generated by the Coalition in an attempt to prioritize watershed areas for initial evaluation to ultimately select monitoring sites in their respective areas based upon existing infrastructure, historical monitoring data, land-use patterns, historical pesticide use, and the presence of 303(d)-listed water bodies.

Coalition members selected sampling sites in priority watersheds based upon the following fundamental assumptions regarding management of non-point source discharges to surface water bodies: 1) Landscape scale sampling at the bottom of drainage areas allows for determinations regarding the presence of a water quality problems using a variety of analytical methods including water column and sediment toxicity testing as well water chemistry analyses and bioassessment; 2) Strategic source investigations utilizing Geographic Information Systems can be used to identify upstream parcels with attributes that may be related to the analytical results, including crops, pesticide applications, and soil type; and 3) Though recognizably complex, management practice effectiveness can best be assessed by coalitions at the drainage and watershed scale to determine compliance with water quality objectives in designated water bodies. Results from farm-level management practices evaluations will be used to complement Coalition efforts on the watershed scale by providing crop-specific information that will support management practice recommendations.

In January 2009, the Coalition implemented a revised MRPP responsive to the new ILRP MRP (ORDER NO. R5-2008-0005). The Coalition MRPP included an analysis of historical data and basic patterns and processes related to potential water quality impacts from agricultural discharges. There were no changes in monitoring objectives, but there were several modifications to monitoring strategy in the MRP. These included the following significant revisions in monitoring approach:

- Monitoring at sites in drainages representative of larger regions based on shared agricultural and geographic characteristics
- A three-year cycle of one year of Assessment monitoring for the broad suite of ILRP analytes and two years of Core monitoring of a reduced set of analytes.
- Customization of monitoring schedules and the analytes monitored based on the characteristics of individual subwatersheds.

Representative monitoring sites for 2009 were selected primarily from previously monitored locations. A total of 21 sites were monitored for Core or Assessment analytes. Nineteen sites had already completed Assessment level monitoring in previous years and were monitored according to the Core monitoring schedule. Two sites were monitored according to the Assessment monitoring parameter schedule. Additionally, Management Plan water sampling was conducted at 18 of the Core and Assessment sites, and at four additional sites. Management Plan sediment toxicity sampling was conducted at one of the Core sites, and at two additional sites.

Management Plan sediment sampling for legacy organochlorine pesticides was also conducted at 33 sites, including three of the Core sites.

SAMPLING SITE LOCATIONS AND LAND USES

The water and sediment sites monitored by the Coalition in 2009 are listed in **Table 3** and **Table 4**. All sites monitored in 2009 have been approved by the Water Board as ILRP compliance sites. An overall map of Coalition and subwatershed sites is presented in **Figure 1**, and sediment sites sampled for organochlorine pesticides are presented in **Figure 2**. Site-specific drainage maps with land use patterns for all monitoring locations are also provided in **Appendix F**.

Table 3. Coalition Monitoring Sites, 2009

Subwatershed	Site Name	Latitude	Longitude	Implementing Agency	Site ID (Fig. 1)
ButteYubaSutter	Butte Slough at Pass Rd	39.1873	-121.90847	SVWQC	BTTSL
ButteYubaSutter	Gilsizer Slough at George Washington Rd	39.009	-121.6716	SVWQC	GILSL
ButteYubaSutter	Lower Honcut Creek at Hwy 70	39.30915	-121.59542	SVWQC	LHNCT
ButteYubaSutter	Lower Snake R. at Nuestro Rd	39.18531	-121.70358	SVWQC	LSNKR
ButteYubaSutter	Pine Creek at Nord Gianella Rd	39.78114	-121.98771	SVWQC	PNCGR
ButteYubaSutter	Sacramento Slough bridge near Karnak	38.785	-121.6533	SVWQC/CRC	SSKNK
ColusaGlenn	Colusa Basin Drain above KL	38.8121	-121.7741	SVWQC/CRC	COLDR
ColusaGlenn	Freshwater Creek at Gibson Rd	39.17664	-122.18915	SVWQC	FRSHC
ColusaGlenn	Stony Creek on Hwy 45 near Rd 24	39.71005	-122.00404	SVWQC	STYHY
ColusaGlenn	Walker Creek near 99W and CR33	39.62423	-122.19652	SVWQC	WLKCH
ElDorado	Coon Hollow Cr	38.75335	-120.72404	SVWQC	COONH
ElDorado	North Canyon Cr	38.7604	-120.7102	SVWQC	NRTCN
LakeNapa	Middle Creek u/s from Highway 20	39.17641	-122.91271	SVWQC	MDLCR
LakeNapa	Pope Creek upstream from Lake Berryessa	38.64637	-122.36424	PCWG	PCULB
PitRiver	Pit River at Pittville	41.0454	-121.3317	NECWA	PRPIT
PNSSNS	Coon Creek at Brewer Rd	38.93399	-121.45184	SVWQC	CCBRW
PNSSNS	Coon Creek at DLX Ranches	38.9353	-121.408	SVWQC	CCDLX
PNSSNS	Coon Creek at Striplin Rd	38.8661	-121.5803	SVWQC	CCSTR
SacramentoAmador	Cosumnes River at Twin Cities Rd	38.29098	-121.38044	SVWQC	CRTWN
SacramentoAmador	Grand Island Drain near Leary Rd	38.2399	-121.5649	SVWQC	GIDLR
SacramentoAmador	Laguna Creek at Alta Mesa Rd	38.31102	-121.2263	SVWQC	LAGAM
ShastaTehama	Anderson Creek at Ash Creek Rd	40.418	-122.2136	SVWQC	ACACR
SolanoYolo	Cache Creek at Capay Diversion Dam	38.7137	-122.0851	SVWQC	CCCPY
SolanoYolo	Shag Slough at Liberty Island Bridge	38.30677	-121.69337	SVWQC	SSLIB
SolanoYolo	Ulatis Creek at Brown Rd	38.307	-121.794	SVWQC	UCBRD
SolanoYolo	Willow Slough Bypass at Pole Line	38.59015	-121.73058	SVWQC	WLSPL
SolanoYolo	Z Drain – Dixon RCD	38.45215	-121.6752	SVWQC	ZDDIX
UpperFeatherRiver	Indian Creek at Arlington Bridge	40.0846	-120.9161	UFRW	INDAB
UpperFeatherRiver	Middle Fork Feather River above Grizzly Cr	39.816	-120.426	UFRW	MFFGR
UpperFeatherRiver	Spanish Creek below Greenhorn Cr	39.9735	-120.9103	UFRW	SPGRN

Table 4. Coalition Monitoring Sites, 2009: Organochlorine Pesticides in Sediment

Subwatershed	Site Name	Latitude	Longitude	Implementing Agency	Site ID (Fig. 2)
ButteYubaSutter	Gilsizer Slough at Bogue Rd	39.098282	-121.638734	SVWQC	GILBR
ButteYubaSutter	Gilsizer Slough at George Washington Rd	39.009	-121.6716	SVWQC	GILSL
ButteYubaSutter	Gilsizer Slough at Hutchins Rd	39.039968	-121.646118	SVWQC	GILHR
ButteYubaSutter	Gilsizer Slough at Lincoln Rd	39.112711	-121.636384	SVWQC	GILLR
ButteYubaSutter	Gilsizer Slough at Oswald Rd	39.06904	-121.643109	SVWQC	GILOR
ButteYubaSutter	Lower Honcut Creek at Hwy 70	39.30915	-121.59542	SVWQC	LHNCT
ColusaGlenn	Lateral 3 RD 108	38.881725	-121.83346	SVWQC	LTTHR
ColusaGlenn	Lateral 6, RD 108	38.898376	-121.860227	SVWQC	LTSIX
ColusaGlenn	Lateral 7, RD 108	38.929529	-121.881859	SVWQC	LTSVN
ColusaGlenn	Lateral 8, RD 108	38.932591	-121.8867	SVWQC	LTATE
ColusaGlenn	Lurline Creek at 99W	39.21215	-122.18331	SVWQC	LRLNC
ColusaGlenn	Lurline Creek at GCID Canal	39.217164	-122.254204	SVWQC	LGCID
ColusaGlenn	Lurline Creek East of Danley Rd	39.218841	-122.227449	SVWQC	LRLED
ColusaGlenn	Reckers Ditch North Drainage	39.218693	-122.199556	SVWQC	RKRSD
ColusaGlenn	Rough and Ready Pumping Plant (RD 108)	38.86209	-121.7927	SVWQC	RARPP
ColusaGlenn	South Channel South of Lurline Rd	39.210624	-122.218733	SVWQC	SCHNL
ColusaGlenn	Southdown Ditch on Gibson Rd	39.208853	-122.190462	SVWQC	SDDGR
ColusaGlenn	Sycamore Slough at Highway 45	38.86059	-121.82137	SVWQC	SYSLH
ElDorado	Coon Hollow Creek	38.75335	-120.72404	SVWQC	COONH
ElDorado	Coon Hollow Creek FU SITE 1	38.74805	-120.72388	SVWQC	CNHFU
ElDorado	Coon Hollow Creek Lower Follow Up	38.7486	-120.7243	SVWQC	CNHFA
ElDorado	Coon Hollow Creek Middle Follow Up	38.7486	-120.7243	SVWQC	CNHFB
ElDorado	North Canyon Cr	38.7604	-120.7102	SVWQC	NRTCN
ElDorado	North Canyon Creek at Audubon Rd	38.756	-120.6938	SVWQC	NCAUD
ElDorado	North Canyon Creek at Larsen Rd	38.7517	-120.6815	SVWQC	NLRSN
SacramentoAmador	Grand Island Drain East Fork	38.243158	-121.563591	SVWQC	GIDEF
SacramentoAmador	Grand Island Drain Middle Fork	38.255241	-121.560619	SVWQC	GIDMF
SacramentoAmador	Grand Island Drain near Leary Rd	38.2399	-121.5649	SVWQC	GIDLR
SacramentoAmador	Grand Island Drain West Fork	38.244668	-121.564725	SVWQC	GIDWF
SolanoYolo	Willow Slough Bypass at Pole Line	38.59015	-121.73058	SVWQC	WLSPL
SolanoYolo	Willow Slough at CR29	38.618784	-121.743376	SVWQC	WLSTN
SolanoYolo	Willow Slough at CR99	38.6049	-121.7854	SVWQC	WLSNO
SolanoYolo	Dry Slough at CR99	38.59524	-121.7856	SVWQC	WLSSO

Figure 1. Coalition Monitoring Sites

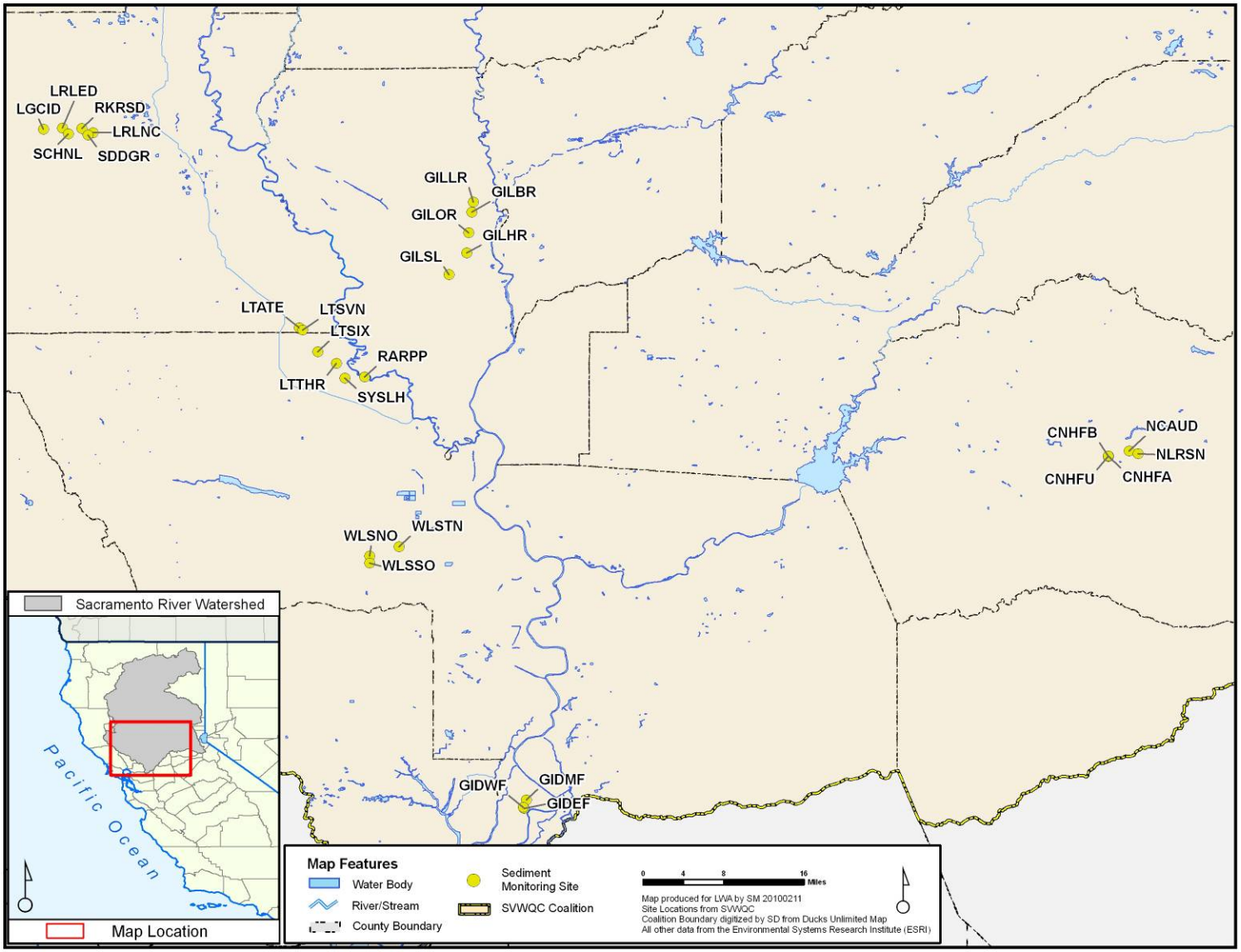

Figure 2. Coalition Monitoring Sites: Organochlorine Pesticides in Sediment

SITE DESCRIPTIONS

Butte/Yuba/Sutter Subwatershed

Butte Slough at Pass Road (BTTSL)

Butte Slough is a tributary of Butte Creek. It joins Butte Creek near its outflow to the Sacramento River. The sampling location is approximately 1.5 miles from the confluence with Butte Creek. Butte Creek is a source of water in Butte Slough when irrigation withdrawals are being made. In addition to the water from Butte Creek, Butte Slough receives drainage from the wetlands of Gray Lodge Waterfowl Management Area, Butte Sink Wildlife Management Area, the fields surrounding Cherokee Canal and the orchards and fields west of Gridley and the Buttes.

Gilsizer Slough at George Washington Road (GILSL)

Gilsizer Slough is an unlined storm drainage outfall canal that runs from the Gilsizer County Drainage District's north pump station approximately 15 miles to the Sutter Bypass, draining 6,005 total acres. The monitoring location is located roughly 1.5 drainage miles from its confluence with the Sutter bypass and is a natural drainage channel that historically has drained Yuba City and the area south of town. Principal crops grown in this area include prunes, walnuts, peaches, and almonds.

Lower Honcut Creek at Highway 70 (LHNCT)

Lower Honcut Creek (in the Lower Honcut Creek drainage) was selected to represent the drainages in the eastern part of the Butte-Yuba-Sutter subwatershed. This drainage includes the dominant crops and typically has flows allowing sampling through irrigation season. The sampling site is located approximately 3.5 miles from its confluence with the Feather River. Dominant crops in this drainage include rice, walnuts, prunes, pasture, citrus, olive, grapes, Lower Honcut receives flows from North Honcut Creek and South Honcut Creek, which extend up into the foothills and include more pasture acreage.

Lower Snake River at Nuestro Road (LSNKR)

The Lower Snake River is an unlined irrigation supply and runoff canal that serves approximately 25,000 total acres and includes a relatively high percentage of rice acreage. The other predominant crops include prunes, peaches, idle acreage, and operations producing flowers, nursery stock, and Christmas trees.

Pine Creek at Nord-Gianella Road (PNCGR)

The watershed sampled upstream from the monitoring site represents approximately 13,440 acres of varied farmland, riparian habitat and farmsteads. The predominant crops in this area are walnuts, almonds, prunes, wheat, oats, barley, beans, squash, cucumbers, alfalfa, pasture, and safflower.

Sacramento Slough Bridge near Karnak (SSKNK)

This site aggregates water from all areas in the subwatershed between the Feather and Sacramento Rivers. The major contributing areas include the areas downstream of the Butte

Slough and Wadsworth monitoring sites. These areas include Sutter Bypass and its major inputs from Gilsizer Slough, RD 1660, RD 1500, and the Lower Snake River. Monitoring at this site is coordinated with the California Rice Commission.

Colusa Glenn Subwatershed

Colusa Basin Drain above Knights Landing (COLDR)

This site is near the outfall gates of the Colusa Basin Drain before its confluence with the Sacramento River. This site is downstream of all of the other monitoring sites within the basin. The upstream acreage consists of almonds, tomatoes, wetlands, pasture, corn, and walnuts. Monitoring at this site is coordinated with the California Rice Commission.

Freshwater Creek at Gibson Road (FRSHC)

The Freshwater Creek drainage includes approximately 83,000 total acres. Irrigated acreage (excluding rice acreage) is approximately 19,000 acres. Predominant crops in the drainage are rice, tomatoes, idle, squash, grain, pasture, and safflower.

Stony Creek at Hwy 45 (near Rd. 24) (STYHY)

This site characterizes water from the contributing area downstream of Black Butte Reservoir just north of the town of Orland and includes approximately 20,000 acres of irrigated lands. The major irrigated crops in the Lower Stony Creek drainage are pasture, almonds, prunes, and wheat.

Walker Creek at County Road 48 (WLKRC)

The Walker Creek drainage is located east of Wilson Creek in Glenn County, and the Walker Creek monitoring site is located 1.3 miles north of the Town of Willows. The Walker Creek drainage includes approximately 27,000 total irrigated acres. Predominant crops in this drainage are almonds, rice, corn, and alfalfa.

El Dorado County Subwatershed

Coon Hollow Creek (COONH)

This site is located in the Apple Hill area of Camino, approximately 1 mile north of the intersection of North Canyon Road and Carson Road and 1/2 mile south of the confluence with South Canyon Creek. Agricultural operations within the drainage include apples, wine grapes, cherries, and blueberries. Coon Hollow Creek is considered a low-flow perennial stream.

North Canyon Creek (NRTCN)

This site captures representative agricultural drainage from the Camino-"Apple Hill" drainage in El Dorado County. Crops grown in this region include apples, pears, wine grapes, stone fruit, and Christmas trees. This site is approximately one (1) mile upstream from the confluence with the South Fork American River and is a perennial stream.

Lake/Napa Subwatershed

Middle Creek Upstream from Highway 20 (MDLCR)

The Middle Creek drainage contains approximately 60,732 acres. Over 55,000 acres are listed as Native Vegetation with the US Forest Service controlling the majority of the land. Irrigated agriculture constitutes approx 1,112 acres participating in the Lake County Watershed group. This includes 374 acres of walnuts, 308 acres of grapes, 186 acres of pears 159 acres of hay/pasture, 10 acres of specialty crops/nursery crops and about 70 acres of wild rice.

The sampling location was chosen to avoid influence for the town of Upper Lake, and captures approximately 60% of irrigated agricultural operations within this drainage. Due to the ephemeral nature of the creek, sampling at this site is planned to be conducted three times per year: twice during the storm season, and once after commencement of the irrigation season.

Pope Creek (PCULB)

The site on Pope Creek in Napa County is downstream of major storm runoff but is above the level of the receiving waters of Lake Berryessa. Collectively, these sites capture drainage from approximately 3,400 acres of irrigated lands. Primary crops include vineyards and olive orchards. Based upon the ephemeral nature of this Napa County creek, samples are planned to be collected from December through May.

Pit River Subwatershed

Pit River at Pittville Bridge (PRPIT)

This site captures drainage from Big Valley, Ash Creek and Horse Creek. This site captures drainage from the primary land-use, native pasture, as well as alfalfa, oat hay, grain and duck marsh, ultimately incorporating approximately 9,000 acres in the Fall River Valley.

Placer/Nevada/South Sutter/North Sacramento Subwatershed

Coon Creek at Brewer Road (CCBRW)

This site captures drainage from the Middle Coon Creek drainage areas as identified in the Placer-Northern Sacramento Drainage Prioritization Table in the Coalition's Watershed Evaluation Report (WER). This site is on Coon Creek about six miles northwest of the town of Lincoln and includes predominantly agricultural acreage. The drainage includes approximately 65,000 irrigated acres of rice, rice, pasture, grains, and sudan grass, with a high percentage of rice acreage.

Coon Creek at DLX Ranches (CCDLX)

This site is monitored for potential sources of *E. coli*. It is located approximately 3.5 miles upstream from Coon Creek at Brewer Road (CCBRW). It is immediately upstream from the Coon Creek Trap and Skeet Range and immediately downstream from Coon Creek Duck Club and Rice Ranch.

Coon Creek at Striplin Road (CCSTR)

This site captures drainage from the Middle and Lower Coon Creek drainage areas. The sampling site is on Coon Creek about one mile downstream of the confluence with Ping Slough. The site drains approximately 25,000 irrigated acres of orchards, pasture, and wheat. There may also be some urban runoff contributions at this site.

Sacramento/Amador Subwatershed

Cosumnes River at Twin Cities Road (CRTWN)

This site characterizes flows from the east via the Cosumnes River and a handful of tributary creeks that originate in the foothills. Contributing agricultural acreage including pasture, vineyards, corn and grains. This site captures drainage from the two largest drainages in the subwatershed: Lower Cosumnes and Middle Cosumnes, which drain approximately 55,000 irrigated acres.

Grand Island Drain near Leary Road (GIDLR)

Grand Island is located in the heart of the Sacramento Delta. Crops include alfalfa, corn, safflower, apples, pears, cherries, blueberries, asparagus, grapes, and pasture land. Water is pumped on to the island at several locations. The monitoring site is located just up-slough from a station that returns water to the Delta. Approximately 8,000 acres drains to the monitoring site.

Laguna Creek at Alta Mesa Road (LAGAM)

Laguna Creek is a tributary to the Cosumnes River. Laguna Creek originates in Amador County and flows south-west into Sacramento County, draining Willow, Hadselville, Brown and Griffith Creeks, among others. The primary agricultural uses are vineyards, field crops, grain and hay crops and pasture.

Shasta/Tehama Subwatershed

Anderson Creek at Ash Creek Road (ACACR)

Anderson Creek was identified as the highest priority drainage in the Shasta county portion of the Shasta/Tehama subwatershed. This ranking was based on total irrigated acreage, crop types by acreage, and amount and type of pesticide use. Anderson Creek originates about three miles west of the city of Anderson and then flows into the Sacramento River. Crops are predominantly pasture, followed by walnuts and alfalfa/hay and then smaller amounts of other field and orchard crops. Total irrigated land is 8,989 acres.

Solano/Yolo Subwatershed

Cache Creek at Diversion Dam (CCCPY)

The diversion dam on Cache Creek near Capay is the main diversion point for irrigation water in the 190,000 acre Yolo County Flood Control and Water Conservation District. The Diversion Dam is located 1.9 miles west of the town of Capay. During the summer irrigation season, the water at this site is released from storage approximately 50-60 miles upstream, from the Clear Lake and Indian Valley Reservoirs. There is no snow pack in this coastal watershed, therefore

winter flows are very flashy (rising and falling quickly). Major crops in this drainage include tomatoes, alfalfa, corn, wheat, grapes, and orchards.

Shag Slough at Liberty Island Bridge (SSLIB)

Due to the access difficulties, Toe Drain was replaced with Shag Slough in late 2005. Shag Slough drains a large portion of the South Yolo Bypass. Crops grown in this drainage area include corn, safflower, grain, vineyards, tomatoes, and irrigated pasture. The Liberty Island Bridge site is approximately 2.5 to 3 miles southwest of the Toe Drain in Shag Slough. Like the Toe Drain, it is a tidally influenced site and is likely to contain a mixture of Toe Drain water along with water from other sub-drainages within the South Yolo Bypass and the Southwest Yolo Bypass.

Ulatis Creek at Brown Road (UCBRD)

Ulatis Creek is a flood control project (FCP) that drains the majority of the central portion of Solano County. The Ulatis Creek FCP monitoring site is approximately 8.5 miles south of Dixon and 1.5 miles east of State Highway 113 on Brown Road. This site drains the Cache Slough area, as designated in the Yolo/Solano subwatershed map, and empties into Cache Slough. The major crops in this area include wheat, corn, pasture, tomatoes, alfalfa, Sudan grass, walnuts and almonds.

Willow Slough Bypass at Pole Line Road (WLSPL)

The Willow Slough is a large drainage including approximately 102,000 total acres. Irrigated acreage (excluding rice acreage) is approximately 66,000 acres. Predominant crops in the drainage are grain, pasture, corn, tomatoes, rice, and walnuts.

Upper Feather River Watershed

Agriculture in this subwatershed is localized in mountain valleys that are suitable for grazing and growing alfalfa and grain hay crops. Monitoring in this subwatershed is therefore focused on characterizing drainage from three valleys with considerable agricultural acreage.

Indian Creek at Arlington Bridge (INDAB)

This site replaced Indian Creek downstream from Indian Valley. This site is located at the edge of the irrigated agriculture in the Indian Creek Watershed. Indian Creek drains the second largest irrigated agricultural region in this subwatershed, the Indian Valley. There are approximately 12,500 acres of native pasture, hay, and alfalfa. Drainage flows through the Indian Valley via Wolf Creek, Cooks Creek, Lights Creek and Indian Creek. The first three creeks ultimately flow to the southwest and join Indian Creek on the west side of the valley upstream from the monitoring site. This site provides a baseline for potential upstream monitoring on these tributary streams if necessary.

Middle Fork Feather River above Grizzly Creek (MFFRG)

The Middle Fork above Grizzly Creek is below the last irrigated site in the Sierra Valley sub-watershed and has year-round flow in most years. This site replaces Middle Fork Feather River

at County Rd A-23, which lacks year-round flow (often dry by mid-July) and has numerous non-agricultural uses, including recreation and water trucks.

Spanish Creek below Greenhorn Creek Confluence (SPGRN)

This site replaced Spanish Creek above the confluence with Greenhorn Creek. This site captures drainage from both Greenhorn and Spanish Creeks in the American Valley, which encompasses approximately 1,800 irrigated acres of pasture. Spanish Creek and Greenhorn Creek are the two primary streams draining the valley. A third stream, Mill Creek, connects with Spanish Creek upstream of the monitoring point. These creeks generally flow in a northerly direction, and ultimately, Spanish Creek connects with the North Fork Feather River.

Sampling and Analytical Methods

The objective of data collection for this monitoring program is to produce data that represent, as closely as possible, *in situ* conditions of agricultural discharges and water bodies in the Central Valley. This objective will be achieved by using standard accepted methods to collect and analyze surface water and sediment samples. Assessing the monitoring program's ability to meet this objective will be accomplished by evaluating the resulting laboratory measurements in terms of detection limits, precision, accuracy, representativeness, comparability, and completeness, as described in the Coalition's QAPP (SVWQC 2008) and approved by the Water Board.

Surface water samples were collected for analysis of the constituents listed in **Table 2** as specified in the Coalition's Monitoring Plans. Surface water and sediment samples were collected for chemical analyses and toxicity testing. All samples were collected and analyzed using the methods specified in the QAPP; any deviations from these methods were explained.

SAMPLE COLLECTION METHODS

All samples were collected in a manner appropriate for the specific analytical methods used and to ensure that water column samples were representative of the flow in the channel cross-section. Water quality samples were collected using clean techniques that minimize sample contamination. Samples were cross-sectional composite samples or mid-stream, mid-depth grab samples, depending on sampling site and event characteristics. Where appropriate, water samples were collected using a standard multi-vertical depth integrating method. Abbreviated sampling methods (i.e., weighted-bottle or dip sample) may be used for collecting representative water samples. If grab sample collection methods were used, samples were taken at approximately mid-stream and mid-depth at the location of greatest flow (where feasible).

Sediment sampling was conducted on an approximately 50 meter reach of the waterbody near the same location as water quality sampling stations. The specific reach definitions vary based on conditions at each sampling station. If USGS methods were applicable, sediment sub-samples were collected from five to ten wadeable depositional zones. Depositional zones include areas on the inside bend of a stream or areas downstream from obstacles such as boulders, islands, sand bars, or simply shallow waters near the shore. In low-energy waterbodies, composite samples may be collected from the bottom of the channel using appropriate equipment, as specified in the Coalition's QAPP. Sediment samples for toxicity analyses were collected in such a manner to minimize air above sediment and to prevent exposure to air.

Details of the standard operating procedures (SOPs) for collection of surface water and sediment samples are provided in the Coalition's QAPP. The sites and number of samples planned to be collected for the Coalition's 2009 monitoring are summarized in **Table 5**Error! Reference source not found.Error! Reference source not found.. The Coalition's monitoring strategy for 2009 was designed to characterize high and medium priority drainages representative of subwatershed agriculture and practices. This sampling approach was designed to comply with the requirements in the adopted ILRP MRP (*Monitoring and Reporting Program Order No. R5-2008-0005*). The elements that are key to achieving the Coalition's goals and satisfying the intent of the requirements of the R5-2008-0005 MRP are (1) the Coalition's prioritization process for selecting representative drainages and monitoring sites, and (2) identification of monitoring parameters and schedules appropriate for these representative drainages. This approach and the

resulting monitoring plan are documented in the Coalition's 2009 Monitoring and Reporting Program Plan, as required by *Order No. R5-2008-0005*.

Table 5. Coalition 2009 Monitoring: Planned Annual Sampling Frequency

Subwatershed	Location	Category	Core and Assessment Sampling Schedule	Water Column Sample Events	Sediment Sample Events	Independent Mgt Plan Sediment Samples	pH, Conductivity, DO, Temperature, Flow	Turbidity, TDS, TSS, TOC	Nutrients	Pathogen Indicators: *E. Coli* and Fecal Coliform	Trace Metals and Hardness	Organophosphate Pesticides	Triazines	Organochlorines in Water	Organochlorines in Sediment	Carbamate and Urea Pesticides	Trifluralin	Glyphosate	Paraquat	Ceriodaphnia, 96-h acute	Pimephales, 96-hour acute	Selenastrum, 96-h short-term chronic	Hyalella, 10-day short-term chronic	Grain Size in Sediments	OPs, Pyrethroids, and TOC in Toxic Sediments	Implementation
Butte-Sutter-Yuba	Lower Snake R. at Nuestro Rd	Core & SP	JAN-DEC	12	0	0	12	12	9	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	SVWQC
Butte-Sutter-Yuba	Sacramento Slough bridge near Karnak	Core & SP	JAN-DEC	12	0	0	12	12	9	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	SVWQC
Butte-Sutter-Yuba	Lower Honcut Creek at Hwy 70	Assessment	JAN-DEC	12	2	0	12	12	9	12	7	8	7	7	0	7	6	10	10	10	10	10	2	2	2	SVWQC
Butte-Sutter-Yuba	Pine Creek at Nord Gianelli Rd	Core & SP	JAN-DEC	12	0	0	12	12	9	12	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	SVWQC
Butte-Sutter-Yuba	Gilsizer Sl. at G. Washington Rd	SP only		2	0	6	0	0	0	0	0	2	0	0	6	0	0	0	0	0	0	0	0	0	0	SVWQC
Butte-Sutter-Yuba	Butte Slough at Pass Road	SP only		4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	SVWQC+CRC
Colusa Glenn	Colusa Drain above KL	Core	JAN-DEC	12	0	0	12	12	8	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	SVWQC+CRC
Colusa Glenn	Freshwater Creek at Gibson Rd	Core & SP	JAN-DEC	12	0	0	12	12	8	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	SVWQC
Colusa Glenn	Walker Creek at 99W and CR33	Assessment & SP	JAN-DEC	12	2	0	12	12	8	12	7	8	9	4	0	10	6	10	9	10	10	8	2	2	2	SVWQC
Colusa Glenn	Lurline Creek at 99W	SP only		0	0	6	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	SVWQC
Colusa Glenn	Rough and Ready Pumping Plant (RD 108)	SP only		0	0	6	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	SVWQC
Colusa Glenn	Stony Creek on Hwy 45 near Rd 24	SP only		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	2	SVWQC
El Dorado	North Canyon Creek	Core & SP	DEC-AUG	9	0	4	9	9	0	9	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	SVWQC
El Dorado	Coon Hollow Creek	SP only		0	0	4	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	SVWQC
Lake-Napa	Middle Creek u/s Hwy 20	Core	JAN-SEP	10	0	0	10	10	10	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	SVWQC
Lake-Napa	Pope Cr u/s from L. Berryessa	Core	DEC-MAY	6	0	0	6	6	6	6	5	0	4	0	0	0	0	6	0	0	0	0	0	0	0	PCWG
Pit River	Pit River at Pittville	Core & SP	APR-NOV	8	0	0	8	8	5	8	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	NECWA
PNSNSS	Coon Creek at Brewer Rd	Core & SP	JAN-DEC	12	0	0	12	12	9	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	SVWQC
PNSNSS	Coon Creek at Striplin Rd	SP only		5	0	0	5	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	SVWQC
PNSNSS	Coon Creek at DLX Ranch	SP only		6	0	0	6	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	SVWQC
Sac-Amador	Cosumnes River at Twin Cities Rd	Core & SP	JAN-DEC	12	2	0	12	12	8	12	0	0	0	0	0	0	0	0	0	0	0	0	2	2	2	SVWQC
Sac-Amador	Grand Island Drain near Leary Road	Core & SP	JAN-DEC	12	0	4	12	12	8	12	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	SVWQC
Sac-Amador	Laguna Creek at Alta Mesa Rd	SP only		4	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	SVWQC
Shasta-Tehama	Anderson Creek at Ash Creek Road	Core & SP	JAN-DEC	12	0	0	12	12	9	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	SVWQC
Solano-Yolo	Shag Sl. at Liberty Island Bridge	Core	JAN-DEC	12	0	0	12	12	12	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	SVWQC
Solano-Yolo	Willow Sl. Bypass at Pole Line	Core & SP	JAN-DEC	12	0	6	12	12	12	12	0	4	0	0	6	0	0	0	0	4	0	4	0	0	0	SVWQC
Solano-Yolo	Cache Cr. at Diversion Dam	SP only		4	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	SVWQC
Solano-Yolo	Ulatis Creek at Brown Road	Core & SP	JAN-DEC	12	0	0	12	12	12	12	0	7	0	0	0	4	0	0	0	0	0	4	0	0	0	SVWQC
Solano-Yolo	Z Drain – Dixon RCD	SP only		0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	2	SVWQC
Upper Feather	Middle Fork Feather River above Grizzly Cr	Core & SP	MAY-SEP	5	0	0	5	5	0	5	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	UFRW
Upper Feather	Spanish Creek below Greenhorn Cr	Core & SP	MAY-SEP	5	0	0	5	5	0	5	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	UFRW
Upper Feather	Indian Creek below Arlington Bridge	Core & SP	MAY-SEP	5	0	0	5	5	0	5	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	UFRW

Note: *Implementation* indicates whether monitoring is conducted by the Coalition (SVWQC), Northeastern California Water Association (NECWA), Napa County Putah Creek Watershed Group (PCWG), Upper Feather River Watershed Prop 50 Project Team (UFRW), or in coordination with California Rice Commission (CRC).

ANALYTICAL METHODS

Water chemistry samples were analyzed for filtered (dissolved) and unfiltered/whole (total) fractions of the samples. Pesticide analyses were conducted only on unfiltered (whole) samples. Laboratories analyzing samples for this program have demonstrated the ability to meet the minimum performance requirements for each analytical method, including the ability to meet the project-specified quantitation limits (QL), the ability to generate acceptable precision and recoveries, and other analytical and quality control parameters documented in the Coalition's QAPP. Analytical methods used for chemical analyses follow accepted standard methods or approved modifications of these methods, and all procedures for analyses are documented in the QAPP or available for review and approval at each laboratory.

Toxicity Testing and Toxicity Identification Evaluations

Water quality samples were analyzed for toxicity to *Ceriodaphnia dubia*, *Pimephales promelas*, and *Selenastrum capricornutum*. Sediment samples were analyzed for toxicity to *Hyalella azteca*. Toxicity tests were conducted using standard USEPA methods for these species.

- Determination of acute toxicity to *Ceriodaphnia* and *Pimephales* was performed as described in *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, Fifth Edition* (USEPA 2002a). Toxicity tests with *Ceriodaphnia* and *Pimephales* were conducted as 96-hour static renewal tests, with renewal 48 hours after test initiation. If found to be necessary to control pathogen-related mortality for acute tests with *Pimephales*, test procedures may be modified as described in Geis *et al*. (2003). These modifications consist of using smaller test containers (30 mL), including only two fish per container, and increasing the number of replicates to ten.
- Determination of toxicity to *Selenastrum* was performed using the non-EDTA procedure described in *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, Fourth Edition* (USEPA 2002b). Toxicity tests with *Selenastrum* were conducted as a 96-hour static non-renewal test.
- Determination of sediment toxicity to *Hyalella* was performed as described in *Methods for Measuring the Toxicity and Bioaccumulation of Sediment-Associated Contaminants with Freshwater Invertebrates–Second Edition* (USEPA 2000). Toxicity tests with *Hyalella* were conducted as a 10-day whole-sediment toxicity test with renewal of overlying water at 12-hour intervals.

For all initial screening toxicity tests at each site, 100% ambient water and a control were used for the acute water column tests. If 100% mortality to a test species was observed any time after the initiation of the initial screening toxicity test, a multiple dilution test using a minimum of five sample dilutions was conducted with the initial water sample to estimate the magnitude of toxicity.

Procedures in the Coalition's QAPP state that if any measurement endpoint from any of the three aquatic toxicity tests exhibits a statistically significant reduction in survival (*Ceriodaphnia* and *Pimephales*) or cell density (*Selenastrum*) of greater than or equal to 50% compared to the control, Toxicity Identification Evaluation (TIE) procedures will be initiated using the most sensitive species to investigate the cause of toxicity. The 50% mortality threshold is consistent with the approach recommended in guidance published by USEPA for conducting TIEs (USEPA

1996b), which recommends a minimum threshold of 50% mortality because the probability of completing a successful TIE decreases rapidly for samples with less than this level of toxicity. For samples that met these trigger criteria, Phase 1 TIEs to determine the general class of constituent (*e.g.*, metal, non-polar organics) causing toxicity or pesticide-focused TIEs were conducted. TIE methods generally adhere to the documented USEPA procedures referenced in the QAPP. TIE procedures were initiated as soon as possible after toxicity is observed to reduce the potential for loss of toxicity due to extended sample storage. Procedures for initiating and conducting TIEs are documented in the QAPP (SVWQC 2008).

Detection and Quantitation Limits

The Method Detection Limit (MDL) is the minimum analyte concentration that can be measured and reported with a 99% confidence that the concentration is greater than zero. The Quantitation Limit (QL) represents the concentration of an analyte that can be routinely measured in the sampled matrix within stated limits and confidence in both identification and quantitation. For this program, QLs were established based on the verifiable levels and general measurement capabilities demonstrated by labs for each method. Note that samples required to be diluted for analysis (or corrected for percent moisture for sediment samples) may have sample-specific QLs that exceed the established QLs. This is unavoidable in some cases.

Project Quantitation Limits

Laboratories generally establish QLs that are reported with the analytical results—these may be called *reporting limits*, *detection limits*, *reporting detection limits*, or several other terms by different laboratories. In most cases, these laboratory limits are less than or equal to the project QLs listed in **Table 6** and **Table 7**. Wherever possible, project QLs are lower than the proposed or existing relevant numeric water quality objectives or toxicity thresholds, as required by the *ILRP*.

All analytical results between the MDL and QL are reported as numerical values and qualified as estimates (Detected, Not Quantified (DNQ), or sometimes, "J-values").

Table 6. Laboratory Method Detection Limit (MDL) and Quantitation Limit (QL) Requirements for Analyses of Surface Water for Coalition Monitoring and Reporting Program Plan

Method	Analyte	Fraction	Units	MDL	QL	LAB
Physical and Conventional Parameters						
EPA 130.2	Hardness, total as CaCO3	Unfiltered	mg/L	3	5	CALTEST
EPA 180.1; SM2130B	Turbidity	Unfiltered	NTU	0.1	1	CALTEST
EPA 160.1; SM2540C	Total Dissolved Solids (TDS)	Filtered	mg/L	6	10	CALTEST
EPA 160.2; SM2540D	Total Suspended Solids (TSS)	Particulate	mg/L	2	3	CALTEST
EPA 415.1; SM5310C	Organic Carbon, Total (TOC)	Unfiltered	mg/L	0.3	1	CALTEST
Pathogen Indicators						
SM 9223	*E. Coli* bacteria	NA	MPN/100 mL	2	2	CALTEST
SM 9221B/E	Fecal coliform bacteria	NA	MPN/100 mL	2	2	CALTEST
Organophosphorus Pesticides						
EPA 625(m)	Azinphos-methyl	Unfiltered	µg/L	0.05	0.1	CRG
EPA 625(m)	Chlorpyrifos	Unfiltered	µg/L	0.005	0.01	CRG
EPA 625(m)	Diazinon	Unfiltered	µg/L	0.005	0.01	CRG
EPA 625(m)	Dimethoate	Unfiltered	µg/L	0.005	0.01	CRG
EPA 625(m)	Disulfoton	Unfiltered	µg/L	0.01	0.02	CRG
EPA 625(m)	Malathion	Unfiltered	µg/L	0.005	0.01	CRG
EPA 625(m)	Methamidophos	Unfiltered	µg/L	0.05	0.1	CRG
EPA 625(m)	Methidathion	Unfiltered	µg/L	0.01	0.02	CRG
EPA 625(m)	Parathion, Methyl	Unfiltered	µg/L	0.01	0.02	CRG
EPA 625(m)	Parathion, Ethyl	Unfiltered	µg/L	0.01	0.02	CRG
EPA 625(m)	Phorate	Unfiltered	µg/L	0.01	0.02	CRG
EPA 625(m)	Phosmet	Unfiltered	µg/L	0.05	0.1	CRG
Organochlorine Pesticides						
EPA 625(m)	4,4'-DDT (o,p' and p,p')	Unfiltered	µg/L	0.001	0.005	CRG
EPA 625(m)	4,4'-DDE (o,p' and p,p')	Unfiltered	µg/L	0.001	0.005	CRG
EPA 625(m)	4,4'-DDD (o,p' and p,p')	Unfiltered	µg/L	0.001	0.005	CRG
EPA 625(m)	Aldrin	Unfiltered	µg/L	0.001	0.005	CRG
EPA 625(m)	Chlordane	Unfiltered	µg/L	0.001	0.005	CRG
EPA 625(m)	Dicofol	Unfiltered	µg/L	0.05	0.1	CRG
EPA 625(m)	Dieldrin	Unfiltered	µg/L	0.001	0.005	CRG
EPA 625(m)	Endosulfan	Unfiltered	µg/L	0.001	0.005	CRG
EPA 625(m)	Endrin	Unfiltered	µg/L	0.001	0.005	CRG
EPA 625(m)	Heptachlor	Unfiltered	µg/L	0.001	0.005	CRG
EPA 625(m)	Heptachlor epoxide	Unfiltered	µg/L	0.001	0.005	CRG
EPA 625(m)	Hexachlorocyclohexane	Unfiltered	µg/L	0.001	0.005	CRG
EPA 625(m)	Methoxychlor	Unfiltered	µg/L	0.001	0.005	CRG
EPA 625(m)	Toxaphene	Unfiltered	µg/L	0.01	0.05	CRG
Carbamate and Urea Pesticides						
EPA 8321	Aldicarb	Unfiltered	µg/L	0.2	0.4	APPL
EPA 8321	Carbaryl	Unfiltered	µg/L	0.05	0.07	APPL
EPA 8321	Carbofuran	Unfiltered	µg/L	0.05	0.07	APPL

Method	Analyte	Fraction	Units	MDL	QL	LAB
EPA 8321	Diuron	Unfiltered	µg/L	0.2	0.4	APPL
EPA 8321	Linuron	Unfiltered	µg/L	0.2	0.4	APPL
EPA 8321	Methiocarb	Unfiltered	µg/L	0.2	0.4	APPL
EPA 8321	Methomyl	Unfiltered	µg/L	0.05	0.07	APPL
EPA 8321	Oxamyl	Unfiltered	µg/L	0.2	0.4	APPL
Pyrethroid Pesticides						
EPA 625(m)	Biphenthrin	Unfiltered	µg/L	0.005	0.025	CRG
EPA 625(m)	Cyfluthrin	Unfiltered	µg/L	0.005	0.025	CRG
EPA 625(m)	Cypermethrin	Unfiltered	µg/L	0.005	0.025	CRG
EPA 625(m)	Esfenvalerate/Fenvalerate	Unfiltered	µg/L	0.005	0.025	CRG
EPA 625(m)	Lambda-Cyhalothrin	Unfiltered	µg/L	0.005	0.025	CRG
EPA 625(m)	Permethrin	Unfiltered	µg/L	0.005	0.025	CRG
Herbicides						
EPA 625(m)	Atrazine	Unfiltered	µg/L	0.005	0.01	CRG
EPA 625(m)	Simazine	Unfiltered	µg/L	0.005	0.01	CRG
EPA 625(m)	Cyanazine	Unfiltered	µg/L	0.005	0.01	CRG
EPA 625(m)	Trifluralin	Unfiltered	µg/L	0.001	0.005	CRG
EPA 549.2	Paraquat	Unfiltered	µg/L	0.2	0.5	NorthCoast
EPA 547	Glyphosate	Unfiltered	µg/L	4	5	NorthCoast
Trace Elements						
EPA 200.8	Arsenic	Filtered, Unfiltered	µg/L	0.08	0.5	CALTEST
EPA 2008	Boron	Filtered, Unfiltered	µg/L	1	10	CALTEST
EPA 200.8	Cadmium	Filtered, Unfiltered	µg/L	0.04	0.1	CALTEST
EPA 200.8	Copper	Filtered, Unfiltered	µg/L	0.2	0.5	CALTEST
EPA 200.8	Lead	Filtered, Unfiltered	µg/L	0.02	0.25	CALTEST
EPA 200.8	Molybdenum	Filtered, Unfiltered	µg/L	0.01	0.1	CALTEST
EPA 200.8	Nickel	Filtered, Unfiltered	µg/L	0.2	0.5	CALTEST
EPA 200.8	Selenium	Unfiltered	µg/L	0.5	1	CALTEST
EPA 200.8	Zinc	Filtered, Unfiltered	µg/L	0.6	1	CALTEST
Nutrients						
EPA 351.3; EPA 351.2	Total Kjeldahl Nitrogen	Unfiltered	mg/L	0.07	0.1	CALTEST
EPA 353.2	Nitrate + Nitrite as N	Unfiltered	mg/L	0.02	0.05	CALTEST
EPA 350.1; EPA 350.2	Ammonia as N	Unfiltered	mg/L	0.02	0.1	CALTEST
EPA 365.2; SM4500-P E	Soluble Orthophosphate	Filtered	mg/L	0.01	0.05	CALTEST
EPA 365.2; SM4500-P E	Phosphorus, Total	Unfiltered	mg/L	0.02	0.05	CALTEST

Table 7. Laboratory Method Detection Limit (MDL) and Quantitation Limit (QL) Requirements for Analyses of Sediments for the Coalition Monitoring and Reporting Program Plan

Method	Analyte	Fraction	Units	MDL	QL	LAB
Physical and Conventional Parameters						
SM 2560D	Grain Size Analysis	various	% fraction	NA	1	ABC
EPA 160.3	Solids (TS)	Total	%	NA	0.1	CALTEST
EPA 160.4	Solids (TVS)	Total Volatiile	mg/kg d.w.	NA	0.1	CALTEST
EPA 9060	Organic Carbon	Total	mg/kg d.w.	50	200	AMS
Pyrethroids and Chlorpyrifos						
EPA 8270	Biphenthrin	Total	µg/kg d.w.	5	25	CRG
EPA 8270	Chlorpyrifos	Total	µg/kg d.w.	5	40	CRG
EPA 8270	Cyfluthrin	Total	µg/kg d.w.	5	25	CRG
EPA 8270	Cypermethrin	Total	µg/kg d.w.	5	25	CRG
EPA 8270	Esfenvalerate/Fenvalerate	Total	µg/kg d.w.	5	25	CRG
EPA 8270	Lambda-Cyhalothrin	Total	µg/kg d.w.	5	25	CRG
EPA 8270	Permethrin	Total	µg/kg d.w.	5	25	CRG
Organochlorine Pesticides						
EPA 8270	4,4'-DDT (o,p' and p,p')	Total	µg/kg d.w.	1	5	CRG
EPA 8270	4,4'-DDE (o,p' and p,p')	Total	µg/kg d.w.	1	5	CRG
EPA 8270	4,4'-DDD (o,p' and p,p')	Total	µg/kg d.w.	1	5	CRG
EPA 8270	Dieldrin	Total	µg/kg d.w.	1	5	CRG
EPA 8270	Endrin	Total	µg/kg d.w.	1	5	CRG
EPA 8270	Methoxychlor	Total	µg/kg d.w.	1	5	CRG

Monitoring Results

The following sections summarize the monitoring conducted by the Coalition and its subwatershed partners in 2009 (December 2008 through September 2009).

SUMMARY OF SAMPLE EVENTS CONDUCTED

This report presents monitoring results from nine Coalition sampling events (Events 035-043), as well as data for events conducted by coordinating Subwatershed monitoring programs between December 2008 and September 2009. Samples collected for all of these events are listed in **Table 8**. Monitoring conducted by Subwatershed monitoring programs coordinating with the Coalition monitoring effort is included in this document and also summarized in **Table 8**. Samples collected for organochlorine pesticides in sediment are summarized in **Table 9**.

The Coalition and Subwatershed monitoring events were conducted throughout the year. Event monitoring analyses included water chemistry and aquatic toxicity. Sediment toxicity testing was also conducted by the Coalition in April and August as specified in the MRPP and QAPP (with additional sampling for one site with no appropriate sediment substrate attempted in September). Additional sediment sampling for organochlorine pesticides was conducted in June with additional samples collected in July and planned (but not collected) in August and September at sites with access challenges. The sites and parameters for all events were monitored in accordance with the Coalition's MRPP and QAPP.

The field logs for all Coalition and Subwatershed samples collected for the December 2008 through September 2009 events, as well as associated photographs, are provided in **Appendix A**.

Table 8. Sampling for 2009 Coalition Monitoring

		Sample Count											
Agency/Subwatershed	**Site ID**	**Planned**	**Collected**	**DEC**	**JAN**	**FEB**	**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**
PCWG	PCULB	6	6	W	W	W	W	W	W	-	-	-	-
NECWA	PRPIT	6	6	-	-	-	-	W	W	W	W	W	W
UFRW	INDAB	5	5	-	-	-	-	-	W	W	W	W	W
	MFFGR	5	5	-	-	-	-	-	W	W	W	W	W
	SPGRN	5	5	-	-	-	-	-	W	W	W	W	W
SVWQC													
ButteYubaSutter	BTTSL	3	3	-	W	W	W	-	-	-	-	-	-
	GILSL	2	2	-	W	W	-	-	-	-	-	-	-
	LHNCT	11	10	-	W	W	W	W, S	W	W	W	W, [1]	W, [1]
	LSNKR	9	9	-	W	W	W	W	W	W	W	W	W
	PNCGR	9	6	-	W	W	W	W	W	W	D	D	D
	SSKNK	9	9	-	W	W	W	W	W	W	W	W	W
ColusaGlenn	COLDR	9	9	-	W	W	W	W	W	W	W	W	W
	FRSHC	9	9	-	W	W	W	W	W	W	W	W	W
	STYHY	3	0	-	-	-	-	D	-	-	-	D	D
	WLKCH	11	10	-	D	W	W	W, S	W	W	W	W, S	W
ElDorado	COONH	1	1	-	-	-	-	-	-	-	W	-	-
	NRTCN	8	8	-	W	W	W	W	W	W	W	W	-
LakeNapa	MDLCR	9	6	-	W	W	W	W	W	W	D	D	D
PNSSNS	CCBRW	9	9	-	W	W	W	W	W	W	W	W	W
	CCDLX	6	6	-	W	W	W	W	W	W	-	-	-
	CCSTR	5	5	-	-	-	-	-	W	W	W	W	W
SacramentoAmador	CRTWN	9	6	-	W	W	W	W	W	W	D	D	D
	GIDLR	9	9	-	W	W	W	W	W	W	W	W	W
	LAGAM	5	5	-	-	W	W	W	-	W	-	W	-
ShastaTehama	ACACR	9	9	-	W	W	W	W	W	W	W	W	W
SolanoYolo	CCCPY	4	4	-	-	-	-	-	W	W	W	W	-
	SSLIB	9	9	-	W	W	W	W	W	W	W	W	W
	UCBRD	9	9	-	W	W	W	W	W	W	W	W	W
	WLSPL	9	9	-	W	W	W	W	W	W	W	W	W
	ZDDIX	2	2	-	-	-	-	S	-	-	-	S	-
	Totals	**205**	**190**										

Notes:
W = Water sample collected
S = Sediment Toxicity sample collected
D = Site was dry; no samples collected.
"—" = no samples planned.
[1] = Sediment not sampled due to substrate consistency
PCWG = Putah Creek Watershed Group
NECWA = Northeastern California Watershed Association
UFRW = Upper Feather River Watershed Group
SVWQC = Sacramento Valley Water Quality Coalition
PNSSNS = PlacerNevadaSSutterNSacramento

Table 9. Sampling for 2009 Coalition Monitoring: Organochlorine Pesticides in Sediment

			Sample Count					
Agency/Subwatershed	**Site ID**	**Site Name**	**Planned**	**Collected**	**JUN**	**JUL**	**AUG**	**SEP**
SVWQC								
ButteYubaSutter	GILBR	Gilsizer Slough at Bogue Road	1	1	S	-	-	-
	GILHR	Gilsizer Slough at Hutchins Road	1	1	S	-	-	-
	GILLR	Gilsizer Slough at Lincoln Road	1	1	S	-	-	-
	GILOR	Gilsizer Slough at Oswald Road	1	1	S	-	-	-
	GILSL	Gilsizer Slough at George Washington Rd	1	1	S	-	-	-
ColusaGlenn	LGCID	Lurline Creek at GCID Canal	1	1	S	-	-	-
	LRLED	Lurline Creek East of Danley Road	1	1	S	-	-	-
	LRLNC	Lurline Creek at 99W	1	1	S	-	-	-
	LTATE	Lateral 8, RD 108	1	1	S	-	-	-
	LTSIX	Lateral 6, RD 108	1	1	S	-	-	-
	LTSVN	Lateral 7, RD 108	1	1	S	-	-	-
	LTTHR	Lateral 3 RD 108	1	1	S	-	-	-
	RARPP	Rough and Ready Pumping Plant (RD 108)	1	1	S	-	-	-
	RKRSD	Reckers Ditch North Drainage	1	1	S	-	-	-
	SCHNL	South Channel South of Lurline Road	1	1	S	-	-	-
	SDDGR	Southdown Ditch on Gibson Road	1	1	S	-	-	-
	SYSLH	Sycamore Slough at Highway 45	1	1	S	-	-	-
ElDorado	CNHFB	Coon Hollow Creek Middle Follow Up	1	1	S	-	-	-
	CNHFU	Coon Hollow Creek FU Site 1	1	1	S	-	-	-
	CNHFA	Coon Hollow Creek Lower Follow Up	1	0	[1]	-	-	-
	COONH	Coon Hollow Creek	1	1	[1]	S	-	-
	NCAUD	North Canyon Creek at Audubon Road	1	1	S	-	-	-
	NLRSN	North Canyon Creek at Larsen Road	1	1	S	-	-	-
SacramentoAmador	GIDEF	Grand Island Drain East Fork	1	0	[1]	[1]	[1]	[1]
	GIDLR	Grand Island Drain near Leary Road	1	1	S	-	-	-
	GIDMF	Grand Island Drain Middle Fork	1	1	S	-	-	-
	GIDWF	Grand Island Drain West Fork	1	1	S	-	-	-
SolanoYolo	WLSNO	Willow Slough at CR99	1	1	S	-	-	-
	WLSSO	Dry Slough at CR99	1	1	S	-	-	-
	WLSTN	Willow Slough at CR29	1	1	S	-	-	-
	Totals		**30**	**28**				

Notes:
S = Sediment sample collected
SVWQC = Sacramento Valley Water Quality Coalition
"—" = no samples planned.
[1] = Site not sampled due to accessibility issues

SAMPLE CUSTODY

All samples that were collected for the Coalition monitoring effort met the requirements for sample custody. Sample custody must be traceable from the time of sample collection until results are reported. A sample is considered under custody if:

- it is in actual possession;
- it is in view after in physical possession; and
- it is placed in a secure area (i.e., accessible by or under the scrutiny of authorized personnel only after in possession).

The chain-of-custody forms (COCs) for all samples collected by Coalition contractors for the monitoring events conducted from December 2008 through September 2009 are included with the related lab reports and are provided in **Appendix B**. All COCs for *ILRP* monitoring conducted by Coalition partners during this same period are also provided in **Appendix B** with their associated lab reports.

QUALITY ASSURANCE RESULTS

The Data Quality Objectives (DQOs) used to evaluate the results of the Coalition monitoring effort are detailed in the Coalition's QAPP (SVWQC 2008). These DQOs are the detailed quality control specifications for precision, accuracy, representativeness, comparability, and completeness. These DQOs are used as comparison criteria during data quality review to determine if the minimum requirements have been met and the data may be used as planned.

Results of Field and Laboratory QC Analyses

Quality Control (QC) data are summarized in **Table 10** through **Table 17** and discussed below. All program QC results are included with the lab reports in **Appendix B** of this document, and any qualifications of the data provided were retained and are presented with the tabulated monitoring data. Monitoring results for all programs discussed are tabulated in **Appendix C**.

Hold Times

Results were evaluated for compliance with required preparation and analytical hold times. With the exceptions discussed below, all analyses met the target data quality objectives for hold times:

- The organophosphorus pesticide sample collected at UCBRD for Event 038 was analyzed past its hold time. This sample included one broken bottle (not analyzed), and the remaining bottle was preserved one day past the seven-day hold time. The results (25 total) were qualified for the holding time violation and are considered to be estimated values.
- Two orthophosphate samples were analyzed past their hold time due to a laboratory tracking error, and the results were qualified for the holding time violation and are considered to be estimated values.
- Three turbidity samples were analyzed past their hold time due to a laboratory tracking error, and the results were qualified for the holding time violation and are considered to be estimated values.

Method Detection Limits and Quantitation Limits

Target Method Detection Limits (MDL) and Quantitation Limits (QL) were assessed for all parameters. With the exceptions discussed below, analyses met the target data quality objectives:

- 2 of 21 glyphosate results had QLs greater than the project DQO due to the laboratory (North Coast Laboratories) not meeting the DQO. The glyphosate MDL was twice the value of the project DQO QL. The elevated analytical QLs were adequate to assess exceedances of the ILRP trigger limit for glyphosate.
- 2 of 14 hardness results had MDLs and QLs greater than the project DQO due to dilution required to analyze the samples. The elevated analytical QLs for hardness were adequate to assess exceedances of associated water quality objectives for trace metals.
- 11 of 35 organophosphorus pesticides results had MDLs and QLs greater than the project DQO due to the laboratory (Caltest) not meeting the project DQO. All of these results were for the PCULB site and most were for analytes not required at this site. The QLs for required analytes were adequate to assess exceedances of ILRP trigger limits and all associated results were non-detect.
- 13 of 13 paraquat results had MDLs marginally greater than the project DQO; the MDL used by the laboratory (North Coast Laboratories) was greater than the DQO by 0.01 ug/L. All paraquat QLs met the project DQO.
- 17 of 117 total phosphorus as P results had QLs greater than the project DQO due to the laboratory not meeting the project DQO.
- 23 of 113 total dissolved solids (TDS) results had MDLs or QLs greater than the project DQO due to dilution required to analyze the samples. The QLs for all TDS analyses were adequate to assess ambient water quality and exceedances of ILRP trigger limits.
- 5 of 117 total Kjeldahl nitrogen (TKN) results had MDLs and QLs greater than the project DQO due to the laboratory not meeting the project DQO. The QLs for all TKN analyses were adequate to assess ambient water quality and all associated results were greater than the elevated QLs.
- 4 of 170 total organic carbon (TOC) results had QLs greater than the project DQO due to dilution required to analyze the samples.
- 6 of 145 total suspended solids (TSS) results had QLs greater than the project DQO due to dilution required to analyze the samples.
- 3 of 148 trace metals results (selenium) had QLs greater than the project DQO due to the laboratory (Caltest) not meeting the project DQO. The MDLs met project DQOs and QLs for all selenium analyses were adequate to assess ambient water quality and exceedances of ILRP trigger limits.
- 3 of 157 turbidity results had MDLs greater than the project DQO due to dilution required to analyze the samples.

Field Blanks

Field blanks were collected and analyzed for all analyses (**Table 10**). With the exceptions discussed below, analytes of interest were generally not detected in field blanks:

- Ammonia was detected above the QL in one field blank. This resulted in one environmental result being qualified due to potential contamination. The qualification did not affect assessment of any exceedances.
- Total phosphorus was detected above the QL in six field blank analyses. Three environmental results required qualification. Assessment of exceedances was not affected.
- Total Kjeldahl Nitrogen was detected above the QL in four field blank analyses. Three environmental results required qualification. Assessment of exceedances was not affected.
- Total organic carbon was detected above the QL in three field blank analyses. Four environmental results required qualification. Assessment of exceedances was not affected.
- Trace metals were detected above the QL in four field blank analyses. Four environmental results required qualification. Assessment of exceedances was not affected.
- Turbidity was detected above the QL in four field blank analyses. One environmental result required qualification. Assessment of exceedances was not affected.

Field Duplicates

Field duplicate samples were collected and analyzed for all parameters (**Table 11**). The data quality objective for field duplicates is a Relative Percent Difference (RPD) not exceeding 25% or a difference between duplicates that is less than the QL. With the exceptions discussed below, all field replicates met this data quality objective:

- Field duplicate RPD results exceeded the DQO for one ammonia result. One environmental result was qualified as estimated on this basis. The qualifications did not affect assessment of any exceedances.
- Field duplicate RPD results exceeded the DQO for one hardness test. One environmental result was qualified as estimated on this basis. The qualifications did not affect assessment of any exceedances.
- Field duplicate RPD results exceeded the DQO for one orthophosphate result and one total phosphorus result. Two environmental results were qualified as estimated on this basis. The qualifications did not affect assessment of any exceedances.
- Field duplicate RPD results exceeded the DQO for two organophosphate pesticide results. Two environmental results were qualified as estimated on this basis. The qualifications did not affect assessment of any exceedances.

- Field duplicate RPD results exceeded the DQO for two Total Kjeldahl Nitrogen tests. Two environmental results were qualified as estimated on this basis. The qualifications did not affect assessment of any exceedances.
- Field duplicate RPD results exceeded the DQO for one total suspended solids test. One environmental result was qualified as estimated on this basis. The qualifications did not affect assessment of any exceedances.
- Field duplicate RPD results exceeded the DQO for nine trace metals results. All nine associated environmental results were qualified as estimated on this basis. The qualifications did not affect assessment of any exceedances.
- Field duplicate RPD results exceeded the DQO for two turbidity tests. Two environmental results were qualified as estimated on this basis. The qualifications did not affect assessment of any exceedances.

Method Blanks

Method blanks were analyzed for TDS, TSS, TOC, turbidity, trace metals, nutrients, and pesticides (**Table 12**). The data quality objective for method blanks is no detectible concentrations of the analyte of interest. With the exceptions discussed below, all analyses met this data quality objective:

- Total dissolved solids were detected above the PQL in one method blank analysis. Two analytical results were qualified as a result of potential analytical contamination. The qualifications did not affect assessment of any exceedances.
- Total Kjeldahl Nitrogen was detected above the PQL in two method blank analyses. No analytical results were qualified as a result of potential analytical contamination. The qualifications did not affect assessment of any exceedances.

Laboratory Control Spikes and Surrogates

Laboratory Control Spike (LCS) recoveries were analyzed for TDS, TSS, TOC, trace metals, nutrients, and pesticides (**Table 13**). Surrogate recoveries were analyzed for organophosphorus and carbamate pesticides (**Table 14**). The data quality objective for Laboratory Control Spikes (LCS) is 80-120% recovery of the analytes of interest for most analytes. The data quality objectives for Laboratory Control Sample recoveries and surrogate recoveries of pesticides vary by analyte and surrogate and are based on the standard deviation of actual recoveries for the method.

- The results of 16 LCS recovery analyses for pesticides by EPA 625 were outside the acceptable recovery DQO. 16 analytical results were qualified as low biased as a result of low recoveries. No environmental results required qualification as high biased.
- The results of one LCS recovery analyses for paraquat were outside the acceptable recovery DQO. One environmental result required qualification.
- The results of three LCS recovery analyses for trace metals were outside the acceptable recovery DQO. Two environmental results were qualified as low biased as a result of low recoveries. One environmental result was qualified as high biased as a result of high recoveries.

- The result of one surrogate recovery analysis for pesticides by EPA 8321A was outside the acceptable recovery DQO. No environmental results required qualification.
- The results of four surrogate recovery analysis for pesticides in sediment by EPA 8270C were outside the acceptable recovery DQO. No environmental results required qualification.

Laboratory Duplicates

Laboratory Duplicates were analyzed for color, TDS, TSS, turbidity, and pesticides (**Table 15**). The data quality objective for laboratory duplicates is a Relative Percent difference (RPD) not exceeding 25%. With the exceptions discussed below, all laboratory duplicate analyses met this data quality objective:

- Laboratory duplicate results exceeded the DQO for four results for pesticides by EPA 625. One environmental result was qualified as estimated on this basis. The qualifications did not affect assessment of any exceedances.
- Laboratory duplicate results exceeded the DQO for seven results for pesticides by EPA 8270C. Two environmental results were qualified as estimated on this basis. The qualifications did not affect assessment of any exceedances.
- Laboratory duplicate results exceeded the DQO for one turbidity result. No environmental results were qualified as estimated on this basis.
- Laboratory duplicate results exceeded the DQO for one total suspended solids result. One environmental result was qualified as estimated on this basis.

Matrix Spikes and Matrix Spike Duplicates

Matrix Spikes and Matrix Spike Duplicates were analyzed for trace metals, nutrients, and pesticides (**Table 16**). The data quality objective for matrix spikes is 80-120% recovery of most analytes of interest. The data quality objective for matrix spike recoveries of pesticides varies for each analyte or surrogate and is based on the standard deviation of actual recoveries for the method. With the exceptions discussed below, all analyses met these data quality objectives:

- Matrix Spike recoveries for one non-project sample ammonia analysis by EPA 350.2 were outside the DQO. No associated project results required qualification.
- Matrix Spike recoveries for 14 hardness analyses (including 11 non-project samples) by EPA 130.2 were outside the DQO. Two associated environmental results required qualification.
- Matrix Spike recoveries for nine non-project sample nitrate analyses by EPA 353.2 were outside the DQO. No associated project results required qualification.
- Matrix Spike recoveries for 14 TKN analyses (including 12 non-project samples) by EPA 351.3 were outside the DQO. One associated environmental result required qualification.
- Matrix Spike recoveries for 36 metals analyses by EPA 200.8 were outside the DQO. Most were non-project matrices with high sample concentrations. One associated result was qualified as low biased.

- Matrix Spike recoveries for two total phosphate analyses by EPA 365.2 were outside the DQO. One associated result required qualification as low biased.
- Matrix Spike recoveries for two total organic carbon analyses by EPA 415.1 were outside the DQO. One associated result required qualification.
- Matrix Spike recoveries for 46 pesticide analyses by EPA 8270Cm were outside the DQO. Twelve associated results required qualification as high or low biased.
- Matrix Spike recoveries for 57 pesticide analyses by EPA 625m were outside the DQO. All results associated with high recoveries were below detection did not require qualification. Three associated results required qualification as low biased.

Matrix Spike RPDs

Matrix Spikes and Matrix Spike Duplicates and the associated Relative Percent Differences (RPDs) were analyzed for trace metals, nutrients, and pesticides (**Table 17**). The data quality objective for matrix spike duplicates is an RPD not exceeding 25%. With the exceptions discussed below, all analyses met these data quality objectives:

- Matrix spike duplicate results exceeded the DQO for two results for pesticides by EPA 8270C. Two environmental results were qualified as estimated on this basis. The qualifications did not affect assessment of any exceedances.
- Matrix spike duplicate results exceeded the DQO for 16 results for pesticides by EPA 625. No results were qualified as estimated on this basis.
- Matrix spike duplicate results exceeded the DQO for five (including four non-project samples) results for total Kjeldahl nitrogen. One environmental result was qualified as estimated on this basis. The qualifications did not affect assessment of any exceedances.

Summary of Precision and Accuracy

Based on the QC data for the monitoring discussed above, the precision and accuracy of the majority of monitoring results meet the DQOs, and there were no systematic sampling or analytical problems. These data are adequate for the purposes of the Coalition's monitoring program, and few results required qualification. Of the 120 total qualified data, 24 results were qualified as *estimated* due to high variability in lab or field replicate analyses, 41 results were qualified as *high biased* or *low biased* and 17 results were potentially affected by contamination and qualified as *upper limits*. Of the results qualified as *upper limits*, one was below the QL, and none of the data qualified as *upper limits* was an exceedance. Due to pH probe failure, 33 results were *rejected*. Of the 5,594 environmental analytical results generated from December 2008 through September 2009, 5,474 results required no qualification, resulting in 97.8% valid and unqualified data with no restrictions on use.

Completeness

The objectives for completeness are intended to apply to the monitoring program as a whole. As summarized in **Table 8**, 190 of the 205 initial water column and sediment toxicity sample events planned by the Coalition and coordinating programs were conducted, for an overall sample event success rate of 92.7%. Thirteen (13) planned samples were not collected because the respective sites were dry. Planned sampling that was not completed successfully is summarized below:

- Samples for three events planned for Cosumnes River (CRTWN) were not collected because the sampling site was dry.
- Samples for three events planned for Middle Creek (MDLCR) were not collected because the sampling site was dry.
- Samples for three events planned for Pine Creek (PNCGR) were not collected because the sampling site was dry.
- Samples for three events planned for Stony Creek (STYHY) were not collected because the sampling site was dry.
- Samples for one event planned for Walker Creek (WLKCH) were not collected because the site was dry.
- One planned sediment toxicity sample for Lower Honcut Creek (LHNCT) could not be collected because no appropriate sediment substrate was present at the sampling site.

A total of 4,709 water column samples were collected, and 4,709 samples were analyzed, for an analytical success rate of 100%.

As summarized in **Table 9**, 28 of the 30 sediment samples planned by the Coalition for legacy organochlorine pesticides analysis were collected for an overall sample event success rate of 93%. Planned sampling that was not completed successfully is summarized below:

- One planned sediment sample for Coon Hollow Creek (CNHFA) was not collected due to site accessibility issues.
- One sample planned for Grand Island Drain (GIDEF) could not be collected due to site accessibility issues.

27 of the 28 sediment samples collected were analyzed for organochlorine pesticides, for an analytical success rate of 96.4%.

Table 10. Summary of Field Blank Quality Control Sample Evaluations for 2009 Coalition Monitoring

Method	Analyte	DQO	Number of Analyses	Number Passing	% Success
EPA 350.2 / SM4500-NH3 C	Ammonia, Total as N	< PQL	10	9	90%
EPA 8321A	Carbamate Pesticides	< PQL	50	50	100%
SM20-9223	E. coli	< PQL	12	12	100%
SM20-9221 B/E	Fecal Coliforms	< PQL	4	4	100%
EPA 547	Glyphosate	< PQL	2	2	100%
EPA 300.0	Nitrate as N	< PQL	1	1	100%
EPA 353.2	Nitrate+Nitrite, as N	< PQL	9	8	89%
EPA 354.1 / SM4500-NO2 B	Nitrite as N	< PQL	1	1	100%
EPA 625	Organophosphorus, Organochlorine and Triazine Pesticides	< PQL	130	130	100%
EPA 365.2 / SM4500-P E	Orthophosphate/ Phosphorus, as P	< PQL	17	11	65%
EPA 549.2	Paraquat	< PQL	2	2	100%
SM 9223 B	Total Coliforms	< PQL	3	3	100%
EPA 160.1 / SM2540C	Total Dissolved Solids	< PQL	6	6	100%
EPA 351.3 / SM4500-NH3 C	Total Kjeldahl Nitrogen	< PQL	10	6	60%
EPA 415.1 / SM5310B	Total Organic Carbon	< PQL	11	8	73%
EPA 160.2 / SM2540D	Total Suspended Solids	< PQL	7	7	100%
EPA 200.8	Trace Metals	< PQL	28	24	86%
EPA 180.1	Turbidity	< PQL	7	3	43%
Totals			**310**	**287**	**93%**

Table 11. Summary of Field Duplicate Quality Control Sample Results for 2009 Coalition Monitoring

Method	Analyte	DQO	Number of Analyses	Number Passing	% Success
EPA 350.2 / SM4500-NH3 C	Ammonia, Total as N	RPD ≤25%	7	6	86%
EPA 8321A	Carbamate Pesticides	RPD ≤25%	52	52	100%
Toxicity Tests	Ceriodaphnia, Selenastrum	RPD ≤25%	2	2	100%
SM20-9223	E. coli	RPD ≤25%			
SM20-9221 B/E	Fecal Coliforms	RPD ≤25%			
EPA 547	Glyphosate	RPD ≤25%	4	4	100%
EPA 130.2/SM2340B	Hardness as CaCO3	RPD ≤25%	6	5	83%
EPA 300.0	Nitrate as N	RPD ≤25%	1	1	100%
EPA 353.2	Nitrate+Nitrite, as N	RPD ≤25%	5	5	100%
EPA 354.1 / SM4500-NO2 B	Nitrite as N	RPD ≤25%	1	1	100%
EPA 365.2 / SM4500-P E	Organophosphate/ Phosphorus, as P	RPD ≤25%	16	14	88%
EPA 625	Organophosphorus, Organochlorine and Triazine Pesticides	RPD ≤25%	200	198	99%
EPA 549.2	Paraquat	RPD ≤25%	2	2	100%
EPA 160.1 / SM2540C	Total Dissolved Solids	RPD ≤25%	6	6	100%
EPA 351.3 / SM4500-NH3 C	Total Kjeldahl Nitrogen	RPD ≤25%	7	5	71%
EPA 415.1 / SM5310B	Total Organic Carbon	RPD ≤25%	11	11	100%
EPA 160.2 / SM2540D	Total Suspended Solids	RPD ≤25%	9	8	89%
EPA 200.8	Trace Metals	RPD ≤25%	24	15	63%
EPA 180.1	Turbidity	RPD ≤25%	9	7	78%
Totals			**362**	**342**	**94%**

Table 12. Summary of Method Blank Results for 2009 Coalition Monitoring

Method	Analyte	DQO	Number of Analyses	Number Passing	% Success
EPA 350.1/350.2 / SM4500-NH3 C	Ammonia, Total as N	< RL	42	42	100%
EPA 8321A	Carbamate Pesticides	< RL	225	225	100%
EPA 110.2	Color	< RL	2	2	100%
SM20-9223	E. coli	< RL	38	38	100%
EPA 547	Glyphosate	< RL	8	8	100%
EPA 130.2 / SM2340B	Hardness as CaCO3	< RL	17	17	100%
EPA 300.0	Nitrate as N	< RL	3	3	100%
EPA 353.2	Nitrate+Nitrite, as N	< RL	37	37	100%
EPA 354.1 / SM4500-NO2 B	Nitrite as N	< RL	3	3	100%
EPA 8270C	Organochlorine and Pyrethroid Pesticides in Sediment	< RL	104	104	100%
EPA 507	Organonitrogen and Organochlorine Pesticides	< RL	26	26	100%
EPA 625	Organophosphorus, Organochlorine and Triazine Pesticides	< RL	603	603	100%
EPA 365.2 / SM4500-P E	Orthophosphate/ Phosphorus, as P	< RL	78	78	100%
EPA 549.2	Paraquat	< RL	9	9	100%
EPA 160.1 / SM2540C	Total Dissolved Solids	< RL	35	34	97%
EPA 351.3 / SM4500-NH3 C	Total Kjeldahl Nitrogen	< RL	49	47	94%
EPA 415.1 / SM5310B	Total Organic Carbon	< RL	53	53	100%
EPA 160.2 / SM2540D	Total Suspended Solids	< RL	45	45	100%
EPA 200.8	Trace Metals	< RL	149	149	100%
EPA 180.1/SM 2130 B	Turbidity	< RL	47	47	100%
Totals			**1573**	**1570**	**99.8%**

Table 13. Summary of Lab Control Spike Results for 2009 Coalition Monitoring

Method	Analyte	DQO	Number of Analyses	Number Passing	% Success
EPA 350.1M/350.2 / SM4500-NH3	Ammonia, Total as N	90 - 110%	42	42	100%
EPA 8321A	Carbamate Pesticides	[1]	234	234	100%
EPA 110.2	Color	90 - 110%	2	2	100%
EPA 547	Glyphosate	80 - 120%	15	15	100%
EPA 130.2 / SM2340B	Hardness as CaCO3	80 - 120%	17	17	100%
EPA 300.0	Nitrate as N	90 - 110%	3	3	100%
EPA 353.2	Nitrate+Nitrite, as N	90 - 110%	37	37	100%
EPA 354.1 / SM4500-NO2 B	Nitrite as N	80 - 120%	3	3	100%
EPA 8270C	Organochlorine and Pyrethroid Pesticides in Sediment	[1]	240	240	100%
EPA 507	Organonitrogen and Organochlorine Pesticides	[1]	42	42	100%
EPA 625	Organophosphorus, Organochlorine and Triazine Pesticides	[1]	1240	1224	99%
EPA 365.2 / SM4500-P E	Orthophosphate/ Phosphorus, as P	90 - 110%	78	78	100%
EPA 549.2	Paraquat	50 - 141%	15	14	93%
EPA 160.1 / SM2540C	Total Dissolved Solids	80 - 120%	33	33	100%
EPA 351.2/351.3 / SM4500-NH3 C	Total Kjeldahl Nitrogen	90 - 110%	49	49	100%
EPA 415.1/SM5310B/9060A	Total Organic Carbon	80 - 120%	55	55	100%
EPA 160.2 / SM2540D	Total Suspended Solids	80 - 120%	45	45	100%
EPA 200.8	Trace Metals	85 - 115%	149	146	98%
EPA 180.1/SM 2130 B	Turbidity	90 - 110%	52	52	100%
Totals			**2351**	**2331**	**99.1%**

1. Data Quality Objectives for pesticide LCS recoveries vary by parameter and are based on 3x the standard deviation of the lab's actual recoveries for each parameter.

Table 14. Summary of Surrogate Recovery Results for 2009 Coalition Monitoring

Method	Analyte	DQO	Number of Analyses	Number Passing	% Success
EPA 8321A	Carbamate and Urea Pesticides	[1]	46	45	98%
EPA 8270C	Organochlorine and Pyrethroid Pesticides in Sediment	[1]	216	212	98%
EPA 507	Organonitrogen and Organochlorine Pesticides	[1]	26	26	100%
EPA 625	Organophosphorus, Organochlorine and Triazine Pesticides	[1]	384	384	100%
Totals			**672**	**667**	**99.3%**

1. Data Quality Objectives for pesticide surrogate recoveries vary by parameter and are based on 3x the standard deviation of the lab's actual recoveries for each parameter.

Table 15. Summary of Lab Duplicate Results for 2009 Coalition Monitoring

Method	Analyte	DQO	Number of Analyses	Number Passing	% Success
EPA 350.1M	Ammonia, Total as N	RPD ≤25%	8	8	100%
EPA 8321A	Carbamate Pesticides	RPD ≤25%	1	1	100%
EPA 110.2	Color	RPD ≤25%	2	2	100%
SM20-9223	*E. coli*	RPD ≤25%	7	7	100%
EPA 547	Glyphosate	RPD ≤25%	7	7	100%
EPA 353.2	Nitrate+Nitrite, as N	RPD ≤25%	6	6	100%
EPA 8270C	Organochlorine and Pyrethroid Pesticides in Sediment	RPD ≤25%	240	237	99%
EPA 507	Organonitrogen and Organochlorine Pesticides	RPD ≤25%	5	5	100%
EPA 625	Organophosphorus, Organochlorine and Triazine Pesticides	RPD ≤25%	830	823	99%
EPA 365.2 / SM4500-P E	Orthophosphate/ Phosphorus, as P	RPD ≤25%	12	12	100%
EPA 549.2	Paraquat	RPD ≤25%	6	6	100%
EPA 160.1 / SM2540C	Total Dissolved Solids	RPD ≤25%	39	39	100%
EPA 351.2	Total Kjeldahl Nitrogen	RPD ≤25%	7	7	100%
EPA 415.1/SM5310B/9060A	Total Organic Carbon	RPD ≤25%	10	10	100%
EPA 160.2 / SM2540D	Total Suspended Solids	RPD ≤25%	48	47	98%
EPA 180.1/SM 2130 B	Turbidity	RPD ≤25%	48	47	98%
SM 2540 B	% Solids	RPD ≤25%	2	2	100%
Totals			**1278**	**1265**	**99.0%**

Table 16. Summary of Matrix Spike Recovery Results for 2009 Coalition Monitoring

Method	Analyte	DQO	Number of Analyses	Number Passing	% Success
EPA 350.2 / SM4500-NH3 C	Ammonia, Total as N	90 - 110%	81	81	100%
EPA 8321A	Carbamate Pesticides	[1]	156	156	100%
EPA 547	Glyphosate	80 - 120%	4	4	100%
EPA 130.2 / SM2340B	Hardness as CaCO3	80 - 120%	34	20	59%
EPA 300.0	Nitrate as N	90 - 110%	6	6	100%
EPA 353.2	Nitrate+Nitrite, as N	90 - 110%	72	68	94%
EPA 354.1 / SM4500-NO2 B	Nitrite as N	80 - 110%	6	6	100%
EPA 8270C	Organochlorine and Pyrethroid Pesticides in Sediment	[1]	208	161	77%
EPA 625	Organophosphorus, Organochlorine and Triazine Pesticides	[1]	694	637	92%
EPA 365.2 / SM4500-P E	Orthophosphate/Phosphorus, as P	90 - 110%	84	80	95%
EPA 549.2	Paraquat	50 - 141%	4	4	100%
SM 2540 C	Total Dissolved Solids	90 - 110%	2	2	100%
EPA 351.3 / SM4500-NH3 C	Total Kjeldahl Nitrogen	90 - 110%	56	42	75%
EPA 415.1 / SM5310B	Total Organic Carbon	80 - 120%	82	75	91%
EPA 200.8	Trace Metals	85 - 115%	442	406	92%
Totals			**1931**	**1748**	**91%**

1. Data Quality Objectives for pesticide matrix spike recoveries vary by parameter and are based on 3x the standard deviation of the lab's actual recoveries for each parameter.

Table 17. Summary of Matrix Spike Duplicate Precision Results for 2009 Coalition Monitoring

Method	Analyte	DQO	Number of Pairs Analyzed	Number Passing	% Success
EPA 350.2 / SM4500-NH3 C	Ammonia, Total as N	RPD ≤25%	40	40	100%
EPA 8321A	Carbamate Pesticides	RPD ≤25%	75	75	100%
EPA 547	Glyphosate	RPD ≤25%	2	2	100%
EPA 130.2 / SM2340B	Hardness as CaCO3	RPD ≤25%	17	17	100%
EPA 300.0	Nitrate as N	RPD ≤25%	3	3	100%
EPA 353.2	Nitrate+Nitrite, as N	RPD ≤25%	35	35	100%
EPA 354.1 / SM4500-NO2 B	Nitrite as N	RPD ≤25%	3	3	100%
EPA 8270C	Organochlorine and Pyrethroid Pesticides in Sediment	RPD ≤25%	104	102	98%
EPA 625	Organophosphorus, Organochlorine and Triazine Pesticides	RPD ≤25%	347	331	95%
EPA 365.2 / SM4500-P E	Orthophosphate/Phosphate, as P	RPD ≤25%	56	56	100%
EPA 549.2	Paraquat	RPD ≤25%	2	2	100%
SM 4500-P E	Phosphorus as P, Total	RPD ≤25%	16	15	94%
EPA 351.3 / SM4500-NH3 C	Total Kjeldahl Nitrogen	RPD ≤25%	47	42	89%
EPA 415.1 / SM5310B	Total Organic Carbon	RPD ≤25%	68	68	100%
EPA 200.8	Trace Metals	RPD ≤25%	221	221	100%
Totals			**1036**	**1012**	**98%**

TABULATED RESULTS OF LABORATORY ANALYSES

Copies of final laboratory reports, including chromatographs for pesticide analyses, and all reported QA data for Coalition monitoring results are provided in **Appendix B**. The tabulated results for all validated and Quality Assurance-evaluated (QA) data are provided in **Appendix C**. These data were submitted previously with the quarterly data submittals.

Data Interpretation

SUMMARY OF SAMPLING CONDITIONS

Samples were collected throughout the year for the Coalition (see **Table 8** and **Table 9**, Sampling for 2009 Coalition Monitoring). Sample collection for the December 2008 – March 2009 Coalition Storm Season was characterized by above-average precipitation during the month of February and below-average precipitation during the months of December, January, and March.[2] Sample collection for the April 2009 – September 2009 Coalition Irrigation Season was characterized by predominantly dry weather with mean temperatures mostly higher than historical temperatures.

The 2009 Water Year (October – September) was classified as a "Dry" year by the Department of Water Resources, and was the third year in a row with below average precipitation and runoff for the Sacramento Valley. The 2009 irrigation season was delayed in some valley regions due to significant precipitation in late April and early May 2009. The region is currently considered to be in a severe drought condition. Regional precipitation patterns for December 2008 – September 2009 are illustrated in **Figures 3-a** through **3-e**. Storm flows through the watershed exhibited typical wet season variability during the storm season (**Figures 4 a-f**), and samples were successfully collected to characterize a wide range of hydrological conditions.

Table 18. Summary of Climate Data at Sacramento Executive Airport, December 2008 – September 2009

Month	Departure from Normal Mean Temperature	Days with Maximum Temperature ≥ 90°F	Precipitation Total (Inches)
December 2008	-1.8	0	1.53
January 2009	1.1	0	1.41
February 2009	-0.4	0	5.07
March 2009	-0.1	0	2.09
April 2009	0.6	4	1.46
May 2009	3.2	8	1.01
June 2009	-0.3	10	0.56
July 2009	0	19	Trace Amount
August 2009	0.2	18	0
September 2009	3.1	20	0.14

Based on climate data available for the Sacramento Executive Airport weather station[3] there was moderate rainfall during the 2009 irrigation season (**Table 18**). No precipitation occurred in July and August. Precipitation during the months of January, March, July, August, and September was below normal. The maximum temperature exceeded 90 degrees Fahrenheit on four days in

[2] Climate data (general trends) for the Sacramento-Delta region available at: http://www.wrcc.dri.edu/monitor/cal-mon/frames_version.html

[3] Climate data (temperature and precipitation) for Sacramento Executive Airport available at: http://www.weather.gov/climate/index.php?wfo=sto

April, eight days in May, 10 days in June, 19 days in July, 18 days in August, and 20 days in September. The average maximum temperatures at the Sacramento Executive Airport were 72.9, 83.9, 87.4, 92.6, 91.6, and 91.4 degrees Fahrenheit, respectively.

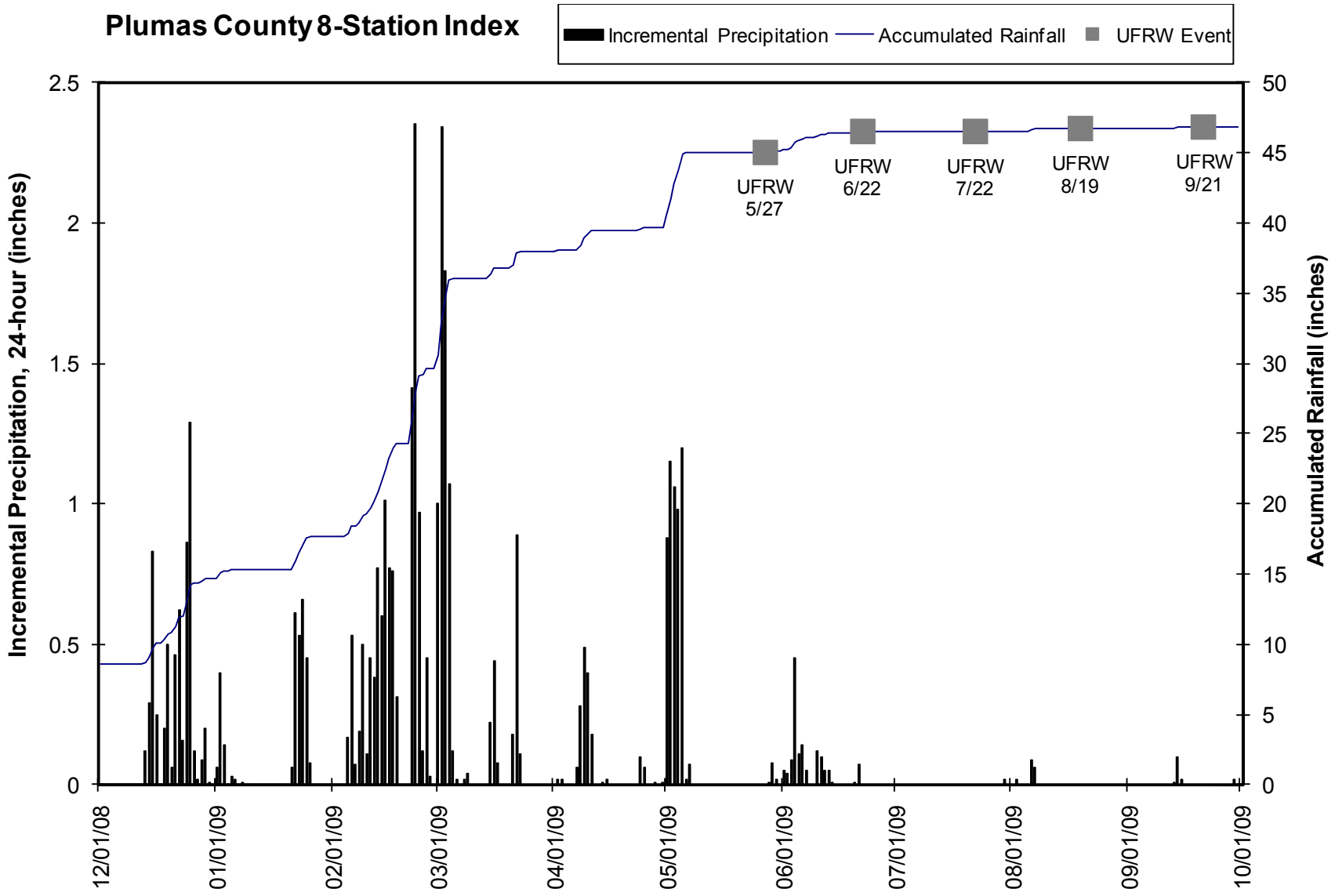

Figure 3-a. Precipitation during December 2008 – September 2009 Coalition Monitoring: Plumas County

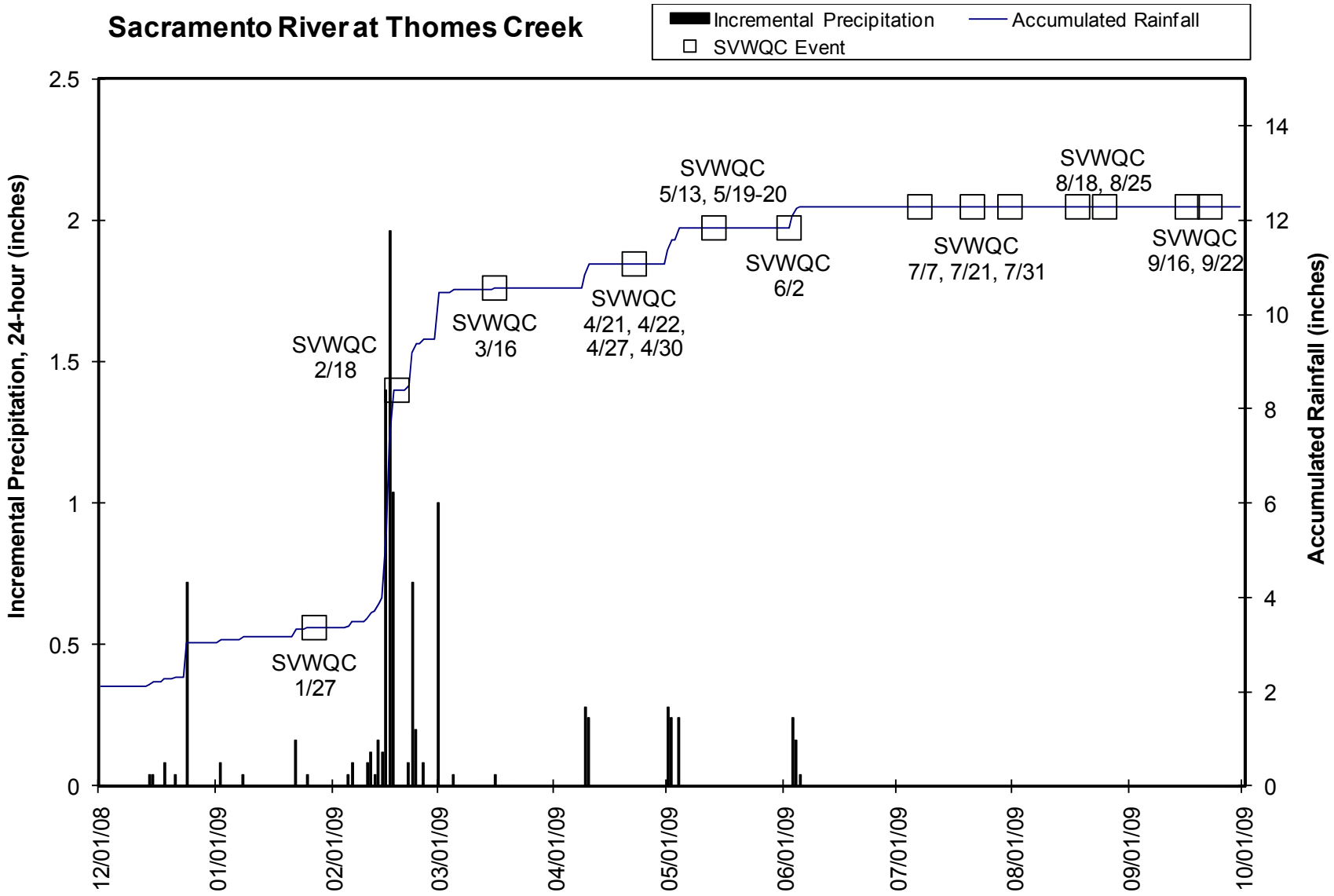

Figure 3-b. Precipitation during December 2008 – September 2009 Coalition Monitoring: Upper Sacramento Valley

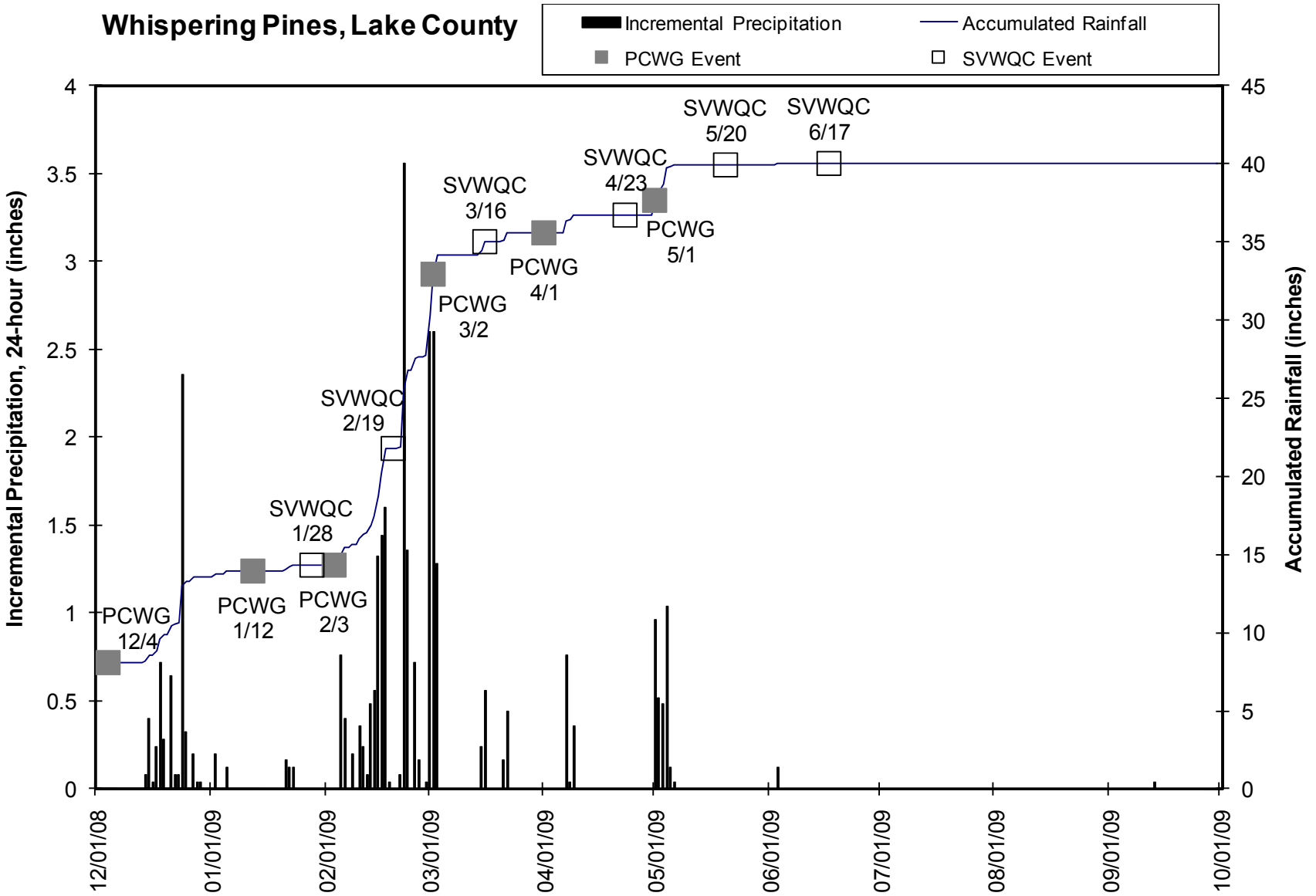

Figure 3-c. Precipitation during December 2008 – September 2009 Coalition Monitoring: Lake County

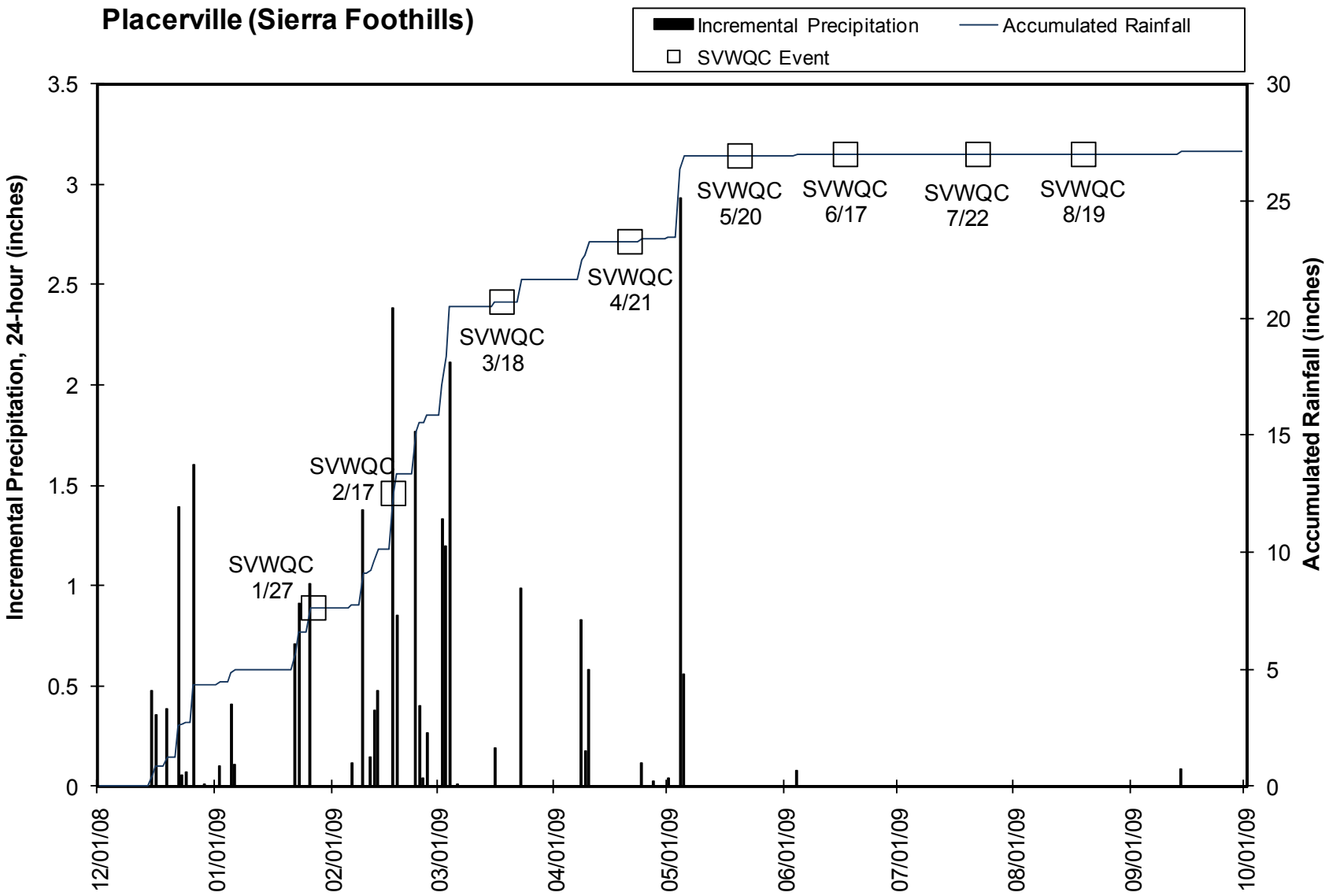

Figure 3-d. Precipitation during December 2008 – September 2009 Coalition Monitoring: Sierra Foothills

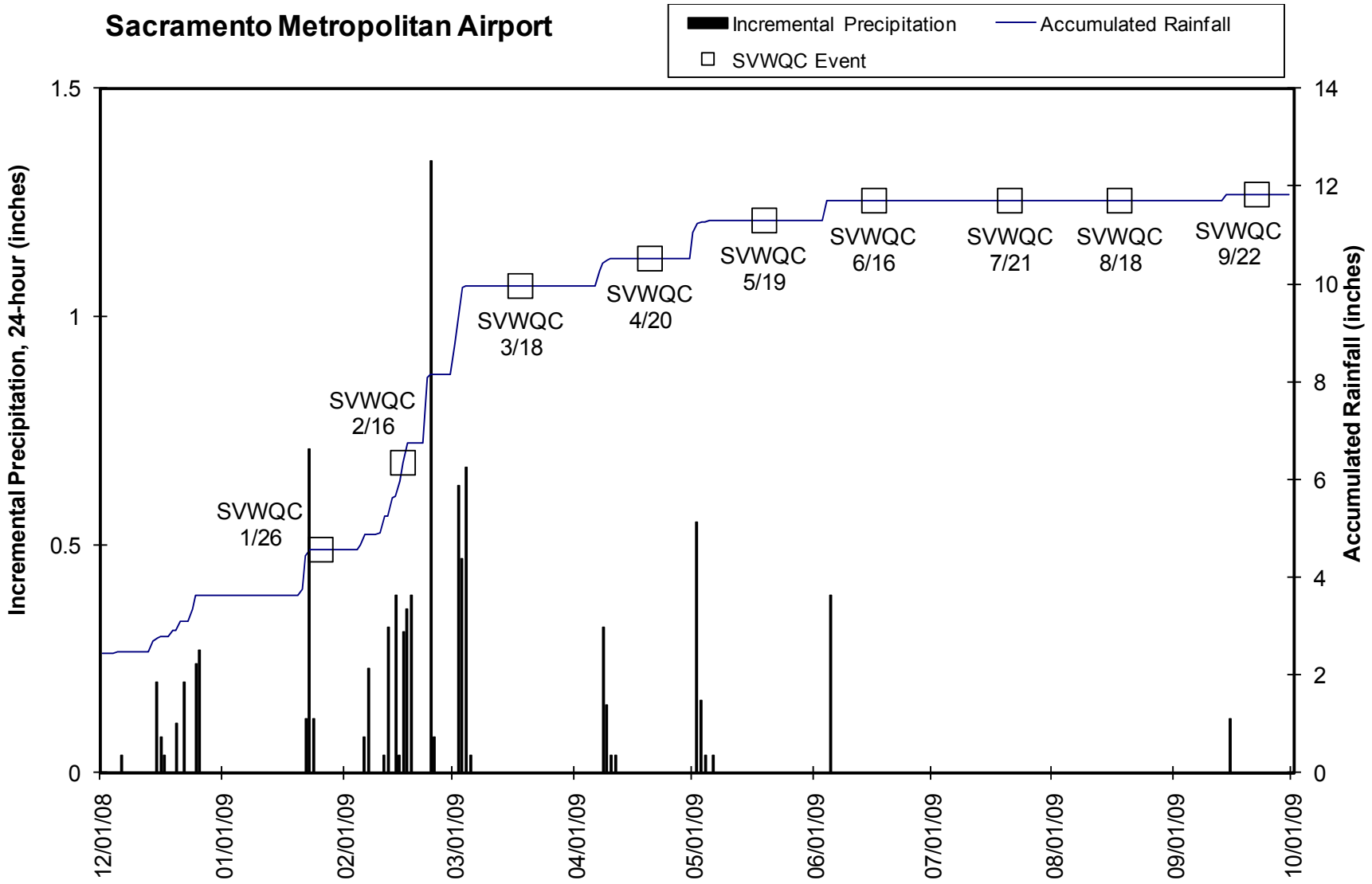

Figure 3-e. Precipitation during December 2008 – September 2009 Coalition Monitoring: Lower Sacramento Valley

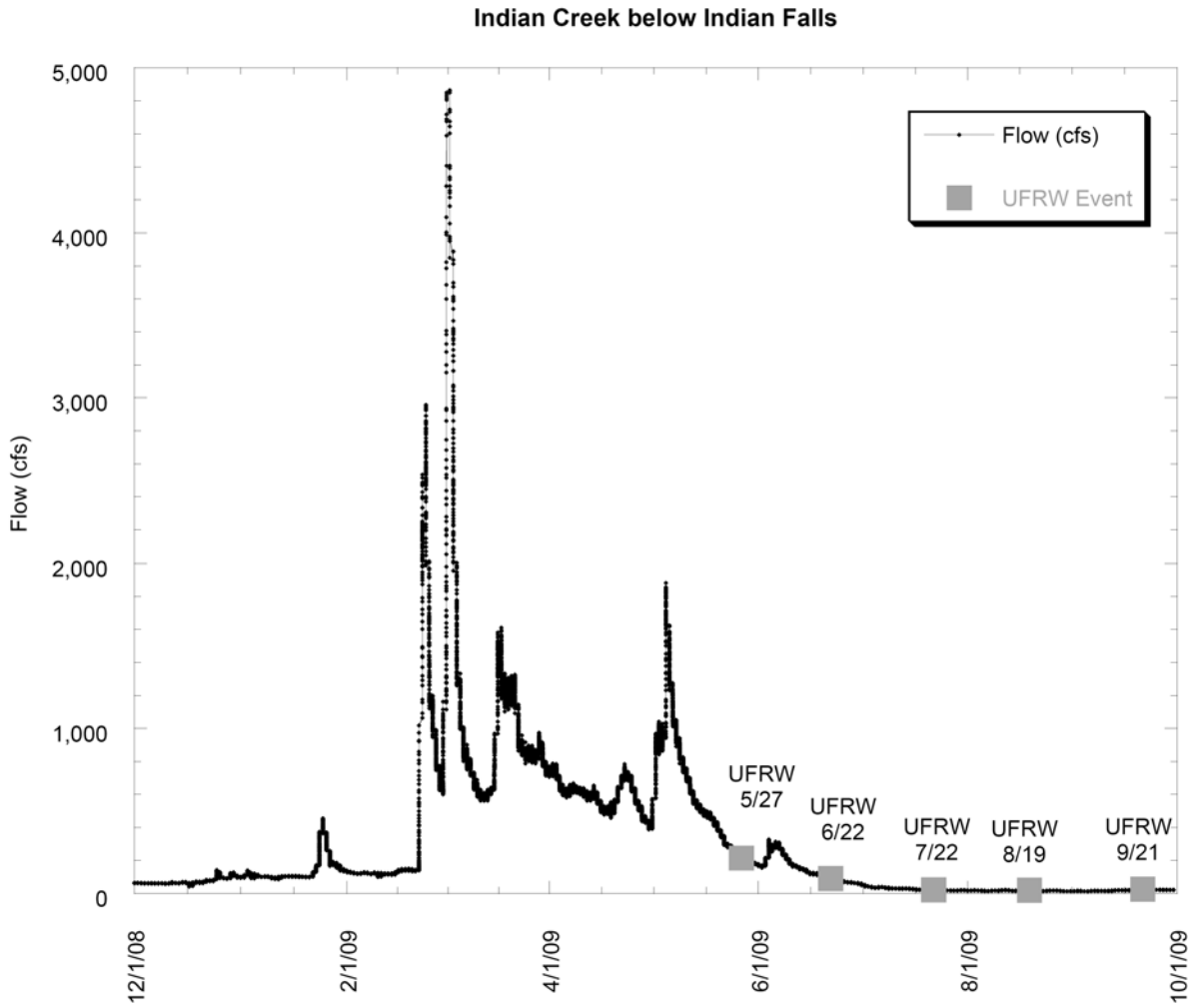

Figure 4-a. Flows during December 2008 – September 2009 Coalition Monitoring: Plumas County

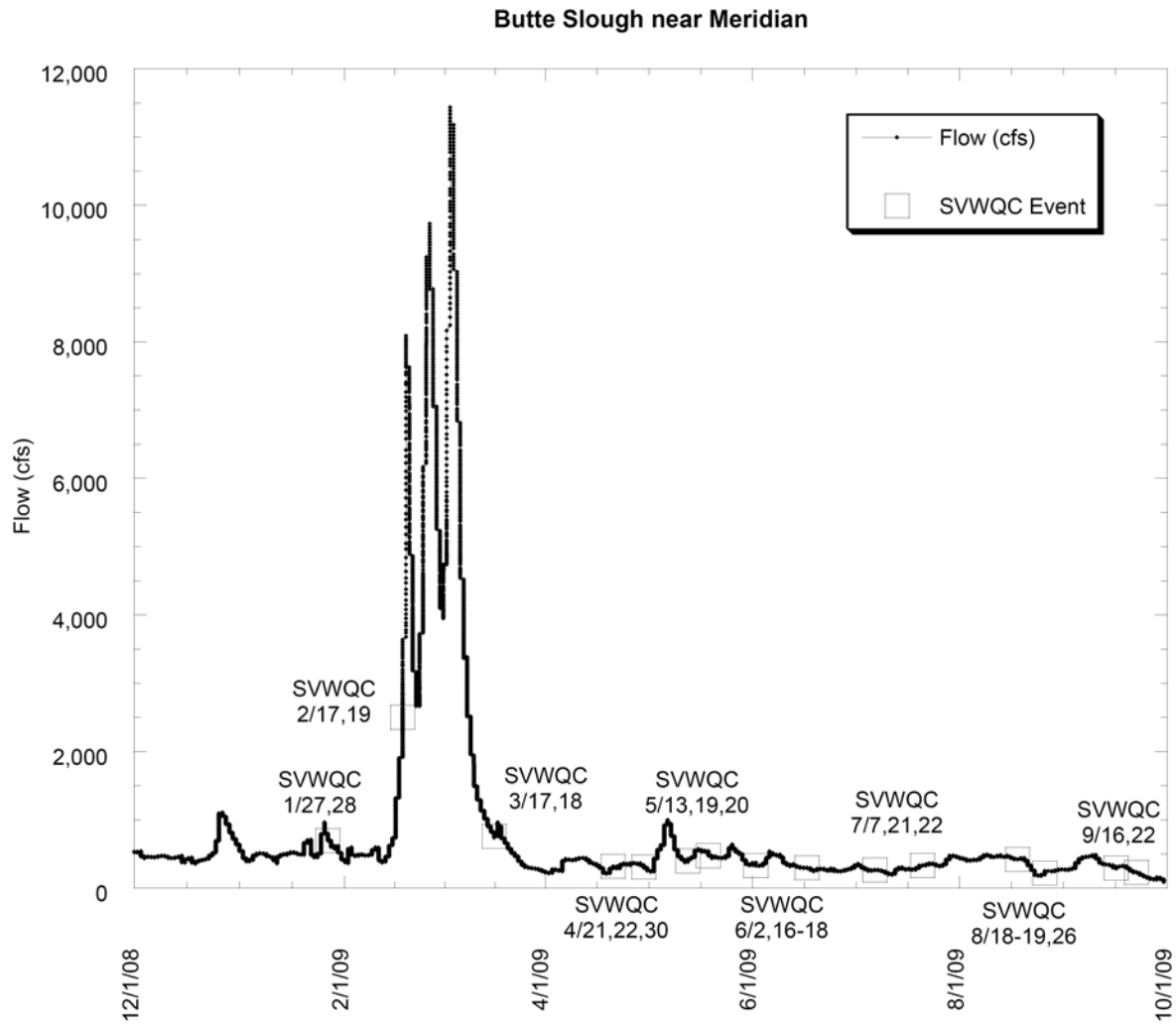

Figure 4-b. Flows during December 2008 – September 2009 Coalition Monitoring: East Sacramento Valley

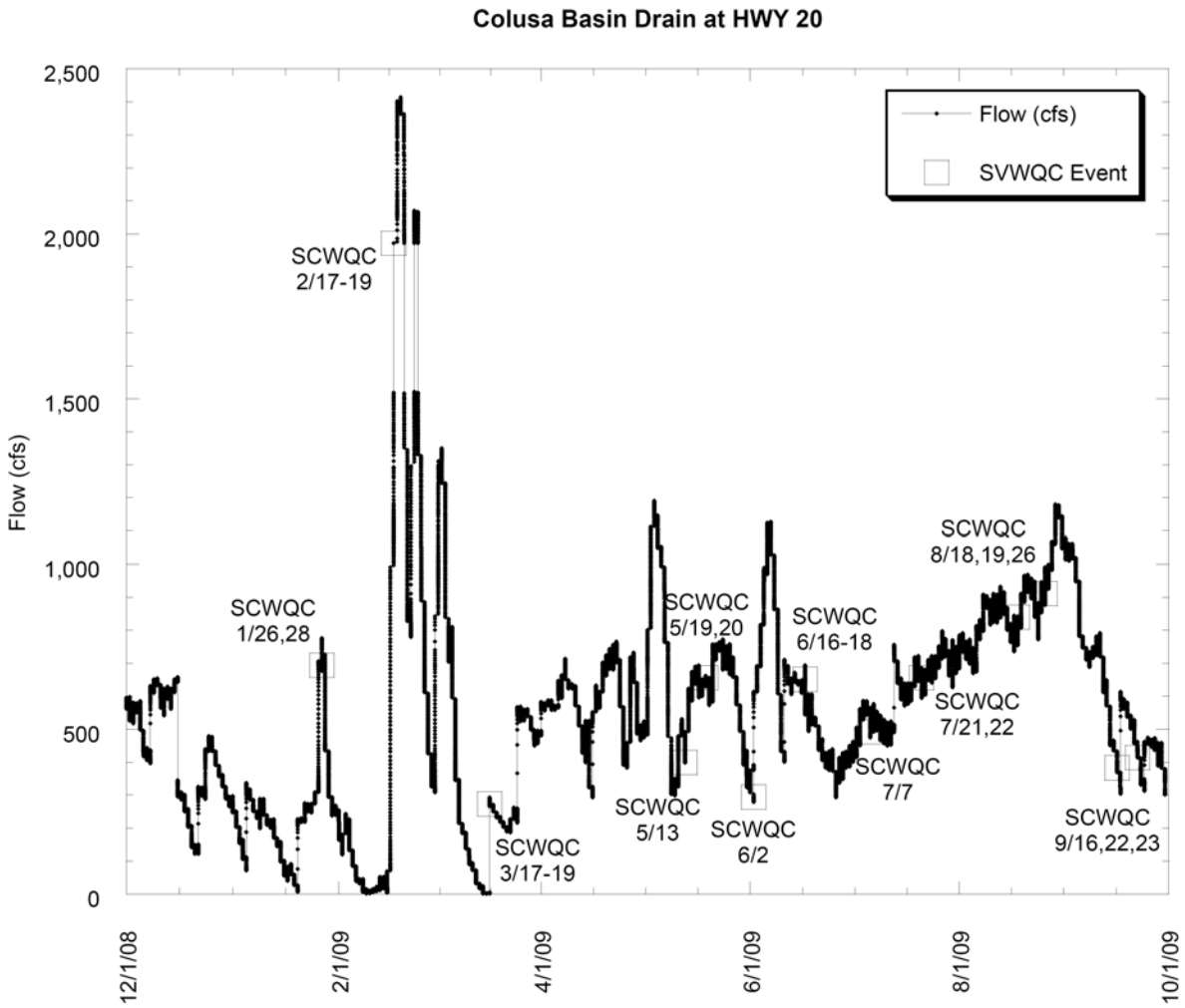

Figure 4-c. Flows during December 2008 – September 2009 Coalition Monitoring: West Sacramento Valley

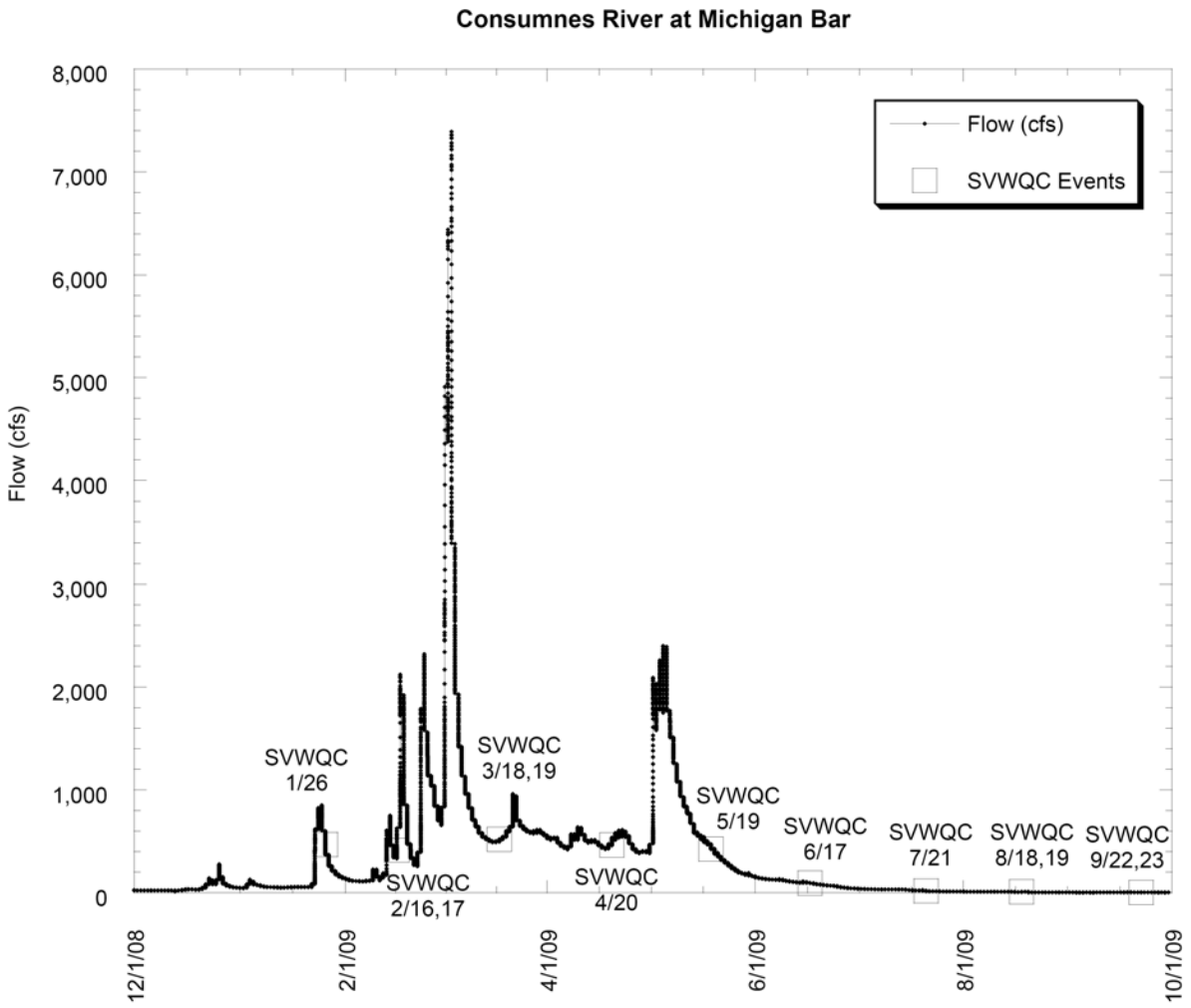

Figure 4-d. Flows during December 2008 – September 2009 Coalition Monitoring: Lower Sacramento Valley

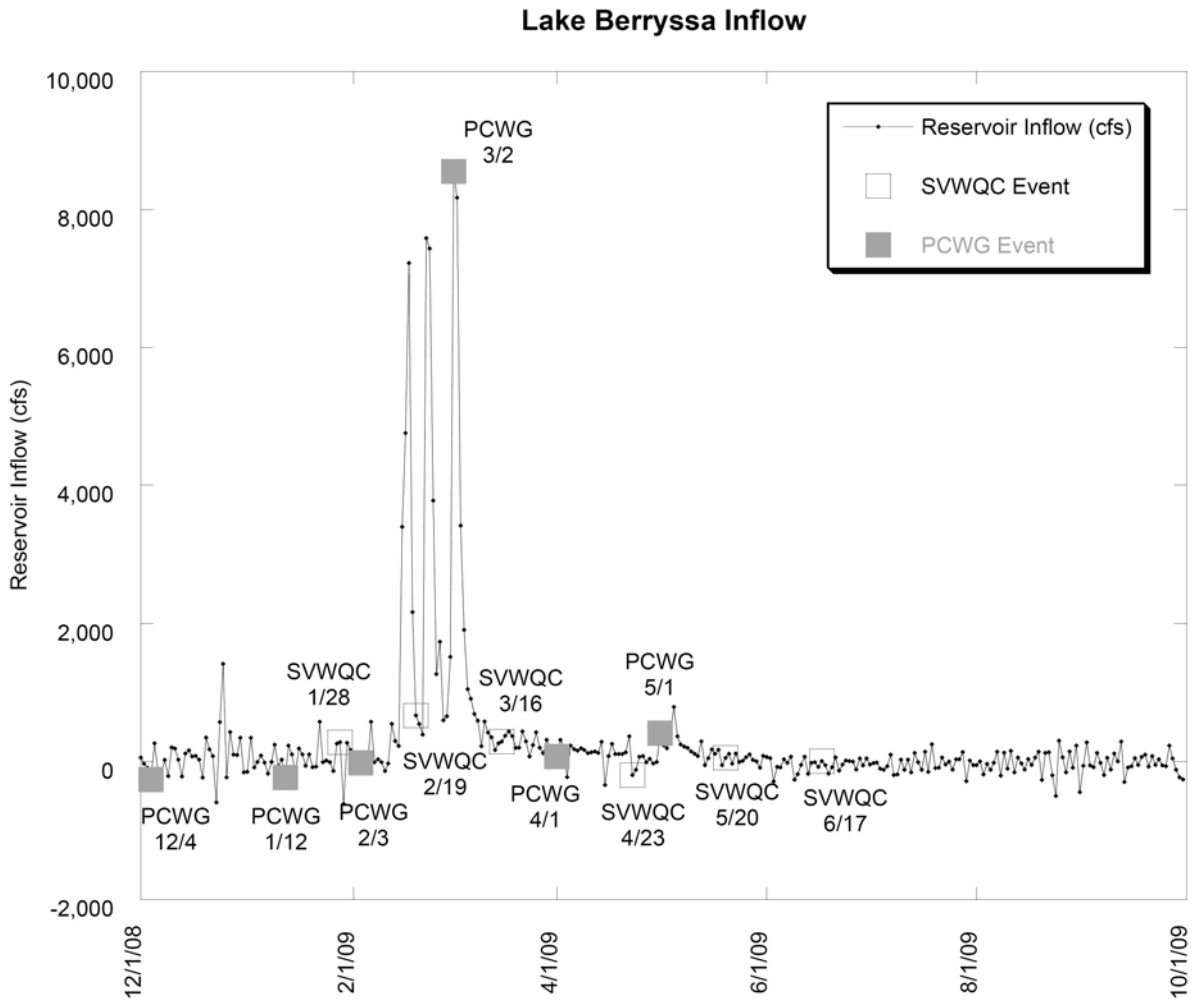

Figure 4-e. Flows during December 2008 – September 2009 Coalition Monitoring: Lake Berryessa (Reservoir Inflow)

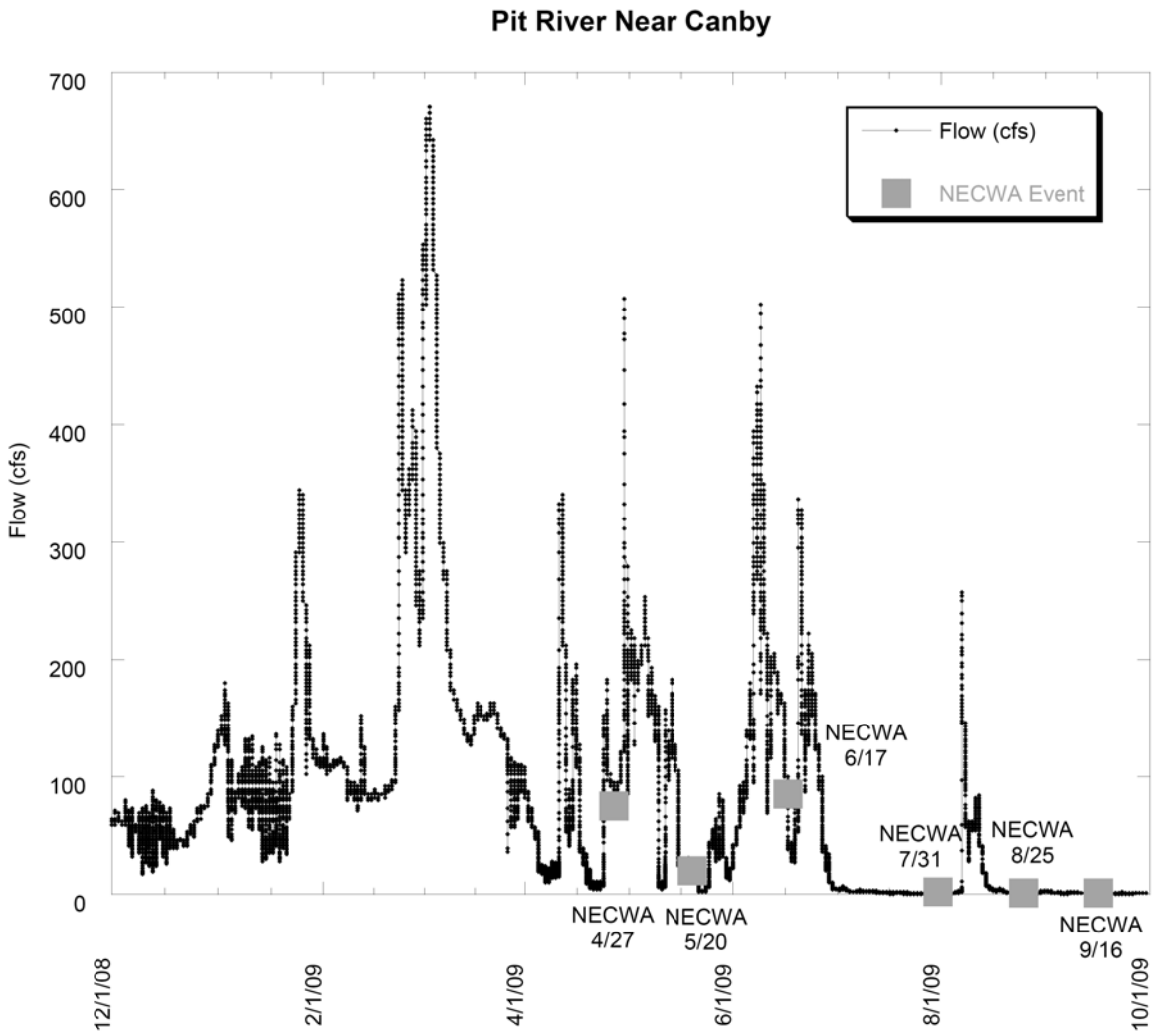

Figure 4-f. Flows during December 2008 – September 2009 Coalition Monitoring: Pit River near Canby

ASSESSMENT OF DATA QUALITY OBJECTIVES

The QC data for the Coalition's monitoring program have been evaluated and discussed previously in this document (Quality Assurance Results, beginning **page 26**). Based on these evaluations, the program data quality objectives of completeness, representativeness, precision, and accuracy of monitoring data have largely been achieved. These results indicate that the data collected are valid and adequate to support the objectives of the monitoring program, and demonstrate compliance with the requirements of the *ILRP*. The results of these evaluations were summarized previously in **Table 10** through **Table 17**.

EXCEEDANCES OF RELEVANT WATER QUALITY OBJECTIVES

Coalition and subwatershed monitoring data were compared to *ILRP* Trigger Limits. Generally, these trigger limits are based on applicable narrative and numeric water quality objectives in the Central Valley Basin Plan (CVRWQCB 1995), subsequent adopted amendments, the California Toxics Rule (USEPA 2000), and numeric interpretations of the Basin Plan narrative objectives. Observed exceedances of the ILRP trigger limits are the focus of this discussion.

Other relevant non-regulatory toxicity thresholds were also considered for the purpose of identifying potential causes of observed toxicity. It should be noted that these unadopted non-regulatory toxicity thresholds are not appropriate criteria for determining exceedances for the purpose of the Coalition's monitoring program and evaluating compliance with the *ILRP***.** The additional toxicity thresholds were acquired from USEPA's Office of Pesticide Programs (OPP) Ecotoxicity database (USEPA 2007).

Water quality objectives and other relevant water quality thresholds discussed in this section are summarized in **Table 19** and **Table 20**. Monitored analytes without relevant water quality objectives or trigger limits are listed in **Table 21**.

The data evaluated for exceedances in this document include all Coalition collected results, as well as the compiled results from the Subwatershed monitoring programs presented in this report. The results of these evaluations are discussed below.

Table 19. Adopted Basin Plan and California Toxics Rule Objectives for Analytes Monitored for 2009 Coalition Monitoring

Analyte	Most Stringent Objective[1]	Units	Objective Source[2]
Ammonia, Total as N	narrative	mg/L	Basin Plan
Arsenic, dissolved	150	ug/L	CTR
Arsenic, total	50	ug/L	CA 1˚ MCL
Atrazine	1	ug/L	CA 1˚ MCL
Cadmium, dissolved	hardness dependent[4]	ug/L	CTR
Carbofuran	0.4	ug/L	Basin Plan
Chlorpyrifos	0.015	ug/L	Basin Plan
Color	15[3]	CU	CA 1˚ MCL
Copper, dissolved	hardness dependent[4]	ug/L	CTR
DDD (o,p' and p,p')	0.00083	ug/L	CTR
DDE (o,p' and p,p')	0.00059	ug/L	CTR
DDT (o,p' and p,p')	0.00059	ug/L	CTR
Diazinon	0.10	ug/L	Basin Plan
Dieldrin	0.00014	ug/L	CTR
Dissolved Oxygen	5	mg/L	Basin Plan
Endrin	0.036	ug/L	CTR
Fecal coliform	400	MPN/100mL	Basin Plan
Glyphosate	700	ug/L	CA 1˚ MCL
Lead, dissolved	hardness dependent[4]	ug/L	CTR
Malathion	ND[5] (0.1)	ug/L	Basin Plan
Methoxychlor	30	ug/L	CA 1˚ MCL
Molinate	ND[5] (10)	ug/L	Basin Plan
Nickel, dissolved	hardness dependent[4]	ug/L	CTR
Nitrate, as N	10	mg/L	CA 1˚ MCL
Oxamyl	200	ug/L	CA 1˚ MCL
Parathion, Methyl	ND[5] (0.13)	ug/L	Basin Plan
pH	6.5-8.5	-log[H+]	Basin Plan
Selenium, total	5	ug/L	Basin Plan
Simazine	4	ug/L	CA 1˚ MCL
Temperature	narrative	ug/L	Basin Plan
Thiobencarb	ND[5] (1)	ug/L	Basin Plan
Total Suspended Solids	narrative	mg/L	Basin Plan
Toxicity, Algae Cell Density	narrative	ug/L	Basin Plan
Toxicity, Fathead Minnow Survival	narrative	ug/L	Basin Plan
Toxicity, Water Flea Survival	narrative	ug/L	Basin Plan
Turbidity	narrative	ug/L	Basin Plan
Zinc, dissolved	hardness dependent[4]	ug/L	CTR

Notes:
1. For analytes with more than one limit, the most limiting applicable adopted water quality objective is listed.
2. *CA 1˚ MCLs* are California's Maximum Contaminant Levels for treated drinking water; *CTR* = California Toxics Rule criteria.
3. Applies only to treated drinking water.
4. Objective varies with the hardness of the water.
5. Discharge prohibition is interpreted as Not Detected (ND). Value in parentheses is Basin Plan performance goal.

Table 20. Unadopted Water Quality Limits Used to Interpret Narrative Water Quality Objectives for Analytes Monitored for 2009 Coalition Monitoring

Analyte	Unadopted Limit[1]	Units	Limit Source
Azinphos methyl	0.01	µg/L	USEPA National Recommended Water Quality Criteria
Boron, total	700	ug/L	Ayers and Westcott 1988
Boron, total	700	µg/L	Ayers and Westcott 1988
Carbaryl	2.53	µg/L	California Department of Fish and Game
Conductivity	900	uS/cm	CA Recommended 2° MCL
Conductivity	700	uS/cm	Ayers and Westcott 1988
Cyanazine	1	µg/L	USEPA Health Advisory
Dichlorvos	0.085	µg/L	Californai EPA One-in-a-Million Cancer Risk Estimate
Dimethoate	1	µg/L	California Dept of Public Health Notification Level
Disulfoton	0.05	µg/L	USEPA National Recommended Water Quality Criteria
Diuron	2	µg/L	USEPA Health Advisory
E. coli (1)	235	MPN/100 ml	Basin Plan Amendment
Linuron	1.4	µg/L	USEPA IRIS Reference Dose
Methamidophos	0.35	µg/L	USEPA IRIS Reference Dose
Methidathion	0.7	µg/L	USEPA IRIS Reference Dose
Methiocarb	0.5	µg/L	Johnson and Finley.1980, Handbook of Acute Toxicity of Chemicals to Fish and Aquatic Invertebrates. United States Department of the Interior Fish And Wildlife Service, Resource Publication 137. Washington.D.C. 1980
Methomyl	0.52	µg/L	California Department of Fish and Game
Molybdenum	10	µg/L	Ayers and Westcott 1988
Paraquat	3.2	µg/L	USEPA IRIS Reference Dose
Phorate	0.7	µg/L	USEPA IRIS Reference Dose
Phosmet	140	µg/L	USEPA IRIS Reference Dose
Total Dissolved Solids	500	mg/L	CA Recommended 2° MCL
Total Dissolved Solids	450	mg/L	Ayers and Westcott 1988
Trifluralin	5	µg/L	USEPA IRIS One-in-a-Million Cancer Risk Estimate

Note:
1. Adopted by the Water Board but not approved by State Water Resources Control Board

Table 21. Analytes Monitored for 2009 Coalition Monitoring without Applicable Adopted or Unadopted Limits

Analytes	
Alkalinity	Oryzalin
Bromacil	Phosphorus as P, Total
Discharge	Total Kjeldahl Nitrogen
Hardness	Total Organic Carbon
Orthophosphate, dissolved as P	

Toxicity and Pesticide Results

Statistically significant toxicity was observed in five Coalition water quality samples collected from five different sites during 2009 Coalition Monitoring. Significant toxicity to the algae *Selenastrum* was observed in four samples from four sites, and one sample exhibited significant sediment toxicity to *Hyalella*. Samples exhibiting statistically significant toxicity are summarized in **Table 22**. Significant toxicity to *Ceriodaphnia* or fathead minnows (*Pimephales*) was not observed in any samples. The observations of toxicity to *Selenastrum* and *Hyalella* were considered exceedances of the Basin Plan narrative objective for toxicity ("*All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life*.").

All statistically significant results for samples collected during the Coalition Irrigation Season monitoring were reported to the Water Board by the Coalition in "Exceedance Reports" as required by the *ILRP* and the Coalition's MRPP. The Exceedance Reports detailing these results are provided in **Appendix D**. The results of these reports and of the follow-up testing conducted on the samples are summarized by event below.

Event 036, February 2009

Ulatis Creek at Brown Road (UCBRD)

In toxicity tests conducted with *Selenastrum*, the Coalition observed reductions in cell density of 43% compared to the control. In the UCBRD sample, diuron was detected at a concentration that explained the observed *Selenastrum* toxicity (9.7 ug/L; *Selenastrum* four-day EC50 = 2.4 ug/L).

In the UCBRD drainage, 53 different pesticides (i.e., active ingredients) were applied in the month prior to sampling. There were 19 diuron applications to approximately 222 acres reported in the month prior to sampling. Based on the pesticide analyses and application data, it was concluded that diuron was the specific cause of the toxicity identified in the UCBRD sample.

Willow Slough Bypass at Pole Line Road (WSLPL)

In toxicity tests conducted with *Selenastrum*, the Coalition observed reductions in cell density of 47% compared to the control. There were no herbicide results available for this WSLPL sample. Diuron has been indicated in previous algae toxicity exceedances observed at this time of year at this site.

In the WSLPL drainage, 54 different pesticides (i.e., active ingredients) were applied in the WSLPL drainage in the month prior to sampling. There were 10 diuron applications to approximately 523 acres reported in the month prior to sampling. Based on the application data and on previous monitoring results, diuron is a probable cause or contributor of toxicity in the WSLPL sample.

Event 039, May 2009

Colusa Basin Drain above Knight's Landing (COLDR)

In toxicity tests conducted with *Selenastrum*, the Coalition observed reductions in cell density of 15.8% compared to the control. Monitoring conducted for the *California Rice Commission Algae Aquatic Toxicity Management Plan* did not detect any herbicides or copper at concentrations

expected to be toxic to *Selenastrum*. Copper concentrations did not exceed the hardness-adjusted CTR criterion. The only detected herbicide was clomazone. (2.8 ug/L; *Selenastrum* four-day EC50 = 3500 ug/L). Other monitored herbicides were carfentrazone ethyl, glyphosate, pendimethalin, penoxsulam, and triclopyr.

In the COLDR sample, no additional follow-up or review of pesticide applications for possible causes of toxicity was conducted. These evaluations are conducted when mortality or reductions in cell density are ≥20% compared to control.

Sacramento Slough Bridge near Karnak (SSKNK)

In toxicity tests conducted with *Selenastrum*, the Coalition observed reductions in cell density of 11.8% compared to the control. Monitoring conducted for the *California Rice Commission Algae Aquatic Toxicity Management Plan* did not detect any herbicides or copper at concentrations expected to be toxic to *Selenastrum*. Copper concentrations did not exceed the hardness-adjusted CTR criterion. The only detected herbicide was clomazone. (1.7 ug/L; *Selenastrum* four-day EC50 = 3500 ug/L). Other monitored herbicides were carfentrazone ethyl, glyphosate, pendimethalin, penoxsulam, and triclopyr.

In the SSKNK sample, no additional follow-up or review of pesticide applications for possible causes of toxicity was conducted. These evaluations are conducted when mortality or reductions in cell density are ≥20% compared to control.

Event 042, August 2009

Z-Drain – Dixon RCD (ZDDIX)

In sediment toxicity tests conducted with *Hyalella*, the Coalition observed reductions in survival of 97.4% compared to the control. In the ZDDIX sediment sample, concentrations of pyrethroids were present that explained the observed *Hyalella* toxicity. Based on the published LC50 data for Hyalella (Amweg et al., 2005), concentrations of esfenvalerate (0.94 µg/g organic carbon; 10-day Hyalella LC50 = 0.89 µg/g organic carbon) accounted for approximately 1.1 Toxic Units, and bifenthrin, fenvalerate, and L-cyhalothrin accounted for approximately 1.0 additional Toxic Units. Cypermethrin was also detected at concentrations that did not contribute significantly to toxicity (<0.05 Toxic Units).

In the ZDDIX drainage (including acreage in both Solano and Yolo Counties), 50 different pesticides (i.e., active ingredients) were applied in the month prior to sampling. There were 47 pyrethroid applications (including esfenvalerate, lambda-cyhalothrin, and bifenthrin) to approximately 2,547 acres reported in the month prior to sampling. Based on these evaluations, it was concluded that pyrethroid pesticides were the cause of toxicity in this sample.

Table 22. Summary of Water Column Samples Exceeding the Basin Plan Narrative Toxicity Objective in 2009 Coalition Monitoring

Site	Date	Species	% of Control
Willow Slough Bypass at Pole Line Road	2/16/2009	*Selenastrum* Cell Density	53%
Ulatis Creek at Brown Road	2/16/2009	*Selenastrum* Cell Density	57%
Colusa Basin Drain above KL	5/14/2009	*Selenastrum* Cell Density	84.20%
Sacramento Slough Bridge near Karnak	5/14/2009	*Selenastrum* Cell Density	88.20%
Z Drain	8/18/2009	*Hyalella azteca* Survival	2.60%

Pesticides Detected in Coalition Monitoring

Pesticides were analyzed in 95 individual water column samples collected from 12 different sites during 2009 Coalition Monitoring.

Analyses were conducted for organophosphates, carbamates, organochlorines, triazines, pyrethroids, trifluralin, glyphosate, and paraquat. Within these categories, nine different pesticides were detected in 25 separate samples (out of 95 individual samples) collected for Coalition monitoring. Legacy organochlorines were not detected in any samples. There were a total of six pesticide exceedances of water quality objectives: all of these were for registered pesticides.

It should be noted that detected pesticides are not equivalent to exceedances. Four registered pesticides (chlorpyrifos, diazinon, diuron, and malathion) exceeded applicable water quality objectives or *Trigger Limits* in a total of five 2009 Coalition Monitoring samples. In only one case was a pesticide detected at concentrations with the potential to cause toxicity to sensitive test species actually associated with significant toxicity (diuron and *Selenastrum* toxicity at UCBRD on 2/16/2009).

All detected pesticide concentrations for 2009 Coalition Monitoring are summarized in **Table 23**. Pesticides were compared to relevant numeric and narrative water quality objectives, and to toxicity threshold concentrations published in USEPA's *ECOTOX Database (USEPA 2007)*.

- The herbicide bromacil was detected in one sample at Ulatis Creek (0.2 µg/L) below the QL and well below the 5-day *Selenastrum* EC50 of 6.8 µg/L.
- The insecticide chlorpyrifos was detected in three samples from two different sites. Chlorpyrifos exceeded the Basin Plan Amendment objective (0.015 ug/L) in one sample at Walker Creek. There was no toxicity associated with this sample; *Ceriodaphnia* survival was 95%. Chlorpyrifos was applied in the Walker Creek drainage in the month prior to sampling; approximately 3,044 acres were treated with chlorpyrifos.
- The insecticide diazinon was detected in four samples from three different sites. One detected concentration at Gilsizer Slough exceeded the Basin Plan Amendment objective of 0.10 ug/L. Toxicity was not tested at this site for this event. Diazinon was applied in the Gilsizer Slough drainage in the month prior to sampling; approximately 2,867 acres were treated with diazinon.

- The herbicide diuron was detected in four samples from three different sites. One detected concentration at Ulatis Creek exceeded the ILRP *Trigger Limit* (2 ug/L) as well as levels with the potential to cause adverse effects to *Selanastrum* (2.4 ug/L); this exceedance was associated with *Selenastrum* toxicity in a sample collected at Ulatis Creek at Brown Road on 2/16/2009. Diuron was applied in the Ulatis Creek drainage in the month prior to sampling; approximately 222 acres were treated with diuron.
- Malathion was detected in three samples from two sites. Detection of malathion is an exceedance of the Basin Plan prohibition if not used on rice. Toxicity was not tested at these sites for these events. However, malathion is not likely to be toxic to *Ceriodaphnia* at the detected concentrations. The *Ceriodaphia* two-day EC50 is 0.5 – 3.4 ug/L and detected concentrations were less 0.05 µg/L. Malathion was applied in the Gilsizer Slough drainage in the month prior to sampling; approximately 2,853 acres of alfalfa were treated with malathion.
- The insecticide methidathion was detected in one sample (Gilsizer Slough) but was not an exceedance of the ILRP *Trigger Limit* (0.7 ug/L). Toxicity was not tested at this site for this event. However, methidathion is not likely to be toxic to *Ceriodaphnia* at the detected concentration (0.054 µg/L), which was well below the range of *Daphnia magna* two-day EC50s of 6.4 – 11.9 ug/L.
- The herbicide oryzalin was detected in two samples from two sites. There was no toxicity associated with either sample, and oryzalin is not likely to be toxic to *Selenastrum* at the detected concentrations (*Selenastrum* five-day EC50 = 42 ug/L).
- The insecticide phosmet was detected in one sample (Gilsizer Slough) but was not an exceedance of the ILRP *Trigger Limit* (140 ug/L). Phosmet is not likely to be toxic to *Ceriodaphnia* at the detected concentration (*Daphnia magna* two-day EC50 = 5.6 – 24 ug/L; no *Ceriodaphnia* LC50 data in ECOTOX database).
- The herbicide simazine was the most common of the pesticides detected (in six samples from two different sites). Simazine did not exceed the California 1˚ MCL of 4 ug/L in any samples and was not likely to be toxic to *Selenastrum* at the detected concentrations (*Selenastrum* four-day EC50 = 100 ug/L). There was no *Selenastrum* toxicity associated with these samples, and *Selenastrum* growth for each of the associated toxicity tests was greater than 100% of the control.

Table 23. Pesticides Detected in 2009 Coalition Monitoring

Site ID	Date Sampled	Analyte	Result[1] (µg/L)		Trigger Limit[2]	Basis for Limit[3]
UCBRD	2/16/2009	Bromacil	DNQ	0.2	NA	NA
PNCGR	6/18/2009	Chlorpyrifos	=	0.0132	0.015	BPA
WLKCH	6/18/2009	Chlorpyrifos	=	0.0137	0.015	BPA
WLKCH	**7/22/2009**	**Chlorpyrifos**	**=**	**0.0217**	**0.015**	**BPA**
WLSPL	1/26/2009	Diazinon	=	0.0071	0.1	**BPA**
GILSL	**1/27/2009**	**Diazinon**	**=**	**0.6007**	**0.1**	**BPA**
LHNCT	1/27/2009	Diazinon	=	0.0103	0.1	**BPA**
GILSL	2/18/2009	Diazinon	=	0.0931	0.1	**BPA**
UCBRD	**2/16/2009**	**Diuron**	**=**	**9.7**	**2**	**Narrative**
WLKCH	2/19/2009	Diuron	=	0.87	2	Narrative
WLKCH	5/20/2009	Diuron	DNQ	0.25	2	Narrative
LHNCT	6/16/2009	Diuron	DNQ	0.27	2	Narrative
GILSL	**1/27/2009**	**Malathion**	**=**	**0.0123**	**ND[4]**	**BP**
GILSL	**2/18/2009**	**Malathion**	**=**	**0.0398**	**ND[4]**	**BP**
WLSPL[5]	**3/19/2009**	**Malathion**	**=**	**0.0373**	**ND[4]**	**BP**
GILSL	2/18/2009	Methidathion	=	0.054	0.7	**Narrative**
UCBRD	2/16/2009	Oryzalin	=	1.8	NA	NA
WLKCH	2/19/2009	Oryzalin	=	2.2	NA	NA
GILSL	1/27/2009	Phosmet	=	0.375	140	**Narrative**
LHNCT	1/27/2009	Simazine	=	0.0103	4	CA 1° MCL
LHNCT	2/18/2009	Simazine	=	0.0457	4	CA 1° MCL
WLKCH	2/19/2009	Simazine	=	0.3282	4	CA 1° MCL
WLKCH	3/17/2009	Simazine	DNQ	0.0076	4	CA 1° MCL
WLKCH	4/22/2009	Simazine	DNQ	0.0068	4	CA 1° MCL
WLKCH	5/20/2009	Simazine	=	0.0101	4	CA 1° MCL

BOLD = Exceedance

1. "DNQ" (Detected Not Quantified) indicates that the detected value was greater than the method detection limit (MDL) but less than the quantitation or reporting limit (QL)
2. Water Quality Objective or Narrative Interpretation Limits for ILRP.
3. Water Quality Objective Basis: BP = Central Valley Basin Plan; BPA = Basin Plan Amendment; CTR = California Toxics Rule; Narrative = unadopted limits used to interpret Basin Plan narrative objectives by the Central Valley Regional Board.
4. The Basin Plan states: "…discharge is prohibited unless the discharger is following a management practice approved by the Board." This has been interpreted as an ILRP Trigger Limit of ND (*Not Detected*). The Basin Plan performance goal for malathion is 0.1 ug/L.
5. This environmental sample was a field duplicate.

Other Coalition-Monitored Water Quality Parameters

Exceedances of adopted Basin Plan objectives, CTR criteria, or ILRP *Trigger Limits* were observed for conductivity and total dissolved solids (TDS), dissolved oxygen, *E. coli* and fecal coliform, nutrients (nitrate as N), pH, and trace metals (dissolved lead) during 2009 Coalition Monitoring (**Table 24**).

Conductivity and Total Dissolved Solids

Conductivity was monitored in 211 samples from 54 Coalition sites. Conductivity exceeded the California recommended 2˚ MCL (900 uS/cm) for drinking water in 21 samples and the unadopted UN Agricultural Goal (700 uS/cm) in a total of nine samples collected from 11 different sites. Note that two sites (GILBR and GILLR) were upstream from the primary Gilsizer Slough monitoring site (GILSL), and one site (WLSTN) was upstream from the primary Willow Slough monitoring site (WLSPL). Eight of the exceedances were observed at Ulatis Creek (UCBRD), and nine of the exceedances were observed at Willow Slough (WLSPL and WLSTN).

Total dissolved solids (TDS) were monitored in 107 samples from 21 Coalition sites. TDS exceeded the unadopted UN Agricultural Supply Goal (450 mg/L) and the California recommended 2˚ MCL (500 mg/L) for drinking water in 18 samples collected from six sites. Five of the six samples also exceeded the conductivity objective. The conductivity and TDS MCLs are intended to apply to treated drinking water and are based on aesthetic acceptance by consumers of the water.

Dissolved Oxygen

During 2009 Coalition Monitoring, dissolved oxygen was measured in 211 samples from 54 Coalition sites. Dissolved oxygen concentrations were below the Basin Plan lower limit of 5.0 mg/L for waterbodies with a WARM designated beneficial use in 16 samples from 10 sites and below the Basin Plan lower limit of 7.0 mg/L for waterbodies with a COLD designated beneficial use in an additional 16 samples from 12 sites.

In addition, two dissolved oxygen concentrations at two sites (Pine Creek, PNCGR, and Walker Creek, WLKCH) were flagged as being below the Basin Plan lower limit of 7.0 mg/L for waterbodies with a COLD designated beneficial use, but these two water bodies meet the WARM designation; these values were not previously reported as exceedances.

Dissolved oxygen exceedances occurred between April and September and were primarily due to low flows, stagnant conditions, and/or extensive submerged aquatic vegetation. The low flows and stagnant conditions have the potential to limit oxygen production by instream algae and also to trap organic particulates that contribute to instream oxygen consumption. In most cases, it was determined that the conditions contributing to low dissolved oxygen were typical for irrigation season at these sites.

E. coli *Bacteria and Fecal Coliform*

E. coli bacteria were monitored in 163 samples from 22 sites, and fecal coliform bacteria were monitored in 71 samples from 19 sites. *E. coli* results exceeded the single sample maximum objective (235 MPN/100mL) in 51 samples from 18 different Coalition locations. Fecal coliform results exceeded the Basin Plan objective (400 MPN/100 mL) in 17 samples from 11 different

Coalition locations. The Basin Plan objectives are intended to protect contact recreational uses where ingestion of water is probable (e.g., swimming). Agricultural lands commonly support a large variety (and sometimes very large numbers) of birds and other wildlife. These avian and wildlife resources are expected to be significant sources of *E. coli* and other bacteria in agricultural runoff and irrigation return flows. Other sources include, but are not limited to cattle, horses, and septic systems.

Nutrients

Nutrients monitored during 2009 Coalition Monitoring included nitrate, nitrite, total Kjeldahl nitrogen (TKN), ammonia, total phosphorus, and dissolved orthophosphate. Nutrients were monitored in 591 samples at 18 different Coalition sites. Nitrate as N results exceeded the Basin Plan objective (10 mg/L) in one sample from one site (Ulatis Creek, UCBRD). Ammonia concentrations were typically below quantitation limits and did not exceed the temperature- and pH-dependent national water quality criterion for this parameter in any sample. There are no applicable water quality objectives (adopted or unadopted) for TKN, total phosphorus, or orthophosphate.

pH

During 2009 Coalition Monitoring, pH was measured in 214 samples from 54 Coalition sites. pH exceeded the Basin Plan maximum of 8.5 Standard Units (-log[H+]) in seven Coalition samples collected from six different sites. Two of these exceedances occurred at Middle Fork Feather River (MFFGR). Note that one site (WLSNO) was upstream from the primary Willow Slough monitoring site (WLSPL), although the exceedances occurred on different dates.

The Basin Plan limit for pH is intended to be assessed based on "…*an appropriate averaging period that will support beneficial uses*" (CVRWQCB 1995). This parameter typically exhibits significant natural diurnal variation over 24 hours in natural waters with daily fluctuations controlled principally by photosynthesis, rate of respiration, and buffering capacity of the water. These processes are controlled by light and nutrient availability, concentrations of organic matter, and temperature. These factors combine to cause increasing pH during daylight hours and decreasing pH at night. Diurnal variations in winter are typically smaller because less light is available and there are lower temperatures and higher flows. Irrigation return flows may influence this variation primarily by increasing or decreasing in-stream temperatures or by increasing available nutrients or organic matter.

The pH exceedances occurred during the irrigation season, between late March and September. In general, the reason for these pH exceedances was not immediately obvious or easily determined. In most cases, the marginal pH exceedances were likely due primarily to in-stream algal respiration, caused in part by low flows, conditions or ponded and stagnant conditions. The elevated pHs appear to be within normal range of ambient pH for these sites.

Trace Metals

Total and dissolved trace metals required for *ILRP* monitoring included arsenic, boron, cadmium, copper, lead, molybdenum, nickel, selenium, and zinc. Trace metals were monitored in 33 samples collected from 4 Coalition sites. Dissolved lead exceeded the California Toxics Rule Freshwater Aquatic Life Protection— Criterion Continuous Concentration (2.24 ug/L as a 4-day average; calculated based on water sample hardness) in one sample from Pit River (PRPIT). The cause of the lead exceedance was not determined. No other trace metals exceeded

objectives in the PRPIT sample, and there are no known agricultural sources of lead. The Coalition is pursuing preliminary source identification for this exceedance. There were no exceedances of objectives for arsenic, boron, cadmium, copper, molybdenum, nickel, selenium, or zinc in any other samples in 2009 monitoring.

Table 24. Other Physical, Chemical, and Microbiological Parameters Observed to Exceed Numeric Objectives in 2009 Coalition Monitoring

Site ID	Sample Date	Analyte	Units	Result	Trigger Limit[1]	Basis for Limit[2]	Mgt Plan[3]
CCCPY	5/19/09	Conductivity	uS/cm	942	900, 700[4]	Narrative	YES
COLDR	2/17/09	Conductivity	uS/cm	854	900, 700[4]	Narrative	YES
COLDR	3/18/09	Conductivity	uS/cm	1053	900, 700[4]	Narrative	YES
FRSHC	9/22/09	Conductivity	uS/cm	855	900, 700[4]	Narrative	NO
FRSHC	1/28/09	Conductivity	uS/cm	1592	900, 700[4]	Narrative	YES
FRSHC	3/17/09	Conductivity	uS/cm	797	900, 700[4]	Narrative	YES
GILBR[6]	6/16/09	Conductivity	uS/cm	830	900, 700[4]	Narrative	YES
GILLR[6]	6/16/09	Conductivity	uS/cm	883	900, 700[4]	Narrative	YES
GIDLR	2/17/09	Conductivity	uS/cm	924	900, 700[4]	Narrative	YES
GIDLR	3/19/09	Conductivity	uS/cm	1028	900, 700[4]	Narrative	YES
LSNKR	1/27/09	Conductivity	uS/cm	953	900, 700[4]	Narrative	NO
UCBRD	1/26/09	Conductivity	uS/cm	946	900, 700[4]	Narrative	YES
UCBRD	3/19/09	Conductivity	uS/cm	987	900, 700[4]	Narrative	YES
UCBRD	4/20/09	Conductivity	uS/cm	1055	900, 700[4]	Narrative	YES
UCBRD	5/19/09	Conductivity	uS/cm	810	900, 700[4]	Narrative	YES
UCBRD	6/16/09	Conductivity	uS/cm	1071	900, 700[4]	Narrative	YES
UCBRD	7/21/09	Conductivity	uS/cm	986	900, 700[4]	Narrative	YES
UCBRD	8/18/09	Conductivity	uS/cm	808	900, 700[4]	Narrative	YES
UCBRD	9/22/09	Conductivity	uS/cm	797	900, 700[4]	Narrative	YES
WLSTN	6/16/09	Conductivity	uS/cm	1017	900, 700[4]	Narrative	YES
WLSPL	1/26/09	Conductivity	uS/cm	1100	900, 700[4]	Narrative	YES
WLSPL	3/19/09	Conductivity	uS/cm	1006	900, 700[4]	Narrative	YES
WLSPL	4/23/09	Conductivity	uS/cm	1677	900, 700[4]	Narrative	YES
WLSPL	5/19/09	Conductivity	uS/cm	1480	900, 700[4]	Narrative	YES
WLSPL	6/16/09	Conductivity	uS/cm	1554	900, 700[4]	Narrative	YES
WLSPL	7/21/09	Conductivity	uS/cm	1575	900, 700[4]	Narrative	YES
WLSPL	8/18/09	Conductivity	uS/cm	1486	900, 700[4]	Narrative	YES
WLSPL	9/22/09	Conductivity	uS/cm	1394	900, 700[4]	Narrative	YES
ZZDIX	4/20/09	Conductivity	uS/cm	1041	900, 700[4]	Narrative	YES
ZDDIX	8/18/09	Conductivity	uS/cm	837	900, 700[4]	Narrative	YES
CCCPY	8/19/09	Dissolved Oxygen	mg/L	6.62	7 (COLD), 5 (WARM)	BP	NO
COLDR	6/2/09	Dissolved Oxygen	mg/L	3.21	7 (COLD), 5 (WARM)	BP	YES
COLDR	7/7/09	Dissolved Oxygen	mg/L	2.97	7 (COLD), 5 (WARM)	BP	YES
COLDR	8/26/09	Dissolved Oxygen	mg/L	6.4	7 (COLD), 5 (WARM)	BP	YES
CCBRW	8/18/09	Dissolved Oxygen	mg/L	5.52	7 (COLD), 5 (WARM)	BP	NO
CCBRW	9/22/09	Dissolved Oxygen	mg/L	6.15	7 (COLD), 5 (WARM)	BP	NO
CCSTR	5/19/09	Dissolved Oxygen	mg/L	1.84	7 (COLD), 5 (WARM)	BP	YES
CCSTR	6/16/09	Dissolved Oxygen	mg/L	4.72	7 (COLD), 5 (WARM)	BP	YES
CCSTR	7/21/09	Dissolved Oxygen	mg/L	4.66	7 (COLD), 5 (WARM)	BP	YES

Site ID	Sample Date	Analyte	Units	Result	Trigger Limit[1]	Basis for Limit[2]	Mgt Plan[3]
CCSTR	8/18/09	Dissolved Oxygen	mg/L	2.39	7 (COLD), 5 (WARM)	BP	YES
FRSHC	8/18/09	Dissolved Oxygen	mg/L	4.93	7 (COLD), 5 (WARM)	BP	YES
GILSL	6/16/09	Dissolved Oxygen	mg/L	5.53	7 (COLD), 5 (WARM)	BP	YES
INDAB	8/19/09	Dissolved Oxygen	mg/L	6.9	7 (COLD), 5 (WARM)	BP	YES
LAGAM	6/18/09	Dissolved Oxygen	mg/L	5.99	7 (COLD), 5 (WARM)	BP	YES
LTATE	6/18/09	Dissolved Oxygen	mg/L	2.63	7 (COLD), 5 (WARM)	BP	YES
LTSVN	6/18/09	Dissolved Oxygen	mg/L	2.12	7 (COLD), 5 (WARM)	BP	YES
LTSIX	6/19/09	Dissolved Oxygen	mg/L	5.61	7 (COLD), 5 (WARM)	BP	YES
LTTHR	6/19/09	Dissolved Oxygen	mg/L	6.85	7 (COLD), 5 (WARM)	BP	YES
LHNCT	8/18/09	Dissolved Oxygen	mg/L	5.78	7 (COLD), 5 (WARM)	BP	YES
LHNCT	9/22/09	Dissolved Oxygen	mg/L	3.4	7 (COLD), 5 (WARM)	BP	YES
PNCGR[5]	4/22/09	Dissolved Oxygen	mg/L	5.73	7 (COLD), 5 (WARM)	BP	NO
PNCGR	5/20/09	Dissolved Oxygen	mg/L	3.15	7 (COLD), 5 (WARM)	BP	NO
PNCGR	6/18/09	Dissolved Oxygen	mg/L	4.43	7 (COLD), 5 (WARM)	BP	NO
PRPIT	7/31/09	Dissolved Oxygen	mg/L	5.8	7 (COLD), 5 (WARM)	BP	YES
RARPP	6/19/09	Dissolved Oxygen	mg/L	3.54	7 (COLD), 5 (WARM)	BP	YES
SSKNK	6/2/09	Dissolved Oxygen	mg/L	6.03	7 (COLD), 5 (WARM)	BP	NO
SSKNK	7/7/09	Dissolved Oxygen	mg/L	6.58	7 (COLD), 5 (WARM)	BP	NO
SYSLH	6/19/09	Dissolved Oxygen	mg/L	4.38	7 (COLD), 5 (WARM)	BP	YES
WLKCH[5]	4/22/09	Dissolved Oxygen	mg/L	5	7 (COLD), 5 (WARM)	BP	YES
WLKCH	5/20/09	Dissolved Oxygen	mg/L	4.86	7 (COLD), 5 (WARM)	BP	YES
WLKCH	6/18/09	Dissolved Oxygen	mg/L	5.8	7 (COLD), 5 (WARM)	BP	YES
WLKCH	7/22/09	Dissolved Oxygen	mg/L	4.76	7 (COLD), 5 (WARM)	BP	YES
WLKCH	8/19/09	Dissolved Oxygen	mg/L	6.52	7 (COLD), 5 (WARM)	BP	YES
WLKCH	9/23/09	Dissolved Oxygen	mg/L	6.41	7 (COLD), 5 (WARM)	BP	YES
ACACR	1/28/09	*E. coli*	MPN/100mL	280	235	BPA	YES
ACACR	2/19/09	*E. coli*	MPN/100mL	260	235	BPA	YES
ACACR	4/22/09	*E. coli*	MPN/100mL	340	235	BPA	YES
ACACR	5/20/09	*E. coli*	MPN/100mL	520	235	BPA	YES
ACACR	6/17/09	*E. coli*	MPN/100mL	1200	235	BPA	YES
ACACR	7/22/09	*E. coli*	MPN/100mL	370	235	BPA	YES
ACACR	9/23/09	*E. coli*	MPN/100mL	690	235	BPA	YES
CCBRW	2/17/09	*E. coli*	MPN/100mL	1600	235	BPA	YES
CCDLX	3/18/09	*E. coli*	MPN/100mL	410	235	BPA	NO
CCDLX	4/21/09	*E. coli*	MPN/100mL	460	235	BPA	YES
CCDLX	5/19/09	*E. coli*	MPN/100mL	290	235	BPA	YES
CRTWN	1/26/09	*E. coli*	MPN/100mL	250	235	BPA	NO
CRTWN	2/16/09	*E. coli*	MPN/100mL	920	235	BPA	NO
FRSHC	6/17/09	*E. coli*	MPN/100mL	260	235	BPA	NO
FRSHC	1/28/09	*E. coli*	MPN/100mL	240	235	BPA	NO
GIDLR	1/26/09	*E. coli*	MPN/100mL	490	235	BPA	YES
GIDLR	5/19/09	*E. coli*	MPN/100mL	260	235	BPA	YES
INDAB	8/19/09	*E. coli*	MPN/100mL	410.6	235	BPA	YES
INDAB	9/21/09	*E. coli*	MPN/100mL	387.3	235	BPA	YES
LHNCT	1/27/09	*E. coli*	MPN/100mL	460	235	BPA	NO
LHNCT	2/18/09	*E. coli*	MPN/100mL	770	235	BPA	NO
LHNCT	4/21/09	*E. coli*	MPN/100mL	1300	235	BPA	YES

Site ID	Sample Date	Analyte	Units	Result	Trigger Limit[1]	Basis for Limit[2]	Mgt Plan[3]
LHNCT	5/19/09	*E. coli*	MPN/100mL	2000	235	BPA	NO
LHNCT	8/18/09	*E. coli*	MPN/100mL	240	235	BPA	NO
LSNKR	2/18/09	*E. coli*	MPN/100mL	1500	235	BPA	YES
LSNKR	4/21/09	*E. coli*	MPN/100mL	510	235	BPA	YES
LSNKR	5/19/09	*E. coli*	MPN/100mL	250	235	BPA	YES
LSNKR	6/16/09	*E. coli*	MPN/100mL	610	235	BPA	YES
LSNKR	7/22/09	*E. coli*	MPN/100mL	370	235	BPA	YES
LSNKR	9/22/09	*E. coli*	MPN/100mL	460	235	BPA	YES
MDCLR	6/17/09	*E. coli*	MPN/100mL	240	235	BPA	NO
NRTCN	4/21/09	*E. coli*	MPN/100mL	>2400	235	BPA	YES
PCULB	3/2/09	*E. coli*	MPN/100mL	820	235	BPA	NO
SSLIB	5/19/09	*E. coli*	MPN/100mL	870	235	BPA	NO
SPGRN	7/22/09	*E. coli*	MPN/100mL	238.2	235	BPA	YES
SPGRN	9/21/09	*E. coli*	MPN/100mL	613.1	235	BPA	YES
UCBRD	2/16/09	*E. coli*	MPN/100mL	>2400	235	BPA	YES
UCBRD	5/19/09	*E. coli*	MPN/100mL	1300	235	BPA	YES
UCBRD	8/18/09	*E. coli*	MPN/100mL	870	235	BPA	YES
UCBRD	9/22/09	*E. coli*	MPN/100mL	2,400	235	BPA	YES
WLKCH	2/19/09	*E. coli*	MPN/100mL	2400	235	BPA	YES
WLKCH	3/17/09	*E. coli*	MPN/100mL	460	235	BPA	YES
WLKCH	4/22/09	*E. coli*	MPN/100mL	>2400	235	BPA	YES
WLKCH	5/20/09	*E. coli*	MPN/100mL	280	235	BPA	YES
WLKCH	8/19/09	*E. coli*	MPN/100mL	870	235	BPA	YES
WLKCH	9/23/09	*E. coli*	MPN/100mL	2,400	235	BPA	YES
WLSPL	2/16/09	*E. coli*	MPN/100mL	2000	235	BPA	YES
WLSPL	4/23/09	*E. coli*	MPN/100mL	1300	235	BPA	YES
WLSPL	5/19/09	*E. coli*	MPN/100mL	250	235	BPA	YES
WLSPL	8/18/09	*E. coli*	MPN/100mL	2400	235	BPA	YES
WLSPL	9/22/09	*E. coli*	MPN/100mL	870	235	BPA	YES
ACACR	4/22/09	Fecal Coliform	MPN/100mL	500	400	BP	YES
ACACR	5/20/09	Fecal Coliform	MPN/100mL	500	400	BP	YES
ACACR	6/17/09	Fecal Coliform	MPN/100mL	900	400	BP	YES
CCDLX	4/21/09	Fecal Coliform	MPN/100mL	900	400	BP	YES
FRSHC	4/21/09	Fecal Coliform	MPN/100mL	900	400	BP	NO
FRSHC	6/17/09	Fecal Coliform	MPN/100mL	900	400	BP	NO
GIDLR	5/19/09	Fecal Coliform	MPN/100mL	>1600	400	BP	YES
LHNCT	4/21/09	Fecal Coliform	MPN/100mL	1600	400	BP	YES
LHNCT	5/19/09	Fecal Coliform	MPN/100mL	900	400	BP	NO
LSNKR	4/21/09	Fecal Coliform	MPN/100mL	900	400	BP	YES
LSNKR	5/19/09	Fecal Coliform	MPN/100mL	500	400	BP	YES
LSNKR	6/16/09	Fecal Coliform	MPN/100mL	1600	400	BP	YES
SSLIB	5/19/09	Fecal Coliform	MPN/100mL	1600	400	BP	NO
UCBRD	5/19/09	Fecal Coliform	MPN/100mL	1600	400	BP	YES
WLKCH	3/17/09	Fecal Coliform	MPN/100mL	≥1600	400	BP	YES
WLKCH	4/22/09	Fecal Coliform	MPN/100mL	≥1600	400	BP	YES
WLSPL	4/23/09	Fecal Coliform	MPN/100mL	1600	400	BP	YES
PRPIT	6/17/09	Lead, Dissolved	µg/L	2.5	2.24	CTR	NO

Site ID	Sample Date	Analyte	Units	Result	Trigger Limit[1]	Basis for Limit[2]	Mgt Plan[3]
UCBRD	1/26/09	Nitrate as N	mg/L	11	10[5]	BP	NO
MFFGR	8/19/09	pH	-log[H+]	9.43	6.5-8.5	BP	YES
MFFGR	9/21/09	pH	-log[H+]	8.74	6.5-8.5	BP	YES
PRPIT	5/20/09	pH	-log[H+]	8.80	6.5-8.5	BP	YES
UCBRD	4/20/09	pH	-log[H+]	9.11	6.5-8.5	BP	YES
WLSNO	6/16/09	pH	-log[H+]	8.61	6.5-8.5	BP	NO
WLSPL	3/19/09	pH	-log[H+]	8.92	6.5-8.5	BP	NO
ZZDIX	4/20/09	pH	-log[H+]	8.77	6.5-8.5	BP	YES
COLDR	1/26/09	TDS	mg/L	520	450[6]	Narrative	YES
COLDR	2/17/09	TDS	mg/L	540	450[6]	Narrative	YES
COLDR	3/18/09	TDS	mg/L	650	450[6]	Narrative	YES
FRSHC	3/17/09	TDS	mg/L	470	450[6]	Narrative	YES
FRSHC	1/28/09	TDS	mg/L	470	450[6]	Narrative	YES
GIDLR	2/17/09	TDS	mg/L	620	450[6]	Narrative	YES
GIDLR	3/19/09	TDS	mg/L	690	450[6]	Narrative	YES
PCULB	12/1/08	TDS	mg/L	480	450[6]	Narrative	NO
UCBRD	1/26/09	TDS	mg/L	590	450[6]	Narrative	YES
UCBRD	3/19/09	TDS	mg/L	590	450[6]	Narrative	YES
UCBRD	4/21/09	TDS	mg/L	630	450[6]	Narrative	YES
UCBRD	5/19/09	TDS	mg/L	480	450[6]	Narrative	YES
UCBRD	6/16/09	TDS	mg/L	610	450[6]	Narrative	YES
WLSPL	3/19/09	TDS	mg/L	580	450[6]	Narrative	YES
WLSPL	4/23/09	TDS	mg/L	990	450[6]	Narrative	YES
WLSPL	5/19/09	TDS	mg/L	880	450[6]	Narrative	YES
WLSPL	6/16/09	TDS	mg/L	870	450[6]	Narrative	YES
WLSPL	1/26/09	TDS	mg/L	720	450[6]	Narrative	YES

Notes:

1. Water Quality Objective or Narrative Interpretation Limits for ILRP.
2. Water Quality Objective Basis: BP = Central Valley Basin Plan; BPA = Basin Plan Amendment; CTR = California Toxics Rule; Narrative = unadopted limits used to interpret Basin Plan narrative objectives by the Central Valley Regional Board.
3. Indicates whether sites and parameter are currently being addressed by an ongoing management plan, study, or TMDL
4. Conductivity exceeded the unadopted UN Agricultural Goal (700 uS/cm) and/or the California recommended 2˚ MCL (900 uS/cm) for drinking water.
5. This water body meets the WARM designation; hence, this value was not reported as an exceedance.
6. TDS exceeded the unadopted UN Agricultural Supply Goal (450 mg/L) and/or the California recommended 2˚ MCL (500 mg/L).

Management Practices and Actions Taken

RESPONSE TO EXCEEDANCES

To address specific water quality exceedances, the Coalition and its partners developed a Management Plan in 2008, subsequently approved by the Water Board. The Coalition also previously developed a *Landowner Outreach and Management Practices Implementation Communications Process for Monitoring Results (Management Practices Process)* to address exceedances. Implementation of the approved management plan is the primary mechanism for addressing exceedances observed in the Coalition's *ILRP* monitoring.

Management Plan Status Update

The primary activities conducted in 2009 to implement the Coalition's Management Plan were focused on addressing registered pesticides and toxicity exceedances. Implementation completed for registered pesticides included review and evaluation of pesticide application data, identification of potential sources, and determination of likely agricultural sources. Implementation completed to address toxicity exceedances included review and evaluation of pesticide application data, evaluation of monitoring results to identify potential causes of toxicity, and determination of likely agricultural sources of identified causes of toxicity. These evaluations were documented in Source Evaluation Reports for each water body and management plan element. For registered pesticides and identified causes of toxicity, surveys of Coalition members operating on high priority parcels were conducted to determine the degree of implementation of relevant management practices. These survey results will be used to establish goals for additional management practice implementation needed to address exceedances of Basin Plan water quality objectives and *ILRP* trigger limits.

LANDOWNER OUTREACH EFFORTS

The Coalition and its subwatersheds, working with the Coalition for Urban/Rural Environmental Stewardship (CURES), stand committed to working with the Regional Water Board and its staff to implement the *Management Practices Process* and the Coalition's approved Management Plan to address water quality problems identified in the Sacramento Valley. The primary strategic approach taken by the Coalition is to notify and educate the subwatershed landowners, farm operators, and/or wetland managers about the cause(s) of toxicity and/or exceedance(s) of water quality standards. Notifications are focused on (but not limited to) growers who operate directly adjacent to or within close proximity to the waterway. The broader outreach program, which includes both grower meetings and the notifications distributed through direct mailings, encourages the adoption of BMPs and modification of the uses of specific farm and wetland inputs to prevent movement of constituents of concern into Sacramento Valley surface waters.

Targeted Outreach Efforts

The Coalition's targeted outreach approach is to focus on the growers with fields directly adjacent to or near the actual waterway of concern. To identify those landowners operating in high priority lands, the Coalition identifies the assessor parcels and subsequently the owners of agricultural operations nearest the water bodies of interest. From the list of assessor parcel numbers, the Coalition identifies its members and mails to them an advisory notice along with

information on how to address the specific exceedances using BMPs. This same approach has been used to conduct management practice surveys in areas targeted by the Management Plan.

General Outreach Efforts

Highlights of outreach efforts conducted by the Coalition and its partners for specific subwatersheds from January through September 2009 are listed in **Table 25**.

Table 25. Summary of Landowner Outreach Efforts, January 2009 – September 2009

Subwatershed	Date	Organization	Topics/Exceedances Discussed	Location	# of People in Attendance or # on Distribution List	Document Enclosed
Butte-Yuba-Sutter	1/20/2009	Yuba County RCD	Open to Membership – General ILRP Issues	Marysville, CA	5	Agenda
Butte-Yuba-Sutter	1/24/2009	Sutter County RCD	Open to Membership – General ILRP Issues	Yuba City, CA	9	Agenda
Butte-Yuba-Sutter	1/26/2009	Yuba/Sutter Farm Bureau	General CVRWQCB Issues	Yuba City, CA	12	Agenda
Butte-Yuba-Sutter	1/28/2009	Butte County RCD	Open to Membership – General ILRP Issues	Oroville, CA	14	Agenda
Butte-Yuba-Sutter	2/17/2009	Yuba County RCD	Open to Membership – General ILRP Issues	Marysville, CA	5	Agenda
Butte-Yuba-Sutter	2/23/2009	Sutter County RCD	Open to Membership – General ILRP Issues	Yuba City, CA	9	Agenda
Butte-Yuba-Sutter	2/23/2009	Yuba/Sutter Farm Bureau	General CVRWQCB Issues	Yuba City, CA	12	Agenda
Butte-Yuba-Sutter	2/25/2009	Butte County RCD	Open to Membership – General ILRP Issues	Oroville, CA	14	Agenda
Butte-Yuba-Sutter	3/16/2009	Sutter County RCD	Open to Membership – General ILRP Issues	Yuba City, CA	9	Agenda
Butte-Yuba-Sutter	3/17/2009	Yuba County RCD	Open to Membership – General ILRP Issues	Marysville, CA	5	Agenda
Butte-Yuba-Sutter	3/23/2009	Yuba/Sutter Farm Bureau	General CVRWQCB Issues	Yuba City, CA	12	Agenda
Butte-Yuba-Sutter	3/25/2009	Butte County RCD	Open to Membership – General ILRP Issues	Oroville, CA	14	Agenda
Butte-Yuba-Sutter	4/18/2009	Sutter County RCD	Open to Membership – General ILRP Issues	Yuba City, CA	9	Agenda
Butte-Yuba-Sutter	4/21/2009	Sutter County RCD	Open to Membership – General ILRP Issues	Yuba City, CA	9	Agenda
Butte-Yuba-Sutter	4/21/2009	Sutter County RCD	AWEP Newsletter – General ILRP Issues	Yuba City, CA	61	Agenda
Butte-Yuba-Sutter	4/21/2009	Sutter County RCD	Newsletter – General CVRWQCB Issues	Yuba City, CA	1,100	Newsletter
Butte-Yuba-Sutter	4/22/2009	Butte County RCD	Open to Membership – General ILRP Issues	Oroville, CA	14	Agenda
Butte-Yuba-Sutter	4/27/2009	Yuba/Sutter Farm Bureau	General CVRWQCB Issues	Yuba City, CA	12	Agenda

Subwatershed	Date	Organization	Topics/Exceedances Discussed	Location	# of People in Attendance or # on Distribution List	Document Enclosed
Butte-Yuba-Sutter	5/19/2009	Yuba County RCD	Open to Membership – General ILRP Issues	Marysville, CA	5	Agenda
Butte-Yuba-Sutter	5/20/2009	Sutter County RCD	Open to Membership – General ILRP Issues	Yuba City, CA	9	Agenda
Butte-Yuba-Sutter	5/25/2009	Yuba/Sutter Farm Bureau	General CVRWQCB Issues	Yuba City, CA	12	Agenda
Butte-Yuba-Sutter	5/27/2009	Butte County RCD	Open to Membership – General ILRP Issues	Oroville, CA	14	Agenda
Butte-Yuba-Sutter	6/16/2009	Yuba County RCD	Open to Membership – General ILRP Issues	Marysville, CA	5	Agenda
Butte-Yuba-Sutter	6/22/2009	Sutter County RCD	Open to Membership – General ILRP Issues	Yuba City, CA	9	Agenda
Butte-Yuba-Sutter	6/22/2009	Yuba/Sutter Farm Bureau	General CVRWQCB Issues	Yuba City, CA	12	Agenda
Butte-Yuba-Sutter	6/24/2009	Butte County RCD	Open to Membership – General ILRP Issues	Oroville, CA	14	Agenda
Butte-Yuba-Sutter	7/21/2009	Yuba County RCD	Open to Membership – General ILRP Issues	Marysville, CA	5	Agenda
Butte-Yuba-Sutter	7/22/2009	Butte County RCD	Open to Membership – General ILRP Issues	Oroville, CA	14	Agenda
Butte-Yuba-Sutter	7/27/2009	Sutter County RCD	Open to Membership – General ILRP Issues	Yuba City, CA	9	Agenda
Butte-Yuba-Sutter	7/27/2009	Yuba/Sutter Farm Bureau	General CVRWQCB Issues	Yuba City, CA	12	Agenda
Butte-Yuba-Sutter	8/11/2009	Subwatershed	Sub-watershed Coordinators Meeting	Sacramento, CA	5	Agenda
Butte-Yuba-Sutter	8/18/2009	Yuba County RCD	Open to Membership – General ILRP Issues	Marysville, CA	5	Agenda
Butte-Yuba-Sutter	8/18/2009	Sutter County RCD	Open to Membership – General ILRP Issues	Yuba City, CA	9	Agenda
Butte-Yuba-Sutter	8/20/2009	ILRP	Advisory Committee Workshop	Rancho Cordova, CA	19	Agenda
Butte-Yuba-Sutter	8/24/2009	ILRP	Monitoring Workshop	Woodland, CA	16	Agenda
Butte-Yuba-Sutter	8/26/2009	Yuba/Sutter Farm Bureau	General CVRWQCB Issues	Yuba City, CA	12	Agenda
Butte-Yuba-Sutter	8/26/2009	Butte County RCD	Open to Membership – General ILRP Issues	Oroville, CA	14	Agenda
Butte-Yuba-Sutter	8/26/2009	Sutter County RCD	Newsletter – NRCS AWEP/WQ BMPs	Yuba City, CA	61	Newsletter

Subwatershed	Date	Organization	Topics/Exceedances Discussed	Location	# of People in Attendance or # on Distribution List	Document Enclosed
Butte-Yuba-Sutter	8/31/2009	Delta	Methyl-mercury Workgroup	Sacramento, CA	23	Agenda
Butte-Yuba-Sutter	9/1/2009	Y/S Farm Bureau	Strategy Meeting	Yuba City, CA	6	Agenda
Butte-Yuba-Sutter	9/14/2009	NRCS FWQMP	Scoping Meeting	Davis, CA	4	N
Butte-Yuba-Sutter	9/15/2009	Yuba County RCD	Open to Membership – General ILRP Issues	Marysville, CA	5	Agenda
Butte-Yuba-Sutter	9/15/2009	Sutter County RCD	Open to Membership – General ILRP Issues	Yuba City, CA	9	Agenda
Butte-Yuba-Sutter	9/17/2009	SVWQC	Coalition Meeting	Willows, CA	22	Agenda
Butte-Yuba-Sutter	9/17/2009	Delta Methyl-mercury	Workgroup	Sacramento, CA	35	Agenda
Butte-Yuba-Sutter	9/23/2009	Butte County RCD	Open to Membership – General ILRP Issues	Oroville, CA	14	Agenda
Butte-Yuba-Sutter	9/28/2009	Yuba/Sutter Farm Bureau	General CVRWQCB Issues	Yuba City, CA	12	Agenda
Colusa Glenn	2/26/2009	Colusa Glenn Subwatershed Program	Election results for Glenn County Director Seats, Finances, MOU with GCRCD to perform outreach and education, outreach and education update, SVWQC water quality management plan, director reports	Willows USDA Service Center, City of Willows	14	Agenda, Minutes
Colusa Glenn	3/5/2009	Colusa Glenn Subwatershed Program & Sacramento National Wildlife Refuge	Program elements, partnership opportunities, monitoring opportunities	Sacramento National Wildlife Refuge, South from City of Willows	4	N/A
Colusa Glenn	3/19/2009	Colusa Glenn Subwatershed Program, Colusa & Glenn Ag Commissioner, Northern California Water Association & Regional Water Quality Control Board	Program elements, membership activities, monitoring locations, Q&A	Colusa and Glenn Counties	15	Agenda, Press Release

Subwatershed	Date	Organization	Topics/Exceedances Discussed	Location	# of People in Attendance or # on Distribution List	Document Enclosed
Colusa Glenn	5/13/2009	Colusa Glenn Subwatershed Program, Glenn County Ag Department & Sonoma State University	Best Management Practices: "A socio-economic and behavior analysis of growers' decisions to adopt or reject voluntary conservation-oriented BMPs"	Willows USDA Service Center, City of Willows & Walker Creek Watershed	4	N/A
Colusa Glenn	5/27/2009	Colusa Glenn Subwatershed Program	LETTER: Stewardship of Chlorpyrifos to Avoid Water Quality Issues	Walker Creek Watershed Landowners & Ag Dealers, PCA's, Operators	131	Letter (Landowner & Ag Service Providers)
Colusa Glenn	6/3/2009	Colusa Glenn Subwatershed Program	PRESS RELEASE: Stewardship of Chlorpyrifos to Avoid Water Quality Issues	Tri-Counties, The Sacramento Valley Mirror & Chico Enterprise-Record Newspaper	Did not publish	Press Release
Colusa Glenn	7/1/2009	Colusa Glenn Subwatershed Program	PRESS RELEASE: Stewardship of Chlorpyrifos to Avoid Water Quality Issues	Colusa & Glenn County's Farm Bureau, Family Water Alliance, plus distribution list	6,150	Press Release
Colusa Glenn	7/9/2009	Colusa Glenn Subwatershed	Director reports, finances, Glenn County participant map, monitoring results update, Long-Term ILRP update, outreach and education update, draft procedure manual, election of Director At-Large, next meeting	Willows USDA Service Center, City of Willows	8	Agenda, Minutes
Colusa Glenn	7/20/2009	Open House: Willows USDA Service Center - Glenn County RCD & Colusa Glenn Subwatershed Program	Program elements, monitoring results/exceedances, Q&A	Willows USDA Service Center, City of Willows	50	N/A
Colusa Glenn	9/23/2009	Glenn County RCD	FARM DAY: Water quality	Glenn County Farm Bureau, City of Orland (fairgrounds)	400	News Article
Colusa Glenn	9/30/2009	Glenn Fertilizer Wilbur-Elis	Chlorpyrifos Exceedance in Walker Creek Watershed	Glenn County	3	N/A
Colusa Glenn	Monthly	Glenn County Resource Conservation District	Program elements, monitoring results/exceedances, Q&A	Willows USDA Service Center, City of Willows	10 - 20 each month	Verbal reports only
Colusa Glenn	Monthly	Glenn County Farm Bureau	Program elements, monitoring results/exceedances, Q&A	Glenn County Farm Bureau, City of Orland	20 - 30 each month	Verbal reports only

Subwatershed	Date	Organization	Topics/Exceedances Discussed	Location	# of People in Attendance or # on Distribution List	Document Enclosed
Colusa Glenn	Quarterly	Colusa County Farm Bureau	Program elements, monitoring results/exceedances, Q&A	Colusa County Farm Bureau, City of Colusa	25 each quarter	Verbal reports only
Colusa Glenn	Updated Weekly	Colusa Glenn Subwatershed	Program information and links	www.glenncountyrcd.org	N/A	N/A
El Dorado	2/20/2009	UC Cooperative Extension	Foothill Spray Tech & Calibration Field Day, Improving pesticide applications and off site movement by calibrating equipment, understanding nozzles, etc.	Placerville, CA	42	N/A
El Dorado	3/3/2009	UC Cooperative Extension	CA Small Farms Conference, Least Toxic Tree Fruit Pest Management Methods	Sacramento, CA	35	N/A
El Dorado	3/19/2009	Resource Conservation District	Soil Erosion & Farm Qater Quality	Placerville, CA	12	Y
El Dorado	6/3/2009	UC Cooperative Extension	Gill's Mealybug Update, Biology and management plan for Gill's mealybug, 2009 meeting for growers with infestations	Placerville, CA	13	N/A
El Dorado	6/4/2009	UC Cooperative Extension	Tailgate Field meeting: Alternative grape growing practices, organic and biodynamic grape growing practices	Plymouth, CA	36	N/A
El Dorado	Jan – Sep 2009	EDC Agriculture Department	Pesticide trainings	Placerville, CA	24	N/A
El Dorado	Jan – Sep 2009	EDC Agriculture Department	Restricted Materials Permits or Operator Identification Numbers	Placerville, CA	452	N/A
El Dorado	Summer 2009	EDC Ag Water Quality Management Corp.	Member Newsletter	Placerville, CA	350	Y
El Dorado	Winter 2009	EDC Ag Water Quality Management Corp.	Member Newsletter	Placerville, CA	350	Y
Lake County	2/2/2009	Lake County Watershed Group	Water Quality Issue Region 5	CFBF, Sacramento	2	N/A
Lake County	2/11/2009	UC Extension- Farm Advisors	Pear Growers Mtg - Pesticide Use & Irrigation techniques	Lake County	30	Y
Lake County	2/11/2009	Lake County Watershed Group	Innovative Programs Earns Honors	LCFB News & Review pg3	900	Y
Lake County	3/9/2009	UC Extension – Farm Advisors	Walnut Growers Mtg - Pesticide Use & Irrigation Techniques	Lake County	30	Y

Subwatershed	Date	Organization	Topics/Exceedances Discussed	Location	# of People in Attendance or # on Distribution List	Document Enclosed
Lake County	3/16/2009		SVWQC meeting			
Lake County	4/2/2009		SVWQC Meeting	Williams, CA		
Lake County	4/22/2009	Lake County Watershed Group	Lake County Watershed Tour	Countywide	9	N/A
Lake County	6/19/2009	Lake County Watershed Group	LCFB hosts watershed tour	LCFB News & Review Pg1	900	Y
Lake County	6/19/2009	Lake County Watershed Group	RWQCB Ground Water Quality Monitoring	LCFB News & Review pg14	900	Y
Lake County	6/19/2009	Lake County Watershed Group	Irrigated Ag Lands Waiver Update	LCFB News & Reviews pg15	900	Y
Lake County	7/1/2009		SVWQC Meeting	Yolo County Farm Bureau		
Napa Co. PCWG	1/15/2009	Napa Co. PCWG	Annual General Membership Meeting: Membership, finances, LTILP, water quality monitoring, BMPs	Pope Valley Farm Center, Pope Valley, CA	36 in attendace; 74 on distribution list	Y
Napa Co. PCWG	5/7/2009	Napa Co. PCWG	Steering Committee Meeting: Membership, finances, LT ILP, water quality reports, Pilot Plan	Napa County Farm Bureau, Napa, CA	8 in attendance; 12 on distribution list	Y
Napa Co. PCWG	8/24/2009	Napa Co. PCWG	Steering Committee Meeting: Membership, finances, LT ILP, water quality monitoring, Pilot Plan, BMPs	Napa County Farm Bureau, Napa, CA	7 in attendance; 12 on distribution list	Y
NECWA (Pit River)	3/10/2009	NECWA	NECWA Annual General Membership Meeting	Alturas, CA	69	Y
NECWA (Pit River)	4/28/2009	NECWA	Board Meeting - Open to membership	McArthur, CA	12	Y
NECWA (Pit River)	7/28/2009	NECWA	Board Meeting - Open to membership	McArthur, CA	11	Y
NECWA (Pit River)	1/19/2009	NECWA	Board Meeting - Open to membership	McArthur, CA	12	Y
PNSSNS	2/11/2009	Annual Membership Mtg.	E. coli, year's test results, BMP for livestock	Placer Co. Water Agency	50	N
PNSSNS	7/16/2009	Regional Water Board	Irrigated Pasture, Orchards	Sutter/Placer Co.	14	N
PNSSNS	Fall 2009	Newsletter	BMP for Cattle, pH problems		850	N
PNSSNS	Spring 2009	Newsletter	BMP for Orchards & Row Crops		850	N
Sac Amador	2/14/2009	Cal-West	General Information/Atrazine	Herald Fire Dept	50	N/A
Sac Amador	2/19/2009	SAWQA Members	General Information	Newsletter	733	newsletter

Subwatershed	Date	Organization	Topics/Exceedances Discussed	Location	# of People in Attendance or # on Distribution List	Document Enclosed
Sac Amador	3/18/2009	Amador RCD	General Information	Amador County	5	monthly report
Sac Amador	3/25/2009	Sac County Ag Commissioners	General Information	Wilton Fire House	30	N/A
Sac Amador	4/15/2009	Amador RCD	General Information	Amador County	5	monthly report
Sac Amador	5/20/2009	Amador RCD	General Information	Amador County	5	monthly report
Sac Amador	6/28/2009	Lower Cosumnes RCD	General Information	Sacramento County Farm Bureau	7	Report
Sac Amador	7/22/2009	Amador RCD	General Information	Amador County	5	monthly report
Sac Amador	N/A	Sac County Farm Bureau	ILRP Fact Sheet	http://sacfarmbureau.org/	N/A	Fact sheet
Sac Amador	N/A	Amador RCD	General Information	http://www.amadorrcd.org/	N/A	N/A
Shasta Tehama	1/30/2009	Walnut Day	Program Status	Red Bluff, CA	117	N
Shasta Tehama	2/13/2009	Prune Day	Program Status	Red Bluff, CA	87	N
Shasta Tehama	7/1/2009	STWEC Newsletter	Program Status	N/A	1100	Y
Shasta Tehama	Monthly	STWEC Board Meeting	Program Status	Cottonwood and Red Bluff, CA	10-15	N
Shasta Tehama	Monthly	Cow Creek Watershed Management Group	Program Status	Palo Cedro, CA	10-15	N
Shasta Tehama	Monthly	Shasta County Cattlemen	Program Status	Redding, CA	15-20	N
Solano Yolo	1/29/2009	Dixon Solano Water Quality Coalition	Monitoring Results & Program Requirements presentation for Solano growers	Solano County Ag Commissioner's Pesticide Applicator Training	56	N/A
Solano Yolo	7/1/2009	Dixon Solano Water Quality Coalition	Annual Newsletter for Coalition members	Sent to membership by mail	675	Y
Upper Feather River	2009	UCCE, UFRWG	Producer Stories	Watershed-wide	to be distributed at local mtgs	Y
Upper Feather River	1/12/2009	UCCE, UC Davis Art of Regional Change	Passion for the Land - initial meeting, draft Sierra valley rancher stories for digital format distribution	Vinton Grange Hall	15 attendees; finished stories to be distributed statewide	http://artofregionalchange.ucdavis.edu/
Upper Feather River	1/14/2009	UC Davis, UCCE	Water Quality & Rangeland Workshop	Browns Valley, CA	2 UFRWG reps	N
Upper Feather River	1/22/2009	UFRWG, NECWA, Goose Lake Coalition	Upper Watersheds Issues and Alternative Planning	Fall River RCD	10	N
Upper Feather River	2/23/2009	Sierra Valley RCD, UFRWG	1st Weeds Newsletter	Watershed-wide	125 mailing list	Y

Subwatershed	Date	Organization	Topics/Exceedances Discussed	Location	# of People in Attendance or # on Distribution List	Document Enclosed
Upper Feather River	2/28/2009	UFRWG	Board of Directors Mtg	Graeagle, CA	7	N
Upper Feather River	3/25/2009	Plumas-Sierra Cattlemen UFRWGroup	Riparian Restoration Workshop	Vinton Grange Hall	35	N
Upper Feather River	4/15/2009	CVRWQCB	ILRP Advisory Group - Ground Water Information Mtg	Sacramento, CA	1 UFRWG rep	N
Upper Feather River	4/22/2009	UFRWG, Sierra Valley RCD, Plumas Flood Control District	Water Issues of Upper Feather River Region	Sierraville, CA	5 UFRWG reps	N
Upper Feather River	9/16/2009	UFRWG	Board of Directors Mtg	Graeagle, CA	10	Y
Upper Feather River	9/25/2009	Feather River Land Trust, UFRWG, Plumas-Sierra Cattlemen, Feather River College	Sustainable Ag Workshop and Ranch BMP Tour	Taylorsville, CA	120 mailing list; 70+ attendance	Y
Upper Feather River	May 2009	UFRWG	Directors Report	Watershed-wide	120 mailing list	Y

Conclusions and Recommendations

The Coalition submits this *2009 Annual Monitoring Report* (AMR) as required under the Water Board's Irrigated Lands Regulatory Program (*ILRP*). The AMR provides a detailed description of our monitoring results as part of our ongoing efforts to characterize irrigated agricultural and wetlands related water quality in the Sacramento River Basin.

To summarize, the results from the ILRP monitoring in 2009 continue to indicate that there are no major water quality problems with agricultural and managed wetlands discharges in the Sacramento River Basin.

Statistically significant toxicity was observed in four of the 89 water column toxicity tests performed on 54 samples. All cases of toxicity were for *Selenastrum* algae tests – there were no cases of toxicity observed for *Ceriodaphnia* or *Pimephales* tests. These results were considered exceedances of the Basin Plan narrative objective (4.5% of all toxicity results and 7.4% of water samples). Toxicity was observed in one of the six samples tested for sediment toxicity. For the sites with observed toxicity, the Coalition and its subwatersheds took the appropriate actions to address these issues. By its nature, the AMR focuses in detail on the small number of sites and samples that exhibited toxicity and exceedances of conventional and microbiological parameters, as well as the actions taken and planned by the Coalition and its members to address these issues.

This AMR characterizes potential water quality impacts of agricultural drainage from a broad geographic area in the Sacramento Valley from December 2008 through September 2009. To date, a total of 43 Coalition storm and irrigation season events have been completed, with additional events collected by coordinating programs. For the period of record in this AMR (December 2008-September 2009), samples were collected during seven scheduled monthly events and two storm events.

Chemical results were evaluated each case of observed toxicity. In one case, the herbicide diuron was determined to have caused or contributed to the toxicity to *Selenastrum*, and diuron was also suspected in a second case. In two additional cases, the reductions of Selenastrum growth were minimal (<20%) and no specific causes of toxicity could be identified. No water samples triggered TIE procedures or definitive serial dilution toxicity tests. In the single case of sediment toxicity observed, sediment chemistry results indicated that pyrethroid pesticides were the cause of the toxicity.

When detected, pesticides rarely exceeded applicable objectives, and were infrequently associated with toxicity. Four registered pesticides (diazinon, chlorpyrifos, diuron, and malathion) exceeded applicable water quality objectives in a total of six samples.

Many of the pesticides specifically required to be monitored by the *ILRP* have rarely been detected in Coalition water samples, including glyphosate, paraquat, and all of the pyrethroid pesticides. Glyphosate, one of the most widely used agricultural pesticides, has been detected in only seven Coalition samples to date, and has never approached concentrations likely to cause toxicity to sensitive test species. Over 98% of all pesticide analyses performed to date for the Coalition are below detection. This indicates that monitoring for many of these pesticides in water is unlikely to provide meaningful results regarding sources or needs for changes in management practices. Based on these results, the Coalition has proposed that monitoring of ILRP pesticides be conducted based on use in the subwatersheds. Similarly, the Coalition has proposed to conduct more focused monitoring of most trace elements (arsenic, cadmium, lead,

molybdenum, nickel, selenium, and zinc); the Coalition's monitoring has demonstrated that these metals do not exceed objectives and are not likely to cause adverse impacts to aquatic life or human health in waters receiving agricultural runoff in the Coalition watershed. A more focused strategy for monitoring pesticides and trace metals will be implemented with the Coalition's 2009 MRP (Order No. R5-2009-0875, CVRWQCB 2009[4]).

The majority of exceedances of adopted numeric objectives consisted of pH, conductivity, dissolved solids, and *E. coli*. Although agricultural runoff and irrigation return flows may contribute to exceedances of these objectives, all of these parameters are controlled or significantly affected by natural processes and sources that are not controllable by agricultural management practices. Follow-up strategies to evaluate causes of pH and dissolved oxygen exceedances were implemented by the Coalition beginning in the 2006 Irrigation Season. Sources of *E. coli* exceedances have been investigated through a region-wide pilot study conducted by the Coalition. The Coalition also continues to participate in the *ILRP* Technical Issues Committee (TIC) workgroups to develop procedures and guidelines for *ILRP* monitoring and evaluation of exceedances. The TIC has worked with Water Board *ILRP* staff to develop recommendations incorporated into the revised *ILRP* Monitoring and Reporting Program requirements and procedures adopted by the Water Board in 2008 (*Order No. R5-2008-0005*) and 2009 (*Order No. R5-2009-0875*). The Coalition has also been an active participant in the Water Board's stakeholder process to develop a Long-Term *ILRP*.

The Coalition has implemented the required elements of the *ILRP* since 2004. The Coalition developed a Watershed Evaluation Report (WER) that set the priorities for development and implementation of the Monitoring and Reporting Program Plan (MRPP). The Coalition successfully developed the MRPP, QAPP, and Management Plan as required by the *ILRP* and these documents have been approved by the Water Board. Subsequent revisions requested by the Water Board have been incorporated into these documents and were implemented during the 2006 Irrigation Season monitoring, and continued through the Coalition's 2009 and 2010 *ILRP* monitoring efforts. The Coalition continues to adapt and improve elements of the monitoring program based on the knowledge gained through *ILRP* monitoring efforts.

The Coalition has implemented the approved monitoring program in coordination with its subwatershed partners, has initiated follow-up activities to address observed exceedances, and is continuing implementation of the approved Management Plan. Throughout this process, the Coalition has kept an open line of communication with the Water Board and has made every effort to fulfill the requirements of the *ILRP* in a cost-effective and scientifically defensible manner. This annual monitoring report is documentation of the success and continued progress of the Coalition in achieving these objectives.

[4] CVRWQCB 2009. Monitoring and Reporting Program Order No. R5-2009-0875 for Sacramento Valley Water Quality Coalition under Amended Order No. R5-2006-0053, Coalition Group Conditional Waiver Of Waste Discharge Requirements For Discharges From Irrigated Lands. California Regional Water Quality Control Board, Central Valley Region.

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Appendices

The following appendices are available in electronic form on the CD provided.

Appendix A: Field Log Copies

Appendix B: Lab Reports and Chains-of-Custody

Appendix C: Tabulated Monitoring Results

Appendix D: Exceedance Reports

Appendix E: Exceedance-Related Pesticide Use Data

Appendix F: Site-Specific Drainage Maps

Appendix G: SVWQC Outreach Materials