San Joaquin Valley Drainage Authority

Westside San Joaquin River Watershed Coalition

Semi-Annual Monitoring Report
2014 Irrigation Season Report

Covering the period: March through August 2014
(Sampling Events R15 through 116)

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SECTION 1: EXECUTIVE SUMMARY

This report covers the 2014 irrigation season sampling events beginning March 2014 through August 2014 (Event R15 through Event 116). Nineteen of the 22 monitoring sites within the Westside San Joaquin River Watershed Coalition (Westside Coalition) are located on streams that are dominated by summer agricultural drainage runoff.

The 2014 irrigation season was classified as a critical hydrologic year type for the westside of the San Joaquin Valley with Federal Water Contractors receiving 0% of federal water contract allocation. There were no significant storms during the report period. See **Section 3** for a discussion of measured rainfall. Irrigation season monitoring samples were collected at all sites containing sufficient water in accordance with the Westside Coalition's Monitoring and Reporting Plan (MRP – see MRP Order No. R5-2008-0831). Sediment samples were collected in March 2014, as scheduled. Severe sediment toxicity (<80% survival) was observed at Blewett Drain, Ingram Creek at River Rd., Del Puerto Creek near Cox Rd., and Orestimba Creek at Hwy. 33; less significant sediment toxicity (>80 Survival) was observed at Ramona Lake, Hospital Creek, Westley Wasteway, Los Banos Creek at Hwy 140, and Los Banos Creek at China Camp Rd. The four sediment samples exhibiting severe toxicity were tested for selected pesticides. See **Sections 8** and **9.**

Attachment 1 details the samples collected at each site during each sampling event. A summary of the monitoring results is presented in **Appendix A**. During the report period, significant aquatic toxicity was measured three times for *Selenastrum capricornutum* (algae) which is summarized in **Table 1** below.

Table 1: Summary of Aquatic Toxicity

Event	Site	Species/% Survival or % Control Growth
R15 (March)	Orestimba Cr. at Hwy 33	*Selenastrum* – 64% of Control Growth
R15 (March)	SJR at Lander Av.	*Selenastrum* – 36% of Control Growth
112 (April)	Orestimba Cr. at Hwy 33	*Selenastrum* – 41% of Control Growth

These results, along with associated follow up testing, water quality and flow data, are summarized in **Attachment 2**. Details of aquatic toxicity analyses are included in **Appendix C**.

Quality control samples were collected in addition to the event analysis sample. The quality control samples included field blanks, field duplicates, laboratory blanks and spike, and matrix spike/matrix spike duplicate samples (MS/MSD).

There were a handful of minor quality control issues, including exceedance of the field duplicate relative percent difference (RPD) value, and surrogate, matrix spike, or laboratory spike recoveries outside of the expected range. None of these issues are expected to affect data usability. Results of the Field Quality Control samples are discussed in **Section 6** and **Attachment 3**. A review of laboratory quality assurance activities is included in **Appendix D.**

Table 2 lists the sites that were sampled during the 2014 irrigation season.

Table 2: Collected Samples March through August 2014.

Map Designation	Monitoring Site	R15 Event 111		Event 112	Event 113	Event 114	Event 115	Event 116
	Discharge Sites	March		April	May	June	July	August
1	Hospital Cr at River Road	NF	SS	S	S	S	S	S
2	Ingram Cr at River Road	S	SS	S	S	S	S	S
3	Westley Wasteway near Cox Road	NA	SS	S	S	S	S	S
4	Del Puerto Cr near Cox Road	S	SS	S	S	S	S	S
5	Del Puerto Cr at Hwy 33	NF	NF	S	S	NF	NF	NF
7	Ramona Lake near Fig Avenue	S	SS	S	S	S	S	S
8	Marshall Road Drain near River Road	S	NF	S	S	S	S	NF
9	Orestimba Cr at River Road	NF	NF	NF	NF	NF	NF	NF
10	Orestimba Cr at Hwy 33	S	SS	S	S	S	NA	S
11	Newman Wasteway near Hills Ferry Road	S	SS	S	S	S	S	S
13	San Joaquin River at Lander Avenue	S	SS	S	S	S	S	S
14	Mud Slough u/s San Luis Drain	S	SS	S	S	S	S	S
15	Salt Slough at Lander Avenue	S	SS	S	S	S	S	S
16	Salt Slough at Sand Dam	S	SS	S	S	S	S	S
17	Los Banos Creek at Highway 140	S	SS	S	S	S	S	S
18	Los Banos Creek at China Camp Road	S	SS	S	S	S	S	S
19	Turner Slough near Edminster Road	S	SS	S	S	NP	NP	NP
20	Blewett Drain near Highway 132	NF	SS	S	S	NF	S	S
21	Poso Slough at Indiana Avenue	S	SS	S	S	S	S	S
	Source Water Sites							
12	San Joaquin River at Sack Dam	S	NP	S	S	S	S	S
22	San Joaquin River at PID Pumps	S	NP	S	S	S	S	S
23	Delta Mendota Canal at Del Puerto WD	S	NP	S	S	S	S	S
Notes:	S = Water sampled according to the MRP.			NF = Not sampled due to lack of flow.				
	SS = Sediment sampled according to the MRP.			NP = Not included in the sampling plan.				
	NA = Not sampled due to lack of safe access.			NS = Not sampled - sample missed.				

SECTION 2: COALITION AND MONITORING PROGRAM DESCRIPTION

In June, 2003, the San Joaquin Valley Drainage Authority (SJVDA) submitted a Conditional Waiver Report for the Westside San Joaquin River Watershed Coalition (Westside Coalition). The Westside Coalition watershed generally lies on the westside of the San Joaquin River from approximately the Stanislaus River on the north to 10 miles south of Mendota and encompasses an area of approximately 460,000 acres. There are approximately 4,000 landowners and 1,500 operators within the watershed. Most of the watershed receives water supplies from the Central Valley Project, while certain areas receive water from the State Water Project. In addition, some areas receive supplies from the San Joaquin River and local water sources, one area receives a Kings River supply, and some areas receive water from groundwater wells. The Delta-Mendota Canal and San Luis Canal run through the watershed. Water deliveries are made to Federal Central Valley Project Contractors and to San Joaquin River Exchange Contractors from these facilities. State water deliveries are also made to one area.

The Westside Coalition area also includes federal, state, and private managed wetlands. These areas share water delivery and drainage conveyance systems with the surrounding agricultural areas. Due to the integrated nature of the water facilities the managed wetlands have joined the Westside Coalition as a wetland sub-watershed participant to comply with the Conditional Waiver to effectively and efficiently address water quality issues. The effects of discharges from the wetland areas are covered in this monitoring program.

The communities of Grayson, Westley, Vernalis, Crows Landing, Patterson, Newman, Gustine, Stevinson, Los Banos, Dos Palos, South Dos Palos, Firebaugh, Mendota and Tranquillity lie within the geographic area of the Westside Coalition. These communities do not have discharges from irrigated lands and are not included in the Westside Coalition, but contribute storm waters and municipal waste waters to the watershed and may impact discharges from irrigated lands.

Interstate Highway 5, State Highways 33, 140, 165 and 152 and many county roads run through the geographic area of the Westside Watershed. Storm water discharges from these roads and highways can contribute contaminants to the same water bodies that carry agricultural return water.

The San Joaquin Valley Drainage Authority, a joint powers agency, is the umbrella organization for the Westside Coalition for purposes of the Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands within the Central Valley Region (Resolution No.R5-2003-0105). On July 30, 2004, the Westside Coalition received approval for its irrigated agricultural monitoring plan from the Central Valley Regional Water Quality Control Board. The first sampling event took place on July 6, 2004, with subsequent event samples collected monthly. In February, 2008, the Westside Coalition received approval for a revised Monitoring and Reporting Plan (Revised MRP). The Revised MRP was designed to focus monitoring efforts at sites with known water or sediment issues and to support the Management Plan issues. The Revised MRP was implemented in March of 2008. Monitoring and Reporting Program Order No. R5-2008-0831 (MRP Order or MRP) was issued by the Regional Board in September 2008. This order was largely reflective of the Revised MRP and took effect in March 2009, modified after the 2011/12 assessment period. See **Attachment 7**.

The MRP Order includes a targeted monthly sampling plan for 22 monitoring sites within the Coalition area as well as plans for sampling for two rain events during each year. The monitoring sites include three source water sites and 19 sites that discharge agricultural drain water.

During any given sampling event, each accessible site is visited, visually assessed, and samples are collected in accordance with the field sampling manual. See **Table 2.**

The objectives of the original monitoring program are:

- To assess the existing water quality characteristics of major agricultural drains within the watershed area.
- To determine the location and magnitude of water quality problems.
- To determine the cause of water quality problems and develop solutions.

Two sampling crews have been trained by the analytical laboratories to collect samples according to the Westside Coalition's QAPP and Field Sampling Manual. These crews are responsible for collecting samples at each of the 22 sites; the field coordinator for the northerly region is responsible for collecting samples north of Newman Wasteway. The field coordinator for the southerly region is responsible for collecting samples south of (and including) Newman Wasteway. The sampling responsibilities include completion of the field data sheets, collection of water and sediment samples, completion of labels and chain of custody sheets, and

coordination with the labs for sample pickup. The MRP Sample Regimens at each site are shown in **Table 3**. The laboratory, method, and constituent groups analyzed are shown in **Table 4** and a list of specific analytes is included in **Attachment 7**.

Table 3: Monitoring Stations and Sample Regimen

Monitoring Site	Site Code	2014 Irrigation Season		
		Irrigation (Mar-Aug)	Non-Irrigation (Sep-Feb)	Rain Event (2X per year)
Discharge Sites				
Blewett Drain at Highway 132	VH132	Assmt	Assmt	Rain
Poso Slough at Indiana Avenue	PSAIA	Assmt	Assmt	Rain
Hospital Cr at River Road	HCARR	Assmt	Assmt	Rain
Ingram Cr at River Road	ICARR	Assmt	Assmt	Rain
Westley Wasteway near Cox Road	WWNCR	Assmt	Assmt	Rain
Del Puerto Cr near Cox Road	DPCCR	Assmt	Assmt	Rain
Del Puerto Cr at Hwy 33	DPCHW	Assmt	Assmt	Rain
Ramona Lake near Fig Avenue	ROLFA	Assmt	Assmt	Rain
Marshall Road Drain near River Road	MRDRR	Assmt	Assmt	Rain
Orestimba Cr at River Road	OCARR	Assmt	Assmt	Rain
Orestimba Cr at Hwy 33	OCAHW	Assmt	Assmt	Rain
Newman Wasteway near Hills Ferry Road	NWHFR	Assmt	Assmt	Rain
San Joaquin River at Lander Avenue	SJRLA	Assmt	Assmt	Rain
Mud Slough u/s San Luis Drain	MSUSL	Assmt	Assmt	Rain
Salt Slough at Lander Avenue	SSALA	Assmt	Assmt	Rain
Salt Slough at Sand Dam	SSASD	Assmt	Assmt	Rain
Los Banos Creek at Highway 140	LBCHW	Assmt	Assmt	Rain
Los Banos Creek at China Camp Road	LBCCC	Assmt	Assmt	Rain
Turner Slough near Edminster Road	TSAER	Assmt	Assmt	Rain
Source Water Sites				
San Joaquin River at Sack Dam	SJRSD	Source	Source	Source
Delta Mendota Canal at Del Puerto WD	DMCDP	Source	Source	Source
San Joaquin River at PID Pumps	SJRPP	Source	Source	Source

Table 4: Analytes, Laboratories, and Methods

	Constituent	Laboratory	Method	Units	Laboratory SOP No.
Field Data	pH	Field Crew	YSI meter	-	Field Manual
	Temperature	Field Crew	YSI meter	ºC	Field Manual
	Conductivity	Field Crew	YSI meter	µmhos/cm	Field Manual
	Dissolved Oxygen	Field Crew	YSI meter	mg/L	Field Manual
	Flow	Field Crew	Estimate	cfs	Field Manual
Gen. Phy. / D.W.	Color (A.P.H.A.)	Caltest	SM 2120B	-	COLOR-rev4E
	pH	Caltest	SM 4500-H+B	-	PH-rev4
	TDS	Caltest	SM 2540C	mg/L	TDS-rev4E
	TSS	Caltest	SM 2540D	mg/L	TSS-rev4
	Turbidity	Caltest	SM 2130B	NTU	TURB-rev4E
	Hardness	Caltest	EPA 130.2	mg/L	HARD-rev5E
	Metals	Caltest	EPA 200.7, 200.8	mg/L	M-ICP-rev10E & 2008rev5Ea
	Bromide/Nitrate	Caltest	EPA 300.0	mg/L	DIONEX-rev5E
	Nitrogen, Nitrite	Caltest	EPA 354.1	mg/L	NO2-rev6
	TKN	Caltest	EPA 351.3	mg/L	NH3-TKN-rev6E
	Phosphate	Caltest	EPA 365.2	mg/L	PHOS-rev4
	Ammonia (as N)	Caltest	EPA 350.2	mg/L	NH3-TKN-rev6E
	DOC	Caltest	SM 5310-B/C	mg/L	TOC-D0C-rev7E
	TOC	Caltest	SM 5310-B/C	mg/L	TOC-D0C-rev7E
	Fecal coliform	Caltest	SM20-9221B/E	mpn/100ml	MMOMUG-rev8E
	E. Coli	Caltest	SM 9221BF/9223-B	mpn/100ml	MMOMUG-rev8E
Pesticides	Organophosphates	APPL	EPA 8141A	µg/L	ANA8141A
	Organochlorines	APPL	8081A/8082	µg/L	ANA8081A
	Carbamates	APPL	EPA 8321A LL	µg/L	HPL8321A
	Herbicides	APPL	EPA 8141A	µg/L	ANA8151A
Sediment	Organochlorine	Caltest	SW846 8081	mg/kg (dry)	8081rev8
	Pyrethroid	Caltest	SW846 8270(SIM)	mg/kg (dry)	Pyrethroidsrev4a
	% Solids	Caltest	EPA 160.3	%	Residue-rev6
	TOC	Caltest	EPA 9060A	%	WalkleyBlack TOC
Toxicity	*Ceriodaphnia d.*	PER	EPA-821-R-02-012	% survival	Acute Cerio SOP
	Selenastrum c.	PER	EPA-821-R-02-013 & EPA-600-4-91-002	cell growth	Chronic Selenastrum SOP
	Pimephales p.	PER	EPA-821-R-02-012	% survival	Acute FHM SOP
	Hyalella a.	PER	EPA-600-R-99-064	% survival	10-D HyalellaAcuteSedTest

Caltest Labs in Napa, California
APPL Labs in Fresno, California
Pacific EcoRisk (PER) in Fairfield, California

Aquatic toxicity samples were collected and analyzed by Pacific EcoRisk, Inc. using the methods described below:

- *Ceriodaphnia dubia*: "Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms" (USEPA 2002a).
- *Pimephales promelas*: "Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms" (USEPA 2002a).
- *Selenastrum capricornutum*: "Short-term Methods for Estimated the Chronic Toxicity of Effluents and Receiving Water to Freshwater Organisms" (USEPA 2002b).
- *Hyalella azteca*: "Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Organisms" (USEPA 2000).

SECTION 3: MONITORING EVENT SUMMARIES

Monitoring Event Summaries.
In accordance with the MRP order, irrigation season monitoring was implemented at all discharge sites beginning in March 2014. Each site was visited monthly during the reporting period and samples were collected from every site with sufficient water to submerge and fill a sample container.

Three CIMIS[1] stations were monitored by the Westside Coalition for rainfall: Patterson, Los Banos, and Firebaugh. **Table 5** summarizes the monthly rainfall measured at each station.

Table 5: Monthly Rainfall in Inches

Month	Patterson	Los Banos	Firebaugh
March	1.36	1.09	0.71
April	0.68	0.36	0.53
May	0.00	0.02	0.02
June	0.00	0.00	0.04
July	0.00	0.00	0.17
August	0.00	0.00	0.11
Report Period Total	2.04	1.47	1.58

Rainfall during the 2014 irrigation season was typical of summer precipitation conditions and no significant storms occurred.

Rain Event 15 and Event 111, March 3rd and 10th, 2014.
Irrigation season water samples were collected at 14 discharge sites and 3 source water sites on March 3rd in accordance with the Westside Coalition MRP. There was insufficient flow for sample collection at Blewett Drain, Hospital Creek, Del Puerto Creek at Highway 33, and Orestimba Creek at River Road; Westley Wasteway could not be sampled due to lack of safe access. Aquatic toxicity was tested for algae, invertebrates, and fish in accordance with the Monitoring Order (see **Attachment 7**). Aquatic toxicity to Selenastrum was observed at San Joaquin River at Lander Ave. (SJRLA) and Orestimba Creek at Hwy. 33 sites (36.4% and 63.9% different from the lab control respectively) with diuron and prowl detected in the samples. A Phase 1 Toxicity Identification Evaluation (TIE) was performed on the SJRLA sample and the TIE results suggest a non-polar organic compound (e.g. herbicide) may have contributed to the toxicity of the sample; the herbicide Diuron was detected at the SJRLA site.

Sediment samples were collected at 16 monitoring sites on March 10th. Significant toxicity was observed in the Blewett Drain (61.3% survival) sample, the Hospital Creek sample (87.5% survival), the Ingram Creek sample (40% survival), the Westley Wasteway sample (87.5% survival), the Del Puerto Creek near Cox Road sample (23.8% survival), the Ramona Lake sample (81.3% survival), the Orestimba Creek at Highway 33 sample (76.2% survival), the Los Banos Creek at Highway 140 sample (92.9% survival), the Los Banos Creek at China Camp Road sample (88.8% survival), Salt Slough at Sand Dam sample (81.3% survival). Although the

[1] California Irrigation Management Information System, http://wwwcimis.water.ca.gov/cimis/welcome.jsp

toxicity in the Ramona Lake, Hospital Creek, Westley Wasteway, Los Banos Creek at Hwy 140, Los Banos Creek at China Camp Rd., and Salt Slough at Sand Dam samples were statistically significant, they did not require follow-up testing. Sediment from the Blewett Drain, Ingram Creek, Del Puerto Creek near Cox Rd., and Orestimba Creek at Hwy 33 samples were sent to Caltest Laboratories for pesticide analysis. In those four sediment samples, pesticides were present in sufficient concentration to have caused the observed toxicity. See **Section 8** and **Attachment 4**.

Event 112, April 8th, 2014.
Irrigation season water samples were collected at 18 discharge sites and 3 source water sample sites. There was insufficient flow to collect samples at Orestimba Creek at River Road site. Aquatic toxicity samples were collected in accordance with the MRP and Selenastrum toxicity was observed in the Orestimba Creek at Hwy 33 sample. A Phase 1 TIE was performed on the Orestimba Creek at Hwy 33 sample and it was determined that multiple compounds may have been responsible for the toxicity of the ambient water sample. The pesticide analysis determined that only the pesticide dimethoate was present in the ambient water sample. No aquatic toxicity was observed in any of the other samples.

Event 113, May 13th, 2014.
Irrigation season water samples were collected at 18 monitoring sites and 3 source water sites on May 14th. There was insufficient flow to collect samples at the Orestimba Creek at River Road site. Aquatic toxicity samples were collected in accordance with the MRP with no observed toxicity. During the initial toxicity testing of the Los Banos Creek at Hwy 140 sample, toxicity was observed, but the laboratory detected the presence of a foreign algal species. Due to the presence of foreign algal species in the Los Banos Creek at Hwy 140 test replicate flasks, the laboratory, in their best professional judgment, could not definitively conclude that the reduction in algal growth was due to a toxicant, as the foreign species observed in the test could also have reduced algal growth (i.e., competition for nutrients), and that the results from this test should not be used for regulatory compliance purposes.

Event 114, June 10th, 2014.
Irrigation season water samples were collected at 15 monitoring sites and 3 source water sites on June 10th in accordance with the Westside Coalition's MRP[2]. There was insufficient flow at Del Puerto Creek at Highway 33 and Orestimba Creek at River Road for sample collection. Aquatic toxicity was tested in accordance with the MPR with no observed toxicity. Due to the presence of foreign algal species in the Newman Wasteway near Hills Ferry Road (NWHFR) test replicate flasks; it is the laboratory's best professional judgment that the results of this test should not be used for regulatory compliance purposes. There was a test PMSD of ~40% in the Salt Slough at Sand Dam (SSASD) sample that exceeds the EPA 90th percentile of 29%; per EPA guidance, the results from this test are not considered valid.

[2] The Turner Slough near Edminster Road (TSAER) monitoring site has been permanently removed from the monitoring plan as the lands that are represented by the TSAER site have been permanently removed from the Irrigated Lands Regulatory Program and moved into the Dairy Program.

Event 115, July 8th, 2014.
Irrigation season water samples were collected at 15 discharge sites and 3 source water sites. Due to insufficient flow at Del Puerto Creek at Highway 33 and at Orestimba Creek at River Road no samples were collected; the Orestimba Creek at Highway 33 site could not be safely accessed and no sample was collected. Aquatic toxicity samples were collected in accordance with the MRP. No aquatic toxicity was observed in any of the samples. Due to the presence of foreign algal species in the test replicate flasks in both the initial test of the sample collected from Los Banos Creek at Highway 140 (LBCHW) and the re-test of the sample using 0.2 µm filtration, it is the laboratory's best professional judgment that they cannot definitively conclude that the reduction in algal growth was due to a toxicant, as the foreign species observed in the test could also have reduced algal growth (i.e., competition for nutrients). Accordingly, the results from this test should not be used for regulatory compliance purposes.

Event 116, August 12th, 2014.
Irrigation season water samples were collected at 15 discharge sites and 3 source water sites. There was insufficient flow at Del Puerto Creek at Highway 33, Marshall Road Drain near River Road, and at Orestimba Creek at River Road. Aquatic toxicity samples were collected in accordance with the MRP. No aquatic toxicity was observed in any of the samples. There was test interference for the Poso Slough at Indiana Avenue PSAIA algae test due to the presence of foreign algal species in test replicate flasks for this sample (foreign algal species were not present in the Lab Control test replicate flasks). This likely caused high inter-replicate variability, resulting in a test PMSD that exceeded the EPA's 90th percentile PMSD established for this test method. Based on the presence of foreign algal species that would compete for nutrients with the *Selenastrum* added to the test chambers and the elevated PMSD, it is the laboratory's best professional judgment that the results of this test should not be used for regulatory compliance purposes.

SECTION 4: SAMPLING SITE AND WATERSHED DESCRIPTIONS

Figure 1 shows the Westside Coalition area and the location of the monitoring sites. Following is a description and rationale for the monitoring sites.

- Blewett Drain near Highway 132 (originally called Vernalis at Highway 132 [VH132]). This site is located at the northerly boundary of the Westside Coalition. The cropping pattern for discharges into this drain is similar to that of Hospital Creek. Flow at this site is calculated as an estimated velocity and measured flow area. The Westside Coalition began monitoring this site in 2008.
- Poso Slough at Indiana Avenue (PSAIA). This site is located on Poso Slough near the boundary between San Luis Canal Company and Central California Irrigation District in the Dos Palos Subarea of the Westside Coalition. Flow at this site is calculated as an estimated velocity and measured flow area. The Westside Coalition began monitoring this site in 2008. Poso Slough is a tributary to Salt Slough, discharging upstream of the Sand Dam monitoring site.
- Hospital Creek at River Road (HCARR). This site is a significant drainage for the Patterson Subarea of the Westside Coalition and has been monitored since July 2004 for a variety of constituents. Sediment discharge, sediment toxicity, aquatic toxicity (water

flea), and pesticides have been measured at this site. It is on the 303(d) list for pesticides. Flow at this site is measured by a rectangular weir.

- Ingram Creek at River Road (ICARR). This site is a significant drainage for the Patterson Subarea of the Westside Coalition and has been monitored since July 2004 for a variety of constituents. Sediment discharge, sediment toxicity, aquatic toxicity (water flea), and pesticides have been measured at this site. It is on the 303(d) list for pesticides. Flow at this site is measured by a rectangular weir.
- Westley Wasteway near Cox Road (WWNCR). Westley Wasteway is a significant drainage for the Patterson Subarea for both tailwater and storm runoff. Land use upstream of this monitoring station is similar to that of Del Puerto Creek. This site has been monitored for a variety of constituents since 2004. Sediment discharge, sediment toxicity, aquatic toxicity (water flea), and pesticides have been measured at this site. Flow at this site is measured by a rectangular weir.
- Del Puerto Creek near Cox Road (DPCCR) and Del Puerto Creek near Highway 33 (DPCHW). Del Puerto Creek is on the 303(d) list for pesticides and is a major drainage for the Patterson Subarea and major storm runoff collector. Two stations are identified on this water-body; one near the discharge to the San Joaquin River, and one at Highway 33, near the middle of the Patterson Subarea. Biological assessments are performed on Del Puerto Creek to assess its overall health, which will be useful in relating to collected water quality data. Both of these sites have been monitored for a variety of constituents since 2004. Sediment discharge, sediment toxicity, aquatic toxicity (water flea), and pesticides have been measured at both sites. At the Highway 33, flow is estimated using the float method. A family of beavers have constructed a dam downstream of the Cox Road site, creating a backwater that prevents safe flow measurement at the site. The Coalition is considering options to address this issue.
- Ramona Lake near Fig Avenue (ROLFA). This site monitors discharge from a small lake as it flows into the San Joaquin River. Agricultural and storm runoff from the Patterson Subarea can discharge into the lake. This site has been monitored for a variety of constituents since 2004. Some pesticides have been measured at this site.
- Marshall Road Drain near River Road (MRDRR). This site monitors a pipe drain that carries agricultural and storm runoff from the Patterson Subarea of the Westside Coalition. This site has been monitored for a variety of constituents since 2004. Some pesticides and aquatic toxicity have been measured at this site. Flow from this site is measured by a weir within the pipe. During periods of high flow, the weir can become submerged and incapable of measuring flow.
- Orestimba Creek at River Road (OCARR) and Highway 33 (OCAHW). There are two monitoring locations on Orestimba Creek; one near the discharge point to the San Joaquin River; and one upstream at Highway 33. Orestimba Creek is similar to that of Del Puerto in both the surrounding landscape and discharged water quality. It is on the 303(d) list for pesticides, is a major drainage for the Patterson Subarea, and is included in the biological assessment portion of the monitoring program. Pesticides, sediment discharge, sediment toxicity, and aquatic toxicity have been measured at these sites. USGS monitors and reports flow at Orestimba Creek at River Road. Flow at Orestimba Creek at Highway 33 is calculated through an estimated velocity and cross-sectional flow area.

- Newman Wasteway near Hills Ferry Road (NWHFR). The Newman Wasteway is a significant drainage for the Patterson Subarea and is on the 303(d) list for salt and pesticides. This site measures drainage that originates from the southerly region of the Patterson Subarea, and has been monitored for a variety of constituents since 2004. Pesticides, sediment discharge, sediment toxicity, and aquatic toxicity have been measured at this site. Flow at this site is calculated through an estimated velocity and cross-sectional flow area.
- The San Joaquin River at Lander Avenue (SJRLA). This site is both a receiving water body for agricultural and storm drainage and a source water for districts that pump from the San Joaquin River. It also receives drainage flows from irrigated wetlands in the fall and winter months. It has been monitored for a variety of constituents since 2004, and pesticides, sediment toxicity, and aquatic toxicity have been measured. Flow at this site is reported by a nearby CDEC station.
- Mud Slough upstream of the San Luis Drain (MSUSL). This site measures drainage originating from the Dos Palos and Los Banos Subareas that flow through the wetlands as well as the wetlands themselves. Mud Slough is on the 303(d) list for a variety of constituents. In addition to the Westside Coalition's monitoring program, the Central Valley Regional Water Quality Control Board's Surface Water Ambient Monitoring Program (SWAMP) collects and analyzes samples from this site throughout the year. These samples are analyzed for selenium, boron, and EC, along with other constituents. Flow at this site is calculated as the difference between the flow downstream of the San Luis Drain (reported by CDEC) and the measured San Luis Drain Discharge. The SWAMP Data is available via the internet at: http://www.waterboards.ca.gov/centralvalley/programs/agunit/swamp/index.html.
- Salt Slough at Lander Avenue (SSALA) Salt Slough at Lander Avenue measures agricultural, storm, and wetland runoff from the Dos Palos and Los Banos Subareas, and has been monitored (and 303(d) listed) for a variety of constituents since 2004. In addition to the Westside Coalition's monitoring program, the Central Valley Regional Water Quality Control Board, SWAMP collects and analyzes samples from this site throughout the year. These samples are analyzed for selenium, boron, and EC, along with other constituents. Flow at this site is reported by CDEC. The SWAMP Data is available via the internet at: http://www.waterboards.ca.gov/centralvalley/programs/agunit/swamp/index.html.
- Salt Slough at Sand Dam (SSASD). This site is upstream of the Lander Avenue site and measures agricultural and storm drainage originating in portions of the Dos Palos Subarea. Pesticides and aquatic toxicity have been measured at this site, which has been monitored for a variety of constituents since 2004. Flow at this site is measured by a weir.
- Los Banos Creek at Highway 140 (LBCHW). This site carries agricultural, storm and irrigated wetland runoff from the Los Banos Subarea. Some pesticides have been measured at this site. Flow at this site is calculated through an estimated velocity and cross-sectional flow area.
- Los Banos Creek at China Camp Road (LBCCC). This site monitors agricultural and storm runoff from the Los Banos Subarea, upstream of the Highway 140 site. There is a farmer-maintained dam downstream of this site which is frequently used to stop flows so

that it may be diverted for irrigation. Flow at this site is calculated through an estimated velocity and cross-sectional flow area.

- *Turner Slough near Edminster Road (TSAER). The Turner Slough near Edminster Road monitoring site was permanently removed from the monitoring plan in June of 2014. The lands that are represented by the TSAER site have been permanently removed from the Irrigated Lands Regulatory Program and moved into the Dairy Program.*
- San Joaquin River at Sack Dam (SJRSD). This is a source water monitoring site located at the diversion point for San Luis Canal Company. This site is monitored for source water constituents. Flow at this site is measured across the dam.
- Delta Mendota Canal at Del Puerto Water District (DMCDP). This site monitors water quality in the Delta Mendota Canal at a Del Puerto Water District turnout. This site characterizes the source water quality typical of the Delta Mendota Canal, and is monitored for source water constituents. Flow is not measured at this site.
- San Joaquin River at Patterson Irrigation District Pumps (SJRPP). This monitoring site is located at the Patterson Irrigation District pump station on the San Joaquin River and characterizes the source water quality of the San Joaquin River in the Patterson Subarea. This site is monitored for source water constituents. Flow from this site is reported by CDEC. This site is the same as the San Joaquin River at Las Palmas site listed in the Chlorpyrifos and Diazinon TMDL program.

Table 6 lists the monitoring sites and coordinates in the WGS84 datum.

Table 6: Monitoring Site Coordinates

Site	Latitude (N)	Longitude (W)
Hospital Cr at River Road	37.61047	121.23078
Ingram Cr at River Road	37.60022	121.22506
Westley Wasteway near Cox Road	37.55822	121.16372
Del Puerto Cr near Cox Road	37.53936	121.12206
Del Puerto Cr at Hwy 33	37.51406	121.15956
Ramona Lake near Fig Avenue	37.47875	121.06839
Marshall Road Drain near River Road	37.43631	121.03617
Orestimba Cr at River Road	37.41386	121.01489
Orestimba Cr at Hwy 33	37.37717	121.05856
Newman Wasteway near Hills Ferry Road	37.32036	120.98336
San Joaquin River at Sack Dam	36.98353	120.50050
San Joaquin River at Lander Avenue	37.29506	120.85139
Mud Slough u/s San Luis Drain	37.26164	120.90614
Salt Slough at Lander Avenue	37.24797	120.85225
Salt Slough at Sand Dam	37.13664	120.76194
Los Banos Creek at Highway 140	37.27619	120.95547
Los Banos Creek at China Camp Road	37.11447	120.88953
Turner Slough near Edminster Road	37.30411	120.90083
Blewett Drain at Highway 132	37.64053	121.22942
Poso Slough at Indiana Ave	37.00622	120.59033
SJR at PID Pumps	37.49739	121.08267
DMC at Del Puerto WD	37.43678	121.13347

FIGURE 1: WATERSHED MAP W/ MONITORING SITES.

More than 59 different varieties of crops are grown within the Westside Coalition watershed area, ranging from fruit and nut trees to melons and cotton. **Table 7** shows the top ten crops within the Coalition area based on 2013 irrigation season USDA data (2014 data is not yet available).

Table 7: Top 10 Crops Grown by County

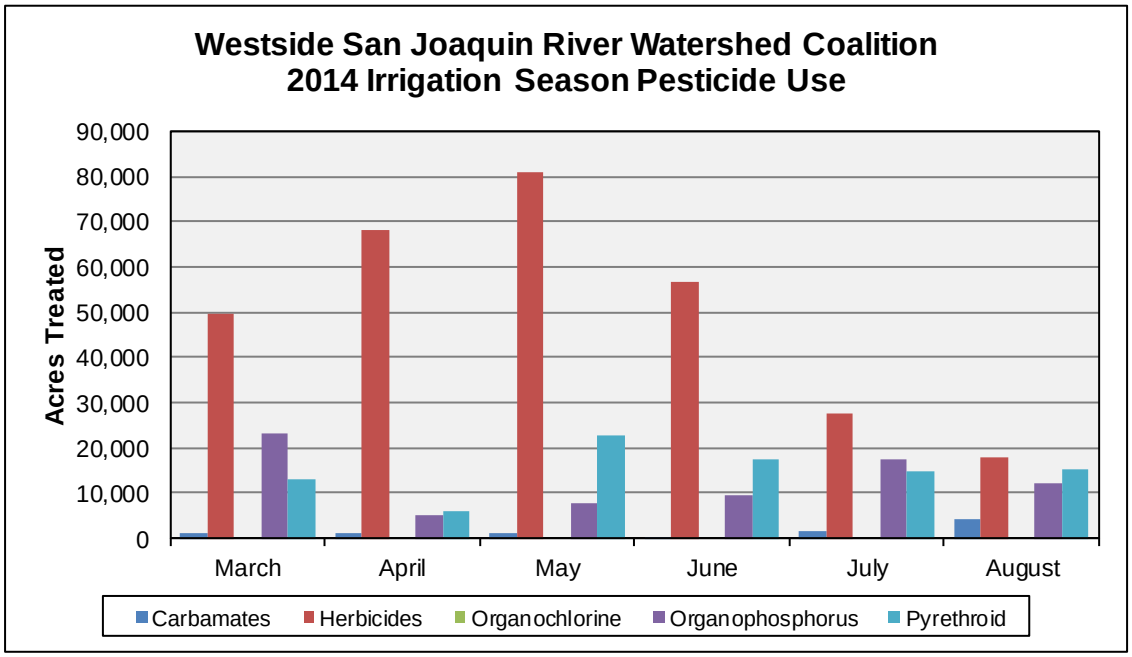
Fresno	Merced	Stanislaus
Almonds	Alfalfa	Almonds
Cotton	Cotton	Alfalfa
Alfalfa	Winter Wheat	Tomatoes
Tomatoes	Almonds	Walnuts
Winter Wheat	Tomatoes	Oats
Corn	Corn	Winter Wheat
Grapes	Oats	Dry Beans
Pistachios	Hay/Non Alfalfa	Grapes
Rice	Walnuts	Corn
Onions	Barley	Hay/Non Alfalfa

These crops are dispersed approximately evenly throughout the Coalition area, with the exceptions of cotton (mostly in the Los Banos, Dos Palos and Tranquillity Subareas), and fruit trees and beans (mostly in the Patterson Subarea). The planting practices are typical for conventional agriculture within the Central Valley. A complete crop list and detailed crop calendar was presented in the "Watershed Evaluation Report", submitted in April, 2004.

Annual field crops are typically planted as seed or transplants after the field has been pre-irrigated to provide salt leaching and soil moisture for germination. These crops can be irrigated using various methods, such as, furrow irrigated using a plowed head-ditch or gated pipe; sprinkler irrigated with hand-move sprinkler pipe; sub-surface drip irrigated. Permanent field crops such as pasture or alfalfa are usually flood or sprinkler irrigated. The younger fruit and nut trees are almost universally irrigated with drip or micro-sprinkler systems, though some of the older orchards are still flood irrigated.

The irrigation season is typically the peak of agricultural activity, with most planting occurring between March and May. Intensive irrigation and cultivation activities begin just after planting and carrying on until harvest. Harvest timing is dependent or crop and weather conditions and may be as early as July or as late as October. Pesticide applications during the non-irrigation season include both insecticides and herbicides and will be applied according to the growth stage of the affected crop and the actual pest pressures. **Figure 2** shows the 2014 irrigation season monthly pesticide application within the Westside Coalition by pesticide group. Note that data for the full period is not available yet.

Figure 2: 2014 Irrigation Season Pesticide Use.



A more detailed review of pesticide use and detections is provided in **Section 8**. **Table 8** shows the 10 most commonly applied pesticides during the 2014 irrigation season (by acreage) within the three counties occupied by the Westside Coalition. A complete list of reported pesticide applications is included in **Attachment 6**.

Table 8: Most Commonly Applied Pesticides by County - 2014 Irrigation Season

Fresno County		Merced County		Stanislaus County	
Pesticide	**Class**	**Pesticide**	**Class**	**Pesticide**	**Class**
GLYPHOSATE	Herbicide	GLYPHOSATE	Herbicide	GLYPHOSATE	Herbicide
BIFENTHRIN	Pyrethroid	DIMETHOATE	Organophosphorus	LAMBDA-CYHALOTHRIN	Pyrethroid
PENDIMETHALIN	Herbicide	S-METOLACHLOR	Herbicide	DIMETHOATE	Organophosphorus
PARAQUAT DICHLORIDE	Herbicide	TRIFLURALIN	Herbicide	OXYFLUORFEN	Herbicide
LAMBDA-CYHALOTHRIN	Pyrethroid	CHLORPYRIFOS	Organophosphorus	ESFENVALERATE	Pyrethroid
S-METOLACHLOR	Herbicide	LAMBDA-CYHALOTHRIN	Pyrethroid	PENDIMETHALIN	Herbicide
CLETHODIM	Herbicide	PENDIMETHALIN	Herbicide	PARAQUAT DICHLORIDE	Herbicide
OXYFLUORFEN	Herbicide	PARAQUAT DICHLORIDE	Herbicide	BIFENTHRIN	Pyrethroid
SAFLUFENACIL	Herbicide	OXYFLUORFEN	Herbicide	SAFLUFENACIL	Herbicide
RIMSULFURON	Herbicide	BETA-CYFLUTHRIN	Pyrethroid	CHLORPYRIFOS	Organophosphorus

SECTION 5: FIELD SAMPLING PROCEDURE

Field water quality data and sample collections were collected as outlined in the Westside Coalition's Quality Assurance Project Plan (QAPP) and Field Sampling Manual. Two sampling crews have been trained by the analytical laboratories to collect samples according to the Westside Coalition's QAPP and Field Sampling Manual. These crews are responsible for collecting samples at each of the monitoring sites. The field coordinator for the northerly region is responsible for collecting samples from north of Newman Wasteway. The field coordinator for the southerly region is responsible for collecting samples south of (and including) Newman Wasteway. The sampling responsibilities include completion of the field data sheets, collection of water and sediment samples, completion of labels and chain of custody sheets, and coordination with the labs for sample pickup. Samples are collected as either a direct grab from the water-body or as a bucket grab, where a large volume of water is collected in a stainless steel bucket and transferred to the sample bottles. Details of these collection methods are explained in the Field Sampling Manual. The list of tested constituents is discussed in the MRP Order.

In accordance with the MRP Order, the Westside Coalition collected Assessment Monitoring samples starting with the March 2014 sample event. Aquatic toxicity, pesticides, and metals are analyzed at all discharge sites according to the monitoring plan. See **Attachment 7**.

SECTION 6: FIELD AND LABORATORY QUALITY CONTROL SAMPLES

Laboratory Quality Control Samples. The three laboratories that perform analyses for the Westside Coalition monitoring activities are certified through the National Environmental Laboratory Accreditation Program (NELAP) and perform all testing and analyses according to the most current NELAP standards, including the performance of several quality control tests to ensure all methods and equipment are operating correctly. A few control tests for Pacific EcoRisk, APPL, and Caltest failed to meet acceptability criteria. These failures represented less than 4% of the total QA/QC analyses performed by each lab and do not affect data usability. Details of the laboratory quality control review are included in **Appendix D**. Although the Westside Coalition reviews each of the laboratories' QA/QC results, it considers each of the laboratories to be experts in their respective fields and defers to their judgment regarding data acceptability.

Field Quality Control Samples. Field quality control samples included the collection of field duplicate samples for sediment and aquatic toxicity analysis, and the collection of both field duplicate and field blank samples for pesticides, drinking water, and general physical constituent analysis. It should be noted that the field duplicate samples are typically collected as separate samples simultaneously with the event sample (as opposed to field split samples). The calculated RPD between the event sample and field duplicate sample should be considered a measurement of site water variability.

- **Water Chemistry Analyses.** Six sets of field duplicate and field blank samples were collected during the reporting period and analyzed for general chemistry and drinking water constituents. A comparison of the event samples, duplicate samples, and blank samples is tabulated in **Attachment 3**. A total of 156 duplicate analyses were completed

and compared to the event sample results. Twenty three (23) duplicate samples exceeded the 25% relative percent difference (RPD) established in the QAPP for:

Ammonia (N)	Bromide	Cadmium (total)	Copper (total)
E. coli	Lead (total)	Nickel (total)	Nitrate+Nitrite as N
TKN	TSS	Turbidity	Zinc (total)

These exceedances of the field duplicate quality control criteria account for less than 15% of the field duplicates analyzed and are reflective of the complicated nature of the site water and the naturally occurring variations of the stream water quality. Although the number of field duplicates exceeding the RPD criteria is higher than in previous report periods, the Westside Coalition does not expect these variations to impact data usability.

Six field blank sample sets were analyzed during the report period (156 results, total). Of these, ten (10) analyses resulted in values greater than 20% of the event sample result for:

Copper (dissolved)	Copper (total)	Lead (dissolved)
Zinc (dissolved)	Zinc (total)	

- **Pesticide Analyses.** Six field duplicate and field blank samples sets were collected during the reporting period and analyzed for pesticides (336 duplicate and 338 blank results). Calculated RPD for field duplicate had one (1) exceedance of the 25% threshold criteria for chlorpyrifos and the field blank results had two (2) exceedances of the 20% threshold criteria for methamidophos during this report period. The results of the field blank, field duplicate and event sample comparisons are tabulated in **Attachment 3**.

- **Aquatic Toxicity Analyses.** Field duplicate samples were collected and analyzed for toxicity to all species tested during the report period. The calculated RPD value did not exceeded the 25% threshold for the sampling events for this report period.

- **Sediment Toxicity Analyses.** A field duplicate sample was collected for sediment toxicity during the March sampling event (Event 111). The measured RPD was 1.4%.

Completeness for sampling collection and analysis was reviewed for samples collected during this monitoring program. Completeness was measured for sample collection and transit, sample analysis, and field quality control samples.

- Collection and Transit: Completeness for this report period is 100%.
- Sample Analysis: Completeness for sample analysis during this reporting period is 100%.
- Field Quality Control Samples: All field quality control samples were collected and analyzed. Completeness for toxicity duplicate samples is 100% for this reporting period. The completeness for field blank and duplicate samples is 100% for both pesticide analyses and water chemistry samples.

SECTION 7: ANALYTICAL METHODS

Table 4 indicates the laboratories responsible for the analytical results of this monitoring program, the analytical method used, and the standard operating procedure (SOP) document number. This table reflects the constituents analyzed as part of the Revised MRP.

Chain of Custody (COC) sheets were maintained from the time of sample collection to receipt at the laboratories. Copies of the COC sheets are included in **Appendix A**, along with a summary of the data results. The data summary includes all of the field readings, analytical chemistry results, pesticide scan results, and toxicity screening test results. The original laboratory reports are included in **Appendix C**. These reports also include all of the field and internal quality control results.

The laboratory original data sheets (raw data) for the toxicity results are included in **Appendix C**, as part of the laboratory reports. Raw data for general physical results, drinking water results, and pesticide results are kept by the laboratories for a minimum of five years and are available upon request.

SECTION 8: DATA INTERPRETATION

The primary objective of the monitoring program is to identify water bodies that are adversely affected by agricultural discharges and to help determine the impacts of management activities. The monitoring program has used a combination of toxicity tests and pesticide analyses, along with close coordination among districts and growers to not only identify problem areas but also to determine the magnitude and cause of the problems. During this report period, toxicity analyses for all three species along with pesticide analyses and metals analyses were performed according to the irrigation season Special Monitoring schedule included in the MRP Order (as modified in the March 2012 letter. See **Attachment 7**).

The Westside Coalition's monitoring program includes 22[3] monitoring sites on the Westside of the San Joaquin Valley (see **Table 2** and **Figure 1**). These sites are representative of the various regions within the Coalition and include agricultural discharge sites, storm drainage sites, and irrigation source water sites. A summary of this data is presented in **Appendix A**, and the laboratory data reports are provided in **Appendix C**.

All of the analyzed parameters were reviewed regularly to evaluate the overall health of the water bodies within the Coalition area. This reporting period covered the 2014 irrigation season months, during which there was significant agricultural activity. Based on incidental reports from growers, pest pressures during this irrigation season were high requiring aggressive actions to manage pests. Statistically significant aquatic toxicity occurred three times during two sample events. These observations of aquatic toxicity are summarized below and detailed in **Attachment 2**.

[3]The Turner Slough near Edminster Road monitoring site was permanently removed from the monitoring plan in June of 2014. The lands that are represented by the TSAER site have been permanently removed from the Irrigated Lands Regulatory Program and moved into the Dairy Program.

Selenastrum capricornutum (algae). There were three observations of *Selenastrum* toxicity at 2 monitoring sites during this report period. This toxicity occurred during the March event (two sites), the April event (one site).

Rain Event 15 (March)

- Orestimba Creek at Hwy 33 – 64% of control growth. Follow up testing was not required (sample growth was >50% of control growth); no pesticides were detected that would account for the toxicity.
- San Joaquin River at Lander Ave. - 36% of control growth. A TIE was performed and the results suggest that a non-polar organic compound (e.g. herbicide) was responsible for the toxicity. Diuron was detected (5.4µg/L) and was probably the cause.

Event 112(April)

- Orestimba Creek at Hwy 33 - 41% of control growth. A TIE was performed and the results suggest that multiple compounds could have been responsible for the observed toxicity. No herbicides were detected in the sample and the cause of the toxicity is unknown.

Ceriodaphnia dubia (water flea). There were no observations of Ceriodaphnia dubia toxicity during this report period.

Pimephales promelas (fathead minnow). There were no observations of fathead minnow toxicity during this report period.

Sediment Toxicity (*Hyalella azteca*). Sixteen samples and one duplicate sample were collected and tested for toxicity to *Hyalella azteca* on March 10, 2014. Statistically significant toxicity was measured at ten sites – four of which exhibited severe toxicity (<80% survival). Follow up pesticide analysis were performed on those four samples. **Table 9** lists the results for the sites exhibiting sediment toxicity. **Table 10** summarizes the detected pesticide data at those four sites. See **Appendix C** for the full laboratory report. **Table 11** shows the sediment toxicity results since September 2009.

Table 9: Sites Exhibiting Statistically Significant Toxicity to *Hyalella azteca.*

Site	Percent Survival
Blewett Drain at Highway 132*	61.3%
Hospital Creek at River Road	87.5%
Ingram Creek at River Road*	40%
Westley Wasteway near Cox Road	87.5%
Del Puerto Creek near Cox Road*	23.8%
Ramona Lake near Fig Avenue	81.3%
Orestimba Creek at Highway 33*	76.2%
Los Banos Creek at China Camp Road	88.8%
Los Banos Creek at Highway 140	92.9%
Salt Slough at Sand Dam	81.3%

* Sample analyzed for specific pesticides.

Table 10: Detected Pesticides in Sediment Samples - March 2014

	Blewett Drain at Hwy 132	Ingram Creek at River Rd.	Del Puerto Creek Near Cox Road	Orestimba Creek at Highway 33
Sediment Toxicity (% survival)	61.3	40	23.8	76.2
Percent Solids (%)	95	93	89	89
Bifenthrin (ng/g)	3.4	1.7	3.9	9.3
Chlorpyrifos (ng/g)	4.0	3.9	34	0.71
Lambda-cyhalothrin (ng/g)	0.31**j**	1.7	4.0	3.7
Cyfluthrin (ng/g)	ND	ND	ND	0.16**j**
Cypermethrin (ng/g)	ND	0.7	ND	ND
DDD (ng/g)	ND	2.1**j**	2.6**j**	17
DDE (ng/g)	11	52	47	170
DDT (ng/g)	2.3**j**	18	8.0	14
Es/Fenvalerate (ng/g)	0.89	1.7	1.3	2.1
Total Organic Carbon (mg/kg)	3,500	5,200	12,000	22,000

Details of the sediment pesticide analyses are in **Attachment 4.**

Table 11: Sediment Toxicity Results.

Site	Mar 14 % Survival	Mar 14 Toxicity (Y/N)	Sept 13 % Survival	Sept 13 Toxicity (Y/N)	Mar 13 % Survival	Mar 13 Toxicity (Y/N)	Sept 12 % Survival	Sept 12 Toxicity (Y/N)
Blewett Drain (Vernalis at hwy 132)	**61.3**	**Y**	86.2	N	**3.75**	**Y**	**3.75**	**Y**
Hospital Creek	**87.5**	**Y**	**0**	**Y**	96.3	N	**2.5**	**Y**
Ingram Creek	**40**	**Y**	**0**	**Y**	**1.25**	**Y**	**1.3**	**Y**
Westley Wasteway	**87.5**	**Y**	**2.5**	**Y**	**1.25**	**Y**	**13.8**	**Y**
Del Puerto Creek (Cox Rd)	**23.8**	**Y**	90	N	96.2	N	93.8	N
Del Puerto Creek (Hwy 33)			**58.8**	**Y**	98.8	N		
Orestimba Creek at River Rd.					98.8	N	77.5	N
Orestimba Creek at Hwy 33	**76.2**	**Y**			93.8	N	**10**	**Y**
Ramona Lake at Fig Ave.	**81.3**	**Y**	93.3	N	**91.3**	**Y**	96.3	N
Newman Wasteway	90	N			**90**	**Y**	92.5	N
Poso Slough	95	N	96.3	N	98.8	N	91.3	N
Turner Slough	91.3	N						
SJR at Lander	96.3	N						
Salt Slough at Lander	95	N						
Salt Slough at Sand Dam	**81.3**	**Y**	97.5	N	83.8	N	96.3	N
Los Banos Creek at Hwy 140	**92.9**	**Y**						
Los Banos Creek at China Camp Rd.	**88.8**	**Y**	**80**	**Y**	100	N	85	N
Mud Slough	98.8	N						

Site	Mar 12 % Survival	Mar 12 Toxicity (Y/N)	Sept 11 % Survival	Sept 11 Toxicity (Y/N)	May 11 % Survival	May 11 Toxicity (Y/N)	Sept 10 % Survival	Sept 10 Toxicity (Y/N)
Blewett Drain (Vernalis at hwy 132)	95	N	**56.3**	**Y**	86.3	N		
Hospital Creek	**81.3**	**Y**	**20**	**Y**	**8.75**	**Y**	**0**	**Y**
Ingram Creek	**60**	**Y**	**0**	**Y**	**16.3**	**Y**	**0**	**Y**
Westley Wasteway	**15**	**Y**	90	N	93.8	N	**41.2**	**Y**
Del Puerto Creek (Cox Rd)	97.5	N	88.8	N	81.3	N	**0**	**Y**
Del Puerto Creek (Hwy 33)	98.6	N			96.3	N	**81.2**	**Y**
Orestimba Creek at River Rd.	97.5	N	96.3	N	100	N	95	N
Orestimba Creek at Hwy 33	**36.3**	**Y**	**0**	**Y**	92.5	N	93.8	N
Ramona Lake at Fig Ave.	95	N	96.3	N	**92.5**	**Y**	92.5	N
Newman Wasteway	100	N	97.5	N			97.5	N
Poso Slough	96.3	N	98.8	N	**87.5**	**Y**		
Turner Slough			95	N	100	N		
SJR at Lander			98.8	N				
Salt Slough at Lander			97.5	N				
Salt Slough at Sand Dam	92.5	N	100	N	**78.8**	**Y**		
Los Banos Creek at Hwy 140			97.5	N	97.5	N		
Los Banos Creek at China Camp Rd.	100	N	97.5	N	98.15	N	98.8/96.2	N
Mud Slough			98.8	N	96.3	N		

Pesticide Analyses.
A total of eight different pesticides were detected in water samples during the 2014 irrigation season for a total of 51 detections. Each of the detected pesticides is discussed below.

- Chlorpyrifos (12 detections): Chlorpyrifos is a common organophosphate pesticide used to control a wide range of insects in orchards, pasture, and field crops. It can be used as a dormant spray for fruit and nut trees. Chlorpyrifos use during this reporting season likely occurred on field and forage crops (corn, cotton, and alfalfa) in the fall and as dormant sprays on fruit and nut trees in the mid to late winter.
- DDT/DDE (1 DDT and 3 DDE detections): DDT is an organo-chlorine pesticide that was banned for agricultural use in 1972. It is a legacy pesticide that is still detected in the watershed at relatively low levels. DDE has no commercial use but is a compound normally associated with the degradation of DDT.
- Dimethoate (8 detection): Dimethoate is an organophosphate pesticide used to control a wide range of insects. It is used on a variety of field crops including alfalfa, beans, tomatoes, and cotton.
- Diuron (13 detections): Diuron is a substitute urea herbicide used to control weeds in a variety of field crops including cotton, alfalfa, walnuts and wheat. It is also effective in controlling algae.
- EPTC (1 detections): EPTC is a selective thiocarbamate herbicide used for control of annual grassy weeds, perennial weeds, and some broadleaf weeds in beans, forage legumes, potatoes, corn, and sweet potatoes.
- Methomyl (3 detections): Methomyl is a carbamate insecticide used to control a variety of pests on vegetable, fruit, and field crops.
- Pendimethalin (10 detections): Pendimethalin is a selective herbicide used to control most annual grasses and certain broadleaf weeds in field corn, potatoes, rice, cotton, soybeans, tobacco, peanuts, sunflowers and vineyards.

Exceedances of Recommended Water Quality Values.
Water chemistry analyses were compared to recommended water quality values[4] (RWQV). **Attachment 5** tabulates all of the RWQV exceedances for the reporting period by site.

- **Field, General Physical and Drinking Water Quality Exceedances.** Comparisons were made to several RWQVs. **Attachment 5** tabulates the results for these constituents and the comparison to the RWQVs. The Westside Coalition performed analyses or observed more than 2,730 field and chemistry (non-pesticide) parameters during the reporting period, during which, 383 (14%) results were greater than the RWQVs. Electrical conductivity and total dissolved solids (TDS) accounted for 112 and 100, exceedances respectively. Combined, they accounted for more than 55% of the exceedances. E. coli results accounted for 33 of these exceedances, 57 for boron and 19 for dissolved oxygen. The RWQV for cadmium, copper, lead, nickel, and zinc are dependent on site water hardness and is a calculated value. There were no exceedances of dissolved metals during this report period. Potential causes for EC/TDS, E. coli, DO, and boron exceedances are discussed below.

[4] Water Quality Limits were provided by the Central Valley Regional Water Quality Control Board as part of the MRP Order. Water quality limits for cadmium, copper, lead, nickel and zinc are calculated from equations provided by the Central Valley Regional Water Quality Control Board.

- **EC/TDS.** Electrical Conductivity and TDS are measures of the amount of salts dissolved in the water column. There are a variety of sources of salts that may be contributing to these results including natural marine sediments, accretion of shallow/perched ground water, and the irrigation source water. Additionally, many growers rely on groundwater wells to supplement surface water supplies; most of the groundwater wells within the Westside Coalition are more saline than the surface water sources.
- **E. coli.** E. coli is a measurement of bacteria in the water column. The Westside Coalition has participated in a study to attempt to identify the source of these exceedances. The preliminary results were not conclusive, however human sources were identified as the possible cause for at least some of the exceedances. There is also some suspicion that E. coli colonies have become self-sustaining within some watersheds. The Westside Coalition's Management Plan, approved November 18, 2008, and discusses future activities related to the E. coli exceedances. In a letter dated February 17, 2012, the Westside Coalition was requested to participate in a group discussion to develop a joint work plan. The Westside Coalition will continue to participate in this workgroup.
- **Dissolved Oxygen.** Dissolved Oxygen (DO) is measured through a field probe at the time of sample collection. DO, by its nature, is highly variable and influenced by a variety of conditions including sunlight exposure (related to time of day and time of year), turbidity, biological growth/decay, and channel turbulence. The cause of the DO exceedances measured during this report period is not immediately clear, in many cases, a low DO measurement is accompanied with no flow – indicating that the water is stagnant.
- **Boron.** Boron is a metal element commonly found in soils on the Westside of the San Joaquin Valley. It is not applied by growers for any agricultural purpose but may be dissolved in tail water, storm runoff, subsurface flows, or groundwater supplies.

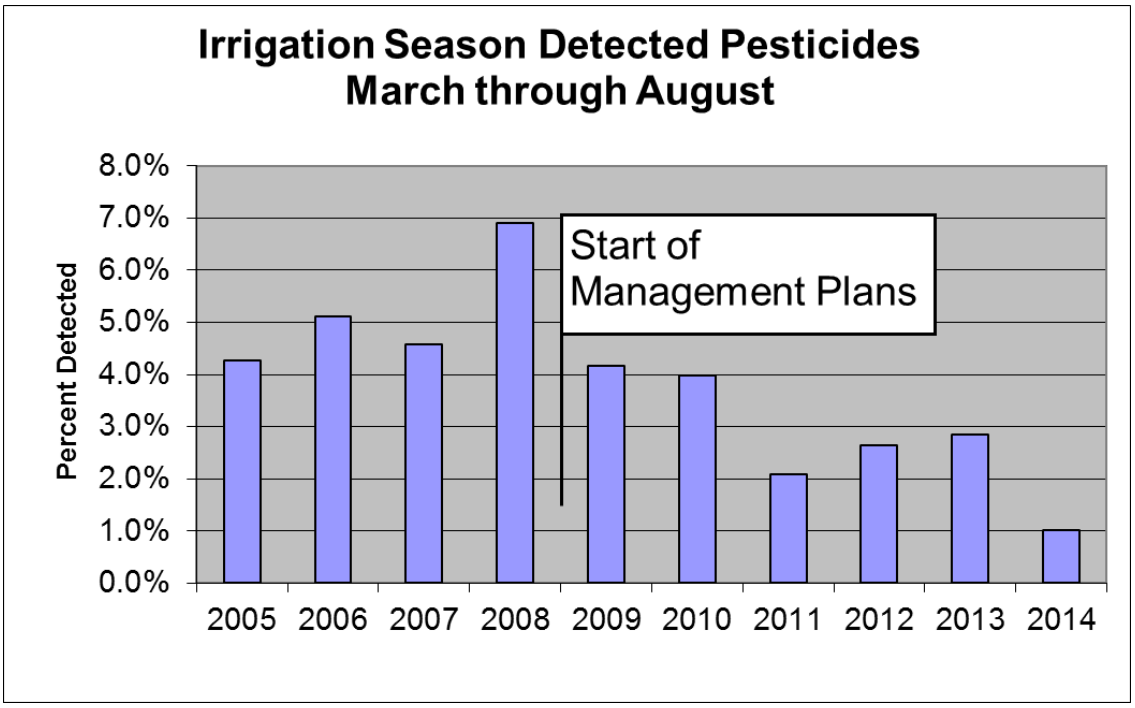
The number and type of field and general chemistry exceedances were slightly more than the 2013 irrigation season (15% this year compared to 10% in 2013, for approximately the same number of samples).

- **Pesticide exceedances.** Up to 48 different pesticides were tested at monitoring sites each month. During the non-irrigation season, pesticide samples are collected at four sites which convey irrigation runoff from wetland areas on a monthly basis, source water sites, and at all sampled sites during rain events. Samples collected within the Westside Coalition during this report period provided more than 5,070 pesticide results, nearly 99% of which resulted in no detection. Of the detected pesticides (51), 20 were greater than established RWQVs. These included:
  - Chlorpyrifos (12 exceedances)
  - DDE (3 exceedances)
  - DDT (1 exceedance)
  - Dimethoate (2 exceedances)
  - Diuron (2 exceedances)

DDT and DDE (degradate of DDT) are legacy pesticides no longer in use and account for 20% of the exceedances.

As a fraction of the number of pesticide tests, there were fewer pesticides detected during this reporting period as compared to the previous irrigation season (1.3% this period versus 2.8% for the 2013 irrigation season). **Figure 3** shows the percent of total pesticides detected in each irrigation season since 2005 (number of detections / number of results).

Figure 3: Percent of Total Pesticides Detected.



Chlorpyrifos and Diazinon. In 2010, the Regional Board implemented a chlorpyrifos and diazinon TMDL on the San Joaquin River. In response to this TMDL, the Westside Coalition has increased its outreach efforts with additional grower workshops and individual grower meetings in regions with a history of chlorpyrifos or diazinon exceedances. These meetings emphasized the water quality issues related to these materials and management practices that could be implemented to reduce or eliminate discharge. During this reporting period there were 0 detections of diazinon and 12 detections of chlorpyrifos at several monitoring sites within the Westside Coalition service area. Although none of these detections occurred within the San Joaquin River. Letters and notices were given to District Managers of Central California Irrigation District, San Luis Canal Company, West Stanislaus Irrigation District, Del Puerto Water District, and Patterson Irrigation District regarding the chlorpyrifos detections and other pesticide and toxicity exceedances. The flyers were distributed to growers within the respective districts. In August 2014, the Coalition published a newsletter that included an article on the Chlorpyrifos detections and

exceedances. The newsletter was widely distributed to the Membership through direct mailings by most of the District's listed above and it was also posted on the District's websites as well as the Coalition's website. Pesticide use report (PUR) data was requested after the March and April exceedances were detected. The Coalition mapped the detection areas and provided Coalition field personnel with targeted outreach material to specific growers in the affected areas. However, the first contact with growers was not until mid-June and by that time the relevancy of the information has lost its impact. The reason for the lag is that the data from the County Ag Commissioners lags about 90 days behind the chemical application. Without real-time pesticide application data, the outreach efforts will have a limited impact.

In accordance with the TMDL program requirements, an annual monitoring report for chlorpyrifos and diazinon monitoring results, covering the period of October 2012 through September 2013, was submitted in May 2014. Chlorpyrifos (0.038 µg/L) was detected in the San Joaquin River at Patterson Pumps (aka SJR at Las Palmas) in March (Event 100). The only other chlorpyrifos detection during this event was in Poso Slough, more than 40 miles upstream. Pesticide use data for the period of January 1 2014 to the date of the sample event was received and reviewed in May. The PUR data indicated five applications of chlorpyrifos on alfalfa between March 10 and March 11 2014 (144 acres, total) occurring in fields geographically upstream of the San Joaquin River at Patterson Pumps monitoring site. These applications occurred within the Ramona Lake and Marshall Road Drain subwatersheds. As indicated earlier, chlorpyrifos was not detected from either the Ramona Lake or Marshall Road Drain monitoring sites.

Partially in response to these water quality concerns, a Stakeholder group of growers in the Hospital and Ingram creeks subwatersheds was formed in 2012. The group did not meet in the period of March through September of 2014, but have plans to resume the meetings in 2015.

SECTION 9: ACTIONS TAKEN TO ADDRESS WATER QUALITY IMPACTS – MANAGEMENT PLAN ACTIVITIES

In October 2008, the Westside Coalition submitted a Management Plan and Focused Watershed Plan (Focused Plan) which described the actions that would be taken to address the water quality issues identified by the monitoring program. The Management Plan described a general approach that covered all of the subwatersheds within the Westside Coalition. Focused Plans have been developed for specific issues within Hospital Creek, Ingram Creek, Del Puerto Creek, Westley Wasteway, Orestimba Creek, Salt Slough (including both Salt Slough monitoring sites and Poso Slough), and Blewett and Marshall Road Drain subwatersheds (submitted July 2013; approved). **Table 12** shows the implementation schedule listed in the Management Plan (see the Management Plan – General Approach, Table 4, October 23, 2008). In addition to these actions, the Westside Coalition reviews exceedances over the past three years to determine what modifications (if any) need to be made to the Management or Focused plans. A tally of exceedances from September 2011 through August 2014 is included in **Attachment 6**, along with a more detailed review of Management Plan activities. Based on the review of that data, additional focused plans are scheduled. These are shown in **Table 13**.

Table 12: Management Plan Implementation Schedule

Item	Action	Affecting	Estimated Start	Estimated Completion
1	Continue monitoring program	All Categories	On-going	On-going
2	Develop and implement Focused Plan	Site-specific	July 2008	2013
3	Compile MP inventory	All Categories	Jan. 2009	Complete for FP1, FP2, and FP3
4	Develop subwatershed maps	All Categories	On-going	Jan. 2013
5	Determine regional pesticide application	Pesticides, aquatic toxicity	On-going	Annually updated
6	Continue participation in the Dissolved Oxygen Study	Dissolved Oxygen	On-going	On-going
7	Analyze results of E. coli study and map/inventory potential sources	E. coli	Sept. 2007	Jan. 2010
8	Continue outreach and education efforts	All Categories	On-going	On-going
9	Analyze for correlation between low DO and other parameters	Dissolved Oxygen	Sept. 2008	June 2009
10	Continue participation in the Salinity TMDL Program	EC/TDS	On-going	On-going
11	Track changes in water quality	All Categories	On-going	On-going

Table 13: Anticipated Focused Plan Schedule

Subwatershed	Anticipated Start Date
Ramona Lake	February 2015
Newman Wasteway	February 2015
Los Banos Creek	February 2016

1. Continue Monitoring Program.
This semi-annual monitoring report represents the 20th monitoring report submitted by the Westside Coalition since its inception in 2004. The monitoring program (as revised by the MRP Order) is designed to be a dynamic program that aggressively tracks known water quality issues and conducts broad assessment monitoring to identify new issues (see the MRP Order). The monitoring program is also designed to support the activities of the Management Plan and the Focused Watershed plans. The results of the monitoring program are reported twice annually (June and November). Beginning in March of 2014 the Westside Coalition implemented assessment monitoring at all discharge sites which will continue through February 2015. The results of the assessment monitoring period will be reviewed and adjustments may be made to the Special Project Monitoring table included in the MRP order (see **Attachment 7**).

2. Develop and Implement Focused Watershed Plan.
A Focused Plan for the Ingram and Hospital Creek watersheds was developed and submitted to the Regional Board on October 23, 2008 followed by a Focused Plan for the Westley Wasteway, Del Puerto Creek, and Orestimba Creek in February 2011. The Focused Plan for Salt Slough (including Poso Slough) was adopted in December 2011. A Focused Plan for Blewett Drain and Marshall Road Drain was submitted in July 2013, revised in December 2013, and formally approved in January 2014. Since that time, the Westside Coalition has implemented a number of focused plan activities. A detailed update of the focused plan activities is included in **Attachment 6.** Additional focused plans have been scheduled (see **Table 13**).

3. Compile Management Practice Inventory.
A management plan survey for the Ingram and Hospital Creek watersheds was completed in 2010 with a similar survey completed for Del Puerto Creek, Westley Wasteway, and Orestimba Creek completed in the Spring of 2011, the results of which were reported in the June 2011 SAMR. A management practice survey for Salt Slough was completed and submitted in August 2012. A management plan survey for the Blewett and Marshall drains was sent to affected growers in November 2013; the survey has been completed. The results of the survey will allow the Coalition to finalize survey findings and report on the management practice baseline, produce a summary of existing management activities, and move forward with the goals and objectives of the management plan. A summary of the survey results are included in **Attachment 6**.

4. Develop Subwatershed Maps.
The Westside Coalition submitted subwatershed maps for the major watersheds within its boundaries in 2008. These maps were based on known drainage patterns and available mapping information. As part of the focused plans, the Westside Coalition collected highly detailed drainage information on the Ingram and Hospital Creek subwatersheds. Draft maps for the Westley Wasteway, Del Puerto Creek, Orestimba Creek, and Salt Slough subwatersheds have been developed and submitted in previous SAMRs. New draft maps for Blewett Drain and Marshall Road Drain have been submitted to the Regional Board as part of Focused Plan IV (see **Attachment 6**).

5. Determine Regional Pesticide Use.
Pesticide use report data is collected from the agricultural commissioners in the various counties in the Westside Coalition's service area. In addition to general trends analysis, specific regional pesticide use data is periodically reviewed to attempt to compare with pesticide detections through the monitoring program. Limitations with pesticide use report data completeness and availability limit the usefulness of this data for that purpose. A summary of available pesticide use data is provided in **Attachment 6**.

6. Continue Participation in the Dissolved Oxygen Study.
On January 27, 2005 the Central Valley Regional Water Quality Control Board adopted Resolution R5-2005-0005 which included a TMDL directed to the point and non-point discharges that contribute to the dissolved oxygen impairment in the Stockton Deepwater Ship Channel (DO TMDL). As part of the DO TMDL certain studies were required. The San Joaquin Valley Drainage Authority received funds from the State Water Resources Control Board to undertake these studies (Recipient Agreement ERP-02D-P63). These studies were completed in June of 2008. The project established a series of monitoring stations, developed a DO model, characterized the fate of algae and nutrients, developed linkages between flow, algae, nutrients, and dissolved oxygen. The last set of studies, focused in the downstream tidal reach of the San Joaquin River between Mossdale and Turner Cut, has been completed. These studies, referred to as the "Downstream Studies", were funded by the California Department of Fish and Wildlife's Ecosystem Restoration Program. The studies were initiated in January 2011 and the final reports were submitted to Regional Board staff in September 2014. The Regional Board is developing recommendations for future actions to address the remaining dissolved oxygen impairment. The Westside Coalition has maintained the monitoring sites within boundaries of the Westside Coalition to maintain the data availability. The Westside Coalition also is prepared to continue

to participate in the DO TMDL as further actions are developed. The SJVDA is currently participating with other stakeholders to provide funding for operation of the aerator installed by the Department of Water Resources. A funding agreement was completed in April 2012 between the parties and a mechanism in place to fund short term operation of the Stockton Deepwater Ship Channel aerator until May 2014. The agreement has been extended until May 2015 and is expected to be extended through May 2016. The aerator has been very successful in meeting DO levels and is expected to be continued.

7. Analyze results of E. coli study and map/inventory potential sources.

Since 2007, the Westside Coalition has participated in studies and other investigations to attempt to identify the source and cause of various E. coli exceedances (reported in previous SAMRs). A technical committee is currently developing an approach plan with which the Westside Coalition will participate.

8. Continue Reporting and Outreach.

Westside Coalition outreach during this report period included direct to grower mailings, publications distributed by the districts, and various meetings.

- Direct Mailings. The Westside Coalition began mailing out nearly 2500 farm evaluation surveys directly to growers starting in July 2014 and will culminate October 2014. The survey responses will provide the data to establish Coalition-wide baseline criteria for irrigation methods, best management practices, nutrient management, and sediment/erosion control. A newsletter was distributed to district managers of CCID, San Luis Canal Company, West Stanislaus Irrigation District, Del Puerto Water District, Patterson Irrigation District, and the Exchange Contractors highlighting pesticide and toxicity exceedances. The newsletter was distributed to growers and posted on District websites within the respective districts as well as the Coalition's website. See **Attachment 6**.
- Stakeholder Meeting. Beginning in November 2012, growers within the Hospital and Ingram creek subwatersheds formed a stakeholder group to discuss issues related to the ILRP, water quality conditions and management practices that they could implement at the farm level. The Stakeholder group has met monthly since its inception. In April 2014, the group sponsored a tour of the Stanislaus portion of the Coalition, exhibiting growers' management practices and methods to 20 representatives from DPR, EPA, the Regional Board, the State Board and other agencies. More information on the Stakeholder group is included in **Attachment 6**.
- Grower Meetings. Three grower workshops were organized by the Coalition and held in July 2014. Over 2400 invitations (**see Attachment** 6) were sent to Coalition members inviting them to the workshops, during which current water quality issues and the Long-term Irrigated Lands Regulatory Program were presented and discussed with the growers. These meetings are listed in **Table 14**.
- Individual (tailgate) Meetings. Staff members of the Westside Coalition conducted tailgate meetings with thirty Coalition growers to provide written information packets (**see Attachment 6**) and to discuss water quality issues and management practices. These meetings were triggered primarily by chlorpyrifos exceedances in March and April 2014.

- Contract Commercial Pesticide Applicators. A staff person from the Westside Coalition met with eight major commercial pesticide applicators operating within the Westside Coalition. The primary purpose of these meetings was to clarify the pesticide-related water quality issues within the Westside Coalition.
- Observation Drives. Staff from the Westside Coalition performed weekly drives through key coalition areas and reported observations on farming activities and creek/drain flow conditions. When appropriate, this information was used during tailgate and other outreach meetings. Between March 2014 and August 2014, 69 observation drives were completed.

Table 14 below lists the outreach activities performed during this reporting period coalition-wide.

Table 14: Outreach Meetings

DATE	GROUP	LOCATION	DESCRIPTION	ATTENDANCE	PRESENTER
3/4/2014	SJVDA Meeting	Los Banos	Coalition Bd. Meeting	15	Joe McGahan
Various	One-on One Visits	Northerly area	Follow up with farmers to complete surveys for Focused MP.	Varies	Rich Peltzer
6/2014 - 8/2014	One-on One Visits	Northerly area	Present chlorpyrifos packets and discuss BMP's	Varies	Rich Peltzer, Jorge Alvarado
3/2014 - 8/2014	Observation Drives	Northerly area	Observe and report sediment conditions in drains	Varies	Rich Peltzer
Various	Meetings with Commercial Sprayers	Northerly area	Inform about chlorpyrifos situation in watershed	Varies	Rich Peltzer
3/26/2014	Ingram/Hospital Outreach	Westley	Spanish Training Meeting	40	Chester A., NRCS Spanish speakers, Rich P.
3/27/2014	SLCC Annual Meeting	Dos Palos	Update of ILRP and issues in area	40	Joe McGahan
4/1/2014	SJVDA Meeting	Los Banos	Coalition Bd. Meeting	15	Joe McGahan
4/15/2014	CCID Landowners Meeting	Firebaugh	Dos Palos Area Update	50	David Cory
4/16/2014	CCID Landowners Meeting	Los Banos	Los Banos Area Update	75	Joe McGahan
4/17/2014	CCID Landowners Meeting	Gustine	Patterson Area Update	75	Joe McGahan
5/12/2014	SJVDA Meeting	Los Banos	Coalition Bd. Meeting	15	Joe McGahan
5/17/2014	Grassland Water District Annual Meeting	Los Banos	Update of new ILRP and wetland requirements	200	Joe McGahan
5/27/2014	Columbia Canal Co Annual Meeting	Firebaugh	Update of new ILRP and provide NOC and FEP for completion by farmers	40	Joe McGahan, Orvil McKinnis
6/9/2014	SJVDA Meeting	Los Banos	Coalition Bd. Meeting	15	Joe McGahan
7/8/2014	CCID and SLCC Special Staff Meeting	Los Banos	ILRP and NOC/FEP Workshop	12	Joe McGahan, Orvil McKinnis
7/15/2014	Coalition Growers - Southern Coalition Area	Los Banos	Update of new ILRP and pesticide exceedances; presentation of NOC/FEP	175	Joe McGahan, Orvil McKinnis

DATE	GROUP	LOCATION	DESCRIPTION	ATTENDANCE	PRESENTER
7/16/2014	Coalition Growers - Middle Coalition Area	Newman	Update of new ILRP and pesticide exceedances; presentation of NOC/FEP	100	Joe McGahan, Orvil McKinnis
7/17/2014	Coalition Growers - Northern Coalition Area	Westley	Update of new ILRP and pesticide exceedances; presentation of NOC/FEP	75	Joe McGahan, Orvil McKinnis
7/23/2014	CCID Board Meeting	Los Banos	ILRP and NOC/FEP Presentation	20	Orvil McKinnis
7/24/2014	SLCC Board Meeting	Los Banos	ILRP and NOC/FEP Presentation	15	Orvil McKinnis
8/5/2014	DPWD, PID, and WSID	Patterson	ILRP and NOC/FEP Presentation	8	Orvil McKinnis
8/5/2014	SJVDA Meeting	Los Banos	Coalition Bd. Meeting	15	Joe McGahan
8/22/2014	DPWD and SLWD	Patterson & Los Banos	One on One NOC/FEP Training	5	Orvil McKinnis

Grant Funding

The Westside Coalition continued to offer private grant funding to its members totaling more $30,000 for construction of new tailwater silt ponds or to maintain existing ponds. The program funds 75% of the costs of any single project, up to a maximum of $6,000 per project. A large number of sediment pond cleanout projects were completed at the end of the last irrigation season (reported in the November 2012 SAMR) and no new project was funded this period. To date, $28,600 of the grant funds have been expended for this fiscal year (about 95% of the available funds). Most of these projects were in the northerly region of the Westside Coalition, affecting about 6,000 acres that drain into the Marshall Road Drain, Orestimba Creek, Spanish Land Grant Drain and Delta-Mendota Canal. See the November 2012 SAMR for details.

Proposition 84 has also been made available in 2012 through a program managed by CURES and funded by the State Water Resources Control Board. Information on the grant funding availability has been communicated during the previous reporting period to landowners and operators through direct mailings, grower group meetings and individual contacts with landowners.

The Proposition 84 program provides funding for projects in the Central Valley primarily for the purpose of improving irrigation systems. Outreach by CURES was focused on landowners with fields along waterways with management plans in place by the local watershed coalition and located in the northern San Joaquin Valley, San Joaquin County/Sacramento Rivers Delta and southern Sacramento Valley. As of August 2014, 49 projects have been funded of which 42 have been completed; six of the seven remaining projects were awarded in August 2014. The projects will ultimately affect nearly 4,100 acres within the Westside Coalition.

In addition to grower-implemented management practices, several districts within the Westside Coalition have implemented or are in the process of implementing a number of regional drainage management projects. Although these project differ in approach, they all capture tailwater flows and return them to the irrigation system, thereby reducing the volume of tailwater discharged from the respective watershed. See **Attachment 6** for a more detailed discussion.

9. Analyze for Correlation Between Low DO and Other Parameters.
The Westside Coalition has performed a preliminary review of the low DO measurements and other data. A summary of this review was included in the November 2009 Semi-Annual Monitoring Report. No additional work has been performed on this issue.

10. Continue Participation in the Salinity TMDL Program.
The Westside Coalition is actively engaged in the Central Valley Salinity Alternatives for Long-term Sustainability (CVSALTS) process and is an active member of the Central Valley Salinity Coalition that has been organized to facilitate the funding of the CVSALT effort. The Coalition's participation includes both monetary contributions and a substantial commitment of staff time.

Specific actions by the Westside Coalition to support the CVSALT efforts include: (1) Coalition representative's consistent participation in the CVSALT committees and sub-committees including serving as chair of the Economic and Social Impact Committee. (2) Consistent participation and economic contributions to the Central Valley Salinity Coalition, including representative serving as president of the CV Salinity Coalition. In addition the San Joaquin Valley Drainage Authority is providing contracting and contract administration services for the CVSALT effort. The Westside Coalition has committed to substantial resources to help ensure that the CVSALT effort results in an effective and efficient salinity management program for the Central Valley.

The SJVDA has been participating with the US Bureau of Reclamation in implementation of a Real Time Monitoring Program (RTMP). This program is a component of the compliance with the Vernalis TMDL for salt. It is anticipated that the RTMP will be submitted to the CVSALTS Lower San Joaquin River Committee for review and comment and then would be taken to the Regional Board for approval.

11. Track Changes in Water Quality.
Water quality changes are tracked through the Westside Coalition's monitoring program (see the MRP Order). Water quality data is reported and summarized twice annually.

Other Activities:

- **Conversion to high efficiency irrigation systems:** Several of the districts within the Westside Coalition have implemented grant and loan programs to assist growers in upgrading their irrigation systems, and more 11,000 acres of high efficiency systems came on-line during the 2012/13 non-irrigation season within the Westside Coalition, including nearly 4,100 acres funded (or approved for funding) through the Proposition 84 program. Typically, irrigation improvements are installed during the non-irrigation season for use in the following irrigation season. For the 2014 irrigation season, San Luis Canal Company provided $1,210,000 in funding assistance for irrigation system improvements.
- **NRCS EQUIP Funding:** The National Resource Conservation Service (NRCS) provides funding to growers for the construction of various improvements including distribution systems (i.e. canal lining or piping) and irrigation system improvements (such as

drip or micro-sprinklers). Funding is provided directly to growers (although often with assistance from the Districts) and typically covers the cost of materials.

Monitoring Results:
Data gathered since the inception of the monitoring program has allowed the Westside Coalition to identify problem areas and issues. Details of sites exhibiting significant toxicity during this monitoring period are included in **Attachment 2** and all results that exceeded RWQVs are included in **Attachment 5**. This information, along with results from previous years will be used as talking points during upcoming grower meetings to outline the problem issues and sites. The Management Plan and Focused Watershed Plan also outline approaches that will be implemented to address the highlighted issues. A number of preliminary conclusions can be made from the data collected so far:

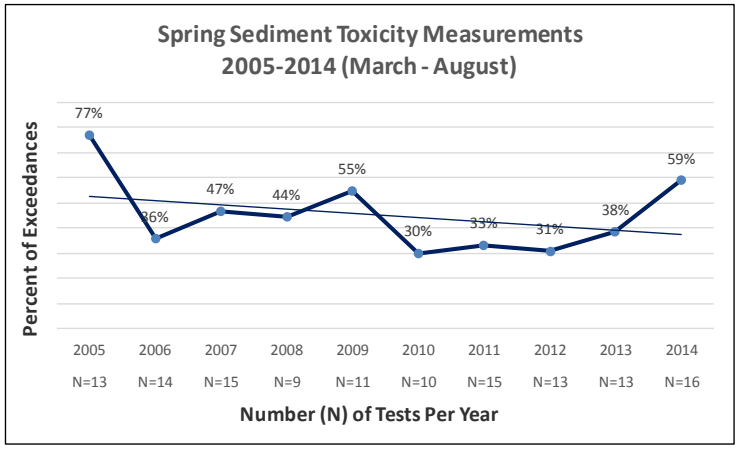
- **Sediment Toxicity:** Sediment toxicity tests were performed on 16 samples and one duplicate sample collected in March (Event 111). Statistically significant toxicity was measured at ten sites (See **Tables 10** and **11**), although 4 of the ten measured survival greater than 85%. Follow up pesticide testing was performed on four samples exhibiting severe toxicity (<80%). These results were compared to literature values for the purpose of determining the probable cause of toxicity in each sample. In all cases pesticides were present in sufficient quantity to have caused the toxicity.

    - Blewett Drain at Highway 132 (61.3% survival): A total of 2.75 sediment toxic units (TUs) were calculated based on the detected pesticides. Bifenthrin accounted for 1.77 TUs, esfenvalerate 0.16 TUs, lambda-cyhalothrin 0.19 TUs, permethrin 0.01 TUs, and chlorpyrifos accounted for 0.61 TUs.
    - Ingram Creek (40% Survival): 2.19 TUs were calculated, with bifenthrin 0.58 TUs, and lambda cyhalothrin 0.33 TUs, esfenvalerate 0.20, and chlorpyrifos accounted for 0.39 TUs.
    - Del Puerto Creek near Cox Road (23.8% Survival): A total of 2.67 TUs were calculated with bifenthrin 0.56 TUs, lambda cyhalothrin 0.66 TUs, esfenvalerate 0.06 TUs, and chlorpyrifos, accounted for 1.39 TUs.
    - Orestimba Creek at Highway 33 (76.3% survival): 1.14 TUs were calculated, with bifenthrin 0.72 TUs, cyfluthrin 0.01 TUs, lambda cyhalothrin 0.33 TUs, esfenvalerate 0.06, and chlorpyrifos accounted for 0.02 TUs.

Bifenthrin, Lambda-cyhalothrin, and Esfenvalerate are all pyrethroids used on a variety of field and tree crops including, tomatoes, corn, beans, alfalfa, walnuts, and almonds, all of which are grown in the northerly part of the Westside Coalition. The majority of walnut and almond orchards within the Westside Coalition are irrigated with micro-sprinklers and drip systems which do not generate significant tailwater. It is likely that the discharge of these materials were from field crops using furrow or other surface irrigation methods.

Figure 4 shows the percentage of test exceedances during the spring sediment sampling events since 2005. The spring 2014 sediment results did show a higher percentage of test exceedances than the previous year, although the measured toxicity at four of the sites was relatively mild. In spite of the 2014 results the nine year trend of the percentage of exceedances is trending down. The Westside Coalition believes the best way to reduce sediment toxicity will be through the management of sediment discharges at the farm level. However, the steep land slopes and erodible condition of the soil, particularly in the Patterson Subarea, continues to be an obstacle to overcome. Sedimentation ponds and tailwater return ponds, along with grower awareness of the issue will likely reduce the amount of sediment load leaving the farm and depositing in the waterways. The Coalition's Management Plan and Focused Watershed Plan include management approaches to address sediment toxicity. There appears to be an improving trend in sediment toxicity, possibly due to the Coalition's outreach efforts.

Figure 4: Percent Test Exceedance



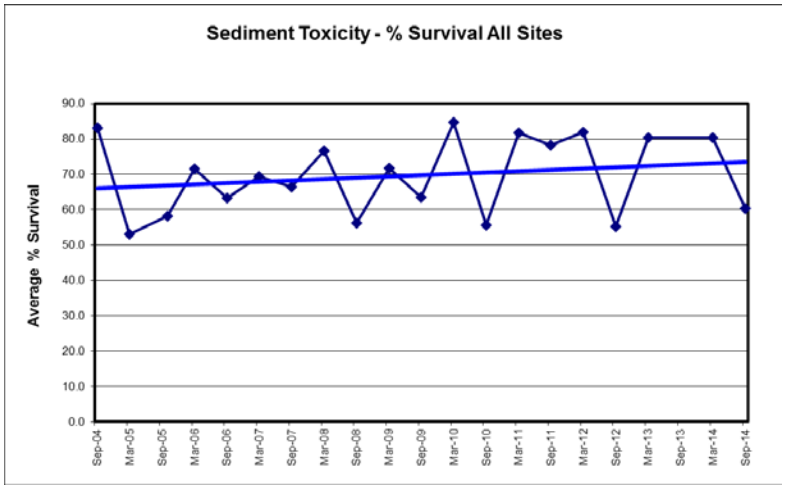


Figure 5: Percent Survival Trend.

Figure 5 shows the trend of percent survival for sediment toxicity (average percent survival for all tested sites at each event), along with a linear trendline. Based on the trendline, there is an overall improving trend in terms of the magnitude of survival, although the most recent toxicity results were not an improvement over the 2013 fall test results.

- **Aquatic Toxicity:** Aquatic toxicity to *Ceriodaphnia dubia* (water flea), *Pimephales Promelas* (fathead minnow), and *Selenastrum capricornutum* (algae) were tested in accordance with the MRP Order (see **Attachment 7**). A total of 316 aquatic toxicity tests were performed, including 18 field duplicates. Aquatic toxicity was observed three times to algae. **Attachment 2** provides monitoring results for all of the sites that measured significant toxicity, including a discussion of the TIE findings.

- **Pesticide Analyses:** During this reporting period, 9 different pesticides were detected in water samples during the 2014 irrigation season for a total of 51 detections. Twenty of these detections exceeded the established RWQV, including 12 for chlorpyrifos and 0 for diazinon. See **Attachment 2**.

- **Chlorpyrifos and Diazinon TMDL Program:** In addition to its monthly monitoring program, the Westside Coalition also participates in the San Joaquin River Chlorpyrifos and Diazinon TMDL program. The Westside Coalition collects water monthly samples for chlorpyrifos and diazinon analysis at the San Joaquin River at Sack Dam, Lander Avenue, and Las Palmas Avenue (near the PID pumps) and collaborates with the Eastside Coalition in the development of the TMDL monitoring report and outreach activities. The annual monitoring report for the San Joaquin River Chlorpyrifos and Diazinon TMDL program covering October 2012 through September 2013 was submitted on time to the Central Valley Regional Water Quality Control Board in May 2014. During that reporting period, chlorpyrifos was detected at the San Joaquin River at Patterson Pumps (Las Palmas Avenue) monitoring site during the March 2013 sampling event. The annual monitoring report for the October 2013 through September 2014 will be submitted to the Central Valley Regional Water Quality Control Board in May 2015.

- **General Chemistry and Field Observations:** The monitoring results for field and general chemistry tests were generally similar to previous irrigation seasons. EC/TDS measured the largest number of exceedances for this reporting period (112 and 100 exceedances, respectively). Bacteria continues to be a leading source of exceedances (33 for E. coli during this period). There were also 57 boron exceedances. Boron is typically connected with shallow groundwater within the Westside San Joaquin Valley, and given the dismal water supply, growers likely relied more on wells than is typical for a more normal water year. Dissolved cadmium, copper, lead, nickel, and zinc results were compared to the calculated RWQV (based on site water hardness) and no exceedances were measured during this reporting period. With many of these constituents, the source of the exceedance is neither clear nor easily traceable, and often can be found in the source water itself (such as the San Joaquin River at Sack Dam or the Delta-Mendota Canal).

SECTION 10: COMMUNICATION REPORTS

Exceedance reports were submitted to the Central Valley Regional Water Quality Control Board in response to monitoring results for the reporting period. These reports are included in **Appendix B.**

Follow-up included reporting statistically significant toxic events and exceedances of water quality values to the overlying districts, PCA's and to individual Coalition participants. The districts would then communicate with the affected growers to notify them that there is a problem. Meetings are then to be organized at the Coalition level as required to inform landowners, operators, PCA's, chemical applicators and others on monitoring results and likely best management measures that could be undertaken to minimize these problems (see **Table 14**).

SECTION 11: CONCLUSIONS AND RECOMMENDATIONS

The Westside Coalition's monitoring program has identified constituents of concern (see **Attachments 2** and **5**). The Westside Coalition has submitted a Management Plan and Focused Watershed Plan to address the water quality concerns discovered by previous monitoring. Implementation of these plans has begun.

The Westside Coalition monitoring program has accumulated data from 116 regular monitoring events and 15 rain events. Data from this reporting period has verified previously identified water quality issues but has also showed some indications of an improving trend in water quality (see **Section 9**). The Westside Coalition began implementation of management plans in 2008. For a basis of comparison, data from the most recent three year period (September 2011 to August 2014) was compared to the three year period prior to management plan implementation (September 2005 to August 2008) and there are some promising improvements:

- Ceriodaphnia dubia toxicity: 12 exceedances out of 426 tests (<3%) for the most current period, compared to 25 exceedances out of 394 tests (6%).
- Fathead minnow toxicity: 1 exceedances out of 224 tests (<1%) for the most current period, compared to 5 exceedances out of 309 tests (2%).
- Algae toxicity: 17 exceedances out of 284 tests (<6%) for the most current period, compared to 33 exceedances out of 345 tests (10%).
- Chlorpyrifos: 39 exceedances out of 565 tests (<7%) for the most current period compared to 67 exceedances out of 390 tests (17%).
- Diazinon: 9 exceedances out of 566 tests (<2%) for the most current period compared to 6 exceedances out of 391 tests (2%).
- Total pesticide detections: Approximately 1.8% of analyzed pesticides detected in the current period verses almost 5% of analyzed pesticides detected in the period prior to management plan implementation.
- Sediment toxicity: 27 toxicity observations out of 80 tests (<34%) in the current period compared to 38 observations out of 85 tests (45%).

A complete tally of exceedances by site and constituent is included in **Attachment 6**.

Attachment 1
Sampling Event Details

Attachment 2
Significant Aquatic Toxicity Results

Attachment 3
Field Quality Control Sample Results

Attachment 4
Sediment Toxicity Follow-up Analyses

Attachment 5
Exceedance of Recommended Water Quality Values

Attachment 6
Management Plan Activities

Exceedance Tally

Pesticide Use Report Summary

(Includes partial data, duplicate records and incomplete records)

Chlorpyrifos & Diazinon Specific Pesticide Use Report Summary

(Includes partial data, duplicate records and incomplete records)

District Outreach Flyers

Management Practice Maps

Focused Management Plan Schedule Review

Attachment 7
Special Project Monitoring and Constituents

Appendix A
Chain of Custody Sheets and Data Summary

Appendix A
Definitions

Sample Type:
E: Event sample
FD: Field duplicate sample
FB: Field blank sample.

Result Flags:
ND: Not Detected.
DNQ: Estimated result, detected below Reporting Limit.

Note: Pesticides with results indicating "Non-Detect" are not reported in this summary. See **Table 7** for a list of analytes. See **Appendix C** for the laboratory data reports.

Appendix A
Chain of Custody Sheets

Appendix A

Sediment and Aquatic Toxicity Results

Appendix A
Data Summary

Appendix B
Communication Reports
Organized by Event Date

Appendix C
Laboratory Data Reports and EDDs

Field Data Sheets
CalTest General Physical, Drinking Water Data, Nutrient Data, Metals Data
APPL Pesticide Analyses
Pacific Ecorisk Toxicity Reports
Electronic Data Deliverable Files

Appendix D
Laboratory Quality Assurance Review

Appendix E
Sampling Event Photos

Appendix F
Wetland Water Quality Summary

EVENT R15

EVENT 111

EVENT 112

EVENT 113

EVENT 114

EVENT 115

EVENT 116