

Sacramento Stormwater Quality Partnership

2004/2005

Joint Program Annual Report

NPDES STORMWATER PERMIT No. CAS082597

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County of Sacramento and the
Cities of Sacramento, Citrus Heights, Elk Grove, Folsom, Galt, and Rancho Cordova



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Sacramento Stormwater Quality Partnership 2004/2005 Joint Program Annual Report

Chapter 1 — Introduction

This Annual Report describes activities conducted during the 2004/2005 fiscal year in compliance with the Stormwater Quality Municipal Separate Stormdrain System Permit (Permit). The work was performed as a collaborative effort by the seven permittees in the Sacramento Stormwater Quality Partnership (Partnership). The participating agencies include the County of Sacramento and the cities of Citrus Heights, Elk Grove, Galt, Folsom, Ranch Cordova and Sacramento (hereinafter referred to as Permittees). Annual Reports are being submitted separately by each of the Permittees for their agency specific activities conducted during the fiscal year.

The Permittees coordinate and cost-share on various major elements of the Partnership activities, including monitoring, target pollutant reduction, special studies, and program evaluation. These efforts are described in this Joint Program Annual Report. The Permittees also coordinate and cost-share on selected public outreach and commercial/industrial activities; those activities are described in each individual Permittee 2004/05 Annual Report being submitted under separate cover to the Central Valley Regional Water Quality Control Board (Regional Board). Cost-share arrangements for the Joint Program activities are described in a Memorandum of Understanding (MOU) executed by the Permittees in Spring 2003. The County and City of Sacramento generally conduct and manage the joint Program work and are reimbursed by the other Permittees according to the cost-share MOU.

Table 1.1-1 presents a summary of expenditures incurred in the 2004/05 fiscal year related to the joint Program activities described in this Annual Report:

Table 1.1-1. 2004/2005 Joint Program Expenditures¹

Program Element	Joint Cost
Monitoring and Special Studies	\$759,000
Target Pollutant Reduction	\$100,000
Total	\$859,000

¹ 2004/2005 expenditures related to public outreach and industrial joint program activities are presented in individual Permittee 2004/2005 Annual Reports, being submitted under separate cover.

Chapter 2 — Monitoring Program

2.1 Overview of 2004/05 Monitoring Activities and Expenditures

The 2004/05 fiscal year (July 1, 2004 – June 30, 2005) monitoring included both permit-required and additional Permittee-initiated monitoring activities. Permit-required monitoring activities included receiving water, urban tributary, “additional” pesticide, and bioassessment monitoring. Monitoring studies not required in the permit included an assessment of pesticide concentrations over multiple days at urban tributaries and pathogen source identification (not yet reported) using advanced research methodologies in cooperation with the University of California at Davis (UCD). These activities were undertaken to better understand pollutant concentration variations throughout a storm event and possible sources of pathogens in runoff. Additionally, a statistically based model simulation was also completed to better understand the characteristics of the constituents of interest in Sacramento urban area runoff and to calculate loads.

2004/05 Fiscal Year Accomplishments and Permit Compliance Status

A Monitoring Work Plan for 2005/06 was completed and submitted to the Regional Board on May 1, 2005. The 2005/2006 Monitoring Work Plan proposed to complete the requirements in the Monitoring and Reporting Program (MRP) section of the Permit along with additional Permittee-initiated monitoring activities. In addition, the 2005/2006 Monitoring Work Plan was consistent with the revised Five-Year Monitoring Work Plan also submitted to the Board on May 1, 2005. The Five-Year Monitoring Work Plan had been revised and resubmitted for Board approval in an effort to better coordinate monitoring studies during the years when discharge monitoring would be scheduled. The schedule for monitoring of constituents in Table 2 of the MRP was changed from 2004/05 and 2007/08 to 2005/06 and 2006/07 when discharge monitoring will be conducted.

Table 2.1-1 outlines the major NPDES permit accomplishments for the 2004/05 fiscal year. Urban runoff (a.k.a. discharge characterization) monitoring was not performed in 2004/05, as it is required in only two out of every three years. Table 2.1-2 describes the monitoring activities conducted in 2004/05 related to the various water bodies in the Sacramento area. Figure 2.1-1 shows the 2004/05 monitoring sites, along with the reaches scheduled for bioassessment in 2004/05 (the bioassessment monitoring schedule allows for the “staggering” of locations from year-to-year).

The Permittees also updated their assessment of urban runoff loadings of selected constituents in the 2005 Discharge Characterization Study, initiated an urban tributary pesticide persistence study, and collected samples for a pathogen source tracking effort. The Discharge Characterization Study used 2000-2004 monitoring data in a continuous simulation model of urban runoff loading. The model includes multiple variable regressions of constituent concentrations against significant “antecedent” and storm characteristics. This analysis was last performed in 1996. The report was used as the basis for the assessment of the relative contribution of chlorpyrifos and diazinon in urban runoff within watershed “hot spots”.

Additional pesticide samples were collected at the urban tributary sites the day before a wet weather event, and in each of the two days following the event in an effort to determine the persistence of pesticide concentrations during rain events. Results from this study are included in the Urban Tributary Report (Appendix D).

The Permittees also collected American River, Sacramento River, and Strong Ranch Slough samples during wet and dry weather as part of a pathogen tracking study being performed by Stefan Wuertz at the University of California at Davis. Results of these analyses are not yet available.

Program Responsibilities

All of the Permittees participate in decision-making and goal-setting for the monitoring program, are involved in consultant selection, and review and comment on compliance reports and other work products. Consultant contract administration and management is divided between the City and County of Sacramento with responsibilities generally alternating during the five-year permit term as needed.

2004/05 Monitoring Expenditures

The 2004/05 monitoring costs for consultant and contractor services, purchase and lease of equipment, and laboratory analyses are presented in Table 1.1-1 in the Introduction to this Joint Program Annual Report. The costs reflect monitoring in compliance with the Permit MRP for the 2004/05 season. These are joint costs that were shared by the Permittees according to the cost-share arrangements described in the Permittee MOU. The joint costs do not include Permittee staff time spent on the monitoring program and County/City of Sacramento resources to manage the monitoring activities on behalf of the other Permittees. These costs are included in the totals shown in the Program Management section of the individual Annual Reports prepared by the County and cities and submitted under separate cover.

Table 2.1-1. Monitoring Program Accomplishments for the 2004/05 Fiscal Year

Monitoring Activity	Status
River Monitoring	<ul style="list-style-type: none">• 8 total events monitored• 3 events coordinated with urban tributary storm event sampling• 2 events coordinated with urban tributary dry weather monitoring
Urban Tributary	<ul style="list-style-type: none">• 3 wet weather and 2 dry weather events successfully monitored• Coordination with river monitoring was achieved for all 5 events• Pesticide persistence monitoring for 3 wet weather events, which includes monitoring the day before the storm and the subsequent 2 days after the storm.
Additional Pesticide	<ul style="list-style-type: none">• 2 wet weather and 2 dry weather events monitored at 6 additional urban tributary monitoring locations• Fully coordinated with urban tributary and river.
Bioassessment	<ul style="list-style-type: none">• 2 streams monitored in spring 2005 – Arcade Creek and Morrison Creek (two reaches each)
Pathogen Tracking	<ul style="list-style-type: none">• In cooperation with UC Davis, 1 wet weather and 1 dry weather pathogen source tracking events were monitored.
Rainwater	<ul style="list-style-type: none">• 9 monitoring events at Sump 104• 7 monitoring events at Prairie City OHV Park• 5 events coordinated with Regional Board

Table 2.1-2. 2004/05 Monitoring Activities by Water Body

Water Body	River Water Quality	Creek Water Quality	Urban Discharge	Pesticide Monitoring	Bio-assessment	Pathogen Source Tracking	Pesticide Persistence Study
Rivers							
American River	■			■		■	
Sacramento River	■			■		■	
Urban Discharge							
Sump 104			○				
Sump 111			○				
Strong Ranch Slough			○				
Creeks							
Arcade Creek		■		■	■	■	■
Elder Creek				■			
Elk Grove Creek				■			
Laguna Creek				■	◆		
Morrison Creek		■		■	■		■
Natomas East Main Drain				■			
Chicken Ranch Slough				■			
Willow Creek		■		■	◆		■

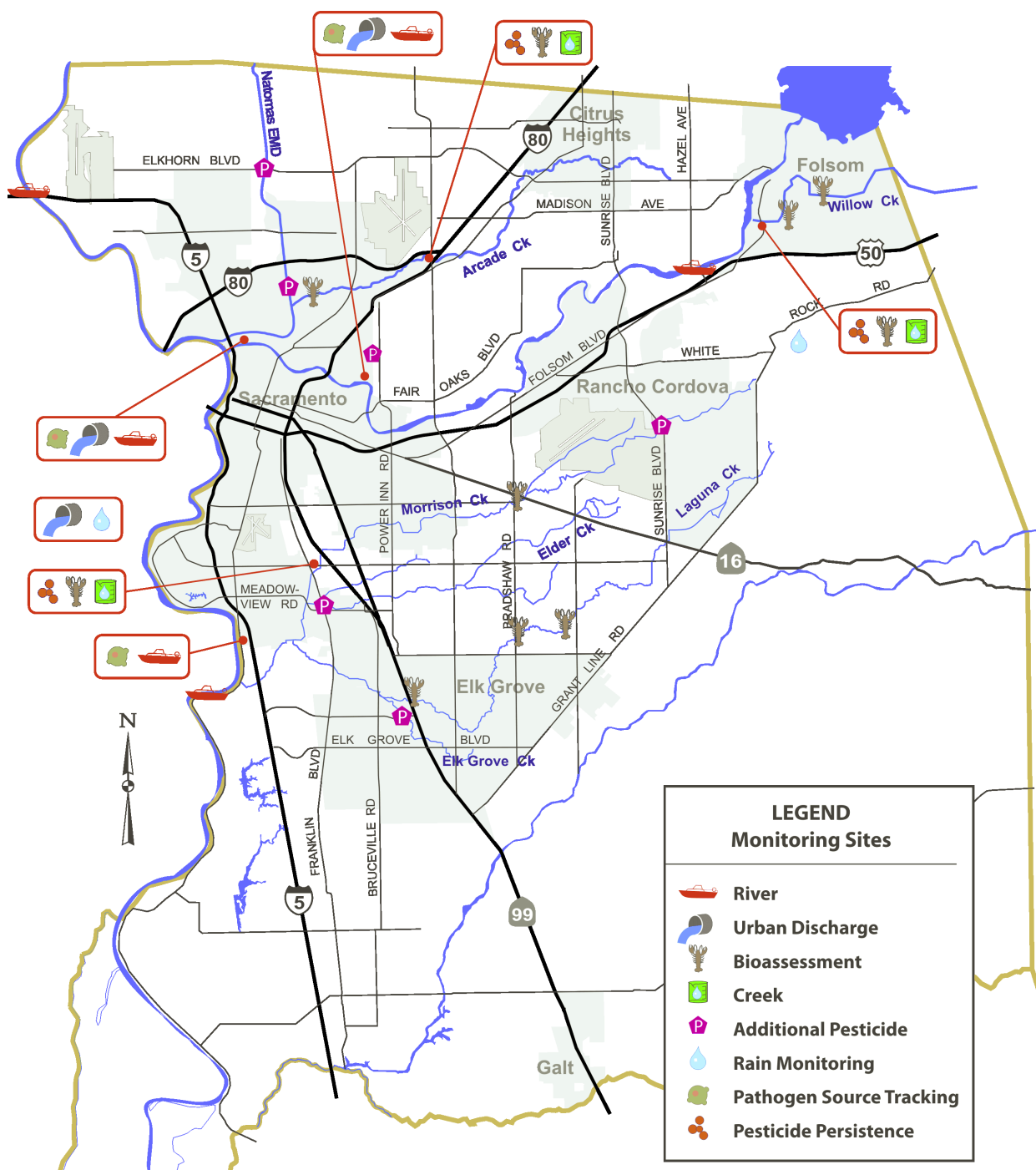
■ Monitoring performed in spring 2005.

◆ Bioassessment monitoring locations alternate year-to-year. These sites to be monitored again in Spring 2006, previously monitored in spring 2004..

○ Urban discharge monitoring scheduled for 2005/2006. Not performed during 2004/2005.

Rainwater monitoring

Figure 2.1-1. Map of Monitoring Sites



Notes:

- Bioassessment monitoring performed on alternating schedule with two creeks monitored per year. Arcade Creek and Morrison Creek were monitored in the spring of 2005. Willow Creek and Laguna Creek were monitored in the spring of 2004.
- Urban discharge monitoring not performed in 2004/2005.

2.2 2004/05 Water Quality Exceedances

Notifications of Water Quality Exceedances (NWQEs) were prepared by the Permittees during the 2004/05 fiscal year as required by Section I.C. of MRP section of the Permit. NWQEs were submitted to the Regional Board within 90 days of each event, when comparisons to WQOs identified constituents that exceed WQOs, as required by the Permit. Beginning in January 2003, water quality data from each monitoring event for receiving waters has been compared with water quality objectives from the California Toxics Rule (CTR), Department of Fish and Game (DFG) Criteria (incorporated in Finding 65 of the Permit), the Water Quality Control Plan for the Sacramento and San Joaquin River Basins (Basin Plan), and Maximum Contaminant Levels (MCLs) for chemical constituents (incorporated into the Basin Plan by reference for those waters that are used for drinking water supply). However, in a letter from the Central Valley Regional Water Quality Control Board², turbidity secondary MCLs were removed for WQO comparisons because turbidity is considered a physical water quality property rather than a chemical constituent. The list of applicable water quality objectives (WQOs) used for this comparison is presented in Appendix A.

Direct comparisons of receiving water constituent concentrations to the WQOs do not consider the duration or frequency of exceedances. Toxicity-based WQOs are based on both of these factors. Because storm events are episodic, a more sophisticated statistical model should be used to assess compliance with the statistically derived WQOs. Human health WQOs generally refer to a consistent exposure period over a lifetime (i.e., 3 liters of water consumed per day for seventy years), and chronic aquatic life WQOs refer to an exposure period of four days. The duration of storm event exposure depends on the hydrology of the creek or river, but is most likely more akin to an acute (instantaneous) exposure than a chronic exposure.

The 2004/05 monitoring year was the second year that included extensive monitoring of urban tributaries. Results for urban tributary monitoring were compared against WQOs and considered in NWQEs. The Basin Plan does not specifically list beneficial uses for the tributaries, however, to be consistent with a recent total maximum daily load (TMDL)³ and “tributary rule” policies, the downstream beneficial uses in the American and Sacramento Rivers are applied. The appropriateness of this policy for certain constituents and reaches should be more carefully examined to determine if the beneficial use does exist and it is impacted in the same way as the known downstream beneficial use. Application of this “tributary rule” should also consider hydraulic dilution and in-stream water chemistry changes between the water body of interest and the downstream impacted beneficial use.

Section I. D. of the Permit MRP requires the Permittees to prepare a Report of Water Quality Exceedance (RWQE) upon determination by either the Permittees or the Regional Board that discharges are causing or contributing to an exceedance of an applicable water quality standard. The RWQE “describes BMPs that are currently being implemented and additional BMPs that will be implemented to prevent or reduce any pollutants that are causing or contributing to the exceedance of Water Quality Standards.”

² April 14, 2004 Letter communication from Kenneth Landau, CVRWQB. to Cecilia Jensen, County of Sacramento Water Resources Division.

³ CVRWQB. *Total Maximum Daily Load Report for the Pesticides Diazinon and Chlorpyrifos in: arcade Creek, Elder Creek, Elk Grove Creek, Morrison Creek, Chicken Ranch Slough, and Strong Ranch Slough.* July 2004.

In general, constituents identified in these comparisons had been previously identified in the American or Sacramento Rivers or were already included in the Partnership's target pollutant list. Several exceedances of CTR total metals concentrations do not require RWQEs because the corresponding dissolved concentration did not exceed dissolved concentrations on which the CTR WQO are based. Although dissolved oxygen, pH, and temperature sometimes did not meet WQOs, actual compliance cannot be determined without more data to assess the variation over time and other natural effects.

Tables 2.2-1 through 2.2-5 summarize monitoring sites, monitoring events, constituents, and applicable WQOs addressed by 2004/2005 NWQEs.

Table 2.2-1. 2004/05 Exceedances of Water Quality Objectives in American River

EVENT	CONSTITUENT	RESULT	UNITS	QUALIFIERS	WQO	WQO SOURCE	INCLUDED IN NWQE
NIMBUS DAM							
October 19-20, 2004 Wet Weather Event	bis(2-ethylhexyl)phthalate	148	µg/L		1.8	CTR-HH	Yes
	Escherichia Coli	800	MPN/100mL		235	Basin Plan	Yes
	Fecal Coliform	800	MPN/100mL		400	Basin Plan	Yes
February 14-17, 2005 Wet Weather Event	pH,Field Measurement	8.6	Units		6.5-8.5	Basin Plan	Yes
HIGHWAY 80							
October 19-20, 2004 Wet Weather Event	Benz[a]anthracene	0.0225	µg/L		0.0044	CTR-HH	Yes
	Benzo(b)fluoranthene	0.0378	µg/L		0.0044	CTR-HH	Yes
	Benzo(k)fluoranthene	0.0292	µg/L		0.0044	CTR-HH	Yes
	Chrysene	0.0399	µg/L		0.0044	CTR-HH	Yes
	Escherichia Coli	>16,000	MPN/100mL		235	Basin Plan	Yes
	Fecal Coliform	>16,000	MPN/100mL		400	Basin Plan	Yes
	Total Aluminum	843	µg/L		200	Basin Plan	Yes
	Total Copper	7.2	µg/L		3.65	CTR-Acute	Yes
					2.76	CTR-Chronic	Yes
	Total Lead	5.39	µg/L		0.52	CTR-Chronic	Yes
	Iron, Total	862	µg/L		300	Title 22, 2nd MCL	No (1)
	Total Zinc	38.2	µg/L		35.8	CTR-Chronic/acute	Yes
January 25-30, 2005 Wet Weather Event	Total Aluminum	222	ug/L		200	Title 22, 2nd MCL	Yes
DISCOVERY PARK							
October 19-20, 2004 Wet Weather Event	Total Aluminum	369	µg/L		200	Title 22, 2nd MCL	Yes
	Iron, Total	466	µg/L		300	Title 22, 2nd MCL	No
December 7-8, 2004 Dry Weather Event	Fecal Coliform	800	MPN/100mL		400	Basin Plan	Yes
	Escherichia Coli	280	MPN/100mL		235	Basin Plan	Yes
	Total Mercury	139	ng/L		50	CTR-HH	Yes

Note: (1) The corresponding basin plan limit for dissolved iron, reflective of DHS requirements, is not exceeded.

Table 2.2-2. 2004/05 Exceedances of Water Quality Objectives in Sacramento River

EVENT	CONSTITUENT	RESULT	UNITS	QUALIFIERS	WQO	WQO SOURCE	INCLUDED IN NWQE
VETERANS BRIDGE							
October 5-6, 2004 Dry Weather Event	Aluminum, Total	405	µg/L		200	Title 22, 2nd MCL	Yes
January 25-30, 2005 Wet Weather Event	Aluminum, Total	2560	µg/L		200	Title 22, 2nd MCL	Yes
February 14-17, 2005 Wet Weather Event	Aluminum, Total	953	µg/L		200	Title 22, 2nd MCL	Yes
April 12, 2005 Dry Weather Event	Aluminum, Total	707	µg/L		200	Title 22, 2nd MCL	Yes
	Iron, Total	1250	µg/L		300	Title 22, 2nd MCL	Yes
June 7-8, 2005 Dry Weather Event	Aluminum, Total	345	µg/L		200	Title 22, 2nd MCL	Yes
FREEPORT MARINA							
October 5-6, 2004 Dry Weather Event	Aluminum, Total	247	µg/L		200	Title 22, 2nd MCL	Yes
January 25-30, 2005 Wet Weather Event	Aluminum, Total	534	ug/L		200	Title 22, 2nd MCL	Yes
February 14-17, 2005 Wet Weather Event	Escherichia Coli	500	MPN/100mL		235	Basin Plan	Yes
	Coliform,Fecal	500	MPN/100mL		400	Basin Plan	Yes
	TDS	150	mg/L		125	Basin Plan	Yes
	Aluminum, Total	557	µg/L		200	Title 22, 2nd MCL	Yes
April 12, 2005 Dry Weather Event	Aluminum, Total	406	µg/L		200	Title 22, 2nd MCL	Yes
	Iron, Total	653	µg/L		300	Basin Plan	Yes
June 7-8, 2005 Dry Weather Event	Aluminum, Total	237	µg/L		200	Title 22, 2nd MCL	Yes
RIVER MILE 44							
August 10-11, 2004 Dry Weather Event	Chlorpyrifos	0.1	µg/L		0.02 0.014	DFG Acute DFG Chronic	Yes Yes
October 5-6, 2004 Dry Weather Event	Aluminum, Total	370	µg/L		200	Title 22, 2nd MCL	Yes
February 14-17, 2005 Wet Weather Event	Aluminum, Total	493	µg/L		200	Title 22, 2nd MCL	Yes
June 7-8, 2005 Dry Weather Event	Aluminum, Total	335	µg/L		200	Title 22, 2nd MCL	Yes

Notes: (1) Basin Plan dissolved criteria supercedes and should be applied. No exceedance notification necessary.

(2) The corresponding basin plan limit for dissolved iron, reflective of DHS requirements, is not exceeded.

Table 2.2-3. 2004/05 Exceedances of Water Quality Objectives in Arcade Creek at Watt

EVENT	CONSTITUENT	RESULT	UNITS	QUALIFIERS	WQO	WQO SOURCE	INCLUDED IN NWQE
October 5-6, 2004 Dry Weather Event	Escherichia Coli	300	MPN/100mL		235	Basin Plan	Yes
	Fecal Coliform	500	MPN/100mL		400	Basin Plan	Yes
	Specific Conductance (field)	285	µmhos/cm		240	Basin Plan 50th Percentile	Yes
	Dissolved Oxygen	6	mg/L		7	Basin Plan	Yes
October 19-20, 2004 Wet Weather Event	Specific Conductance (field)	281	µmhos/cm		240	Basin Plan 50th Percentile	Yes
	Dissolved Oxygen	5.5	mg/L	EST/J	7	Basin Plan	No (2)
	Pentachlorophenol	0.295	µg/L		0.28	CTR-Human Health	Yes
	Escherichia Coli	80,000	MPN/100mL		235	Basin Plan	Yes
	Fecal Coliform	130,000	MPN/100mL		400	Basin Plan	Yes
	bis(2-Ethylhexyl)phthalate	5.61	µg/L	J/MIH	1.8	CTR-Human Health	Yes
	Copper, Total Recoverable	35.1	µg/L		4.64	CTR-Acute	Yes
					3.43	CTR-Chronic	Yes
	Iron, Total Recoverable	6,970	µg/L	J/NR	300	Title 22, 2nd MCL	No (3) (7) (8)
	Lead, Total Recoverable	26.2	µg/L		0.72	CTR-Chronic	Yes
					18.4	CTR-Acute	Yes
	Mercury, Total Recoverable	69.9	ng/L		50	CTR-HH	No
	Zinc, Total Recoverable	298	µg/L		44	CTR-Chronic	Yes
					44	CTR-Acute	Yes
	Benz(a)anthracene	0.0274	µg/L		0.0044	CTR-HH	Yes
	Benzo(a)pyrene	0.0282	µg/L		0.0044	CTR-HH	Yes
	Benzo(b)fluoranthene	0.0441	µg/L		0.0044	CTR-HH	Yes
	Benzo(k)fluoranthene	0.0472	µg/L		0.0044	CTR-HH	Yes
	Chrysene	0.07	µg/L		0.0044	CTR-HH	Yes
January 25-30, 2005 Wet Weather Event	Specific Conductance (field)	391	µmhos/cm		240	Basin Plan 50th Percentile	Yes
					340	Basin Plan 90th Percentile	Yes
	Dissolved Oxygen (field)	5.5	mg/L		7	Basin Plan	Yes
	Copper, Total Recoverable	23.3	µg/L	J/NR	4	CTR-Chronic	No (5)
	Diazinon	0.2	µg/L	Y	0.05	DFG-Chronic	Yes
					0.08	DFG-Acute	Yes
	Escherichia Coli	7,000	MPN/100mL		235	Basin Plan	Yes
	Fecal Coliform	11,000	MPN/100mL		400	Basin Plan	Yes
	Diazinon	0.26	µg/L	Y	0.05	DFG-Chronic	Yes
					0.08	DFG-Acute	Yes
	Simazine	6	ug/L		4	Basin Plan	Yes
	Dissolved Oxygen (field)	6	mg/L		7	Basin Plan	Yes
	Diazinon	0.21	µg/L	Y	0.05	DFG-Chronic	Yes
					0.08	DFG-Acute	Yes
February 14-17, 2005 Wet Weather Event	Specific Conductance (field)	327	µmhos/cm		240	Basin Plan 50th Percentile	Yes
	Escherichia Coli	17,000	MPN/100mL		235	Basin Plan	Yes
	Fecal Coliform	17,000	MPN/100mL		400	Basin Plan	Yes
	Copper, Total Recoverable	16.4	µg/L		7.8	CTR-Chronic	Yes
	Dissolved Oxygen	6	mg/L		7	Basin Plan	Yes
	pH	6.1	std. Units		6.5-7.5	Basin Plan	Yes

Table 2.2-3 Notes

(2) Estimated Value/Equipment malfunction. Exceedance not verifiable.

(3) Rejected data point. Exceedance not verifiable.

(5) Estimated value. Exceedance not verifiable.

(7) Result higher than highest calibration point of the instrument. Exceedance not verifiable.

(8) DHS applies dissolved objective. Corresponding dissolved data point is not available.

Y = % difference between primary and confirmation column is >40%.

J, EST = Estimated value

NR = Not reproducible due to duplicate imprecision.

MIH = Matrix interference, High.

Table 2.2-4. 2004/05 Exceedances of Water Quality Objectives in Morrison Creek at Brookfield (downstream)

EVENT	CONSTITUENT	RESULT	UNITS	QUALIFIERS	WQO	WQO SOURCE	INCLUDED IN NWQE
October 5-6, 2004	Fecal Coliform	500	MPN/100mL		400	Basin Plan	Yes
Dry Weather Event	Specific Conductance (field)	360	µmhos/cm		240/340	Basin Plan 50th and 90th Percentile	Yes
	Temperature (field)	25.7	degrees C		20	Basin Plan	No (4)
October 19-20, 2004	Specific Conductance (field)	360	µmhos/cm		240/340	Basin Plan 50th and 90th Percentile	Yes
Wet Weather Event	Pentachlorophenol	0.748	µg/L		0.28	CTR-Human Health	Yes
	bis(2-Ethylhexyl)phthalate	3.59	µg/L	MIH	1.8	CTR-Human Health	Yes
	Copper, Total Recoverable	44.3	µg/L	NR	9.33	CTR	Yes
	Iron, Total Recoverable	5,490	µg/L	NR	300	Basin Plan	No (5) (7) (9)
	Lead, Total Recoverable	54.8	µg/L	NR	3.2	CTR	Yes
	Zinc, Total recoverable	133	µg/L		57.5	CTR	Yes
	Benz(a)anthracene	0.0398	µg/L		0.0044	CTR-HH	Yes
	Benzo(a)pyrene	0.047	µg/L		0.0044	CTR-HH	Yes
	Benzo(b)fluoranthene	0.071	µg/L		0.0044	CTR-HH	Yes
	Benzo(k)fluoranthene	0.0539	µg/L		0.0044	CTR-HH	Yes
	Chrysene	0.108	µg/L		0.0044	CTR-HH	Yes
	Indeno(1,2,3-cd)pyrene	0.0366	µg/L		0.0044	CTR-HH	Yes
	Escherichia Coli	17,000	MPN/100mL		235	Basin Plan	Yes
	Fecal Coliform	80,000	MPN/100mL		400	Basin Plan	Yes
	Dissolved Oxygen	2.9	mg/L		7	Basin Plan	Yes
January 25-30, 2005	Specific Conductance (field)	265	µmhos/cm		240	Basin Plan 50th Percentile	Yes
Wet Weather Event	Escherichia Coli	8,000	MPN/100mL		235	Basin Plan	Yes
	Fecal Coliform	13,000	MPN/100mL		400	Basin Plan	Yes
	Diazinon	0.25	µg/L	Y	0.05	DFG-Chronic	Yes
	Simazine	6	µg/L		0.08	DFG-Acute	Yes
February 14-17, 2005	pH	9.5	std. Units		4	Basin Plan	Yes
Wet Weather Event	Specific Conductance (field)	289	µmhos/cm		6.5-7.5	Basin Plan	Yes
	Specific Conductance (field)	249	µmhos/cm		240	Basin Plan 50th Percentile	Yes
	Diazinon	0.37	µg/L		0.05	DFG-Chronic	Yes
					0.08	DFG-Acute	Yes
	Escherichia Coli	50,000	MPN/100mL		235	Basin Plan	Yes
	Fecal Coliform	130,000	MPN/100mL		400	Basin Plan	Yes
	Simazine	8.5	µg/L		4	Basin Plan	Yes
April 12, 2005	Specific Conductance (field)	248	µmhos/cm		240	Basin Plan 50th Percentile	Yes
Dry Weather Event	Temperature	6.1	°C		5	Basin Plan	Yes
	pH	8.7	std. Units		6.5-7.5	Basin Plan	Yes

Table 2.2-4 Notes

- (4) Upstream data is not available for comparison, temperature change cannot be verified.
 - (5) Estimated value. Exceedance not verifiable.
 - (7) Result higher than highest calibration point of the instrument. Exceedance not verifiable.
 - (9) Basin plan applies dissolved objective. Dissolved data is not available.
- Y = % difference between primary and confirmation column is >40%.
- NR = Not reproducible due to duplicate imprecision.
- MIH = Matrix interference, High.

Table 2.2-5. 2004/05 Exceedances of Water Quality Objectives in Willow Creek at Blue Ravine

EVENT	CONSTITUENT	RESULT	UNITS	QUALIFIERS	WQO	WQO SOURCE	INCLUDED IN NWQE
October 19-20, 2004 Wet Weather Event	pH	6.04	std. units		6.5-8.5	Basin Plan	Yes
	BHC, alpha	0.0091	µg/L	DNQ	0.0039	CTR-HH	Yes
	BHC, gamma	0.021	µg/L		0.019	CTR-HH	Yes
	Iron, Total Recoverable	1,600	µg/L	J/NR	300	Title 22, 2nd MCL	No (3) (7) (8)
	Dissolved Oxygen	5.5	mg/L		7	Basin Plan	Yes
	Solids, Total Dissolved	150	mg/L		125	Basin Plan	Yes
	Copper, Total Recoverable	12.6	µg/L		4.63	CTR-Chronic	Yes
					6.46	CTR-Acute	Yes
	Iron, Total Recoverable	3,970	µg/L	J/NR	300	Title 22, 2nd MCL	No (3) (7) (8)
	Escherichia Coli	30,000	MPN/100mL	EST	235	Basin Plan	Yes
	Fecal Coliform	30,000	MPN/100mL	EST	400	Basin Plan	Yes
	Mercury, Total Recoverable	110	ng/L		50	CTR-HH	No
January 25-30, 2005 Wet Weather Event	Escherichia Coli	17,000	MPN/100mL		235	Basin Plan	Yes
	Fecal Coliform	1,300	MPN/100mL		400	Basin Plan	Yes
	Dissolved Oxygen (field)	5.5	mg/L		7	Basin Plan	Yes
	Dissolved Oxygen (field)	5	mg/L		7	Basin Plan	Yes
February 14-17, 2005 Wet Weather Event	Escherichia Coli	1,300	MPN/100mL		235	Basin Plan	Yes
	Fecal Coliform	1,300	MPN/100mL		400	Basin Plan	Yes
	Dissolved Oxygen	6.5	mg/L		7	Basin Plan	Yes
	pH	6.2	std. units		6.5-7.5	Basin Plan	Yes

Notes

(3) Rejected data point. Exceedance not verifiable.

(7) Result higher than highest calibration point of the instrument. Exceedance not verifiable.

(8) DHS applies dissolved objective. Dissolved data is not available.

NR = Not reproducible due to duplicate imprecision.

DNQ = detected, but not quantified

Table 2.2-6a. 2004/05 Exceedances of Water Quality Objectives at Additional Pesticide Monitoring Locations

EVENT	CONSTITUENT	RESULT	UNITS	QUALIFIERS	WQO	WQO SOURCE	INCLUDED IN NWQE
NATOMAS EAST MAIN DRAIN AT SAN JUAN ROAD (NEMD01)							
October 5-6, 2004	Dissolved Oxygen	5.5	mg/L		7	Basin Plan	Yes
Dry Weather Event	Specific Conductance (field)	554	µmhos/cm		240	Basin Plan 50th Percentile	Yes
					360	Basin Plan 90th Percentile	Yes
January 25-30, 2005	pH (field)	4.8	std. units	R	6.5-8.5	Basin Plan	No (3)
Wet Weather Event	Specific Conductance (field)	404	µmhos/cm		240	Basin Plan 50th Percentile	Yes
					360	Basin Plan 90th Percentile	Yes
February 14-17, 2005	Specific Conductance (field)	449	µmhos/cm		360	Basin Plan 90th Percentile	Yes
Wet Weather Event							
April 12, 2005	Specific Conductance (field)	370	µmhos/cm		240	Basin Plan 50th Percentile	Yes
Dry Weather Event							
NATOMAS EAST MAIN DRAIN AT ELKHORN ROAD (NEMD02)							
October 5-6, 2004	Dieldrin	0.012	µg/L		0.00014	CTR-HH	Yes
Dry Weather Event	Dissolved Oxygen	<1	mg/L		7	Basin Plan	Yes
	pH	6.32	std. units		6.5-8.5	Basin Plan	Yes
					240	Basin Plan 50th Percentile	Yes
	Specific Conductance (field)	378	µmhos/cm		360	Basin Plan 90th Percentile	Yes
January 25-30, 2005	pH (field)	4	std. units	R	6.5-8.5	Basin Plan	No (3)
Wet Weather Event							
February 14-17, 2005	Dissolved Oxygen	4	mg/L		7	Basin Plan	Yes
Wet Weather Event							
ELK GROVE CREEK AT LAGUNA							
January 25-30, 2005	pH (field)	3.65	std. units	R	6.5-8.5	Basin Plan	No (3)
Wet Weather Event	Chlorpyrifos	0.015	µg/L	J/DNQ	0.014	DFG-Chronic	No (6)
	Diazinon	0.12	µg/L	Y	0.05	DFG-Chronic	Yes
					0.08	DFG-Acute	Yes

Table 2.2-6b. 2004/05 Exceedances of Water Quality Objectives at Additional Pesticide Monitoring Locations

EVENT	CONSTITUENT	RESULT	UNITS	QUALIFIERS	WQO	WQO SOURCE	INCLUDED IN NWQE
MORRISON CREEK AT SUNRISE							
February 14-17, 2005	pH	5.5	std. units		6.5-7.5	Basin Plan	Yes
Wet Weather Event	Dissolved Oxygen	5.5	mg/L		7	Basin Plan	Yes
ELDER CREEK AT MORRISON CREEK							
January 25-30, 2005	pH (field)	6.2	std. units		6.5-8.5	Basin Plan	Yes
Wet Weather Event	Chlorpyrifos	0.023	µg/L	J/DNQ	0.014	DFG-Chronic	Yes (6)
					0.02	DFG-Acute	
	Diazinon	0.28	µg/L	Y	0.05	DFG-Chronic	Yes
					0.08	DFG-Acute	Yes
	pH (field)	6.2	std. units		6.5-8.5	Basin Plan	Yes
April 12, 2005	Diazinon	0.62	µg/L	Y	0.05	DFG-Chronic	Yes
Dry Weather Event					0.08	DFG-Acute	Yes
CHICKEN RANCH SLOUGH							
January 25-30, 2005	Chlorpyrifos	0.017	µg/L	J/DNQ	0.014	DFG	No (6)
Wet Weather Event	Diazinon	0.21	µg/L	Y	0.05	Basin Plan	Yes
					0.08	Basin Plan	Yes
February 14-17, 2005	Escherichia Coli	7,000	MPN/100mL		235	Basin Plan	Yes
Wet Weather Event	Fecal Coliform	7,000	MPN/100mL		400	Basin Plan	Yes

Table 2.2-5 Notes:

(3) Rejected data point. Exceedance not verifiable.

(6) Detected by not quantified. Exceedance not verifiable.

Y = % difference between primary and confirmation column is >40%.

J = Estimated value

R = Rejected data point

DNQ = detected, but not quantified

Previous Years' Constituent RWQEs

The RWQE procedure, as set forth in §B.2. of the Permit, does not require the Permittees to repeat the RWQE process for recurring constituents unless directed to do so by the Central Valley RWQCB.

The following constituents were identified in the 2002/2003 RWQE (see 2002/2003 Joint Program Annual Report):

- Bacteriological indicators (Fecal Coliform and *E. coli*.)
- Total Dissolved Solids and Specific Conductance (electrical conductivity/EC)
- Diazinon
- Copper

The following constituents were identified in the 2003/2004 RWQE (see 2003/2004 Joint Program Annual Report):

- Polycyclic Aromatic Hydrocarbons
- Dichlorodiphenyltrichloroethane (DDT)

2004/05 Constituent RWQEs

Monitoring in 2004/05 resulted in several new constituents identified at concentrations above receiving water WQOs. Most of these constituents are already included in the Permittees' list of target pollutants. An evaluation was completed to identify the contribution of urban runoff to receiving water exceedances and the need for a RWQE. Three new constituents required RWQEs in 2004/05 as discussed below (i.e. mercury, pentachlorophenol, and chlorpyrifos).

Mercury

The CTR Human Health WQO for total mercury is 50 ng/L for consumption of water and organisms. One sample from the American River at Discovery Park (139 ng/L) exceeded this WQO during the December 7-8, 2004 wet weather monitoring event. The previous maximum detected total mercury concentration at this site in 140 samples since 1992 was 13.3 ng/L. This reported sample concentration was approximately sixty standard deviations greater than the long term average. The sample concentration was confirmed by the laboratory. The WQO objective was also exceeded at Arcade Creek at Watt (69.9 ng/L) and Willow Creek at Blue Ravine (110 ng/L) during the October 19-20, 2004 wet weather event, however, these WQO exceedances were erroneously omitted in the January 19, 2005 NWQE due to a units comparison error.

Mercury is included in the region's 303(d) listing for the lower American River, the Sacramento River to the 'I' Street Bridge, and the Delta. After diazinon and chlorpyrifos, mercury is the next highest listed constituent on the Permittees' target pollutant prioritization list, and is already a part of the Partnership's stormwater management and pollutant reduction programs. A RWQE for mercury is included in Appendix A.

Pentachlorophenol

Pentachlorophenol is a pesticide that is commonly used by licensed applicators on wood (telephone poles, railroad ties, etc.). Since 1984, pentachlorophenol has not been available to the general public. The wet weather storm sample from Arcade Creek at Watt (0.295 µg/L) on October 19, 2004 and the pre-storm sample from Morrison Creek at Brookfield (0.748 µg/L) on October 17, 2004 exceeded the CTR human health WQO (0.28 µg/L). Previously in 2003/04, the Morrison Creek at Brookfield sample from the December 14-15, 2003 monitoring event exceeded the CTR human health WQO. Because of the short duration and limited detection it could not be determined if urban runoff caused or contributed to the WQO exceedance and a RWQE was not required (see 2003/2004 Joint Program Annual Report, October 2004 for more information).

No urban runoff or other ambient pentachlorophenol samples were reported at concentrations above the CTR human health criteria in 2004/05. Historically pentachlorophenol has occasionally been detected in urban runoff above the CTR WQO (14% of the time in full event composite samples since 1991). Existing BMPs are described in the May 2004 Pesticide Plan. A RWQE for pentachlorophenol is included in Appendix A.

Chlorpyrifos

The Basin Plan and CTR do not directly incorporate diazinon or chlorpyrifos WQOs. However, in the MRP the Central Valley RWQCB has interpreted a narrative toxicity objective in the Basin Plan to incorporate the DFG WQOs for diazinon and chlorpyrifos. The DFG criteria for chlorpyrifos are 0.020 µg/L, one hour average (acute) and 0.014 µg/L, four-day average (chronic).

At the urban tributaries, several samples were reported by the laboratory as “estimated” above a chlorpyrifos WQO. Because the estimated concentrations were greater than the method detection limit (MDL) but less than the more reliable minimum level (ML), these samples are qualified as “detected, but not quantified” (DNQ)⁴. The Elder Creek sample (0.023 µg/L) exceeded the acute WQO during the January 28, 2005 wet weather event. During that same storm event, the chronic WQO was exceeded at Elk Grove Creek (0.015 µg/L), Morrison Creek at Brookfield (0.013 µg/L), Chicken Ranch Slough (0.017 µg/L), and Arcade Creek at Watt (0.012 µg/L). None of the other pesticide persistence study pre- and post-storm samples at the urban tributary locations exceeded the chronic WQO. The pesticide persistence study performed by the Permittees at the urban tributary locations collects data for a four day period to examine the chronic compliance period. When the concentrations cannot be explicitly quantified, as has been the case with all the urban tributary results, it is not possible to confirm that the WQO was exceeded. The Sacramento River at River Mile 44 sample on August 11, 2004 (0.10 µg/L) was the only unqualified sample that exceeded the acute and chronic WQOs.

The unquantifiable concentrations of chlorpyrifos in urban tributaries and urban runoff do not provide sufficient evidence in themselves of urban tributary WQO exceedances in 2004/05. However, chlorpyrifos has been identified as a water quality issue through the TMDL effort and has been detected frequently in Sacramento urban runoff monitoring with some quantifiable concentrations above the WQOs. Because chlorpyrifos is included in the 303(d) impairment list for several water bodies in the Sacramento urban area, and is included in a TMDL for the urban watershed, a RWQE is included in Appendix A.

⁴ 2000. State Water Resources Control Board. Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California

Receiving Water WQO Exceedances Not Requiring RWQE

From the list of constituents identified as not meeting a receiving water WQO, many of these exceedance results could not be shown to be caused by urban runoff or were otherwise based on unreliable results. These constituents do not require a RWQE according to the Permit requirements, however, they are discussed below in light of current activities the Permittees perform or are planning. Additionally, when total metals concentrations exceeded CTR aquatic life WQOs and the corresponding dissolved concentrations did not exceed the dissolved-based CTR WQO, a RWQE was not necessary.

Aluminum

Aluminum is not included in the “standard” list of monitoring constituents (MRP Table 1) in urban runoff or the urban tributaries. Aluminum will be included during urban runoff monitoring activities in 2005/06 and 2006/07 as part of the MRP Table 2 monitoring list. However, river monitoring efforts included aluminum monitoring for the first time during the June 8-9, 2003 dry weather monitoring event and all subsequent events. The secondary MCL for aluminum (200 µg/L) was exceeded in the Sacramento River only. Aluminum is a naturally occurring element in the earth’s crust and is likely present in river water bound in particulate form as silicates. Because urban runoff aluminum monitoring has not been performed, it is not known whether Sacramento area urban runoff causes or contributes to these receiving water WQO exceedances. Moreover, all dissolved aluminum concentrations in 2004/05 were all below the secondary MCL.

There are no aluminum specific BMPs currently used in the Sacramento area, however, any solids reducing BMPs, e.g. detention basins and swales, would substantially reduce total aluminum mass loading in urban runoff. The Permittees will continue to track this constituent and begin two years of urban runoff data collection in 2005/2006.

Dieldrin

Dieldrin was detected at the upstream Natomas East Main Drain (NEMD, 0.012 µg/L) location during the October 6, 2005 dry weather monitoring event above the CTR human health WQO (0.00014 µg/L). Dieldrin is an insecticide used on fruits, soil, and agricultural seeds that readily binds to sediment with a half-life exceeding 5 years. Dieldrin is also a decomposition product of the insecticide aldrin, which was commonly used for termite control and applied directly to soil. Dieldrin and aldrin use was banned in the United States in 1987 by EPA. Because this in-stream exceedance occurred upstream of the Sacramento urban area, urban runoff cannot be shown to cause or contribute to the exceedance. Existing BMPs are described in the May 2004 Pesticide Plan.

Dissolved Oxygen (DO)

In the Sacramento River or American River dissolved oxygen (DO) was not measured below the Basin Plan limit of 7.0 mg/L (COLD and SPWN beneficial use designations and Delta waters on the Sacramento River downstream of the ‘I’ Street Bridge) during 2004/05 monitoring. Although it is not known if the Sacramento and American River beneficial uses apply to the upstream urban tributaries, the minimum DO WQOs were not met during 2004/05 monitoring activities at both upstream and downstream urban tributary locations. This pattern was also noted in 2003/04, and a RWQE was not prepared at that time because the data were thought to be unreliable.

Aside from the specific Sacramento River minimum DO requirements and other surface waters with specific minimum DO requirements, the Basin Plan also specifies that DO “shall not fall below 85% of saturation in the main water mass, and the 95 percentile concentration shall not fall below 75% of saturation. These Basin Plan WQOs are likely not achieved in some urban tributaries for certain durations during storm events.

A fish kill was observed in Elk Grove Creek associated with an early season wet weather event and a RWQE was developed and submitted⁵ to the Central Valley RWQCB by the City of Elk Grove. The fish kill was thought to be caused by localized depressed dissolved oxygen concentrations. Fish kills were not reported to the Permittees at any other urban tributary locations during 2004/05.

The causes of DO depression and the effect on beneficial uses in these urban tributaries are not well understood based on the limited grab sample based monitoring that is conducted. Although DO depression is not uncommon in urban tributaries and has been studied closely elsewhere, a more comprehensive study in and above the urban Sacramento watershed area could potentially help identify site specific causes and the critical periods of DO depression. Rather than proposing general BMPs or source control options in an RWQE, the Permittees will proceed with developing an assessment strategy for DO in 2005/06. The primary objectives of the study are to characterize DO concentrations over longer periods, identify causes of depressed DO, and assess the impact on pertinent beneficial uses. The status of this assessment strategy and proposed follow-up activity (e.g., monitoring, technical studies, etc.) will be reported in the 2005/06 Joint Program Annual Report.

pH

The Basin Plan requires that pH “shall not be depressed below 6.5 nor raised above 8.5” for all inland water bodies, and allows that the “appropriate averaging period may be applied provided that beneficial uses will be fully protected.” Samples taken both upstream and downstream of the urban watershed urban tributary locations were observed to have pH values outside of the Basin Plan range, and one sample at upstream river receiving water sample at Nimbus Dam was high. Some reported field-measured values were rejected based on comparisons to lab-measured duplicates and improbable values.

At this time, preparing a RWQE is impractical and infeasible because of the limited field-measured data for assessing variability over time, an incomplete understanding of the impacted beneficial uses. Background upstream pH conditions are similar to the conditions downstream from urban runoff influence.

The Permittees will instead move forward with developing an assessment strategy to develop a better understanding of pH conditions in the urban tributaries, including a better understanding of “natural” pH conditions, time variability, and the impact on any possible beneficial uses that are identified in the urban tributaries. The status of this assessment strategy and proposed follow-up activity (e.g., monitoring, technical studies, etc.) will be reported in the 2005/06 Joint Program Annual Report.

⁵ June 8, 2005. Letter sent by the City of Elk Grove to William J. Marshall, California Regional Water Quality Control Board, Central Valley Region. *Water Quality Standards Exceedance, Elk Grove Creek, Sacramento Municipal Separate Storm Sewer Systems (MS4) Permit, City of Elk Grove, Sacramento County, Order No. R5-2002-0206, NPDES No. CAS082597. Report of Water Quality Exceedance (RWQE).*

Lead

Similar to the reported exceedances in 2003/04, the American River (at Highway 80), Morrison Creek at Brookfield, and Arcade Creek at Watt reported an exceedance of the hardness adjusted total recoverable lead WQO. In the absence of a State Board stormwater implementation policy the Permittees evaluated these exceedances following the procedures set forth in the State Implementation Plan (SIP) that is used to evaluate effluent discharges from point discharges. As described previously, these comparisons may not clearly indicate the impact of the observed exceedance and as such, additional analysis and discussion is provided for these exceedances.

The CTR lead WQOs are promulgated as dissolved concentrations; however, the SIP⁶ requires development of “total recoverable” effluent limitations when implementing the CTR WQOs and assessing effluent compliance. The dissolved form of metals is considered more bioavailable for aquatic life than the total (particulate-borne) form. Lead concentrations in stormwater are primarily in the less bioavailable particulate form as is evident by the low dissolved (filtered) to total concentration ratio.

No sample in the 2004/05 monitoring year exceeded the applicable dissolved lead WQO, however, because of lab error, dissolved samples at Morrison and Arcade Creeks were not analyzed for the sample that had the total recoverable exceedance.

A RWQE was not considered necessary for total recoverable lead because there already is a solids reduction programs in place, and dissolved lead is already on the Permittee Target Pollutant list. Moreover, no dissolved WQOs were exceeded, urban runoff cannot be shown to cause or contribute to a (dissolved) receiving water WQO exceedance.

Lead was identified by the Permittees as a target pollutant in 1996 and the Permittees subsequently conducted studies to identify and prioritize sources of lead and identify potentially effective BMPs. The studies indicated that the most significant sources of lead in the urban environment are from uses that are no longer legal but that have resulted in a legacy of a reservoir of lead. The Permittees now implement BMPS to target potential legacy sources. Examples include lead paint on many existing buildings, and soil contaminated by auto emissions when leaded gasoline was prevalent. Ongoing sources of lead are primarily associated with automobiles, such as batteries, used oil, and radiators. Electronic waste contains a significant amount of lead, although its contribution to lead in urban runoff is not expected to be high.

Zinc

Samples at American River at Highway 80 and Willow Creek exceed the CTR acute and chronic WQO for total recoverable zinc in the October 19, 2005 monitoring event. In 2003/04 exceedances of total recoverable zinc occurred in the American River and the other two urban tributary locations. However, no dissolved zinc sample concentrations between 2003 and 2005 exceeded the corresponding dissolved CTR WQOs, which are the technical basis for the promulgated CTR WQOs.

⁶ 2000 State Water Resources Control Board, California Environmental Protection Agency *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (Phase 1 of the Inland Surface Waters Plan and the Enclosed Bays and Estuaries Plan)*. Resolution No. 2000-15

In the absence of a State Board stormwater implementation policy the Permittees evaluated these exceedances following the procedures set forth in the SIP that is used to evaluate effluent discharges from point discharges. As described previously, these comparisons may not clearly indicate the impact of the observed exceedance and as such, additional analysis and discussion is provided for these exceedances.

The CTR zinc WQOs are promulgated as dissolved concentrations, however, the SIP requires development of “total recoverable” effluent limitations when implementing the CTR WQOs and assessing effluent compliance. The dissolved form of metals is considered more bioavailable for aquatic life than the total (particulate-borne) form. Zinc concentrations in stormwater are primarily in the less bioavailable particulate form as is evident by the low dissolved (filtered) to total concentration ratio. Dissolved zinc concentrations in urban runoff samples would also generally not exceed the corresponding CTR WQO and it cannot be demonstrated that urban runoff causes or contributes to an exceedance of the applicable WQO.

Zinc was previously identified by the Permittees as a target pollutant. Based on work conducted on copper and lead sources⁷, the Permittees currently believe that the primary source of zinc in urban runoff is tire tread wear. Other sources include used motor oil, soil erosion, and outdoor metal structures with galvanized metal surfaces. BMPs already in place to control other ubiquitous target pollutants that are likely to be bound to sediment particles, such as copper and lead, are also expected to reduce levels of zinc in urban runoff.

Temperature

The Basin Plan contains WQOs for temperature that are dependent on location and time-of-year, and also includes narrative temperature objectives. The objectives are primarily based on the beneficial use of “Fish and Wildlife”. The Chinook salmon-based objective for the Sacramento River at Freeport is a narrative objective of 20°C between April 1 and June 30 and between September 1 through November 30. The Freeport objective is 18.9°C between January 1 and March 31. The Sacramento River upstream (i.e., Veterans Bridge) Basin Plan objective is 20°C “when temperature increases will be detrimental to the fishery”. Temperature increases of intrastate waters with WARM and COLD beneficial uses cannot be increased more than 5°C due to controllable factors. The Basin Plan also allows that “appropriate averaging periods may be applied provided that beneficial uses will be fully protected”. The American and Sacramento Rivers are clearly included in these WQOs (narrative and otherwise), however, as with DO, the beneficial uses of the urban tributaries are not established. The Central Valley RWQCB has previously applied the WARM and COLD designations to Sacramento urban tributaries in the OP pesticide TMDL, citing the Tributary Rule.

⁷ November 1998. Sacramento Stormwater Monitoring Program. Technical Memorandum: Copper Control Measure Identification. Prepared by Larry Walker Associates.

There were no exceedances of the temperature objectives in the American or Sacramento Rivers during the 2004/05 monitoring events. There were four cases of dry weather temperature exceedances of the American or Sacramento River objectives in urban tributaries, assuming the Tributary Rule applies. These apparent exceedances were limited to Morrison and Elder Creeks. No upstream temperature data is available in Elder Creek to confirm whether a 5°C increase occurred, however both (October 6 and April 12) exceedances were above 25°C. Both of these urban tributaries have limited flow during dry periods, and the water present during the dry season, if any, is slow moving. The sampling locations have limited cover, and the samples were taken in the mid-afternoon on sunny days (October 6 high temperature = 89°F, April 12 high temperature = 70°F).

A RWQE is not considered appropriate at this time because protection of the beneficial uses related to temperature in these urban tributaries is not well understood. Also, aside from the already significant illicit discharge identification program implemented by the Permittees there are no programmatic temperature control techniques (i.e., “controllable factors”). Finally, the limited dry weather thermal mass from these urban tributaries does not have a significant effect on downstream receiving water temperature. In lieu of the RWQE, the Permittees will proceed with development of an assessment plan with the objective of identifying temperature changes over time, appropriate temperature averaging periods to assess WQO compliance, and an assessment of sampling locations where “ponding” and localized stagnant pools may not be representative of the overall urban tributary location. The status of this assessment strategy and proposed follow-up activity (e.g., monitoring, technical studies, etc.) will be reported in the 2005/06 Joint Program Annual Report.

Iron

The Basin Plan objective for dissolved iron (300 µg/L) in Delta waters was not exceeded during 2004/05 monitoring at any locations. However, the Basin Plan incorporates Title 22 WQOs including the secondary MCL for iron (300 µg/L) for areas outside of the delta. Several total iron concentrations in the Sacramento River and in urban tributaries exceeded this MCL, however, the corresponding dissolved concentration (when available) did not exceed this objective. The Department of Health Services requires that the water treatment facilities comply with the MCL using filtered samples (i.e., dissolved analysis). A RWQE was not be prepared for iron in 2004/05 because urban runoff cannot be shown to cause or contribute significantly to the exceedance of the dissolved WQO. Moreover, the upstream concentrations in both rivers is not appreciably changed by the input of urban runoff, the concentration of total iron is associated with filterable solids, and all dissolved concentrations were below the applicable objective.

Gamma-hexachlorocyclohexane (gamma-BHC or Lindane)

One sample from the October 17-18, 2004 composite sample at Willow Creek contained concentrations of lindane (0.021 µg/L) above the CTR human health WQO (0.019 µg/L). The same sample had detected concentrations of alpha-BHC above the applicable WQO, however, that sample concentration was below the minimum level (ML) and could not be accurately quantified. Because lindane was historically the primary active ingredient in shampoo treatments for head lice and scabies infections and it is a highly persistent organochlorine OC pesticide, it has been frequently found in wastewater treatment streams.

Lindane is a persistent, toxic, and bioaccumulative organochlorine (OC) pesticide and is still used as a topical pharmaceutical on humans in the United States outside of California. Lindane shampoos and consumer products containing lindane were banned by the State of California in 2001. Agriculturally, it is used for treatment of some types of seeds and livestock. Because of its persistence, atmospheric deposition plays a role in lindane transport through the environment.

Historically, lindane has never been detected in urban runoff, however beta-BHC (a degradation product of lindane) has been detected in 5% of urban runoff samples. Existing BMPs are described in the May 2004 Pesticide Plan. A RWQE for lindane is not deemed necessary because urban runoff cannot be shown to cause or contribute to the water quality exceedance.

Simazine

Simazine was detected above the Basin Plan incorporated drinking water MCL (4 µ/L) in two samples from Morrison Creek at Brookfield. These two samples were taken the day following storm events that occurred during (1/29/05) and immediately following (2/17/05) the dormant spray period. Simazine was detected below the MCL numerous times at Morrison Creek at Brookfield in 2004/05 and less frequently in other urban tributaries and in rain (wet deposition) samples.

Simazine is used as a pre-emergence herbicide for control of broad-leaved and grassy weeds on a variety of deep-rooted crops such as corn, artichokes, asparagus, berry crops, broad beans, citrus, etc. It is also used for algae control on non-crop areas such as farm ponds and fish hatcheries, and in aquariums. Other herbicides with which simazine is combined include: paraquat, on apples, peaches; Roundup or Oust for non-crop use; Surflan on Christmas trees; Dual on corn and ornamentals. If released to water, simazine will not bind to sediments or evaporate. It may leach to ground water. Its persistence varies from a few months to a few years, depending mainly on the rate of degradation by microbes. Simazine has a low potential to bioaccumulate in fish.⁸

No urban runoff or other ambient simazine samples were reported at concentrations above the Basin Plan WQO in 2004/05. Moreover, simazine was detected in urban runoff above the Basin Plan WQO in only 3% of event composite samples since 1991. All samples above the WQO occurred in 1995. Simazine is detected in Sacramento urban runoff approximately 30% of the time. Existing BMPs are described in the May 2004 Pesticide Plan. A RWQE for simazine is not necessary because urban runoff cannot be shown to cause or contribute to receiving water WQO exceedances more than once every three years.

2.3 Summary of Monitoring Activities

Sampling Protocols

All monitoring studies conform to sampling and analysis standards and protocols that are described in annually updated sampling plans. Sampling for the 2004/05 monitoring program was conducted as prescribed in the sampling plans for each of the studies that are included in Appendix B to this report:

- Coordinated Event Sampling Plan: 2004/05 Sacramento Stormwater Quality Partnership Monitoring Program

⁸ Summary of information found at:
http://www.epa.gov/safewater/contaminants/dw_contamfs/simazine.html

- 2004-2005 Sacramento Stormwater NPDES Monitoring Urban Tributary and Additional Pesticide Sampling and Analysis Plan, October 2004.
- Sacramento Stormwater Quality Partnership Bioassessment Monitoring Plan
- Natomas Wet Detention Basin Monitoring and Analysis Work Plan

The Coordinated Event Sample Plan refers to coordination of river sampling with the other monitoring elements and identifies the target monitoring events to be coordinated, sampling strategies, constituents and sampling methods, procedures for documentation and shipping, site-specific sampling plans and a communication plan. This monitoring effort is coordinated with the Sacramento County Regional Sanitation District (SCRSD) and the Sacramento Regional Wastewater Treatment Plant (SRWTP) receiving water monitoring activities to complete the river monitoring elements of the Permit. The Urban Tributary Sampling and Analysis Plan identifies the monitoring sites, maintenance and preparation for the monitoring sites, storm tracking, communication, and tracking procedures, field equipment and station preparation for sampling events, monitoring management, field monitoring site visit procedures, procedures for quality control samples, and procedures for sample splitting and shipment. These plans meet the requirements of Section II. A. and Section IV. A., C, D, G, H and K of the Monitoring and Reporting Program (MRP) of the Permit. Table 2.3-1 shows the events monitored and event coordination between monitoring elements that have wet weather monitoring elements.

Table 2.3-1. 2004/05 Monitoring Events (Excluding Bioassessment)

Monitoring Study Element	10/6/04[a]	10/18-19/04	1/26/05	1/27-29/05	2/15-16/05	2/19-20/05	2/26-28/05	3/4/05	3/18-20/05	3/21-22/05	4/3/05	4/12-13/05 [a]
River Monitoring (CMP)	X	X		X		X						X
Creek Monitoring	X	X[b]		X[b]		X[b]						X[c]
Additional Pesticide Sites	X			X		X						X
Rainfall Monitoring			X	X	X[d]	X	X[d]	X	X[d]	X[d]	X	

[a] Dry weather event.

[b] Pesticide persistence monitoring one day prior to event and in each of the two days following the event.

[c] Pesticides only.

[d] Coordinated with Central Valley RWQCB rainfall monitoring in Lincoln and Stockton.

Receiving Water Monitoring

Receiving water monitoring consists of river and urban tributary (creek) monitoring for water quality constituents as required in Section II. B of the MRP. River monitoring has been an integral part of the Sacramento Stormwater Quality Partnership Monitoring Program for many years. The Permittees have compiled river monitoring data collected since 1992 in a database, and this has become a useful resource for many government, private, and non-profit groups. This database was updated in 2004/05 to automate laboratory submittal of electronic data reports and data quality evaluation. Eight successful river monitoring events were performed in the Sacramento and American Rivers; five of these events (as shown in Table 2.3-1) were coordinated with other stormwater related monitoring. Urban tributary monitoring, as required in the Permit, was continued in 2004/05 with five successful events (three wet weather and two dry weather).

American and Sacramento River Monitoring

River monitoring is conducted through the Coordinated Monitoring Program (CMP). The CMP is managed by the SRCSD with funding provided by the SRCSD and the Sacramento Stormwater Quality Partnership. During the 2004/05 fiscal year, the CMP collected water quality samples according to a schedule that was modified, as needed, to include events coordinated with storm events. CMP events were scheduled to occur every other month to meet SRCSD SRWTP permit requirements. Half of these events included additional samples and were coordinated with SRWTP monitoring (a.k.a. "P4" events). The CMP monitors three locations on the Sacramento River and two locations on the American River. The CMP adds an additional American River monitoring location at Highway 80 for events coordinated with stormwater monitoring. The locations of all river sites are shown on Figure 2.1-1. The Stormwater Quality Partnership utilized the sampling data collected at the sites shown in Table 2.3-2. River Mile 44 data are also collected by the CMP, but are not required in the stormwater Permit.

Table 2.3-2. 2004/05 River Monitoring Sites for Stormwater Program

River	Site	Description of Site Location and Upstream Land Use
American River	Nimbus Dam	Immediately Upstream are Both Lake Natoma and Folsom Reservoir
	Highway 80	Just Upstream of the Highway 80 Bridge and Downstream of Strong Ranch Slough Gravity Discharge from Basin D5)
	Discovery Park	Upstream is Mixed Use Area, but Primarily Residential Area
Sacramento River	Veterans Bridge	Agriculture Dominates the immediate Upper Watershed
	Freeport Marina	Cities of Sacramento and West Sacramento

Water quality samples collected from the sites listed above were evaluated for the constituents listed on Table 1 of the Monitoring and Reporting Program of the Permit. Water quality data for the 2004/05 CMP monitoring activities are presented in the 2004/05 Coordinated Monitoring Program Annual Report, included as Appendix C to this report.

Urban Tributary Monitoring (Creek Monitoring)

Three urban tributary locations were monitored in 2004/05 during three wet weather events and two dry weather events. These locations were monitored for the constituents in Table 1 of the MRP for the first event of the year, and dissolved oxygen, pH, temperature, conductivity, total suspended solids, indicator bacteria, and any constituents for which the creek is considered impaired according to the 303d list for all other events. The sites that were monitored are listed in Table 2.3-3.

Table 2.3-3. Urban Tributary Monitoring Sites

Creek	Site	Downstream Water Body	303d Listing	Description of Site Location and Upstream Land Use
Arcade Creek	Watt Ave. Sacramento	Natomas East Main Drain	Chlorpyrifos Diazinon Copper	Highly urbanized, predominant land use: older residential
Morrison Creek	Brookfield Dr. Sacramento County	Sacramento River downstream of Freeport Marina	Diazinon	Upper watershed is under development or will be developed in future; currently agriculture and open space. Lower watershed is highly urbanized with mix of industrial, commercial and residential land uses.
Willow Creek	Blue Ravine Rd. Folsom	Lake Natoma		Watershed consists of suburban development creek with new residential/commercial development. Note: This creek has more gradient than other creeks.

These creeks represent watersheds with different phases, types and levels of development. Arcade Creek is highly developed, primarily with older residential development. Morrison Creek has a mix of different land uses. The upper watershed is undergoing development while there is still irrigated agriculture along its corridor with a mix of industrial, commercial, and residential development downstream. The majority of the Willow Creek watershed in Folsom is residential, however, since the area has been developed more recently (since the early 1990's), most of the urban runoff is treated in water quality detention basins before it reaches the creek.

Monitoring of these creeks was performed for five separate events during the 2004/05 monitoring year and was coordinated with several other monitoring elements (see Table 2.3-1). OP pesticides were also monitored the day before and in each of the two days following a wet weather event as part of the "pesticide persistence study". The first wet weather event of the year (10/18-19/05) included sampling for all MRP "Table 1" constituents using a flow-weighted compositing technique. Sample aliquots were taken at time intervals for the duration of the runoff event and then composited based on runoff volume estimates during the preceding time interval. The second wet weather event of the year (1/28/05) was performed during the dormant spray period and included grab samples collected near the peak runoff period. The final wet weather event (2/15/05) was after most all commercial dormant spraying performed in the urban area and the river(s) watershed. Agricultural dormant spraying was monitored through

communications with county agricultural commissioners. Grab sampling was also performed for the dry weather events (10/6/04 and 4/12/04). A complete report of all events and activities, including analytical results, is included as Appendix D: Urban Tributary and Additional Pesticide Monitoring Report 2004/05.

Additional Pesticide Monitoring

Monitoring of several new sites for the pesticides diazinon and chlorpyrifos was performed as shown in Table 2.3-1. The purpose of this additional monitoring is to determine if diazinon and/or chlorpyrifos at these sites are significantly different than other longer-term creek monitoring sites. Table 2.3-6 describes the sites monitored. This monitoring is in addition to pesticide analyses routinely performed at other creek monitoring sites. A complete report of all events and activities, including analytical results, is included as Appendix D: Urban Tributary and Additional Pesticide Monitoring Report 2004/05.

Table 2.3-6. Additional Pesticide Monitoring Sites for 2004/2005

Creek	Site	Downstream Water Body	Watershed Description
Elder Creek	Prior to Morrison Creek confluence	Morrison Creek	Watershed is mix of agriculture and new development
Elk Grove Creek	Prior to Laguna Creek confluence	Laguna Creek	Mix of older and new residential subdivisions and commercial land uses
Natomas East Main Drain Downstream	Prior to Arcade Creek confluence	Sacramento River Prior to Confluence with American River	Urban and developing areas with irrigated agriculture and pasture in the upper watershed.
Natomas East Main Drain Upstream	Upper Watershed at Elkhorn Blvd.	Sacramento River Prior to Confluence with American River	Primarily irrigated agriculture and pasture.
Morrison Creek	Upper Watershed at Sunrise Blvd.	Sacramento River downstream of Freeport	Upper watershed is range, cropland, and open space that is in the initial stage of residential and commercial development
Chicken Ranch Slough	Downstream location at Hurley Way	American River	Mostly older residential with some commercial (3,400 acres).

The two years of chlorpyrifos and diazinon data from the “additional pesticide” sites were statistically compared to long-term urban tributary sites (Appendix E)⁹. From the seven monitoring events the statistical analysis determined that the sites could be divided into two groups of similar diazinon and chlorpyrifos concentrations. The Elder Creek, Elk Grove Creek, and Chicken Ranch Slough additional pesticide sites are likely sufficiently comparable, for the purpose of general urban watershed monitoring, to the Arcade Creek at Watt and Morrison Creek at Brookfield long-term urban tributary sites. The NEMD sites and the upstream Morrison Creek at Brookfield site did not have any reported concentrations of diazinon or chlorpyrifos, which compares well with the Willow Creek long-term urban tributary location.

Continued monitoring of the additional pesticide locations is only necessary if there are changes in (sub-) watershed-specific activities that are anticipated in the specific tributary watersheds that would affect OP pesticide concentrations differently from creek-to-creek. Based on this analysis, the Permittees formally request from the Central Valley RWQCB that they waive the additional monitoring requirements at these six monitoring locations for the remaining years in the current Permit.

⁹ September 1, 2005. Larry Walker Associates. Technical Memorandum to the Sacramento Stormwater Partnership. *Evaluation of Additional Pesticide Monitoring Data*

Rainfall monitoring is a component of the additional pesticide monitoring and is required in up to five events per year at two locations. The locations, as shown in Table 2.3-7 are required to include a location within the urban area and a location outside of the urban area. This monitoring is required only if it can be coordinated with other monitoring efforts outside of Sacramento County. The Central Valley RWQCB contacted the Stormwater Quality Partnership in late January 2005 to commence coordination activities. Nine events (five coordinated with Central Valley RWQCB activities) were successfully monitored and are reported in Appendix D: Urban Tributary and Additional Pesticide Monitoring Report 2004/05.

Table 2.3-7. Rainwater Monitoring Sites for 2004/05

Creek	Site Location	Surrounding Land Use Description	Rainwater Data Collection History
Sump 104	Urban location within City Limits at Fruitridge Rd. and South Land Park Dr.	Residential and commercial land uses; Highway 5 within 1 mile	Pesticides and metals rainwater samples collected in 1999/2000 as part of a CalFed Grant Study and 2003-05 as part of NPDES Permit.
Prairie City	Outside of urban area; 20 miles east of downtown and 3 miles south of Highway 50	County location in off road vehicle park operated by the California State Parks Department Agricultural and rural residential land uses.	2003-05 as part of NPDES Permit.

Bioassessment Monitoring

During spring 2004, the August 2003 Bioassessment Monitoring Plan was updated to incorporate Standard Operating Procedures (SOPs) consistent with modified Environmental Monitoring and Assessment Program (EMAP) protocols published by USEPA as recommended by the California Department of Fish and Game (CDFG), the California Department of Pesticide Regulation (DPR), and the Central Valley RWQCB. The updated SOP is included in Appendix F. These protocols were primarily selected over other commonly used methodologies because they are more applicable to low gradient Central Valley creeks and streams. The monitoring plan was also amended to include consideration of multivariate analysis when sufficient data are available. The Permit also requires coordination with the Surface Water Ambient Monitoring Program (SWAMP) to ensure that study data can be incorporated into the statewide database. The SWAMP is a statewide effort and consistency with this program is intended to provide a more comprehensive statewide “inventory” of the biological characteristics of streams, creeks, and other waters of the State.

The primary goals of the Permittees bioassessment monitoring program are to:

- Assess the potential biological impacts upstream and downstream of stormwater discharges
- Assess long-term trends in biological data over time
- Provide data useful in interpreting the efficacy of best management practices (BMPs)
- Maintain consistency with the “Reference Condition Approach” being developed by the Central Valley RWQCB and CDFG

Table 2.3-8. Bioassessment Monitoring Watersheds

Creek	Number of Sampling Sites (Reaches)	Watershed Description
Arcade	2	Highly urbanized, predominant land use: older residential
Laguna	3	Upper watershed is mix of agriculture mining and new development. Lower watershed is residential.
Morrison	2	Upper watershed is under development or will be developed in future; currently agriculture and open space. Lower watershed is highly urbanized with mix of industrial, commercial and residential land uses.
Willow	3	Watershed consists of suburban development creek with limited new development. Note: This creek has more gradient than other

In April 2005, two reaches were monitored in both Arcade Creek and Morrison Creek. A description of the watersheds is provided in Table 2.3-8. The monitoring field work and taxonomic classification included 20% inter-laboratory verification. Assessments were performed to measure the habitat and benthic macroinvertebrate characteristics of the reaches. Changes over time in benthic habitat will be easier to track over time and potentially related to changes in the watershed area. The report prepared for the Stormwater Quality Partnership is included as Appendix F, Sacramento Stormwater Quality Partnership: 2005 Bioassessment Monitoring Report.

Arcade Creek

With regard to the habitat assessment, the Arcade Creek reaches were characterized by marginal sediment deposition scores, marginal channel flow scores, and a marginal to suboptimal riparian vegetative zone width, resulting in a suboptimal habitat quality ranking.

With regard to the benthic macroinvertebrate assessment, the Arcade Creek reaches were characterized by:

- 3-16 different taxa;
- absence of mayflies, caddisflies, and stoneflies (EPT taxa);
- a moderate number of tolerant organisms;
- one taxa dominating from 78.7% to 93.1% of the organisms;
- a benthic community composed of primarily the collector functional feeding group;
- overall abundance values between 272-789 (on a ft² basis).

Morrison Creek

With regard to the habitat assessment, the Morrison Creek reaches were characterized by marginal channel flow scores (i.e., water in 25-75% of the channel) and a marginal riparian vegetative zone width, resulting in marginal to suboptimal habitat ranking. The Morrison Creek sites were found to have marginal to suboptimal rankings for physical habitat. The Morrison Creek sites ranked as suboptimal.

The Morrison Creek reaches were characterized by:

- 12-14 different taxa;
- absence of mayflies, caddisflies, and stoneflies (EPT taxa);
- a moderate number of tolerant organisms;

- one taxa dominating from 49.2% to 66.0% of the organisms;
- a benthic community composed of primarily the collector functional feeding group;
- overall abundance values between 958-2,212 (on a ft² basis).

Additional Permittee Monitoring and Assessment Studies

Sacramento Urban Runoff Discharge Characterization 2005 – Sacramento Stormwater Quality Partnership

Characterization of urban runoff constituent loads is complicated by the episodic nature of stormwater runoff events, and the variable concentrations observed in them. Loading calculations can be useful in assessing the relative contribution of sources on a watershed basis. A statistically-based modeling approach was developed to quantify urban runoff pollutant loadings for the Sacramento Stormwater Permittees in the 1990s (prior to formation of the current Partnership) by Larry Walker Associates (LWA). This approach, which incorporated probabilistic methods to account for build-up and wash-off effects, was first applied in the 1992 Discharge Characterization Project (DCP) report (LWA, 1992). The DCP was updated in 1996 using additional data generated by the Permittees' discharge monitoring program, and incorporating a refined statistical approach (LWA, 1996). The 1996 DCP update created what is considered to be a characterization of runoff pollutant loadings based on a five-year "baseline" of monitoring data (from 1990-1995). In 2004-05, the Sacramento Stormwater Quality Partnership updated this analysis to consider the 2000-2004 data collection period and to assess current constituents of interest. The 2005 analysis compared the more recent results to previous modeling efforts, when possible. The entire 2005 report is included as Appendix G.

Assessment of the Relative Contribution of Stormwater Runoff to Diazinon and Chlorpyrifos Concentrations in Waters Identified as Toxic Hot Spots or 303(d) Impaired

A technical memorandum was prepared to fulfill the requirements of Section II. E. 6 of the Permit MRP (see Appendix H). The Permittees are required to determine the relative contribution of diazinon and chlorpyrifos in Sacramento urban runoff to water bodies within that jurisdiction that are either identified as a toxic hot spot (per Section 13394 of California Water Code) or are on the Federal Clean Water Act (CWA) 303(d) impairment list.

This assessment was made using available urban load modeling, pesticide rainfall data, and upstream load assumptions. The estimates of relative load derived in this analysis are intended to determine if the contribution of urban runoff to impairment was negligible. These estimates should not be used as the basis for other load derivation efforts or cited for purposes other than assessing relative contributions of (urban vs. non-urban) sources within Sacramento County. In some cases, the urban tributary watersheds extend outside of Sacramento County. These areas outside of the county are not considered in this analysis. It was determined that, despite strict limitations on the sale and use of these OP Pesticides, the load from urban runoff cannot be shown to be negligible. The Partnership will continue to assess the relative contribution of these pesticides and report annually until it can be shown that the loading is negligible.

Detention Basin Sediment Monitoring — County of Sacramento

Since 1993, the County has been conducting a study to measure the accumulation of pollutants (e.g., metals) in sediments at various County-owned water quality detention basins. Six of the seven detention basins studied are now owned by the City of Elk Grove. The primary purpose of the study is to determine which pollutants are accumulating in detention basin sediment, at what concentrations, and whether concentrations are increasing or decreasing with time. Pollutants concentrations are compared to Class III landfill disposal criteria, and other relevant criteria, to evaluate disposal alternatives. Ultimately, the knowledge gained from this study will be used to guide detention basin maintenance procedures and frequencies. During the 2004/05 fiscal year, a round of sampling was not conducted. The County evaluated all analytical laboratory data collected thus far and compared the data to study objectives. The County determined that the constituents exceeding Class III landfill disposal criteria are not those typically associated with urban runoff and, instead, are constituents common to native soils in the region. As a result of this determination, the County has decided to manage sediment in its detention basins from a capacity and stormwater quality treatment perspective rather than from a sediment disposal perspective. The County will be evaluating alternative disposal options for removed sediment. The final report describing findings of this study will be presented in the 2005/06 Annual Report.

Sump Station Sediment Monitoring – City of Sacramento

In 1996 the City began sampling of sediment deposited in stormwater sump stations in an effort to characterize the pollutant loads removed during maintenance operations. This sediment sampling effort was continued in 2004/05 at sump stations not previously sampled.

Sump Station Water Quality Monitoring – City of Sacramento

At the request of the Regional Board the City began conducting monthly water quality sampling in June 2004 at Sump 90. The sampling frequency and monitoring parameters were developed in an effort to identify the cause of offensive odors emanating from the discharge. The monitoring data collected to date has not identified sources or confirmed preexisting conditions that may explain the previously observed odor problem.

Additional Monitoring by Other Entities in Region

The Permittees consider other monitoring studies conducted by outside agencies, particularly those conducted within the American and Sacramento River watersheds, when evaluating Monitoring Program activities. The Sacramento River Watershed Program (SRWP) is the primary resource for compiling relevant monitoring data from agencies in the Sacramento River Watershed. The SRWP is an association of stakeholders in the Sacramento River watershed that includes representatives of local municipalities and districts, state and federal agencies, agriculture, industry, landowners, environmental organizations, universities, technical consultants and watershed conservancies. The SRWP was incorporated as a not-for-profit entity in 2004.

The SRWP watershed monitoring program was initiated in 1998. Results of SRWP monitoring efforts as well as other monitoring in the watershed are reported in the SRWP Annual Reports, which can be accessed at www.sacrriver.org. The CMP Annual Report also describes current monitoring efforts in the region (see Appendix C). Other regional studies of interest are described in the following sub-sections.

Sacramento River Toxic Pollutant Control Program

The Sacramento River Toxic Pollutant Control Program is a project that is funded through direct Congressional appropriations distributed through the U.S. EPA budget. The Sacramento Regional County Sanitation District (SRCSD) is the recipient of this funding. The long-term objective of this program is to bring the Sacramento River into compliance with toxic pollutant standards and protect its beneficial uses through a locally-driven, watershed management approach. The majority of the monitoring program for the watershed was initiated in June 1998 (fish tissue monitoring was initiated in 1997) and is completed through the SRWP. The 2005/2006 monitoring program is funded through a Proposition 50 grant to the SRWP and will monitor a broad array of parameters, including mercury and methyl mercury, pesticides, aquatic toxicity, pathogens, nutrients, and conventional parameters in water, bioassessment parameters, and mercury and trace organic parameters in fish. Monitoring is funded through 2007.

Sacramento River Basin National Water Quality Assessment Program (NAWQA)

The USGS conducted the first intensive monitoring of the Sacramento River basin from 1996-1998, and has been conducting low-intensity monitoring at a reduced number of locations since 1998 (<http://nwis.waterdata.usgs.gov>). Low-intensity monitoring in the Sacramento River basin will continue at only two locations for 2005 (Arcade Creek at Watt Avenue and Sacramento River at Freeport). The next high-intensity phase is scheduled to begin in 2006 and will include more locations and more frequent monitoring. This work has been performed as part of the NAWQA program for the Sacramento River. The NAWQA program is based on a combination of physiography, land use, hydrology, and contaminant issues for a particular basin. The Sacramento River Basin NAWQA Program includes monitoring sites that provide information on metals, pesticides, and urban runoff inputs to the Basin. One of the key sources of contaminants studied during the intensive phase of the program was mine pollution, which is a major contributor of acid-mine drainage and trace metals, especially copper, lead and zinc, to the upper reach of the Sacramento River system. Agricultural drainage was also studied to determine pesticide and other contaminant inputs. The NAWQA study addressed urban runoff effects by utilizing data from the Sacramento CMP and a sampling station in Arcade Creek, in addition to the NAWQA data for the Sacramento River. The 2006-2008 high-intensity monitoring phase is expected to sample at most of the original sites and will likely include a revised list of parameters and analyses.

San Francisco Estuary Regional Monitoring Program

The Regional Monitoring Program for Trace Substances (RMP) is a pollutant monitoring program funded by 63 entities, including municipal dischargers, industrial dischargers, stormwater dischargers, and dredgers that are located in the San Francisco Bay Estuary. The RMP is managed by the San Francisco Estuary Institute (SFEI). The purpose of the RMP is to measure the concentration of trace substances and toxicity in the Estuary. The Permittees track the results from the RMP as it provides information on how contaminant concentrations in the Estuary are responding to pollution prevention and other steps being taken by dischargers and information to determine whether the resources spent on these efforts are having the desired effects.

The RMP has analyzed more than 100 individual chemical parameters in water, sediment, and tissue. The frequency for water, sediment and tissue sampling has varied between two and three times per year at up to 25 fixed sampling sites. Toxicity tests on water and sediment samples have also been conducted to determine possible toxicity to selected organisms. Current monitoring is conducted at a combination of fixed and randomly selected sites through the Bay.

Central Valley Regional Water Quality Control Board (CVRWQCB) Monitoring Efforts

Staff of the CVRWQCB perform water quality monitoring throughout the Central Valley. Permittee staff coordinate with the Regional Board's recent monitoring efforts in support of the development of total maximum daily loads (TMDL) for water bodies. Current TMDL monitoring efforts are focused on mercury and organophosphate pesticides. The CVRWQCB also administers the Agricultural Waiver Monitoring Program in the Central Valley Region (Phase II), to be conducted from 2005-2006. The Regional Board also participates in several SRWP committees and monitoring projects.

SWRCB Toxic Substances Monitoring Program

The Toxic Substances Monitoring Program (TSMP) was initiated in 1976 by the California SWRCB to provide a uniform statewide approach to the detection and evaluation of the occurrence of toxic substances in fresh, estuarine, and marine waters of the State through the analysis of the tissues of fish and other aquatic life. The TSMP primarily targets water bodies with known or suspected water quality impairment and is not intended to give an overall assessment of the water quality of each of the State's waters. Funding for this program is determined on an annual basis and no guarantee exists that the program will continue in coming years. Little monitoring has been conducted by the TSMP in recent years, although some funding was provided to augment ongoing fish tissue monitoring by the SRWP.

SWRCB Surface Water Ambient Monitoring Program (SWAMP)

The State's Surface Water Ambient Monitoring Program, required by AB 982, was initiated in 2000. It is intended to provide the necessary information for effective watershed (water quality) management. The challenge is considerable: California has 190 hydrologic units (655 hydrologic sub-areas), 211,000+ miles rivers and streams, over 10,000 lakes (1.6+ million acres), over 1,300,000+ acres of bays and estuaries, and 1,609 miles of coastline. SWAMP is intended to coordinate all SWRCB water quality monitoring projects and programs to ensure that comparable data are produced.

Ongoing and planned SWAMP monitoring for the Sacramento River watershed through 2005 includes studies in the Redding area, and in the Big Chico Creek and Pit River watersheds. Due to severe reductions in funding, many of the elements for this program have been significantly delayed.

2.4 Data Management

All monitoring data generated or utilized by the Sacramento Stormwater Quality Partnership are maintained in searchable computerized databases. Currently there are two databases; both use Microsoft Access® as their platform. The river monitoring data is maintained in the CMP database and all other data for urban discharge and special studies are maintained in the Sacramento Stormwater Quality Partnership database. Both databases keep records in three areas: laboratory results, quality control data that are used to operate qualifiers for the results, and event data. These databases have been designed to be user-friendly for quick queries. This allows prompt response by City and County of Sacramento staff and their consultants to requests from the RWQCB and other interested parties.

2.5 Regulatory Agency/Permittee Coordination Activities

Coordination Amongst Permittees

During the 2004/05 fiscal year, the Permittees participated in several monitoring coordination meetings in addition to regular monitoring discussions at the monthly Permittee meetings. At these meetings, the City and County of Sacramento staffs generally take a leadership role in reporting progress and facilitating discussion and decision-making related to key monitoring topics. The County and City of Sacramento also attend quarterly CMP steering committee meetings and provide status reports to the other Permittees.

Coordination with Regulatory Agencies and Other Groups

During the 2004/05 fiscal year, there was again a significant effort to coordinate with the Regional Board staff with respect to monitoring activities. The Permittees and the Regional Board staff worked together to ensure consistent understanding of the permit requirements and both parties' objectives. Permittee staff, Permittee consultant staff, and Central Valley RWQCB staff also coordinated joint rain water monitoring activities by sharing forecasting and equipment resources. The Permittees also made an effort during the fiscal year to coordinate with other groups and agencies to determine information sources on past and current efforts and on standard procedures.

2.6 Compliance with Standard Monitoring Provisions

The Permittees are committed to maintaining a monitoring program that provides reliable, accurate data that can be used as a measure of the current condition of the resources in the Sacramento area and be used within and outside the Program to determine the effectiveness of future efforts. The Program focuses on four areas to ensure that data obtained are widely accepted as conforming to the best available methods: sample collection, sample transfer to laboratories for testing, laboratory testing, and review of the results including quality control. Quality control, in addition to quality assurance practices, has been incorporated to test the methodologies, laboratories, and quality assurance plans. This provides internal confidence of the results and a data set that is acceptable for use by outside parties.

Sample Collection

Sampling and analysis plans are developed for each type of monitoring and regularly updated, usually prior to each monitoring year. Crews are regularly trained and required to attend refresher training on sample collection and handling protocols. Monitoring study design considers both the current quality assurance/quality control methods and equipment. The protocols are consistent with other regional monitoring programs and conform to state and national recommendations and requirements.

Sample Transfer

The sampling and analysis plans outline chain of custody methods and requirements. In addition, transfer requirements for different samples are predetermined to ensure that the monitoring event is designed to allow adequate time for transportation and receipt of the samples at the laboratories.

Laboratory Testing

The Permittees annually review local laboratories to create a list of those certified for the various analysis methods and their respective ranking based on technical qualification and past experience. The Permittees use the list developed to create the basis for laboratory selection and a list of substitute laboratories if needed.

Quality Control

To ensure that the data obtained are valid and defensible, the Permittees have committed to a comprehensive quality control program. Each sampling and analysis plan describes specific QA/QC measures to be implemented. The Program records the results from its quality control activities along with the environmental data. The Program maintains a more detailed list of qualifier data than that requested by the USEPA, yet is consistent with USEPA methods. The quality control procedures are detailed in a data quality evaluation plan, updated annually.

Permit Specified Requirements

The Permit outlines required monitoring provisions and methods of compliance in Section IV of the Monitoring and Reporting Program, as summarized below:

IV.A Samples and Measurements to be Representative

- Flow-weighted composite samples are collected when feasible with automatic sampling equipment (EPA protocols require the use of grab samples for certain constituents).
- Manual compositing techniques are currently used at the urban tributary sites for collection of flow-weighted composite samples
- River monitoring collects spatial composite sample of entire cross section when feasible
- Event data such as flow rate are recorded and linked to environmental data

IV.B Monitoring Records

- All records are kept for the required time frame
- The Program maintains a database of all lab reports, event data, and quality control results throughout its history for internal and external use

IV.C Monitoring Records Requirements

Records are kept of:

- Date, location, and time of sample
- Individual(s) collecting sample
- Date of analysis
- Laboratory or analyst
- Method of analysis
- Results of analysis
- Quality control records

IV.D Sampling Meets 40 CFR Part 136

- Standard operating procedures are designed to meet this requirement

IV.E False Results

- Quality control methods are used to ensure conformance to data quality protocol

IV.F Laboratory Certification

- Review of laboratories was conducted to determine their qualifications and previous reliability
- The laboratories are state and/or EPA certified

IV.G ML and MDL analysis

- Laboratory selection was based on ability to provide results consistent with necessary ML and MDL limits when feasible.

IV.H.1 Reporting of Concentrations Above ML

- Sample results along with qualifiers are reported and records maintained

IV.H.2 Reporting of Concentrations at or Below ML and MDL

- Regardless of concentration all results are recorded and maintained.
- The Program employs statistical techniques that estimate the concentration at or below MDL for use in statistical analysis

IV.I Unattainable ML

- The Program reviewed laboratories to determine which ML values were attainable
- Conservative estimates are used when limits are at or below ML
- For some sample matrices, some pesticide constituents cannot be reported at the Permit MLs. A thorough review of laboratories is performed each year to locate a lab that can meet the low reporting limits required.

IV.J Reporting Non-Permit Required Samples

- The Program includes all data collected in its pursuit of a data set enabling selection and design of effective measures that improve the water quality of the region
- The Program maintains this data to help with future studies

IV.K Arithmetic Mean unless otherwise noted

- Standard operating procedures report the statistical method for analyzing data. Arithmetic means are used whenever appropriate.
- Calculations requiring averaging use the method as outlined in the criteria requiring the averaging.

IV.L Changes to Monitoring Program

- The Co-Permittees work toward adapting the permit to better reflect local conditions with the input of the Regional Board

2.7 Proposed Revisions/Improvements to Monitoring Program

The Permittee's monitoring program successfully supported the goals of the Program to comply with Permit requirements and provide quality data for use in characterizing urban discharges and evaluating program effectiveness. The evaluation of this program is based upon performance measures and effectiveness measures of the individual monitoring tasks. The actual data results from the Monitoring Program are utilized to evaluate the effectiveness of the overall Stormwater Program.

All of the 2004/2005 monitoring activities were completed in accordance with the performance measures required by the Permit. As previously reported in this chapter, river, urban tributary, bioassessment, and additional pesticide monitoring were conducted during 2004/2005 during the seasons and for the durations prescribed by the Permit. Stormwater monitoring activities were coordinated as indicated in Table 2.1-1.

The data resulting from receiving water quality monitoring activities were reviewed and evaluated after each monitoring event following the Data Quality Evaluation Plan included as Appendix D to this report. The success rates for 2004/2005 analyses are generally high, with a few exceptions. Data issues that were identified for additional consideration included rejected and qualified field measurements; sample precision; and data rejection. After reviewing these data issues it is recommended that field crews collect additional field measurements of dissolved oxygen, temperature and pH as an effort to improve the quality of the data during FY 2005/2006 monitoring activities.

The Permit reporting requirements also were completed in accordance with the performance measures required by the Permit. Notices of Water Quality Exceedances for the receiving water monitoring events were submitted to the Board within the 90 day deadline required by the Permit for most of the exceedances. Additional analysis of the receiving water monitoring data was conducted at the end of the monitoring season to support Program effectiveness evaluations and preparation of Reports of Water Quality Exceedances as required by the Permit. Two previously unreported exceedances were reported in this report. Data review procedures will be automated as much as possible in 2005/2006 to avoid this mistake.

As a result of the development of the Report of Water Quality Exceedance, the Permittees are also proposing to develop a monitoring study to evaluate DO, pH and temperature exceedances in various urban tributaries. The goals of the study will be to:

- Characterize DO concentrations over longer periods
- Identify causes of depressed DO
- Assess the impact of depressed DO on pertinent beneficial uses
- Characterize “natural” pH conditions and time variability
- Assess the impact of changes in pH on any possible beneficial uses that are identified in the urban tributaries
- Characterize temperature changes over time
- Identify appropriate temperature averaging periods to assess WQO compliance
- Assess sampling locations where “ponding” and localized stagnant pools may not be representative of the overall urban tributary location

The status of the development, implementation and results of the monitoring study (e.g., monitoring, technical studies, proposed BMPs, etc.) will be reported in the 2005/06 annual report.

Chapter 3 — Target Pollutant Reduction

3.1 Introduction

The Target Pollutant Reduction Element allows the Permittees to identify and focus resources on the highest priority pollutants. Using discharge and receiving water data from many sources, the Permittees have established a detailed and comprehensive process for identifying and prioritizing Target Pollutants.

This process was extensively revised and updated in March, 2001. The Permittees have developed a ranked list of Target Pollutants for their use in prioritizing stormwater control efforts (see Appendix I). This list assists the agencies in effectively allocating stormwater program resources where they are most needed, with the overall goal of reducing pollutants in urban runoff discharges to the maximum extent practicable (MEP).

3.2 Overview of 2004/2005 Target Pollutant Reduction Activities

This section describes the Target Pollutant Reduction activities conducted in compliance with Provision C. 14 of the 2002 Permit. During the 2004/2005 fiscal year, the Permittees continued implementation of ongoing BMPs for copper, lead, diazinon, chlorpyrifos, pesticides, mercury, and coliform/pathogens. Progress on specific ongoing and new Target Pollutant Reduction work plan tasks is summarized in Appendix J.

3.3 Program Responsibilities

The Permittees participate in the implementation and funding of Target Pollutant Reduction work plan tasks as a joint effort or as an individual agency effort. The summary in Appendix J describes the work plan tasks and indicates whether the task was appropriate for joint implementation.

3.4 Pesticides

The Permittees submitted to the Regional Board in May 2004 a draft Pesticide Plan. Comments from the Regional Board were received in writing in March 2005, and revisions to address the comments received are in progress.

The Pesticide Plan is designed to reduce the level of pesticides in the urban runoff discharged to local receiving waters, building on activities that the Permittees have conducted for several years. Although past activities have focused on diazinon and chlorpyrifos, based on the Permittees' analysis that identified these pesticides as top priority target pollutants, the overall strategy of the Pesticide Plan now also addresses and helps reduce the discharge of all pesticides. The Permittees anticipate that the phasing out of registered uses of diazinon and chlorpyrifos in the urban environment will result in a steady decrease of these pesticides in urban runoff. However, reduced use of the prohibited products is likely to cause a shift to use of other pesticide products, which may also have a potential to cause toxicity in urban runoff. Therefore, the Pesticide Plan addresses pesticide use in general, rather than focusing solely on diazinon and chlorpyrifos.

Although the Pesticide Plan has not been finalized pending public comment and revisions made in response to Regional Board comments, the Permittees have begun implementation of various action items in the plan, and have continued on-going pesticide control activities. Described below are the pesticide source reduction activities conducted during the 2004/2005 fiscal year.

Permittee Pest Control

Integrated Pest Management (IPM) Tool Box. The Permittees developed a web-based “tool box” of information resources, to facilitate development of in-house IPM programs by each Permittee. It includes resources such as model IPM ordinances and programs, sample contracts, and IPM practices. The tool box is published on the Permittees’ Stormwater Quality Partnership website (www.sacramentostormwater.org). It is also accessible through a link on the NorCal IPM website, which is a regional IPM resource, created as a work product of the Bay Area’s Urban Pesticide Pollution Prevention project.

Workshops for Permittees. The Permittees held several workshops to assist Stormwater Program staff from each Permittee agency in implementing the requirements of the Pesticide Plan. Subjects included the IPM toolbox, IPM program development, individual and joint responsibilities, and resource requirements.

IPM Training. Permittee staff participated and attended numerous training seminars and conferences on IPM, including the following:

- Santa Clara County IPM Reporting System, San Jose
- Emerging IPM Problems in Winter, Marin County Cooperative Extension, San Rafael
- Urban Entomology Conference, UC Riverside, Riverside
- IPM for Parks, California Parks and Recreation Society, Sacramento.
- Annual IPM Conference, City of San Francisco
- Regional IPM conference, Oakland
- Mosquito and Vector Control Conference, Monterey
- Weed Science Conference, California Weed Science Society, Monterey
- Continuing education seminar, Pesticide Applicators Professional Association, Sacramento

Regional IPM training conference. The Permittees sponsored and participated in the organizing committee of the Regional IPM training conference in Oakland. The primary audience for this conference was city and county and other public agency management and staff involved in pest management. Approximately 25 Permittee staff attended the conference, including those involved in pest management at parks, airports, roadsides, open space, and drainage facilities. A copy of the conference program is provided in Appendix K.

IPM “Summit”. A representative of the Permittees participated in a meeting hosted by the San Francisco Estuary Project UP3 project to discuss opportunities to facilitate regional cooperation in promoting IPM.

Pesticide applications by Permittees. Pesticide applications by the Permittees are regulated by State pesticide laws. Under these laws, pesticide applications by Permittee staff are conducted under the supervision of Qualified Applicators. Training requirements for Qualified Applicators are regulated by the Department of Pesticide Regulation. Applications of agricultural pesticides, such as those made to landscapes, rights of way, drainage facilities, parks, and roadside vegetation, are documented and reported through the Pesticide Use Report system established by the Department of Pesticide Regulation.

Aquatic Pesticide Permit. The County is the only Permittee that utilizes pesticides subject to the requirements of the SWRCB General Permit for Aquatic Pesticides. The County Department of Water Resources applies glyphosate to control weeds in creeks and channels. Under the terms of the Aquatic Pesticide Permit, the County implements a monitoring plan and submits annual reports to the Regional Board.

Coordination with the Sacramento-Yolo Mosquito and Vector Control District. Managers and staff of the Permittees' drainage systems have begun communication with water management staff of the Sacramento-Yolo Mosquito and Vector Control District (District), on how drainage facility design and maintenance can be modified or improved to reduce the production of mosquitoes. District staff will continue to provide information to the Permittees on mosquito issues associated with drainage facilities, and provide guidance on implementing improvements to drainage systems.

Water Wise Pest Control Program. The Permittees continued to implement the Water Wise Pest Control Program (Water Wise). Water Wise was developed in 1999 using CALFED grant funding. The program educates residents about integrated pest management (IPM) and proper use and disposal of pesticides. There is a focus on diazinon and chlorpyrifos, but the overall message targets general pesticide use and emphasizes using the least toxic control methods. Water Wise conducts outreach to residential pesticide users through special events, display carts and print materials at about ten participating gardening stores in Sacramento, a web site, and the UC Master Gardener program. The Permittees continued updating the list of contact names for each of the major home improvement retailers in the area and offered the display cart for use by each one of these retailers. Quantification of the Water Wise effort is included in the Public Outreach section of the County 04/05 Annual Report.

Our Water Our World. The Permittees began in 2004/2005 supporting an IPM outreach program called Our Water Our World (OWOW) in the five Orchard Supply Hardware (OSH) stores located in Sacramento County. OWOW is a successful integrated pest management outreach program begun by several water quality agencies in the Bay Area, in cooperation with the Bio-Integral Resource Center. It has expanded to a statewide program supported by many local agencies and OSH. OWOW is similar to the Permittee's Water Wise Program, as it includes point of sale distribution of printed material, as well as web-based documents. Many of its materials are in Spanish. In addition, it includes web-based capabilities for asking pest control questions of integrated pest management professionals. As part of OWOW, the Permittees also provided training on IPM and least toxic products to OSH staff. OWOW program materials and quantification of the OWOW effort is included in the Public Outreach section of the County 04/05 Annual Report.

Sacramento Zoo Bug Zone. The Permittees sponsored a special exhibit at the Sacramento Zoo called the Bug Zone. The exhibit, which lasted approximately three months, incorporated information about IPM, including Water Wise and Our Water Our World materials. The exhibit also was designed to foster a greater understanding of insects and other invertebrates, which is important background for the promotion of IPM. The zoo estimates that approximately 165,000 people attended the exhibit. Program materials from the exhibit are included in Public Outreach section of the County 04/05 Annual Report.

EcoLandscaping Conference. The Permittees were financial sponsors and participated in the organizing committee of the second annual EcoLandscaping Conference, which was held in Sacramento on February 5, 2005. The conference promotes environmentally friendly landscape design, construction, and maintenance. It provides information on landscaping practices that reduce the discharge of pollutants such as sediment, fertilizer, and pesticides. The target audience for this seminar is the landscaping industry (contractors, landscape architects, designers) and public agency staff that interact with developers and builders on a regular basis (planners, engineers, plan checkers, and environmental impact analysts). Permittee staff, including landscape architects, environmental analysts, parks, and water quality staff attended the seminar. A copy of the conference program is provided in Appendix L.

Ecofriendly Landscaping Manual. The Permittees are funding a revision of the successful Bay Friendly Landscaping booklet. This publication, an eco-friendly landscape guideline manual for use by landscape professionals, residents and nurseries, will be adapted to be specific to the Sacramento region. The manual includes IPM concepts as one of its guiding principles. The Permittees will distribute these manuals once they become available.

Creek-friendly Landscaping Article. The Sacramento Urban Creeks Council published an article in its Creek Watch Newsletter that was written by Permittee staff. The article, entitled “Creek Friendly Landscaping”, provides information on landscaping techniques and principles that reduce discharges of pesticides and other pollutants. A copy of the article is provided in Appendix M.

Special district outreach. The Permittees have developed a contact list of school district and park district managers and maintenance and pest management staff, which is used to provide these agencies with information on IPM, such as training opportunities. For instance, these districts were invited to participate in the Regional IPM conference in Oakland.

Pesticide Surveys. The Permittees completed studies of pesticide use in the Sacramento region, which were submitted to the Regional Board on December 1, 2004. The studies included a residential pesticide use telephone survey, a retail pesticide shelf survey, and a review of the reported urban pesticide uses in Sacramento County. The results of the survey were reviewed and incorporated into public outreach activities as necessary.

Urban Pesticide Committee

During the 2004/2005 fiscal year, Permittee staff and consultants participated in the Urban Pesticide Committee (UPC). The UPC is a multi-stakeholder ad-hoc committee initially formed in response to observed toxicity from diazinon and chlorpyrifos. The UPC now focuses on issues and information regarding pesticide toxicity in discharges from urban areas. Members include representatives from the Central Valley Regional Board, San Francisco Bay Regional Board, DPR, Bay Area and Central Valley Stormwater Programs, wastewater dischargers, integrated pest management consultants, and pesticide registrants. Topics of importance to the Permittees that were discussed through the UPC include the following:

- IPM program development and implementation
- State and Federal regulatory issues
- Pesticide registration
- TMDL development
- Monitoring
- Shelf survey results
- Grant project updates
- Regional outreach efforts

Household Hazardous Waste collection

The Permittees continued to support Household Hazardous Waste (HHW) programs that provide a mechanism for proper disposal of unused pesticides and pesticide containers. The County and the City of Sacramento each operate HHW stations that are available to the public at no charge. Any resident of the County may use either of these stations. The City of Folsom operates a HHW program for city residents that provides at-home pickup of wastes on an appointment basis. The City of Galt operates an annual HHW collection event for its residents. Additional details on these programs are provided in the Illegal Discharge section of each jurisdiction's 04/05 Annual Report.

PCO Outreach

Promote IPM Implementation by PCOs: Pesticide Research and Identification of Sources and Mitigation (PRISM) Grant for Promotion of Integrated Pest Management

The Permittees are participants in a SWRCB PRISM grant project entitled "Making IPM Mainstream: Tools and Market-Based Incentives for Restoring Pesticide-Contaminated Waterways" which was awarded \$785,000 in 2004. The project participants are the Bio-Integral Resource Center (BIRC), various environmental consultants, the Sacramento Stormwater Quality Partnership, the San Francisco Estuary Project, the Natural Resources Defense Council, and the Association of Bay Area Governments (ABAG). The project is scheduled for completion in 2007.

This PRISM project represents a major effort on the part of several stakeholders to promote IPM in the urban environment. The project, which builds on structural IPM standards developed through a Proposition 13 grant, will develop landscaping IPM standards, and establish an IPM certification program for Northern California. The project will address pesticide contamination in urban waterways by improving public awareness of IPM services, and facilitating access to professional IPM practitioners. The project includes a substantial effort to train, certify, and market IPM to professional practitioners and the public in the San Francisco Bay Area and Sacramento Region.

Permittee Pesticide Monitoring

The Permittees conducted and/or funded several ongoing monitoring efforts that provided information on the levels of pesticides in urban creeks and other receiving waters.

Ongoing pesticide monitoring efforts include the following:

- River monitoring
- Creek monitoring
- Bioassessment
- Additional pesticide monitoring
- Rainwater Monitoring

Monitoring data is reviewed after each sampling event. Exceedances in water quality objectives are reported to the Board and evaluated annually to identify revisions to existing BMPs as necessary. BMPs address specific watershed areas when it is possible to identify specific watershed trends. The results from these monitoring efforts are discussed in the Monitoring section of this report and in Appendix A as part of the Report of Water Quality Exceedance. Changes to existing BMPs are added to the work plans that are incorporated into the Pesticide Plan.

PRISM Grant Study of Pyrethroid Sediment Concentrations

The use of pyrethroids has increased in urban settings, in large part due to diazinon and chlorpyrifos products being removed from the market. The Permittees cooperated with the recipients of the PRISM grant awarded in 2004 entitled “Distribution and Toxicity of Sediment-Associated Pesticides in the Sacramento River Watershed”. The SRWP is the project lead agency and the work was lead by Dr. Donald Weston of UC Berkeley with assistance from Pacific EcoRisk, Southern Illinois University, and the California Department of Fish and Game. This is a research study of pyrethroid pesticides in sediments in agricultural and urban waterways. The study monitored pyrethroid concentrations in sediments and their toxicity to organisms that live in sediment. The results of the study are expected to be published in late 2005 or early 2006, and will help assess the impact of pyrethroid pesticides on urban creeks.

Permittee Participation in the Pesticide Regulatory Process

The Permittees continued to participate in regulatory processes that affect pesticide discharges. These activities include the following:

- Through the UPC, participated in ongoing discussion of State and Federal regulatory activities.
- A representative of the Permittees, appointed by DPR, participates as an alternate representative to DPR’s Pest Management Advisory Committee.
- A representative of the Permittees participates in work group appointed by DPR called Pest Management for the 21st Century (PM21) committee. PM21 is tasked with providing recommendations to DPR on how to adapt to changing conditions in the field of pesticide regulations. The work group was specifically asked to make recommendations on how DPR can better address emerging urban pesticide issues, and how to better promote IPM.
- A representative of the Permittees participates in the CASQA Pesticide Committee. This committee was formed to facilitate proactive action by CASQA on pesticide issues, including effective participation in the regulatory process.

3.5 Mercury

The comprehensive draft Mercury Plan, submitted to the Regional Board on May 1, 2004, guides the Permittees' mercury reduction activities. Although comments on the draft plan have not been received to date, the Permittees have already implemented key provisions to ensure continued progress. The plan continues ongoing activities, and identifies new activities consistent with Section 14.a. of the Permit. Described below are the mercury source reduction activities conducted during the 2004/2005 fiscal year a summary of the work plan tasks and status is included in Appendix J.

Municipal Mercury Survey – As required by the Permit, the Permittees completed an in-house survey of mercury sources associated with municipal activities. The report is included as Appendix N. The purpose of the survey was to identify the Permittees' current use of and disposal procedures for mercury-containing products including mercury-containing lamps (metal halide, high pressure sodium, fluorescent, and neon lamps), mercury-containing switches including switches in automobile devices, batteries, thermostats, and thermometers. The process of conducting the survey also served as an educational activity, wherein information on Universal Waste Rule requirements for handling and disposal of mercury-containing products was disseminated to the Permittee personnel who were surveyed. The survey was completed through phone contacts and site visits/interviews of various department personnel.

The general finding of the survey was that most Permittee departments that handle or dispose of mercury containing wastes were already aware of and in compliance with the state's Universal Waste Rule requirements.

Mercury webpage. The Permittees created a mercury web page on the joint website, which can be accessed at www.sacramentostormwater.org. It contains information for residents and businesses about mercury impacts, and steps that they can take to reduce the discharge of mercury to the environment. It also includes links to Be Mercury Free and other key websites concerning mercury, including key fish consumption advisories.

Tracking mercury efforts. The Permittees continued to track information on relevant work conducted by others. The relevant work conducted by others included (1) characterization of the atmospheric contribution of mercury to the environment and (2) regulatory-driven urban mercury control efforts in the San Francisco Bay Area. The "Summary of Related Mercury Efforts - FY 04/05" is included in Appendix O.

Be Mercury Free

Some of the Permittees provide funding for Be Mercury Free, a program established by the Sacramento Regional County Sanitation District (SRCSD) to reduce mercury discharges in the Sacramento region. As stated on the program website, "Be Mercury Free is a regional partnership making a comprehensive effort through outreach and education, to eliminate common sources of mercury pollution, such as mercury thermometers found in households, old laboratory equipment in schools and universities, blood-pressure cuffs used in hospitals and amalgam ("silver") fillings used in dental offices - all of which can end up in the watershed if disposed of improperly. By providing information and resources specific to each source of mercury pollution, "Be Mercury Free", A Regional Partnership for Mercury Pollution Reduction, is working to significantly reduce the amount of mercury entering the local watershed. More information about the program is included in Appendix P.

The Permittees benefit significantly from the Be Mercury Free program for several reasons. Because mercury is a high priority constituent of concern for SRCSD the Be Mercury Free program is funded and staffed by SRCSD at a much higher level than is possible for the Stormwater Partnership, resulting in a much larger program than the Permittees could support on their own. In addition, because of the Permittee's participation, the program consistently includes stormwater messages (especially fluorescent lamps) in its outreach materials that reach a wide audience. Permittee participation in the program also leads to a consistent, coordinated regional message about controlling sources of mercury.

Delta Tributary Mercury Council

The Permittees currently participate in the Delta Tributary Mercury Council (DTMC), a watershed-level program intended to reduce mercury levels and mercury consumption. The DTMC is a subcommittee to the Sacramento River Watershed Program (SRWP) and consists of representatives of various federal, state and local agencies, academic institutions, consulting firms, industries and citizen stakeholders who meet approximately every six weeks to evaluate the status of existing knowledge of environmental mercury in various rivers and streams that discharge into the Sacramento and San Joaquin Delta and ultimately into the San Francisco Bay area.

The DTMC has adopted a Strategic Plan to reduce mercury in the watershed in the most resource efficient manner. The DTMC Strategic Plan, as described on the SRWP website, is intended to accomplish the following:

- Describe the problem to be addressed and the success criteria for the strategic plan
- Describe the analysis of actions to:
 - Reduce mercury in key environmental compartments (e.g. fish tissues)
 - Reduce risk from human consumption of locally caught fish
 - Reduce management uncertainties
- Recommend selected actions to meet success criteria

Sacramento Regional County Sanitation District Mercury Offsets

In December 2004 the SRCSD concluded a series of stakeholder workshops on mercury offsets and submitted its Mercury Offset Feasibility Study to the Regional Board in May 2005. These workshops were intended to begin the development of a mechanism to provide credits to the SRCSD for achieving mercury reductions in the watershed that are not directly related to the SRCSD discharges. The workshops provided participants a forum to discuss issues of mercury pollutant trading and offset policies, the nature of the mercury problem in the Delta and its tributaries, possible offset projects, measures of success, and mechanisms for selecting projects.

The stakeholders included representatives from the Stormwater Partnership, other stormwater programs, POTWs, the SWRCB, the Regional Board, U.S. EPA, and other State and Federal agencies.

The Permittees are not required to utilize offsets, but they are a mechanism with great potential to utilize limited resources in an efficient manner to control mercury on a watershed basis. The Permittees will continue to track the progress of projects examined in the Feasibility Study, and will consider participation in offset projects as appropriate.

Industrial Inspections

The Permittees have identified several key industries including metal recyclers, auto dismantlers, auto body shops, landfills, and refuse haulers that have significant potential to release mercury into the storm drain system. These industries are likely to have some or all of the following mercury sources: mercury switches (automobiles and major appliances), mercury-containing control devices (major appliances), and discarded mercury thermometers, thermostats, and fluorescent lamps from households and commercial buildings.

Stormwater inspections are conducted by the County Department of Environmental Management (EMD) at metal recyclers, auto dismantlers, and auto body shops, beginning in July 2004. In 2003/2004 EMD entered into formal agreements with the Permittees to conduct these inspections on their behalf, and the Permittees provide technical assistance on incorporating mercury issues in industrial inspections.

Staff have provided to EMD guidance materials developed by the State Department of Toxics Substances Control to assist industries that need to comply with these regulations.

The County agreed to provide funding to the State of California Auto Dismantlers Association (SCADA) to create an industrial stormwater compliance manual for its members, which will include information on proper handling of mercury switches.

Household Hazardous Waste Collection

The Permittees continued to support household hazardous waste (HHW) programs that provide a mechanism for proper disposal of mercury containing wastes that may be generated by households, including fluorescent lamps, thermostats, and thermometers. The County and the City of Sacramento continued to operate HHW collection centers that are available to the public at no charge. Any resident of the County may use either of these stations. The City of Folsom continues to operate a HHW program for city residents that provides at-home pickup of wastes on an appointment basis. The City of Galt continues to operate an annual HHW collection event for its residents. Additional details on these programs are provided in the Illegal Discharge section of the individual Annual Repots prepared by the County and cities and submitted under separate cover.

The HHW collection programs in Folsom and Sacramento maintain websites that include fluorescent lamps and other mercury containing products on the list of acceptable items.

As part of the Be Mercury Free program, the Permittees began discussions with representatives of the HHW collection programs to identify opportunities to expand cooperation on mercury control programs. Currently, Be Mercury Free promotes proper disposal of mercury-containing products at HHW programs through its website, fact sheets, brochures, and utility bill inserts.

3.6 Coliform/Pathogens

The Permittees formed the Coliform/Pathogen Work Group (Work Group) in prior years to guide and direct activities related to reducing the sources of coliform bacteria in urban discharges. The primary function of the Work Group this year was the implementation of the Fecal Waste Reduction Strategy (FRWS) finalized in 2003/2004. The principle finding of the strategy is that some sources of coliform/pathogens, such as wildlife, are not readily amenable to source control. Therefore, the Permittees following the FRWS, focused on implementation of the following control measures in 2004/2005.

Pet Waste Control

Kennel Inspections. The Permittees initiated inspections of kennels through the county-wide industrial stormwater inspection program conducted by the County Environmental Management Department. Kennels are inspected on a triennial basis.

Pups on the Parkway. The Permittees provided funding (along with other local agencies) for the “Pups on the Parkway” project. This project installed dog waste bag dispenser stations and informational kiosks about pet waste disposal along the American River Parkway. The Permittees’ sponsorship of this project complements the Stormwater Program’s public outreach messages that promote proper pet waste disposal.

Local Park Pet Waste Stations. The Permittees continued support of their successful pilot program to install and pet waste disposal bag dispensers in local parks. The dispenser stations include outreach messages.

Ordinances. Local ordinances prohibit disposal of pet waste to the storm drain system.

Municipal Operations. The Permittees continued implementation of municipal operation BMPs that eliminate or reduce fecal matter in the storm drain system including work towards elimination of sanitary sewer cross connections and sanitary sewer overflows, street sweeping, and cleaning of the storm drainage system infrastructure and detention basins.

UC Davis Pathogen Research. The Permittees coordinated with UC Davis pathogen researchers investigating viruses in the Sacramento River watershed. This included the collection of water samples from the Sacramento River, American River and from Strong Ranch Slough in FY 04/05. Additional samples will be collected in FY05/06. Results are pending.

Livestock Facilities. The Permittees with livestock facilities within their jurisdiction conducted on-site reviews of the facilities and encouraged manure management practices to reduce pollutant stormwater discharges.

General Outreach. The Permittees continued to include pet waste messages in general stormwater outreach materials. A fecal waste reduction fact sheet was developed for posting on the Permittee joint web page. The fact sheet includes information on proper pet waste disposal, proper manure management and useful links to other fecal waste reduction programs. In addition, the Permittees participated in “Keep Our Waters Clean” media events. The “Keep Our Waters Clean Campaign” is a comprehensive outreach effort funded by a coalition of public utility and park agencies to reduce fecal waste discharged to the Sacramento and American Rivers by recreational users of the parkways and waterways. The campaign includes messages encouraging proper disposal of trash, diapers, boat waste tanks, pet waste and use of public restrooms. The Permittees also participated in organizing and attending the CASQA November 2004 session “Bacteria – A to Z: the Latest Update”.

Tracking related coliform and pathogen work of others. The FWRS recognizes the need to continue ongoing review of the work of other dischargers that is relevant to the characterization, impact, regulation and/or control of bacteria and pathogens in urban runoff. This activity focused on related efforts in three distinct areas: (1) the status of best management practices (BMPs) being implemented at the California Exposition and State Fair (CalExpo) confined animal facility operation (CAFO) that drains to the City of Sacramento Sump 152, (2) a review of current California research related to stormwater and pathogens, and (3) a summary of two new State Water Resources Control Board (SWRCB) policies for listing impaired water bodies and implementing TMDLs, as they relate to bacteria water quality. More detail on these efforts is included in Appendix Q.

3.7 Copper and Lead

The Permittees continued activities during the 2004/2005 fiscal year to reduce the discharge of copper and lead in urban runoff. The BMPs for addressing copper and lead are generally incorporated in other Program Elements. These BMPs have been reported in previous Annual Reports and the SQIP, and are discussed in more detail in other sections of the Permittee Annual Reports. They include the following activities:

- Industrial inspections
- Sediment control at construction sites
- Household hazardous waste collection
- Street sweeping
- New development BMPs

The Permittees also continued to financially support the Brake Pad Partnership, a national effort intended to characterize and address the potential contribution to urban runoff from the copper content of brake pads. Studies conducted in the past by some dischargers indicated that brake pads may be a significant source of the copper found in urban runoff. One of the major tasks of the Partnership is to complete a series of technical studies designed to determine if brake pads do make a significant contribution of copper to urban runoff. Permittee staff attended a Partnership meeting in May 2005 presenting an update on the status of this effort. The document *Brake Pad Partnership Update* in Appendix R provides a detailed summary.

3.8 Target Pollutant Effectiveness Evaluation

Effectiveness evaluation of the Target Pollutant program element is based upon completion of tasks required by the Permit and/or identified in the Pesticide Plan, Mercury Plan, and Coliform/Pathogen Plan. As shown in Appendix J, the tasks identified in the work plans were completed.

The Pesticide Use Survey is designed to assess pesticide use by the public and was submitted to the Regional Board in December 2004. It will be the baseline for measuring program effectiveness in reducing pesticide discharges by the public, as subsequent surveys are conducted. The Pesticide Use Survey is scheduled for completion in December 2006. Pesticide use inventories, which are under development as part of the Pesticide Plan, will measure trends in pesticide use by the Permittees.

The Public Awareness Survey described in the Public Education section of this report includes questions on fluorescent lamp and pet waste disposal practices, which provide baseline data relevant to the Mercury Plan and Coliform Plan, respectively. Subsequent surveys will be used to evaluate the effectiveness of these plans.

Monitoring data for target pollutants is examined each year but cannot be used definitively to assess trends or program effectiveness on an annual basis or even on a scale of 2-5 years, due to the limitations presented by the number of data points and the variability of data. In 1996, a technical study prepared by Larry Walker Associates concluded that 20 years of data would be needed to provide statistically valid conclusions about Program effectiveness. See *Technical Memorandum: An Evaluation of Methods for the Assessment of Long term Effectiveness of the Sacramento Comprehensive Stormwater Management Program*, contained in Appendix E of the 1995/96 Annual Monitoring Report.

Chapter 4 — Special Studies

4.1 Overview of Special Studies

The Permittees have conducted various monitoring and literature research studies over the years to evaluate the applicability and effectiveness of particular stormwater quality BMPs for use in the Sacramento area. BMPs that have been studied to date include a dry extended detention basin, a vegetated swale, a stormwater interceptor, a catch basin insert, and various construction sediment control devices. Each of these studies has provided useful data and information for use by the Permittees in determining whether the BMPs are effective and should be accepted for local development projects. Information and results on the prior years' studies can be found in past years' Joint Program Annual Reports.

There are four special studies required by the Sacramento Stormwater Permit and summarized in Table 4.1-1: Wet Water Quality Detention Basin Effectiveness Study, Erosion Potential Study, Dry Weather Flow Study and Structural BMP Effectiveness Study. Further details on the status of each are provided in this chapter.

Table 4.1-1. Status of Special Studies Being Conducted by the Sacramento Stormwater Management Program

Special Studies	Status
Wet Water Quality Detention Basin Effectiveness Study	Equipment installed at the selected sites 2004/2005 Monitoring to begin in 2005/06
Erosion Potential Study	Submitted December 2004
Dry Weather Flow Study	Report to be completed by October 1, 2006
Structural BMP Effectiveness Studies	Work begun in 2004/2005 Completion expected 2005/2006

4.2 Water Quality Detention Basin Study

The Partnership began developing the scope for a wet water quality detention basin effectiveness study in 2002 with the intention of evaluating performance of wet basins in removing common urban runoff pollutants. The study is intended to further determine the applicability of this BMP for the Sacramento area, recommend design guidelines for these facilities, and estimate pollutant load reductions.

In September 2003, the Partnership submitted a work plan to the Regional Board for the Wet Weather Water Quality Detention Basin Study that identified the monitoring and data analysis that would be utilized in determining the effectiveness of a wet water quality detention basin in the City of Sacramento. The monitoring plan included in Appendix D of that report describes specific monitoring protocols, frequency of monitoring, data collection objectives, and effectiveness measurement techniques. Monitoring equipment was also purchased and installed in 2004.

4.3 Erosion Potential Study

The Permittees conducted a study to evaluate current flood, erosion control and habitat protection requirements and determine whether those requirements adequately prevent downstream erosion and protect stream habitat. The study included an analysis of physical habitat, drainage master plans, and standards and policies to determine the impact of flood control work on downstream erosion. Field work began in May and continued through the Fall of 2004. This Permittees submitted the report of findings and recommendations in December 2004. The Erosion Potential Study Report is included as Appendix S.

4.4 Dry Weather Flow Study

Work related to this study commenced this fiscal year. The Permittees will conduct a study evaluating the feasibility of routing dry weather urban runoff discharges from drainage sumps into the sanitary or combined sewer systems. The report is required to be submitted to the Regional Board by October 1, 2006.

4.5 Structural BMP Effectiveness Studies

The Permittees began a multi-year research study of commercially available on-site structural stormwater quality control measures in 1999. The initial study developed monitoring and data protocols that should be satisfied in order for a device to be considered for acceptance in the Sacramento area and evaluated fourteen (14) proprietary devices. The Permittees solicited data again in 2000 from the 14 manufacturers and 17 new manufacturers. A draft addendum analyzing the new data was prepared in the 2001/2002 fiscal year. A peer review of the draft addendum to determine the validity of the study method was also conducted. In May 2003, data that had been submitted since the draft addendum was reviewed and analyzed. The devices reviewed included AquaFilter®, CDS®, StormFilter®, StormVault®, and Vortechs®. A technical memorandum was prepared stating whether or not the data for each unit conformed to the Comprehensive Monitoring Protocols established in 1999 and met the performance criteria (method of Comparative Performance). The StormVault® was the only device recommended for acceptance in the technical memorandum.

In 2003/2004, the Permittees retained the services of a consultant to review the current methodology, the peer review, comments from manufacturers, and other BMP effectiveness programs throughout the country. The study will recommend changes to the proprietary study to keep abreast of recent innovations and research in proprietary treatment assessment techniques. The assessment programs reviewed include the Washington State Technology Assessment Protocol, the Portland Evaluation Program, and the U.S. EPA ETV evaluation process. In addition, as part of the review the Permittees will solicit new performance data from proprietary device manufacturers for evaluation. This work will be completed during the 2005/2006 fiscal year.

Chapter 5 – Program Evaluation

5.1 Program Evaluation Objectives and Methods

Annual evaluations of the Sacramento Stormwater Management Program (Program) are required by the Stormwater Permit to demonstrate compliance and measure progress toward satisfying the requirements of the Stormwater Permit. Evaluations are also necessary to provide feedback for continuous improvement and to verify that public funds are being utilized appropriately.

The July 2003 Stormwater Quality Improvement Plans¹⁰ prepared by the Permittees describe a system for evaluating the Program. The strategy is to evaluate the Program on three levels:

- Overall Program – Evaluations of the overall Stormwater Management Program are conducted jointly by all Permittees under the leadership of the County and City of Sacramento and reported in this Joint Program Annual Report;
- Program Element – Evaluations of the Program Elements (e.g. Construction Element, Municipal Element, Industrial Element) are conducted by individual Permittees and reported in the Permittee Annual Reports, submitted under separate cover. For the Program Elements Monitoring and Target Pollutants an evaluation is reported in the respective chapters of this Joint Program Annual Report. An evaluation of the Public Outreach Program is included in this section of the Joint Program Annual Report; and
- Activity/Best Management Practice (BMP) – Evaluations of individual Element work plan tasks (e.g. Construction Element – training, Municipal Element – street cleaning, Industrial Element – inspections) are conducted by individual Permittees and reported in the Permittee Annual Reports, submitted under separate cover. In addition, the Permittees complete several Special Studies in an effort to evaluate effectiveness of BMPs. A discussion of the results of these Special Studies is included in this section.

For each of the above levels, two different methods may be used to evaluate efforts:

- Performance measures – Designed to measure level of effort, such as number of public events attended or number of staff trained.
- Effectiveness measure – Intended to measure the degree to which a particular effort is deemed successful. For example, the percentage increase in public awareness as measured by public opinion surveys. In some cases, the Permittees will be able to measure the effectiveness of an activity or facility in improving water quality or providing other environmental benefits. For example, measuring the amount of pollutants removed by a water quality detention basin is a measure of pollutants that could have otherwise been discharged to a downstream creek or river.

¹⁰ See Chapter 3.7 of County of Sacramento SQIP and Chapter 7 of City of Sacramento SQIP for additional details about proposed methods for evaluating the Program.

5.2 Evaluation of the Public Outreach Program

Public Outreach and Training

The effectiveness of a public outreach campaign depends upon the ability to reach a desired audience, deliver the necessary message in an effective manner, and ultimately elicit change or action. In consultation with professional outreach consultants, the Permittees determined a much higher performance measure for audience contact would be necessary for an effective public outreach campaign. As such, under the leadership of the County and City of Sacramento, the Permittees combined their resources to make over 45 million impressions on residents in the Stormwater Permit area during the 2004/2005 fiscal year. This far exceeded the performance measure required by the Permit requirement of 2.5 million impressions. The Permittees next evaluated the effectiveness of this program primarily by reviewing the results of various survey efforts and revising the outreach strategy as needed. The results of the survey efforts identified differences in audience responses to the outreach campaign and identified gaps of knowledge for the outreach campaign to address.

Overall, the successful regional media campaign included billboards, public service announcements on TV, newspaper and magazine advertisements. In terms of reaching targeted population subgroups, the Permittees continued to distribute a diverse array of messages and materials to residential and commercial audiences, sponsored many training workshops for the construction community and conducted classroom presentations and other activities to reach schoolchildren and their teachers. Actual numbers of people reached in these population subgroups are reported in the individual Permittee Annual Reports.

In 2004/2005, the Permittees, in partnership with the Regional Water Authority (RWA) continued their contract with the South Yuba River Citizens League (SYRCL) to offer stormwater pollution prevention outreach to Sacramento schools in the third through sixth grades. The program will be completed in Fall 2006.

A Public Awareness Survey was conducted in early 2004, including residents of the cities of Sacramento, Citrus Heights, Elk Grove, Folsom, Rancho Cordova and Galt and residents of the unincorporated areas of Sacramento County. In the 2004/2005 fiscal year the Permittees used the information from this survey to more effectively target outreach resources to reach some of the ethnic groups not previously targeted. For example, the survey revealed that 12% of all County residents are Hispanic or Latino and that this group was behind others regarding knowledge of stormwater issues. With this knowledge, the Permittees subsequently translated and printed a number of outreach brochures to Spanish in better reach this group. Additional translations are planned for the 2005/2006 fiscal year.

A pilot program began in January 2005 to provide outreach literature to home improvement stores and equipment rental facilities in the County for distribution to their customers. Quarterly, each store is sent a post card with information about reordering brochures. The brochures provided will be tracked and the results of will be reported in the 2005/2006 Annual Report.

5.3 Special Studies

The Permittees have conducted special studies to evaluate stormwater quality BMP performance for many years. Special studies have been completed of the following BMPs to date, as reported in previous annual reports: vegetated swale, storm drain inlet filter, and dry extended detention basin. There are four new special studies being planned or implemented at this time, as summarized in Table 4.1-1: Wet Water Quality Detention Basin, Erosion Potential Study, Dry Weather Diversion Study and Structural BMP Effectiveness Study. During the 2004/2005 fiscal year, the Permittees worked with consultant teams to purchase and install monitoring equipment and prepare monitoring sites for the Wet Detention Basin Study. The Permittees finalized work on and submitted the Erosion Potential Study. The City and County of Sacramento are administering and managing the consultant contracts on behalf of all the Permittees, and the other Permittees will be involved in reviewing work products.

For special studies of this nature, several years' data is typically required in order to draw statistically valid conclusions for reporting purposes. The Erosion Potential Study was the only study completed during the 2004/2005 fiscal year. Refer to future Joint Program Annual Reports for other study results (see Table 4.1-1 for projected completion dates).

5.4 Evaluation of the Overall Stormwater Program

The evaluation of program elements and BMPs are presented in the individual Permittee 2004/2005 Annual Reports submitted to the Regional Board under separate cover. The Permittees report the major accomplishments for the fiscal year for each program element and the level of effort expended to complete the activities and BMPs required by the Stormwater Permit. For the most part, fulfillment of these prescriptive permit requirements constitutes compliance with performance standards or measures. For some program elements, additional performance measures may have been proposed by the Permittees in their July 1, 2003 SQIPs.

In the future, the Permittees may also recommend modifications to the SQIPs or Stormwater Permit, where the past years' activities and results indicate a need for a change in order to improve the Program. As a result of the development of the Report of Water Quality Exceedance, the Permittees are proposing to develop a monitoring study to evaluate DO, pH, and temperature exceedances in various urban tributaries. The status of the development, implementation, and results of the monitoring study (e.g. monitoring, technical studies, proposed BMPs) will be reported in the 2005/2006 Joint Program Annual Report.

Whenever possible, the Permittees will draw conclusions about perceived effectiveness based on observations and direct experiences. For example, a Permittee may conclude that its staff training program is effective based on increased staff awareness and involvement, as well as a measured increase in number of projects in compliance (or decrease in number of projects not in compliance) with the stormwater regulations.