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MEMORANDUM

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DATE: December 9, 2004

SUBJECT: PRELIMINARY RESULTS FOR STUDY 219: MONITORING SURFACE
WATERS AND SEDIMENTS OF THE SALINAS AND SAN JOAQUIN
RIVER BASINS FOR ORGANOPHOSPHATE AND PYRETHROID
PESTICIDES

Scope of the Memorandum

The purpose of this memorandum is to provide preliminary results of water sampling conducted at four sites in the San Joaquin River Watershed (Stanislaus County) and four sites in the Salinas River Watershed (Monterey County). The Department of Pesticide Regulation's (DPR's) personnel collected water and sediment samples during the summer of 2003 (June 10 through September 30, 2003). This memorandum reports data for organophosphate (OP) and pyrethroid pesticides in surface water, suspended sediment in surface water, and pyrethroid pesticides in bed sediment. Chemical analysis of water and sediment samples was performed by the Department of Food and Agriculture's Center for Analytical Chemistry. Analysis of total suspended solids in water samples was conducted by DPR.

This memorandum presents a summary of the data. A final report will detail agricultural use of the pesticides in the vicinity of the sampling sites, and present total organic carbon data for the bed sediment samples.

Background

The purpose of this study was to determine the presence of pyrethroid insecticides in water and bed sediments and the presence of OP pesticides in water during the summer growing season. The Salinas and San Joaquin valleys were selected because they are important agricultural regions in California, with concomitant use of a wide variety of pesticides throughout the summer growing season (DPR, 2002).

Pyrethroid insecticides were selected for monitoring based on three criteria: (a) their relatively high use, (b) their high potential aquatic toxicities, and (c) the relative paucity of current monitoring data.



Materials and Methods

Target Pesticides

Pyrethroid Insecticides

Pyrethroid insecticides are used on a variety of crops in the Salinas River and San Joaquin River Basins from May through October. Table 1 shows the use of the pyrethroid insecticides bifenthrin, cyfluthrin, cypermethrin, esfenvalerate, lambda-cyhalothrin, and permethrin during the summer in counties in those river basins. Table 2 shows the physico-chemical and aquatic toxicity of these pyrethroids.

Organophosphate Pesticides

A wide variety of OP insecticides, including diazinon and chlorpyrifos, are applied in both river basins during the summer (DPR, 2002), and have been detected in San Joaquin Valley surface water (Foe, 1995; Kratzer, 1997). Other OP insecticides have been detected during non-summer seasonal monitoring efforts and thus were included in this memo. Water samples were analyzed to provide current information on the presence of these pesticides during summer months due to ongoing concerns over the impact of OPs on water quality (Table 3).

Site Descriptions

Monterey County (Salinas River Watershed)

Sampling sites were chosen on waterways (two creeks and two agricultural ditches) whose flows are dominated by summer agricultural field run-off and which drain into the Salinas River (Figure 1). Pyrethroid and OP insecticides have historically been applied to the agricultural fields, which drain into these watercourses. All creeks/agricultural ditches were surveyed prior to the onset of sampling, and specific sample collection points were chosen based on available public access to the water body. Samples were collected on Monday of each week for 16 weeks, from June 16, 2003, through September 29, 2003. Samples were transported to the lab each Wednesday.

Stanislaus County (San Joaquin River Watershed)

Streamside sites draining into the San Joaquin River were chosen on waterways (two creeks and two agricultural ditches) whose flows are dominated by summer agricultural field run-off (Figure 2). Pyrethroid and OP insecticides have historically been applied to the agricultural

Table 1. Pyrethroid insecticides applied to agricultural commodities in the Salinas River Basin and the San Joaquin River Basin during 2001. (DPR 2002)

	May	June	July	August	September	October	Total
BIFENTHRIN	Pounds Active Ingredient						
Fresno [†]	21.3	810.0	882.0	301.2	44.5	0.3	2,059.3
Madera [†]	0.0	9.4	10.4	43.7	0.0	0.0	63.6
Merced [†]	0.9	238.6	829.1	271.1	23.0	0.0	1,362.7
San Joaquin [†]	0.0	89.4	19.7	33.6	15.1	0.8	158.6
Stanislaus [†]	16.8	153.6	307.7	309.5	55.5	8.0	851.1
Monterey [‡]	18.2	55.2	136.3	73.1	81.9	18.8	383.4
CYFLUTHRIN	Pounds Active Ingredient						
Fresno	849.7	160.2	909.7	1162.0	107.1	89.5	3278.2
Madera	62.6	35.0	45.3	1.1	0.0	0.0	144.1
Merced	0.0	49.8	43.9	96.8	17.6	12.2	220.3
San Joaquin	0.4	0.0	1.3	0.0	0.0	0.0	1.7
Stanislaus	239.5	12.3	44.4	21.5	10.7	0.0	328.4
Monterey	0.2	0.2	0.5	0.5	0.1	0.5	2.0
CYPERMETHRIN	Pounds Active Ingredient						
Fresno	549.4	210.2	49.7	0.0	287.2	318.6	1,415.0
Madera	0.0	1.4	0.8	0.0	0.0	0.0	2.1
Merced	0.0	73.8	8.4	2.3	0.0	0.0	84.6
San Joaquin	0	0	0	0	0	0	0
Stanislaus	19.7	19.7	17.2	22.6	21.6	21.7	122.4
Monterey	199.6	206.4	334.8	419.3	293.7	148.2	1,602.1
ESFENVALERATE	Pounds Active Ingredient						
Fresno	356.7	180.0	168.8	305.9	305.9	131.7	1,449.1
Madera	76.0	4.7	115.5	13.1	3.9	0.0	213.1
Merced	225.8	221.7	292.3	235.9	56.1	12.0	1,043.8
San Joaquin	0	0	0	0	0	0	0
Stanislaus	437.1	317.2	892.6	134.8	4.2	0.0	1,785.9
Monterey	210.6	388.8	406.9	395.7	456.0	331.2	2,189.1
LAMBDA-CYHALOTHRIN	Pounds Active Ingredient						
Fresno	123.6	198.8	305.8	189.1	46.5	61.8	925.7
Madera	0	0	0	0	0	0	0
Merced	114.8	37.0	30.0	10.7	32.2	6.5	231.2
San Joaquin	0	0	0	0	0	0	0
Stanislaus	18.6	23.1	80.3	43.1	50.0	26.9	242.0
Monterey	440.8	378.9	350.2	369.6	485.1	255.5	2,280.1
PERMETHRIN	Pounds Active Ingredient						
Fresno	319.7	220.9	862.0	514.9	1413.3	3,493.8	6,824.7
Madera	0	0	0	0	0	0	0
Merced	1,138.2	769.4	960.8	249.8	120.7	16.8	3,255.7
San Joaquin	0	0	0	0	0	0	0
Stanislaus	632.7	411.8	1,515.9	78.7	5.5	2.6	2,647.1
Monterey	5,980.2	4,548.5	3,921.8	4,068.8	4,219.9	2,690.4	25,429.7

[†] San Joaquin River basin counties.

[‡] Salinas River counties.

Table 2. Physical and aquatic toxicity data for pyrethroid insecticides.

Pesticide	Koc [†]	Solubility (mg/l) [†]	Half-life Soil (days) [†]	Hydrolytic (pH 7) Half-life (days) [†]	Toxicity LC ₅₀ (ppb) <i>Daphnia magna</i> [‡]
Bifenthrin	237,000	1.4 x 10 ⁻⁵	96-425	Stable	1.6
Cyfluthrin	124,000	2.3 x 10 ⁻³	12-34	183	0.16
Cypermethrin	310,000	4.0 x 10 ⁻³	28-55	274	1.25
Esfenvalerate [§]	215,000	6.0 x 10 ⁻³	39-94	Stable	0.24
Lambda-cyhalothrin	326,000	5.0 x 10 ⁻³	43	Stable	0.23
Permethrin	277,000	5.5 x 10 ⁻³	40-197	Stable	0.075

[†] Laskowski (2002).

[‡] DPR (2003).

[§] DPR (2004).

Table 3. Physical and aquatic toxicity data for organophosphate pesticides.

<i>Pesticide</i>	Koc [†]	Solubility (mg/l) [†]	Half-Life Soil (days) [†]		Hydrolytic Half-life (days) [†]	Toxicity LC ₅₀ (ppb) <i>Daphnia magna</i> [‡]
			Aerobic	Anaerobic		
Azinphos-methyl	347	27.95	44.0	68.0	10	1.1
Chlorpyrifos	125	1.39	75 [§]	75 [§]	30.7 – 74.6	0.1
Diazinon	1,581	60	39.7	15.6	138	0.96
DDVP (dichlorvos)		15,700	---	---	5.77	---
Dimethoate	11	39,800	2.4	22	68	2,500
Disulfoton	522	12.0	1.7	15.6	23.2	13
Ethoprop	161	843	33.5	13.0	449	43,900
Fenamiphos	341	329	33 [§]	---	300	---
Fonofos	916	16.9	150 [§]	115	430	2
Malathion	291	125	2.5	20	6.21	2
Methidathion	341	221	11	---	40.8	7.2
Methyl parathion	476	70.3	12 [§]	1.1	44.6	4
Phosmet	5,807	2.0	7.2	26.7	< 37.5	5.6
Thimet (Phorate)	657	29.0	3	14.4	3.1	4
Profenofos	2,016	28.4	1.9	2.9	61.7	1.4
Tribufos	90.4	2.3	74.5	389	61.3	120

[†] DPR (2004).

[‡] DPR (2003).

[§] Denotes average values.

Figure 1. Location of sampling sites (▲) in Monterey County, Summer 2003.

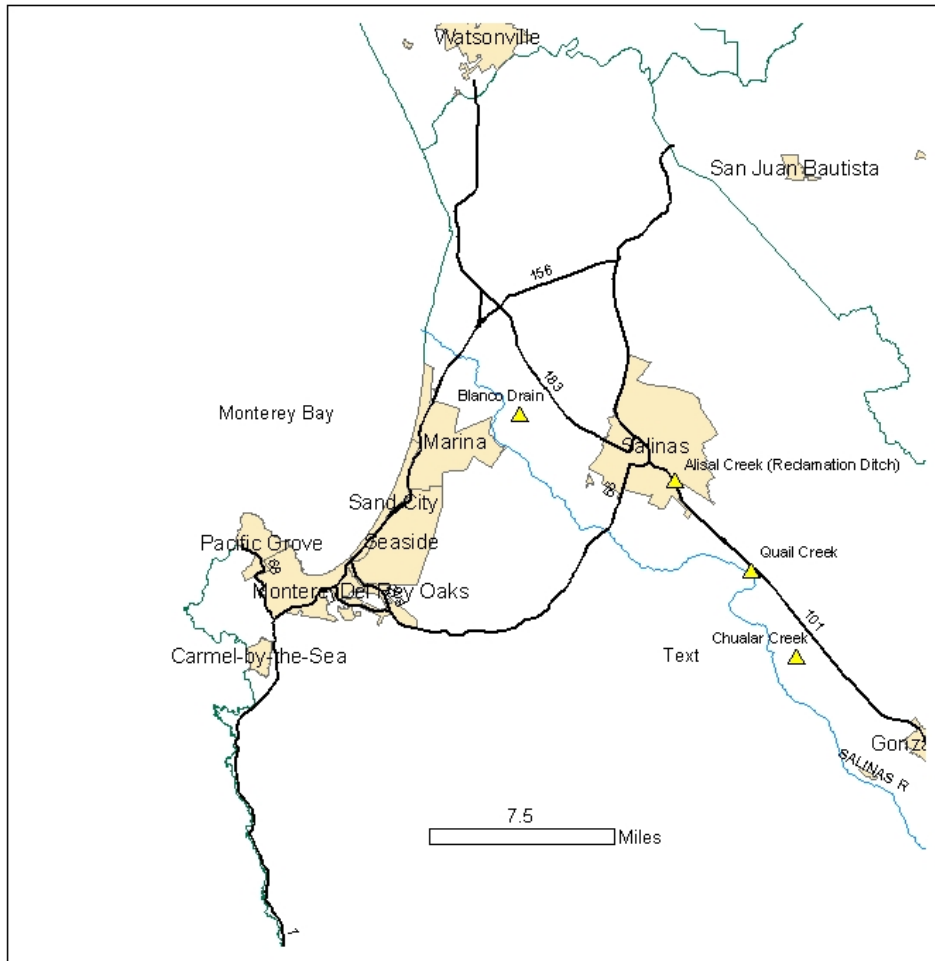
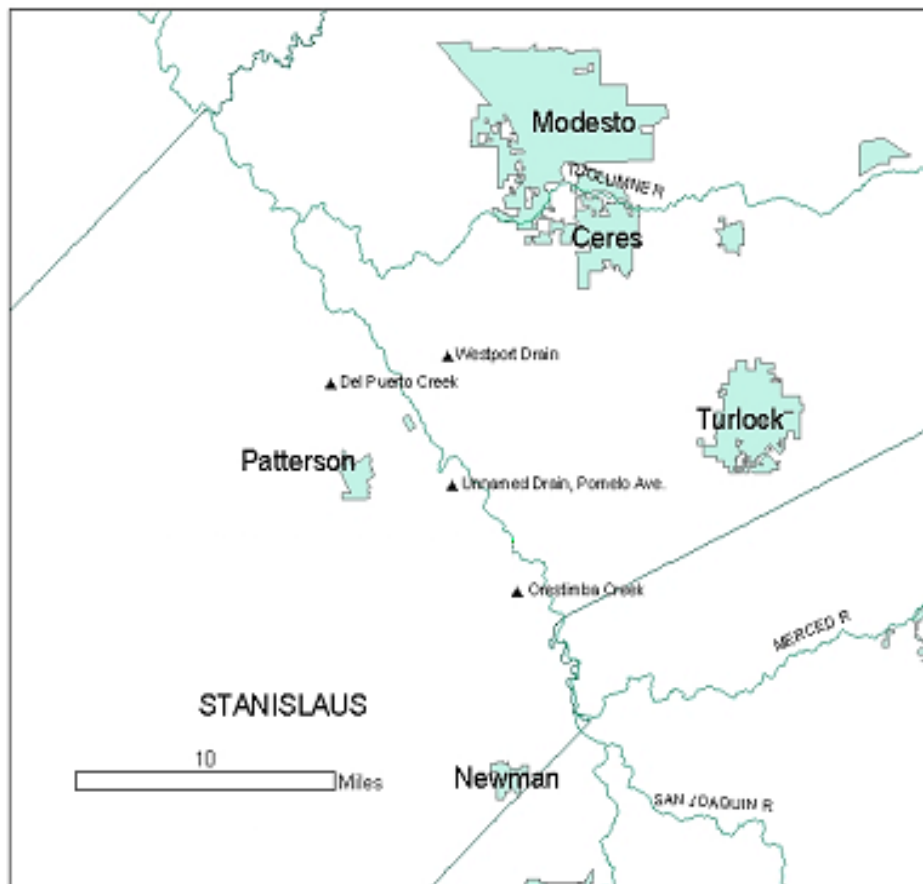


Figure 2. Location of sampling sites (▲) in Stanislaus County, Summer 2003.



fields which drain into these waterways. Sample collection sites were surveyed prior to the onset of sampling, with specific sample collection points were chosen based on available public access to the water body. The Orestimba Creek and Del Puerto Creek sample sites have been visited during previous studies.

Samples were collected on Tuesday of each week for 17 weeks, from June 10, 2003, through September 30, 2003. Samples were transported to the lab each Wednesday.

Site Coordinates

Four sites were chosen for sampling in both Monterey and Stanislaus Counties. The site name (used throughout this document) as well as the GPS coordinates and a basic description is contained in Table 4.

Table 4. Name, coordinates, and description for sample collection sites in Monterey and Stanislaus counties.

Monterey County Sites

Site Name	Site Coordinates†	Site Descriptions
Alisal Creek (Reclamation Ditch)	N36.66121 W121.61913	Alisal Creek (Reclamation Ditch), De La Torre Street ca. 0.15 mile ESE from Airport Blvd; drains West to Old Salinas River
Quail Creek	N36.60923 W121.56227	Quail Creek at HWY 101, (between Spence and Potter Roads) 25 meters SW of HWY 101 (tributary to Salinas River)
Chualar Creek	N36.55861 W121.52886	Chualar Creek at Chualar River Rd., ca. 1.2 mi. SW from HWY 101 (tributary to Salinas River.)
Blanco Drain	N36.69876 W121.73414	Blanco Drain at Cooper Road, ca. 0.2 mile South of Nashua Road, drains West to Salinas River

Stanislaus County Sites

Site Name	Site Coordinates†	Site Descriptions
Westport Drain (Taylor/Jennings)	N37.53682 W121.06575	Westport Drain (TID#3) at Jennings Rd Bridge. Drains West to San Joaquin River.
Pomelo	N37.46924 W121.06190	Unnamed agricultural drain at Pomelo Ave near Paradise Avenue. Drains North to San Joaquin River.
Orestimba Creek	N37.41360 W121.01500	Orestimba Creek at River Road (tributary to San Joaquin River).
Del Puerto Creek	N37.52174 W121.14806	Del Puerto Creek at Vineyard Ave. (tributary to San Joaquin River)

† North American Datum 1927 (NAD27) notation.

Environmental Measurements

Water Quality Measurements

Dissolved oxygen (DO), electrical conductivity (EC), pH, and water temperature were measured in situ for each sample collection event. DO, EC, and temperature were measured with a YSI 80 Dissolved Oxygen/Conductivity meter and pH was measured using a YSI 60 pH meter. Stream flow, stream depth, and stream width measurements were also measured at each sample collection event. Gauging/flow data were measured using a Global FP201 Flow Probe.

Sample Collection, Handling, and Transport

At each sampling site, a pyrethroid grab sample, an OP grab sample, a total suspended solids grab sample and two backup samples (one acidified) were collected directly into 1-liter amber glass bottles and sealed with Teflon-lined lids. Grab samples were collected as close to center channel as possible, either via hand immersion or via a grab pole consisting of the glass bottle at the end of an extendable pole. Samples were not transferred from the original sample bottle until analysis at the lab. Amber bottles containing sample waters were resealed with Teflon-lined caps and stored in coolers and covered with wet ice for transport. A total of five 1-liter water samples were collected at each collection site on each sampling date.

Streambed sediment was collected at each site using either a hollow coring device (2-inch inside diameter) or a hand-held trowel, depending on creek bed or riverbed composition. No more than the top $\frac{3}{4}$ - to 1-inch of the streambed sediment was kept, thus several corings (or trowels full) were collected and combined in pint Mason™ jars (filled one-half to three-quarters full) to create one composite sediment sample per site. Two separate composite samples were collected at each sampling point on each sampling date to be analyzed for pyrethroid insecticides or total organic carbon.

Sample containers were rinsed with de-ionized water, wiped with an anti-microbial wipe, and then rerinsed. Samples were then stored overnight in coolers under wet ice and transported the next day to DPR's warehouse facility in West Sacramento, California, where they were removed from coolers, rinsed, and stored in a 4°C refrigerator. Samples were transported to the lab the following day.

Stanislaus County samples were transported immediately to the warehouse, removed from coolers, rinsed, and stored in a 4°C refrigerator. Samples were transported to the lab the following day.

Pesticide Analysis and Total Suspended Solids Measurement

Chemical Analysis

Chemical analyses were performed by the California Department of Food and Agriculture's Center for Analytical Chemistry. Water and sediment samples were analyzed for bifenthrin, cyfluthrin, cypermethrin, esfenvalerate, lambda-cyhalothrin, and permethrin. Aqueous samples were also analyzed for a suite of OP pesticides.

For all pyrethroid water analyses, the whole samples, including any suspended sediment, were extracted in the sample bottle (*in toto*) and the pyrethroid residues are reported on a whole sample basis (water plus suspended sediment).

Reporting limits and minimum detection limits (MDL) for each pesticide are listed in Appendix 1. A trace detection is defined as an analyte concentration that falls between the reporting limit and the method detection limit. In addition, the chemist determines where a trace detection is likely due to the analyte of interest (Goh, 2002).

Suspended Solids Measurement

Samples to be analyzed for suspended solids were collected concomitant with other water samples. Samples were allowed to settle for three weeks, stored at 4 °C until analyzed as follows: Buchner funnels lined with glass fiber filters (pore size 0.7µm), placed under vacuum, were used to separate suspended solids from water. Samples were decanted through the lined Buchner funnels until all fluid had been pulled through. Glass filters with sediments were then dried at 80 °C for 24 hours, cooled to room temperature in a desiccating chamber, and then weighed. If any breakthrough occurred while the sample was being filtered, the water was refiltered through a second glass fiber filter. Weights of material on the primary and secondary filters were combined.

Quality Control

Quality control for chemistry analyses was performed in accordance with Standard Operating Procedure QAQC001.00 (Segawa, 1995) and consisted of a continuing quality control program. Ten percent of the total number of water samples were submitted for chemistry analyses as field blanks and another ten percent as blind spikes.

Results

Water Quality Measurements

Monterey County Sites

The ranges and averages for five water quality measurements taken at the time of sample collection are presented in Table 5.

DO ranged from 0.01 parts per million (ppm) through 17.9 ppm, both extremes measured at the Alisal Creek/Reclamation Ditch site over the course of the study. Dissolved oxygen concentrations over the course of the study averaged 6.83 ppm at the Reclamation Ditch, 7.89 ppm at Quail Creek, 5.68 ppm at Chualar Creek, and 6.39 ppm at Del Puerto Creek.

Temperatures of the four water bodies ranged from 16.7 °C at Blanco Drain to 26.5 °C at Quail Creek over the course of the study. The average temperature was 22.0 °C at the Reclamation Ditch site, 22.2 °C at Quail Creek, 22.8 °C at Chualar Creek, and 21.2 °C at Blanco Drain.

The pH of the four water bodies ranged from 7.0 at Reclamation Ditch to 10.5 at Blanco Drain. The average pH was 8.34 at the Reclamation Ditch, 7.75 at Quail Creek, 8.43 at Chualar Creek, and 8.21 at Blanco Drain.

Electrical conductivity of the four waterways ranged from 844 micro Siemens/centimeter ($\mu\text{S}/\text{cm}$) at Quail Creek to 3,166 $\mu\text{S}/\text{cm}$ at Blanco Drain. The average electrical conductivity was 1,162.3 $\mu\text{S}/\text{cm}$ at the Reclamation Ditch, 1,215.3 $\mu\text{S}/\text{cm}$ at Quail Creek, 1,593.3 $\mu\text{S}/\text{cm}$ at Chualar Creek, and 2,840.3 $\mu\text{S}/\text{cm}$ at Blanco Drain.

Water flow was also measured at all four sites and ranged from 0 m/sec (meters/second) at the Reclamation Ditch, Chualar Creek, and Blanco Drain to 4.6 m/sec at Orestimba Creek. Average water flow was 0.12 m/sec at the Reclamation Ditch, 2.12 m/sec at Quail Creek, 1.52 m/sec at Chualar Creek, and 0.94 m/sec at Blanco Drain.

Stanislaus County Sites

The ranges and averages for water quality measurements are shown in Table 6.

DO ranged from 0.49 ppm at Pomelo through 15.5 ppm at the Westport Drain site over the course of the study. DO concentrations in the Westport Drain averaged 8.86 ppm, at Pomelo 7.42 ppm, at Orestimba Creek 7.33 ppm, and at Del Puerto Creek 7.34 ppm.

Temperatures of the four water bodies ranged from 19.4 °C at Del Puerto Creek to 29.5 °C at Orestimba Creek over the course of the study. The average temperature was 22.3 °C at Westport Drain, 24.1 °C at Pomelo, 25.8 °C at Orestimba Creek, and 22.2 °C at Del Puerto Creek.

Table 5. Environmental parameters measured during water sampling events at sites in Monterey County during the Summer of 2003. Averages based on sixteen data points unless otherwise noted.

Location	Measurement	DO (ppm)	Temperature (°C)	pH	EC (µS/cm)	Flow (m/sec)
Alisal Creek (Reclamation Ditch)	Average	6.83	22.0	8.34	1,162.3	0.12 [†]
	Range	0.01 – 17.9	19.3 – 24.8	7.0 – 9.65	966 – 1392	0 – 1.24
Quail Creek	Average	7.89	22.2	7.75	1,215.3	2.12 [†]
	Range	2.61 – 11.52	17.2 – 26.5	7.15 – 8.6	844 – 1764	0.6 – 0.64
Chualar Creek	Average	5.68	22.8	8.43	1,593.3	1.52 [†]
	Range	2.4 – 7.75	21.2 – 25.8	7.77 – 9.15	1123 – 2145	0 – 3.34
Blanco Drain	Average	6.39	21.2	8.21	2,840.3 [†]	0.94 [†]
	Range	0.84 – 11.3	16.7 – 25.1	7.58 – 10.5	1962 – 3166	0 – 1.77

† Fifteen data points collected.

Table 6. Environmental parameters measured during water sampling events at sites in Stanislaus County during the Summer of 2003. Averages based on seventeen data points unless otherwise noted.

Location	Measurement	DO (ppm)	Temperature (°C)	pH	EC (µS/cm)	Flow (m/sec)
<i>Westport Drain</i>	Average	8.86	22.34	8.0	687.6 [†]	1.15
	Range	4.55 – 15.5	21.00 – 26.00	7.40 – 8.67	231 – 1,030	0 – 2.53
Pomelo	Average	7.42	24.1	8.09	1287.7	0.2 [†]
	Range	0.49 – 11.44	20.80 – 28.40	7.37 – 8.80	1.6 – 1,843	0 – 1.74
Del Puerto Creek	Average	7.34	22.24	7.77 [†]	536.2	0.8
	Range	5.04 – 10.83	19.40 – 25.80	6.70 – 9.73	0.5 – 920	0 – 1.39
Orestimba Creek	Average	7.33	25.76	8.0	804.9	2.34 [†]
	Range	4.95 – 9.62	22.30 – 29.50	7.15 – 8.64	0.5 – 1,284	0.92 – 3.56

† Sixteen data points collected.

The pH of the four water bodies ranged from 6.70 to 9.73, both extremes measured at Del Puerto Creek. The average pH was 8.0 at Westport Drain, 8.09 at Pomelo, 8.0 at Orestimba Creek, and 7.77 at Del Puerto Creek.

EC of the four water bodies ranged from 0.5 $\mu\text{S}/\text{cm}$ at Orestimba Creek and Del Puerto Creek to 1,843 $\mu\text{S}/\text{cm}$ at Pomelo. Extreme low values are attributed to equipment failure. The average EC was 687.6 $\mu\text{S}/\text{cm}$ at Westport Drain, 1,287.7 $\mu\text{S}/\text{cm}$ at Pomelo, 804.9 $\mu\text{S}/\text{cm}$ at Orestimba Creek, and 536.2 $\mu\text{S}/\text{cm}$ at Del Puerto Creek.

Water flow was also measured at all four sites and ranged from 0 m/sec at Westport Drain, Pomelo, and Del Puerto Creek, to 3.56 m/sec at Orestimba. Average water flow was 1.15 m/sec at Westport Drain, 0.2 m/sec at Pomelo, 2.34 m/sec at Orestimba Creek and 0.8 m/sec at Del Puerto Creek.

Pesticide Concentrations

Table 7 lists OP pesticides and pyrethroid insecticides that were not detected in any water sample collected in either Monterey County or Stanislaus County. Detections of the remaining OP and pyrethroid insecticides are presented in the following sections. Reporting limits and minimum detection levels for each pesticide in water and sediment are presented in Appendix 1.

Monterey County

Data for OP pesticide detections is presented in Table 8. Data includes the concentration for each OP, the number of detections for each OP, and the maximum concentration detected of each OP over the course of the study.

Data for pyrethroid insecticide detections in water samples is presented in Table 9. Data for pyrethroid insecticide detections in sediment samples is presented in Table 10.

Table 7. Organophosphate and pyrethroid pesticides not detected in water samples.

Monterey County		Stanislaus County	
Organophosphate	Pyrethroid	Organophosphate	Pyrethroid
Methidathion	Cyfluthrin	Fenamiphos	Lambda-cyhalothrin
Fenamiphos		Azinphos methyl	Cyfluthrin
Phorate		DDVP	Cypermethrin
Fonofos		Phorate	
Tribufos (DEF)		Fonofos	
Profenfos		Tribufos (DEF)	
		Profenfos	

Reclamation Ditch/Alisal Creekh

Six OP insecticides were detected in waters collected from the Reclamation Ditch over the course of the study. Diazinon and dimethoate were detected in all samples. Chlorpyrifos was detected in nine samples, malathion in five samples, disulfoton in four samples, and methidathion in one sample. Maximum concentrations for detected insecticides were diazinon, 3.16 µg/L; dimethoate, 1.04 µg/L; chlorpyrifos, trace; malathion, 0.075 µg/L; disulfoton, 0.785 µg/L; and methidathion, trace.

Pyrethroid insecticides detected in water samples include bifenthrin, detected in one sample, lambda-cyhalothrin, detected in one sample; permethrin, detected in two samples; and esfenvalerate, detected in one sample. Maximum concentrations were bifenthrin, 0.0165 µg/L; lambda-cyhalothrin, trace; permethrin, 0.195 µg/L; and esfenvalerate, trace.

In sediment collected from the Reclamation Ditch, permethrin was detected in 15 samples, with a maximum concentration of 0.0363 µg/g.

Quail Creek

Five OP insecticides were detected in waters collected from Quail Creek over the course of the study. Diazinon, chlorpyrifos, and dimethoate were detected in all samples. Malathion was detected in five samples, and DDVP was detected in one sample. Maximum concentrations were diazinon, 7.25 µg/L; chlorpyrifos, 3.96 µg/L; dimethoate, 11.31 µg/L; malathion, 0.0518 µg/L; and DDVP, trace.

Pyrethroid insecticides detected in water samples include permethrin, detected in 11 samples, and cypermethrin, detected in one sample. Maximum concentrations were permethrin, 0.162 µg/L and cypermethrin, trace.

Two pyrethroid insecticides were detected in sediment samples collected from Quail Creek. Permethrin was detected in 15 samples, and cypermethrin was detected in six samples. Maximum concentrations were permethrin 0.119 µg/g and cypermethrin 0.0199 µg/g.

Chualar Creek

Four OP insecticides were detected in waters collected from Chualar Creek over the course of the study. Diazinon, chlorpyrifos, and dimethoate were detected in all samples, and malathion was detected in five samples. Maximum concentrations were diazinon, 5.33 µg/L; chlorpyrifos, 0.684 µg/L; malathion, 0.544 µg/L; and dimethoate, 5.27 µg/L.

No pyrethroid insecticides were detected in water samples. In sediment collected from Chualar Creek, the only pyrethroid detected was permethrin with trace amounts detected in three samples.

Blanco Drain

Four OP insecticides were detected in waters collected from Blanco Drain over the course of the study. Only diazinon was detected in all samples. Dimethoate was detected in five samples, with chlorpyrifos, and malathion detected in single samples. Maximum concentrations were diazinon, 0.684 µg/L; chlorpyrifos, 0.044 µg/L; malathion, trace; DDVP, trace; and dimethoate, 0.075 µg/L.

No pyrethroid insecticides were detected in water samples. Permethrin was the only pyrethroid detected in sediment samples from Blanco Drain. Maximum concentration was 0.0103 µg/g.

Table 8. Concentrations of organophosphate pesticides in whole water samples collected in Monterey County.

Alisal Creek/Reclamation Ditch

Date Sampled	Concentration (µg/L)														
	Ethoprop	Diazinon	Disulfoton	Chlorpyrifos	Malathion	Methidathion	Fenamiphos	Azinphos-methyl	DDVP	Phorate	Fonofos	Dimethoate	Methyl Parathion	DEF	Profenofos
16-Jun	nd [†]	0.616	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.0697	nd	nd	nd
23-Jun	nd	0.698	nd	0.04	nd	nd	nd	nd	nd	nd	nd	trace [‡]	nd	nd	nd
30-Jun	nd	0.602	nd	trace	nd	trace	nd	nd	nd	nd	nd	0.0448	nd	nd	nd
7-Jul	nd	0.413	trace	trace	trace	nd	nd	nd	nd	nd	nd	0.124	nd	nd	nd
14-Jul	nd	1.097	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.202	nd	nd	nd
21-Jul	nd	2.37	nd	trace	nd	nd	nd	nd	nd	nd	nd	0.278	nd	nd	nd
28-Jul	nd	0.841	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.159	nd	nd	nd
4-Aug	nd	0.762	nd	trace	nd	nd	nd	nd	nd	nd	nd	0.15	nd	nd	nd
11-Aug	nd	3.16	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.395	nd	nd	nd
18-Aug	nd	1.5	nd	trace	trace	nd	nd	nd	nd	nd	nd	0.358	nd	nd	nd
25-Aug	nd	1.68	0.0785	trace	trace	nd	nd	nd	nd	nd	nd	0.192	nd	nd	nd
2-Sep	nd	0.95	trace	trace	nd	nd	nd	nd	nd	nd	nd	trace	nd	nd	nd
8-Sep	nd	2.03	nd	nd	trace	nd	nd	nd	nd	nd	nd	0.149	nd	nd	nd
15-Sep	nd	0.282	trace	trace	0.075	nd	nd	nd	nd	nd	nd	0.355	nd	nd	nd
22-Sep	nd	0.643	nd	nd	nd	nd	nd	nd	nd	nd	nd	1.04	nd	nd	nd
29-Sep	nd	2.48	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.0586	nd	nd	nd
# Positive	0	16	4	9	5	1	0	0	0	0	0	16	0	0	0
Maximum (µg/L)	--	3.16	0.0785	trace	0.075	trace	--	--	--	--	--	1.04	--	--	--

Table 8 (cont). Concentrations of organophosphate pesticides in whole water samples collected in Monterey County.

Quail Creek

Date Sampled	Concentration (µg/L)														
	Ethoprop	Diazinon	Disulfoton	Chlorpyrifos	Malathion	Methidathion	Fenamiphos	Azinphos-methyl	DDVP	Phorate	Fonofos	Dimethoate	Methyl Parathion	DEF	Profenofos
16-Jun	nd	0.126	nd	0.113	nd	nd	nd	nd	nd	nd	nd	0.921	nd	nd	nd
23-Jun	nd	0.0825	nd	1.297	trace	nd	nd	nd	nd	nd	nd	2.507	nd	nd	nd
30-Jun	nd	0.118	nd	0.197	nd	nd	nd	nd	nd	nd	nd	11.31	nd	nd	nd
7-Jul	nd	0.053	nd	0.107	nd	nd	nd	nd	nd	nd	nd	2.81	nd	nd	nd
14-Jul	nd	0.212	nd	0.179	0.0518	nd	nd	nd	nd	nd	nd	0.234	nd	nd	nd
21-Jul	nd	0.0809	nd	3.96	trace	nd	nd	nd	nd	nd	nd	0.28	nd	nd	nd
28-Jul	nd	0.066	nd	0.344	nd	nd	nd	nd	nd	nd	nd	0.07	nd	nd	nd
4-Aug	nd	4.09	nd	0.156	nd	nd	nd	nd	nd	nd	nd	0.136	nd	nd	nd
11-Aug	nd	0.327	nd	0.371	nd	nd	nd	nd	nd	nd	nd	trace	nd	nd	nd
18-Aug	nd	1.06	nd	0.123	trace	nd	nd	nd	nd	nd	nd	9.57	nd	nd	nd
25-Aug	nd	0.128	nd	0.132	0.0405	nd	nd	nd	nd	nd	nd	4.35	nd	nd	nd
2-Sep	nd	0.85	nd	0.0594	nd	nd	nd	nd	nd	nd	nd	0.962	nd	nd	nd
8-Sep	nd	10.6	nd	0.106	nd	nd	nd	nd	trace	nd	nd	0.11	nd	nd	nd
15-Sep	nd	7.25	nd	0.073	nd	nd	nd	nd	nd	nd	nd	1.14	nd	nd	nd
22-Sep	nd	0.63	nd	0.0936	nd	nd	nd	nd	nd	nd	nd	0.443	nd	nd	nd
29-Sep	nd	0.203	nd	0.066	trace	nd	nd	nd	nd	nd	nd	0.388	nd	nd	nd
# Positive	0	16	0	16	5	0	0	0	1	0	0	16	0	0	0
Maximum (µg/L)	--	7.25	--	3.96	0.0518	--	--	--	trace	--	--	11.31	--	--	--

Table 8 (cont). Concentrations of organophosphate pesticides in whole water samples collected in Monterey County.

Chualar Creek

Date Sampled	Concentration (µg/L)														
	Ethoprop	Diazinon	Disulfoton	Chlorpyrifos	Malathion	Methodathion	Fenamiphos	Azinphos-methyl	DDVP	Phorate	Fonofos	Dimethoate	Methyl Parathion	DEF	Profenofos
16-Jun	nd	0.16	nd	0.243	nd	nd	nd	nd	nd	nd	nd	trace	nd	nd	nd
23-Jun	nd	0.241	nd	0.179	nd	nd	nd	nd	nd	nd	nd	1.656	nd	nd	nd
30-Jun	nd	0.068	nd	0.114	nd	nd	nd	nd	nd	nd	nd	0.53	nd	nd	nd
7-Jul	nd	0.0681	nd	0.144	nd	nd	nd	nd	nd	nd	nd	5.27	nd	nd	nd
14-Jul	nd	0.726	nd	0.215	nd	nd	nd	nd	nd	nd	nd	0.232	nd	nd	nd
21-Jul	nd	0.13	nd	0.118	nd	nd	nd	nd	nd	nd	nd	1.14	nd	nd	nd
28-Jul	nd	0.15	nd	0.127	nd	nd	nd	nd	nd	nd	nd	0.0529	nd	nd	nd
4-Aug	nd	0.254	nd	0.188	nd	nd	nd	nd	nd	nd	nd	2.55	nd	nd	nd
11-Aug	nd	5.33	nd	0.097	trace	nd	nd	nd	nd	nd	nd	1.75	nd	nd	nd
19-Aug	nd	0.34	nd	0.684	trace	nd	nd	nd	nd	nd	nd	3.71	nd	nd	nd
25-Aug	nd	0.0605	nd	trace	nd	nd	nd	nd	nd	nd	nd	0.89	nd	nd	nd
2-Sep	nd	0.13	nd	trace	0.544	nd	nd	nd	nd	nd	nd	0.289	nd	nd	nd
8-Sep	nd	0.16	nd	trace	0.045	nd	nd	nd	nd	nd	nd	2.49	nd	nd	nd
15-Sep	nd	0.158	nd	0.0435	0.152	nd	nd	nd	nd	nd	nd	1.27	nd	nd	nd
22-Sep	nd	0.24	nd	trace	nd	nd	nd	nd	nd	nd	nd	0.579	nd	nd	nd
29-Sep	nd	0.128	nd	0.0394	nd	nd	nd	nd	nd	nd	nd	1.1	nd	nd	nd
# Positive	0	16	0	16	5	0	0	0	0	0	0	16	0	0	0
Maximum (µg/L)	--	5.33	--	0.684	0.544	--	--	--	--	--	--	5.27	--	--	--

Table 8 (cont). Concentrations of organophosphate pesticides in whole water samples collected in Monterey County.

Blanco Drain @ Cooper Rd

Date Sampled	Concentration (µg/L)														
	Ethoprop	Diazinon	Disulfoton	Chlorpyrifos	Malathion	Methidathion	Fenamiphos	Azinphos-methyl	DDVP	Phorate	Fonofos	Dimethoate	Methyl Parathion	DEF	Profenofos
17-Jun	nd	0.156	nd	0.044	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
23-Jun	nd	0.208	nd	nd	nd	nd	nd	nd	nd	nd	nd	trace	nd	nd	nd
30-Jun	nd	0.097	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
7-Jul	nd	0.0644	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
14-Jul	nd	0.0939	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
21-Jul	nd	0.073	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
28-Jul	nd	0.066	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
4-Aug	nd	0.471	nd	nd	trace	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
11-Aug	nd	0.0445	nd	nd	nd	nd	nd	nd	nd	nd	nd	trace	nd	nd	nd
18-Aug	nd	0.395	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
25-Aug	nd	0.0891	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
2-Sep	nd	0.114	nd	nd	nd	nd	nd	nd	nd	nd	nd	trace	nd	nd	nd
8-Sep	nd	0.4	nd	nd	nd	nd	nd	nd	nd	nd	nd	trace	nd	nd	nd
15-Sep	nd	0.684	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.075	nd	nd	nd
22-Sep	nd	0.221	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
29-Sep	nd	0.0606	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
# Positive	0	15	0	1	1	0	0	0	0	0	0	5	0	0	0
Maximum (µg/L)	--	0.684	--	0.044	trace	--	--	--	--	--	--	0.075	--	--	--

† nd = Non-detect

‡ trace = Concentration above the method detection limit but below reporting limit (Appendix 1).

Table 9. Concentration of pyrethroid insecticides in whole water samples collected in Monterey County.

Site	Date	Concentration (µg/L)					
		Bifenthrin	Lambda-cyhalothrin	Permethrin	Cyfluthrin	Cypermethrin	Esfenvalerate
Reclamation Ditch Alisal Creek	16-Jun	nd [†]	nd	nd	nd	nd	nd
	23-Jun	0.0165	trace	0.195	nd	nd	nd
	30-Jun	nd	nd	nd	nd	nd	nd
	7-Jul	trace [‡]	nd	nd	nd	nd	nd
	14-Jul	nd	nd	nd	nd	nd	nd
	21-Jul	nd	nd	nd	nd	nd	nd
	28-Jul	nd	nd	nd	nd	nd	nd
	4-Aug	nd	nd	nd	nd	nd	nd
	11-Aug	nd	nd	nd	nd	nd	nd
	18-Aug	nd	nd	nd	nd	nd	nd
	25-Aug	nd	nd	0.0859	nd	nd	nd
	2-Sep	nd	nd	nd	nd	nd	nd
	8-Sep	nd	nd	nd	nd	nd	nd
	15-Sep	nd	nd	nd	nd	nd	nd
	22-Sep	nd	nd	nd	nd	nd	nd
29-Sep	nd	nd	nd	nd	nd	trace	
Quail Creek	16-Jun	nd	nd	0.0712	nd	nd	nd
	23-Jun	nd	nd	0.135	nd	nd	nd
	30-Jun	nd	nd	0.0847	nd	nd	nd
	7-Jul	nd	nd	nd	nd	nd	nd
	14-Jul	nd	nd	trace	nd	nd	nd
	21-Jul	nd	nd	nd	nd	nd	nd
	28-Jul	nd	nd	nd	nd	nd	nd
	28-Jul	nd	nd	0.0872	nd	nd	nd
	4-Aug	nd	nd	nd	nd	nd	nd
	11-Aug	nd	nd	0.0972	nd	nd	nd
	18-Aug	nd	nd	162	nd	nd	nd
	25-Aug	nd	nd	nd	nd	nd	nd
	2-Sep	nd	nd	0.0961	nd	nd	nd
	8-Sep	nd	nd	nd	nd	nd	nd
	15-Sep	nd	nd	trace	nd	nd	nd
22-Sep	nd	nd	trace	nd	trace	nd	
29-Sep	nd	nd	trace	nd	nd	nd	

Table 9 (cont). Concentration of pyrethroid insecticides in whole water samples collected in Monterey County.

Site	Date	Concentration (µg/L)					
		Bifenthrin	Lambda-cyhalothrin	Permethrin	Cyfluthrin	Cypermethrin	Esfenvalerate
Chualar Creek	16-Jun	nd	nd	nd	nd	nd	nd
	23-Jun	nd	nd	nd	nd	nd	nd
	30-Jun	nd	nd	nd	nd	nd	nd
	7-Jul	nd	nd	nd	nd	nd	nd
	14-Jul	nd	nd	nd	nd	nd	nd
	21-Jul	nd	nd	nd	nd	nd	nd
	28-Jul	nd	nd	nd	nd	nd	nd
	4-Aug	nd	nd	nd	nd	nd	nd
	11-Aug	nd	nd	nd	nd	nd	nd
	18-Aug	nd	nd	nd	nd	nd	nd
	25-Aug	nd	nd	nd	nd	nd	nd
	2-Sep	nd	nd	nd	nd	nd	nd
	8-Sep	nd	nd	nd	nd	nd	nd
	15-Sep	nd	nd	nd	nd	nd	nd
	22-Sep	nd	nd	nd	nd	nd	nd
29-Sep	nd	nd	nd	nd	nd	nd	
Blanco Drain	17-Jun	nd	nd	nd	nd	nd	nd
	23-Jun	nd	nd	nd	nd	nd	nd
	30-Jun	nd	nd	nd	nd	nd	nd
	7-Jul	nd	nd	nd	nd	nd	nd
	14-Jul	nd	nd	nd	nd	nd	nd
	28-Jul	nd	nd	nd	nd	nd	nd
	4-Aug	nd	nd	nd	nd	nd	nd
	11-Aug	nd	nd	nd	nd	nd	nd
	18-Aug	nd	nd	nd	nd	nd	nd
	25-Aug	nd	nd	nd	nd	nd	nd
	2-Sep	nd	nd	nd	nd	nd	nd
	8-Sep	nd	nd	nd	nd	nd	nd
	15-Sep	nd	nd	nd	nd	nd	nd
	22-Sep	nd	nd	nd	nd	nd	nd
	29-Sep	nd	nd	nd	nd	nd	nd

† nd = Non-detect

‡ trace = concentration above the detection limit but below reporting limit.

Table 10. Concentration of pyrethroid insecticides in bed sediments from Monterey County.

Reclamation Ditch (Alisal Creek)	Date	Concentration ($\mu\text{g/g}$)					
		Bifenthrin	Lambda-cyhalothrin	Permethrin	Cyfluthrin	Cypermethrin	Esfenvalerate
	16-Jun	nd [†]	nd	0.0256	nd	nd	nd
	23-Jun	nd	nd	0.0332	nd	nd	nd
	30-Jun	nd	nd	0.0106	nd	nd	nd
	7-Jul	nd	nd	0.0228	nd	nd	nd
	14-Jul	nd	nd	nd	nd	nd	nd
	21-Jul	nd	nd	0.0363	nd	nd	nd
	28-Jul	nd	nd	0.0208	nd	nd	nd
	4-Aug	nd	nd	0.0263	nd	nd	nd
	11-Aug	nd	nd	0.013	nd	nd	nd
	18-Aug	nd	nd	0.023	nd	nd	nd
	25-Aug	nd	nd	trace [‡]	nd	nd	nd
	2-Sep	nd	nd	0.0203	nd	nd	nd
	8-Sep	nd	nd	0.0204	nd	nd	nd
	15-Sep	nd	nd	0.0184	nd	nd	nd
	22-Sep	nd	nd	0.0176	nd	nd	nd
	29-Sep	nd	nd	0.022	nd	nd	nd
Quail Creek	16-Jun	nd	nd	0.037	nd	nd	nd
	23-Jun	nd	nd	0.119	nd	0.0164	nd
	30-Jun	nd	nd	0.0186	nd	0.0127	nd
	7-Jul	nd	nd	0.0159	nd	nd	nd
	14-Jul	nd	nd	nd	nd	nd	nd
	21-Jul	nd	nd	0.0194	nd	nd	nd
	28-Jul	nd	nd	0.0206	nd	nd	nd
	4-Aug	nd	nd	trace	nd	nd	nd
	11-Aug	nd	nd	0.0297	nd	nd	nd
	18-Aug	nd	nd	0.0419	nd	nd	nd
	25-Aug	nd	nd	0.0262	nd	0.0185	nd
	2-Sep	nd	nd	0.0524	nd	0.0197	nd
	8-Sep	nd	nd	0.0225	nd	0.0199	nd
	15-Sep	nd	nd	0.0284	nd	0.0141	nd
	22-Sep	nd	nd	0.0193	nd	nd	nd
29-Sep	nd	nd	0.014	nd	nd	nd	

Table 10 (cont). Concentration of pyrethroid insecticides in bed sediments from Monterey County.

Chualar Creek	Date	Concentration ($\mu\text{g/g}$)					
		Bifenthrin	Lambda cyhalothrin	Permethrin	Cyfluthrin	Cypermethrin	Esfenvalerate
	16-Jun	nd	nd	nd	nd	nd	nd
	23-Jun	nd	nd	nd	nd	nd	nd
	30-Jun	nd	nd	nd	nd	nd	nd
	7-Jul	nd	nd	nd	nd	nd	nd
	14-Jul	nd	nd	trace	nd	nd	nd
	21-Jul	nd	nd	nd	nd	nd	nd
	28-Jul	nd	nd	nd	nd	nd	nd
	4-Aug	nd	nd	nd	nd	nd	nd
	11-Aug	nd	nd	nd	nd	nd	nd
	18-Aug	nd	nd	nd	nd	nd	nd
	25-Aug	nd	nd	nd	nd	nd	nd
	2-Sep	nd	nd	trace	nd	nd	nd
	8-Sep	nd	nd	nd	nd	nd	nd
	15-Sep	nd	nd	nd	nd	nd	nd
	22-Sep	nd	nd	nd	nd	nd	nd
	29-Sep	nd	nd	trace	nd	nd	nd
Blanco Drain	17-Jun	nd	nd	nd	nd	nd	nd
	23-Jun	nd	nd	0.0103	nd	nd	nd
	30-Jun	nd	nd	trace	nd	nd	nd
	7-Jul	nd	nd	nd	nd	nd	nd
	14-Jul	nd	nd	nd	nd	nd	nd
	21-Jul	nd	nd	trace	nd	nd	nd
	28-Jul	nd	nd	nd	nd	nd	nd
	4-Aug	nd	nd	nd	nd	nd	nd
	11-Aug	nd	nd	nd	nd	nd	nd
	18-Aug	nd	nd	nd	nd	nd	nd
	25-Aug	nd	nd	nd	nd	nd	nd
	2-Sep	nd	nd	nd	nd	nd	nd
	8-Sep	nd	nd	nd	nd	nd	nd
	15-Sep	nd	nd	nd	nd	nd	nd
	22-Sep	nd	nd	nd	nd	nd	nd
29-Sep	nd	nd	nd	nd	nd	nd	

† nd = Non-detect

‡ trace = Concentration above the detection limit but below reporting limit (Appendix 1).

Stanislaus County

Data for OPs detected in water samples are presented in Table 11. Data includes the concentration for each OP, the number of detections for each OP, and the maximum concentration detected of each OP over the course of the study.

Data for pyrethroids detected in water samples is presented in Table 12. Data for pyrethroid insecticides detected in sediment samples is presented in Table 13.

Westport Drain (Taylor Road/Jennings Road)

Two OPs were detected in waters collected from Westport Drain. Chlorpyrifos was detected in four samples, and methyl parathion in two samples. Maximum concentrations were chlorpyrifos 0.54 µg/L; dimethoate, 0.0504 µg/L.

Esfenvalerate was detected in a single water sample at a concentration of 0.0566 µg/L.

Permethrin was detected in one sediment sample at a concentration of 0.0319 µg/g.

Pomelo Ag Drain

Four OP insecticides were detected in waters collected from Pomelo Ag Drain over the course of the study. Dimethoate was detected in 15 samples, and chlorpyrifos, malathion, and ethoprop were detected in single samples. Maximum concentrations were dimethoate, 7.73 µg/L; chlorpyrifos, trace; malathion, 0.0741 µg/L; and ethoprop, trace.

Two pyrethroids were detected in water samples collected from the Pomelo Ag Drain over the course of the study. Bifenthrin was detected in two samples, and esfenvalerate was detected in one sample. Maximum concentrations were bifenthrin, 0.0195 µg/L; and esfenvalerate, 0.142 µg/L.

Two pyrethroid insecticides were detected in sediment samples. Esfenvalerate was detected in three samples, and permethrin was detected in one sample. The maximum concentration of esfenvalerate was 0.0174 µg/g and permethrin in trace amounts.

Table 11. Concentrations of organophosphate pesticides in whole water samples collected in Stanislaus County.

Westport Drain (Jennings at Taylor)

Date Sampled	Concentration (µg/L)														
	Ethoprop	Diazinon	Disulfoton	Chlorpyrifos	Malathion	Methidathion	Fenamiphos	Azinphos-methyl	DDVP	Phorate	Fonofos	Dimethoate	Methyl Parathion	DEF	Profenofos
10-Jun	nd [†]	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
17-Jun	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
23-Jun	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.0504	nd	nd	nd
1-Jul	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
8-Jul	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	trace	nd	nd	nd
15-Jul	nd	nd	nd	trace [‡]	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
22-Jul	nd	nd	nd	0.453	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
29-Jul	nd	nd	nd	0.058	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
4-Aug	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
12-Aug	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
19-Aug	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
26-Aug	nd	nd	nd	trace	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
2-Sep	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
9-Sep	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
16-Sep	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
22-Sep	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
30-Sep	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
# Positive	0	0	0	4	0	0	0	0	0	0	0	2	0	0	0
Maximum (µg/L)	--	--	--	0.453	--	--	--	--	--	--	--	0.0504	--	--	--

Table 11 (cont). Concentrations of organophosphate pesticides in whole water samples collected in Stanislaus County.

Pomelo Ag Drain

Date Sampled	Concentration (µg/L)														
	Ethoprop	Diazinon	Disulfoton	Chlorpyrifos	Malathion	Methidathion	Fenamiphos	Azinphos-methyl	DDVP	Phorate	Fonofos	Dimethoate	Methyl Parathion	DEF	Profenofos
10-Jun	trace	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
17-Jun	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	trace	nd	nd	nd
23-Jun	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	trace	nd	nd	nd
1-Jul	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.0428	nd	nd	nd
8-Jul	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	trace	nd	nd	nd
15-Jul	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.0447	nd	nd	nd
22-Jul	nd	nd	nd	trace	nd	nd	nd	nd	nd	nd	nd	0.108	nd	nd	nd
29-Jul	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	6.62	nd	nd	nd
4-Aug	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.189	nd	nd	nd
12-Aug	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.346	nd	nd	nd
19-Aug	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.0622	nd	nd	nd
26-Aug	nd	nd	nd	nd	0.0741	nd	nd	nd	nd	nd	nd	1.7	nd	nd	nd
2-Sep	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	trace	nd	nd	nd
9-Sep	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	5.72	nd	nd	nd
16-Sep	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	7.73	nd	nd	nd
22-Sep	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.0837	nd	nd	nd
30-Sep	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
# Positive	1	0	0	1	1	0	0	0	0	0	0	15	0	0	0
Maximum (µg/L)	trace	--	--	trace	0.0741	--	--	--	--	--	--	7.73	--	--	--

Table 11 (cont). Concentrations of organophosphate pesticides in whole water samples collected in Stanislaus County.

Orestimba Creek

Date Sampled	Concentration (µg/L)														
	Ethoprop	Diazinon	Disulfoton	Chlorpyrifos	Malathion	Methidathion	Fenamiphos	Azinphos-methyl	DDVP	Phorate	Fonofos	Dimethoate	Methyl Parathion	DEF	Profenofos
10-Jun	0.134	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
17-Jun	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	trace	nd	nd	nd
23-Jun	0.0753	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.157	nd	nd	nd
1-Jul	0.0689	nd	nd	trace	nd	nd	nd	nd	nd	nd	nd	0.106	0.0912	nd	nd
8-Jul	0.0742	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.1827	trace	nd	nd
15-Jul	nd	nd	nd	trace	nd	nd	nd	nd	nd	nd	nd	1.2	trace	nd	nd
22-Jul	0.112	0.055	nd	trace	nd	nd	nd	nd	nd	nd	nd	1.05	trace	nd	nd
29-Jul	trace	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.0849	nd	nd	nd
4-Aug	nd	trace	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.533	trace	nd	nd
12-Aug	nd	trace	nd	0.042	nd	nd	nd	nd	nd	nd	nd	1.24	nd	nd	nd
19-Aug	nd	nd	nd	2.42	nd	nd	nd	nd	nd	nd	nd	0.344	nd	nd	nd
26-Aug	nd	nd	nd	trace	nd	nd	nd	nd	nd	nd	nd	1.57	nd	nd	nd
2-Sep	nd	nd	nd	trace	nd	nd	nd	nd	nd	nd	nd	trace	nd	nd	nd
9-Sep	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.345	nd	nd	nd
16-Sep	nd	nd	trace	nd	nd	nd	nd	nd	nd	nd	nd	0.09	nd	nd	nd
22-Sep	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.069	nd	nd	nd
30-Sep	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	1.07	nd	nd	nd
# Positive	6	3	1	7	0	0	0	0	0	0	0	16	5	0	0
Maximum (µg/L)	0.134	0.055	trace	2.42	--	--	--	--	--	--	--	1.24	0.912	--	--

Table 11 (cont). Concentrations of organophosphate pesticides in whole water samples collected in Stanislaus County.

Del Puerto Creek

Date Sampled	Concentration (µg/L)														
	Ethoprop	Diazinon	Disulfoton	Chlorpyrifos	Malathion	Methidathion	Fenamiphos	Azinphos-methyl	DDVP	Phorate	Fonofos	Dimethoate	Methyl Parathion	DEF	Profenofos
10-Jun	trace	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
17-Jun	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
23-Jun	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	trace	nd	nd	nd
1-Jul	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.454	nd	nd	nd
8-Jul	trace	0.0639	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.174	trace	nd	nd
15-Jul	nd	trace	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.193	nd	nd	nd
22-Jul	nd	nd	nd	nd	nd	nd	nd	0.826	nd	nd	nd	2.36	nd	nd	nd
29-Jul	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	trace	nd	nd	nd
4-Aug	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.154	nd	nd	nd
12-Aug	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.057	nd	nd	nd
19-Aug	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	5.46	nd	nd	nd
26-Aug	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.0436	nd	nd	nd
2-Sep	nd	nd	nd	trace	nd	nd	nd	nd	0.242	nd	nd	0.1	nd	nd	nd
9-Sep	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.171	nd	nd	nd
16-Sep	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.362	nd	nd	nd
22-Sep	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.507	nd	nd	nd
30-Sep	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
# Positive	2	2	0	1	0	0	0	1	1	0	0	14	1	0	0
Maximum (µg/L)	trace	0.0639	--	trace	--	--	--	0.826	0.242	--	--	5.46	trace	--	--

† nd = Non-detect

‡ trace = Concentration above the method detection limit but below reporting limit (Appendix 1).

Table 12. Concentration of pyrethroid insecticides in whole water samples collected in Stanislaus County.

Site	Date	Concentration (µg/L)					
		Bifenthrin	Lambda-cyhalothrin	Permethrin	Cyfluthrin	Cypermethrin	Esfenvalerate
Westport Drain Taylor at Jennings	10-Jun	nd [†]	nd	nd	nd	nd	nd
	17-Jun	nd	nd	nd	nd	nd	nd
	23-Jun	nd	nd	nd	nd	nd	nd
	1-Jul	nd	nd	nd	nd	nd	nd
	8-Jul	nd	nd	nd	nd	nd	nd
	15-Jul	nd	nd	nd	nd	nd	nd
	22-Jul	nd	nd	nd	nd	nd	0.0566
	29-Jul	nd	nd	nd	nd	nd	nd
	4-Aug	nd	nd	nd	nd	nd	nd
	12-Aug	nd	nd	nd	nd	nd	nd
	19-Aug	nd	nd	nd	nd	nd	nd
	26-Aug	nd	nd	nd	nd	nd	nd
	2-Sep	nd	nd	nd	nd	nd	nd
	9-Sep	nd	nd	nd	nd	nd	nd
	16-Sep	nd	nd	nd	nd	nd	nd
22-Sep	nd	nd	nd	nd	nd	nd	
30-Sep	nd	nd	nd	nd	nd	nd	
Pomelo Ag Drain	10-Jun	nd	nd	nd	nd	nd	nd
	17-Jun	nd	nd	nd	nd	nd	nd
	23-Jun	nd	nd	nd	nd	nd	nd
	1-Jul	nd	nd	nd	nd	nd	nd
	8-Jul	nd	nd	nd	nd	nd	nd
	15-Jul	nd	nd	nd	nd	nd	nd
	22-Jul	nd	nd	nd	nd	nd	nd
	29-Jul	nd	nd	nd	nd	nd	0.142
	4-Aug	nd	nd	nd	nd	nd	nd
	12-Aug	nd	nd	nd	nd	nd	nd
	19-Aug	nd	nd	nd	nd	nd	nd
	26-Aug	nd	nd	nd	nd	nd	nd
	2-Sep	nd	nd	nd	nd	nd	nd
	9-Sep	19.5	nd	nd	nd	nd	nd
	16-Sep	19.5	nd	nd	nd	nd	nd
22-Sep	nd	nd	nd	nd	nd	nd	
30-Sep	nd	nd	nd	nd	nd	nd	

Table 12 (cont). Concentration of pyrethroid Insecticides in whole water samples collected in Stanislaus County.

Site	Date	Concentration (µg/L)					
		Bifenthrin	Lambda-cyhalothrin	Permethrin	Cyfluthrin	Cypermethrin	Esfenvalerate
Orestimba Creek	10-Jun	nd	nd	nd	nd	nd	nd
	17-Jun	nd	nd	nd	nd	nd	nd
	23-Jun	nd	nd	nd	nd	nd	nd
	1-Jul	nd	nd	nd	nd	nd	nd
	8-Jul	nd	nd	nd	nd	nd	nd
	15-Jul	nd	nd	nd	nd	nd	nd
	22-Jul	nd	nd	nd	nd	nd	nd
	29-Jul	nd	nd	nd	nd	nd	nd
	4-Aug	nd	nd	nd	nd	nd	nd
	12-Aug	trace [‡]	nd	nd	nd	nd	nd
	19-Aug	nd	nd	nd	nd	nd	nd
	26-Aug	nd	nd	nd	nd	nd	nd
	2-Sep	trace	nd	nd	nd	nd	nd
	9-Sep	nd	nd	nd	nd	nd	nd
	16-Sep	nd	nd	nd	nd	nd	nd
	22-Sep	nd	nd	nd	nd	nd	nd
30-Sep	nd	nd	nd	nd	nd	nd	
Del Puerto Creek	10-Jun	nd	nd	nd	nd	nd	nd
	17-Jun	nd	nd	nd	nd	nd	nd
	23-Jun	nd	nd	nd	nd	nd	nd
	1-Jul	nd	nd	nd	nd	nd	trace
	8-Jul	nd	nd	nd	nd	nd	nd
	15-Jul	nd	nd	trace	nd	nd	nd
	22-Jul	0.0554	nd	nd	nd	nd	nd
	29-Jul	0.00721	nd	nd	nd	nd	nd
	4-Aug	trace	nd	nd	nd	nd	nd
	12-Aug	0.0169	nd	nd	nd	nd	nd
	19-Aug	0.00901	nd	nd	nd	nd	0.166
	26-Aug	0.00504	nd	nd	nd	nd	nd
	2-Sep	trace	nd	nd	nd	nd	nd
	9-Sep	trace	nd	nd	nd	nd	nd
	16-Sep	0.00619	nd	nd	nd	nd	nd
	22-Sep	0.0061	nd	nd	nd	nd	nd
30-Sep	0.0162	nd	nd	nd	nd	nd	

[†] nd = Non-detect

[‡] trace = concentration above the detection limit but below reporting limit.

Table 13. Concentration of pyrethroid Insecticides in bed sediments from Stanislaus County.

Westport Drain (Jennings at Taylor)	Date	Concentration (µg/g)					
	Date	Bifenthrin	Lambda cyhalothrin	Permethrin	Cyfluthrin	Cypermethrin	Esfenvalerate
	10-Jun	nd [†]	nd	nd	nd	nd	nd
	17-Jun	nd	nd	nd	nd	nd	nd
	23-Jun	nd	nd	0.0319	nd	nd	nd
	1-Jul	nd	nd	nd	nd	nd	nd
	8-Jul	nd	nd	nd	nd	nd	nd
	15-Jul	nd	nd	nd	nd	nd	nd
	22-Jul	nd	nd	nd	nd	nd	nd
	29-Jul	nd	nd	nd	nd	nd	nd
	4-Aug	nd	nd	nd	nd	nd	nd
	12-Aug	nd	nd	nd	nd	nd	nd
	19-Aug	nd	nd	nd	nd	nd	nd
	26-Aug	nd	nd	nd	nd	nd	nd
	2-Sep	nd	nd	nd	nd	nd	nd
	9-Sep	nd	nd	nd	nd	nd	nd
	16-Sep	nd	nd	nd	nd	nd	nd
	22-Sep	nd	nd	nd	nd	nd	nd
	30-Sep	nd	nd	nd	nd	nd	nd
Pomelo (Ag Drain)	10-Jun	nd	nd	nd	nd	nd	nd
	17-Jun	nd	nd	nd	nd	nd	nd
	23-Jun	nd	nd	nd	nd	nd	nd
	1-Jul	nd	nd	nd	nd	nd	nd
	8-Jul	nd	nd	nd	nd	nd	nd
	15-Jul	nd	nd	nd	nd	nd	nd
	22-Jul	nd	nd	nd	nd	nd	nd
	29-Jul	nd	nd	nd	nd	nd	nd
	4-Aug	nd	nd	nd	nd	nd	nd
	12-Aug	nd	nd	nd	nd	nd	nd
	19-Aug	nd	nd	nd	nd	nd	nd
	26-Aug	nd	nd	trace [‡]	nd	nd	0.0126
	2-Sep	nd	nd	nd	nd	nd	nd
	9-Sep	nd	nd	nd	nd	nd	0.0174
	16-Sep	nd	nd	nd	nd	nd	nd
22-Sep	nd	nd	nd	nd	nd	nd	
30-Sep	nd	nd	nd	nd	nd	trace	

Table 13 (cont). Concentration of pyrethroid Insecticides in bed sediments from Stanislaus County.

Orestimba Creek	Date	Concentration (µg/g)					
		Bifenthrin	Lambda cyhalothrin	Permethrin	Cyfluthrin	Cypermethrin	Esfenvalerate
	10-Jun	nd	nd	nd	nd	nd	nd
	17-Jun	nd	nd	nd	nd	nd	nd
	23-Jun	nd	nd	nd	nd	nd	nd
	1-Jul	nd	nd	nd	nd	nd	nd
	8-Jul	nd	nd	nd	nd	nd	nd
	15-Jul	nd	nd	nd	nd	nd	nd
	22-Jul	nd	nd	nd	nd	nd	trace
	29-Jul	nd	nd	nd	nd	nd	trace
	4-Aug	nd	nd	nd	nd	nd	0.0232
	12-Aug	nd	nd	nd	nd	nd	0.0201
	19-Aug	nd	nd	nd	nd	nd	0.0117
	26-Aug	nd	nd	nd	nd	nd	0.0126
	2-Sep	nd	nd	nd	nd	nd	nd
	9-Sep	nd	nd	nd	nd	nd	0.0122
	16-Sep	nd	nd	nd	nd	nd	trace
	22-Sep	nd	nd	nd	nd	nd	nd
	30-Sep	nd	nd	nd	nd	nd	nd
Del Puerto Creek	10-Jun	nd	nd	nd	nd	nd	nd
	17-Jun	nd	nd	0.0139	nd	nd	nd
	23-Jun	nd	nd	trace	nd	nd	nd
	1-Jul	nd	nd	nd	nd	nd	nd
	8-Jul	nd	nd	nd	nd	nd	0.0115
	15-Jul	nd	nd	nd	nd	nd	trace
	22-Jul	nd	nd	nd	nd	nd	trace
	29-Jul	nd	nd	nd	nd	nd	nd
	4-Aug	nd	nd	nd	nd	nd	trace
	12-Aug	nd	nd	nd	nd	nd	nd
	19-Aug	nd	nd	nd	nd	nd	0.0113
	26-Aug	nd	nd	nd	nd	nd	nd
	2-Sep	nd	nd	nd	nd	nd	nd
	9-Sep	nd	nd	nd	nd	nd	trace
	16-Sep	nd	nd	0.0113	nd	nd	nd
22-Sep	nd	nd	nd	nd	nd	nd	
30-Sep	nd	nd	nd	nd	nd	nd	

† nd = Non-detect

‡ trace = Concentration above the detection limit but below reporting limit (Appendix 1).

Orestimba Creek

Six OPs were detected in waters. Dimethoate was detected in 16 samples, chlorpyrifos in seven samples, ethoprop in six samples, methyl parathion in five samples, diazinon in three samples, and disulfoton in one sample. Maximum concentrations were dimethoate, 7.73 µg/L; chlorpyrifos, 2.42 µg/L; ethoprop, 0.134 µg/L; methyl parathion, 0.912 µg/L; diazinon, 0.55 µg/L; and disulfoton, trace.

Bifenthrin was detected at trace amounts in two samples.

Esfenvalerate was the only pyrethroid detected in sediment samples. Esfenvalerate was detected in eight samples, at a maximum concentration of 0.0232 µg/g.

Del Puerto Creek

Seven OPs were detected in waters collected from Del Puerto Creek. Dimethoate was detected in 14 samples, and diazinon in two samples. Ethoprop, chlorpyrifos, azinphos-methyl, and DDVP were each detected in single samples. Maximum concentrations were dimethoate, 5.46 µg/L; diazinon, 0.0639 µg/L; ethoprop, trace; chlorpyrifos, trace; azinphos-methyl, 0.826 µg/L; malathion, trace; and DDVP 0.242 µg/L.

Three pyrethroids were detected in water samples. Bifenthrin was detected in 11 samples, esfenvalerate was detected in two samples, and permethrin was detected in one sample. Maximum concentrations were bifenthrin, 0.0554 µg/L; esfenvalerate, 0.166 µg/L; and permethrin, trace.

Two pyrethroids were detected in sediment samples. Esfenvalerate was detected in six samples, and permethrin was detected in three samples. Maximum concentrations were esfenvalerate, 0.0115 µg/g and permethrin, 0.0139 µg/g.

Quality Control

There were no detections of any pesticides in any of the field blank samples.

Suspended Sediment

Monterey County Sites

Suspended sediment concentrations in water samples collected concurrently with samples analyzed for pyrethroids varied considerably over the course of the study; data are shown in Table 14. Waters collected from Blanco Drain and Chualar Creek generally contained less suspended sediment than waters collected at Alisal Creek. All three sites generally had less suspended sediments than Quail Creek.

Suspended sediment concentrations at Alisal Creek/Reclamation Ditch ranged from 0.007 g/L to 1.751 g/L, averaging 0.13 g/L. Of the 16 samples collected, 15 contained less than 0.061 g/L, with the remaining sample containing a high sediment level of 1.751 g/L.

Suspended sediments were consistently greater at Quail Creek than at any other site. Suspended sediment concentrations at Quail Creek ranged from 0.07 g/L to 2.914 g/L. Average suspended sediment was 0.504 g/L.

At Chualar Creek, suspended sediment concentrations ranged from 0.002 g/L to 0.278 g/L. Average suspended sediment concentration was 0.057 g/L.

At Blanco Drain, suspended sediment concentrations ranged from 0.000 g/L to 0.177 g/L. Average suspended sediment concentration was 0.033g/L.

Stanislaus County Sites

Suspended sediment concentrations in water samples collected concurrently with samples analyzed for pyrethroids varied considerable over the course of the study (Table 15). Waters collected from Westport Drain and Pomelo generally contained less suspended sediment than waters collected at Del Puerto Creek. All three sites generally had less suspended sediments than Orestimba Creek.

Suspended sediment concentrations at Westport Drain ranged from 0.000 g/L to 0.12 g/L, averaging 0.005 g/L.

Suspended sediment concentrations at Pomelo Agricultural Ditch ranged from 0.000 g/L to 0.167 g/L. Average suspended sediment was 0.087g/L.

Suspended sediments were consistently greater at Orestimba Creek than at any other site. Suspended sediment concentrations ranged from 0.071 g/L to 0.712 g/L. Average suspended sediment concentration was 0.327 g/L.

At Del Puerto Creek, suspended sediment concentrations ranged from -0.024 g/L to 0.577 g/L. Average suspended sediment concentration was 0.126 g/L.

Discussion

Commonly used OP and pyrethroid insecticides were detected in water samples collected over the course of this study. Pyrethroid insecticides were also detected in sediment samples collected from the streambeds where water samples were collected. An in-depth analysis is beyond the scope of this memorandum, as information regarding pesticide use in and around the sample sites at the time of sampling is not yet available. When this information becomes available, a full report will be issued.

Table 14. Suspended sediment in whole water samples collected in Monterey County from June through September 2003. .

Date	Alisal Creek (Reclamation Ditch)	Quail Creek	Chualar Creek	Blanco Drain
	grams/liter			
16-Jun	0.026	0.321	0.146	0.266 [†]
23-Jun	1.751	0.778	0.210	0.023 [‡]
30-Jun	0.037	0.070	0.064	0.008
7-Jul	0.027	0.111	0.278	0.000
14-Jul	0.041	0.247	0.030	0.001
21-Jul	0.010	0.100	0.002	0.000
28-Jul	0.011	0.102	0.004	0.000
4-Aug	0.009	0.070	0.006	0.001
11-Aug	0.007	2.914	0.008	0.006
18-Aug	0.016	0.338	0.007	0.005
25-Aug	0.016	0.433	0.022	0.009
2-Sep	0.015	2.085	0.016	0.177
8-Sep	0.014	0.099	0.019	0.023
15-Sep	0.007	0.152	0.039	0.013
22-Sep	0.061	0.164	0.029	0.005
29-Sep	0.028	0.087	0.028	0.004
Average	0.130	0.504	0.057	0.033
Range	0.007 – 1.751	0.070 – 2.914	0.002 – 0.278	0.000 – 0.177

[†] Sample collected from agricultural ditch feeding into Blanco Drain.

[‡] Sample collected 100 yards downstream from where the remaining samples were collected.

Table 15. Suspended sediment in whole water samples collected in Stanislaus County from June through September 2003.

Date	Westport Drain Taylor @ Jennings	Pomelo Ag Ditch	Orestimba Creek	Del Puerto Creek
	grams/liter			
9-Jun	0.000	0.000	0.220	0.022
16-Jun	0.000	0.027	0.276	0.089
23-Jun	0.011	0.137	0.197	0.049
30-Jun	0.010	0.098	0.498	0.148
7-Jul	0.002	0.136	0.712	0.442
14-Jul	0.012	0.050	0.247	0.061
21-Jul	0.003	0.143	0.658	0.144
28-Jul	0.006	0.184	0.370	0.036
4-Aug	0.006	0.041	0.221	0.146
11-Aug	0.010	0.078	0.202	0.053
18-Aug	0.003	0.098	0.188	0.024
25-Aug	0.003	0.110	0.113	0.577
2-Sep	0.006	0.049	0.713	0.083
8-Sep	0.004	0.079	0.080	0.085
15-Sep	0.001	0.049	0.216	0.040
22-Sep	0.006	0.167	0.577	0.104
29-Sep	0.003	0.041	0.071	0.041
Average	0.005	0.087	0.327	0.126
Range	0.000– 0.012	0.000 – 0.167	0.071 – 0.712	0.024 – 0.577

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Appendix 1

California Department Of Food And Agriculture, Center For Analytical Chemistry Synthetic Pyrethroid, Organophosphate, Analytical Screens.

Organophosphate Pesticides in Surface Water. Method – GC/FPD

<u>Compound</u>	<u>Minimum Detection Limit (µg/L)</u>	<u>Reporting Limit (µg/L)</u>
Azinphos methyl	0.0099	0.05
Chlorpyrifos	0.0109	0.04
Diazinon	0.011	0.04
DDVP (dichlorvos)	0.0098	0.05
Dimethoate	0.0079	0.04
Disulfoton	0.0093	0.04
Ethoprop	0.0098	0.05
Fenamiphos	0.0125	0.05
Fonofos	0.008	0.04
Malathion	0.0117	0.04
Methidathion	0.0111	0.05
Methyl Parathion	0.008	0.03
Thimet (Phorate)	0.0083	0.05
Profenofos	0.0114	0.05
Tribufos	0.0142	0.05

Pyrethroid Pesticides in Surface Water. Method – GC/EC

<u>Compound</u>	<u>Minimum Detection Limit(µg/L)</u>	<u>Reporting Limit (µg/L)</u>
Bifenthrin	0.00216	0.005
Cyfluthrin	0.0555	0.08
Cypermethrin	0.0566	0.08
Esfenvalerate	0.0225	0.05
Lambda-Cyhalothrin	0.00776	0.02
Permethrin	0.0169	0.05

Pyrethroid Pesticides in Sediment. Method – GC/EC

<u>Compound</u>	<u>Minimum Detection Limit (µg/g)</u>	<u>Reporting Limit (µg/g)</u>
Bifenthrin	0.007	0.01
Cyfluthrin	0.008	0.01
Cypermethrin	0.008	0.01
Esfenvalerate	0.008	0.01
Lambda-Cyhalothrin	0.009	0.01
Permethrin	0.006	0.01