# APPENDIX I

# HIGH PRIORITY SITE SUBWATERSHED ANALYSIS

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# INTRODUCTION

It is important for the Coalition to assess management of water quality at two levels: at the Coalition's regional level and an individual subwatershed level. Therefore, the SJCDWQC Management Plan is divided into two parts, an overall Management Plan approach with a regional analysis and individual Site Subwatershed Management Plans for high priority sites. Individual Site Subwatershed Management Plans include:

- discussions of specific water quality impairments for each site subwatershed including all exceedances of WQTLs,
- analysis of sourcing techniques,
- recommendations of management practices to improve water quality, and
- specific schedules for outreach and evaluation of management practice effectiveness.

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

The 2015 SQMP details the Coalition's new Management Plan Strategy. Once approved, the Coalition will update all of its reports according to the new strategy.

# HIGH PRIORITY SITE SUBWATERSHEDS (2008–2010)

# I. DUCK CREEK @ HWY 4

## Overview

Duck Creek @ Hwy 4 is one of the Coalition's first priority site subwatersheds. The Coalition completed the focused outreach portion of its management plan strategy in 2012 (including additional outreach) and monitoring results from 2009 through September 2014 indicate water quality improved within the site subwatershed. The Coalition received approval to remove diazinon, pH, and water column toxicity to *S. capricornutum* from the active management plan on March 22, 2012 (Table I-1). The remaining constituents in the Duck Creek @ Hwy 4 site subwatershed management plan include chlorpyrifos, DO, *E. coli,* water column toxicity to *C. dubia*, and sediment toxicity to *H. azteca* (Table I-1).

The Coalition initially planned to conduct focused outreach from 2008 through 2010. Due to continued exceedances of the WQTL for chlorpyrifos and associated toxicity to *C. dubia*, the Coalition conducted additional focused outreach to growers in 2010 and 2012. No exceedances of the WQTL for chlorpyrifos and toxicity to *C. dubia* have occurred since 2011, which suggests that additional outreach activities were successful in improving water quality within the site subwatershed.

In 2014, the Coalition conducted MPM for chlorpyrifos, water column toxicity to *C. dubia*, and sediment toxicity to *H. azteca*; there were no exceedances or toxicity. Exceedances of the WQTL for DO occurred in 2014; however, the frequency of exceedances decreased from 2013. *E. coli* is a priority E constituent and therefore was not included in MPM in 2014.

In 2015, Duck Creek @ Hwy 4 is classified as a Represented site and MPM will continue for chlorpyrifos, water column toxicity to *C. dubia,* and sediment toxicity to *H. azteca*. Field parameters, including DO and pH will be measured during all MPM events.

**Table I-1. Duck Creek @ Hwy 4 management plan constituents.**
Management plan initiation year refers to when the site and constituent are addressed in the SJCDWQC MPURs and in the Management Plan Progress Report sections of the Annual Reports.

| PRIORITY | CONSTITUENT | MANAGEMENT PLAN INITIATION YEAR | MANAGEMENT PLAN REMOVAL YEAR |
|---|---|---|---|
| A/B | Chlorpyrifos | 2007 | Active |
| D | *C. dubia* water column toxicity | 2009 | Active |
| D | *H. azteca* sediment toxicity | 2013 | Active |
| E | Dissolved Oxygen | 2007 | Active |
| E | *E. coli* | 2007 | Active |
| **CONSTITUENT (REMOVED)** | | | |
| A/B | Diazinon | 2008 | 2012 |
| E | pH | 2008 | 2012 |
| E | *S. capricornutum* water column toxicity | 2009 | 2012 |

## Description of Site Subwatershed

Duck Creek @ Hwy 4 is a rotating Assessment Monitoring location within Zone 2 under the 2008 MRPP. The site subwatershed consists of 12,958 irrigated acres which include grains, hay, and field crops (Figure I-1). There are also large areas of deciduous nuts, truck farm/nursery, berries, irrigated pasture, and vineyards. This site is located just to the east of the city of Stockton and drains a section of southern San Joaquin County between Stockton and the Lone Tree Creek site subwatershed. The site subwatershed includes an upstream location, Duck Creek @ Drais Rd (Table I-2).

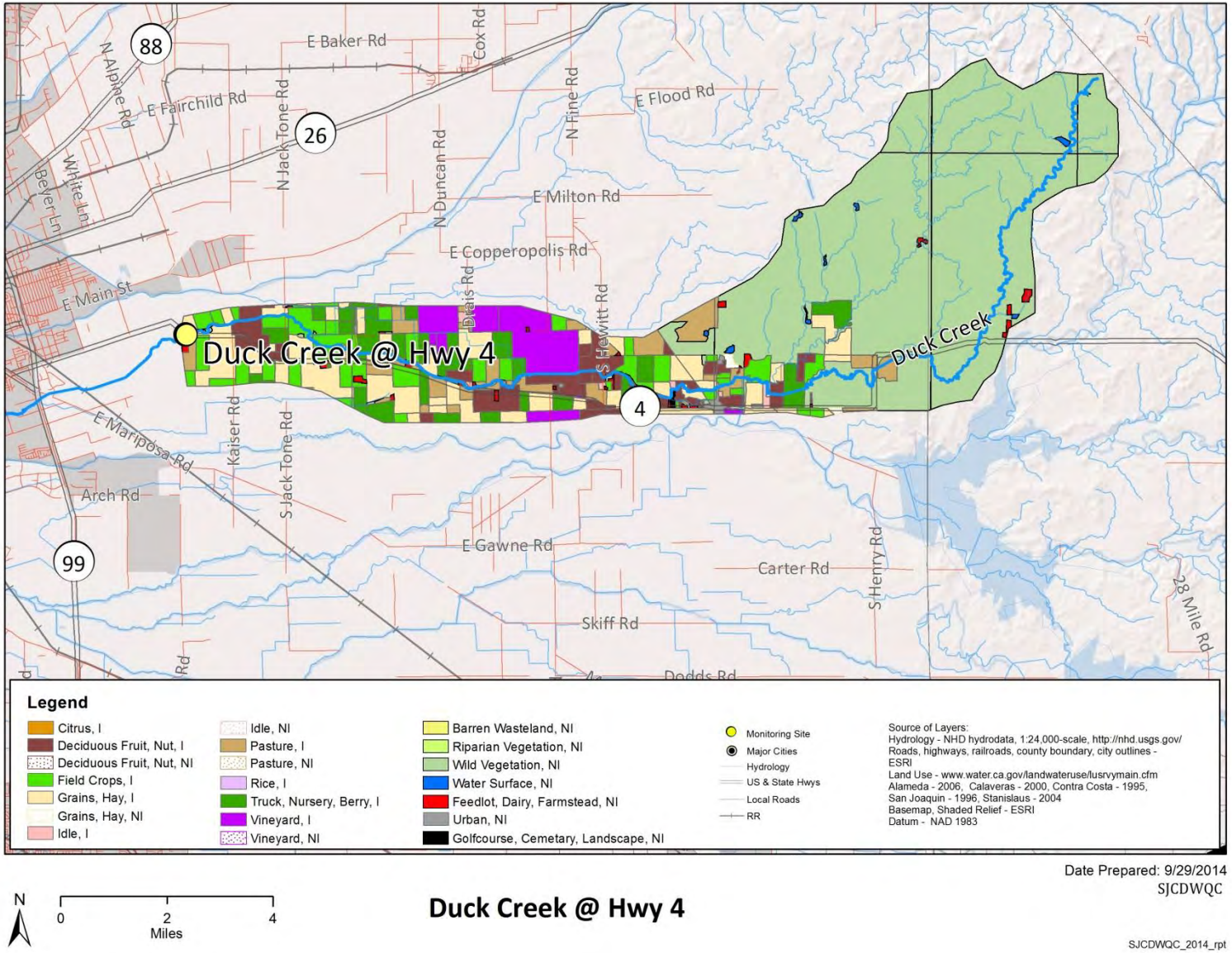
Duck Creek (San Joaquin County) is listed on California's 303(d) List of Impaired Waterbodies for chlorpyrifos, *E. coli,* and mercury (last updated in 2010).

**Table I-2. Duck Creek site subwatershed sampling locations coordinates.**

| Site Name | Station Code | Target Latitude | Target Longitude |
|---|---|---|---|
| Duck Creek @ Hwy 4* | 531XDCAHF | 37.94949 | -121.18208 |
| Duck Creek @ Drais Rd [US] | 531XDCADR | 37.93480 | -121.08412 |

[US] Upstream sites
*Original SJCDWQC sampling site

**Figure I-1. Duck Creek @ Hwy 4 site subwatershed land use map.**



## Subwatershed Monitoring History

Normal Monitoring began at Duck Creek @ Hwy 4 in 2004. No monitoring occurred in 2005; however sampling resumed in 2006 and continued through September 2014. Table I-3 contains the number of events monitored per year and the constituents (by group) from 2008 through September 2014. The most recent Assessment Monitoring at Duck Creek @ Hwy 4 occurred in 2012. From January through September 2014, Duck Creek @ Hwy 4 was classified as an Assessment site.

In 2007, MPM was initiated to address exceedances of chlorpyrifos, DO, and *E. coli*. In an effort to source exceedances of the WQTL for chlorpyrifos, additional sampling occurred in 2007 and in 2008 at the upstream location, Duck Creek @ Drais Rd. During the 2009 and 2013 WYs, MPM was initiated for water column toxicity to *C. dubia* and sediment toxicity to *H. azteca* toxicity, respectively. In order to evaluate the effectiveness of the Coalition's outreach strategy and the newly implemented management practices, MPM occurred since 2009 during months of past exceedances (Table I-4). The last detections of chlorpyrifos and diazinon were in 2011 and 2009, respectively; load information for those constituents can be found in the 2014 MPUR, Appendix I, Table I-7.

**Table I-3. Duck Creek @ Hwy 4 sampling events and analyses per year.**

Only environmental samples are counted.

| TYPE | ANALYTE | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|---|
| Sampling Events | Events Scheduled | 15 | 9 | 11 | 8 | 13 | 7 | 7 |
| | Dry Sites | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| | Events Sampled | 15 | 9 | 11 | 8 | 13 | 7 | 6 |
| | | | | | | | | |
| Field and Physical Parameters | BOD | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Color | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Dissolved Oxygen | 15 | 9 | 11 | 8 | 13 | 7 | 6 |
| | Dissolved Solids | 10 | 3 | 0 | 0 | 12 | 0 | 0 |
| | *E. coli* | 10 | 3 | 0 | 0 | 12 | 0 | 0 |
| | Grain size (sediment) | 0 | 0 | 1 | 0 | 2 | 2 | 2 |
| | Hardness as CaCO3 | 9 | 3 | 0 | 0 | 12 | 0 | 0 |
| | pH | 15 | 9 | 11 | 8 | 13 | 7 | 6 |
| | Specific Conductivity | 15 | 9 | 11 | 8 | 13 | 7 | 6 |
| | Suspended Solids | 0 | 3 | 3 | 0 | 12 | 0 | 0 |
| | Total Organic Carbon | 10 | 3 | 0 | 0 | 14 | 0 | 0 |
| | Total Organic Carbon (sediment) | 0 | 0 | 0 | 1 | 2 | 2 | 2 |
| | Turbidity | 10 | 3 | 0 | 0 | 12 | 0 | 0 |
| Nutrients | Ammonia as N | 9 | 3 | 0 | 0 | 12 | 0 | 0 |
| | Nitrate + Nitrite as N | 0 | 3 | 3 | 0 | 12 | 0 | 0 |
| | Nitrate as N | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Nitrite as N | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Nitrogen, Total Kjeldahl | 9 | 3 | 0 | 0 | 12 | 0 | 0 |
| | Orthophosphate as P | 9 | 3 | 0 | 0 | 12 | 0 | 0 |
| | Phosphate as P | 9 | 3 | 0 | 0 | 12 | 0 | 0 |
| Metals (Dissolved) | Cadmium | 3 | 3 | 0 | 0 | 12 | 0 | 0 |
| | Copper | 3 | 3 | 0 | 0 | 12 | 0 | 0 |
| | Lead | 3 | 3 | 0 | 0 | 12 | 0 | 0 |
| | Nickel | 3 | 3 | 0 | 0 | 12 | 0 | 0 |
| | Zinc | 3 | 3 | 0 | 0 | 12 | 0 | 0 |
| Metals (Total) | Arsenic | 9 | 3 | 0 | 0 | 12 | 0 | 0 |
| | Boron | 9 | 3 | 0 | 0 | 12 | 0 | 0 |

| Type | Analyte | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|---|
| | Cadmium | 9 | 3 | 0 | 0 | 12 | 0 | 0 |
| | Copper | 9 | 3 | 0 | 0 | 12 | 0 | 0 |
| | Lead | 9 | 3 | 0 | 0 | 12 | 0 | 0 |
| | Molybdenum | 3 | 3 | 0 | 0 | 12 | 0 | 0 |
| | Nickel | 9 | 3 | 0 | 0 | 12 | 0 | 0 |
| | Selenium | 9 | 3 | 0 | 0 | 12 | 0 | 0 |
| | Zinc | 9 | 3 | 0 | 0 | 12 | 0 | 0 |
| Carbamates | Aldicarb | 10 | 3 | 0 | 0 | 12 | 0 | 0 |
| | Carbaryl | 10 | 3 | 0 | 0 | 12 | 0 | 0 |
| | Carbofuran | 10 | 3 | 0 | 0 | 12 | 0 | 0 |
| | Diuron | 10 | 3 | 0 | 0 | 12 | 0 | 0 |
| | Linuron | 10 | 3 | 0 | 0 | 12 | 0 | 0 |
| | Methiocarb | 10 | 3 | 0 | 0 | 12 | 0 | 0 |
| | Methomyl | 10 | 3 | 0 | 0 | 12 | 0 | 0 |
| | Oxamyl | 10 | 3 | 0 | 0 | 12 | 0 | 0 |
| Group A Pesticides | Aldrin | 3 | 3 | 0 | 0 | 0 | 0 | 0 |
| | Chlordane | 3 | 3 | 0 | 0 | 0 | 0 | 0 |
| | Endosulfan I | 3 | 3 | 0 | 0 | 0 | 0 | 0 |
| | Endosulfan II | 3 | 3 | 0 | 0 | 0 | 0 | 0 |
| | HCH, alpha | 0 | 3 | 3 | 0 | 0 | 0 | 0 |
| | HCH, beta | 0 | 3 | 3 | 0 | 0 | 0 | 0 |
| | HCH, delta | 0 | 3 | 3 | 0 | 0 | 0 | 0 |
| | HCH, gamma | 0 | 3 | 3 | 0 | 0 | 0 | 0 |
| | Heptachlor | 0 | 3 | 3 | 0 | 0 | 0 | 0 |
| | Heptachlor epoxide | 0 | 3 | 3 | 0 | 0 | 0 | 0 |
| | Toxaphene | 0 | 3 | 3 | 0 | 0 | 0 | 0 |
| Herbicides | Atrazine | 10 | 3 | 0 | 0 | 12 | 0 | 0 |
| | Cyanazine | 10 | 3 | 0 | 0 | 12 | 0 | 0 |
| | Glyphosate | 10 | 3 | 0 | 0 | 12 | 0 | 0 |
| | Paraquat | 10 | 3 | 0 | 0 | 12 | 0 | 0 |
| | Simazine | 10 | 3 | 0 | 0 | 12 | 0 | 0 |
| | Trifluralin | 0 | 3 | 3 | 0 | 12 | 0 | 0 |
| Organochlorines | DDD(p,p') | 10 | 3 | 0 | 0 | 12 | 0 | 0 |
| | DDE(p,p') | 10 | 3 | 0 | 0 | 12 | 0 | 0 |
| | DDT(p,p') | 10 | 3 | 0 | 0 | 12 | 0 | 0 |
| | Dicofol | 10 | 3 | 0 | 0 | 12 | 0 | 0 |
| | Dieldrin | 10 | 3 | 0 | 0 | 12 | 0 | 0 |
| | Endrin | 10 | 3 | 0 | 0 | 12 | 0 | 0 |
| | Methoxychlor | 10 | 3 | 0 | 0 | 12 | 0 | 0 |
| Organophosphates | Azinphos methyl | 10 | 3 | 0 | 0 | 12 | 0 | 0 |
| | Chlorpyrifos | 10 | 9 | 9 | 8 | 12 | 6 | 5 |
| | Demeton-s | 3 | 3 | 0 | 0 | 12 | 0 | 0 |
| | Diazinon | 10 | 3 | 8 | 2 | 12 | 0 | 0 |
| | Dichlorvos | 3 | 3 | 0 | 0 | 12 | 0 | 0 |
| | Dimethoate | 10 | 3 | 0 | 0 | 12 | 0 | 0 |
| | Disulfoton | 10 | 3 | 0 | 0 | 12 | 0 | 0 |
| | Malathion | 10 | 3 | 0 | 0 | 12 | 0 | 0 |
| | Methamidophos | 10 | 3 | 0 | 0 | 12 | 0 | 0 |
| | Methidathion | 10 | 3 | 0 | 0 | 12 | 0 | 0 |
| | Molinate | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Parathion, Methyl | 10 | 3 | 0 | 0 | 12 | 0 | 0 |
| | Phorate | 10 | 3 | 0 | 0 | 12 | 0 | 0 |
| | Phosmet | 10 | 3 | 0 | 0 | 12 | 0 | 0 |
| | Thiobencarb | 7 | 0 | 0 | 0 | 0 | 0 | 0 |

| Type | Analyte | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|---|
| Pyrethroids | Bifenthrin | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cyfluthrin, total | 7 | 0 | 0 | 0 | 2 | 0 | 0 |
| | Cyhalothrin, lambda, total | 7 | 0 | 0 | 0 | 2 | 0 | 0 |
| | Cypermethrin, total | 7 | 0 | 0 | 0 | 2 | 0 | 0 |
| | Esfenvalerate/Fenvalerate, total | 7 | 0 | 0 | 0 | 2 | 0 | 0 |
| | Permethrin, total | 7 | 0 | 0 | 0 | 2 | 0 | 0 |
| Sediment Pesticides | Bifenthrin | 0 | 0 | 1 | 0 | 2 | 0 | 0 |
| | Chlorpyrifos | 0 | 0 | 1 | 0 | 2 | 0 | 0 |
| | Cyfluthrin | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| | Cyhalothrin, lambda | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| | Cypermethrin | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| | Deltamethrin: Tralomethrin | 0 | 0 | 1 | 0 | 2 | 0 | 0 |
| | Esfenvalerate/ Fenvalerate | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| | Fenpropathrin | 0 | 0 | 1 | 0 | 2 | 0 | 0 |
| | Permethrin | 0 | 0 | 1 | 0 | 2 | 0 | 0 |
| Toxicity | *Ceriodaphnia dubia* | 12 | 6 | 3 | 3 | 12 | 3 | 2 |
| | *Pimephales promelas* | 10 | 3 | 0 | 0 | 12 | 0 | 0 |
| | *Selenastrum capricornutum* | 12 | 5 | 3 | 3 | 12 | 0 | 0 |
| | *Hyalella azteca* | 1 | 0 | 2 | 0 | 2 | 2 | 2 |

**Table I-4. Duck Creek Management Plan Monitoring schedule (2007-September 2014).**

| Site Name | Sample Date | Monitoring Type | Chlorpyrifos | Diazinon | *C. dubia* | *S. capricornutum* | *H. azteca* |
|---|---|---|---|---|---|---|---|
| Duck Creek @ Hwy 4 | 9/25/2007 | Add. | X | | | | |
| Duck Creek @ Drais Rd | 5/5/2008 | US | X | | | | |
| Duck Creek @ Drais Rd | 7/15/2008 | US | X | | | | |
| Duck Creek @ Drais Rd | 9/16/2008 | US | X | | | | |
| Duck Creek @ Hwy 4 | 4/14/2009 | MPM | X | | X | X | |
| Duck Creek @ Hwy 4 | 5/12/2009 | MPM | X | | | X | |
| Duck Creek @ Hwy 4 | 6/9/2009 | MPM | X | | | | |
| Duck Creek @ Hwy 4 | 7/14/2009 | MPM | X | | X | | |
| Duck Creek @ Hwy 4 | 8/11/2009 | MPM | X | | | | |
| Duck Creek @ Hwy 4 | 9/15/2009 | MPM | X | | X | | |
| Duck Creek @ Hwy 4 | 2/9/2010 | MPM | | X | | X | |
| Duck Creek @ Hwy 4 | 4/13/2010 | MPM | X | | X | X | |
| Duck Creek @ Hwy 4 | 5/11/2010 | MPM | X | | | X | |
| Duck Creek @ Hwy 4 | 6/8/2010 | MPM | X[1] | X[2] | | | |
| Duck Creek @ Hwy 4 | 7/13/2010 | MPM | X[1] | X[2] | X | | |
| Duck Creek @ Hwy 4 | 8/10/2010 | MPM | X[1] | X[2] | | | |
| Duck Creek @ Hwy 4 | 9/7/2010 | MPM | X[1] | X[2] | X | | X[2] |
| Duck Creek @ Hwy 4 | 10/12/2010 | MPM | X[2] | X[2] | | | |
| Duck Creek @ Hwy 4 | 11/9/2010 | MPM | X[2] | X[2] | | | |
| Duck Creek @ Hwy 4 | 12/7/2010 | MPM | X[2] | X[2] | | | |
| Duck Creek @ Hwy 4 | 1/11/2011 | MPM | X[2] | X[2] | | | |
| Duck Creek @ Hwy 4 | 2/8/2011 | MPM | X[2] | X[1] | | X | |
| Duck Creek @ Hwy 4 | 4/12/2011 | MPM | X | | X | X | |
| Duck Creek @ Hwy 4 | 5/24/2011 | MPM | X | | | X | |
| Duck Creek @ Hwy 4 | 6/28/2011 | MPM | X | | | | |
| Duck Creek @ Hwy 4 | 7/26/2011 | MPM | X | | X | | |
| Duck Creek @ Hwy 4 | 8/23/2011 | MPM | X | | | | |
| Duck Creek @ Hwy 4 | 9/20/2011 | MPM | X | | X | | |
| Duck Creek @ Hwy 4 | 2/14/2012 | MPM | | X | | X | |
| Duck Creek @ Hwy 4 | 4/12/2012 | MPM | X | | X | | |
| Duck Creek @ Hwy 4 | 5/16/2012 | MPM | X | | | | |
| Duck Creek @ Hwy 4 | 6/19/2012 | MPM | X | | | | |
| Duck Creek @ Hwy 4 | 7/17/2012 | MPM | X | | X | | |
| Duck Creek @ Hwy 4 | 8/21/2012 | MPM | X | | | | |
| Duck Creek @ Hwy 4 | 9/18/2012 | MPM | X | | X | | |
| Duck Creek @ Hwy 4 | 3/19/2013 | MPM | | | | | X |
| Duck Creek @ Hwy 4 | 4/02/2013 | MPM | X | | X | | |
| Duck Creek @ Hwy 4 | 5/21/2013 | MPM | X | | | | |
| Duck Creek @ Hwy 4 | 6/18/2013 | MPM | X | | | | |
| Duck Creek @ Hwy 4 | 7/16/2013 | MPM | X | | X | | |
| Duck Creek @ Hwy 4 | 8/20/2013 | MPM | X | | | | |
| Duck Creek @ Hwy 4 | 9/17/2013 | MPM | X | | X | | X |
| Duck Creek @ Hwy 4 | 3/5/2014 | MPM | | | | | X |
| Duck Creek @ Hwy 4 | 4/15/2014 | MPM | X | | X | | |
| Duck Creek @ Hwy 4 | 5/20/2014 | MPM | X | | | | |
| Duck Creek @ Hwy 4 | 6/17/2014 | MPM | X | | | | |
| Duck Creek @ Hwy 4 | 7/15/2014 | MPM | X | | X | | |
| Duck Creek @ Hwy 4 | 8/19/2014 | MPM | X | | | | |
| Duck Creek @ Hwy 4 | 9/16/2014 | MPM | X | | X | | X |

[1] MPM and Department of Pesticide Regulation (DPR) grant monitoring.
[2] DPR grant monitoring
Add. – Additional sampling
US – Upstream sampling
X – Constituent sampled for Management Plan Monitoring (MPM).

## Monitoring Results

From January through September 2014, MPM occurred at Duck Creek @ Hwy 4 for chlorpyrifos, water column toxicity to *C. dubia,* and sediment toxicity to *H. azteca*. There were no detections of the WQTL for chlorpyrifos, and no toxicity to *C. dubia* or toxicity to *H. azteca* occurred. During MPM in 2014, DO and pH were also measured; four exceedances of the WQTL occurred for DO and no exceedances of the WQTL occurred for pH. Although *E. coli* is in the site's management plan, it was last monitored in 2012 during Assessment Monitoring and one exceedance of the WQTL occurred during December 2012 (Table I-5).

Table I-5 is a tally of exceedances of WQTLs from 2006 through September 2014 for management plan constituents in the Duck Creek @ Hwy 4 site subwatershed (organized alphabetically by constituent priority). Table I-6 contains detections and WQTL exceedance results of all sampling events since the constituent became part of the site subwatershed management plan. A record of all exceedances since monitoring began is provided in Appendix II, Table I-A.

**Table I-5. Duck Creek @ Hwy 4 management plan constituent exceedance tally (2006-September 2014).**
Exceedances that occurred during resampling for field parameters and toxicity are included in the tally. Exceedances are organized alphabetically by constituent priority. A complete list of exceedances can be found in Appendix II, Table I-A.

| | Active Management Plan Constituents | | | | | Removed Management Plan Constituents | | |
|---|---|---|---|---|---|---|---|---|
| Monitoring Year | Chlorpyrifos, >0.015 µg/L | *C. dubia*, (%Control) | *H. azteca*, (%Control) | *E. coli*, >235 MPN/100 mL | Oxygen, Dissolved, <7 mg/L | Diazinon, >0.1 µg/L | pH, <6.5 and >8.5 units | *S. capricornutum*, ( % control) |
| 2006 | 2 | 1 | 0 | 2 | 3 | 0 | 1 | 0 |
| 2007 | 3 | 0 | 0 | 3 | 5 | 1 | 1 | 1 |
| 2008 | 5 | 4 | 0 | 1 | 8 | 0 | 1 | 2 |
| 2009 | 3 | 1 | NA | 0 | 6 | 0 | 0 | 0 |
| 2010 | 4 | 0 | 1 | NA | 8 | 0 | 0 | 0 |
| 2011 | 1 | 1 | NA | NA | 4 | 0 | 0 | 0 |
| 2012 | 0 | 0 | 2 | 1 | 10 | 0 | 0 | 0 |
| 2013 | 0 | 0 | 1 | NA | 6 | NA | 0 | NA |
| 2014 WY* | 0 | 0 | 0 | 0 | 4 | NA | 0 | NA |
| **Overall Tally** | **18** | **7** | **4** | **7** | **54** | **1** | **3** | **3** |
| **Constituent Priority** | **A/B** | **D** | **D** | **E** | **E** | **A/B$^{R}$** | **E$^{R}$** | **E$^{R}$** |

NA – Not Applicable; monitoring did not occur for this constituent during the year.
$^{R}$ – Removed from active management plan.
*2014 includes January through September results only.

**Table I-6. Duck Creek @ Hwy 4 subwatershed monitoring results for priority A/B - D constituents since management plan initiation.**

Exceedance values are in bold. Resampling (RS) due to toxicity not included in table. MPM results after September 2014 not included in table (grey cells).

| | Month: | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **2007 NM (@ Hwy 4)** | Date | NA | NA | NA | 4/10/07 | 5/22/07 | 6/12/07 | 7/10/07 | 8/07/07 | 9/04/07 | | NA | NA | NA |
| | Chlorpyrifos (µg/L) | NA | NA | NA | <0.003 | <0.003 | <0.003 | **0.024** | <0.003 | **0.025** | | NA | NA | NA |
| **2007 MPM Add. (@ Hwy 4)** | Date | NA | NA | NA | NA | NA | NA | NA | NA | 9/25/07 | | NA | NA | NA |
| | Chlorpyrifos (µg/L) | NA | NA | NA | NA | NA | NA | NA | NA | **0.029** | | NA | NA | NA |
| **2008 NM (@Hwy 4)** | Date | 1/23/08 | NA | NA | 4/15/08 | 5/13/08 | 6/10/08 | 7/15/08 | 8/12/08 | 9/16/08 | | 10/14/08 | 11/4/08 | 12/9/08 |
| | Chlorpyrifos (µg/L) | 0.0081 | NA | NA | **0.057** | <0.003 | **0.110** | **0.066** | **0.017** | **0.027** | | <0.003 | <0.003 | <0.003 |
| | Diazinon (µg/L) | 0.018 | NA | NA | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | | <0.004 | <0.004 | <0.004 |
| **2008 MPM US (@ Drais Rd)** | Date | NA | NA | NA | NA | 5/13/08 | NA | 7/15/08 | NA | 9/16/08 | | NA | NA | NA |
| | Chlorpyrifos (µg/L) | NA | NA | NA | NA | **0.420** | NA | <0.003 | NA | <0.003 | | NA | NA | NA |
| **2009 NM (@Hwy 4)[1]** | Date | 1/13/09 | 2/10/09 | 3/10/09 | NA | NA | NA | NA | NA | NA | | NA | NA | NA |
| | Chlorpyrifos (µg/L) | 0.005 | 0.0037 | <0.003 | NA | NA | NA | NA | NA | NA | | NA | NA | NA |
| | Diazinon (µg/L) | 0.012 | <0.004 | <0.004 | NA | NA | NA | NA | NA | NA | | NA | NA | NA |
| | *C. dubia* toxicity (% Control) | 100 | 100 | 100 | NA | NA | NA | NA | NA | NA | | NA | NA | NA |
| | *S. capricornutum* toxicity (% Control) | 136 | 188 | 147 | NA | NA | NA | NA | NA | NA | | NA | NA | NA |
| **2009 MPM (@ Hwy 4)** | Date | NA | NA | NA | 4/14/09 | 5/12/09 | 6/09/09 | 7/14/09 | 8/11/09 | 9/15/09 | | NA | NA | NA |
| | Chlorpyrifos (µg/L) | NA | NA | NA | <0.003 | 0.011 | **0.070** | **0.150** | **0.031** | <0.003 | | NA | NA | NA |
| | *C. dubia* toxicity (% Control) | NA | NA | NA | 100 | NA | NA | **0** | NA | 100 | | NA | NA | NA |
| | *S. capricornutum* toxicity (% Control) | NA | NA | NA | 516 | 498 | NA | NA | NA | NA | | NA | NA | NA |
| **2010 MPM (@ Hwy 4)** | Date | NA | 2/9/10 | NA | 4/13/10 | 5/11/10 | 6/8/10 | 7/13/10 | 8/10/10 | 9/7/10 | 9/14/10 | 10/12/10 | 11/9/10 | 12/7/10 |
| | Chlorpyrifos (µg/L) | NA | NA | NA | <0.003 | **0.055** | <0.003 | **0.02** | **0.3** | **0.023** | NA | <0.003* | <0.003* | <0.003* |
| | Diazinon (µg/L) | NA | <0.004 | NA | NA | NA | <0.004* | <0.004* | <0.004* | <0.004* | NA | <0.004* | <0.004* | <0.004* |
| | *C. dubia* toxicity (% Control) | NA | NA | NA | 100 | NA | NA | 100 | NA | 100 | NA | NA | NA | NA |
| | *S. capricornutum* toxicity (% Control) | NA | 660 | NA | 992 | 1136 | NA | NA | NA | NA | NA | NA | NA | NA |
| | *H. azteca* toxicity (% Control) | NA | NA | NA | NA | NA | NA | NA | NA | NA | **17*** | NA | NA | NA |
| **2011 MPM (@ Hwy 4)** | Date | 1/11/11 | 2/8/11 | NA | 4/12/11 | 5/24/11 | 6/28/11 | 7/26/11 | 8/23/11 | 9/20/11 | | NA | NA | NA |
| | Chlorpyrifos (µg/L) | <0.003* | 0.004* | NA | <0.003 | <0.003 | <0.003 | <0.003 | <0.003 | **0.12** | | NA | NA | NA |
| | Diazinon (µg/L) | <0.004* | <0.004 | NA | NA | NA | NA | NA | NA | NA | | NA | NA | NA |
| | *C. dubia* toxicity (% Control) | NA | NA | NA | 95 | NA | NA | 100 | NA | **35** | | NA | NA | NA |
| | *S. capricornutum* toxicity (% Control) | NA | 994 | NA | 1204 | 826 | NA | NA | NA | NA | | NA | NA | NA |
| **2012 NM & MPM (@ Hwy 4)** | Date | 1/17/12 | 2/14/12 | 3/15/12 | 4/12/12 | 5/16/12 | 6/19/12 | 7/17/12 | 8/21/12 | 9/18/12 | | 10/16/12 | 11/6/12 | 12/3/12 |
| | Chlorpyrifos (µg/L) | <0.003 | <0.003 | <0.003 | <0.003 | <0.003 | <0.003 | <0.003 | <0.003 | <0.003 | | <0.003 | <0.003 | <0.003 |
| | Diazinon (µg/L) | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | | <0.004 | <0.004 | <0.004 |
| | *C. dubia* toxicity (% Control) | 100 | 100 | 105 | 100 | 100 | 100 | 100 | 100 | 95 | | 100 | 100 | 100 |
| | *S. capricornutum* toxicity (% Control) | 813 | 830 | 88 | 355 | 526 | 293 | 192 | 278 | 466 | | 303 | 294 | 1797 |
| **2013 MPM (@ Hwy 4)** | Date | NA | NA | 3/19/13 | 4/2/13 | 5/21/13 | 6/18/13 | 7/16/13 | 8/20/13 | 9/17/13 | | NA | NA | NA |
| | Chlorpyrifos (µg/L) | NA | NA | NA | <0.003 | <0.003 | <0.003 | <0.003 | <0.003 | <0.003 | | NA | NA | NA |
| | *C. dubia* toxicity (% Control) | NA | NA | NA | 100 | NA | NA | 100 | NA | 100 | | NA | NA | NA |
| | *H. azteca* toxicity (% Control) | NA | NA | **91** | NA | NA | NA | NA | NA | 96 | | NA | NA | NA |
| **2014 MPM (@ Hwy 4)** | Date | NA | NA | 3/05/14 | 04/15/14 | 5/20/14 | 6/17/14 | 7/15/14 | 8/19/14 | 9/16/14 | | | | |
| | Chlorpyrifos (µg/L) | NA | NA | NA | Dry | <0.003 | <0.003 | <0.003 | <0.003 | <0.003 | | | | |
| | *C. dubia* toxicity (% Control) | NA | NA | NA | Dry | NA | NA | 100 | NA | 100 | | | | |
| | *H. azteca* toxicity (% Control) | NA | NA | 100 | NA | NA | NA | NA | NA | 96 | | | | |

[1] Assessment Monitoring at Duck Creek @ Hwy 4 began under the October 2008 MRPP and was scheduled to continue through 2009; however, in March 2009 (Effective April 1, 2009) the Coalition received approval to revise the monitoring schedule, and Assessment Monitoring was rescheduled for 2012.

Add. – Additional Monitoring, conducted in 2007 only.

MPM – Management Plan Monitoring.

NA – Not applicable. No monitoring occurred on this date for this constituent

NM – Normal Monitoring

US – Upstream Monitoring, conducted in 2008 only.

*Additional Department of Pesticide Regulation (DPR) grant monitoring

## Source Identification and Outreach

The Coalition evaluated PUR data and past monitoring results to determine the sources of constituents listed in the Duck Creek @ Hwy 4 management plan. Sourcing analyses for past exceedances of management plan constituents are evaluated in past years' site subwatershed appendices. From January through September 2014, there were no exceedances of the WQTL for chlorpyrifos, toxicity to *C. dubia,* or *H. azteca*. Since there were no exceedances of sourceable constituents, a sourcing analysis was not included.

Priority A/B, C, and D constituents are associated with pesticide applications to assist in determining potential sources of water quality impairments and focusing outreach efforts. However, all management plan constituents are discussed during Coalition focused outreach including management practices intended to reduce agricultural discharge of constituents of concern. The Coalition describes its strategy for outreach in high priority sites in the 2015 Annual Report.

The priority E constituents listed in the active management plan are DO and *E. coli*. Priority E constituents are difficult to source; however, low flow in the waterway can cause exceedances of the WQTL for DO and mismanaged manure applications to crops and/or runoff from dairy farms can lead to exceedances of the WQTL for *E. coli*. The Coalition is not required to conduct MPM for priority E constituents; however, all constituents are discussed with growers during focused outreach and the Coalition believes working with growers to manage applied constituents will also address priority E constituents.

The Coalition carried out its management practice tracking and outreach by contacting targeted growers in 2008 and following up with the growers in 2009 and 2010. The Coalition contacted 35 targeted growers farming 4,978 acres within the Duck Creek @ Hwy 4 site subwatershed (2013 MPUR, Pages 30-32) and documented management practices (2012 MPUR, Pages 43-48). Additional contacts were made with 12 growers in 2010 and three growers in 2012 (2012 MPUR, Page 45-47). These growers were targeted for supplementary focused outreach based on their recent use of chlorpyrifos associated with the exceedance in September 2011. Following focused outreach, all three growers indicated discontinued use of chlorpyrifos, implementation of management practices to control runoff, and management of pesticide applications. Additional management practices include the use of center grass rows, grass waterways or grass filter strips, and installation of micro sprinkler or drip irrigation. There were 19 growers who returned follow-up surveys and documented newly implemented management practices in 2009 or 2010 (2013 MPUR, Page 49).

## Evaluation

Overall, water quality has improved since focused outreach to targeted growers began in the Duck Creek @ Hwy 4 site subwatershed. Due to water quality improvements, the Coalition received approval on March 22, 2012 to remove diazinon, pH, and toxicity to *S. capricornutum* from the active management plan. The remaining high priority constituents include chlorpyrifos, water column toxicity to *C. dubia,* and sediment toxicity to *H. azteca.*

## Next Steps

Focused outreach is completed within this site subwatershed; however, the Coalition will continue to conduct general outreach. In 2015, Duck Creek @ Hwy 4 is classified as a Represented site and is scheduled for MPM during months of past exceedances for chlorpyrifos, water column toxicity to *C. dubia,* and sediment toxicity to *H. azteca.* Field parameters, such as DO and pH, will be measured during all monitoring events.

# II. LONE TREE CREEK @ JACK TONE RD

## Overview

Lone Tree Creek @ Jack Tone Rd is a first priority site subwatershed. The Coalition completed focused outreach in 2012 (including additional outreach) and monitoring results from 2009 through September 2014 indicate water quality improvements. By demonstrating improved water quality, the Coalition received approval to remove SC, diazinon, diuron, copper, water column toxicity to *S. capricornutum*, and sediment toxicity to *H. azteca* from the active management plan on May 21, 2012 and DO on February 27, 2013 (Table II-1). The remaining constituents in the active management plan include ammonia chlorpyrifos, *E. coli,* pH, TDS, and water column toxicity to *P. promelas* (Table II-1).

The Coalition initially planned to conduct focused outreach from 2008 through 2010. Due to continued exceedances of chlorpyrifos, the Coalition conducted additional focused outreach to two growers in 2012.

From January through September 2014, MPM occurred for chlorpyrifos; the remaining constituents do not require MPM since they are priority E (Table II-1).

In 2015, Lone Tree Creek @ Jack Tone Rd is classified as Represented site and MPM will continue for chlorpyrifos; field parameters, including pH, will be measured during all monitoring events.

**Table II-1. Lone Tree Creek @ Jack Tone Rd management plan constituents.**
Management plan initiation year refers to when the site and constituent are addressed in the SJCDWQC MPURs and in the Management Plan Progress Report sections of the Annual Reports.

| PRIORITY | CONSTITUENT | MANAGEMENT PLAN INITIATION YEAR | MANAGEMENT PLAN REMOVAL YEAR |
|---|---|---|---|
| A/B | Chlorpyrifos | 2006 | Active |
| D | *P. promelas* water column toxicity | 2009 | Active |
| E | Ammonia | 2008 | Active |
| E | *E. coli* | 2006 | Active |
| E | pH | 2007 | Active |
| E | Total Dissolved Solids | 2007 | Active |
| **CONSTITUENT (REMOVED)** | | | |
| A/B | Diazinon | 2009 | 2012 |
| C | Copper | 2008 | 2012 |
| C | Diuron | 2008 | 2012 |
| D | *H. azteca* sediment toxicity | 2007 | 2012 |
| D | *S. capricornutum* water column toxicity | 2007 | 2012 |
| E | Dissolved Oxygen | 2006 | 2013 |
| E | Specific Conductivity | 2013 | 2012 |

## Description of Site Subwatershed

Lone Tree Creek @ Jack Tone Rd is a rotating Assessment Monitoring location within Zone 2 under the 2008 MRPP. The site consists of 25,789 irrigated acres and upstream agricultural land use that include deciduous nuts, field crops, grains, irrigated pastures, rice, vineyards, and several dairies (Figure II-1). The site is a 20 mile long modified natural channel, upstream from the French Camp Slough @ Airport Way site in San Joaquin County. This ephemeral stream carries natural storm runoff, agricultural supply, and return flows to Littlejohns Creek during periods of high flow and irrigation. Downstream of the monitoring location, Lone Tree Creek confluences with Littlejohns Creek and eventually forms into French Camp Slough. The site subwatershed includes two upstream locations where the Coalition has monitored in the past: Lone Tree Creek @ Brennan Rd and Lone Tree Creek @ Valley Home Rd (Table II-2).

Lone Tree Creek is listed as a 303(d) List of Impaired Waterbodies for ammonia, BOD, chlorpyrifos, diuron, *E. coli*, and sediment and unknown water column toxicity (lasted updated in 2010).

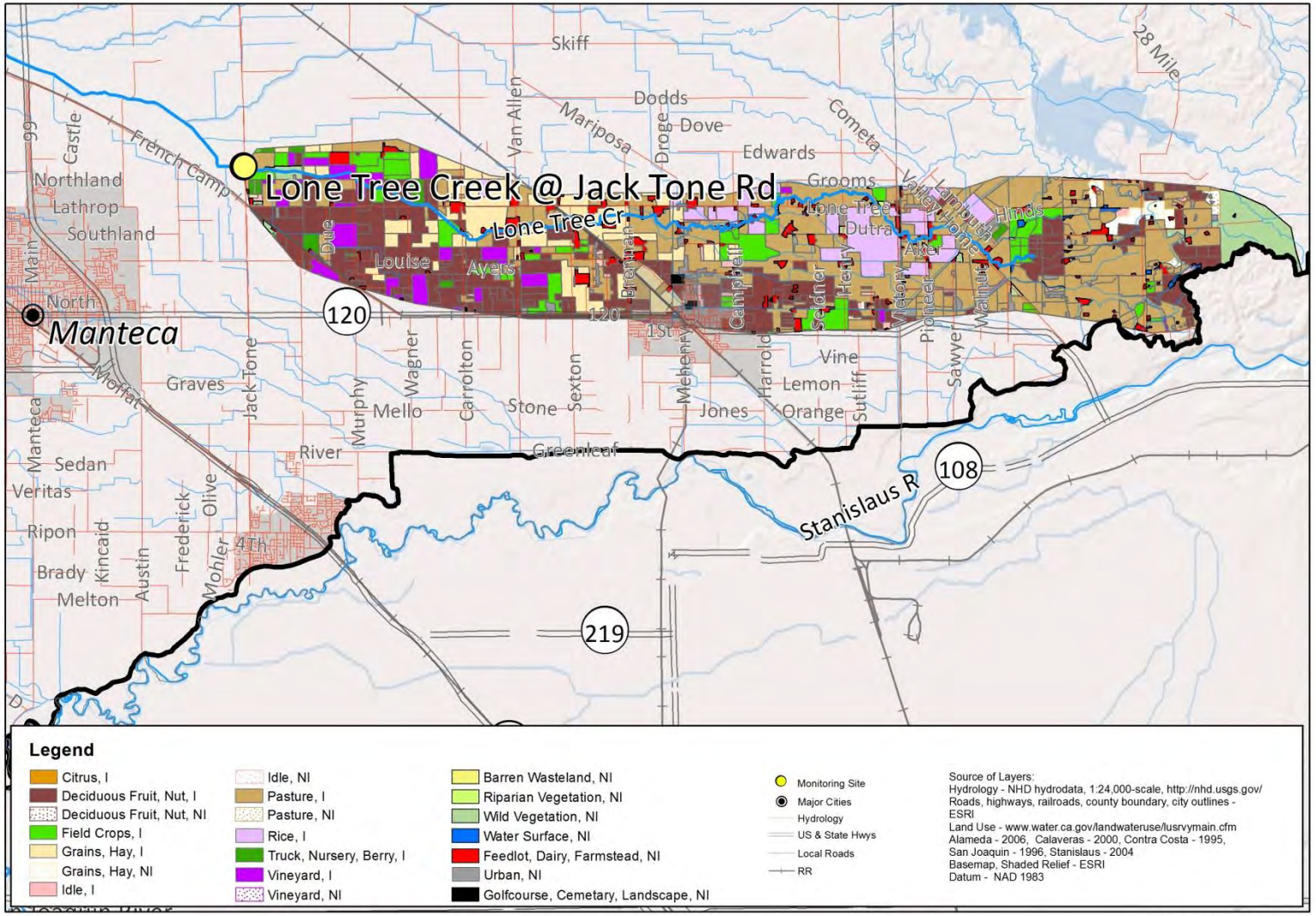
**Table II-2. Lone Tree Creek site subwatershed sampling locations coordinates.**

| Site Name | Station Code | Target Latitude | Target Longitude |
|---|---|---|---|
| Lone Tree Creek @ Jack Tone Rd* | 531XLTCJR | 37.83754 | -121.14460 |
| Lone Tree Creek @ Brennan Rd[US] | 535XLTABR | 37.82552 | -121.01591 |
| Lone Tree Creek @ Valley Home Rd[US] | 535LTCVHR | 37.82023 | -120.90216 |

[US] Upstream sites

*Original SJCDWQC sampling site

**Figure II-1. Lone Tree Creek @ Jack Tone Rd site subwatershed land use map.**



## Subwatershed Monitoring History

Normal Monitoring began at Lone Tree Creek @ Jack Tone Rd during the irrigation season of 2004 and continued through September 2008 at which time the site became an Assessment Monitoring location. Table II-3 contains the number of events monitored per year and the constituents (by group) for years 2008 through September 2014.

In an effort to source the chemicals that caused exceedances, the Coalition monitored upstream for chlorpyrifos at Lone Tree Creek @ Brennan Rd in 2005, and additional sampling at Lone Tree Creek @ Jack Tone Rd for chlorpyrifos occurred in 2007. MPM was initiated in 2007 and in 2008, upstream MPM at Lone Tree Creek @ Brennan Rd and Lone Tree Creek @ Valley Home Rd occurred for copper and chlorpyrifos. MPM during months of past exceedances occurred since 2009 to evaluate the effectiveness of the Coalition's outreach strategy and the newly implemented management practices on water quality (Table II-4). The last detections for chlorpyrifos, copper, diazinon, or diuron were in 2013, 2012, 2010, and 2011, respectively; load information for those constituents can be found in the 2014 MPUR, Appendix I, Table II-7.

**Table II-3. Lone Tree Creek @ Jack Tone Rd sampling events and analyses per year.**
Only environmental samples are counted.

| Type | Analyte | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|---|
| Sampling Events | Events Scheduled | 14 | 6 | 12 | 12 | 11 | 11 | 4 |
| | Dry Sites | 0 | 0 | 0 | 1 | 0 | 1 | 0 |
| | Events Sampled | 14 | 6 | 12 | 11 | 11 | 10 | 4 |
| | | | | | | | | |
| Field and Physical Parameters | BOD | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Color | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Dissolved Oxygen | 14 | 6 | 12 | 11 | 11 | 10 | 4 |
| | Dissolved Solids | 8 | 0 | 0 | 0 | 0 | 0 | 0 |
| | *E. coli* | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Grain size (sediment) | 0 | 0 | 1 | 2 | 1 | 2 | 0 |
| | Hardness as CaCO3 | 6 | 5 | 5 | 5 | 5 | 5 | 0 |
| | pH | 14 | 6 | 12 | 11 | 11 | 10 | 4 |
| | Specific Conductivity | 14 | 6 | 12 | 11 | 11 | 10 | 4 |
| | Suspended Solids | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Total Organic Carbon | 7 | 0 | 1 | 2 | 0 | 0 | 0 |
| | Total Organic Carbon (sediment) | 7 | 0 | 1 | 2 | 2 | 2 | 0 |
| | Turbidity | 8 | 0 | 0 | 0 | 0 | 0 | 0 |
| Nutrients | Ammonia as N | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Nitrate + Nitrite as N | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Nitrate as N | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Nitrite as N | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Nitrogen, Total Kjeldahl | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Orthophosphate as P | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Phosphate as P | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| Metals (Dissolved) | Cadmium | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Copper | 0 | 5 | 5 | 5 | 5 | 5 | 0 |
| | Lead | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Nickel | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Zinc | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Metals (Total) | Arsenic | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Boron | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cadmium | 6 | 0 | 0 | 0 | 0 | 0 | 0 |

| Type | Analyte | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|---|
| | Copper | 6 | 5 | 5 | 5 | 5 | 5 | 0 |
| | Lead | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Molybdenum | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Nickel | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Selenium | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Zinc | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| Carbamates | Aldicarb | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Carbaryl | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Carbofuran | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Diuron | 7 | 0 | 2 | 2 | 2 | 1 | 0 |
| | Linuron | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Methiocarb | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Methomyl | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Oxamyl | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| Group A Pesticides | Aldrin | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Chlordane | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Endosulfan I | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Endosulfan II | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | HCH, alpha | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | HCH, beta | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | HCH, delta | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | HCH, gamma | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Heptachlor | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Heptachlor epoxide | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Toxaphene | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Herbicides | Atrazine | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cyanazine | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Glyphosate | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Paraquat | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Simazine | 7 | 0 | 2 | 2 | 2 | 0 | 0 |
| | Trifluralin | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Organochlorines | DDD(p,p') | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | DDE(p,p') | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | DDT(p,p') | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Dicofol | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Dieldrin | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Endrin | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Methoxychlor | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| Organophosphates | Azinphos methyl | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Chlorpyrifos | 7 | 4 | 10 | 8 | 9 | 8 | 4 |
| | Demeton-s | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Diazinon | 7 | 0 | 7 | 2 | 0 | 0 | 0 |
| | Dichlorvos | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Dimethoate | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Disulfoton | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Malathion | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Methamidophos | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Methidathion | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Molinate | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Parathion, Methyl | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Phorate | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Phosmet | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Thiobencarb | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pyrethroids | Bifenthrin | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cyfluthrin, total | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cyhalothrin, lambda, total | 7 | 0 | 0 | 0 | 0 | 0 | 0 |

| Type | Analyte | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|---|
| | Cypermethrin, total | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Esfenvalerate/Fenvalerate, total | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Permethrin, total | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sediment Pesticides | Bifenthrin | 0 | 0 | 1 | 2 | 1 | 0 | 0 |
| | Chlorpyrifos | 0 | 0 | 1 | 2 | 1 | 0 | 0 |
| | Cyfluthrin | 0 | 0 | 1 | 2 | 1 | 0 | 0 |
| | Cyhalothrin, lambda | 0 | 0 | 1 | 2 | 1 | 0 | 0 |
| | Cypermethrin | 0 | 0 | 1 | 2 | 1 | 0 | 0 |
| | Deltamethrin: Tralomethrin | 0 | 0 | 1 | 2 | 1 | 0 | 0 |
| | Esfenvalerate/ Fenvalerate | 0 | 0 | 1 | 2 | 1 | 0 | 0 |
| | Fenpropathrin | 0 | 0 | 1 | 2 | 1 | 0 | 0 |
| | Permethrin | 0 | 0 | 1 | 2 | 1 | 0 | 0 |
| Toxicity | *Ceriodaphnia dubia* | 9 | 1 | 3 | 3 | 2 | 0 | 0 |
| | *Pimephales promelas* | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | *Selenastrum capricornutum* | 8 | 1 | 3 | 3 | 3 | 0 | 0 |
| | *Hyalella azteca* | 4 | 0 | 1 | 2 | 2 | 2 | 0 |

**Table II-4. Lone Tree Creek Management Plan Monitoring schedule (2007-September 2014).**

| Site Name | Sample Date | Monitoring Type | Copper | Total Metals | Chlorpyrifos | Diazinon | Diuron | *S. capricornutum* | *H. azteca* |
|---|---|---|---|---|---|---|---|---|---|
| Lone Tree Creek @ Jack Tone Rd | 07/30/07 | Add. | | | X | | | | |
| Lone Tree Creek @ Jack Tone Rd | 08/28/07 | Add. | | | X | | | | |
| Lone Tree Creek @ Valley Home Rd | 05/13/08 | US | | X | | | | | |
| Lone Tree Creek @ Valley Home Rd | 06/10/08 | US | | X | | | | | |
| Lone Tree Creek @ Valley Home Rd | 07/15/08 | US | | X | | | | | |
| Lone Tree Creek @ Brennan Rd | 07/15/08 | US | | X | X | | | | |
| Lone Tree Creek @ Valley Home Rd | 08/12/08 | US | | X | | | | | |
| Lone Tree Creek @ Brennan Rd | 08/12/08 | US | | X | X | | | | |
| Lone Tree Creek @ Valley Home Rd | 09/16/08 | US | | X | | | | | |
| Lone Tree Creek @ Brennan Rd | 09/16/08 | US | | X | | | | | |
| Lone Tree Creek @ Jack Tone Rd | 04/14/09 | MPM | | | | | | X | |
| Lone Tree Creek @ Jack Tone Rd | 05/12/09 | MPM | | | | | | X | |
| Lone Tree Creek @ Jack Tone Rd | 07/14/09 | MPM | X | | X | | | | |
| Lone Tree Creek @ Jack Tone Rd | 08/11/09 | MPM | X | | X | | | | |
| Lone Tree Creek @ Jack Tone Rd | 09/15/09 | MPM | X | | | | | | |
| Lone Tree Creek @ Jack Tone Rd | 01/13/10 | MPM | X | | X | X | X | X | |
| Lone Tree Creek @ Jack Tone Rd | 02/09/10 | MPM | X | | X | X | X | X | |
| Lone Tree Creek @ Jack Tone Rd | 03/16/10 | MPM | | | | | | X | |
| Lone Tree Creek @ Jack Tone Rd | 04/13/10 | MPM | | | | | | X | |
| Lone Tree Creek @ Jack Tone Rd | 05/11/10 | MPM | | | | | | X | |
| Lone Tree Creek @ Jack Tone Rd | 06/08/10 | MPM | | | X[2] | X[2] | | | |
| Lone Tree Creek @ Jack Tone Rd | 07/13/10 | MPM | X | | X[1] | X[2] | | | |
| Lone Tree Creek @ Jack Tone Rd | 08/10/10 | MPM | X | | X[1] | X[2] | | | |
| Lone Tree Creek @ Jack Tone Rd | 09/07/10 | MPM | X | | X[2] | X[2] | | | X[2] |
| Lone Tree Creek @ Jack Tone Rd | 10/12/10 | MPM | | | X[2] | X[2] | | | |
| Lone Tree Creek @ Jack Tone Rd | 11/09/10 | MPM | | | X[2] | X[2] | | | |
| Lone Tree Creek @ Jack Tone Rd | 12/07/10 | MPM | | | X[2] | X[2] | | | |
| Lone Tree Creek @ Jack Tone Rd | 01/11/11 | MPM | X | | X[1] | X[1] | X | X | |
| Lone Tree Creek @ Jack Tone Rd | 02/08/11 | MPM | X | | X[1] | X[1] | X | X | |
| Lone Tree Creek @ Jack Tone Rd | 03/08/11 | MPM | | | | | | X | X |
| Lone Tree Creek @ Jack Tone Rd | 04/12/11 | MPM | | | | | | X | |
| Lone Tree Creek @ Jack Tone Rd | 05/24/11 | MPM | | | | | | X | |
| Lone Tree Creek @ Jack Tone Rd | 07/26/11 | MPM | X | | X | | | | |
| Lone Tree Creek @ Jack Tone Rd | 08/23/11 | MPM | X | | X | | | | |
| Lone Tree Creek @ Jack Tone Rd | 09/20/11 | MPM | X | | | | | | |
| Lone Tree Creek @ Jack Tone Rd | 10/14/11 | MPM | | | | | | | X |
| Lone Tree Creek @ Jack Tone Rd | 01/17/12 | MPM | X | | X | X | X | X | |
| Lone Tree Creek @ Jack Tone Rd | 02/14/12 | MPM | X | | X | X | X | X | |
| Lone Tree Creek @ Jack Tone Rd | 03/15/12 | MPM | | | | | | X | X |
| Lone Tree Creek @ Jack Tone Rd | 04/12/12 | MPM | | | | | | X | |
| Lone Tree Creek @ Jack Tone Rd | 05/16/12 | MPM | | | | | | X | |
| Lone Tree Creek @ Jack Tone Rd | 07/17/12 | MPM | | | X | | | | |
| Lone Tree Creek @ Jack Tone Rd | 08/21/12 | MPM | | | X | | | | |
| Lone Tree Creek @ Jack Tone Rd | 01/15/13 | MPM | | | X | | | | |
| Lone Tree Creek @ Jack Tone Rd | 02/21/13 | MPM | | | X | | | | |
| Lone Tree Creek @ Jack Tone Rd | 07/16/13 | MPM | | | X | | | | |
| Lone Tree Creek @ Jack Tone Rd | 08/20/13 | MPM | | | X | | | | |
| Lone Tree Creek @ Jack Tone Rd | 01/28/14 | MPM | | | X | | | | |
| Lone Tree Creek @ Jack Tone Rd | 02/11/14 | MPM | | | X | | | | |
| Lone Tree Creek @ Jack Tone Rd | 07/15/14 | MPM | | | X | | | | |
| Lone Tree Creek @ Jack Tone Rd | 08/19/14 | MPM | | | X | | | | |

[1] MPM and Department of Pesticide Regulation (DPR) grant monitoring.
[2] DPR grant monitoring only.
Add. – Additional sampling.
US – Upstream sampling.
X – Constituent sampled for Management Plan Monitoring (MPM).

## Monitoring Results

From January through September 2014, the Coalition conducted MPM for chlorpyrifos at Lone Tree Creek @ Jack Tone Rd; there were no detections (Table II-5). Chlorpyrifos was added to the site subwatershed's management plan in 2007, and MPM was initiated in 2008. Water column toxicity to *P. promelas* is a priority D constituent, and was added to the management plan after toxicity in 2008. Monitoring did not occur for *P. promelas* toxicity from January through September 2014. The priority E constituent, pH, was monitored during all MPM events through September 2014; one exceedance of the WQTL for pH occurred during the month of February.

On February 27, 2013, the Coalition received approval to remove DO from the active management plan; however DO was measured during all MPM events through September 2014 (Table II-6). In August 2014, the DO concentration was 6.61 mg/L and was considered an exceedance of the WQTL of 7.00 mg/L for DO. However, the Coalition reevaluated the criteria for exceedances of the WQTL for DO provided in the Sacramento and San Joaquin Rivers Basin Plan (September 1998, Chapter III, page 5). The Beneficial Use of the immediate downstream waterbody is protective to warm water aquatic life and the WQTL of 5 mg/L for DO should be utilized for this site. Therefore, the DO concentration of 6.61 mg/L measured during August 2014 MPM was not considered to be an exceedance based on the 5.00 mg/L WQTL and DO was not reinstated into the active management plan. The Coalition also reevaluated the SC measurement (799 µmhos/cm) from February 14, 2012 based on the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Basin Plan (Table 2, Page 13). The Basin Plan indicates that detections of SC from September through March are not considered exceedances when they are below 1,000 µmhos/cm; therefore, the value was not considered an exceedance and the constituent will remain removed from the site's active management plan.

Table II-5 is a tally of exceedances of WQTLs from 2006 through September 2014 for management plan constituents in the Lone Tree Creek @ Jack Tone site subwatershed (organized alphabetically by constituent priority). Table II-6 contains detections and WQTL exceedance results of all sampling events since the constituent became part of the site subwatershed management plan. A record of all exceedances since monitoring began in the site subwatershed is provided in Appendix II, Table II-A.

**Table II-5. Lone Tree Creek @ Jack Tone Rd management plan constituent exceedance tally (2004-September 2014).**

Exceedances that occurred during resampling for field parameters and toxicity are included in the tally. Exceedances are organized alphabetically by constituent priority. A complete list of exceedances can be found in Appendix II, Table II-A.

| | Active Management Plan Constituents | | | | | Removed Management Plan Constituents | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Monitoring Year | Chlorpyrifos, >0.015 µg/L | *P. promelas*, (%Control) | Ammonia, Variable[1] or >1.5 mg/L | *E. coli*, >235 MPN/100 mL | pH, <6.5 and >8.5 units | Diazinon, >0.1 µg/L | Copper (Total), Variable[2] or >1300 µg/L | Diuron, >2 µg/L | *H. azteca*, (%Control) | *S. capricornutum*, (%Control) | Dissolved Oxygen, <7 mg/L | Specific Conductivity, >700 µS/cm |
| 2004 | 0 | 0 | NA | 1 | 0 | 0 | NA | NA | 0 | 0 | 1 | 0 |
| 2005 | 2 | 1 | NA | 7 | 1 | 0 | NA | NA | 1 | 1 | 4 | 0 |
| 2006 | 1 | 0 | 0 | 6 | 1 | 0 | 1 | 0 | 1 | 1 | 6 | 0 |
| 2007 | 2 | 0 | 3 | 6 | 0 | 1 | 5 | 2 | 0 | 1 | 1 | 0 |
| 2008 | 1 | 1 | 1 | 6 | 1 | 1 | 1 | 1 | 0 | 4 | 3 | 0 |
| 2009 | 1 | NA | NA | NA | 0 | NA | 0 | NA | NA | 0 | 2 | 0 |
| 2010 | 2 | NA | NA | NA | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2011 | 0 | NA | NA | NA | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2012 | 0 | NA | NA | NA | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2013 | 1 | NA | NA | NA | 0 | NA | NA | NA | NA | NA | 0 | 0 |
| 2014 WY* | 0 | NA | NA | NA | 1 | NA | NA | NA | NA | NA | 1 | 0 |
| **Overall Tally** | **10** | **2** | **4** | **26** | **6** | **2** | **7** | **3** | **2** | **7** | **19** | **0** |
| **Constituent Priority** | **A/B** | **D** | **E** | **E** | **E** | **A/B[R]** | **C[R]** | **C[R]** | **D[R]** | **D[R]** | **E[R]** | **E[R]** |

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

[2] Metal WQTL variable based on hardness.

NA – Not Applicable; monitoring did not occur for this constituent during the year.

[R] – Removed from active management plan.

*2014 includes January through September results only.

**Table II-6. Lone Tree Creek site subwatershed monitoring results for priority A/B - D constituents since management plan initiation.**

Exceedance values are in bold. Resampling (RS) due to toxicity not included in table. MPM results after September 2014 not included in table (grey cells).

| | Month: | Jan | Feb | mar | Apr | May | Jun | Jul | Aug | Sep | | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **2007 NM (@ Jack Tone Rd)** | Date | NA | 2/11/07 | NA | 4/10/07 | 5/22/07 | 6/12/07 | 7/10/07 | 8/07/07 | 9/04/07 | | NA | NA | NA |
| | Chlorpyrifos (µg/L) | NA | **0.052** | NA | <0.003 | <0.003 | 0.011 | **0.035** | <0.003 | <0.003 | | NA | NA | NA |
| **2007 MPM Add. (@ Jack Tone Rd)** | Date | NA | 2/28/07 | NA | NA | NA | NA | 7/30/07 | 8/28/07 | NA | | NA | NA | NA |
| | Copper (µg/L) | NA | **19** | NA | NA | NA | NA | NA | NA | NA | | NA | NA | NA |
| | Chlorpyrifos (µg/L) | NA | NA | NA | NA | NA | NA | 0.01 | <0.003 | NA | | NA | NA | NA |
| **2008 NM (@ Jack Tone Rd)** | Date | 1/23/08 | NA | NA | 4/15/08 | 5/13/08 | 6/10/08 | 7/15/08 | 8/12/08 | 9/16/08 | | NA | NA | NA |
| | Copper (µg/L) | **40** | NA | NA | 3.5 | 4.5 | 3 | 3.6 | 3.5 | 2.2 | | NA | NA | NA |
| | Chlorpyrifos (µg/L) | **1.7** | NA | NA | <0.003 | <0.003 | <0.003 | <0.003 | <0.003 | <0.003 | | NA | NA | NA |
| **2008 MPM US (@ Valley Home Rd)** | Date | NA | NA | NA | NA | 5/13/08 | 6/10/08 | 7/15/08 | 8/12/08 | 9/16/08 | | NA | NA | NA |
| | Copper (µg/L) | NA | NA | NA | NA | 4.6 | 5.7 | **7.0** | 3.7 | 3.8 | | NA | NA | NA |
| | Chlorpyrifos (µg/L) | NA | NA | NA | NA | NA | NA | NA | NA | NA | | NA | NA | NA |
| **2008 MPM US (@ Brennan Rd)** | Date | NA | NA | NA | NA | NA | NA | 7/15/08 | 8/12/08 | 9/16/08 | | NA | NA | NA |
| | Chlorpyrifos (µg/L) | NA | NA | NA | NA | NA | NA | <0.003 | <0.003 | NA | | NA | NA | NA |
| | Copper (µg/L) | NA | NA | NA | NA | NA | NA | 3.8 | 3.3 | 2.9 | | NA | NA | NA |
| **2009 MPM (@ Jack Tone Rd)** | Date | NA | NA | NA | 4/14/09 | 5/12/09 | NA | 7/14/09 | 8/11/09 | 9/15/09 | | NA | NA | NA |
| | Copper, dissolved(µg/L) | NA | NA | NA | NA | NA | NA | 2.3 | 2.7 | 1.5 | | NA | NA | NA |
| | Copper, total (µg/L) | NA | NA | NA | NA | NA | NA | 3.6 | 4.4 | 2.2 | | NA | NA | NA |
| | Chlorpyrifos (µg/L) | NA | NA | NA | NA | NA | NA | <0.003 | **0.100** | NA | | NA | NA | NA |
| | *S. capricornutum* toxicity (% Control) | NA | NA | NA | 778 | 584 | NA | NA | NA | NA | | NA | NA | NA |
| **2010 MPM (@ Jack Tone Rd)** | Date | 1/13/10 | 2/9/10 | 3/16/10 | 4/13/10 | 5/11/10 | 6/8/10 | 7/13/10 | 8/10/10 | 9/7/10 | 9/14/10 | 10/12/10 | 11/9/10 | 12/7/10 |
| | Copper, dissolved(µg/L) | 7 | 8.7 | NA | NA | NA | NA | 2.2 | 2.3 | 2.8 | NA | NA | NA | NA |
| | Copper, total (µg/L) | 26 | 17 | NA | NA | NA | NA | 3.4 | 3.7 | 4.1 | NA | NA | NA | NA |
| | Chlorpyrifos (µg/L) | **1.1** | <0.003 | NA | NA | NA | <0.003* | **0.27** | 0.015 | 0.0086* | NA | <0.003* | <0.003* | <0.003* |
| | Diazinon (µg/L) | 0.074 | <0.004 | NA | NA | NA | <0.004* | <0.004* | <0.004* | <0.004* | NA | <0.004* | <0.004* | <0.004* |
| | Diuron (µg/L) | 0.51 | 0.26 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | *S. capricornutum* toxicity (% Control) | 636 | 860 | 922 | 2028 | 1305 | NA | NA | NA | NA | NA | NA | NA | NA |
| | *H. azteca* toxicity (% Control) | NA | NA | NA | NA | NA | NA | NA | NA | NA | 103* | NA | NA | NA |
| **2011 MPM (@ Jack Tone Rd)** | Date | 1/11/11 | 2/8/11 | 3/8/11 | 4/12/11 | 5/24/11 | NA | 7/26/11 | 8/23/11 | 9/20/11 | | 10/14/11 | NA | NA |
| | Copper, dissolved(µg/L) | 5.2 | 5 | NA | NA | NA | NA | 1.5 | 1.2 | 1.9 | | NA | NA | NA |
| | Copper, total (µg/L) | 10 | 6 | NA | NA | NA | NA | 2.2 | 2.3 | 3.0 | | NA | NA | NA |
| | Chlorpyrifos (µg/L) | <0.003 | <0.003 | NA | NA | NA | NA | <0.003 | <0.003 | NA | | NA | NA | NA |
| | Diazinon (µg/L) | <0.004 | <0.004 | NA | NA | NA | NA | NA | NA | NA | | NA | NA | NA |
| | Diuron (µg/L) | 1.1 | 0.37 | NA | NA | NA | NA | NA | NA | NA | | NA | NA | NA |
| | *S. capricornutum* toxicity (% Control) | 638 | 1131 | 766 | 1693 | 1212 | NA | NA | NA | NA | | NA | NA | NA |
| | *H. azteca* toxicity (% Control) | NA | NA | 100 | NA | NA | NA | NA | NA | NA | | 98 | NA | NA |

| | Month: | Jan | Feb | mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **2012 MPM (@ Jack Tone Rd)** | Date | 1/17/12 | 2/14/12 | 3/15/12 | 4/12/12 | 5/16/12 | NA | 7/17/12 | 8/21/12 | NA | NA | NA | NA |
| | Copper, dissolved(µg/L) | 1.9 | 3.1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | Copper, total (µg/L) | 4.7 | 18 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | Chlorpyrifos (µg/L) | <0.003 | <0.003 | NA | NA | NA | NA | <0.003 | <0.003 | NA | NA | NA | NA |
| | Diazinon (µg/L) | <0.004 | <0.004 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | Diuron (µg/L) | <0.2 | <0.2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | *S. capricornutum* toxicity (% Control) | 2448 | 116 | 186 | 419 | 620 | NA | NA | NA | NA | NA | NA | NA |
| | *H. azteca* toxicity (% Control) | NA | NA | 105 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| **2013 MPM (@ Jack Tone Rd)** | Date | 1/15/13 | 2/21/13 | NA | NA | NA | NA | 7/16/13 | 8/20/13 | NA | | | |
| | Chlorpyrifos (µg/L) | <0.003 | <0.003 | NA | NA | NA | NA | **0.026** | <0.003 | NA | | | |
| **2014 MPM (@ Jack Tone Rd)** | Date | 1/28/14 | 2/11/14 | NA | NA | NA | NA | 7/15/14 | 8/19/14 | NA | | | |
| | Chlorpyrifos (µg/L) | <0.003 | <0.003 | NA | NA | NA | NA | <0.003 | <0.003 | NA | | | |

Add. – Additional Monitoring, conducted in 2007 only.
MPM – Management Plan Monitoring.
NA – Not applicable. No monitoring occurred on this date for this constituent.
NM – Normal Monitoring.
US – Upstream Monitoring, conducted in 2008 only.
*Additional Department of Pesticide Regulation (DPR) grant monitoring.

## Source Identification and Outreach

The Coalition evaluated PUR data and past monitoring results to determine the sources of constituents listed in the Lone Tree Creek @ Jack Tone Rd management plan. Sourcing analyses for past exceedances of management plan constituents are evaluated in past years' site subwatershed appendices. From January through September 2014, there were no exceedances of the WQTL for chlorpyrifos. Since there were no exceedances of sourceable constituents, a sourcing analysis was not included.

The remaining active management plan constituents include ammonia, *E. coli,* pH, and toxicity to *P. promelas*. Of these, only pH was monitored from January through September 2014 and resulted in a single exceedance in February. The priority E constituent, pH, is non-conserved meaning it can increase or decrease as water moves downstream, which makes it difficult to sources exceedances of the WQTL. Changes in the value of this parameter can result from processes that occur on the land surface, in the water column, and in the sediment.

Priority A/B, C, and D constituents are associated with pesticide applications to assist in determining potential sources of water quality impairments and focusing outreach efforts. However, all management plan constituents are discussed during Coalition focused outreach including implemented management practices to reduce agricultural discharge of constituents of concern.

Focused outreach to document current management practices and track implementation of additional management practices in this site subwatershed began in 2008 and continued through 2010. The Coalition contacted 46 targeted growers farming 4,691 acres within the site subwatershed (2010 MPUR, Page 23). The Coalition recommended management practices to reduce agricultural discharges which included reduction of application rates, alternative material application, spot treating, sprinkler or microspray irrigation, retention pond/hold basin construction, grass waterways or grass filter strip construction, reducing water volumes using irrigation management, and treating runoff waters with PAM or other materials.

Three of the 46 growers were removed from the targeted grower list due to no use of pesticides; therefore, 43 targeted growers farming 3,742 irrigated acres participated in follow-up surveys to document current and newly implemented practices (2011 MPUR, Page 49-53). The most common implemented practices were reducing pesticide use, installing sprinklers or micro irrigation, and managing irrigation to reduce runoff volumes.

During 2012, the Coalition targeted two new growers using chlorpyrifos for additional outreach and education on reducing chlorpyrifos use or using alternatives to chlorpyrifos; results from these contacts were included in the overall assessment of new management practices implemented within first priority site subwatersheds (2012 MPUR, Page 48).

## Evaluation

Overall, water quality has improved since focused outreach began in the Lone Tree Creek @ Jack Tone Rd site subwatershed. Due to improved water quality, the Coalition received approval to remove copper, diazinon, diuron, SC, water column toxicity to *S. capricornutum*, and sediment toxicity to *H. azteca* from the active management plan on May 21, 2012 and DO on February 27, 2013. The remaining constituents in the active management plan are ammonia, chlorpyrifos, *E. coli*, pH, TDS, and water column toxicity to *P. promelas*.

## Next Steps

Focused outreach is completed within this site subwatershed; the Coalition will continue to conduct general outreach. In 2015, Lone Tree Creek @ Jack Tone Rd is classified as a Represented site and is scheduled for MPM during months of past exceedances for chlorpyrifos and water column toxicity to *P. Promelas*. Since pH is a field parameter, it will be measured during all monitoring events.

# III. UNNAMED DRAIN TO LONE TREE CREEK @ JACK TONE RD

## Overview

Unnamed Drain to Lone Tree Creek @ Jack Tone Rd is one of the Coalition's first priority site subwatersheds. The Coalition completed the focused outreach portion of its management plan strategy in the site subwatershed in 2012 (including additional outreach), and monitoring results through September 2014 indicate improved water quality. The Coalition received approval to remove simazine and water column toxicity to *C. dubia* and *S. capricornutum* from the active management plan on May 21, 2012, and petitioned to remove SC on June 9, 2014 after three years of no exceedances. The remaining constituents in the site subwatershed management plan include chlorpyrifos, copper, diuron, DO, *E. coli*, lead, SC, TDS, and sediment toxicity to *H. azteca* (Table III-1).

In addition to focused outreach from 2008 through 2010, the Coalition conducted additional focused outreach with two new growers in 2012 to address continued chlorpyrifos use.

From January through September 2014, the Coalition conducted MPM for chlorpyrifos, copper, diuron, and sediment toxicity to *H. azteca*. No high priority management plan constituents exceeded the WQTLs since 2013, and thus demonstrating an improvement in water quality in the site subwatershed.

In 2015, Unnamed Drain to Lone Tree Creek @ Jack Tone Rd is classified as a Represented site and MPM will continue for chlorpyrifos, copper, diuron and sediment toxicity to *H. azteca*. The field parameters DO and SC will be measured during all high priority MPM events.

**Table III-1. Unnamed Drain to Lone Tree Creek @ Jack Tone Rd management plan constituents.**
Management plan initiation year refers to when the site and constituent are addressed in the SJCDWQC MPURs and in the Management Plan Progress Report sections of the Annual Reports.

| PRIORITY | CONSTITUENT | MANAGEMENT PLAN INITIATION YEAR | MANAGEMENT PLAN REMOVAL YEAR |
|---|---|---|---|
| A/B | Chlorpyrifos | 2007 | Active |
| C | Copper | 2009 | Active |
| C | Diuron | 2008 | Active |
| D | *H. azteca* sediment toxicity | 2009 | Active |
| E | Dissolved Oxygen | 2007 | Active |
| E | *E. coli* | 2008 | Active |
| E | Lead | 2009 | Active |
| E | Specific Conductivity | 2008 | Active |
| E | Total Dissolved Solids | 2008 | Active |
| **CONSTITUENT (REMOVED)** | | | |
| C | Simazine | 2009 | 2012 |
| D | *C. dubia* water column toxicity | 2009 | 2012 |
| D | *S. capricornutum* water column toxicity | 2008 | 2012 |

## Description of Site Subwatershed

The Unnamed Drain to Lone Tree Creek @ Jack Tone Rd (also known as Temple Creek) site subwatershed is a rotating Assessment Monitoring location in Zone 2 under the 2008 MRPP. The site subwatershed consists of 27,900 irrigated acres which includes rice, grains, vineyards, and pasture (Figure III-1). The drain forms in the eastern portion of San Joaquin County, flows west, and eventually confluences with Lone Tree Creek just west of Jack Tone Road. Unnamed Drain to Lone Tree Creek subwatershed includes an upstream sample location, Unnamed Drain to Lone Tree Creek @ Wagner Rd (Table III-2).

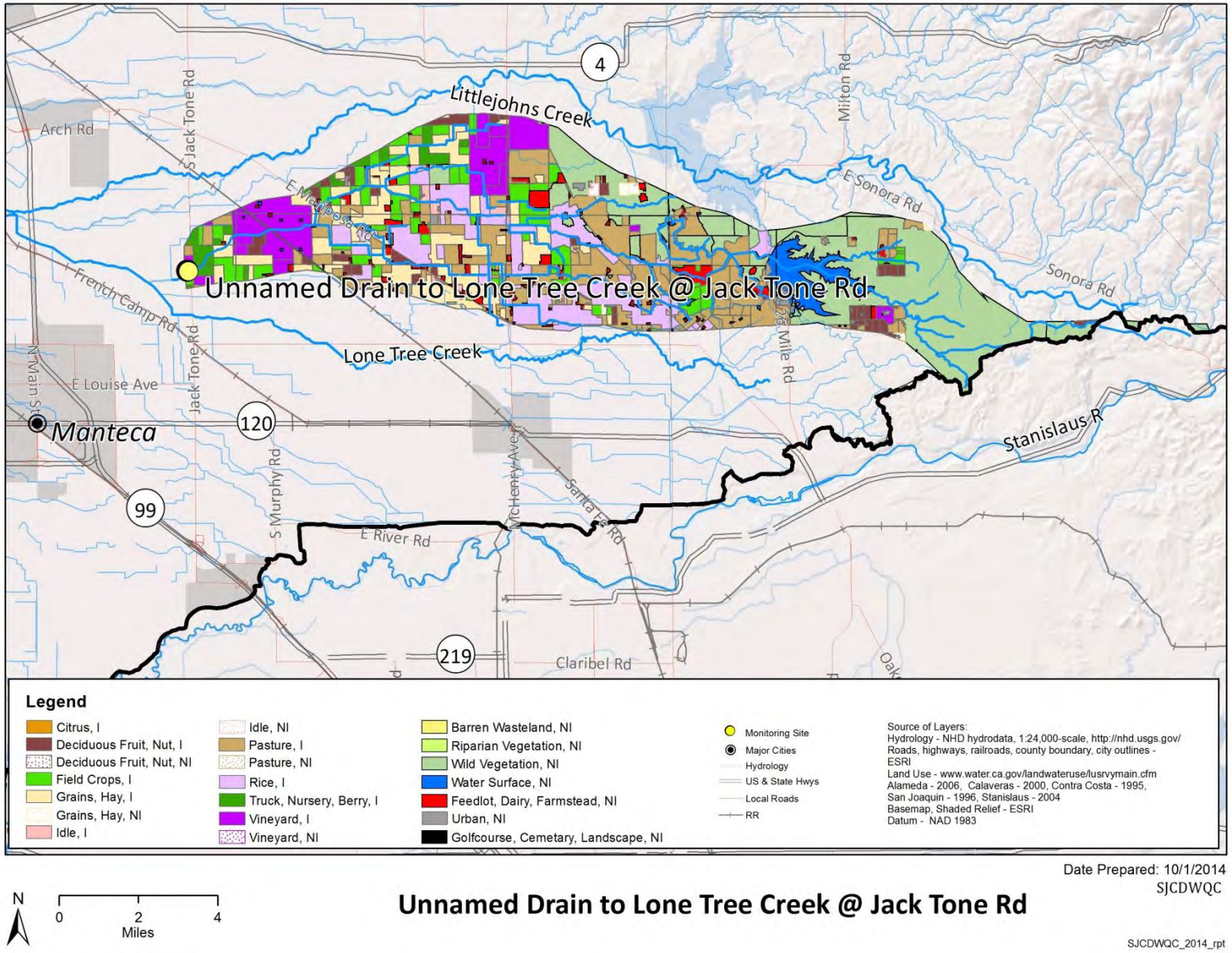
Unnamed Drain to Lone Tree Creek (Temple Creek) is listed on California's 303(d) List of Impaired Waterbodies for ammonia and electrical conductivity with the potential source listed as dairies (last updated in 2010).

**Table III-2. Unnamed Drain to Lone Tree Creek site subwatershed sampling locations and coordinates.**

| Site Name | Station Code | Target Latitude | Target Longitude |
|---|---|---|---|
| Unnamed Drain to Lone Tree Creek @ Wagner Rd[US] | 531UDLTWR | 37.87085 | -121.09109 |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd* | 531UDLTAJ | 37.85360 | -121.14570 |

[US] Upstream site
*Original SJCDWQC sampling site

**Figure III-1. Unnamed Drain to Lone Tree Creek @ Jack Tone Rd site subwatershed land use map.**



## Subwatershed Monitoring History

Normal Monitoring began at Unnamed Drain to Lone Tree Creek @ Jack Tone Rd during the irrigation season of 2006 and continued through September 2008, at which time the site became an Assessment Monitoring location. Table III-3 contains the number of events monitored per year and the constituents (by group) from 2008 through September 2014.

The Coalition initiated MPM during the irrigation season in 2007 and continued through September 2014 (Table III-4). In an effort to source past exceedances, additional MPM for chlorpyrifos occurred at the site in 2007 and at an upstream monitoring location, Unnamed Drain to Lone Tree Creek @ Wagner Rd in 2008. Since 2008, MPM for high priority constituents occurred during months of past exceedances (Table III-4). There were no detections of chlorpyrifos, diuron, or simazine; load information for those constituents can be found in the 2014 MPUR, Appendix I, Table III-7.

**Table III-3. Unnamed Drain to Lone Tree Creek @ Jack Tone Rd sampling events and analyses per year.**
Only environmental samples are counted.

| TYPE | ANALYTE | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|---|
| Sampling Events | Events Scheduled | 14 | 6 | 12 | 12 | 11 | 11 | 9 |
| | Dry Sites | 0 | 0 | 0 | 1 | 0 | 1 | 0 |
| | Events Sampled | 14 | 6 | 12 | 11 | 11 | 10 | 9 |
| | | | | | | | | |
| Field and Physical Parameters | BOD | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Color | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Dissolved Oxygen | 14 | 6 | 12 | 11 | 11 | 10 | 9 |
| | Dissolved Solids | 8 | 0 | 0 | 0 | 0 | 0 | 0 |
| | *E. coli* | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Grain size (sediment) | 0 | 0 | 1 | 2 | 1 | 2 | 2 |
| | Hardness as CaCO3 | 6 | 5 | 5 | 5 | 5 | 5 | 5 |
| | pH | 14 | 6 | 12 | 11 | 11 | 10 | 9 |
| | Specific Conductivity | 14 | 6 | 12 | 11 | 11 | 10 | 9 |
| | Suspended Solids | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Total Organic Carbon | 7 | 0 | 1 | 2 | 0 | 0 | 0 |
| | Total Organic Carbon (sediment) | 7 | 0 | 1 | 2 | 2 | 2 | 2 |
| | Turbidity | 8 | 0 | 0 | 0 | 0 | 0 | 0 |
| Nutrients | Ammonia as N | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Nitrate + Nitrite as N | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Nitrate as N | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Nitrite as N | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Nitrogen, Total Kjeldahl | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Orthophosphate as P | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Phosphate as P | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| Metals (Dissolved) | Cadmium | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Copper | 0 | 5 | 5 | 5 | 5 | 5 | 5 |
| | Lead | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Nickel | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Zinc | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Metals (Total) | Arsenic | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Boron | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cadmium | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Copper | 6 | 5 | 5 | 5 | 5 | 5 | 5 |
| | Lead | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Molybdenum | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Nickel | 6 | 0 | 0 | 0 | 0 | 0 | 0 |

| Type | Analyte | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|---|
| | Selenium | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Zinc | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| Carbamates | Aldicarb | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Carbaryl | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Carbofuran | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Diuron | 7 | 0 | 2 | 2 | 2 | 1 | 2 |
| | Linuron | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Methiocarb | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Methomyl | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Oxamyl | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| Group A Pesticides | Aldrin | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Chlordane | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Endosulfan I | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Endosulfan II | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | HCH, alpha | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | HCH, beta | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | HCH, delta | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | HCH, gamma | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Heptachlor | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Heptachlor epoxide | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Toxaphene | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Herbicides | Atrazine | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cyanazine | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Glyphosate | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Paraquat | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Simazine | 7 | 0 | 2 | 2 | 2 | 0 | 0 |
| | Trifluralin | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Organochlorines | DDD(p,p') | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | DDE(p,p') | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | DDT(p,p') | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Dicofol | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Dieldrin | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Endrin | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Methoxychlor | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| Organophosphates | Azinphos methyl | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Chlorpyrifos | 7 | 4 | 10 | 8 | 9 | 8 | 7 |
| | Demeton-s | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Diazinon | 7 | 0 | 7 | 2 | 0 | 0 | 0 |
| | Dichlorvos | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Dimethoate | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Disulfoton | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Malathion | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Methamidophos | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Methidathion | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Molinate | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Parathion, Methyl | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Phorate | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Phosmet | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Thiobencarb | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pyreth-roids | Bifenthrin | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cyfluthrin, total | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cyhalothrin, lambda, total | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cypermethrin, total | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Esfenvalerate/Fenvalerate, total | 7 | 0 | 0 | 0 | 0 | 0 | 0 |

| Type | Analyte | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|---|
| | Permethrin, total | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sediment Pesticides | Bifenthrin | 0 | 0 | 1 | 2 | 1 | 0 | 0 |
| | Chlorpyrifos | 0 | 0 | 1 | 2 | 1 | 0 | 0 |
| | Cyfluthrin | 0 | 0 | 1 | 2 | 1 | 0 | 0 |
| | Cyhalothrin, lambda | 0 | 0 | 1 | 2 | 1 | 0 | 0 |
| | Cypermethrin | 0 | 0 | 1 | 2 | 1 | 0 | 0 |
| | Deltamethrin: Tralomethrin | 0 | 0 | 1 | 2 | 1 | 0 | 0 |
| | Esfenvalerate/ Fenvalerate | 0 | 0 | 1 | 2 | 1 | 0 | 0 |
| | Fenpropathrin | 0 | 0 | 1 | 2 | 1 | 0 | 0 |
| | Permethrin | 0 | 0 | 1 | 2 | 1 | 0 | 0 |
| Toxicity | *Ceriodaphnia dubia* | 9 | 1 | 3 | 3 | 2 | 0 | 0 |
| | *Pimephales promelas* | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | *Selenastrum capricornutum* | 8 | 1 | 3 | 3 | 3 | 0 | 0 |
| | *Hyalella azteca* | 4 | 0 | 1 | 2 | 2 | 2 | 2 |

**Table III-4. Unnamed Drain to Lone Tree Creek Management Plan Monitoring schedule (2007-September 2014).**

| Site Name | Sample Date | Monitoring Type | Copper | Chlorpyrifos | Diazinon | Diuron | Simazine | *C. dubia* | *S. capricornutum* | *H. azteca* |
|---|---|---|---|---|---|---|---|---|---|---|
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | 07/30/07 | Add. | | X | | | | | | |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | 09/25/07 | Add. | | X | | | | | | |
| Unnamed Drain to Lone Tree Creek @ Wagner Rd | 07/15/08 | US | | X | | | | | | |
| Unnamed Drain to Lone Tree Creek @ Wagner Rd | 09/16/08 | US | | X | | | | | | |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | 04/14/09 | MPM | X | | | | | | | |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | 05/12/09 | MPM | X | X | | | | | X | |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | 06/09/09 | MPM | | X | | | | | | |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | 07/14/09 | MPM | X | X | | | | | | |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | 08/11/09 | MPM | X | | | | | | | |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | 09/15/09 | MPM | X | X | | | | X | | |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | 01/13/10 | MPM | | X | | X | X | X | | |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | 02/09/10 | MPM | | X | | X | X | X | X | |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | 03/16/10 | MPM | | | | | | | X | |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | 04/13/10 | MPM | X | | | | | | | |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | 05/11/10 | MPM | X | X | | | | | X | |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | 06/08/10 | MPM | | X[1] | X[2] | | | | | |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | 07/13/10 | MPM | X | X[1] | X[2] | | | | | |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | 08/10/10 | MPM | X | X[2] | X[2] | | | | | |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | 09/07/10 | MPM | X | X[1] | X[2] | | | X | | X[1] |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | 10/12/10 | MPM | | X[2] | X[2] | | | | | |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | 11/09/10 | MPM | | X[2] | X[2] | | | | | |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | 12/07/10 | MPM | | X[2] | X[2] | | | | | |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | 01/11/11 | MPM | | X[1] | X[2] | X | X | X | | |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | 02/08/11 | MPM | | X[1] | X[2] | X | X | X | X | |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | 03/08/11 | MPM | | | | | | | X | X |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | 04/12/11 | MPM | X | | | | | | | |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | 05/24/11 | MPM | X | X | | | | | X | |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | 06/28/11 | MPM | | X | | | | | | |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | 07/26/11 | MPM | X | X | | | | | | |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | 08/23/11 | MPM | X | X | | | | | | |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | 09/20/11 | MPM | X | X | | | | X | | |

| Site Name | Sample Date | Monitoring Type | Copper | Chlorpyrifos | Diazinon | Diuron | Simazine | *C. dubia* | *S. capricornutum* | *H. azteca* |
|---|---|---|---|---|---|---|---|---|---|---|
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | 10/14/11 | MPM | | | | | | | | X |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | 11/15/11 | MPM | | X | | | | | | |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | 12/13/11 | MPM | | X | | | | | | |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | 01/17/12 | MPM | | X | | X | X | X | | |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | 02/14/12 | MPM | | X | | X | X | X | X | |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | 03/15/12 | MPM | | | | | | | X | X |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | 04/12/12 | MPM | X | | | | | | | |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | 05/16/12 | MPM | X | X | | | | | X | |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | 06/19/12 | MPM | | X | | | | | | |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | 07/17/12 | MPM | X | X | | | | | | |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | 08/21/12 | MPM | X | X | | | | | | |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | 09/18/12 | MPM | X | X | | | | | | X |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | 11/06/12 | MPM | | X | | | | | | |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | 12/03/12 | MPM | | X | | | | | | |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | 01/15/13 | MPM | | X | | X | | | | |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | 02/21/13 | MPM | | X | | X | | | | |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | 03/19/13 | MPM | | | | | | | | X |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | 04/02/13 | MPM | X | | | | | | | |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | 05/21/13 | MPM | X | X | | | | | | |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | 06/18/13 | MPM | | X | | | | | | |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | 07/16/13 | MPM | X | X | | | | | | |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | 08/20/13 | MPM | X | X | | | | | | |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | 09/17/13 | MPM | X | X | | | | | | X |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | 11/12/13 | MPM | | X | | | | | | |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | 12/10/13 | MPM | | X | | | | | | |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | 01/28/14 | MPM | | X | | X | | | | |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | 02/11/14 | MPM | | X | | X | | | | |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | 03/03/14 | MPM | | | | | | | | X |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | 04/15/14 | MPM | X | | | | | | | |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | 05/20/14 | MPM | X | X | | | | | | |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | 06/17/14 | MPM | | X | | | | | | |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | 07/15/14 | MPM | X | X | | | | | | |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | 08/19/14 | MPM | X | X | | | | | | |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | 09/16/14 | MPM | X | X | | | | | | X |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | 01/28/14 | MPM | | X | | X | | | | |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | 02/11/14 | MPM | | X | | X | | | | |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | 03/05/14 | MPM | | | | | | | | X |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | 04/15/14 | MPM | X | | | | | | | |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | 05/20/14 | MPM | X | X | | | | | | |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | 06/17/14 | MPM | | X | | | | | | |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | 07/15/14 | MPM | X | X | | | | | | |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | 08/19/14 | MPM | X | X | | | | | | |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | 09/16/14 | MPM | X | X | | | | | | X |

[1] MPM and Department of Pesticide Regulation (DPR) grant monitoring.
[2] DPR grant monitoring only.
Add. – Additional sampling.
US – Upstream sampling.
X – Constituent sampled for Management Plan Monitoring (MPM).

## Monitoring Results

From January through September 2014, MPM occurred at Unnamed Drain to Lone Tree Creek @ Jack Tone Rd for chlorpyrifos, copper, diuron, and sediment toxicity to *H. azteca*; no exceedances of the WQTLs or toxicity occurred (Table III-5). There were five detections of copper, but none exceeded the WQTL. The priority E constituents DO and SC were monitored during all MPM events through September 2014; one exceedance of the WQTL for DO occurred in April 2014 (Table III-5).

Table III-5 is a tally of yearly exceedances of WQTLs from 2006 through September 2014 for management plan constituents in this site subwatershed (organized alphabetically by constituent priority). Table III-6 contains detections and WQTL exceedance results of all sampling events since the constituent became part of the site subwatershed management plan. Table III-7 contains the instantaneous loads for copper since monitoring began in the site subwatershed. A record of all exceedances since monitoring began is provided in Appendix II, Table III-A.

**Table III-5. Unnamed Drain to Lone Tree Creek @ Jack Tone Rd management plan constituent exceedance tally (2006-September 2014).**

Exceedances that occurred during resampling for field parameters and toxicity are included in the tally Exceedances are organized alphabetically by constituent priority. A complete list of exceedances can be found in Appendix II, Table III-A.

| | Active Management Plan Constituents | | | | | | | | | | Removed Management Plan Constituents | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Monitoring Year | Chlorpyrifos, >0.015 µg/L | Copper (Dissolved), Variable[1] | Copper (Total), Variable[1] or >1300 µg/L | Diuron, >2 µg/L | *H. azteca*, (%Control) | Dissolved Oxygen, <7 mg/L | *E. coli*, >235 MPN/100 mL | Lead (Total), variable[1] or > 15 µg/L | Specific Conductivity, >700µS/cm | Total Dissolved Solids, >450 mg/L | Simazine, >4 µg/L | *C. dubia*, (%Control) | *S. capricornutum*, (%Control) |
| 2006 | 2 | NA | NA | 0 | 0 | 2 | 1 | NA | 0 | 0 | 0 | 0 | 0 |
| 2007 | 3 | NA | NA | 2 | 1 | 0 | 4 | NA | 2 | 1 | 1 | 1 | 4 |
| 2008 | 5 | NA | 5 | 1 | 3 | 2 | 5 | 2 | 0 | 0 | 1 | 3 | 1 |
| 2009 | 3 | 0 | 0 | NA | NA | 1 | NA | NA | 0 | 0 | NA | 1 | 0 |
| 2010 | 3 | 1 | 0 | 0 | 1 | 1 | NA | NA | 0 | 0 | 0 | 0 | 0 |
| 2011 | 2 | 1 | 0 | 0 | 2 | 0 | NA | NA | 1 | 0 | 0 | 0 | 0 |
| 2012 | 1 | 0 | 0 | 1 | 1 | 1 | NA | NA | 0 | 0 | 0 | 0 | 0 |
| 2013 | 1 | 0 | 0 | 0 | 1 | 2 | NA | NA | 0 | NA | NA | NA | NA |
| 2014 WY* | 0 | 0 | 0 | 0 | 0 | 1 | NA | NA | 0 | NA | NA | NA | NA |
| **Overall Tally** | **20** | **2** | **5** | **4** | **9** | **10** | **10** | **2** | **3** | **1** | **2** | **5** | **5** |
| **Constituent Priority** | **A/B** | **C** | **C** | **C** | **D** | **E** | **E** | **E** | **E** | **E** | **C[R]** | **D[R]** | **D[R]** |

[1] Metal WQTL variable based on hardness.
NA – Not Applicable; monitoring for constituent did not occur.
[R] – Removed from active management plan.
*2014 includes January through September results only.

**Table III-6. Unnamed Drain to Lone Tree Creek @ Jack Tone Rd site subwatershed monitoring results for priority A/B - D constituents since management plan initiation.**

Exceedance values are in bold. Resampling (RS) due to toxicity not included in table. MPM results after September 2014 not included in table (grey cells).

| | Month: | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **2007 NM (@ Jack Tone Rd)** | Date | NA | 2/11/07 | NA | 4/10/07 | 5/22/07 | 6/12/07 | 7/10/07 | 8/07/07 | 9/04/07 | NA | NA | NA |
| | Chlorpyrifos (µg/L) | NA | **0.048** | NA | <0.003 | <0.003 | <0.003 | **0.034** | <0.003 | <0.003 | NA | NA | NA |
| **2007 MPM Add. (@ Jack Tone Rd)** | Date | NA | NA | NA | NA | NA | NA | 7/30/07 | NA | 9/25/07 | NA | NA | NA |
| | Chlorpyrifos (µg/L) | NA | NA | NA | NA | NA | NA | 0.014 | NA | **0.017** | NA | NA | NA |
| **2008 NM (@ Jack Tone Rd)** | Date | 1/23/08 | NA | NA | 4/15/08 | 5/13/08 | 6/10/08 | 7/15/08 | 8/12/08 | 9/16/08 | NA | NA | NA |
| | Chlorpyrifos (µg/L) | **0.045** | NA | NA | <0.003 | **0.410** | **0.120** | **0.028** | 0.014 | **0.120** | NA | NA | NA |
| **2008 MPM US (@ Wagner Rd)** | Date | NA | NA | NA | NA | NA | NA | 7/15/08 | NA | 9/16/08 | NA | NA | NA |
| | Chlorpyrifos (µg/L) | NA | NA | NA | NA | NA | NA | <0.003 | NA | **0.140** | NA | NA | NA |
| **2009 MPM (@ Jack Tone Rd)** | Date | NA | NA | NA | 4/14/09 | 5/12/09 | 6/09/09 | 7/14/09 | 8/11/09 | 9/15/09 | NA | NA | NA |
| | Copper, dissolved (µg/L) | NA | NA | NA | 4.3 | 5.0 | NA | 1.5 | 1.5 | 2.5 | NA | NA | NA |
| | Copper, total (µg/L) | NA | NA | NA | 8.5 | 7.3 | NA | 4.6 | 3.8 | 5.0 | NA | NA | NA |
| | Chlorpyrifos (µg/L) | NA | NA | NA | NA | **0.032** | <0.003 | **0.660** | NA | **0.086** | NA | NA | NA |
| | *C. dubia* toxicity (% Control) | NA | NA | NA | NA | NA | NA | NA | NA | **30** | NA | NA | NA |
| | *S. capricornutum* toxicity (% Control) | NA | NA | NA | NA | 500 | NA | NA | NA | NA | NA | NA | NA |
| **2010 MPM (@ Jack Tone Rd)** | Date | 1/13/10 | 2/9/10 | 3/16/10 | 4/13/10 | 5/11/10 | 6/8/10 | 7/13/10 | 8/10/10 | 9/7/10 | 10/12/10 | 11/9/10 | 12/7/10 |
| | Copper, dissolved (µg/L) | NA | NA | NA | **5.5** | 2.1 | NA | 0.81 | 2.3 | 1.9 | NA | NA | NA |
| | Copper, total (µg/L) | NA | NA | NA | 11 | 4.3 | NA | 5 | 4.7 | 4.9 | NA | NA | NA |
| | Chlorpyrifos (µg/L) | <0.003 | <0.003 | NA | NA | <0.003 | <0.003 | 0.008 | **0.039*** | 0.013 | <0.003* | **0.052*** | **0.068*** |
| | Diazinon (µg/L) | NA | NA | NA | NA | NA | <0.004* | <0.004* | <0.004* | <0.004* | <0.004* | <0.004* | <0.004* |
| | Diuron (µg/L) | 0.62 | 0.26 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | Simazine (µg/L) | 0.69 | 0.66 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | *C. dubia* toxicity (% Survival) | 100 | 100 | NA | NA | NA | NA | NA | NA | 95 | NA | NA | NA |
| | *S. capricornutum* toxicity (% Control) | NA | 807 | 1394 | NA | 1107 | NA | NA | NA | NA | NA | NA | NA |
| | *H. azteca* toxicity (% Control) | NA | NA | NA | NA | NA | NA | NA | NA | **76** | NA | NA | NA |
| **2011 MPM (@ Jack Tone Rd)** | Date | 1/11/11 | 2/8/11 | 3/8/11 | 4/12/11 | 5/24/11 | 6/28/11 | 7/26/11 | 8/23/11 | 9/20/11 | 10/14/11 | 11/15/11 | 12/13/11 |
| | Copper, dissolved (µg/L) | NA | NA | NA | 3.2 | **11** | NA | 2.1 | 1.7 | 2.7 | NA | NA | NA |
| | Copper, total (µg/L) | NA | NA | NA | 7.6 | 26 | NA | 5.7 | 4.7 | 5.2 | NA | NA | NA |
| | Chlorpyrifos (µg/L) | **0.020** | <0.003 | NA | NA | <0.003 | <0.003 | **0.028** | <0.003 | <0.003 | NA | <0.003 | Dry |
| | Diazinon (µg/L) | <0.004* | <0.004* | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | Diuron (µg/L) | <0.2 | 0.25 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | Simazine (µg/L) | <0.08 | 0.37 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | *C. dubia* toxicity (% Survival) | 100 | 100 | NA | NA | NA | NA | NA | NA | 100 | NA | NA | NA |
| | *S. capricornutum* toxicity (% Control) | NA | 1101 | 484 | NA | 1341 | NA | NA | NA | NA | NA | NA | NA |

| | Month: | Jan | Feb | mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *H. azteca* toxicity (% Control) | NA | NA | **33** | NA | NA | NA | NA | NA | NA | **46** | NA | NA |
| **2012 MPM (@ Jack Tone Rd)** | Date | 1/17/12 | 2/14/12 | 3/15/12 | 4/12/12 | 5/16/12 | 6/19/12 | 7/17/12 | 8/21/12 | 9/18/12 | NA | 11/6/12 | 12/3/12 |
| | Copper, dissolved (µg/L) | NA | NA | NA | 4.4 | 2.3 | NA | 2.3 | 1.6 | 2.2 | NA | NA | NA |
| | Copper, total (µg/L) | NA | NA | NA | 9.4 | 4.8 | NA | 7.6 | 4.8 | 6.5 | NA | NA | NA |
| | Chlorpyrifos (µg/L) | <0.003 | <0.003 | NA | NA | <0.003 | <0.003 | <0.003 | <0.003 | <0.003 | NA | <0.003 | **0.019** |
| | Diuron (µg/L) | 0.46 | **2.4** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | Simazine (µg/L) | <0.08 | 0.42 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | *C. dubia* toxicity (% Survival) | 100 | 100 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | *S. capricornutum* toxicity (% Control) | NA | 576 | 143 | NA | 585 | NA | NA | NA | NA | NA | NA | NA |
| | *H. azteca* toxicity (% Control) | NA | NA | 106 | NA | NA | NA | NA | NA | **10** | NA | NA | NA |
| **2013 MPM (@ Jack Tone Rd)** | Date | 1/15/13 | 2/21/13 | 3/19/13 | 4/2/13 | 5/21/13 | 6/18/13 | 7/16/13 | 8/20/13 | 9/17/13 | NA | 11/19/13 | 12/17/13 |
| | Copper, dissolved (µg/L) | NA | NA | NA | 4.4 | 3.4 | NA | 1.6 | 1.9 | 2.9 | NA | NA | NA |
| | Copper, total (µg/L) | NA | NA | NA | 6.4 | 6.5 | NA | 4.6 | 4.9 | 5.6 | NA | NA | NA |
| | Chlorpyrifos (µg/L) | <0.003 | DRY | NA | NA | <0.003 | <0.003 | **0.041** | 0.011 | <0.003 | NA | <0.003 | <0.003 |
| | Diuron (µg/L) | <0.2 | DRY | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | *H. azteca* toxicity (% Control) | NA | NA | **94** | NA | NA | NA | NA | NA | 94 | NA | NA | NA |
| **2014 MPM (@ Jack Tone Rd)** | Date | 1/28/14 | 2/11/14 | 3/05/14 | 4/15/14 | 5/20/14 | 6/17/14 | 7/15/14 | 8/19/14 | 9/16/14 | | | |
| | Copper, dissolved (µg/L) | NA | NA | NA | 2 | 2.1 | NA | 1.4 | 0.97 | 1.2 | | | |
| | Copper, total (µg/L) | NA | NA | NA | 8.4 | 8.9 | NA | 4.4 | 3.6 | 3.6 | | | |
| | Chlorpyrifos (µg/L) | <0.003 | <0.003 | NA | NA | <0.003 | <0.003 | <0.003 | <0.003 | <0.003 | | | |
| | Diuron (µg/L) | <0.2 | <0.2 | NA | NA | NA | NA | NA | NA | NA | | | |
| | *H. azteca* toxicity (% Control) | NA | NA | 96 | NA | NA | NA | NA | NA | 94 | | | |

Add. – Additional Monitoring, conducted in 2007 only.
MPM – Management Plan Monitoring.
NA – Not applicable. No monitoring occurred on this date for this constituent.
NM – Normal Monitoring.
US – Upstream Monitoring, conducted in 2008 only.
*Additional Department of Pesticide Regulation (DPR) grant monitoring.

**Table III-7. Unnamed Drain to Lone Tree Creek subwatershed instantaneous load calculations for copper.**

Upstream sites italicized. If discharge was unable to be measured or the analyte was ND, the result is not included in the table. Load information for chlorpyrifos, diuron, and simazine can be found in the 2014 MPUR, Appendix I.

| Site Name | Analyte Name | Sample Date | Discharge, CFS | Concentration | Concentration Unit | Loading Rate[1] | Loading Rate Unit |
|---|---|---|---|---|---|---|---|
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | Copper | 04/15/08 | 4.67 | 23 | µg/L | 3042 | µg/sec |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | Copper | 05/13/08 | 21.52 | 7.8 | µg/L | 4753 | µg/sec |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | Copper | 06/10/08 | 15.85 | 4.8 | µg/L | 2154 | µg/sec |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | Copper | 07/15/08 | 17.55 | 6.9 | µg/L | 3429 | µg/sec |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | Copper | 08/12/08 | 11.11 | 6.8 | µg/L | 2139 | µg/sec |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd* | Copper | 09/16/08 | 18.38 | 6.2 | µg/L | 3227 | µg/sec |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | Copper | 09/16/08 | 18.38 | 6.5 | µg/L | 3383 | µg/sec |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | Copper | 04/14/09 | 2.74 | 4.3 | µg/L | 334 | µg/sec |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | Copper | 04/14/09 | 2.74 | 8.5 | µg/L | 660 | µg/sec |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | Copper | 05/12/09 | 2.48 | 5.0 | µg/L | 351 | µg/sec |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | Copper | 05/12/09 | 2.48 | 7.3 | µg/L | 513 | µg/sec |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | Copper | 07/14/09 | 2.12 | 1.5 | µg/L | 90 | µg/sec |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | Copper | 07/14/09 | 2.12 | 4.6 | µg/L | 276 | µg/sec |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | Copper | 08/11/09 | 10.50 | 1.5 | µg/L | 446 | µg/sec |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | Copper | 08/11/09 | 10.50 | 3.8 | µg/L | 1130 | µg/sec |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | Copper | 09/15/09 | 15.82 | 2.5 | µg/L | 1120 | µg/sec |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | Copper | 09/15/09 | 15.82 | 5.0 | µg/L | 2240 | µg/sec |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | Copper | 04/13/10 | 5.88 | 11 | µg/L | 1832 | µg/sec |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | Copper | 05/11/10 | 4.11 | 4.3 | µg/L | 500 | µg/sec |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | Copper | 07/13/10 | 13.84 | 5.0 | µg/L | 1960 | µg/sec |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | Copper | 08/10/10 | 11.19 | 4.7 | µg/L | 1489 | µg/sec |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | Copper | 09/07/10 | 27.32 | 4.9 | µg/L | 3791 | µg/sec |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | Copper | 04/12/11 | 9.26 | 7.6 | µg/L | 1993 | µg/sec |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | Copper | 05/24/11 | 16.75 | 26 | µg/L | 12332 | µg/sec |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | Copper | 07/26/11 | 5.18 | 5.7 | µg/L | 836 | µg/sec |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | Copper | 08/23/11 | 14.77 | 4.7 | µg/L | 1966 | µg/sec |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | Copper | 09/20/11 | 18.52 | 5.2 | µg/L | 2727 | µg/sec |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | Copper | 04/12/12 | 10.23 | 9.4 | µg/L | 2723 | µg/sec |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | Copper | 05/16/12 | 3.71 | 4.8 | µg/L | 504 | µg/sec |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | Copper | 07/17/12 | 9.35 | 7.6 | µg/L | 2012 | µg/sec |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | Copper | 08/21/12 | 3.64 | 4.8 | µg/L | 495 | µg/sec |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | Copper | 09/18/12 | 16.01 | 6.5 | µg/L | 2947 | µg/sec |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | Copper | 04/02/13 | 7.53 | 6.4 | µg/L | 1365 | µg/sec |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | Copper | 05/21/13 | 7.49 | 6.5 | µg/L | 1379 | µg/sec |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | Copper | 07/16/13 | 16.39 | 4.6 | µg/L | 2135 | µg/sec |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | Copper | 08/20/13 | 27.42 | 4.9 | µg/L | 3805 | µg/sec |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | Copper | 09/17/13 | 4.08 | 5.6 | µg/L | 647 | µg/sec |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | Copper | 04/15/14 | 0.11 | 8.4 | µg/L | 26 | µg/sec |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | Copper | 05/20/14 | 2.98 | 8.9 | µg/L | 751 | µg/sec |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | Copper | 07/15/14 | 6.62 | 4.4 | µg/L | 825 | µg/sec |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | Copper | 08/19/14 | 11.66 | 3.6 | µg/L | 1189 | µg/sec |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | Copper | 09/16/14 | 6.33 | 3.6 | µg/L | 645 | µg/sec |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | Copper (D) | 04/13/10 | 5.88 | 5.5 | µg/L | 916 | µg/sec |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | Copper (D) | 05/11/10 | 4.11 | 2.1 | µg/L | 244 | µg/sec |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | Copper (D) | 07/13/10 | 13.84 | 0.81 | µg/L | 317 | µg/sec |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | Copper (D) | 08/10/10 | 11.19 | 2.3 | µg/L | 729 | µg/sec |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | Copper (D) | 09/07/10 | 27.32 | 1.9 | µg/L | 1470 | µg/sec |

| Site Name | Analyte Name | Sample Date | Discharge, CFS | Concentration | Concentration Unit | Loading Rate[1] | Loading Rate Unit |
|---|---|---|---|---|---|---|---|
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | Copper (D) | 04/12/11 | 9.26 | 3.2 | µg/L | 839 | µg/sec |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | Copper (D) | 05/24/11 | 16.75 | 11 | µg/L | 5217 | µg/sec |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | Copper (D) | 07/26/11 | 5.18 | 2.1 | µg/L | 308 | µg/sec |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | Copper (D) | 08/23/11 | 14.77 | 1.7 | µg/L | 711 | µg/sec |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | Copper (D) | 09/20/11 | 18.52 | 2.7 | µg/L | 1416 | µg/sec |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | Copper (D) | 04/12/12 | 10.23 | 4.4 | µg/L | 1275 | µg/sec |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | Copper (D) | 05/16/12 | 3.71 | 2.3 | µg/L | 242 | µg/sec |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | Copper (D) | 07/17/12 | 9.35 | 2.3 | µg/L | 609 | µg/sec |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | Copper (D) | 08/21/12 | 3.64 | 1.6 | µg/L | 165 | µg/sec |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | Copper (D) | 09/18/12 | 16.01 | 2.2 | µg/L | 997 | µg/sec |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | Copper (D) | 04/02/13 | 7.53 | 4.4 | µg/L | 938 | µg/sec |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | Copper (D) | 05/21/13 | 7.49 | 3.4 | µg/L | 721 | µg/sec |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | Copper (D) | 07/16/13 | 16.39 | 1.6 | µg/L | 743 | µg/sec |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | Copper (D) | 08/20/13 | 27.42 | 1.9 | µg/L | 1475 | µg/sec |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | Copper (D) | 09/17/13 | 4.08 | 2.9 | µg/L | 335 | µg/sec |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | Copper (D) | 04/15/14 | 0.11 | 2.0 | µg/L | 6 | µg/sec |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | Copper (D) | 05/20/14 | 2.98 | 2.1 | µg/L | 177 | µg/sec |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | Copper (D) | 07/15/14 | 6.62 | 1.4 | µg/L | 262 | µg/sec |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | Copper (D) | 08/19/14 | 11.66 | 0.97 | µg/L | 320 | µg/sec |
| Unnamed Drain to Lone Tree Creek @ Jack Tone Rd | Copper (D) | 09/16/14 | 6.33 | 1.2 | µg/L | 215 | µg/sec |

[1] Load = Discharge (cfs) X 28.317L/ft3 X Concentration (µg/L). To convert a concentration measured in mg/L to µg/L multiply by 1000. The load values calculated represent instantaneous loads only, and should not be used to extrapolate loading over any period of time.
*Field Duplicate
Copper (D)-Dissolved Copper

## Source Identification and Outreach

The Coalition evaluated PUR data and past monitoring results to determine the sources of constituents listed in the Unnamed Drain to Lone Tree Creek @ Jack Tone Rd management plan. Sourcing analyses for past exceedances of management plan constituents are evaluated in past years' site subwatershed appendices. From January through September 2014, there were no exceedances of the WQTL for chlorpyrifos, copper, diuron, or sediment toxicity to *H. azteca*. Since there were no exceedances of sourceable constituents, a sourcing analysis was not included.

The priority E constituents listed under the Unnamed Drain to Lone Tree Creek @ Jack Tone Rd site subwatershed active management plan are DO, *E. coli*, lead, SC, and TDS. During all MPM events, field parameters, such as DO and SC are measured; one exceedance of the WQTL for DO occurred in April 2014. Priority E constituents are difficult to source; however, low flow in the waterway can cause exceedances of the WQTL for DO, and minerals leaching into the water column from soils can cause elevated levels of SC. The Coalition is not required to conduct MPM for priority E constituents; however, all constituents are discussed with growers during focused outreach and the Coalition believes the management of applied constituents will also address priority E constituents.

As part of the management practices tracking process, the Coalition contacted 34 growers farming 6,463 acres (22% of direct drainage) within the site subwatershed and documented current and newly implemented management practices. The Coalition recommended management practices to reduce negative impacts of agricultural discharges on water quality that included reduction of application rates,

alternative material application, spot treating, sprinkler or microspray irrigation, retention pond/hold basin construction, grass waterways or grass filter strip construction, reducing water volumes using irrigation management, and treating runoff waters with PAM or other materials. Growers in the site subwatershed implemented new management practices such as center grass rows, retention ponds and holding basins (2011 MPUR, Page 54). In 2012, the Coalition conducted additional focused outreach for two growers, farming 1,238 acres, to address continued exceedances of the WQTL for chlorpyrifos (2013 MPUR, Page 143). These growers implemented management practices such as reducing runoff water volumes using irrigation systems and reducing use of pesticides, such as chlorpyrifos (2013 MPUR, Page 51).

## Evaluation

Overall, water quality is improving; the Coalition will continue to conduct general outreach within the site subwatershed. Due to improvements in water quality, the Coalition received approval to remove simazine and water column toxicity to *C. dubia* and *S. capricornutum* from active the management plan on May 21, 2012, and petitioned to remove SC from MPM on June 6, 2014. The remaining high priority management plan constituents include chlorpyrifos, copper, diuron, and sediment toxicity to *H. azteca*. Monitoring results indicate exceedances of the WQTLs for management plan constituents are in decline. The remaining priority E constituents in the active management plan are DO, lead, SC, *E. coli*, and TDS. The Coalition will continue to discuss priority E constituents at annual grower meetings.

## Next Steps

Although focused outreach is complete within the site subwatershed, the Coalition will continue to conduct general outreach and collect MPM results to determine if additional contacts are warranted. In 2015, Unnamed Drain to Lone Tree Creek @ Jack Tone Rd is classified as a Represented site and is scheduled for MPM during months of past exceedances for chlorpyrifos, copper, diuron, and sediment toxicity to *H. azteca*. The field parameters DO and SC are measured during all monitoring events.

# HIGH PRIORITY SITE SUBWATERSHEDS (2010–2012)

# IV. GRANT LINE CANAL @ CLIFTON COURT RD

## Overview

Grant Line Canal @ Clifton Court is one of the Coalition's second priority site subwatersheds. Monitoring results through September 2014 indicate improved water quality within the site subwatershed. On August 22, 2014 the Coalition received approval to remove chlorpyrifos from the site's active management plan. The remaining high priority constituents in the Grant Line Canal @ Clifton Court management plan are water column toxicity to *S. capricornutum* and sediment toxicity to *H. azteca* (Table IV-1).

The Coalition conducted MPM for chlorpyrifos, sediment toxicity to *H. azteca,* and water column toxicity to *S. capricornutum* from January through September 2014, with the exception of chlorpyrifos in September 2014. There were no exceedances of high priority constituents or toxicity.

In the 2015 WY, the Coalition will continue to address all constituents through general outreach and MPM for water column toxicity to *S. capricornutum* and sediment toxicity to *H. azteca* will occur during months of past exceedances. The Grant Line @ Clifton Court site and the Grant Line near Calpack Road site management plans will be transferred to the new Zone 7 Core site, Union Island Drain @ Bonetti Road. Refer to the 2014 MPU for more information.

**Table IV-1. Grant Line Canal @ Clifton Court Rd management plan constituents.**
Management plan initiation year refers to when the site and constituent are addressed in the SJCDWQC MPURs and in the Management Plan Progress Report sections of the Annual Reports.

| PRIORITY | CONSTITUENT | MANAGEMENT PLAN INITIATION YEAR | MANAGEMENT PLAN REMOVAL YEAR |
|---|---|---|---|
| D | *H. azteca* sediment toxicity | 2007 | Active |
| D | *S. capricornutum* water column toxicity | 2009 | Active |
| E | Arsenic | 2007 | Active |
| E | DDE | 2008 | Active |
| E | Dissolved Oxygen | 2006 | Active |
| E | *E. coli* | 2006 | Active |
| E | Specific Conductivity | 2006 | Active |
| E | Total Dissolved Solids | 2006 | Active |
| **CONSTITUENT (REMOVED)** | | | |
| A/B | Chlorpyrifos | 2006 | 2014 |
| C | Copper | 2007 | 2012 |
| E | Lead | 2007 | 2012 |
| E | pH | 2007 | 2013 |

## Description of Site Subwatershed

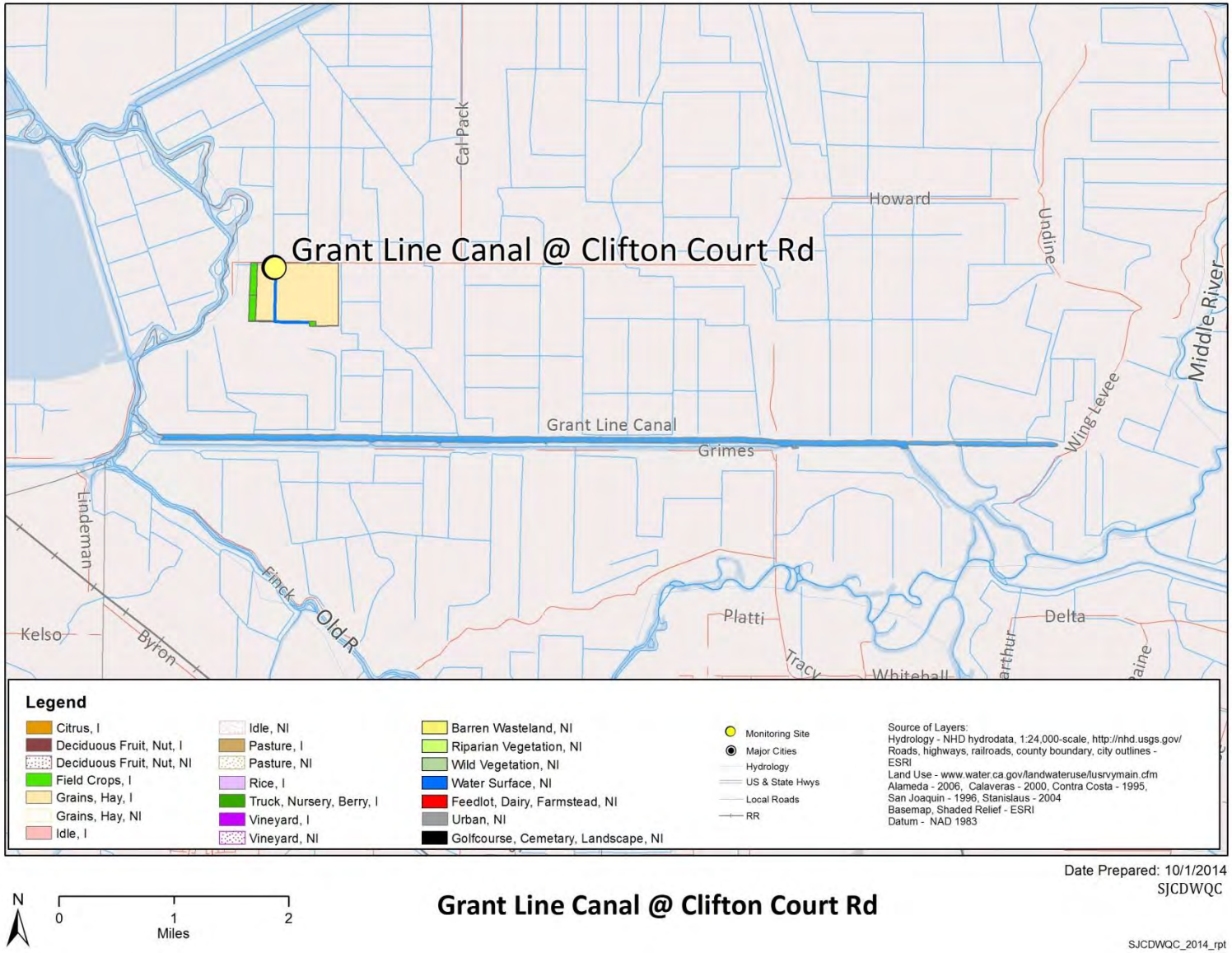
Grant Line @ Clifton Court Rd is a rotating Assessment Monitoring location within Zone 4 under the 2008 MRPP. The site subwatershed consists of 260 irrigated acres which include alfalfa, field crops, and grains (Figure IV-1). The site subwatershed is located west of the Grant Line Canal @ Calpack Rd site, immediately south of Clifton Court Rd, and drains fields east and south (Table IV-2). Source water of the Grant Line Canal depends on delta tides, the natural flows of large waterbodies such as the San Joaquin River, and the operation of agricultural barriers.

The Grant Line Canal is not considered impaired on California's 303(d) List of Impaired Waterbodies (last updated in 2010). However, the section of Old River from the SJR to the Delta Mendota Canal that runs parallel to Grant Line Canal is listed for chlorpyrifos, low DO, TDS, and electrical conductivity.

**Table IV-2. Grant Line Canal @ Clifton Court Rd site subwatershed sampling location coordinates.**

| Site Name | Station Code | Target Latitude | Target Longitude |
|---|---|---|---|
| Grant Line Canal @ Clifton Court Rd | 544XGLCAA | 37.84182 | -121.52999 |

**Figure IV-1. Grant Line Canal @ Clifton Court Rd site subwatershed land use map.**



## Subwatershed Monitoring History

Normal Monitoring began at Grant Line Canal @ Clifton Court Rd in the storm season of 2005 and continued through the storm and irrigation seasons through 2008. Table IV-3 contains the number of events monitored per year and the constituents (by group) from 2008 through September 2014 (see 2013 MPUR Appendix I, Table IV-3 for analytes sampled prior to 2008).

Since 2010, MPM during months of past exceedances occurred for high priority constituents to evaluate the effectiveness of the Coalition's outreach strategy (Table IV-4). The last detections for chlorpyrifos and copper were in 2010 and 2011, respectively; load information for those constituents can be found in the 2014 MPUR, Appendix I, Table IV-7.

**Table IV-3. Grant Line Canal @ Clifton Court Rd sampling events and analyses per year.**

Only environmental samples are counted.

| TYPE | ANALYTE | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|---|
| Sampling Events | Events Scheduled | 11 | 0 | 5 | 9 | 5 | 5 | 5 |
| | Dry Sites | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Events Sampled | 11 | 0 | 5 | 9 | 5 | 5 | 6 |
| | | | | | | | | |
| Field and Physical Parameters | BOD | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Color | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Dissolved Oxygen | 11 | 0 | 5 | 9 | 5 | 5 | 6 |
| | Dissolved Solids | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | *E. coli* | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Grain size (sediment) | 0 | 0 | 1 | 2 | 2 | 2 | 2 |
| | Hardness as CaCO3 | 7 | 0 | 5 | 5 | 0 | 0 | 0 |
| | pH | 11 | 0 | 5 | 9 | 5 | 5 | 6 |
| | Specific Conductivity | 11 | 0 | 5 | 9 | 5 | 5 | 6 |
| | Suspended Solids | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Total Organic Carbon | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Total Organic Carbon (sediment) | 0 | 0 | 1 | 2 | 2 | 2 | 2 |
| | Turbidity | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| Nutrients | Ammonia as N | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Nitrate + Nitrite as N | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Nitrate as N | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Nitrite as N | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Nitrogen, Total Kjeldahl | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Orthophosphate as P | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Phosphate as P | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| Metals (Dissolved) | Cadmium | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Copper | 0 | 0 | 5 | 5 | 0 | 0 | 0 |
| | Lead | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Nickel | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Zinc | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Metals (Total) | Arsenic | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Boron | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cadmium | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Copper | 7 | 0 | 5 | 5 | 0 | 0 | 0 |
| | Lead | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Molybdenum | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Nickel | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Selenium | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Zinc | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pesticides | Aldicarb | 7 | 0 | 0 | 0 | 0 | 0 | 0 |

| Type | Analyte | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|---|
| | Carbaryl | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Carbofuran | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Diuron | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Linuron | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Methiocarb | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Methomyl | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Oxamyl | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| Group A Pesticides | Aldrin | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Chlordane | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Endosulfan I | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Endosulfan II | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | HCH, alpha | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | HCH, beta | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | HCH, delta | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | HCH, gamma | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Heptachlor | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Heptachlor epoxide | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Toxaphene | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Herbicides | Atrazine | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cyanazine | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Glyphosate | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Paraquat | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Simazine | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Trifluralin | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Organochlorines | DDD(p,p') | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | DDE(p,p') | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | DDT(p,p') | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Dicofol | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Dieldrin | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Endrin | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Methoxychlor | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| Organophosphates | Azinphos methyl | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Chlorpyrifos | 7 | 0 | 1 | 4 | 4 | 4 | 3 |
| | Demeton-s | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Diazinon | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Dichlorvos | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Dimethoate | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Disulfoton | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Malathion | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Methamidophos | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Methidathion | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Molinate | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Parathion, Methyl | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Phorate | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Phosmet | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Thiobencarb | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pyrethroids | Bifenthrin | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cyfluthrin, total | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cyhalothrin, lambda, total | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cypermethrin, total | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Esfenvalerate/Fenvalerate, total | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Permethrin, total | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sediment Pesticides | Bifenthrin | 0 | 0 | 1 | 2 | 1 | 2 | 0 |
| | Chlorpyrifos | 0 | 0 | 1 | 2 | 1 | 2 | 0 |
| | Cyfluthrin | 0 | 0 | 1 | 2 | 1 | 2 | 0 |
| | Cyhalothrin, lambda | 0 | 0 | 1 | 2 | 1 | 2 | 0 |
| | Cypermethrin | 0 | 0 | 1 | 2 | 1 | 2 | 0 |
| | Deltamethrin: Tralomethrin | 0 | 0 | 1 | 2 | 1 | 2 | 0 |
| | Esfenvalerate/ Fenvalerate | 0 | 0 | 1 | 2 | 1 | 2 | 0 |

| Type | Analyte | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|---|
| | Fenpropathrin | 0 | 0 | 1 | 2 | 1 | 2 | 0 |
| | Permethrin | 0 | 0 | 1 | 2 | 1 | 2 | 0 |
| Toxicity | *Ceriodaphnia dubia* | 8 | 0 | 0 | 0 | 0 | 0 | 0 |
| | *Pimephales promelas* | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | *Selenastrum capricornutum* | 9 | 1 | 2 | 0 | 2 | 2 | 2 |
| | *Hyalella azteca* | 2 | 0 | 0 | 0 | 2 | 2 | 2 |

**Table IV-4. Grant Line Canal Management Plan Monitoring schedule (2007-September 2014).**

| Site Name | Sample Date | Monitoring Type | Chlorpyrifos | Copper | *S. capricornutum* | *H. azteca* |
|---|---|---|---|---|---|---|
| Grant Line Canal @ Clifton Court Rd | 06/20/07 | Add. | | X | | |
| Grant Line Canal @ Clifton Court Rd | 07/30/07 | Add. | | X | | |
| Grant Line Canal @ Clifton Court Rd | 09/25/07 | Add. | | X | | |
| Grant Line Canal @ Clifton Court Rd | 05/11/10 | MPM | | X | X | |
| Grant Line Canal @ Clifton Court Rd | 06/08/10 | MPM | | X | | |
| Grant Line Canal @ Clifton Court Rd | 07/13/10 | MPM | | X | | |
| Grant Line Canal @ Clifton Court Rd | 08/10/10 | MPM | | X | | |
| Grant Line Canal @ Clifton Court Rd | 09/07/10 | MPM | X | X | | X |
| Grant Line Canal @ Clifton Court Rd | 01/11/11 | MPM | X | | X | |
| Grant Line Canal @ Clifton Court Rd | 02/08/11 | MPM | X | | | |
| Grant Line Canal @ Clifton Court Rd | 03/08/11 | MPM | X | | | X |
| Grant Line Canal @ Clifton Court Rd | 05/24/11 | MPM | | X | X | |
| Grant Line Canal @ Clifton Court Rd | 06/28/11 | MPM | | X | | |
| Grant Line Canal @ Clifton Court Rd | 07/26/11 | MPM | | X | | |
| Grant Line Canal @ Clifton Court Rd | 08/23/11 | MPM | | X | | |
| Grant Line Canal @ Clifton Court Rd | 09/20/11 | MPM | X | X | | |
| Grant Line Canal @ Clifton Court Rd | 10/14/11 | MPM | | | | X |
| Grant Line Canal @ Clifton Court Rd | 01/17/12 | MPM | X | | X | |
| Grant Line Canal @ Clifton Court Rd | 02/14/12 | MPM | X | | | |
| Grant Line Canal @ Clifton Court Rd | 03/15/12 | MPM | X | | | X |
| Grant Line Canal @ Clifton Court Rd | 05/16/12 | MPM | | | X | |
| Grant Line Canal @ Clifton Court Rd | 09/18/12 | MPM | X | | | X |
| Grant Line Canal @ Clifton Court Rd | 01/08/13 | MPM | X | | X | |
| Grant Line Canal @ Clifton Court Rd | 02/21/13 | MPM | X | | | |
| Grant Line Canal @ Clifton Court Rd | 03/19/13 | MPM | X | | | X |
| Grant Line Canal @ Clifton Court Rd | 05/21/13 | MPM | | | X | |
| Grant Line Canal @ Clifton Court Rd | 09/17/13 | MPM | X | | | X |
| Grant Line Canal @ Clifton Court Rd | 01/28/14 | MPM | X | | X | |
| Grant Line Canal @ Clifton Court Rd | 02/11/14 | MPM | X | | | |
| Grant Line Canal @ Clifton Court Rd | 03/03/14 | MPM | X | | | X |
| Grant Line Canal @ Clifton Court Rd | 05/20/14 | MPM | | | X | |
| Grant Line Canal @ Clifton Court Rd | 09/16/14 | MPM | | | | X |

Add. – Additional sampling.
X – Constituent sampled for Management Plan Monitoring (MPM).

## Monitoring Results

From January through September 2014, MPM occurred at Grant Line Canal @ Clifton Court Rd for chlorpyrifos, water column toxicity to *S. capricornutum*, and sediment toxicity to *H. azteca* (Table IV-3). No exceedances of the high priority constituents occurred through September 2014. On August 22, 2014, as a result of three or more years without an exceedance of the WQTL, the Regional Board approved the removal of chlorpyrifos from the active management plan.

Priority E constituents DO and SC were monitored during every MPM sampling event January through September 2014; five exceedances of the WQTL for DO and six exceedances of the WQTL for SC occurred. Arsenic, DDE, *E. coli*, and TDS were not monitored in 2014.

Table IV-5 is a tally of exceedances of WQTLs from 2005 through September 2014 for the management plan constituents in the Grant Line Canal @ Clifton Court Rd site subwatershed (organized alphabetically by constituent priority). The constituents are organized by priority and status (active or removed). Table IV-6 contains detections and WQTL exceedance results of all sampling events since the constituent became part of the site subwatershed management plan. A record of all exceedances at Grant Line Canal @ Clifton Court since monitoring began is provided in Appendix II, Table IV-A.

**Table IV-5. Grant Line Canal @ Clifton Court Rd management plan constituent exceedance tally (2005-September 2014).**

Exceedances that occurred during resampling for field parameters and toxicity are included in the tally Exceedances are organized alphabetically by constituent priority. A complete list of exceedances can be found in Appendix II, Table IV-A.

| Monitoring Year | Active Management Plan Constituents | | | | | | | | | Removed Management Plan Constituents | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Chlorpyrifos, >0.015 µg/L | *H. azteca*, (%Control) | *S. capricornutum*, (%Control) | Arsenic, >10 µg/L | DDE (p,p'), >0.00059 µg/L | Dissolved Oxygen, <7 mg/L | *E. coli*, >235 MPN/100 mL | Specific Conductivity, >700 µS/cm | Total Dissolved Solids, >450 mg/L | Copper (Total), Variable[1] or >1300 µg/L | Lead, (Total), Variable[1] or >15 µg/L | pH, <6.5 and > 8.5 units |
| 2005 | 1 | 1 | 0 | NA | NA | 6 | 4 | 3 | 3 | NA | NA | 0 |
| 2006 | 0 | 1 | 0 | 2 | 1 | 5 | 7 | 2 | 2 | 3 | 3 | 4 |
| 2007 | 3 | 0 | 0 | 4 | 1 | 6 | 5 | 6 | 5 | 2 | 0 | 2 |
| 2008 | 1 | 0 | 2 | 4 | 0 | 6 | 3 | 8 | 6 | 1 | 0 | 1 |
| 2009 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2010 | 1 | 2 | 1 | NA | NA | 4 | NA | 3 | NA | 0 | NA | 0 |
| 2011 | 0 | 2 | 0 | NA | NA | 4 | NA | 6 | NA | 0 | NA | 0 |
| 2012 | 0 | 1 | 1 | NA | NA | 4 | NA | 5 | NA | NA | NA | 0 |
| 2013 | 0 | 1 | 0 | NA | NA | 2 | NA | 4 | NA | NA | NA | 0 |
| 2014 WY* | 0 | 0 | 0 | NA | NA | 5 | NA | 6 | NA | NA | NA | 0 |
| **Overall Tally** | **6** | **8** | **4** | **10** | **2** | **42** | **19** | **43** | **16** | **6** | **3** | **7** |
| **Constituent Priority** | **A/B** | **D** | **D** | **E** | **E** | **E** | **E** | **E** | **E** | **C[R]** | **E[R]** | **E[R]** |

[1] Metal WQTL variable based on hardness.

NA – Not Applicable; monitoring did not occur for this constituent during the year.

[R] – Removed from active management plan.

*2014 includes January through September results only.

**Table IV-6. Grant Line Canal @ Clifton Court Rd site subwatershed monitoring results for priority A/B - D constituents since management plan initiation.**

Exceedance values are in bold. Resampling (RS) due to toxicity not included in table. MPM results after September 2014 not included in table (grey cells).

| | Month: | Jan | Feb | | Mar | | Apr | May | Jun | Jul | Aug | Sep | Oct |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **2007 NM (@ Clifton Court Rd)** | Date | NA | 2/11/07 | 2/28/07 | NA | | 4/11/07 | 5/22/07 | 6/12/07 | 7/10/07 | 8/07/07 | 9/04/07 | NA |
| | Copper (µg/L) | NA | 4.7 | 6.7 | NA | | 5.5 | **24** | 10 | **17** | 10 | 8.5 | NA |
| **2007 MPM Add. (@ Clifton Court Rd)** | Date | NA | NA | | NA | | NA | NA | 6/20/07 | 7/30/07 | NA | 9/25/07 | NA |
| | Copper (µg/L) | NA | NA | | NA | | NA | NA | 8.5 | <0.01 | NA | 3.7 | NA |
| **2008 NM (@ Clifton Court Rd)** | Date | NA | NA | | NA | | 4/15/08 | 5/13/08 | 6/10/08 | 7/15/08 | 8/12/08 | 9/16/08 | NA |
| | Copper (µg/L) | NA | NA | | NA | | 6.5 | 7.9 | 5.9 | 6.2 | **28** | 5.9 | NA |
| **2010 MPM (@ Clifton Court Rd)** | Date | NA | NA | | NA | | NA | 5/11/10 | 6/8/10 | 7/13/10 | 8/10/10 | 9/7/10 | NA |
| | Copper, dissolved (µg/L) | NA | NA | | NA | | NA | 6 | 1.6 | 2.7 | 2.1 | 2.3 | NA |
| | Copper, total (µg/L) | NA | NA | | NA | | NA | 15 | 3.4 | 65 | 40 | 32 | NA |
| | Chlorpyrifos (µg/L) | NA | NA | | NA | | NA | NA | NA | NA | NA | **0.044** | NA |
| | *S. capricornutum* toxicity (% Control) | NA | NA | | NA | | NA | **11** | NA | NA | NA | NA | NA |
| | *H. azteca* toxicity (% Control) | NA | NA | | NA | | NA | NA | NA | NA | NA | **30** | NA |
| **2011 MPM (@ Clifton Court Rd)** | Date | 1/11/11 | 2/8/11 | | 3/8/11 | | NA | 5/24/11 | 6/28/11 | 7/26/11 | 8/23/11 | 9/20/11 | 10/14/11 |
| | Copper, dissolved (µg/L) | NA | NA | | NA | | NA | 0.79 | 4.8 | 1.9 | 4.7 | 2.1 | NA |
| | Copper, total (µg/L) | NA | NA | | NA | | NA | 2 | 10 | 9.8 | 7.8 | 66 | NA |
| | Chlorpyrifos (µg/L) | <0.003 | <0.003 | | <0.003 | | NA | NA | NA | NA | NA | <0.003 | NA |
| | *S. capricornutum* toxicity(% Control) | 286 | NA | | NA | | NA | 556 | NA | NA | NA | NA | NA |
| | *H. azteca* toxicity (% Control) | NA | NA | | **80** | | NA | NA | NA | NA | NA | NA | **79** |
| **2012 MPM (@ Clifton Court Rd)** | Date | 1/17/12 | 2/14/12 | | 3/15/12 | | NA | 5/16/12 | NA | NA | NA | 9/18/12 | NA |
| | Chlorpyrifos (µg/L) | <0.003 | <0.003 | | <0.003 | | NA | NA | NA | NA | NA | <0.003 | NA |
| | *S. capricornutum* toxicity(% Control) | 207 | NA | | NA | | NA | **57** | NA | NA | NA | NA | NA |
| | *H. azteca* toxicity (% Control) | NA | NA | | 97 | | NA | NA | NA | NA | NA | **4** | NA |
| **2013 MPM (@ Clifton Court Rd)** | Date | 1/15/13 | 2/21/13 | | 3/19/13 | | NA | 5/21/13 | NA | NA | NA | 9/17/13 | NA |
| | Chlorpyrifos (µg/L) | <0.003 | <0.003 | | <0.003 | | NA | NA | NA | NA | NA | <0.003 | NA |
| | *S. capricornutum* toxicity(% Control) | 492 | NA | | NA | | NA | 3183 | NA | NA | NA | NA | NA |
| | *H. azteca* toxicity (% Control) | NA | NA | | **36** | | NA | NA | NA | NA | NA | 98 | NA |
| **2014 MPM (@ Clifton Court Rd)** | Date | 1/28/2014 | 2/11/2014 | | 3/3/14 | 3/5/14 | NA | 5/20/14 | NA | NA | NA | 9/16/14 | |
| | Chlorpyrifos (µg/L) | <0.003 | <0.003 | | <0.003 | NA | NA | NA | NA | NA | NA | NA | |
| | *S. capricornutum* toxicity(% Control) | 521 | NA | | NA | NA | NA | 216 | NA | NA | NA | NA | |
| | *H. azteca* toxicity (% Control) | NA | NA | | NA | 96 | NA | NA | NA | NA | NA | 96 | |

Add. – Additional Monitoring, conducted in 2007 only.
MPM – Management Plan Monitoring.
NA – Not applicable. No monitoring occurred on this date for this constituent.
NM – Normal Monitoring.

## Source Identification and Outreach

A complete review of source identification and outreach activities in the Grant Line Canal @ Clifton Court Rd site subwatershed is provided in the 2014 MPUR Appendix I, including an analysis of the management plan constituents that were removed due to improved water quality (Pages 121-128). After the removal of chlorpyrifos from the active management plan in August 2014, there are no longer any priority A/B constituents in the active management plan. Past source identification for chlorpyrifos exceedances can be found in the 2014 MPUR Appendix I, Pages 46-56.

Priority A/B, C, and D constituents are often associated with pesticide applications, which assists in determining potential sources of water quality impairments and focusing outreach efforts. All management plan constituents are discussed during focused outreach including management practices that are implemented to reduce agricultural discharge of constituents of concern. The Coalition described its strategy for conducting outreach in high priority sites in the Management Practice Tracking Strategy sections of the main body of the 2014 MPUR.

The priority E constituents listed under the Grant Line at Clifton Court site subwatershed active management plan are DO and SC. These constituents are difficult to source; however, low flow in the water way can lead to exceedances of the WQTL for DO, and minerals leaching into the water column from soils, or drain water from irrigated agriculture can lead to elevated levels of SC. The Coalition is not required to conduct MPM for priority E constituents; however, all constituents are discussed with growers during focused outreach and the Coalition believes informing growers of other water quality impairments will also address priority E constituents.

In 2010, the Coalition contacted two targeted growers farming 259 acres within the site subwatershed (2012 MPUR, Pages 29-31) and documented their management practices (2011 MPUR, Pages 59-62). Follow-up surveys from 100% of growers indicated that all intended management practices were implemented, such as reducing tailwater water volume using irrigation management, reducing the use of pesticides causing exceedances, and applying PAM or other materials.

## Evaluation

Water quality has improved in the Grant Line Canal @ Clifton Court site subwatershed since focused outreach began in 2010. Due to improved water quality, several constituents were removed from the active management plan. The remaining constituents in the site's management plan are arsenic, DDE, DO, *E. coli*, SC, sediment toxicity to *H. azteca,* TDS, and water column toxicity to *S. capricornutum.*

## Next Steps

The Coalition will continue to conduct general outreach. In the 2015 WY, the Coalition will discontinue monitoring at the Grant Line @ Clifton Court site and the Grant Line near Calpack Road site and management plans will be moved to the new Zone 7 Core site, Union Island Drain @ Bonetti Road. The new Core site represents the same hydrologic unit as the two Grant Line locations and is a better representation of the drainage of the entire island. For more information, refer to the 2014 MPU.

# V. GRANT LINE CANAL NEAR CALPACK RD

## Overview

Grant Line Canal near Calpack Rd is one of the Coalition's second priority site subwatersheds. Focused outreach was initiated in 2010 and continued through 2012. To evaluate the effectiveness of outreach, MPM during months of past exceedances occurred in 2010 through September 2014. The high priority constituents under the site's active management plan include water column toxicity to *C. dubia* and *S. capricornutum* and sediment toxicity to *H. azteca* (Table V-1).

During January through September 2014 MPM, toxicity to *S. capricornutum* occurred three times (Table V-1). Exceedances of the WQTL for priority E constituents DO and SC also occurred at Grant Line Canal near Calpack Rd.

During the 2015 WY, MPM is scheduled to continue for sediment toxicity to *H. azteca* and water column toxicity to *C. dubia* and *S. capricornutum*; DO and SC are field parameters and will be measured during all monitoring events. In the 2015 WY, the Grant Line near Calpack Road along with the Grant Line @ Clifton Court site management plans will be transferred to the new Zone 7 Core site, Union Island Drain @ Bonetti Road. Refer to the 2014 Monitoring Plan Update for more information.

**Table V-1. Grant Line Canal near Calpack Rd management plan constituents.**
Management plan initiation year refers to when the site and constituent are addressed in the SJCDWQC MPURs and in the Management Plan Progress Report sections of the Annual Reports.

| PRIORITY | CONSTITUENT | MANAGEMENT PLAN INITIATION YEAR | MANAGEMENT PLAN REMOVAL YEAR |
|---|---|---|---|
| D | *C. dubia* water column toxicity | 2006 | Active |
| D | *H. azteca* sediment toxicity | 2006 | Active |
| D | *S. capricornutum* water column toxicity | 2008 | Active |
| E | Arsenic | 2007 | Active |
| E | Dissolved Oxygen | 2006 | Active |
| E | *E. coli* | 2006 | Active |
| E | Specific Conductivity | 2006 | Active |
| E | Total Dissolved Solids | 2006 | Active |
| **CONSTITUENT (REMOVED)** | | | |
| A/B | Chlorpyrifos | 2006 | 2013 |

## Description of Site Subwatershed

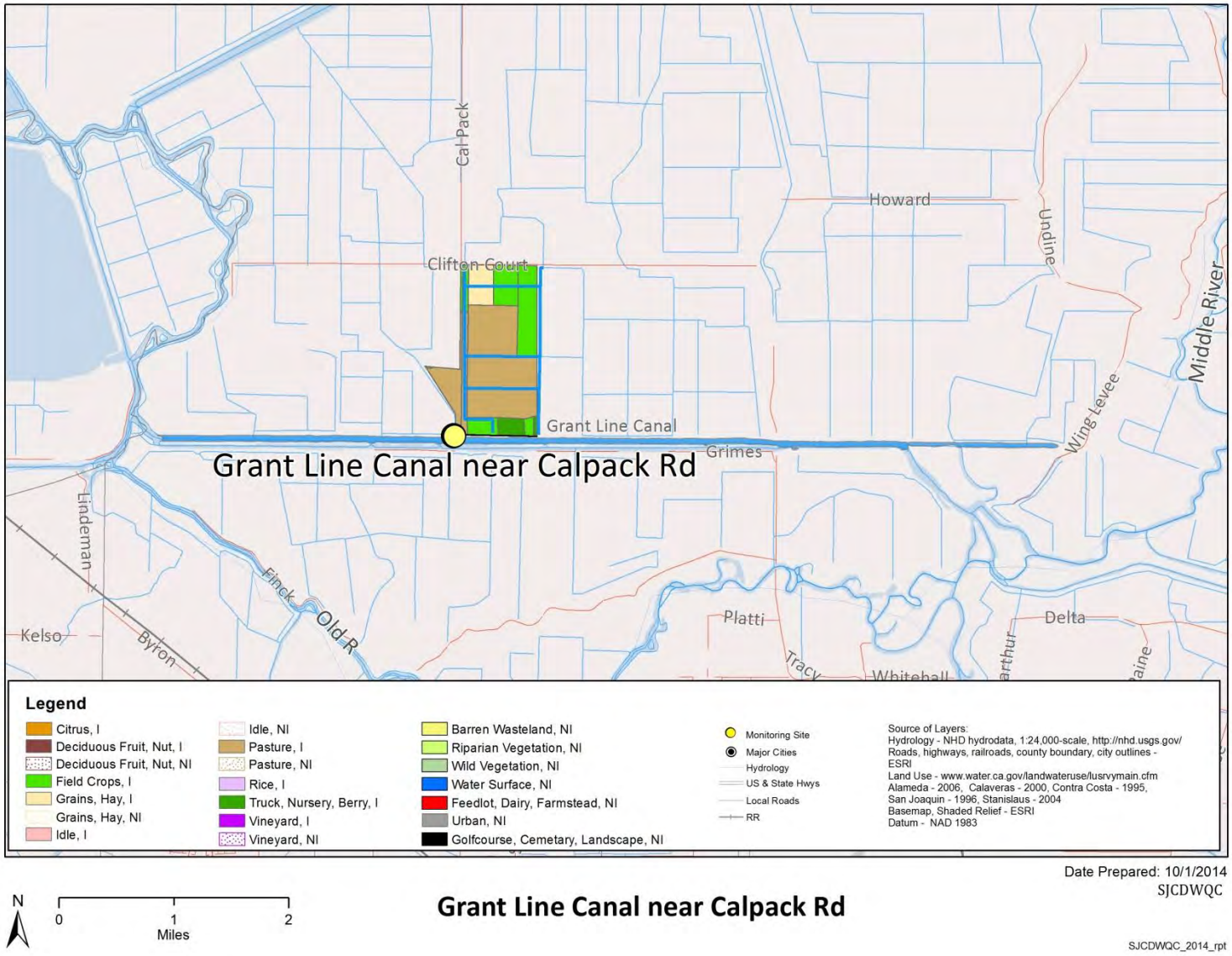
Grant Line Canal near Calpack Rd is a rotating Assessment Monitoring location within Zone 4 under the 2008 MRPP. The site consists of 682 irrigated acres which include alfalfa, field crops (e.g. corn and safflower), grains, and hay (Figure V-1). It is located on the southwest section of Union Island in the Bay-Delta tidal prism and receives water from east and west inputs (Table V-2). The source of water in the Grant Line Canal depends on delta tides, natural flows of large waterbodies such as the San Joaquin River, the operation of agriculture barriers, and the operation of the pumping plants at Clifton Court Forebay.

The Grant Line Canal is not considered impaired on California's 303(d) List of Impaired Waterbodies (last updated in 2010). However, the section of Old River from the SJR to the Delta-Mendota Canal that runs parallel to Grant Line Canal is listed for chlorpyrifos, low DO, electrical conductivity and TDS.

**Table V-2. Grant Line Canal near Calpack Rd site subwatershed sampling location coordinates.**

| Site Name | Station Code | Target Latitude | Target Longitude |
|---|---|---|---|
| Grant Line Canal near Calpack Rd | 544XGLCCR | 37.82084 | -121.50009 |

**Figure V-1. Grant Line Canal near Calpack Rd site subwatershed land use map.**



## Subwatershed Monitoring History

Normal Monitoring at Grant Line Canal near Calpack Rd began in 2005 and continued through 2008. Table V-3 contains the number of events monitored per year and the constituents (by group) from 2008 through September 2014 (see 2013 MPUR Appendix I, Table V-3 for analytes sampled prior to 2008). The most recent Assessment Monitoring for Grant Line Canal near Calpack Rd occurred in 2008.

Since 2010, MPM during months of past exceedances has occurred to evaluate the effectiveness of the Coalition's outreach strategy (Table V-4). The last detections of chlorpyrifos were in 2006; load information for that constituent can be found in the 2014 MPUR, Appendix I, Table V-7.

**Table V-3. Grant Line Canal near Calpack Rd sampling events and analyses per year.**

Only environmental samples are counted.

| TYPE | ANALYTE | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|---|
| Sampling Events | Events Scheduled | 12 | 0 | 5 | 9 | 8 | 8 | 8 |
| | Dry Sites | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Events Sampled | 12 | 0 | 5 | 9 | 8 | 8 | 9 |
| | | | | | | | | |
| Field and Physical Parameters | BOD | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Color | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Dissolved Oxygen | 12 | 0 | 5 | 9 | 8 | 8 | 9 |
| | Dissolved Solids | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | *E. coli* | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Grain size (sediment) | 0 | 0 | 0 | 2 | 2 | 2 | 2 |
| | Hardness as CaCO3 | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | pH | 12 | 0 | 5 | 9 | 8 | 8 | 9 |
| | Specific Conductivity | 12 | 0 | 5 | 9 | 8 | 8 | 9 |
| | Suspended Solids | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Total Organic Carbon | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Total Organic Carbon (sediment) | 0 | 0 | 0 | 2 | 2 | 2 | 2 |
| | Turbidity | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| Nutrients | Ammonia as N | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Nitrate + Nitrite as N | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Nitrate as N | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Nitrite as N | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Nitrogen, Total Kjeldahl | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Orthophosphate as P | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Phosphate as P | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| Metals (Dissolved) | Cadmium | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Copper | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Lead | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Nickel | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Zinc | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Metals (Total) | Arsenic | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Boron | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cadmium | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Copper | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Lead | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Molybdenum | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Nickel | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Selenium | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Zinc | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| Carba mates | Aldicarb | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Carbaryl | 7 | 0 | 0 | 0 | 0 | 0 | 0 |

| Type | Analyte | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|---|
| | Carbofuran | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Diuron | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Linuron | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Methiocarb | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Methomyl | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Oxamyl | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| Group A Pesticides | Aldrin | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Chlordane | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Endosulfan I | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Endosulfan II | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | HCH, alpha | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | HCH, beta | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | HCH, delta | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | HCH, gamma | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Heptachlor | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Heptachlor epoxide | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Toxaphene | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Herbicides | Atrazine | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cyanazine | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Glyphosate | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Paraquat | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Simazine | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Trifluralin | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Organochlorines | DDD(p,p') | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | DDE(p,p') | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | DDT(p,p') | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Dicofol | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Dieldrin | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Endrin | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Methoxychlor | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| Organophosphates | Azinphos methyl | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Chlorpyrifos | 7 | 0 | 3 | 4 | 4 | 0 | 0 |
| | Demeton-s | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Diazinon | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Dichlorvos | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Dimethoate | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Disulfoton | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Malathion | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Methamidophos | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Methidathion | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Molinate | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Parathion, Methyl | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Phorate | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Phosmet | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Thiobencarb | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pyrethroids | Bifenthrin | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cyfluthrin, total | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cyhalothrin, lambda, total | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cypermethrin, total | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Esfenvalerate/Fenvalerate, total | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Permethrin, total | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sediment Pesticides | Bifenthrin | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| | Chlorpyrifos | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| | Cyfluthrin | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| | Cyhalothrin, lambda | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| | Cypermethrin | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| | Deltamethrin: Tralomethrin | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| | Esfenvalerate/ Fenvalerate | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| | Fenpropathrin | 0 | 0 | 0 | 0 | 1 | 1 | 0 |

| Type | Analyte | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|---|
| | Permethrin | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| Toxicity | *Ceriodaphnia dubia* | 7 | 0 | 0 | 3 | 3 | 3 | 3 |
| | *Pimephales promelas* | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | *Selenastrum capricornutum* | 10 | 0 | 3 | 5 | 5 | 5 | 5 |
| | *Hyalella azteca* | 2 | 0 | 1 | 2 | 2 | 2 | 2 |

**Table V-4. Grant Line Canal near Calpack Rd Management Plan Monitoring schedule (2007-September 2014).**

| Site Name | Sample Date | Monitoring Type | Chlorpyrifos | *C. dubia* | *S. capricornutum* | *H. azteca* |
|---|---|---|---|---|---|---|
| Grant Line Canal near Calpack Rd | 07/30/07 | Add. | X | X | | |
| Grant Line Canal near Calpack Rd | 08/28/07 | Add. | X | | | |
| Grant Line Canal near Calpack Rd | 04/13/10 | MPM | | | X | |
| Grant Line Canal near Calpack Rd | 05/11/10 | MPM | X | | X | |
| Grant Line Canal near Calpack Rd | 07/13/10 | MPM | X | | X | |
| Grant Line Canal near Calpack Rd | 08/10/10 | MPM | X | | | |
| Grant Line Canal near Calpack Rd | 09/07/10 | MPM | | | | X |
| Grant Line Canal near Calpack Rd | 01/11/11 | MPM | | | X | |
| Grant Line Canal near Calpack Rd | 02/08/11 | MPM | | | X | |
| Grant Line Canal near Calpack Rd | 03/08/11 | MPM | X | X | | X |
| Grant Line Canal near Calpack Rd | 04/12/11 | MPM | | | X | |
| Grant Line Canal near Calpack Rd | 05/24/11 | MPM | X | X | X | |
| Grant Line Canal near Calpack Rd | 07/26/11 | MPM | X | | X | |
| Grant Line Canal near Calpack Rd | 08/23/11 | MPM | X | X | | |
| Grant Line Canal near Calpack Rd | 10/14/11 | MPM | | | | X |
| Grant Line Canal near Calpack Rd | 01/17/12 | MPM | | | X | |
| Grant Line Canal near Calpack Rd | 02/14/12 | MPM | | | X | |
| Grant Line Canal near Calpack Rd | 03/15/12 | MPM | X | X | | X |
| Grant Line Canal near Calpack Rd | 04/12/12 | MPM | | | X | |
| Grant Line Canal near Calpack Rd | 05/16/12 | MPM | X | X | X | |
| Grant Line Canal near Calpack Rd | 07/17/12 | MPM | X | | X | |
| Grant Line Canal near Calpack Rd | 08/21/12 | MPM | X | X | | |
| Grant Line Canal near Calpack Rd | 09/18/12 | MPM | | | | X |
| Grant Line Canal near Calpack Rd | 01/15/13 | MPM | | | X | |
| Grant Line Canal near Calpack Rd | 02/21/13 | MPM | | | X | |
| Grant Line Canal near Calpack Rd | 03/19/13 | MPM | | X | | X |
| Grant Line Canal near Calpack Rd | 04/02/13 | MPM | | | X | |
| Grant Line Canal near Calpack Rd | 05/21/13 | MPM | | X | X | |
| Grant Line Canal near Calpack Rd | 07/16/13 | MPM | | | X | |
| Grant Line Canal near Calpack Rd | 08/20/13 | MPM | | X | | |
| Grant Line Canal near Calpack Rd | 09/17/13 | MPM | | | | X |
| Grant Line Canal near Calpack Rd | 01/28/14 | MPM | | | X | |
| Grant Line Canal near Calpack Rd | 02/11/14 | MPM | | | X | |
| Grant Line Canal near Calpack Rd | 03/03/14 | MPM | | X | | X |
| Grant Line Canal near Calpack Rd | 04/15/14 | MPM | | | X | |
| Grant Line Canal near Calpack Rd | 05/20/14 | MPM | | X | X | |
| Grant Line Canal near Calpack Rd | 07/15/14 | MPM | | | X | |
| Grant Line Canal near Calpack Rd | 08/19/14 | MPM | | X | | |
| Grant Line Canal near Calpack Rd | 09/16/14 | MPM | | | | X |

Add. – Additional sampling
X – Constituent sampled for Management Plan Monitoring (MPM).

## Monitoring Results

From January through September 2014, MPM was scheduled at Grant Line Canal near Calpack Rd for water column toxicity to *C. dubia* and *S. capricornutum* and sediment toxicity to *H. azteca* (Table V-4). No samples were toxic to *C. dubia* or *H. azteca*; however toxicity to *S. capricornutum* occurred three times (Table V-5). Priority E constituents, DO and SC, were also measured during all monitoring events and resulted in six exceedances of the WQTL of DO and nine exceedances of SC.

Table V-5 is a tally of exceedances of WQTLs from 2005 through September 2014 for management plan constituents in the Grant Line Canal near Calpack Rd site subwatershed (organized alphabetically by constituent priority). Table V-6 contains detections and WQTL exceedance results of all sampling events since the constituent became part of the site subwatershed management plan. A record of all exceedances in the Grant Line Canal near Calpack Rd site subwatershed since monitoring began is provided in Appendix II, Table V-A.

**Table V-5. Grant Line near Calpack Rd management plan constituent exceedance tally (2005-September 2014).**
Exceedances that occurred during resampling for field parameters and toxicity are included in the tally. Exceedances are organized alphabetically by constituent priority. A complete list of exceedances can be found in Appendix II, Table V-A.

| Monitoring Year | Active Management Plan Constituents | | | | | | | | Removed Management Plan Constituents |
|---|---|---|---|---|---|---|---|---|---|
| | *C. dubia*, (%Control) | *H. azteca*, (%Control) | *S. capricornutum*, (%Control) | Arsenic, >10 µg/L | Dissolved Oxygen,<7 mg/L | *E. coli*, >235 MPN/100 mL | Specific Conductivity, >700 µS/cm | Total Dissolved Solids, >450 mg/L | Chlorpyrifos, >0.015 µg/L |
| 2005 | 2 | 3 | 1 | NA | 8 | 5 | 9 | 6 | 3 |
| 2006 | 1 | 1 | 0 | 2 | 7 | 5 | 7 | 4 | 1 |
| 2007 | 0 | 2 | 3 | 1 | 10 | 5 | 14 | 8 | 0 |
| 2008 | 0 | 0 | 6 | 1 | 10 | 4 | 12 | 7 | 0 |
| 2009 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2010 | NA | 1 | 0 | NA | 3 | NA | 5 | NA | 0 |
| 2011 | 0 | 1 | 1 | NA | 2 | NA | 7 | NA | 0 |
| 2012 | 1 | 1 | 0 | NA | 6 | NA | 7 | NA | 0 |
| 2013 | 0 | 1 | 1 | NA | 4 | NA | 8 | NA | NA |
| 2014 WY* | 0 | 0 | 3 | NA | 6 | NA | 9 | NA | NA |
| **Overall Tally** | **4** | **10** | **12** | **4** | **56** | **19** | **78** | **25** | **4** |
| **Constituent Priority** | **D** | **D** | **D** | **E** | **E** | **E** | **E** | **E** | **A/B[R]** |

NA – Not Applicable; monitoring did not occur for constituent.
[R] – Removed from active management plan.
*2014 includes January through September results only.

**Table V-6. Grant Line Canal near Calpack Rd site subwatershed monitoring results for priority A/B - D constituents since management plan initiation.**

Exceedance values are in bold. Resampling (RS) due to toxicity not included in table. MPM results after September 2014 not included in table (grey cells).

| | Month: | Jan | Feb | Mar | | Apr | May | Jun | Jul | Aug | Sep | Oct |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **2007 NM (near Calpack Rd)** | Date | NA | NA | NA | | 4/10/07 | 5/22/07 | 6/12/07 | 7/10/07 | 8/07/07 | 9/04/07 | NA |
| | Chlorpyrifos (µg/L) | NA | NA | NA | | <0.003 | <0.003 | <0.003 | <0.003 | <0.003 | <0.003 | NA |
| | *C. dubia* toxicity (% Control) | NA | NA | NA | | 111 | 95 | 95 | 100 | 100 | 100 | NA |
| **2007 MPM Add. (near Calpack Rd)** | Date | NA | NA | NA | | NA | NA | NA | 7/30/07 | 8/28/07 | NA | NA |
| | Chlorpyrifos (µg/L) | NA | NA | NA | | NA | NA | NA | <0.003 | <0.003 | NA | NA |
| | *C. dubia* toxicity (% Control) | NA | NA | NA | | NA | NA | NA | NA | 100 | NA | NA |
| **2008 NM (near Calpack Rd)** | Date | NA | NA | NA | | 4/15/08 | 5/13/08 | 6/10/08 | 7/15/08 | 8/12/08 | 9/16/08 | NA |
| | Chlorpyrifos (µg/L) | NA | NA | NA | | <0.003 | <0.003 | <0.003 | <0.003 | <0.003 | <0.003 | NA |
| | *C. dubia* toxicity (% Control) | NA | NA | NA | | 100 | 88 | 100 | 100 | 100 | 100 | NA |
| **2010 MPM (near Calpack Rd)** | Date | NA | NA | NA | | 4/13/10 | 5/11/10 | NA | 7/13/10 | 8/10/10 | 9/07/10 | NA |
| | Chlorpyrifos (µg/L) | NA | NA | NA | | NA | <0.003 | NA | <0.003 | <0.003 | NA | NA |
| | *S. capricornutum* toxicity (% Control) | NA | NA | NA | | 426 | 691 | NA | 620 | NA | NA | NA |
| | *H. azteca* toxicity (% Control) | NA | NA | NA | | NA | NA | NA | NA | NA | **91** | NA |
| **2011 MPM (near Calpack Rd)** | Date | 1/11/11 | 2/8/11 | 3/8/11 | | 4/12/11 | 5/24/11 | NA | 7/26/11 | 8/23/11 | NA | 10/14/11 |
| | Chlorpyrifos (µg/L) | NA | NA | <0.003 | | NA | <0.003 | NA | <0.003 | <0.003 | NA | NA |
| | *C. dubia* toxicity (% Control) | NA | NA | 100 | | NA | 95 | NA | NA | 100 | NA | NA |
| | *S. capricornutum* toxicity (% Control) | **53** | 126 | NA | | 846 | 254 | NA | 311 | NA | NA | NA |
| | *H. azteca* toxicity (% Control) | NA | NA | 98 | | NA | NA | NA | NA | NA | NA | **86** |
| **2012 MPM (near Calpack Rd)** | Date | 1/17/12 | 2/14/12 | 3/15/12 | | 4/12/12 | 5/16/12 | 6/19/12 | 7/17/12 | 8/21/12 | 9/18/12 | NA |
| | Chlorpyrifos (µg/L) | NA | NA | <0.003 | | NA | <0.003 | NA | <0.003 | <0.003 | NA | NA |
| | *C. dubia* toxicity (% Control) | NA | NA | 105 | | NA | 100 | NA | NA | **60** | NA | NA |
| | *S. capricornutum* toxicity (% Control) | 1031 | 160 | NA | | 91 | 193 | NA | 98 | NA | NA | NA |
| | *H. azteca* toxicity (% Control) | NA | NA | 102 | | NA | NA | NA | NA | NA | **0** | NA |
| **2013 MPM (near Calpack Rd)** | Date | 1/15/13 | 2/21/13 | 3/19/13 | | 4/2/13 | 5/21/13 | NA | 7/16/13 | 8/20/13 | 9/17/13 | NA |
| | *C. dubia* toxicity (% Control) | NA | NA | 100 | | NA | 105 | NA | NA | 100 | NA | NA |
| | *S. capricornutum* toxicity (% Control) | **37** | 142 | NA | | 213 | 497 | NA | 277 | NA | NA | NA |
| | *H. azteca* toxicity (% Control) | NA | NA | **41** | | NA | NA | NA | NA | NA | 96 | NA |
| **2014 MPM (near Calpack Rd)** | Date | 1/28/14 | 2/11/14 | 3/3/14 | 3/5/14 | 4/15/14 | 5/20/14 | NA | 7/15/14 | 8/19/14 | 9/16/14 | |
| | *C. dubia* toxicity (% Control) | NA | NA | 100 | NA | NA | 100 | NA | NA | 100 | NA | |
| | *S. capricornutum* toxicity (% Control) | **6** | **23** | NA | NA | **53** | 131 | NA | 166 | NA | NA | |
| | *H. azteca* toxicity (% Control) | NA | NA | NA | 95 | NA | NA | NA | NA | NA | 96 | |

Add. – Additional Monitoring, conducted in 2007 only.
MPM – Management Plan Monitoring.
NA – Not applicable. No monitoring occurred on this date for this constituent.
NM – Normal Monitoring.

## Source Identification and Outreach

Priority A/B, C, and D constituents are usually associated with pesticide applications to assist in determining potential sources of water quality impairments and focusing outreach efforts. However, all management plan constituents are discussed during focused outreach including management practices that are implemented to reduce agricultural discharge of constituents of concern. The Coalition described its strategy for conducting outreach in high priority sites in the 2014 MPUR.

Water column toxicity to *S. capricornutum* occurred 15 times since 2005, including four resampling events (Table V-5). The eight TIEs conducted on samples collected from 2005 through September 2014 indicated non-polar organic chemicals and cationic metals as the cause of toxicity. The Coalition believes that management of copper and herbicides will help eliminate the toxicity to algae.

Priority E constituents under the Grant Line Canal near Calpack Rd management plan are arsenic, DO, *E. coli*, SC, and TDS. In January through September 2014, there were nine exceedances of the WQTL of SC and six exceedances of the WQTL for DO. Exceedances of the WQTLs for DO and SC are common within Zone 4 due to a lack of flow. In most cases, flow does not occur in the drains unless the pumps are running.

The Coalition carried out its management practice tracking and outreach which included contacting targeted growers in 2010 and following up in 2011. The Coalition contacted two targeted growers farming 686 acres within the Grant Line Canal near Calpack site subwatershed (2013 MPUR, Pages 33-34) and documented management practices (2011 MPUR, Pages 63-66). Both growers participated in follow-up contacts and documented implementation of the same management practices in 2010 that were previously implemented (2011 MPUR, Pages 63-66).

## Evaluation

The frequency of water quality impairments related to high priority constituents has decreased since focused outreach began in the site subwatershed. The remaining high priority constituents include sediment toxicity to *H. azteca* and water column toxicity to *C. dubia* and *S. capricornutum*. The last toxicity to *C. dubia* and *H. azteca* occurred in 2012 and 2013 respectively.

## Next Steps

Focused outreach is complete within this site subwatershed and the Coalition will continue general outreach during the 2015 WY. In the 2015 WY, the Coalition will discontinue monitoring at the Grant Line near Calpack Road site and the Grant Line @ Clifton Court site and management plans will be moved to the new Zone 7 Core site, Union Island Drain @ Bonetti Road. The new Core site represents the same hydrologic unit as the two Grant Line locations and is a better representation of the drainage of the entire island. For more information, refer to the 2014 MPU.

# VI. LITTLEJOHNS CREEK @ JACK TONE RD

## Overview

Littlejohns Creek @ Jack Tone Rd is one of the Coalition's second priority site subwatersheds. The Coalition completed the focused outreach portion of its management plan strategy in 2012. Monitoring results through September 2014 indicate improved water quality. The remaining constituents under the site's active management plan include chlorpyrifos, copper, DO, and *E. coli* (Table VI-1).

The Coalition conducted MPM from January to September 2014 for chlorpyrifos and copper; the remaining constituents did not require MPM as they are priority E (Table VI-1). Monitoring through September 2014 marked the third consecutive year with no exceedances of the WQTL for chlorpyrifos and copper.

In 2015, Littlejohns Creek @ Jack Tone Rd is classified as a Represented site. As outlined in the 2014 MPU strategy for Represented sites, the Coalition will monitor for diuron based on past exceedances in the Zone 2 Core site, French Camp Slough @ Airport Way. In the 2015 WY, MPM will continue; however, the Coalition will petition to remove chlorpyrifos and copper from the site subwatershed's active management plan.

**Table VI-1. Littlejohns Creek @ Jack Tone Rd management plan constituents.**
Management plan initiation year refers to when the site and constituent are addressed in the SJCDWQC MPURs and in the Management Plan Progress Report sections of the Annual Reports.

| PRIORITY | CONSTITUENT | MANAGEMENT PLAN INITIATION YEAR | MANAGEMENT PLAN REMOVAL YEAR |
|---|---|---|---|
| A/B | Chlorpyrifos | 2006 | Active |
| C | Copper | 2008 | Active |
| E | Dissolved Oxygen | 2006 | Active |
| E | *E. coli* | 2006 | Active |
| E | pH | 2009 | Active |
| **CONSTITUENT (REMOVED)** | | | |
| A/B | Diazinon | 2008 | 2013 |
| D | *S. capricornutum* water column toxicity | 2006 | 2013 |

## Description of Site Subwatershed

Littlejohns Creek @ Jack Tone Rd is a rotating Assessment Monitoring location within Zone 2 under the 2008 MRPP. Littlejohns Creek @ Jack Tone Rd consists of 16,167 irrigated acres of all of the major types of agriculture present in the Coalition region including, field crops, orchards, grains, vineyards, and pasture (Figure VI-1). Littlejohns Creek originates at the western edge of Woodward Reservoir, flows east through the Farmington Flood Control basin and eventually confluences with Lone Tree Creek to form French Camp Slough. The site subwatershed includes two upstream locations: Littlejohns Creek @ 26 Mile Rd and Littlejohns Creek @ Escalon Bellota (Table VI-2).

Littlejohns Creek is listed on California's 303(d) List of Impaired Waterbodies for *E. coli* and unknown toxicity (last updated in 2010).

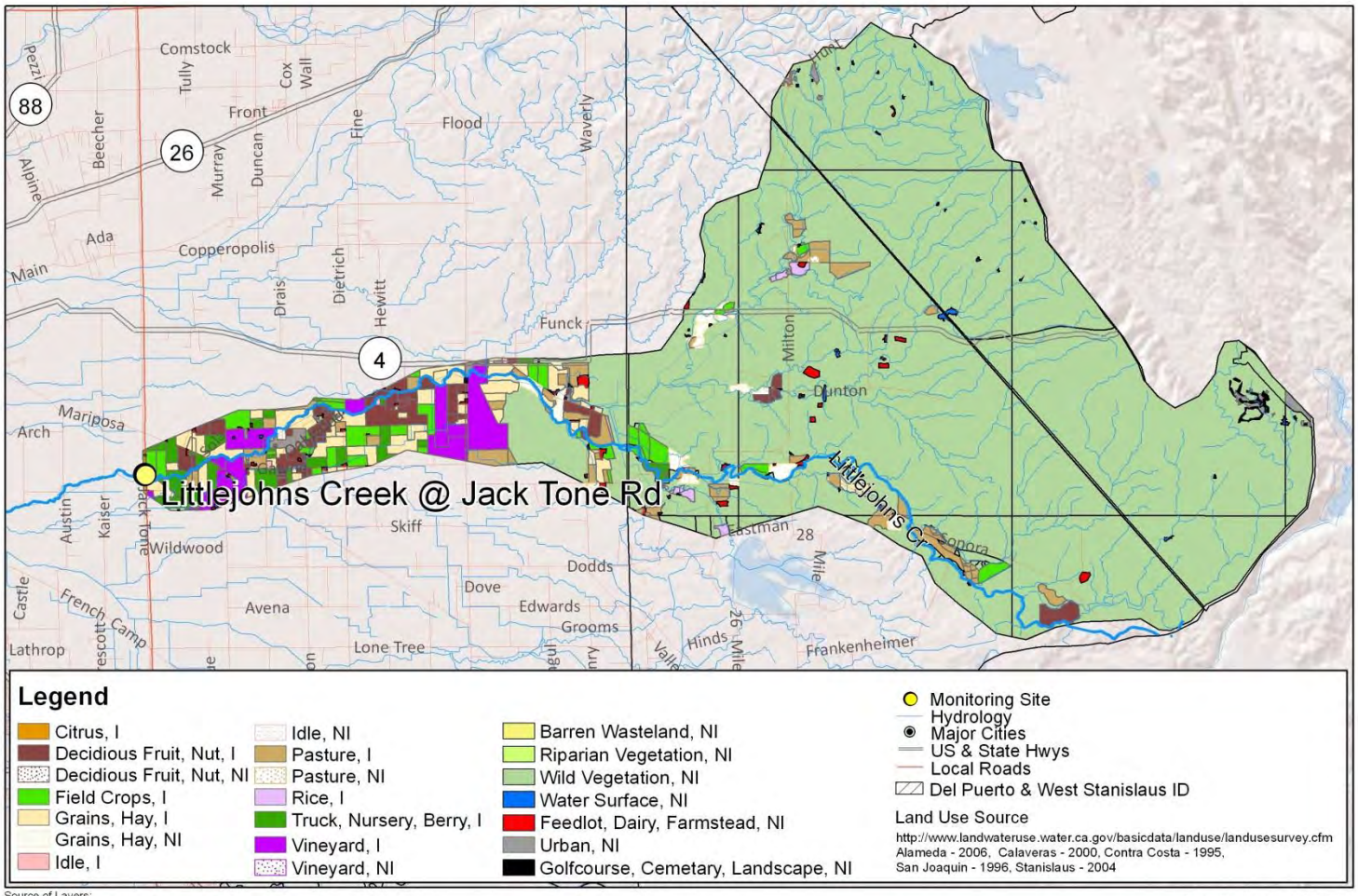
**Table VI-2. Littlejohns Creek site subwatershed sampling locations coordinates.**

| SITE NAME | STATION CODE | TARGET LATITUDE | TARGET LONGITUDE |
|---|---|---|---|
| Littlejohns Creek @ Escalon Bellota [US] | 531XLCAER | 37.92550 | -120.99910 |
| Littlejohns Creek @ 26 Mile Rd [US] | 531LCATMR | 37.89320 | -120.87760 |
| Littlejohns Creek @ Jack Tone Rd [*] | 531XLCAJR | 37.88958 | -121.14727 |

[US] Upstream sites

*Original SJCDWQC sampling site

**Figure VI-1. Littlejohns Creek @ Jack Tone Rd site subwatershed land use map.**



## Subwatershed Monitoring History

Normal Monitoring was initiated at Littlejohns Creek @ Jack Tone Rd in 2004 and continued through the 2008 irrigation season. Table VI-3 contains the number of events monitored per year and the constituents (by group) from 2008 to September 2014 (see 2013 MPUR Appendix I, Table VI-3 for analytes sampled prior to 2008). The most recent Assessment Monitoring occurred at the site in 2008.

The Coalition initiated MPM at Littlejohns Creek @ Jack Tone Rd in 2007 (Table VI-4). In 2008, MPM was conducted at two upstream locations, Littlejohns Creek @ 26 Mile Rd and Littlejohns Creek @ Escalon Bellota Rd, in an attempt to source exceedances of chlorpyrifos, metals, and water column toxicity to *S. capricornutum*. Since 2010, MPM during months of past exceedances occurred to evaluate the effectiveness of the Coalition's outreach strategy (Table VI-4). There were no detections of chlorpyrifos or diazinon; load information for those constituents can be found in the 2014 MPUR, Appendix I, Table VI-7.

**Table VI-3. Littlejohns Creek @ Jack Tone Rd sampling events and analyses per year.**

Only environmental samples are counted.

| Type | Analyte | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|---|
| Sampling Events | Events Scheduled | 10 | 0 | 10 | 10 | 9 | 7 | 6 |
| | Dry Sites | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Events Sampled | 10 | 0 | 10 | 10 | 9 | 7 | 6 |
| | | | | | | | | |
| Field and Physical Parameters | BOD | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Color | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Dissolved Oxygen | 10 | 0 | 10 | 10 | 9 | 7 | 6 |
| | Dissolved Solids | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | *E. coli* | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Grain size (sediment) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Hardness as CaCO3 | 7 | 0 | 3 | 4 | 4 | 4 | 4 |
| | pH | 10 | 0 | 10 | 10 | 9 | 7 | 6 |
| | Specific Conductivity | 10 | 0 | 10 | 10 | 9 | 7 | 6 |
| | Suspended Solids | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Total Organic Carbon | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Total Organic Carbon (sediment) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Turbidity | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| Nutrients | Ammonia as N | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Nitrate + Nitrite as N | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Nitrate as N | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Nitrite as N | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Nitrogen, Total Kjeldahl | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Orthophosphate as P | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Phosphate as P | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| Metals (Dissolved) | Cadmium | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Copper | 0 | 0 | 3 | 4 | 4 | 4 | 4 |
| | Lead | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Nickel | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Zinc | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Metals (Total) | Arsenic | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Boron | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cadmium | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Copper | 7 | 0 | 3 | 4 | 4 | 4 | 4 |
| | Lead | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Molybdenum | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Nickel | 7 | 0 | 0 | 0 | 0 | 0 | 0 |

| Type | Analyte | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|---|
| | Selenium | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Zinc | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| Carbamates | Aldicarb | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Carbaryl | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Carbofuran | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Diuron | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Linuron | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Methiocarb | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Methomyl | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Oxamyl | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| Group A Pesticides | Aldrin | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Chlordane | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Endosulfan I | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Endosulfan II | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | HCH, alpha | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | HCH, beta | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | HCH, delta | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | HCH, gamma | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Heptachlor | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Heptachlor epoxide | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Toxaphene | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Herbicides | Atrazine | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cyanazine | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Glyphosate | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Paraquat | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Simazine | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Trifluralin | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Organochlorines | DDD(p,p') | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | DDE(p,p') | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | DDT(p,p') | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Dicofol | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Dieldrin | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Endrin | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Methoxychlor | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| Organophosphates | Azinphos methyl | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Chlorpyrifos | 7 | 0 | 8 | 6 | 5 | 5 | 4 |
| | Demeton-s | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Diazinon | 7 | 0 | 7 | 2 | 1 | 1 | 0 |
| | Dichlorvos | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Dimethoate | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Disulfoton | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Malathion | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Methamidophos | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Methidathion | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Molinate | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Parathion, Methyl | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Phorate | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Phosmet | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Thiobencarb | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pyrethroids | Bifenthrin | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cyfluthrin, total | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cyhalothrin, lambda, total | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cypermethrin, total | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Esfenvalerate/Fenvalerate, total | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Permethrin, total | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sediment Pesticides | Bifenthrin | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Chlorpyrifos | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cyfluthrin | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cyhalothrin, lambda | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| Type | Analyte | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|---|
| | Cypermethrin | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Deltamethrin: Tralomethrin | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Esfenvalerate/ Fenvalerate | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Fenpropathrin | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Permethrin | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Toxicity | *Ceriodaphnia dubia* | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | *Pimephales promelas* | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | *Selenastrum capricornutum* | 8 | 0 | 3 | 4 | 4 | 0 | 0 |
| | *Hyalella azteca* | 2 | 0 | 1 | 0 | 0 | 0 | 0 |

**Table VI-4. Littlejohns Creek Management Plan Monitoring schedule (2007-September 2014).**

| Site Name | Sample Date | Monitoring Type | Copper | Total Metals | Chlorpyrifos | Diazinon | *S. capricornutum* | *H. azteca* |
|---|---|---|---|---|---|---|---|---|
| Littlejohns Creek @ Jack Tone Rd | 07/30/07 | Add. | | | X | | | |
| Littlejohns Creek @ Jack Tone Rd | 08/28/07 | Add. | | | | | X | |
| Littlejohns Creek @ 26 Mile Rd | 05/13/08 | US | | X | | | | |
| Littlejohns Creek @ Escalon Bellota Rd | 05/13/08 | US | | X | | | | |
| Littlejohns Creek @ 26 Mile Rd | 06/10/08 | US | | X | | | | |
| Littlejohns Creek @ Escalon Bellota Rd | 06/10/08 | US | | X | | | | |
| Littlejohns Creek @ 26 Mile Rd | 07/15/08 | US | | X | | | | |
| Littlejohns Creek @ Escalon Bellota Rd | 07/15/08 | US | | | X | | X | |
| Littlejohns Creek @ 26 Mile Rd | 08/12/08 | US | | X | | | | |
| Littlejohns Creek @ Escalon Bellota Rd | 08/12/08 | US | | | X | | X | |
| Littlejohns Creek @ 26 Mile Rd | 09/16/08 | US | | X | | | | |
| Littlejohns Creek @ Jack Tone Rd | 04/13/10 | MPM | | | X | | X | |
| Littlejohns Creek @ Jack Tone Rd | 05/11/10 | MPM | X | | | | | |
| Littlejohns Creek @ Jack Tone Rd | 06/08/10 | MPM | X | | X[1] | X[2] | | |
| Littlejohns Creek @ Jack Tone Rd | 07/13/10 | MPM | | | X[1] | X[2] | X | |
| Littlejohns Creek @ Jack Tone Rd | 08/10/10 | MPM | | | X[2] | X[2] | X | |
| Littlejohns Creek @ Jack Tone Rd | 09/07/10 | MPM | X | | X[2] | X[2] | | X[2] |
| Littlejohns Creek @ Jack Tone Rd | 10/12/10 | MPM | | | X[2] | X[2] | | |
| Littlejohns Creek @ Jack Tone Rd | 11/09/10 | MPM | | | X[2] | X[2] | | |
| Littlejohns Creek @ Jack Tone Rd | 12/07/10 | MPM | | | X[2] | X[2] | | |
| Littlejohns Creek @ Jack Tone Rd | 01/11/11 | MPM | | | X[2] | X[2] | | |
| Littlejohns Creek @ Jack Tone Rd | 02/08/11 | MPM | X | | X[1] | X[1] | | |
| Littlejohns Creek @ Jack Tone Rd | 03/08/11 | MPM | | | | | X | |
| Littlejohns Creek @ Jack Tone Rd | 04/12/11 | MPM | | | X | | X | |
| Littlejohns Creek @ Jack Tone Rd | 05/24/11 | MPM | X | | | | | |
| Littlejohns Creek @ Jack Tone Rd | 06/28/11 | MPM | X | | X | | | |
| Littlejohns Creek @ Jack Tone Rd | 07/26/11 | MPM | | | X | | X | |
| Littlejohns Creek @ Jack Tone Rd | 08/23/11 | MPM | | | | | X | |
| Littlejohns Creek @ Jack Tone Rd | 09/20/11 | MPM | X | | | | | |
| Littlejohns Creek @ Jack Tone Rd | 11/15/11 | MPM | | | X | | | |
| Littlejohns Creek @ Jack Tone Rd | 02/14/12 | MPM | X | | X | X | | |
| Littlejohns Creek @ Jack Tone Rd | 03/15/12 | MPM | | | | | X | |
| Littlejohns Creek @ Jack Tone Rd | 04/12/12 | MPM | | | X | | X | |
| Littlejohns Creek @ Jack Tone Rd | 05/16/12 | MPM | X | | | | | |
| Littlejohns Creek @ Jack Tone Rd | 06/19/12 | MPM | X | | X | | | |
| Littlejohns Creek @ Jack Tone Rd | 07/17/12 | MPM | | | X | | X | |
| Littlejohns Creek @ Jack Tone Rd | 08/21/12 | MPM | | | | | X | |
| Littlejohns Creek @ Jack Tone Rd | 09/18/12 | MPM | X | | | | | |
| Littlejohns Creek @ Jack Tone Rd | 11/06/12 | MPM | | | X | | | |
| Littlejohns Creek @ Jack Tone Rd | 02/21/13 | MPM | X | | X | X | | |
| Littlejohns Creek @ Jack Tone Rd | 04/02/13 | MPM | | | X | | | |

| Site Name | Sample Date | Monitoring Type | Copper | Total Metals | Chlorpyrifos | Diazinon | *S. capricornutum* | *H. azteca* |
|---|---|---|---|---|---|---|---|---|
| Littlejohns Creek @ Jack Tone Rd | 05/21/13 | MPM | X | | | | | |
| Littlejohns Creek @ Jack Tone Rd | 06/18/13 | MPM | X | | X | | | |
| Littlejohns Creek @ Jack Tone Rd | 07/16/13 | MPM | | | X | | | |
| Littlejohns Creek @ Jack Tone Rd | 09/17/13 | MPM | X | | | | | |
| Littlejohns Creek @ Jack Tone Rd | 11/12/13 | MPM | | | X | | | |
| Littlejohns Creek @ Jack Tone Rd | 02/11/14 | MPM | X | | X | | | |
| Littlejohns Creek @ Jack Tone Rd | 04/15/14 | MPM | | | X | | | |
| Littlejohns Creek @ Jack Tone Rd | 05/20/14 | MPM | X | | | | | |
| Littlejohns Creek @ Jack Tone Rd | 06/17/14 | MPM | X | | X | | | |
| Littlejohns Creek @ Jack Tone Rd | 07/15/14 | MPM | | | X | | | |
| Littlejohns Creek @ Jack Tone Rd | 09/16/14 | MPM | X | | | | | |

[1] MPM and Department of Pesticide Regulation (DPR) grant monitoring.
[2] DPR grant monitoring only.
Add. – Additional sampling
US – Upstream sampling
X – Constituent sampled for Management Plan Monitoring (MPM).

## Monitoring Results

In January through September 2014, MPM occurred at Littlejohns Creek @ Jack Tone Rd for chlorpyrifos and copper (Table VI-4). This year marked the third year with no exceedances of the WQTL for chlorpyrifos or copper (Table VI-5). The priority E constituent ,DO, was measured during all MPM events as a field parameter and four exceedances of the WQTL occurred.

Table VI-5 is a tally of exceedances of WQTLs from 2004 through September 2014 for management plan constituents in the Littlejohns Creek @ Jack Tone Rd site subwatershed (organized alphabetically by constituent priority). Table VI-6 contains detections and WQTL exceedance results of all sampling events since the constituent became part of the site subwatershed management plan. Table VI-7 contains the instantaneous loads for copper since monitoring began in the site subwatershed. A record of all exceedances in the site subwatershed since monitoring began is provided in Appendix II, Table VI-A.

**Table VI-5. Littlejohns Creek @ Jack Tone Rd management plan constituent exceedance tally (2006- September 2014).**

Exceedances that occurred during resampling for field parameters and toxicity are included in the tally. Exceedances are organized alphabetically by constituent priority. A complete list of exceedances can be found in Appendix II, Table VI-A.

| | Active Management Plan Constituents | | | | | | Removed Management Plan Constituents | |
|---|---|---|---|---|---|---|---|---|
| Monitoring Year | Chlorpyrifos, >0.015 µg/L | Copper (Dissolved), Variable[1] | Copper (Total), Variable[2] or >1300 µg/L | Dissolved Oxygen, <7 mg/L | *E. coli*, >235 MPN/100 mL | pH, <6.5 and >8.5 Units | Diazinon, >0.1 µg/L | *S. capricornutum*, (%Control) |
| 2004 | 0 | NA | NA | 1 | 0 | 0 | 0 | 1 |
| 2005 | 1 | NA | NA | 2 | 4 | 1 | 0 | 1 |
| 2006 | 1 | NA | 1 | 3 | 1 | 0 | 0 | 0 |
| 2007 | 2 | NA | 2 | 4 | 1 | 0 | 1 | 1 |
| 2008 | 3 | 0 | 2 | 3 | 0 | 0 | 0 | 2 |
| 2009 | NA | NA | NA | NA | NA | NA | NA | NA |
| 2010 | 1 | 1 | 0 | 4 | NA | 0 | 0 | 0 |
| 2011 | 1 | 1 | 0 | 3 | NA | 1 | 0 | 0 |
| 2012 | 0 | 0 | 0 | 5 | NA | 0 | 0 | 0 |
| 2013 | 0 | 0 | 0 | 4 | NA | 0 | 0 | NA |
| 2014 WY* | 0 | 0 | 0 | 4 | NA | 1 | NA | NA |
| **Overall Tally** | **9** | **2** | **5** | **33** | **6** | **3** | **1** | **5** |
| **Constituent Priority** | **A/B** | **C** | **C** | **E** | **E** | **E** | **A/B[R]** | **D[R]** |

[1] Metal WQTL variable; based on hardness. Dissolved metals not analyzed until October 2008.
[2] Metal WQTL variable; based on hardness.
NA – Not Applicable; monitoring did not occur for this constituent during the year.
[R] – Removed from active management plan.
*2014 includes January through September results only.

**Table VI-6. Littlejohns Creek site subwatershed monitoring results for priority A/B - D constituents since management plan initiation.**

Exceedance values are in bold and upstream sites are italicized. Resampling (RS) due to toxicity not included in table. MPM results after September 2014 not included in table (grey cells).

| | Month: | Jan | Feb | | Mar | Apr | May | Jun | Jul | Aug | Sep | | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **2007 NM (@Jack Tone Rd)** | Date | NA | 2/11/07 | 2/28/07 | NA | 4/10/07 | 5/22/07 | 6/12/07 | 7/10/07 | 8/07/07 | 9/04/07 | | NA | NA | NA |
| | Chlorpyrifos (µg/L) | NA | **0.029** | <0.003 | NA | <0.003 | <0.003 | <0.003 | 0.013 | <0.003 | <0.003 | | NA | NA | NA |
| | *S. capricornutum* toxicity (% Control) | NA | 230 | 125 | NA | 133 | 164 | 251 | **71** | 192 | 182 | | NA | NA | NA |
| **2007 MPM Add. (@Jack Tone Rd)** | Date | NA | NA | | NA | 4/10/07 | 5/22/07 | 6/12/07 | 7/30/07 | 8/28/07 | NA | | NA | NA | NA |
| | Chlorpyrifos (µg/L) | NA | NA | | NA | NA | NA | NA | **0.018** | NA | NA | | NA | NA | NA |
| | *S. capricornutum* toxicity (% Control) | NA | NA | | NA | NA | NA | NA | NA | 363 | NA | | NA | NA | NA |
| **2008 NM (@Jack Tone Rd)** | Date | 1/23/08 | NA | | NA | 4/15/08 | 5/13/08 | 6/10/08 | 7/13/08 | 8/12/08 | 9/16/08 | | NA | NA | NA |
| | Copper (µg/L) | 3.8 | NA | | NA | 3.9 | **4.2 (4.1)** | 3.1 | 3.4 | 2.0 | **4.2 (3.5)** | | NA | NA | NA |
| | Chlorpyrifos (µg/L) | 0.004 | NA | | NA | **0.034** | <0.003 | **0.077** | **0.025** | <0.003 | <0.003 | | NA | NA | NA |
| | *S. capricornutum* toxicity (% Control) | 126 | NA | | NA | **6** | 93 | 131 | 184 | 167 | 155 | | NA | NA | NA |
| **2008 MPM US (@ 26 Mile Rd)** | Date | NA | NA | | NA | NA | 5/13/08 | 6/10/08 | 7/15/08 | 8/12/08 | 9/16/08 | | NA | NA | NA |
| | Copper (µg/L) | NA | NA | | NA | NA | 1.6 | 0.9 | **3.1** | 0.8 | 1.0 | | NA | NA | NA |
| **2008 MPM US (@ Escalon Bellota Rd)** | Date | NA | NA | | NA | NA | 5/13/08 | 6/10/08 | 7/15/08 | 8/12/08 | 9/16/08 | | NA | NA | NA |
| | Copper (µg/L) | NA | NA | | NA | 1.9 | 1.8 | NA | NA | NA | NA | | NA | NA | NA |
| | Chlorpyrifos (µg/L) | NA | NA | | NA | NA | NA | NA | <0.003 | <0.003 | NA | | NA | NA | NA |
| | *S. capricornutum* toxicity (% Control) | NA | NA | | NA | NA | NA | NA | 139 | 117 | NA | | NA | NA | NA |
| **2010 MPM (@Jack Tone Rd)** | Date | NA | NA | | NA | 4/13/10 | 5/11/10 | 6/08/10 | 7/13/10 | 8/10/10 | 9/07/10 | 9/14/10 | 10/12/10 | 11/09/10 | 12/07/10 |
| | Copper, dissolved (µg/L) | NA | NA | | NA | NA | **1.7** | 2.2 | NA | NA | 2.5 | NA | NA | NA | NA |
| | Copper, total (µg/L) | NA | NA | | NA | NA | 2.4 | 4.5 | NA | NA | 2.3 | NA | NA | NA | NA |
| | Chlorpyrifos (µg/L) | NA | NA | | NA | <0.003 | NA | <0.003 | <0.003 | <0.003* | 0.013* | NA | <0.003* | **0.040*** | 0.014* |
| | Diazinon (µg/L) | NA | NA | | NA | NA | NA | <0.004* | <0.004* | <0.004* | <0.004* | NA | <0.004* | <0.004* | <0.004* |
| | *S. capricornutum* toxicity (% Control) | NA | NA | | NA | 904 | NA | NA | 360 | 879 | NA | NA | NA | NA | NA |
| | *H. azteca* toxicity (% Control) | NA | NA | | NA | NA | NA | NA | NA | NA | NA | 110* | NA | NA | NA |
| **2011 MPM (@Jack Tone Rd)** | Date | 1/11/11 | 2/8/11 | | 3/8/11 | 4/12/11 | 5/24/11 | 6/28/11 | 7/26/11 | 8/23/11 | 9/20/11 | | NA | 11/15/11 | NA |
| | Copper, dissolved (µg/L) | NA | 2 | | NA | NA | **1.7** | 1.1 | NA | NA | 1.2 | | NA | NA | NA |
| | Copper, total (µg/L) | NA | 2.8 | | NA | NA | 2.8 | 2.7 | NA | NA | 2.2 | | NA | NA | NA |
| | Chlorpyrifos (µg/L) | <0.003* | <0.003 | | NA | <0.003 | NA | <0.003 | <0.003 | NA | NA | | NA | **0.022** | NA |
| | Diazinon (µg/L) | <0.004* | <0.004 | | NA | NA | NA | NA | NA | NA | NA | | NA | NA | NA |
| | *S. capricornutum* toxicity (% Control) | NA | NA | | 679 | 1643 | NA | NA | 684 | 650 | NA | | NA | NA | NA |
| **2012 MPM (@Jack Tone Rd)** | Date | NA | 2/14/12 | | 3/15/12 | 4/12/12 | 5/16/12 | 6/19/12 | 7/17/12 | 8/21/12 | 9/18/12 | | NA | 11/6/12 | NA |
| | Copper, dissolved (µg/L) | NA | 2.5 | | NA | NA | 1.3 | 0.87 | NA | NA | 0.92 | | NA | NA | NA |
| | Copper, total (µg/L) | NA | 3.4 | | NA | NA | 2.5 | 2.4 | NA | NA | 1.5 | | NA | NA | NA |
| | Chlorpyrifos (µg/L) | NA | <0.003 | | NA | <0.003 | NA | <0.003 | <0.003 | NA | NA | | NA | <0.003 | NA |
| | Diazinon (µg/L) | NA | <0.004 | | NA | NA | NA | NA | NA | NA | NA | | NA | NA | NA |
| | *S. capricornutum* toxicity (% Control) | NA | NA | | 142 | 329 | NA | NA | 273 | 346 | NA | | NA | NA | NA |
| **2013 MPM (@ Jack Tone Rd)** | Date | NA | 2/21/13 | | NA | 4/2/2013 | 5/21/13 | 6/18/13 | 7/16/13 | NA | 9/17/13 | | NA | 11/19/13 | NA |
| | Copper, dissolved (µg/L) | NA | 1.6 | | NA | NA | 1.4 | 0.96 | NA | NA | 1.8 | | NA | NA | NA |
| | Copper, total (µg/L) | NA | 2.7 | | NA | NA | 3.1 | 2.0 | NA | NA | 3.2 | | NA | NA | NA |

| | Month: | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Chlorpyrifos (µg/L) | NA | <0.003 | NA | <0.003 | NA | <0.003 | <0.003 | NA | NA | NA | <0.003 | NA |
| | Diazinon (µg/L) | NA | <0.004 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| **2014 MPM (@ Jack Tone Rd)** | Date | NA | 2/11/14 | NA | 4/15/14 | 5/20/14 | 6/17/14 | 7/15/14 | NA | 9/16/14 | | | |
| | Copper, dissolved (µg/L) | NA | 2.2 | NA | NA | 1.4 | 1.2 | NA | NA | 0.99 | | | |
| | Copper, total (µg/L) | NA | 4.6 | NA | NA | 2.4 | 3.8 | NA | NA | 2.1 | | | |
| | Chlorpyrifos (µg/L) | NA | <0.003 | NA | <0.003 | NA | <0.003 | <0.003 | NA | NA | | | |

Add. – Additional Monitoring, conducted in 2007 only.
MPM – Management Plan Monitoring.
NA – Not applicable. No monitoring occurred on this date for this constituent.
NM – Normal Monitoring
US – Upstream Monitoring, conducted in 2008 only.
*Additional Department of Pesticide Regulation (DPR) grant monitoring.

**Table VI-7. Littlejohns Creek site subwatershed instantaneous load calculations for copper.**

Upstream sites are italicized. If discharge was unable to be measured or the analyte was ND, the result is not included in the table. Load information for chlorpyrifos and diazinon can be found in the 2014 MPUR, Appendix I.

| Site Name | Analyte Name | Sample Date | Discharge, CFS | Concentration | Concentration Unit | Loading Rate[1] | Loading Rate Unit |
|---|---|---|---|---|---|---|---|
| Littlejohns Creek @ Jack Tone Rd | Copper | 05/16/06 | 23.50 | 4.4 | µg/L | 2928 | µg/sec |
| Littlejohns Creek @ Jack Tone Rd* | Copper | 08/15/06 | 12.79 | 2.1 | µg/L | 761 | µg/sec |
| Littlejohns Creek @ Jack Tone Rd* | Copper | 08/15/06 | 12.79 | 2.2 | µg/L | 797 | µg/sec |
| Littlejohns Creek @ Jack Tone Rd | Copper | 08/15/06 | 12.79 | 2.5 | µg/L | 905 | µg/sec |
| Littlejohns Creek @ Jack Tone Rd | Copper | 02/11/07 | 0 | 6.8 | µg/L | 0 | µg/sec |
| Littlejohns Creek @ Jack Tone Rd | Copper | 09/04/07 | 0 | 2.7 | µg/L | 0 | µg/sec |
| Littlejohns Creek @ Jack Tone Rd | Copper | 01/23/08 | 2.45 | 3.8 | µg/L | 264 | µg/sec |
| *Littlejohns Creek @ 26 Mile Rd* | *Copper* | *09/16/08* | *0* | *1.0* | *µg/L* | *0* | *µg/sec* |
| Littlejohns Creek @ Jack Tone Rd | Copper | 02/08/11 | 0 | 2.8 | µg/L | 0 | µg/sec |
| Littlejohns Creek @ Jack Tone Rd | Copper | 02/14/12 | 0 | 3.4 | µg/L | 0 | µg/sec |
| Littlejohns Creek @ Jack Tone Rd | Copper | 05/16/12 | 0 | 2.5 | µg/L | 0 | µg/sec |
| Littlejohns Creek @ Jack Tone Rd | Copper | 02/21/13 | 0 | 2.7 | µg/L | 0 | µg/sec |
| Littlejohns Creek @ Jack Tone Rd | Copper | 02/11/14 | 0 | 4.6 | µg/L | 0 | µg/sec |
| Littlejohns Creek @ Jack Tone Rd | Copper (D) | 02/08/11 | 0 | 2.0 | µg/L | 0 | µg/sec |
| Littlejohns Creek @ Jack Tone Rd | Copper (D) | 02/14/12 | 0 | 2.5 | µg/L | 0 | µg/sec |
| Littlejohns Creek @ Jack Tone Rd | Copper (D) | 05/16/12 | 0 | 1.3 | µg/L | 0 | µg/sec |
| Littlejohns Creek @ Jack Tone Rd | Copper (D) | 02/21/13 | 0 | 1.6 | µg/L | 0 | µg/sec |
| Littlejohns Creek @ Jack Tone Rd | Copper (D) | 02/11/14 | 0 | 2.2 | µg/L | 0 | µg/sec |

[1] Load = Discharge (cfs) X 28.317L/ft3 X Concentration (µg/L). To convert a concentration measured in mg/L to µg/L multiply by 1000. The load values calculated represent instantaneous loads only, and should not be used to extrapolate loading over any period of time.

*Field Duplicate

Copper (D)-Dissolved Copper

## Source Identification and Outreach

A complete review of source identification and outreach activities in the Littlejohns Creek @ Jack Tone Rd site subwatershed is provided in the 2013 MPUR Appendix I including an analysis of the management plan constituents that were removed due to improved water quality (Pages 163-178). The Coalition evaluated the PUR data and past monitoring results to determine the sources of constituents listed in the management plan.

Priority A/B, C, and D constituents are usually associated with pesticide applications to assist in determining potential sources of water quality impairments and focusing outreach efforts. However, all management plan constituents are discussed during focused outreach including management practices to reduce agricultural discharge of constituents of concern. The Coalition described its strategy for conducting outreach in high priority sites in the Management Practice Tracking Strategy sections of the main body of the 2014 MPUR.

Exceedances of priority E constituents such as DO are difficult to source. The Coalition believes that by managing the high priority constituents, water quality in the site subwatershed will improve overall.

The Coalition carried out its management practice tracking and focused outreach in 2010 through 2012. The Coalition contacted 16 targeted growers farming 2,796 acres within the Littlejohns Creek @ Jack

Tone Rd site subwatershed (2013 MPUR, Page 33) and documented their management practices (2012 MPUR, Pages 67-71). In 2012, further outreach and education occurred for six additional growers in the site subwatershed focusing on chlorpyrifos use. The six growers participated in follow-up contacts and documented newly implemented management practices in 2010 or 2011 (2012 MPUR, Pages 67-71).

## Evaluation

The Coalition's focused outreach strategy helped improve water quality in the Littlejohns Creek @ Jack Tone Rd site subwatershed. The remaining high priority constituents in the site subwatershed's active management plan are chlorpyrifos and copper. The Coalition will petition to remove chlorpyrifos and copper during 2015 following three years of monitoring with no exceedances. The Priority E constituents under the active management plan are DO and *E. coli.*

## Next Steps

During the 2015 WY, Littlejohns Creek @ Jack Tone Rd is classified as a Represented site and MPM will occur for chlorpyrifos and copper during months of past exceedances and high application within the site subwatershed; however, the Coalition will petition to remove the constituents from the active management plan. As outlined in the 2014 MPU strategy for Represented sites, the Coalition will monitor for diuron based on past exceedances in the Zone 2 Core site, French Camp Slough @ Airport Way. Field parameters, such as DO, and will be measured during all monitoring events. General outreach will continue in the site subwatershed.

# HIGH PRIORITY SITE SUBWATERSHEDS (2011–2013)

# VII. FRENCH CAMP SLOUGH @ AIRPORT WAY

## Overview

French Camp Slough @ Airport Way is one of the Coalition's third priority site subwatersheds. The Coalition completed focused outreach in the site subwatershed in 2013 and monitoring results from 2011 through September 2014 indicated improved water quality. The Coalition received approval to remove dieldrin from the site subwatershed active management plan (March 22, 2012) as well as copper, diazinon, diuron, lead, and water column toxicity to *C. dubia* and *S. capricornutum* (February 27, 2013). However, there was one sample collected on February 11, 2014 that exceeded the WQTL for diuron; there was also a sample collected on the same event that was toxic to *S. capricornutum*. The Coalition will reclassify diuron and toxicity to *S. capricornutum* as active management plan constituents in the 2015 WY. The remaining constituents in the site's active management plan include chlorpyrifos, DO, *E. coli,* pH, and sediment toxicity to *H. azteca* (Table VII-1).

From January through September 2014, MPM occurred for chlorpyrifos and sediment toxicity to *H. azteca*. No exceedances of the WQTL for chlorpyrifos occurred through September 2014. No sediment toxicity to *H. azteca* occurred during 2014; there were no samples toxic to *H. azteca* collected from this site for three years. Assessment Monitoring through September 2014 resulted in exceedances of the WQTL for diuron, DO, *E. coli*, simazine, and one toxic sample to *S. capricornutum* (Appendix III, Table III-2A).

In 2015, the Coalition will conduct monitoring at French Camp Slough @ Airport Way based on the monitoring strategy at a Core site, as described in the 2014 MPU. Additionally, MPM will occur for chlorpyrifos, diuron, water column toxicity to *S. capricornutum*, and sediment toxicity to *H. azteca*. The field parameters DO and pH will also be measured during all monitoring events.

**Table VII-1. French Camp Slough @ Airport Way management plan constituents.**
Management plan initiation year refers to when the site and constituent are addressed in the SJCDWQC MPURs and in the Management Plan Progress Report sections of the Annual Reports.

| PRIORITY | CONSTITUENT | MANAGEMENT PLAN INITIATION YEAR | MANAGEMENT PLAN REMOVAL YEAR |
|---|---|---|---|
| A/B | Chlorpyrifos | 2006 | Active |
| C | Diuron | 2009, 2015 | Active |
| D | *S. capricornutum* water column toxicity | 2009, 2015 | Active |
| D | *H. azteca* sediment toxicity | 2008 | Active |
| E | Dissolved Oxygen | 2006 | Active |
| E | *E. coli* | 2006 | Active |
| E | pH | 2009 | Active |
| **CONSTITUENT (REMOVED)** | | | |
| A/B | Diazinon | 2008 | 2013 |
| C | Copper | 2007 | 2013 |
| D | *C. dubia* water column toxicity | 2008 | 2013 |
| E | Dieldrin | 2009 | 2012 |
| E | Lead | 2008 | 2013 |

[1] Diuron was approved for removal on February 27, 2013; however, diuron will be reinstated into a management plan during 2015 as a result of exceedance of the WQTL which occurred during the 2014 WY.

## Description of Site Subwatershed

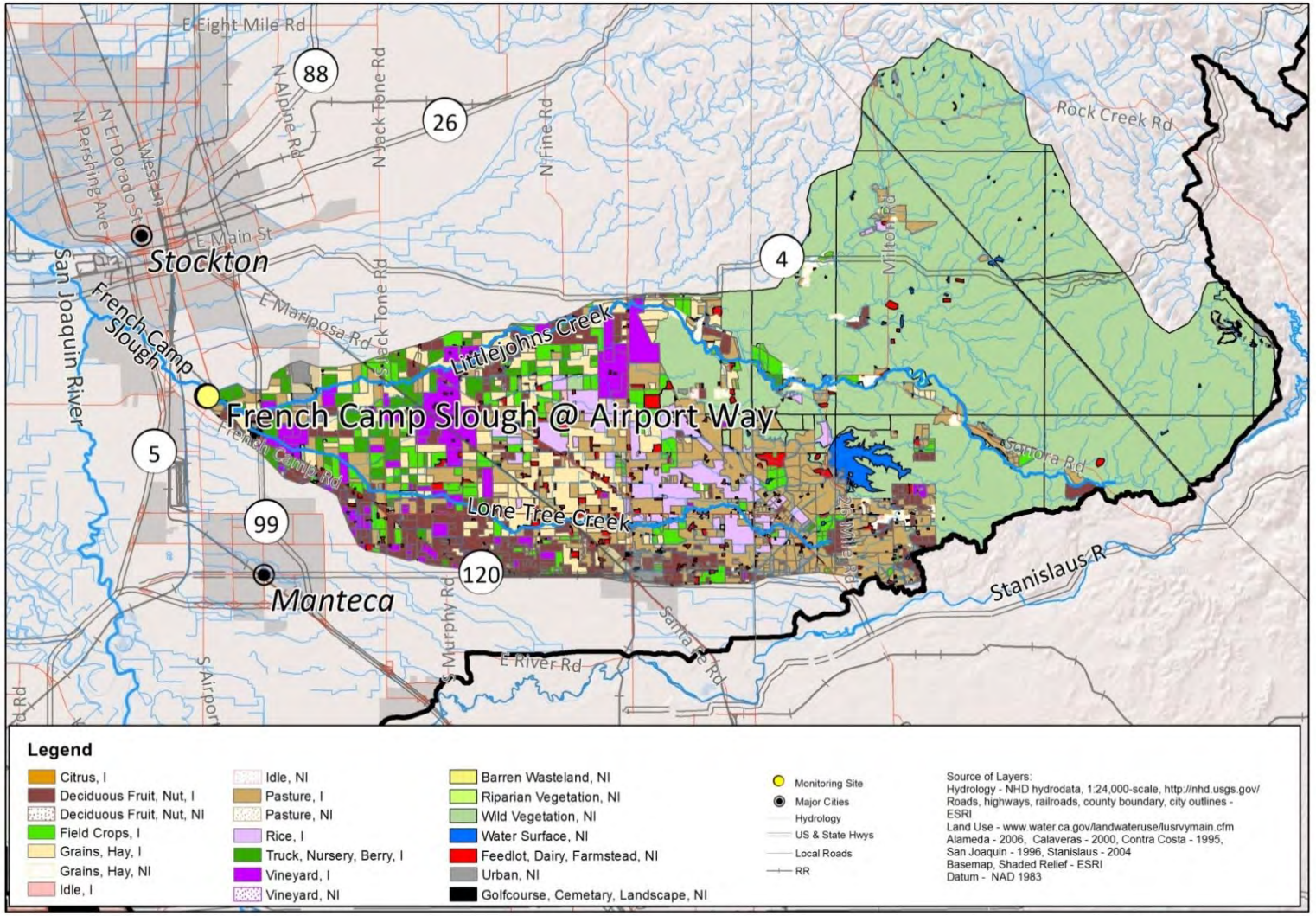
French Camp Slough @ Airport Way is the Core Monitoring site within Zone 2 under the 2008 MRPP. This site contains 83,229 irrigated acres consisting of all major types of agriculture present in the Coalition region including field crops, orchards, grains, hay, rice, tomatoes, vineyards, and irrigated pasture (Figure VII-1). The site subwatershed drains agricultural land to the east of Manteca and Stockton and eventually flows through urban areas prior to discharging into the San Joaquin River; French Camp Slough is created by the confluence of Littlejohns Creek and Lone Tree Creek and includes both of these subwatersheds as well as Unnamed Drain to Lone Tree Creek (a tributary to Lone Tree Creek) in its overall watershed area (Figure VII-1). Table VII-2 lists the coordinates of the location where monitoring occurs on French Camp Slough.

French Camp Slough (confluence of Littlejohns and Lone Tree Creeks to San Joaquin River, San Joaquin County; partly in Delta Waterways, eastern portion) is listed on California's 303(d) List of Impaired Waterbodies for chlorpyrifos, diazinon, DO, *E. coli*, sediment toxicity, and unknown toxicity (last updated in 2010).

**Table VII-2. French Camp Slough @ Airport Way site subwatershed coordinates.**

| Site Name | Station Code | Target Latitude | Target Longitude |
|---|---|---|---|
| French Camp Slough @ Airport Way | 531SJC504 | 37.88172 | -121.24933 |

**Figure VII-1. French Camp Slough @ Airport Way site subwatershed land use map.**



## Subwatershed Monitoring History

Normal Monitoring at French Camp Slough @ Airport Way was conducted from 2005 through 2008. Core Monitoring began in October 2008 with Assessment Monitoring occurring every third year; the last Assessment Monitoring year was 2014. Table VII-3 contains the number of events monitored per year and the constituents (by group) from 2008 through September 2014 (see 2013 MPUR Appendix I, Table VII-3 for analytes sampled prior to 2008).

The Coalition initiated MPM in 2007 and resumed in 2010 (Table VII-4). From 2010 through September 2014, MPM occurred during months of past exceedances. There were no detections of chlorpyrifos, copper, diazinon, or dieldrin from January through September 2014; load information for those constituents can be found in the 2014 MPUR, Appendix I, Table VII-7.

**Table VII-3. French Camp Slough @ Airport Way sampling events and analyses per year.**
Only the environmental samples are counted.

| Type | Analyte | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|---|
| Sampling Events | Events Scheduled | 14 | 13 | 12 | 14 | 12 | 12 | 10 |
| | Dry Sites | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Events Sampled | 14 | 13 | 12 | 14 | 12 | 12 | 10 |
| | | | | | | | | |
| Field and Physical Parameters | BOD | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Color | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Dissolved Oxygen | 14 | 13 | 12 | 14 | 12 | 12 | 10 |
| | Dissolved Solids | 10 | 12 | 12 | 12 | 12 | 12 | 9 |
| | *E. coli* | 10 | 12 | 12 | 12 | 12 | 12 | 9 |
| | Grain size (sediment) | 0 | 0 | 1 | 2 | 2 | 2 | 2 |
| | Hardness as CaCO3 | 7 | 0 | 4 | 12 | 5 | 1 | 9 |
| | pH | 14 | 13 | 12 | 14 | 12 | 12 | 10 |
| | Specific Conductivity | 14 | 13 | 12 | 14 | 12 | 12 | 10 |
| | Suspended Solids | 3 | 12 | 12 | 12 | 12 | 12 | 9 |
| | Total Organic Carbon | 10 | 12 | 12 | 12 | 12 | 12 | 9 |
| | Total Organic Carbon (sediment) | 0 | 0 | 1 | 2 | 2 | 2 | 2 |
| | Turbidity | 10 | 12 | 12 | 12 | 12 | 12 | 9 |
| Nutrients | Ammonia as N | 10 | 12 | 12 | 12 | 12 | 12 | 9 |
| | Nitrate + Nitrite as N | 3 | 12 | 12 | 12 | 12 | 12 | 9 |
| | Nitrate as N | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Nitrite as N | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Nitrogen, Total Kjeldahl | 10 | 12 | 12 | 12 | 0 | 12 | 9 |
| | Orthophosphate as P | 10 | 12 | 12 | 12 | 12 | 12 | 9 |
| | Phosphate as P | 10 | 12 | 12 | 12 | 12 | 12 | 9 |
| Metals (Dissolved) | Cadmium | 0 | 0 | 0 | 12 | 0 | 0 | 9 |
| | Copper | 0 | 0 | 4 | 12 | 5 | 1 | 9 |
| | Lead | 0 | 0 | 0 | 12 | 2 | 0 | 9 |
| | Nickel | 0 | 0 | 0 | 12 | 0 | 0 | 9 |
| | Zinc | 0 | 0 | 0 | 12 | 0 | 0 | 9 |
| Metals (Total) | Arsenic | 7 | 0 | 0 | 12 | 0 | 0 | 9 |
| | Boron | 7 | 0 | 0 | 12 | 0 | 0 | 9 |
| | Cadmium | 7 | 0 | 0 | 12 | 0 | 0 | 9 |
| | Copper | 7 | 0 | 4 | 12 | 5 | 1 | 9 |
| | Lead | 7 | 0 | 0 | 12 | 2 | 0 | 9 |
| | Molybdenum | 0 | 0 | 0 | 12 | 0 | 0 | 9 |
| | Nickel | 7 | 0 | 0 | 12 | 0 | 0 | 9 |
| | Selenium | 7 | 0 | 0 | 12 | 0 | 0 | 9 |

| Type | Analyte | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|---|
| | Zinc | 7 | 0 | 0 | 12 | 0 | 0 | 9 |
| Carbamates | Aldicarb | 10 | 12 | 12 | 12 | 0 | 0 | 9 |
| | Carbaryl | 10 | 12 | 12 | 12 | 0 | 0 | 9 |
| | Carbofuran | 10 | 12 | 12 | 12 | 0 | 0 | 9 |
| | Diuron | 10 | 1 | 0 | 12 | 0 | 2 | 9 |
| | Linuron | 10 | 1 | 0 | 12 | 0 | 0 | 9 |
| | Methiocarb | 10 | 12 | 12 | 12 | 0 | 0 | 9 |
| | Methomyl | 10 | 12 | 12 | 12 | 0 | 0 | 9 |
| | Oxamyl | 10 | 12 | 12 | 12 | 0 | 0 | 9 |
| Group A Pesticides | Aldrin | 0 | 8 | 0 | 0 | 0 | 0 | 0 |
| | Chlordane | 0 | 8 | 0 | 0 | 0 | 0 | 0 |
| | Endosulfan I | 0 | 8 | 0 | 0 | 0 | 0 | 0 |
| | Endosulfan II | 0 | 8 | 0 | 0 | 0 | 0 | 0 |
| | HCH, alpha | 0 | 8 | 0 | 0 | 0 | 0 | 0 |
| | HCH, beta | 0 | 8 | 0 | 0 | 0 | 0 | 0 |
| | HCH, delta | 0 | 8 | 0 | 0 | 0 | 0 | 0 |
| | HCH, gamma | 0 | 8 | 0 | 0 | 0 | 0 | 0 |
| | Heptachlor | 0 | 8 | 0 | 0 | 0 | 0 | 0 |
| | Heptachlor epoxide | 0 | 8 | 0 | 0 | 0 | 0 | 0 |
| | Toxaphene | 0 | 8 | 0 | 0 | 0 | 0 | 0 |
| Herbicides | Atrazine | 7 | 1 | 0 | 12 | 0 | 0 | 9 |
| | Cyanazine | 7 | 1 | 0 | 12 | 0 | 0 | 9 |
| | Glyphosate | 7 | 0 | 0 | 12 | 0 | 0 | 9 |
| | Paraquat | 7 | 0 | 0 | 12 | 0 | 0 | 9 |
| | Simazine | 7 | 1 | 0 | 12 | 0 | 0 | 9 |
| | Trifluralin | 0 | 1 | 0 | 12 | 0 | 0 | 9 |
| Organochlorines | DDD(p,p') | 10 | 12 | 0 | 12 | 0 | 0 | 9 |
| | DDE(p,p') | 10 | 12 | 0 | 12 | 0 | 0 | 9 |
| | DDT(p,p') | 10 | 12 | 0 | 12 | 0 | 0 | 9 |
| | Dicofol | 10 | 12 | 0 | 12 | 0 | 0 | 9 |
| | Dieldrin | 10 | 12 | 1 | 12 | 0 | 0 | 9 |
| | Endrin | 10 | 12 | 0 | 12 | 0 | 0 | 9 |
| | Methoxychlor | 10 | 12 | 0 | 12 | 0 | 0 | 9 |
| Organophosphates | Azinphos methyl | 10 | 12 | 0 | 12 | 0 | 0 | 9 |
| | Chlorpyrifos | 10 | 12 | 5 | 12 | 7 | 7 | 9 |
| | Demeton-s | 3 | 12 | 0 | 12 | 0 | 0 | 9 |
| | Diazinon | 10 | 12 | 0 | 12 | 2 | 2 | 9 |
| | Dichlorvos | 3 | 12 | 0 | 12 | 0 | 0 | 9 |
| | Dimethoate | 10 | 12 | 0 | 12 | 0 | 0 | 9 |
| | Disulfoton | 10 | 12 | 0 | 12 | 0 | 0 | 9 |
| | Malathion | 10 | 12 | 0 | 12 | 0 | 0 | 9 |
| | Methamidophos | 10 | 12 | 0 | 12 | 0 | 0 | 9 |
| | Methidathion | 10 | 12 | 0 | 12 | 0 | 0 | 9 |
| | Molinate | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Parathion, Methyl | 10 | 12 | 0 | 12 | 0 | 0 | 9 |
| | Phorate | 10 | 12 | 0 | 12 | 0 | 0 | 9 |
| | Phosmet | 10 | 12 | 0 | 12 | 0 | 0 | 9 |
| | Thiobencarb | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pyrethroids | Bifenthrin | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cyfluthrin, total | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cyhalothrin, lambda, total | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cypermethrin, total | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Esfenvalerate/Fenvalerate, total | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Permethrin, total | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sediment Pesticides | Bifenthrin | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| | Chlorpyrifos | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| | Cyfluthrin | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| | Cyhalothrin, lambda | 0 | 0 | 1 | 0 | 0 | 0 | 0 |

| Type | Analyte | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|---|
| | Cypermethrin | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| | Deltamethrin: Tralomethrin | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| | Esfenvalerate/ Fenvalerate | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| | Fenpropathrin | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| | Permethrin | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| Toxicity | *Ceriodaphnia dubia* | 7 | 0 | 0 | 12 | 2 | 1 | 9 |
| | *Pimephales promelas* | 7 | 0 | 0 | 12 | 0 | 0 | 9 |
| | *Selenastrum capricornutum* | 8 | 1 | 1 | 12 | 2 | 1 | 9 |
| | *Hyalella azteca* | 3 | 0 | 1 | 2 | 2 | 2 | 2 |

**Table VII-4. French Camp Slough @ Airport Way Management Plan Monitoring schedule (2007-September2014).**

| Site Name | Sample Date | Monitoring Type | Copper | Lead | Chlorpyrifos | Diazinon | Dieldrin | Diuron | *C. dubia* | *S. capricornutum* | *H. azteca* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| French Camp Slough @ Airport Way | 06/12/07 | MPM | X | | | | | | | | |
| French Camp Slough @ Airport Way | 07/10/07 | MPM | X | | X | | | | | | |
| French Camp Slough @ Airport Way | 08/07/07 | MPM | X | | X | | | | | | |
| French Camp Slough @ Airport Way | 04/13/10 | MPM | | | | | | | | X | |
| French Camp Slough @ Airport Way | 05/11/10 | MPM | X | | X | | | | | | |
| French Camp Slough @ Airport Way | 06/08/10 | MPM | X | | | | | | | | |
| French Camp Slough @ Airport Way | 07/13/10 | MPM | X | | X | | X | | | | |
| French Camp Slough @ Airport Way | 08/10/10 | MPM | X | | X | | | | | | |
| French Camp Slough @ Airport Way | 09/07/10 | MPM | | | X | | | | | | X |
| French Camp Slough @ Airport Way | 10/12/10 | MPM | | | X | | | | | | |
| French Camp Slough @ Airport Way | 01/11/11 | MPM | X | | | X | | X | | | |
| French Camp Slough @ Airport Way | 02/08/11 | MPM | | | X | X | | X | X | X | |
| French Camp Slough @ Airport Way | 03/08/11 | MPM | | | | | | | X | | X |
| French Camp Slough @ Airport Way | 04/12/11 | MPM | | | | | | | | X | |
| French Camp Slough @ Airport Way | 05/24/11 | MPM | X | | X | | | | | | |
| French Camp Slough @ Airport Way | 06/28/11 | MPM | X | | | | | | | | |
| French Camp Slough @ Airport Way | 07/26/11 | MPM | X | | X | | X | | | | |
| French Camp Slough @ Airport Way | 08/23/11 | MPM | X | | X | | | | | | |
| French Camp Slough @ Airport Way | 09/20/11 | MPM | | | X | | | | | | |
| French Camp Slough @ Airport Way | 10/06/11 | MPM | | | X | | | | | | |
| French Camp Slough @ Airport Way | 10/14/11 | MPM | | | | | | | | | X |
| French Camp Slough @ Airport Way | 01/17/12 | MPM | | | | X | | X | | | |
| French Camp Slough @ Airport Way | 02/14/12 | MPM | X | | X | X | | X | X | X | |
| French Camp Slough @ Airport Way | 03/15/12 | MPM | | | | | | | X | | X |
| French Camp Slough @ Airport Way | 04/12/12 | MPM | | | X | | | | | X | |
| French Camp Slough @ Airport Way | 05/16/12 | MPM | X | X | X | | | | | | |
| French Camp Slough @ Airport Way | 06/19/12 | MPM | X | X | | | | | | | |
| French Camp Slough @ Airport Way | 07/17/12 | MPM | X | | X | | | | | | |
| French Camp Slough @ Airport Way | 08/21/12 | MPM | X | | X | | | | | | |
| French Camp Slough @ Airport Way | 09/18/12 | MPM | | | X | | | | | | X |
| French Camp Slough @ Airport Way | 10/16/12 | MPM | | | X | | | | | | |
| French Camp Slough @ Airport Way | 01/15/13 | MPM | | | | X | | X | | | |
| French Camp Slough @ Airport Way | 02/21/13 | MPM | X | | X | X | | X | X | X | |
| French Camp Slough @ Airport Way | 03/19/13 | MPM | | | | | | | | | X |
| French Camp Slough @ Airport Way | 04/02/13 | MPM | | | X | | | | | | |
| French Camp Slough @ Airport Way | 05/21/13 | MPM | | | X | | | | | | |
| French Camp Slough @ Airport Way | 07/16/13 | MPM | | | X | | | | | | |
| French Camp Slough @ Airport Way | 08/20/13 | MPM | | | X | | | | | | |
| French Camp Slough @ Airport Way | 09/17/13 | MPM | | | X | | | | | | X |

| Site Name | Sample Date | Monitoring Type | Copper | Lead | Chlorpyrifos | Diazinon | Dieldrin | Diuron | *C. dubia* | *S. capricornutum* | *H. azteca* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| French Camp Slough @ Airport Way | 10/08/13 | MPM | | | X | | | | | | |
| French Camp Slough @ Airport Way | 02/11/14 | MPM | | | X | | | | | | |
| French Camp Slough @ Airport Way | 03/03/14 | MPM | | | | | | | | | X |
| French Camp Slough @ Airport Way | 04/15/14 | MPM | | | X | | | | | | |
| French Camp Slough @ Airport Way | 05/20/14 | MPM | | | X | | | | | | |
| French Camp Slough @ Airport Way | 07/15/14 | MPM | | | X | | | | | | |
| French Camp Slough @ Airport Way | 08/19/14 | MPM | | | X | | | | | | |
| French Camp Slough @ Airport Way | 09/16/14 | MPM | | | X | | | | | | X |

X – Constituent sampled for Management Plan Monitoring (MPM).

## Monitoring Results

In 2014, Assessment Monitoring occurred at French Camp Slough @ Airport Way. Additionally, MPM occurred for chlorpyrifos and sediment toxicity to *H. azteca* (Table VII-4). There were no detections of chlorpyrifos and no sediment toxicity to *H. azteca* through September 2014 (Table VII-5). The Coalition did not conduct MPM for diuron or *S. capricornutum*; however, both constituents were monitored monthly under Assessment Monitoring and resulted in one exceedance of the WQTL for diuron and one sample toxic to *S. capricornutum* in February 2014 (Table VII-5). Furthermore, there was one exceedance of the WQTL for simazine in March 2014. Exceedances of priority E constituents occurred during 2014 Assessment Monitoring including DO (2) and *E. coli* (1).

Table VII-5 is a tally of exceedances of WQTLs from 2006 through September 2014 for management plan constituents (organized alphabetically by constituent priority). Table VII-6 contains detections and WQTL exceedance results of all sampling events since the constituent became part of the site subwatershed management plan. Table VII-7 contains the instantaneous loads for diuron (due to exceedance in 2014) since monitoring began in the site subwatershed. A record of all exceedances since monitoring began is provided in Appendix II, Table VII-A.

**Table VII-5. French Camp Slough @ Airport Way management plan constituent exceedance tally (2005-September 2014).**

Exceedances that occurred during resampling for field parameters and toxicity are included in the tally Exceedances are organized alphabetically by constituent priority. A complete list of exceedances can be found in Appendix II, Table VII-A.

| | Active Management Plan Constituents | | | | | Removed Management Plan Constituents | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Monitoring Year | Chlorpyrifos, >0.015 µg/L | *H. azteca*, (%Control) | Dissolved Oxygen, <7mg/L | *E. coli*, >235 MPN/100 ml | pH, <6.5 or > 8.5 units | Diazinon, >0.1 µg/L | Copper (Total), Variable[1] or >1300 µg/L | Diuron, >2 µg/L | *C. dubia*, (%Control) | *S. capricornutum*, (%Control) | Dieldrin, >0.00014 µg/L | Lead (Total), Variable[1] or >15 µg/L |
| 2005 | 2 | 0 | 3 | 6 | 1 | 0 | NA | NA | 0 | 1 | NA | NA |
| 2006 | 2 | 1 | 3 | 5 | 0 | 0 | 4 | 0 | 1 | 0 | 0 | 1 |
| 2007 | 1 | 1 | 1 | 5 | 0 | 1 | 8 | 1 | 1 | 0 | 1 | 1 |
| 2008 | 3 | 1 | 4 | 4 | 2 | 1 | 0 | 1 | 0 | 1 | 1 | 0 |
| 2009 | 1 | NA | 2 | 1 | 0 | 0 | NA | 0 | NA | NA | 0 | NA |
| 2010 | 1 | 1 | 2 | 5 | 0 | NA | 0 | NA | NA | 0 | 0 | NA |
| 2011 | 2 | 1 | 0 | 5 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2012 | 0 | 0 | 2 | 5 | 1 | 0 | 0 | 0 | 0 | 0 | NA | 0 |
| 2013 | 1 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | NA | NA |
| 2014 WY* | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |
| **Overall Tally** | **13** | **5** | **19** | **37** | **7** | **2** | **12** | **2** | **2** | **2** | **2** | **2** |
| **Constituent Priority** | **A/B** | **D** | **E** | **E** | **E** | **A/B[R]** | **C[R]** | **C[R]** | **D[R]** | **D[R]** | **E[R]** | **E[R]** |

[1] Metal WQTL variable based on hardness.

[R] – Removed from active management plan.

NA – Not Applicable; monitoring did not occur for this constituent during the year.

*2014 includes January through September results only.

**Table VII-6. French Camp Slough @ Airport Way site subwatershed monitoring results for priority A/B - D constituents since management plan initiation.**

Exceedance values are in bold. Resampling (RS) due to toxicity not included in table. MPM results after September 2014 not included in table (grey cells).

| | Month: | Jan | Feb | | Mar | Apr | May | Jun | Jul | Aug | | Sep | Oct | | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **2007 NM (@ Airport Way)** | Date | NA | 2/11/07 | 2/28/07 | NA | 4/10/07 | 5/22/07 | 6/12/07 | 7/10/07 | 8/07/07 | | 9/04/07 | NA | | NA | NA |
| | Copper (µg/L) | NA | 30 | 11 | NA | 5.7 | **5.9** | **5.9** | **5.4** | 5 | | 4.5 | NA | | NA | NA |
| | Chlorpyrifos (µg/L) | NA | **0.049** | <0.003 | NA | 0.013 | <0.003 | 0.013 | 0.014 | <0.003 | | <0.003 | NA | | NA | NA |
| **2007 MPM (@ Airport Way)** | Date | NA | NA | | NA | NA | NA | 6/20/07 | 7/30/07 | 8/28/07 | | NA | NA | | NA | NA |
| | Copper (µg/L) | NA | NA | | NA | NA | NA | **6.7** | **6.9** | **5.9** | | NA | NA | | NA | NA |
| | Chlorpyrifos (µg/L) | NA | NA | | NA | NA | NA | NA | 0.011 | <0.003 | | NA | NA | | NA | NA |
| **2008 NM (@ Airport Way)** | Date | 1/23/08 | NA | | 3/18/08 | 4/15/08 | 5/13/08 | 6/10/08 | 7/15/08 | 8/12/08 | 8/13/08 | 9/16/08 | 10/14/08 | | 11/04/08 | 12/09/08 |
| | Copper (µg/L) | 12 | NA | | NA | 4.9 | 5.6 | 3.2 | 4.8 | 2.8 | NA | 3.9 | NA | | NA | NA |
| | Chlorpyrifos (µg/L) | 0.008 | NA | | NA | 0.003 | **0.4** | <0.003 | <0.003 | **0.022** | NA | **0.039** | <0.003 | | <0.003 | <0.003 |
| | Diazinon (µg/L) | **0.12** | NA | | NA | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | NA | <0.004 | <0.004 | | <0.004 | <0.004 |
| | *C. dubia* (% Control) | 100 | NA | | NA | 100 | 100 | 95 | 100 | 100 | NA | 100 | NA | | NA | NA |
| | *H. azteca* (% Control) | NA | NA | | **94** | NA | NA | NA | NA | NA | 98 | NA | NA | | NA | NA |
| **2009 NM (@ Airport Way)** | Date | 1/15/09 | 2/10/09 | | 3/10/09 | 4/14/09 | 5/12/09 | 6/09/09 | 7/14/09 | 8/11/09 | | 9/15/09 | 10/06/09 | | 11/10/09 | 12/08/09 |
| | Chlorpyrifos (µg/L) | <0.003 | <0.003 | | <0.003 | 0.0045 | <0.003 | <0.003 | <0.003 | <0.003 | | <0.003 | **0.029** | | <0.003 | <0.003 |
| | Diazinon (µg/L) | <0.004 | <0.004 | | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | | <0.004 | <0.004 | | <0.004 | <0.004 |
| | Dieldrin (µg/L) | <0.005 | <0.005 | | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | | <0.005 | <0.005 | | <0.005 | <0.005 |
| | Diuron (µg/L) | NA | NA | | NA | NA | <0.2 | NA | NA | NA | | NA | NA | | NA | NA |
| **2010 MPM (@Airport Way)** | Date | NA | NA | | NA | 4/13/10 | 5/11/10 | 6/08/10 | 7/13/10 | 8/10/10 | | 9/07/10 | 10/12/10 | | NA | NA |
| | Copper, dissolved (µg/L) | NA | NA | | NA | NA | 2.7 | 3.5 | 3.5 | 2.9 | | NA | NA | | NA | NA |
| | Copper, total (µg/L) | NA | NA | | NA | NA | 4.3 | 6.2 | 6 | 4.6 | | NA | NA | | NA | NA |
| | Chlorpyrifos (µg/L) | NA | NA | | NA | NA | <0.003 | NA | <0.003 | **0.022** | | 0.009 | <0.003 | | NA | NA |
| | Dieldrin (µg/L) | NA | NA | | NA | NA | NA | NA | <0.005 | NA | | NA | NA | | NA | NA |
| | *S. capricornutum* toxicity (% | NA | NA | | NA | 1923 | NA | NA | NA | NA | | NA | NA | | NA | NA |
| | *H. azteca* toxicity (% Control) | NA | NA | | NA | NA | NA | NA | NA | NA | | **1** | NA | | NA | NA |
| **2011 NM & MPM (@Airport Way)** | Date | 1/11/11 | 2/8/11 | | 3/8/11 | 4/12/11 | 5/24/11 | 6/28/11 | 7/26/11 | 8/23/11 | | 9/20/11 | 10/6/11 | 10/14/11 | 11/15/11 | 12/13/11 |
| | Copper, dissolved (µg/L) | 3.4* | 2.3 | | 4.3 | 3.5 | 3.5* | 3.5* | 1.9* | 1.8* | | 1.8 | 2.7 | NA | 2.1 | 2.1 |
| | Copper, total (µg/L) | 6* | 2.9 | | 7.7 | 6.6 | 6.4* | 5.8* | 4.2* | 3.1* | | 3.0 | 4.1 | NA | 3 | 3.2 |
| | Chlorpyrifos (µg/L) | <0.003 | <0.003* | | <0.003 | **0.033** | <0.003* | <0.003 | <0.003* | <0.003* | | <0.003* | **0.097*** | NA | <0.003 | <0.003 |
| | Diazinon (µg/L) | <0.004* | <0.004* | | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | | <0.004 | <0.004 | NA | <0.004 | <0.004 |
| | Dieldrin (µg/L) | <0.005 | <0.005 | | <0.005 | <0.005 | <0.005 | <0.005 | <0.005* | <0.005 | | <0.005 | <0.005 | NA | <0.005 | <0.005 |
| | Diuron (µg/L) | <0.2* | <0.2* | | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | | <0.2 | <0.2 | NA | <0.2 | <0.2 |
| | *C. dubia* toxicity (% Control) | 100 | 100* | | 100* | 100 | 100 | 100 | 100 | 100 | | 100 | 100 | NA | 100 | 100 |
| | *S. capricornutum* toxicity (% | 624 | 1021* | | 668 | 1554* | 1004 | 442 | 1425 | 1509 | | 461 | 1197 | NA | 654 | 460 |
| | *H. azteca* toxicity (% Control) | NA | NA | | 100* | NA | NA | NA | NA | NA | | NA | NA | **86*** | NA | NA |

| | Month: | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **2012 MPM (@Airport Way)** | Date | 1/17/12 | 2/14/12 | 3/15/12 | 4/12/12 | 5/16/12 | 6/19/12 | 7/17/12 | 8/21/12 | 9/18/12 | 10/16/12 | NA | NA |
| | Copper, dissolved (µg/L) | NA | 4.5 | NA | NA | 1.8 | 1.6 | 1.6 | 1.4 | NA | NA | NA | NA |
| | Copper, total (µg/L) | NA | 5.7 | NA | NA | 4.2 | 3.8 | 117.6 | 2.9 | NA | NA | NA | NA |
| | Lead , dissolved (µg/L) | NA | NA | NA | NA | 0.1 | 0.09 | NA | NA | NA | NA | NA | NA |
| | Lead , total (µg/L) | NA | NA | NA | NA | 0.9 | 0.74 | NA | NA | NA | NA | NA | NA |
| | Chlorpyrifos (µg/L) | NA | <0.003 | NA | <0.003 | <0.003 | NA | <0.003 | <0.003 | <0.003 | <0.003 | NA | NA |
| | Diazinon (µg/L) | <0.004 | <0.004 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | Diuron (µg/L) | 0.52 | 0.27 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | *C. dubia* toxicity (% Control) | NA | 100 | 105 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | *S. capricornutum* toxicity (% | NA | 865 | NA | 448 | NA | NA | NA | NA | NA | NA | NA | NA |
| | *H. azteca* toxicity (% Control) | NA | NA | 111 | NA | NA | NA | NA | NA | 105 | NA | NA | NA |
| **2013 MPM (@ Airport Way)** | Date | 1/15/13 | 2/21/13 | 3/19/13 | 4/2/13 | 5/21/13 | NA | 7/16/13 | 8/20/13 | 9/17/13 | 10/8/13 | NA | NA |
| | Copper, dissolved (µg/L) | NA | 2.1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | Copper, total (µg/L) | NA | 3.4 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | Chlorpyrifos (µg/L) | NA | <0.003 | NA | <0.003 | <0.003 | NA | **0.042** | <0.003 | <0.003 | <0.003 | NA | NA |
| | Diazinon (µg/L) | <0.004 | <0.004 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | Diuron (µg/L) | <0.2 | <0.2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | *C. dubia* toxicity (% Control) | NA | 100 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | *S. capricornutum* toxicity (% | NA | 1260 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | *H. azteca* toxicity (% Control) | NA | NA | 102 | NA | NA | NA | NA | NA | 94 | NA | NA | NA |
| **2014 NM, MPM (@ Airport Way)** | Date | 1/28/14 | 2/11/14 | 3/3/14 | 3/05/14 | 4/15/14 | 5/20/14 | 6/17/14 | 7/15/14 | 8/19/14 | 9/16/14 | | |
| | Chlorpyrifos (µg/L) | <0.003 | <0.003* | <0.003 | NA | <0.003* | <0.003* | <0.003* | <0.003* | <0.003* | <0.003* | | |
| | *H. azteca* toxicity (% Control) | NA | NA | NA | 100* | NA | NA | NA | NA | NA | 90* | | |

MPM – Management Plan Monitoring.
NA – Not applicable. No monitoring occurred on this date for this constituent.
NM – Normal Monitoring
*NM and MPM occurred during this date for this constituent.

**Table VII-7. French Camp Slough @ Airport Way site subwatershed instantaneous load calculations for diuron.**
If discharge was unable to be measured or the analyte was ND, the result is not included in the table. Load information for chlorpyrifos, copper, diazinon, and dieldrin can be found in the 2014 MPUR, Appendix I.

| Site Name | Analyte Name | Sample Date | Discharge, CFS | Concentration | Concentration Unit | Loading Rate[1] | Loading Rate Unit |
|---|---|---|---|---|---|---|---|
| French Camp Slough @ Airport Way | Diuron | 05/16/06 | 54.83 | 0.21 | µg/L | 326 | µg/sec |
| French Camp Slough @ Airport Way | Diuron | 02/11/07 | 70.48 | 3.2 | µg/L | 6387 | µg/sec |
| French Camp Slough @ Airport Way | Diuron | 04/10/07 | 32.12 | 0.36 | µg/L | 327 | µg/sec |
| French Camp Slough @ Airport Way | Diuron | 05/22/07 | 71.95 | 0.30 | µg/L | 611 | µg/sec |
| French Camp Slough @ Airport Way | Diuron | 07/10/07 | 27.64 | 0.38 | µg/L | 297 | µg/sec |
| French Camp Slough @ Airport Way* | Diuron | 07/10/07 | 27.64 | 0.40 | µg/L | 313 | µg/sec |
| French Camp Slough @ Airport Way | Diuron | 01/23/08 | 8.13 | 3.3 | µg/L | 760 | µg/sec |
| French Camp Slough @ Airport Way* | Diuron | 04/15/08 | 57.81 | 0.79 | µg/L | 1293 | µg/sec |
| French Camp Slough @ Airport Way | Diuron | 04/15/08 | 57.81 | 0.84 | µg/L | 1375 | µg/sec |
| French Camp Slough @ Airport Way | Diuron | 06/10/08 | 19.99 | 0.23 | µg/L | 130 | µg/sec |
| French Camp Slough @ Airport Way | Diuron | 01/17/12 | 6.81 | 0.52 | µg/L | 100 | µg/sec |
| French Camp Slough @ Airport Way | Diuron | 02/14/12 | 0.64 | 0.27 | µg/L | 5 | µg/sec |
| French Camp Slough @ Airport Way | Diuron | 02/11/14 | 0.53 | 38 | µg/L | 570 | µg/sec |
| French Camp Slough @ Airport Way | Diuron | 03/03/14 | 4.07 | 1.1 | µg/L | 127 | µg/sec |
| French Camp Slough @ Airport Way | Diuron | 05/20/14 | 20.56 | 0.21 | µg/L | 122 | µg/sec |

[1] Load = Discharge (cfs) X 28.317L/ft3 X Concentration (µg/L). To convert a concentration measured in mg/L to µg/L multiply by 1000. The load values calculated represent instantaneous loads only, and should not be used to extrapolate loading over any period of time.
*Field Duplicate
Copper (D)-Dissolved Copper

## Source Identification and Outreach

The Coalition evaluated PUR data and past monitoring results in order to source the constituents listed in the French Camp Slough @ Airport Way management plan. Sourcing analyses for past exceedances of management plan constituents are evaluated in past years' site subwatershed appendices. From January through September 2014, there were no exceedances of the WQTL for chlorpyrifos. There was one exceedances of the WQTL for diuron and an evaluation of potential sources is provided below.

An exceedance of the WQTL for diuron (38 µg/L) occurred during the February 11, 2014 storm monitoring event at French Camp Slough @ Airport Way. Diuron is a broad-spectrum herbicide used for weed control on agriculture, highway rights of way, railroads, industrial sites, and by homeowners. Pounds of diuron applied in this site subwatershed in 2014, and the amount of acres treated, were significantly greater compared to the last six years (Table VII-7). PUR data from within the site subwatershed show applications occurring 68 days prior to sampling on December 5, 2013 (Figure VII-2). Applications of 89 gallons of product were made on 178 acres of wine grapes (Table VII-8). The soil half-life of diuron, according to the USDA is approximately 90 days; therefore applications that occurred within 68 days prior to sampling could have persisted in the water column or soil and remobilized due to storm runoff.

**Table VII-7. French Camp Slough @ Airport Way site subwatershed diuron applications, lbs AI applied, and acres treated by year.**

Pesticide Use Report data complete through July 2014 for San Joaquin County.

| Year | Number of Chlorpyrifos Applications | Pounds of AI Applied | Acres Treated |
|---|---|---|---|
| 2005 | 69 | 2644.1 | 3134.7 |
| 2006 | 120 | 5860.0 | 5325.93 |
| 2007 | 78 | 3103 | 3896.04 |
| 2008 | 41 | 1474.6 | 1365.82 |
| 2009 | 53 | 2126.5 | 1815.66 |
| 2010 | 50 | 1587.7 | 1685.32 |
| 2011 | 49 | 3079 | 2121.67 |
| 2012 | 21 | 922.1 | 715.71 |
| 2013 | 48 | 2269.5 | 1254.5 |
| 2014 | 69 | 2644.1 | 3134.7 |
| **Total** | **562** | **25360.3** | **22587.1** |

**Table VII-8. Pounds of diuron applied by crop in the French Camp Slough @ Airport Way site subwatershed (top five crops per year shown).**

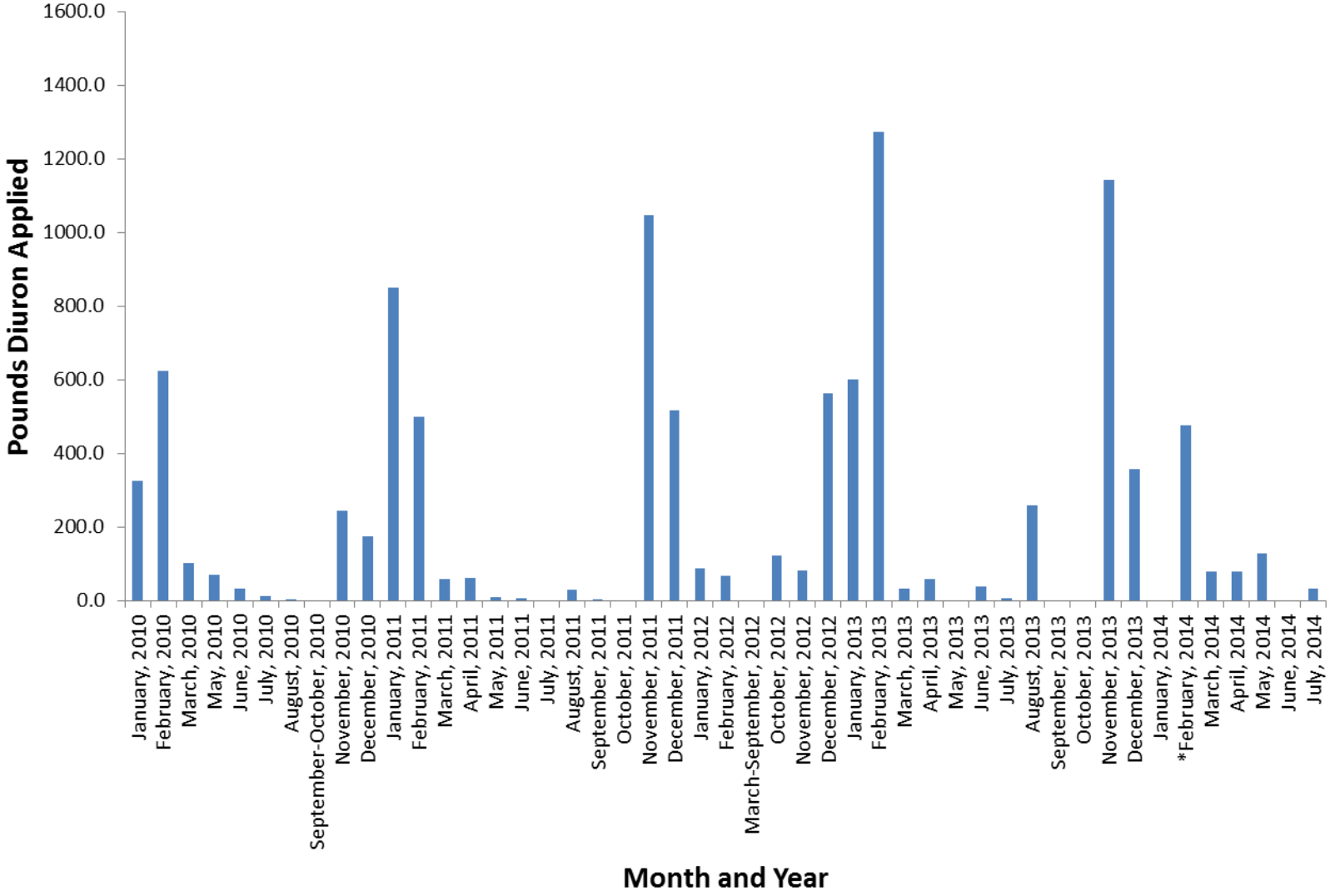
Pesticide Use Report data complete through July 2014 for San Joaquin County.

| Year | Commodity | Pounds of AI Applied |
|---|---|---|
| 2005 | ALFALFA (FORAGE - FODDER) (ALFALFA HAY) | 618.2 |
| | APPLE | 91.9 |
| | GRAPE | 909.4 |
| | UNCULTIVATED NON-AG AREAS (ALL OR UNSPEC) | 182.0 |
| | WALNUT (ENGLISH WALNUT, PERSIAN WALNUT) | 821.4 |
| 2006 | ALFALFA (FORAGE - FODDER) (ALFALFA HAY) | 2564.2 |
| | GRAPE | 949.2 |
| | GRAPE, WINE | 460.0 |
| | UNCULTIVATED NON-AG AREAS (ALL OR UNSPEC) | 681.2 |
| | WALNUT (ENGLISH WALNUT, PERSIAN WALNUT) | 1125.3 |
| 2007 | ALFALFA (FORAGE - FODDER) (ALFALFA HAY) | 882.4 |
| | APPLE | 169.7 |
| | GRAPE, WINE | 724.6 |
| | UNCULTIVATED NON-AG AREAS (ALL OR UNSPEC) | 300.0 |
| | WALNUT (ENGLISH WALNUT, PERSIAN WALNUT) | 1009.2 |
| 2008 | ALFALFA (FORAGE - FODDER) (ALFALFA HAY) | 589.9 |
| | APPLE | 16.8 |
| | GRAPE | 22.1 |
| | UNCULTIVATED NON-AG AREAS (ALL OR UNSPEC) | 335.3 |
| | WALNUT (ENGLISH WALNUT, PERSIAN WALNUT) | 502.3 |
| 2009 | WALNUT (ENGLISH WALNUT, PERSIAN WALNUT) | 502.3 |
| | GRAPE | 39.1 |
| | GRAPE, WINE | 68.2 |
| | UNCULTIVATED NON-AG AREAS (ALL OR UNSPEC) | 802.0 |
| | WALNUT (ENGLISH WALNUT, PERSIAN WALNUT) | 521.8 |
| 2010 | ALFALFA (FORAGE - FODDER) (ALFALFA HAY) | 94.7 |
| | GRAPE, WINE | 738.5 |
| | SOIL APPLICATION, PREPLANT-OUTDOOR (SEEDBEDS,ETC.) | 20.5 |
| | UNCULTIVATED NON-AG AREAS (ALL OR UNSPEC) | 271.4 |
| | WALNUT (ENGLISH WALNUT, PERSIAN WALNUT) | 438.4 |
| 2011 | ALFALFA (FORAGE - FODDER) (ALFALFA HAY) | 65.1 |
| | APPLE | 64.9 |
| | GRAPE, WINE | 2451.1 |
| | OLIVE (ALL OR UNSPEC) | 32.8 |
| | WALNUT (ENGLISH WALNUT, PERSIAN WALNUT) | 465.2 |
| 2012 | ALFALFA (FORAGE - FODDER) (ALFALFA HAY) | 75.2 |
| | APPLE | 23.5 |
| | GRAPE, WINE | 562.9 |
| | UNCULTIVATED NON-AG AREAS (ALL OR UNSPEC) | 7.2 |

| YEAR | COMMODITY | POUNDS OF AI APPLIED |
|---|---|---|
| | WALNUT (ENGLISH WALNUT, PERSIAN WALNUT) | 253.3 |
| 2013 | ALFALFA (FORAGE - FODDER) (ALFALFA HAY) | 187.5 |
| | GRAPE | 1146.2 |
| | GRAPE, WINE | 1973.4 |
| | SOIL FUM/PREPLT | 85.2 |
| | WALNUT (ENGLISH WALNUT, PERSIAN WALNUT) | 318.3 |
| 2014 | ALFALFA (FORAGE - FODDER) (ALFALFA HAY) | 92.0 |
| | GRAPE | 384.4 |
| | GRAPE, WINE | 100.1 |
| | SOIL FUM/PREPLT | 58.8 |
| | WALNUT (ENGLISH WALNUT, PERSIAN WALNUT) | 159.7 |

**Figure VII-2. French Camp Slough @ Airport Way site subwatershed lbs diuron applied by month (2010-July 2014).**

Pesticide Use Report data are complete through July 2014 for San Joaquin County. Asterisk (*) denotes months with exceedances.



The priority E constituents listed under the French Camp @ Airport Way site subwatershed active management plan are DO, *E. coli*, and pH. From January through September 2014, there were exceedances of DO (2) and *E coli* (1). Priority E constituents are difficult to source and per the management plan strategy, and the Coalition believes addressing high priority water quality issues will also address priority E constituents.

The Coalition conducted management practice tracking and outreach, including contacting targeted growers in 2011 and following up in 2012. The Coalition contacted 13 targeted growers farming 3,767 irrigated acres within the French Camp Slough @ Airport Way site subwatershed (2013 MPUR, Page 45) and documented current management practices ( 2012 MPUR, Pages 50-55). The Coalition recommended management practices to reduce negative impacts of agricultural discharges on water quality. Thirteen growers participated in follow-up contacts and documented newly implemented management practices in 2012 (2013 MPUR, Pages 56-59). A final analysis of follow up surveys indicated that reducing runoff water volumes using irrigation management and reducing use of the pesticide of concern were the most popular newly implemented practices; each accounting for 33% of the acreage with new management practices.

Additionally, focused outreach in the high priority site subwatersheds upstream of French Camp Slough (Lone Tree Creek @ Jack Tone Rd, Unnamed Drain to Lone Tree Creek @ Jack Tone Rd, and Littlejohns Creek @ Jack Tone Rd) was completed in 2012 which is expected to contribute to improving the water quality in the French Camp Slough @ Airport Way site subwatershed.

## Evaluation

Overall, there are water quality improvements in the French Camp Slough @ Airport Way site subwatershed. The Coalition received approval on February 27, 2013 to remove six constituents from the site's management plan that included copper, diazinon, diuron, lead, and toxicity to *C. dubia* and *S. capricornutum*. Dieldrin was also approved for removal from the management plan on March 22, 2012. Due to the diuron exceedance in February 2014, this constituent was reinstated to the active management plan. The remaining constituents in the site's active management plan are chlorpyrifos, DO, E. coli, pH, and sediment toxicity to *H. azteca*. According to the PUR data, chlorpyrifos use has decreased in recent years and water quality improvements relative to this constituent are expected to continue. However, there are still several growers in upstream site subwatersheds who are not members of the Coalition and actively apply chlorpyrifos.

## Next Steps

The Coalition concluded focused outreach in the French Camp Slough @ Airport Way site subwatershed during 2013, and general outreach in 2014. In 2015, the Coalition will conduct monitoring at French Camp Slough @ Airport Way based on the monitoring strategy at a Core site, as described in the 2014 MPU. In addition, MPM for chlorpyrifos, diuron, toxicity to *S. capricornutum*, and sediment toxicity to *H. azteca* during months of past exceedances will continue.

# VIII. MOKELUMNE RIVER @ BRUELLA RD

## Overview

Mokelumne River @ Bruella Rd is one of the Coalition's third priority site subwatersheds. The Coalition completed the focused outreach portion of its management plan strategy in 2013, and monitoring results from 2011 through September 2014 indicate improved water quality. The Coalition received approval on May 30, 2012 to remove copper and DO from the site's active management plan and toxicity to *C. dubia* and *S. capricornutum* on February 27, 2013. However, samples collected in May 2014 were toxic to *S. capricornutum*; therefore, the Coalition will re-instate toxicity to *S. capricornutum* in the site's active management plan. The only constituents remaining in the active management plan are toxicity to *S. capricornutum* and priority E constituents, *E. coli* and pH (Table VIII-1).

In 2015, the Coalition will conduct monitoring at Mokelumne River @ Bruella Rd based on the monitoring strategy at a Core site, as described in the 2014 MPU. Additionally, the Coalition will re-initiate MPM for *S. capricornutum*, and continue to monitor the priority E constituents, *E. coli* and pH, during all monitoring events.

**Table VIII-1. Mokelumne River @ Bruella Rd management plan constituents.**
Management plan initiation year refers to when the site and constituent are addressed in the SJCDWQC MPURs and in the Management Plan Progress Report sections of the Annual Reports.

| PRIORITY | CONSTITUENT | MANAGEMENT PLAN INITIATION YEAR | MANAGEMENT PLAN REMOVAL YEAR |
|---|---|---|---|
| D | *S. capricornutum* water column toxicity | 2006, 2015 | Active |
| E | *E. coli* | 2010 | Active |
| E | pH | 2007 | Active |
| **CONSTITUENT (REMOVED)** | | | |
| C | Copper | 2008 | 2012 |
| E | *C. dubia* water column toxicity | 2006 | 2013 |
| E | Dissolved Oxygen | 2006 | 2012 |

## Description of Site Subwatershed

Mokelumne River @ Bruella Rd is the Core Monitoring location within Zone 1 under the 2008 MRPP. The site subwatershed consists of 9,966 irrigated acres, and the upstream agriculture consists of vineyards, orchards, as well as field crops (Figure VIII-1). Flow in the Mokelumne River is controlled by water released from Comanche Reservoir. Water in the Mokelumne River integrates the water quality signal from a relatively large upstream area. The site subwatershed includes an upstream location, Mokelumne River @ Fish Hatchery (Table VIII-2).

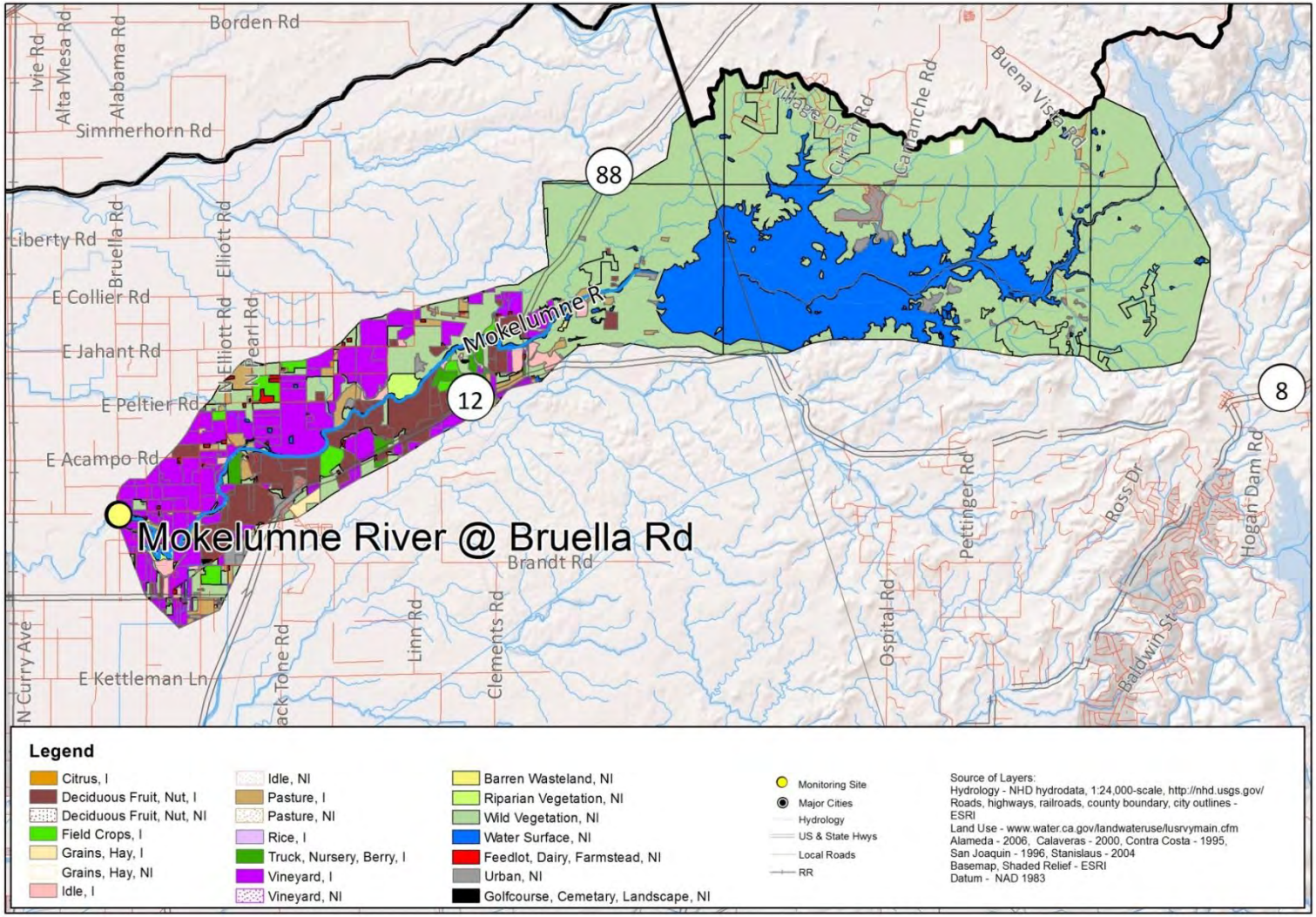
Mokelumne River, Lower (in Delta Waterways, eastern portion) is listed on California's 303(d) List of Impaired Waterbodies for chlorpyrifos, copper, mercury, zinc, unknown toxicity and DO.

**Table VIII-2. Mokelumne River site subwatershed sampling locations coordinates.**

| Site Name | Station Code | Target Latitude | Target Longitude |
|---|---|---|---|
| Mokelumne River @ Bruella Rd* | 531XMRABR | 38.16022 | -121.20643 |
| Mokelumne River @ Fish Hatchery[US] | 531XMRAFH | 38.22640 | -121.02640 |

[US] Upstream site
*Original SJCDWQC sampling site

**Figure VIII-1. Mokelumne River @ Bruella Rd site subwatershed land use map.**



## Subwatershed Monitoring History

Normal Monitoring at Mokelumne River @ Bruella Rd began in August 2004 and continued through 2008. Core Monitoring began in October 2008 with Assessment Monitoring occurring every third year; the last Assessment Monitoring year was 2014. Table VIII-3 contains the number of events monitored per year and the constituents (by group) from 2008 through September 2014.

The Coalition initiated MPM at the site subwatershed in 2010 (Table VIII-4). In an effort to source exceedances, additional sampling occurred in 2007 and 2008, and upstream monitoring occurred at Mokelumne River @ Fish Hatchery in 2005. The Coalition conducted MPM during months of past exceedances at Mokelumne River @ Bruella Rd from 2010 through 2013 to further evaluate water quality in the site subwatershed. No MPM was scheduled from January through September 2014 because the Coalition received approval to remove all high priority constituents from the site's active management plan. The last detections of copper was in 2008; load information for that constituent can be found in the 2014 MPUR, Appendix I, Table VIII-7.

**Table VIII-3. Mokelumne River @ Bruella Rd sampling events and analyses per year.**

Only environmental samples are counted.

| Type | Analyte | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|---|
| Sampling Events | Events Scheduled | 19 | 12 | 12 | 15 | 12 | 12 | 10 |
| | Dry Sites | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Events Sampled | 19 | 12 | 12 | 15 | 12 | 12 | 10 |
| | | | | | | | | |
| Field and Physical Parameters | BOD | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Color | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Dissolved Oxygen | 19 | 12 | 12 | 15 | 12 | 12 | 10 |
| | Dissolved Solids | 10 | 12 | 12 | 12 | 12 | 12 | 9 |
| | *E. coli* | 10 | 12 | 12 | 12 | 12 | 12 | 9 |
| | Grain size (sediment) | 0 | 0 | 0 | 2 | 0 | 0 | 2 |
| | Hardness as CaCO3 | 10 | 0 | 3 | 12 | 0 | 0 | 9 |
| | pH | 19 | 12 | 12 | 15 | 12 | 12 | 10 |
| | Specific Conductivity | 19 | 12 | 12 | 15 | 12 | 12 | 10 |
| | Suspended Solids | 3 | 12 | 12 | 12 | 12 | 12 | 9 |
| | Total Organic Carbon | 10 | 12 | 12 | 12 | 12 | 12 | 9 |
| | Total Organic Carbon (sediment) | 0 | 0 | 0 | 2 | 0 | 0 | 2 |
| | Turbidity | 10 | 12 | 12 | 12 | 12 | 12 | 9 |
| Nutrients | Ammonia as N | 10 | 12 | 12 | 12 | 12 | 12 | 9 |
| | Nitrate + Nitrite as N | 3 | 12 | 12 | 12 | 12 | 12 | 9 |
| | Nitrate as N | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Nitrite as N | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Nitrogen, Total Kjeldahl | 10 | 12 | 12 | 12 | 12 | 12 | 9 |
| | Orthophosphate as P | 10 | 12 | 12 | 12 | 12 | 12 | 9 |
| | Phosphate as P | 10 | 0 | 12 | 12 | 12 | 12 | 9 |
| Metals (Dissolved) | Cadmium | 7 | 0 | 0 | 12 | 0 | 0 | 9 |
| | Copper | 10 | 0 | 3 | 12 | 0 | 0 | 9 |
| | Lead | 7 | 0 | 0 | 0 | 0 | 0 | 9 |
| | Nickel | 7 | 0 | 0 | 0 | 0 | 0 | 9 |
| | Zinc | 7 | 0 | 0 | 12 | 0 | 0 | 9 |
| Metals (Total) | Arsenic | 7 | 0 | 0 | 12 | 0 | 0 | 9 |
| | Boron | 7 | 0 | 0 | 12 | 0 | 0 | 9 |
| | Cadmium | 7 | 0 | 0 | 12 | 0 | 0 | 9 |
| | Copper | 10 | 0 | 3 | 12 | 0 | 0 | 9 |

| TYPE | ANALYTE | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|---|
| | Lead | 7 | 0 | 0 | 0 | 0 | 0 | 9 |
| | Molybdenum | 7 | 0 | 0 | 0 | 0 | 0 | 9 |
| | Nickel | 7 | 0 | 0 | 12 | 0 | 0 | 9 |
| | Selenium | 7 | 0 | 0 | 12 | 0 | 0 | 9 |
| | Zinc | 7 | 0 | 0 | 12 | 0 | 0 | 9 |
| Carbamates | Aldicarb | 7 | 0 | 0 | 12 | 0 | 0 | 9 |
| | Carbaryl | 7 | 0 | 0 | 12 | 0 | 0 | 9 |
| | Carbofuran | 7 | 0 | 0 | 12 | 0 | 0 | 9 |
| | Diuron | 7 | 0 | 0 | 12 | 0 | 0 | 9 |
| | Linuron | 7 | 0 | 0 | 12 | 0 | 0 | 9 |
| | Methiocarb | 7 | 0 | 0 | 12 | 0 | 0 | 9 |
| | Methomyl | 7 | 0 | 0 | 12 | 0 | 0 | 9 |
| | Oxamyl | 7 | 0 | 0 | 12 | 0 | 0 | 9 |
| Group A Pesticides | Aldrin | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Chlordane | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Endosulfan I | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Endosulfan II | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| | HCH, alpha | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| | HCH, beta | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| | HCH, delta | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| | HCH, gamma | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Heptachlor | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Heptachlor epoxide | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Toxaphene | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| Herbicides | Atrazine | 7 | 0 | 0 | 12 | 0 | 0 | 9 |
| | Cyanazine | 7 | 0 | 0 | 12 | 0 | 0 | 9 |
| | Glyphosate | 7 | 0 | 0 | 12 | 0 | 0 | 9 |
| | Paraquat | 7 | 0 | 0 | 12 | 0 | 0 | 9 |
| | Simazine | 7 | 0 | 0 | 12 | 0 | 0 | 9 |
| | Trifluralin | 0 | 0 | 0 | 12 | 0 | 0 | 9 |
| Organochlorines | DDD(p,p') | 10 | 0 | 0 | 12 | 0 | 0 | 9 |
| | DDE(p,p') | 10 | 0 | 0 | 12 | 0 | 0 | 9 |
| | DDT(p,p') | 10 | 0 | 0 | 12 | 0 | 0 | 9 |
| | Dicofol | 10 | 0 | 0 | 12 | 0 | 0 | 9 |
| | Dieldrin | 10 | 0 | 0 | 12 | 0 | 0 | 9 |
| | Endrin | 10 | 0 | 0 | 12 | 0 | 0 | 9 |
| | Methoxychlor | 10 | 0 | 0 | 12 | 0 | 0 | 9 |
| Organophosphates | Azinphos methyl | 7 | 0 | 0 | 12 | 0 | 0 | 9 |
| | Chlorpyrifos | 7 | 0 | 0 | 12 | 0 | 0 | 9 |
| | Demeton-s | 0 | 0 | 0 | 0 | 12 | 0 | 9 |
| | Diazinon | 7 | 0 | 0 | 12 | 0 | 0 | 9 |
| | Dichlorvos | 0 | 0 | 0 | 0 | 12 | 0 | 9 |
| | Dimethoate | 7 | 0 | 0 | 12 | 0 | 0 | 9 |
| | Disulfoton | 7 | 0 | 0 | 12 | 0 | 0 | 9 |
| | Malathion | 7 | 0 | 0 | 12 | 0 | 0 | 9 |
| | Methamidophos | 7 | 0 | 0 | 12 | 0 | 0 | 9 |
| | Methidathion | 7 | 0 | 0 | 12 | 0 | 0 | 9 |
| | Molinate | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Parathion, Methyl | 7 | 0 | 0 | 12 | 0 | 0 | 9 |
| | Phorate | 7 | 0 | 0 | 12 | 0 | 0 | 9 |
| | Phosmet | 7 | 0 | 0 | 12 | 0 | 0 | 9 |
| | Thiobencarb | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pyrethroids | Bifenthrin | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cyfluthrin, total | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cyhalothrin, lambda, total | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cypermethrin, total | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Esfenvalerate/Fenvalerate, total | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Permethrin, total | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| Type | Analyte | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|---|
| Sediment Pesticides | Bifenthrin | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Chlorpyrifos | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cyfluthrin | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cyhalothrin, lambda | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cypermethrin | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Deltamethrin: Tralomethrin | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Esfenvalerate/ Fenvalerate | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Fenpropathrin | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Permethrin | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Toxicity | *Ceriodaphnia dubia* | 9 | 0 | 0 | 12 | 4 | 1 | 9 |
| | *Pimephales promelas* | 0 | 0 | 0 | 12 | 0 | 0 | 9 |
| | *Selenastrum capricornutum* | 12 | 0 | 4 | 12 | 5 | 0 | 9 |
| | *Hyalella azteca* | 2 | 0 | 0 | 2 | 0 | 0 | 2 |

**Table VIII-4. Mokelumne River @ Bruella Rd Management Plan Monitoring schedule (2007-2013).**

There was no MPM from January through September 2014.

| Site Name | Sample Date | Monitoring Type | Copper | *C. dubia* | *S. capricornutum* |
|---|---|---|---|---|---|
| Mokelumne River @ Bruella Rd | 06/20/07 | Add. | | X | |
| Mokelumne River @ Bruella Rd | 08/28/07 | Add. | | | X |
| Mokelumne River @ Bruella Rd | 09/25/07 | Add. | | X | |
| Mokelumne River @ Bruella Rd | 05/07/08 | Add. | | | X |
| Mokelumne River @ Bruella Rd | 06/03/08 | Add. | X | X | |
| Mokelumne River @ Bruella Rd | 07/08/08 | Add. | X | | X |
| Mokelumne River @ Bruella Rd | 08/05/08 | Add. | X | | X |
| Mokelumne River @ Bruella Rd | 09/09/08 | Add. | | X | |
| Mokelumne River @ Bruella Rd | 04/13/10 | MPM | | | X |
| Mokelumne River @ Bruella Rd | 05/11/10 | MPM | | | X |
| Mokelumne River @ Bruella Rd | 06/08/10 | MPM | X | | |
| Mokelumne River @ Bruella Rd | 07/13/10 | MPM | X | | X |
| Mokelumne River @ Bruella Rd | 08/10/10 | MPM | X | | X |
| Mokelumne River @ Bruella Rd | 02/08/11 | MPM | | X | |
| Mokelumne River @ Bruella Rd | 03/08/11 | MPM | | X | X |
| Mokelumne River @ Bruella Rd | 04/12/11 | MPM | | | X |
| Mokelumne River @ Bruella Rd | 05/24/11 | MPM | | | X |
| Mokelumne River @ Bruella Rd | 06/28/11 | MPM | X | X | |
| Mokelumne River @ Bruella Rd | 07/26/11 | MPM | X | | X |
| Mokelumne River @ Bruella Rd | 08/23/11 | MPM | X | | X |
| Mokelumne River @ Bruella Rd | 09/20/11 | MPM | | X | |
| Mokelumne River @ Bruella Rd | 02/14/12 | MPM | | X | |
| Mokelumne River @ Bruella Rd | 03/15/12 | MPM | | X | X |
| Mokelumne River @ Bruella Rd | 04/12/12 | MPM | | | X |
| Mokelumne River @ Bruella Rd | 05/16/12 | MPM | | | X |
| Mokelumne River @ Bruella Rd | 06/19/12 | MPM | | X | |
| Mokelumne River @ Bruella Rd | 07/17/12 | MPM | | | X |
| Mokelumne River @ Bruella Rd | 08/21/12 | MPM | | | X |
| Mokelumne River @ Bruella Rd | 09/18/12 | MPM | | X | |
| Mokelumne River @ Bruella Rd | 02/21/13 | MPM | | X | |

Add. – Additional sampling

X – Constituent sampled for Management Plan Monitoring (MPM).

## Monitoring Results

From January through September 2014, Assessment Monitoring occurred at Mokelumne River @ Bruella Rd. A sample collected on May 20, 2014 during Assessment Monitoring was toxic to *S. capricornutum*; and a single exceedance of the WQTL for pH occurred on July 15, 2014 (Table VIII-5).

Table VIII-5 is a tally of exceedances of WQTLs from 2006 through September 2014 for management plan constituents in the Mokelumne River @ Bruella Rd site subwatershed (organized alphabetically by constituent priority). Table VIII-6 contains detections and WQTL exceedance results of all sampling events since the constituent became part of the site subwatershed management plan. A record of all exceedances in the Mokelumne River @ Bruella Rd site subwatershed since monitoring began is provided in Appendix II, Table VIII-A.

**Table VIII-5. Mokelumne River @ Bruella Rd management plan constituent exceedance tally (2004- September 2014).**

Exceedances that occurred during resampling for field parameters and toxicity are included in the tally. Exceedances are organized alphabetically by constituent priority. A complete list of exceedances can be found in Appendix II, Table VIII-A.

| Monitoring Year | Active Management Plan Constituents | | Removed Management Plan Constituents | | | |
|---|---|---|---|---|---|---|
| | *E. coli*, >235 MPN/100 mL | pH <6.5 and >8.5 units | Copper (Total) Variable[1] or >1300 µg/L | *S. capricornutum*, (%Control) | *C. dubia*, (%Control) | Dissolved oxygen, <7 mg/L |
| 2004 | 0 | 0 | NA | 1 | 1 | 0 |
| 2005 | 0 | 0 | NA | 2 | 2 | 2 |
| 2006 | 0 | 2 | 0 | 0 | 2 | 2 |
| 2007 | 0 | 1 | 3 | 1 | 0 | 0 |
| 2008 | 1 | 0 | 0 | 6 | 0 | 0 |
| 2009 | 1 | 2 | NA | NA | NA | 1 |
| 2010 | 0 | 1 | 0 | 0 | NA | 0 |
| 2011 | 2 | 3 | 0 | 0 | 0 | 0 |
| 2012 | 1 | 1 | NA | 0 | 0 | 0 |
| 2013 | 1 | 1 | NA | NA | 0 | 0 |
| 2014 WY* | 0 | 1 | 0 | 1 | 0 | 0 |
| **Overall Tally** | **6** | **11** | **3** | **10** | **5** | **5** |
| **Constituent Priority** | **E** | **E** | **C[R]** | **D[R]** | **E[R]** | **E[R]** |

[1] Metal WQTL variable based on hardness.
NA – Not Applicable; monitoring did not occur for this constituent during the year.
[R] – Removed from active management plan
*2014 includes January through September results only.

**Table VIII-6. Mokelumne River site subwatershed monitoring results for priority A/B - D constituents since management plan initiation.**

There was no MPM from January through September 2014. Exceedance values are in bold. MPM results after September 2014 not included in table (grey cells).

| | Month: | Jan | Feb | | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **2007 NM (@ Bruella Rd)** | Date | NA | 2/11/07 | 2/28/07 | NA | 4/10/07 | 5/22/07 | 6/12/07 | 7/10/07 | 8/07/07 | 9/04/07 | NA | NA | NA |
| | *C. dubia* toxicity (% Control) | NA | 100 | 100 | NA | 105 | 95 | 90 | 100 | 100 | 100 | NA | NA | NA |
| | *S. capricornutum* toxicity (% Control) | NA | 150 | 121 | NA | 132 | 141 | 186 | **57**[1] | 138 | 118 | NA | NA | NA |
| **2007 MPM (@ Bruella Rd)** | Date | NA | NA | | NA | NA | NA | 6/20/07 | NA | 8/28/07 | 9/25/07 | NA | NA | NA |
| | *C. dubia* toxicity (% Control) | NA | NA | | NA | NA | NA | 100 | NA | NA | 100 | NA | NA | NA |
| | *S. capricornutum* toxicity (% Control) | NA | NA | | NA | NA | NA | NA | NA | 76 | NA | NA | NA | NA |
| **2008 NM (@ Bruella Rd)** | Date | 1/23/08 | NA | | NA | 4/15/08 | 5/13/08 | 6/10/08 | 7/15/08 | 8/12/08 | 9/16/08 | NA | NA | NA |
| | Copper, total (µg/L) | 0.9 | NA | | NA | 1.5 | 1.4 | 0.8 | 1.2 | 0.9 | 1.1 | NA | NA | NA |
| | *C. dubia* toxicity (% Control) | 100 | NA | | NA | 100 | 100 | 100 | 100 | 100 | 100 | NA | NA | NA |
| | *S. capricornutum* toxicity (% Control) | 120 | NA | | NA | **44** | **27** | 110 | 116 | 87 | 98 | NA | NA | NA |
| **2008 MPM (@ Bruella Rd)** | Date | NA | NA | | NA | NA | 5/07/08 | 6/03/08 | 7/08/08 | 8/05/08 | 9/09/08 | NA | NA | NA |
| | Copper, total (µg/L) | NA | NA | | NA | NA | NA | 1.4 | 1.2 | 1.1 | NA | NA | NA | NA |
| | *C. dubia* toxicity (% Control) | NA | NA | | NA | NA | NA | 100 | NA | NA | 100 | NA | NA | NA |
| | *S. capricornutum* toxicity (% Control) | NA | NA | | NA | NA | **10** | NA | **82**[1] | 314 | NA | NA | NA | NA |
| **2010 MPM (@ Bruella Rd)** | Date | NA | NA | | NA | 4/13/10 | 5/11/10 | 6/08/10 | 7/13/10 | 8/10/10 | 9/07/10 | NA | NA | NA |
| | Copper, dissolved (µg/L) | NA | NA | | NA | NA | NA | 0.68 | 0.27 | 0.47 | NA | NA | NA | NA |
| | Copper, total (µg/L) | NA | NA | | NA | NA | NA | 1 | 0.56 | 0.73 | NA | NA | NA | NA |
| | *S. capricornutum* toxicity (% Control) | NA | NA | | NA | 189 | 444 | NA | 327 | 871 | NA | NA | NA | NA |
| **2011 NM & MPM (@ Bruella Rd)** | Date | 1/11/11 | 2/8/11 | | 3/8/11 | 4/12/11 | 5/24/11 | 6/28/11 | 7/26/11 | 8/23/11 | 9/20/11 | 10/6/11 | 11/15/11 | 12/13/11 |
| | Copper, dissolved (µg/L) | 0.72 | 0.56 | | 0.66 | 0.66 | 0.42 | 0.27* | 0.36* | 0.50* | 0.62 | 0.41 | 0.51 | 0.51 |
| | Copper, total (µg/L) | 1.5 | 0.74 | | 1.1 | 1.8 | 1.2 | 0.86* | 0.80* | 0.83* | 1.2 | 1.2 | 1.4 | 0.84 |
| | *C. dubia* toxicity (% Control) | 100 | 100* | | 100* | 100 | 100 | 105* | 100 | 95 | 100* | 100 | 100 | 100 |
| | *S. capricornutum* toxicity (% Control) | 211 | 470 | | 590* | 813* | 419* | 215 | 530* | 371* | 117 | 581 | 303 | 362 |
| **2012 MPM (@ Bruella Rd)** | Date | NA | 2/14/12 | | 3/15/12 | 4/12/12 | 5/16/12 | 6/19/12 | 7/17/12 | 8/21/12 | 9/18/12 | NA | NA | NA |
| | *C. dubia* toxicity (% Control) | NA | 100 | | 105 | NA | NA | 80 | NA | NA | 100 | NA | NA | NA |
| | *S. capricornutum* toxicity (% Control) | NA | NA | | 130 | 176 | 434 | NA | 159 | 102 | NA | NA | NA | NA |
| **2013 MPM (@Bruella Rd)** | Date | NA | 2/21/13 | | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | *C. dubia* toxicity (% Control) | NA | 100 | | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |

[1] *S. capricornutum* toxicity was resampled the following week. Toxicity was not persistent.

MPM – Management Plan Monitoring.

NA – Not Applicable. No monitoring occurred on this date for this constituent.

NM – Normal Monitoring

*NM and MPM sampling occurred during this date for this constituent.

Resampling (RS) due to toxicity not included in table.

## Source Identification and Outreach

The Coalition evaluated PUR data and past monitoring results to determine the sources of constituents listed in the Mokelumne River @ Bruella Rd management plan. Sourcing analyses for past exceedances of management plan constituents are evaluated in past years' site subwatershed appendices. Between 2012 and 2013, three high priority constituents were removed from the active management plan: copper and toxicity to *C. dubia* and *S. capricornutum*. From January through September 2014, there were no exceedances of the WQTL for high priority constituents during Assessment Monitoring. Since there were no exceedances of sourceable constituents, a sourcing analysis was not included.

Toxicity to *S. capricornutum* occurred in May 2014 (58% and 66% survival compared to the control from the field grab and field duplicate, respectively). A TIE was not conducted because survival was greater than 50% compared to the control.

The priority E constituents listed under this site subwatershed active management plan are pH and *E. coli*. Priority E constituents are difficult to source and the Coalition is not required to conduct MPM for priority E constituents. However, all constituents are discussed with growers during focused outreach and the Coalition believes informing growers of other water quality impairments will also address priority E constituents.

The Coalition initiated its management practice tracking and outreach at the Mokelumne River @ Bruella Rd site subwatershed during 2011 with targeted growers. Between 2011 and 2012, the Coalition contacted 12 growers farming 937 acres within the site subwatershed (2013 MPUR, Pages 35-37) and documented current management practices (2013 MPUR, Pages 60-62). The most common management practices in 2010 were use of center grass rows, grass waterways, or grass filter strips (32% of acres with recorded practices). Other management practices currently in place include reducing the use of pesticide of concern (28% of acres with recorded practices), reducing runoff volumes using irrigation management (25% of acres with recorded practices), and installation of sprinkler or micro irrigation (15% of acres with recorded practices). In 2010, 100% of targeted members had one or more management practices that were specific to runoff management and/or pesticide application management. Eleven growers participated in follow-up contacts and documented newly implemented management practices in 2012 (2013 MPUR, Pages 60-62). A final analysis of follow up surveys indicate that reducing use of the pesticide of concern and reducing runoff water volume using irrigation management were the most popular newly implemented practices accounting for 47% and 32% of the acreage with new management practices respectively.

## Evaluation

Water quality has improved since focused outreach began in the Mokelumne River @ Bruella Rd site subwatershed. The Coalition completed focused outreach in the site subwatershed in 2013. Due to improved water quality, the Coalition received approval to remove copper and DO from active management plan; on February 27, 2013 all remaining high priority constituents were approved for

removal: water column toxicity to *C. dubia* and *S. capricornutum*. However, due to the one toxic sample to *S. capricornutum* in May 2014, the Coalition will re-instate *S. capricornutum* back into the site's active management plan in the 2015 WY.

## Next Steps

Focused outreach is completed within this site subwatershed; however, general outreach will continue to occur. In 2015, the Coalition will conduct monitoring at Mokelumne River @ Bruella Rd based on the monitoring strategy at a Core site, as described in the 2014 MPU. Due to the sample that was toxic to *S. capricornutum* in 2014, MPM will also occur in the 2015 WY. The priority E constituents *E. coli* and pH will continue to be monitored as part of monitoring at a Core site.

# IX. TERMINOUS TRACT DRAIN @ HWY 12

## Overview

Terminous Tract Drain @ Hwy 12 is one of the Coalition's third priority site subwatersheds. The Coalition completed focused outreach in the site subwatershed in 2013. To evaluate the effectiveness of outreach, MPM during months of past exceedances occurred from 2010 through September 2014 and monitoring results indicate improved water quality. Based on three or more years of no toxicity, the Coalition received approval to remove water column toxicity to *P. promelas* and *S. capricornutum* from the Terminous Tract @ Hwy 12 active management plan on April 17, 2012 (Table IX-1). The remaining constituents in the site's management plan include: arsenic, chlorpyrifos, DO, *E. coli*, SC, TDS, and sediment toxicity to *H. azteca.*

Core Monitoring occurred through September 2014. Additionally, MPM for chlorpyrifos and sediment toxicity to *H. azteca* occurred; there were exceedances of the WQTLs for DO, *E. coli*, SC, and TDS. The Coalition's management plan strategy includes addressing irrigation and storm water management to improve water quality relative to exceedances of the WQTL for chlorpyrifos. The Coalition's strategy was successful at eliminating the number of chlorpyrifos exceedances; the last exceedance of the WQTL occurred once during 2011.

In 2015, the Coalition will conduct monitoring at Terminous Tract Drain @ Hwy 12 based on the monitoring strategy at a Core site, as described in the 2014 MPU. Additionally, MPM for chlorpyrifos and sediment toxicity to *H. azteca* are scheduled.

**Table IX-1. Terminous Tract Drain @ Hwy 12 management plan constituents.**
Management plan initiation year refers to when the site and constituent are addressed in the SJCDWQC MPURs and in the Management Plan Progress Report sections of the Annual Reports.

| PRIORITY | CONSTITUENT | MANAGEMENT PLAN INITIATION YEAR | MANAGEMENT PLAN REMOVAL YEAR |
|---|---|---|---|
| A/B | Chlorpyrifos | 2009 | Active |
| D | *H. azteca* sediment toxicity | 2007 | Active |
| E | Arsenic | 2008 | Active |
| E | Dissolved Oxygen | 2006 | Active |
| E | *E. coli* | 2006 | Active |
| E | Specific Conductivity | 2006 | Active |
| E | Total Dissolved Solids | 2006 | Active |
| CONSTITUENT (REMOVED) | | | |
| E | *P. promelas* water column toxicity | 2006 | 2012 |
| E | *S. capricornutum* water column toxicity | 2007 | 2012 |

## Description of Site Subwatershed

Terminous Tract Drain @ Highway 12 is the Core Monitoring site in Zone 3 under the 2008 MRPP. This site subwatershed consists of 9,728 acres which include field crops, turf, truck/nursery/berry crops, grains, and hay (Figure IX-1). The site drains all of the acreage north of State Highway 12 and most of the acreage south of Highway 12 on Terminous Tract. The site subwatershed includes two upstream locations, Delta Drain-Terminous Tract off Glasscock Rd and Delta Drain-Terminous Tract off Guard Rd (Table IX-2).

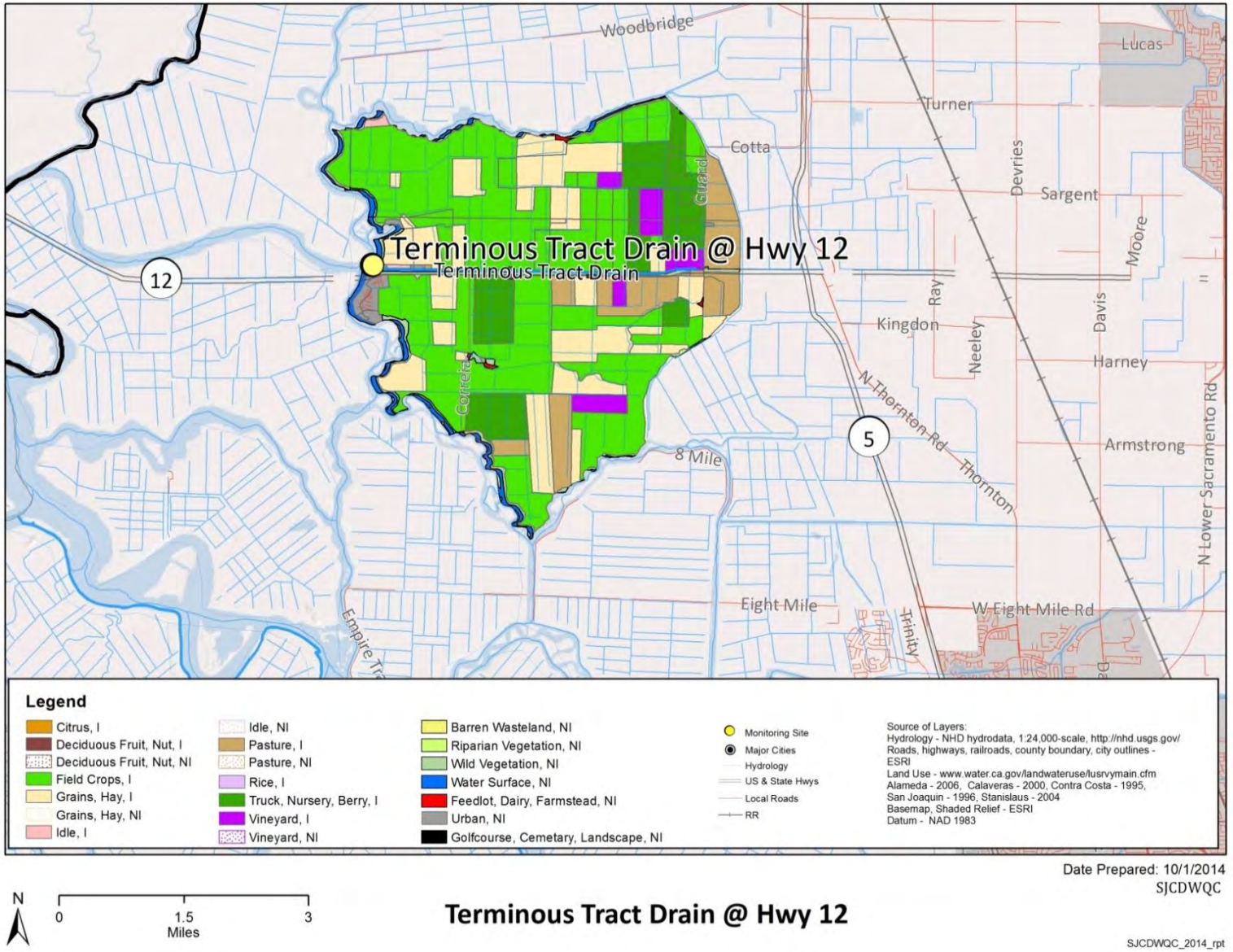
Terminous Tract Drain is not considered an impaired waterway on California's 303(d) List of Impaired Waterbodies (last updated in 2010). However, the represented TMDL subareas in the Delta Waterways (central and eastern portions) where Terminous Tract Drain eventually drains are listed for: chlorpyrifos, DDT, diazinon, group A pesticides, invasive species, mercury, and unknown water column toxicity.

**Table IX-2. Terminous Tract Drain site subwatershed sampling locations coordinates.**

| Site Name | Station Code | Target Latitude | Target Longitude |
|---|---|---|---|
| Terminous Tract Drain @ Hwy 12 | 544XTTHWT | 38.11558 | -121.49380 |
| Terminous Tract off Glascock Rd [US] | 544XTTGLR | 38.12550 | -121.48940 |
| Terminous Tract off Guard Rd [US] | 544XTTGUR | 38.11670 | -121.42110 |

[US] Upstream site

**Figure IX-1. Terminous Tract Drain @ Hwy 12 site subwatershed land use map.**



## Subwatershed Monitoring History

Normal Monitoring was initiated at Terminous Tract Drain @ Hwy 12 in 2005 and continued through 2008. Core Monitoring began in October 2008, with Assessment Monitoring occurring every third year; the last Assessment Monitoring year was 2013. Table IX-3 contains the number of events monitored per year and the constituents (by group) from 2008 through September 2014.

Two upstream sites, Delta Drain-Terminous Tract off Glasscock Rd and Delta Drain-Terminous Tract off Guard Rd, were monitored in 2005 and 2006 to determine if sampling at Terminous Tract Drain @ Hwy 12 was representative of the irrigation drainage on Terminous Tract. After one year of monitoring at Terminous Tract off Glasscock Rd and Terminous Tract off Guard Rd, it was determined that sampling at Terminous Tract Drain @ Hwy 12 was representative of the irrigation drainage on Terminous Tract and monitoring at upstream sites was no longer necessary.

The Coalition conducted MPM during months of past exceedances at Terminous Tract Drain @ Hwy 12 from 2010 through September 2014 (Table IX-4). The last detection of chlorpyrifos was in 2011; load information for that constituent can be found in the 2014 MPUR, Appendix I, Table IX-7.

**Table IX-3. Terminous Tract Drain @ Hwy 12 sampling events and analyses per year.**

Only environmental samples are counted.

| Type | Analyte | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|---|
| Sampling Events | Events Scheduled | 13 | 12 | 12 | 14 | 12 | 13 | 10 |
| | Dry Sites | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Events Sampled | 13 | 12 | 12 | 14 | 12 | 13 | 10 |
| | | | | | | | | |
| Field and Physical Parameters | BOD | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Color | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Dissolved Oxygen | 13 | 12 | 12 | 14 | 12 | 13 | 10 |
| | Dissolved Solids | 10 | 12 | 12 | 12 | 12 | 12 | 9 |
| | *E. coli* | 10 | 12 | 12 | 12 | 12 | 12 | 9 |
| | Grain size (sediment) | 0 | 0 | 2 | 1 | 2 | 2 | 2 |
| | Hardness as CaCO3 | 7 | 0 | 12 | 0 | 0 | 12 | 0 |
| | pH | 13 | 12 | 12 | 14 | 12 | 13 | 10 |
| | Specific Conductivity | 13 | 12 | 12 | 14 | 12 | 13 | 10 |
| | Suspended Solids | 3 | 12 | 12 | 12 | 12 | 12 | 9 |
| | Total Organic Carbon | 10 | 12 | 12 | 12 | 12 | 12 | 9 |
| | Total Organic Carbon (sediment) | 0 | 0 | 2 | 1 | 0 | 2 | 2 |
| | Turbidity | 10 | 12 | 12 | 12 | 12 | 12 | 9 |
| Nutrients | Ammonia as N | 10 | 12 | 12 | 12 | 12 | 12 | 9 |
| | Nitrate + Nitrite as N | 3 | 12 | 12 | 12 | 12 | 12 | 9 |
| | Nitrate as N | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Nitrite as N | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Nitrogen, Total Kjeldahl | 10 | 12 | 12 | 12 | 12 | 12 | 9 |
| | Orthophosphate as P | 10 | 12 | 12 | 12 | 12 | 12 | 9 |
| | Phosphate as P | 10 | 12 | 12 | 12 | 12 | 12 | 9 |
| Metals (Dissolved) | Cadmium | 0 | 0 | 12 | 0 | 0 | 12 | 0 |
| | Copper | 0 | 0 | 12 | 0 | 0 | 12 | 0 |
| | Lead | 0 | 0 | 12 | 0 | 0 | 12 | 0 |
| | Nickel | 0 | 0 | 12 | 0 | 0 | 12 | 0 |
| | Zinc | 0 | 0 | 12 | 0 | 0 | 12 | 0 |

| Type | Analyte | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|---|
| Metals (Total) | Arsenic | 7 | 0 | 12 | 0 | 0 | 12 | 0 |
| | Boron | 7 | 0 | 12 | 0 | 0 | 12 | 0 |
| | Cadmium | 7 | 0 | 12 | 0 | 0 | 12 | 0 |
| | Copper | 7 | 0 | 12 | 0 | 0 | 12 | 0 |
| | Lead | 7 | 0 | 12 | 0 | 0 | 12 | 0 |
| | Molybdenum | 0 | 0 | 12 | 0 | 0 | 12 | 0 |
| | Nickel | 7 | 0 | 12 | 0 | 0 | 12 | 0 |
| | Selenium | 7 | 0 | 12 | 0 | 0 | 12 | 0 |
| | Zinc | 7 | 0 | 12 | 0 | 0 | 12 | 0 |
| Carbamates | Aldicarb | 7 | 0 | 12 | 0 | 0 | 12 | 0 |
| | Carbaryl | 7 | 0 | 12 | 0 | 0 | 12 | 0 |
| | Carbofuran | 7 | 0 | 12 | 0 | 0 | 12 | 0 |
| | Diuron | 7 | 0 | 12 | 0 | 0 | 12 | 0 |
| | Linuron | 7 | 0 | 12 | 0 | 0 | 12 | 0 |
| | Methiocarb | 7 | 0 | 12 | 0 | 0 | 12 | 0 |
| | Methomyl | 7 | 0 | 12 | 0 | 0 | 12 | 0 |
| | Oxamyl | 7 | 0 | 12 | 0 | 0 | 12 | 0 |
| Group A Pesticides | Aldrin | 0 | 8 | 0 | 0 | 0 | 0 | 0 |
| | Chlordane | 0 | 8 | 0 | 0 | 0 | 0 | 0 |
| | Endosulfan I | 0 | 8 | 0 | 0 | 0 | 0 | 0 |
| | Endosulfan II | 0 | 8 | 0 | 0 | 0 | 0 | 0 |
| | HCH, alpha | 0 | 8 | 0 | 0 | 0 | 0 | 0 |
| | HCH, beta | 0 | 8 | 0 | 0 | 0 | 0 | 0 |
| | HCH, delta | 0 | 8 | 0 | 0 | 0 | 0 | 0 |
| | HCH, gamma | 0 | 8 | 0 | 0 | 0 | 0 | 0 |
| | Heptachlor | 0 | 8 | 0 | 0 | 0 | 0 | 0 |
| | Heptachlor epoxide | 0 | 8 | 0 | 0 | 0 | 0 | 0 |
| | Toxaphene | 0 | 8 | 0 | 0 | 0 | 0 | 0 |
| Herbicides | Atrazine | 7 | 0 | 12 | 0 | 0 | 12 | 0 |
| | Cyanazine | 7 | 0 | 12 | 0 | 0 | 12 | 0 |
| | Glyphosate | 7 | 0 | 12 | 0 | 0 | 12 | 0 |
| | Paraquat | 7 | 0 | 12 | 0 | 0 | 12 | 0 |
| | Simazine | 7 | 0 | 12 | 0 | 0 | 12 | 0 |
| | Trifluralin | 0 | 0 | 12 | 0 | 0 | 12 | 0 |
| Organochlorines | DDD(p,p') | 7 | 8 | 12 | 0 | 0 | 12 | 0 |
| | DDE(p,p') | 7 | 8 | 12 | 0 | 0 | 12 | 0 |
| | DDT(p,p') | 7 | 8 | 12 | 0 | 0 | 12 | 0 |
| | Dicofol | 7 | 8 | 12 | 0 | 0 | 12 | 0 |
| | Dieldrin | 7 | 8 | 12 | 0 | 0 | 12 | 0 |
| | Endrin | 7 | 8 | 12 | 0 | 0 | 12 | 0 |
| | Methoxychlor | 7 | 8 | 12 | 0 | 0 | 12 | 0 |
| Organophosphates | Azinphos methyl | 7 | 0 | 12 | 0 | 0 | 12 | 0 |
| | Chlorpyrifos | 7 | 0 | 12 | 2 | 2 | 12 | 2 |
| | Demeton-s | 0 | 0 | 0 | 12 | 0 | 12 | 0 |
| | Diazinon | 7 | 0 | 12 | 0 | 0 | 12 | 0 |
| | Dichlorvos | 0 | 0 | 0 | 12 | 0 | 12 | 0 |
| | Dimethoate | 7 | 0 | 12 | 0 | 0 | 12 | 0 |
| | Disulfoton | 7 | 0 | 12 | 0 | 0 | 12 | 0 |
| | Malathion | 7 | 0 | 12 | 0 | 0 | 12 | 0 |
| | Methamidophos | 7 | 0 | 12 | 0 | 0 | 12 | 0 |
| | Methidathion | 7 | 0 | 12 | 0 | 0 | 12 | 0 |
| | Molinate | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Parathion, Methyl | 7 | 0 | 12 | 0 | 0 | 12 | 0 |
| | Phorate | 7 | 0 | 12 | 0 | 0 | 12 | 0 |
| | Phosmet | 7 | 0 | 12 | 0 | 0 | 12 | 0 |
| | Thiobencarb | 7 | 0 | 0 | 0 | 0 | 0 | 0 |

| Type | Analyte | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|---|
| Pyrethroids | Bifenthrin | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cyfluthrin, total | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cyhalothrin, lambda, total | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cypermethrin, total | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Esfenvalerate/Fenvalerate, total | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Permethrin, total | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sediment Pesticides | Bifenthrin | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| | Chlorpyrifos | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| | Cyfluthrin | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| | Cyhalothrin, lambda | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| | Cypermethrin | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| | Deltamethrin: Tralomethrin | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| | Esfenvalerate/ Fenvalerate | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| | Fenpropathrin | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| | Permethrin | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| Toxicity | *Ceriodaphnia dubia* | 7 | 0 | 12 | 0 | 0 | 12 | 0 |
| | *Pimephales promelas* | 7 | 0 | 12 | 0 | 0 | 12 | 0 |
| | *Selenastrum capricornutum* | 10 | 0 | 12 | 4 | 3 | 12 | 0 |
| | *Hyalella azteca* | 0 | 0 | 2 | 1 | 2 | 2 | 2 |

**Table IX-4. Terminous Tract Drain @ Hwy 12 Management Plan Monitoring schedule (2010-September 2014).**

| Site Name | Sample Date | Monitoring Type | Chlorpyrifos | *S. capricornutum* | *H. azteca* |
|---|---|---|---|---|---|
| Terminous Tract Drain @ Hwy 12 | 04/13/10 | MPM | | X | |
| Terminous Tract Drain @ Hwy 12 | 05/11/10 | MPM | | X | |
| Terminous Tract Drain @ Hwy 12 | 08/10/10 | MPM | X | | |
| Terminous Tract Drain @ Hwy 12 | 09/07/10 | MPM | X | | |
| Terminous Tract Drain @ Hwy 12 | 01/11/11 | MPM | | X | |
| Terminous Tract Drain @ Hwy 12 | 02/08/11 | MPM | | X | |
| Terminous Tract Drain @ Hwy 12 | 04/12/11 | MPM | | X | |
| Terminous Tract Drain @ Hwy 12 | 05/24/11 | MPM | | X | |
| Terminous Tract Drain @ Hwy 12 | 08/23/11 | MPM | X | | |
| Terminous Tract Drain @ Hwy 12 | 09/20/11 | MPM | X | | |
| Terminous Tract Drain @ Hwy 12 | 10/14/11 | MPM | | | X |
| Terminous Tract Drain @ Hwy 12 | 01/17/12 | MPM | | X | |
| Terminous Tract Drain @ Hwy 12 | 02/14/12 | MPM | | X | |
| Terminous Tract Drain @ Hwy 12 | 03/15/12 | MPM | | | X |
| Terminous Tract Drain @ Hwy 12 | 04/12/12 | MPM | | X | |
| Terminous Tract Drain @ Hwy 12 | 08/21/12 | MPM | X | | |
| Terminous Tract Drain @ Hwy 12 | 09/18/12 | MPM | X | | X |
| Terminous Tract Drain @ Hwy 12 | 03/19/13 | MPM | | | X |
| Terminous Tract Drain @ Hwy 12 | 08/20/13 | MPM | X | | |
| Terminous Tract Drain @ Hwy 12 | 09/17/13 | MPM | X | | X |
| Terminous Tract Drain @ Hwy 12 | 03/03/14 | MPM | | | X |
| Terminous Tract Drain @ Hwy 12 | 08/19/14 | MPM | X | | |
| Terminous Tract Drain @ Hwy 12 | 09/16/14 | MPM | X | | X |

X – Constituent sampled for Management Plan Monitoring (MPM).

## Monitoring Results

From January through September 2014, Core Monitoring occurred at Terminous Tract Drain @ Hwy 12 in addition to MPM for chlorpyrifos and sediment toxicity to *H. azteca* (Table IX-4). No exceedances of the WQTL for chlorpyrifos or sediment toxicity to *H. azteca* occurred through September 2014 (Table IX-5). Exceedances of priority E constituents occurred during Core Monitoring including DO (8), *E. coli* (2), SC (3), and TDS (3).

Table IX-5 is a tally of exceedances of WQTLs from 2006 through September 2014 for management plan constituents in the Terminous Tract Drain @ Hwy 12 site subwatershed (organized alphabetically by constituent priority). Table IX-6 contains detections and WQTL exceedance results of all sampling events since the constituent became part of the site subwatershed management plan. A record of all exceedances in the site subwatershed since monitoring began is provided in Appendix II, Table IX-A.

**Table IX-5. Terminous Tract Drain @ Hwy 12 management plan constituent exceedance tally (2005-September 2014).**

Exceedances that occurred during resampling for field parameters and toxicity are included in the tally. Exceedances are organized alphabetically by constituent priority. A complete list of exceedances can be found in Appendix II, Table IX-A.

| | Active Management Plan Constituents | | | | | | | Removed Management Plan Constituents | |
|---|---|---|---|---|---|---|---|---|---|
| Monitoring Year | Chlorpyrifos, >0.015 µg/L | *H. azteca*, (%Control) | Arsenic, >10 µg/L | Dissolved Oxygen, <7 mg/L | *E. coli*, >235 MPN/100 mL | Specific Conductivity, >700 µS/cm | Total Dissolved Solids, >450 mg/L | *P. promelas*, (%Control) | *S. capricornutum*, (%Control) |
| 2005 | 0 | 0 | NA | 4 | 2 | 4 | 2 | 1 | 1 |
| 2006 | 0 | 0 | 1 | 6 | 3 | 3 | 3 | 0 | 0 |
| 2007 | 0 | 0 | 2 | 8 | 3 | 3 | 2 | 0 | 0 |
| 2008 | 2 | 0 | 2 | 5 | 0 | 10 | 6 | 0 | 3 |
| 2009 | NA | NA | NA | 6 | 1 | 6 | 5 | NA | NA |
| 2010 | 0 | 1 | 2 | 7 | 1 | 6 | 6 | 0 | 0 |
| 2011 | 1 | 0 | NA | 9 | 2 | 8 | 7 | NA | 0 |
| 2012 | 0 | 0 | NA | 9 | 2 | 6 | 6 | NA | 0 |
| 2013 | 0 | 1 | 1 | 7 | 1 | 4 | 4 | 0 | 0 |
| 2014 WY* | 0 | 0 | NA | 8 | 2 | 3 | 3 | NA | NA |
| **Overall Tally** | **3** | **2** | **8** | **69** | **17** | **53** | **44** | **1** | **4** |
| **Constituent Priority** | **A/B** | **D** | **E** | **E** | **E** | **E** | **E** | **E[R]** | **E[R]** |

NA – Not Applicable; monitoring did not occur for this constituent during the year.
[R] – Removed from active management plan.
*2014 includes January through September results only.

**Table IX-6. Terminous Tract Drain @ Hwy 12 site subwatershed monitoring results for priority A/B - D constituents since management plan initiation.**

Exceedance values are in bold. Resampling (RS) due to toxicity not included in table. MPM results after September 2014 not included in table (grey cells).

| | Month: | Jan | Feb | | Mar | Apr | May | Jun | Jul | Aug | | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **2007 NM (@ Hwy 12)** | Date: | NA | 2/11/07 | 2/28/07 | 3/6/07 | 4/10/07 | 5/22/07 | 6/12/07 | 7/10/07 | 8/07/07 | 8/9/07 | 9/04/07 | NA | NA | NA |
| | *S. capricornutum* toxicity (% Control) | NA | 280 | 90.8 | NA | 181 | 190 | 811 | 205 | 286 | NA | 301 | NA | NA | NA |
| | *H. azteca* toxicity (% Control) | NA | NA | NA | 95 | NA | NA | NA | NA | NA | 94 | NA | NA | NA | NA |
| **2008 NM (@ Hwy 12)** | Date: | 1/23/08 | NA | | NA | 4/15/08 | 5/13/08 | 6/10/08 | 7/15/08 | 8/12/08 | | 9/16/08 | NA | NA | NA |
| | *S. capricornutum* toxicity (% Control) | **8.3** | NA | | NA | **51** | **0.50** | 256 | 285 | 246 | | 454 | NA | NA | NA |
| **2010 NM (@ Hwy 12)** | Date: | 1/13/10 | 2/09/10 | | 3/16/10 | 4/13/10 | 5/11/10 | 6/08/10 | 7/13/10 | 8/10/10 | | 9/07/10 | 10/12/10 | 11/09/10 | 12/07/10 |
| | Chlorpyrifos µg/L | <0.003 | <0.003 | | <0.003 | <0.003 | <0.003 | <0.003 | <0.003 | NA | | NA | <0.003 | <0.003 | <0.003 |
| | *S. capricornutum* toxicity (% Control) | 231 | 339 | | 985 | NA | NA | 352 | 687 | 1092 | | 369 | 445 | 569 | 171 |
| | *H. azteca* toxicity (% Control) | NA | NA | | 101 | NA | NA | NA | NA | NA | | **45** | NA | NA | NA |
| **2010 MPM (@ Hwy 12)** | Date: | NA | NA | | NA | 4/13/10 | 5/11/10 | NA | NA | 8/10/10 | | 9/07/10 | NA | NA | NA |
| | Chlorpyrifos µg/L | NA | NA | | NA | NA | NA | NA | NA | <0.003 | | 0.011 | NA | NA | NA |
| | *S. capricornutum* toxicity (% Control) | NA | NA | | NA | 1480 | 1121 | NA | NA | NA | | NA | NA | NA | NA |
| **2011 MPM (@ Hwy 12)** | Date: | 1/11/11 | 2/08/11 | | NA | 4/12/11 | 5/24/11 | NA | NA | 8/23/11 | | 9/20/11 | 10/14/11 | NA | NA |
| | Chlorpyrifos µg/L | NA | NA | | NA | NA | NA | NA | NA | <0.003 | | **0.082** | NA | NA | NA |
| | *S. capricornutum* toxicity (% Control) | 207 | 836 | | NA | 1509 | 1138 | NA | NA | NA | | NA | NA | NA | NA |
| | *H. azteca* toxicity (% Control) | NA | NA | | NA | NA | NA | NA | NA | NA | | NA | 109 | NA | NA |
| **2012 MPM (@ Hwy 12)** | Date: | 1/17/12 | 2/14/12 | | 3/15/12 | 4/12/12 | NA | NA | NA | 8/21/12 | | 9/18/12 | NA | NA | NA |
| | Chlorpyrifos µg/L | NA | NA | | NA | NA | NA | NA | NA | <0.003 | | <0.003 | NA | NA | NA |
| | *S. capricornutum* toxicity (% Control) | 915 | 464 | | NA | 332 | NA | NA | NA | NA | | NA | NA | NA | NA |
| | *H. azteca* toxicity (% Control) | NA | NA | | 107 | NA | NA | NA | NA | NA | | 107 | NA | NA | NA |
| **2013 MPM & NM (@Hwy 12)** | Date | 1/15/13 | 2/21/13 | | 3/19/13 | 4/2/13 | 5/21/13 | 6/18/13 | 7/16/13 | 8/20/13 | | 9/17/13 | 10/8/13 | 11/19/13 | 12/17/13 |
| | Chlorpyrifos µg/L | <0.003 | <0.003 | | <0.003 | <0.003 | <0.003 | <0.003 | <0.003 | <0.003 | | <0.003 | <0.003 | <0.003 | <0.003 |
| | *H. azteca* toxicity (% Control) | NA | NA | | 97 | NA | NA | NA | NA | NA | | **48** | NA | NA | NA |
| **2014 MPM & NM (@ Hwy 12)** | Date | 1/28/14 | 2/11/14 | | 3/3/14 | 3/5/14 | 4/15/14 | 5/20/14 | 6/17/14 | 7/15/14 | 8/19/14 | 9/16/14 | | | |
| | Chlorpyrifos µg/L | NA | NA | | NA | NA | NA | NA | NA | NA | <0.003* | <0.003* | | | |
| | *H. azteca* toxicity (% Control) | NA | NA | | NA | 100* | NA | NA | NA | NA | NA | 98* | | | |

MPM – Management Plan Monitoring.

NA – Not Applicable. No monitoring occurred on this date for this constituent.

NM – Normal Monitoring.

**Table IX-7. Terminous Tract Drain site subwatershed instantaneous load calculations for chlorpyrifos.**

If discharge was unable to be measured or the analyte was ND, the result is not included in the table.

| Site Name | Analyte Name | Sample Date | Discharge, cfs | Concentration | Concentration Unit | Loading Rate [1] | Loading Rate Unit |
|---|---|---|---|---|---|---|---|
| Terminous Tract Drain @ Hwy 12 | Chlorpyrifos | 03/21/05 | 9.06 | 0.012 | µg/L | 3 | µg/sec |
| Terminous Tract Drain @ Hwy 12 | Chlorpyrifos | 01/23/08 | 33.93 | 0.0047 | µg/L | 5 | µg/sec |
| Terminous Tract Drain @ Hwy 12 | Chlorpyrifos | 09/16/08 | 18.58 | 0.020 | µg/L | 11 | µg/sec |
| Terminous Tract Drain @ Hwy 12 | Chlorpyrifos | 09/07/10 | 4.07 | 0.011 | µg/L | 1 | µg/sec |
| Terminous Tract Drain @ Hwy 12 | Chlorpyrifos | 09/20/11 | 22.89 | 0.082 | µg/L | 53 | µg/sec |

[1] Load = Discharge (cfs) X 28.317L/ft3 X Concentration (µg/L). To convert a concentration measured in mg/L to µg/L multiply by 1000. The load values calculated represent instantaneous loads only, and should not be used to extrapolate loading over any period of time.

## Source Identification and Outreach

The Coalition evaluates past monitoring results and associated PUR data to identify sources of management plan constituents and develop an outreach strategy. The Coalition sources A/B, C, and D constituents through PUR data and outreach efforts are designed to target the sources of water quality impairments associated with these constituents. From January through September 2014, there were no exceedances of the WQTL for chlorpyrifos or toxicity to *H. azteca*.

Priority A/B, C, and D constituents are associated with pesticide applications to assist in determining potential sources of water quality impairments and in focusing outreach efforts. However, all management plan constituents are discussed during Coalition focused outreach including management practices intended to reduce agricultural discharge of constituents of concern. The Coalition describes its strategy for conducting outreach in high priority sites in the Management Practice Tracking Strategy sections of the main body of the 2014 MPUR.

The Coalition carried out its management practice tracking and outreach which included contacting targeted growers in 2011 and following up with the growers in 2012. The Coalition contacted four targeted growers farming 1,778 acres within the site subwatershed (2013 MPUR, Pages 35-37) and documented current management practices (2012 MPUR, Pages 61-66). The Coalition's recommended management practices for reducing negative impacts of agricultural discharges on water quality include: reduction of application rates, alternative material application, spot treating, sprinkler or microspray irrigation, retention pond/hold basin construction, grass waterways or grass filter strip construction, reducing water volumes using irrigation management, and treating runoff waters with PAM or other materials. All four growers participated in follow-up contacts and documented newly implemented management practices during 2012 (2013 MPUR, Pages 63-65). Reducing water volume using irrigation management accounted for 50% of the acreage on which new management practices were implemented. Installation of sprinkler or micro irrigation and use of center grass rows, grass waterways, or grass filter strips make up the remaining 50%.

## Evaluation

Water quality has improved within the Terminous Tract Drain @ Hwy 12 site subwatershed. After three or more years with no toxicity, *P. promelas* and *S. capricornutum* were approved for removal from the active management plan on April 17, 2012. The remaining high priority constituents under the

management plan include chlorpyrifos and sediment toxicity to *H. azteca*. However, due to no exceedances of chlorpyrifos at this site for three years, this constituent was petitioned for removal on June 4, 2014. The remaining priority E constituents arsenic, DO, *E. coli,* SC, and TDS were discussed during focused and general outreach, and will continue to be discussed at annual grower meetings.

## Next Steps

Focused outreach concluded in the Terminous Tract Drain @ Hwy 12 site subwatershed in 2013 however, general outreach will continue. In 2015, the Coalition will conduct monitoring at Terminous Tract Drain @ Hwy 12 based on the monitoring strategy at a Core site, as described in the 2014 MPU. Additionally, MPM for chlorpyrifos and sediment toxicity to *H. azteca* are scheduled. Monitoring for priority E constituents, *E. coli,* will occur on every sampling event.

# HIGH PRIORITY SITE SUBWATERSHEDS (2012–2014)

# X. KELLOGG CREEK ALONG HOFFMAN LN

## Overview

Kellogg Creek along Hoffman Ln is one of the Coalition's fourth priority site subwatersheds. In 2014, the Coalition completed its focused management plan strategy in the site subwatershed. The Coalition evaluated the effectiveness of implemented management practices and results indicate improved water quality. On August 22, 2014, the Coalition received approval to remove water column toxicity to *S. capricornutum* from the active management plan. The remaining constituents in the site's active management plan include DDE, DDT, *E. coli*, pH, SC, TDS, water column toxicity to *P. promelas,* and sediment toxicity to *H. azteca* (Table X-1).

From January through September 2014, MPM occurred for water column toxicity to *S. capricornutum* and sediment toxicity to *H. azteca*; no toxic samples occurred. The field parameters, pH and SC, were measured during all MPM events and one exceedance of the upper WQTL for each constituent occurred.

In the 2015 WY, Kellogg Creek along Hoffman Ln is classified as a Represented site, and MPM is scheduled for sediment toxicity to *H. azteca*.

**Table X-1. Kellogg Creek along Hoffman Ln management plan constituents.**

Management plan initiation year refers to when the site and constituent are addressed in the SJCDWQC MPURs and in the Management Plan Progress Report sections of the Annual Reports.

| PRIORITY | CONSTITUENT | MANAGEMENT PLAN INITIATION YEAR | MANAGEMENT PLAN REMOVAL YEAR |
|---|---|---|---|
| D | *H. azteca* sediment toxicity | 2006 | Active |
| E | DDE | 2008 | Active |
| E | DDT | 2008 | Active |
| E | *E. coli* | 2006 | Active |
| E | pH | 2006 | Active |
| E | *P. promelas* water column toxicity | 2006 | Active |
| E | Specific Conductivity | 2006 | Active |
| E | Total Dissolved Solids | 2006 | Active |
| **CONSTITUENT (REMOVED)** | | | |
| A/B | Chlorpyrifos | 2006 | 2013 |
| C | Copper | 2008 | 2013 |
| D | *C. dubia* water column toxicity | 2007 | 2013 |
| D | *S. capricornutum* water column toxicity | 2009 | 2014 |
| E | Dissolved Oxygen | 2006 | 2013 |

## Description of Site Subwatershed

Kellogg Creek along Hoffman Ln is a rotating Assessment Monitoring location in Zone 4 under the 2008 MRPP. The site subwatershed consists of 1,831 irrigated acres which is primarily deciduous orchards, truck crops, and field crops (Figure X-1). The site is located north of Livermore, CA and is surrounded by a mixture of agricultural, preserved natural areas, and urban landscapes. Kellogg Creek along Hoffman Ln drains the Los Vaqueros Reservoir in the Round Valley Regional Preserve and runs downstream through Discovery Bay Golf Club. Kellogg Creek @ Hwy 4, located downstream from the club was sampled in 2005 and 2006 (Table X-2); this site was discontinued due to the large urban inputs.

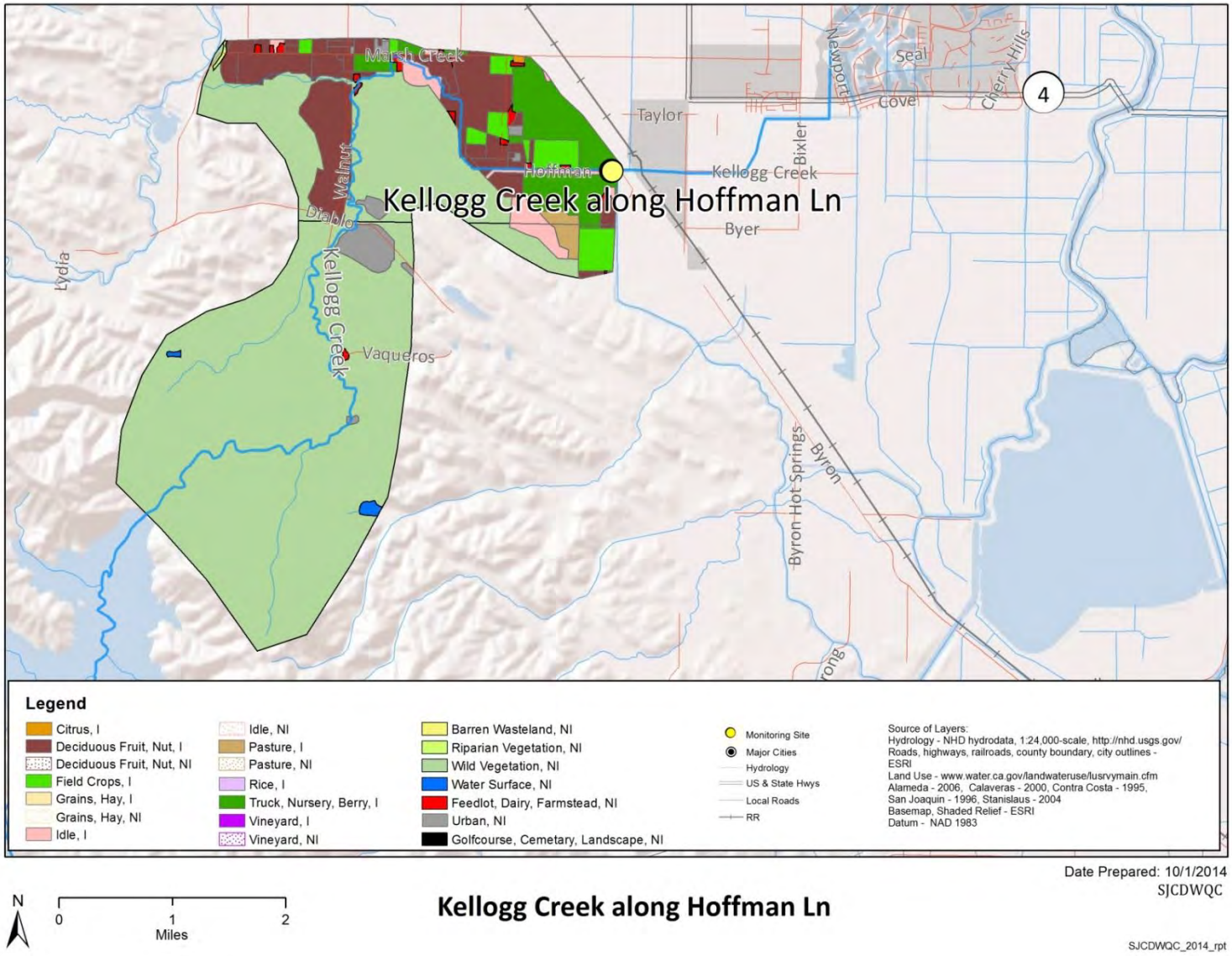
Kellogg Creek is on California's 303 (d) list as an impaired waterbody for *E. coli*, DO, salinity, sediment toxicity, and unknown toxicity.

**Table X-2. Kellogg Creek site subwatershed sampling locations coordinates.**

| Site Name | Station Code | Target Latitude | Target Longitude |
|---|---|---|---|
| Kellogg Creek along Hoffman Ln [US] | 544XKCAHL | 37.88188 | -121.65221 |
| Kellogg Creek @ Hwy 4* | 544XKCHWF | 37.88924 | -121.61901 |

[US] Upstream sites
*Original SJCDWQC sampling site

**Figure X-1. Kellogg Creek along Hoffman Ln site subwatershed land use map.**



## Subwatershed Monitoring History

Normal Monitoring began at Kellogg Creek @ Hwy 4 in the storm season of 2005 and continued through the storm season of 2006. Monitoring at Kellogg Creek along Hoffman Ln replaced Kellogg Creek @ Hwy 4 in 2007. No monitoring occurred from 2009 through 2010, but resumed in 2011. Table X-3 contains the number of events monitored at Kellogg Creek along Hoffman Ln per year and the constituents (by group) from 2008 through September 2014.

Chlorpyrifos was placed in the management plan due to a single exceedance of the WQTL that occurred at Kellogg Creek @ Hwy 4 in 2005. In an effort to source exceedances of constituents of concern, additional MPM occurred for copper and water column toxicity to *C. dubia* in 2007, and for water column toxicity to *P. promelas* in 2008 (Table X-4). The last detections of copper were in 2013; load information for that constituent can be found in the 2014 MPUR, Appendix I, Table X-7.

**Table X-3. Kellogg Creek site sampling events and analyses per year.**

Only environmental samples are counted.

| Type | Analyte | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|---|
| Sampling Events | Events Scheduled | 14 | 0 | 0 | 8 | 7 | 6 | 5 |
| | Dry Sites | 1 | 0 | 0 | 1 | 0 | 0 | 0 |
| | Events Sampled | 13 | 0 | 0 | 7 | 7 | 6 | 5 |
| | | | | | | | | |
| Field and Physical Parameters | BOD | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Color | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Dissolved Oxygen | 14 | 0 | 0 | 7 | 7 | 6 | 5 |
| | Dissolved Solids | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | *E. coli* | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Grain size (sediment) | 0 | 0 | 0 | 2 | 2 | 2 | 2 |
| | Hardness as CaCO3 | 7 | 0 | 0 | 0 | 2 | 1 | 0 |
| | pH | 14 | 0 | 0 | 7 | 7 | 6 | 5 |
| | Specific Conductivity | 14 | 0 | 0 | 7 | 7 | 6 | 5 |
| | Suspended Solids | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Total Organic Carbon | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Total Organic Carbon (sediment) | 0 | 0 | 0 | 2 | 2 | 2 | 2 |
| | Turbidity | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| Nutrients | Ammonia as N | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Nitrate + Nitrite as N | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Nitrate as N | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Nitrite as N | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Nitrogen, Total Kjeldahl | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Orthophosphate as P | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Phosphate as P | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| Metals (Dissolved) | Cadmium | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Copper | 0 | 0 | 0 | 1 | 2 | 1 | 0 |
| | Lead | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Nickel | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Zinc | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Metals (Total) | Arsenic | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Boron | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cadmium | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Copper | 7 | 0 | 0 | 1 | 2 | 1 | 0 |
| | Lead | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Molybdenum | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Nickel | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Selenium | 6 | 0 | 0 | 0 | 0 | 0 | 0 |

| Type | Analyte | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|---|
| | Zinc | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| Carbamates | Aldicarb | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Carbaryl | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Carbofuran | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Diuron | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Linuron | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Methiocarb | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Methomyl | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Oxamyl | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| Group A Pesticides | Aldrin | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Chlordane | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Endosulfan I | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Endosulfan II | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | HCH, alpha | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | HCH, beta | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | HCH, delta | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | HCH, gamma | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Heptachlor | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Heptachlor epoxide | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Toxaphene | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Herbicides | Atrazine | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cyanazine | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Glyphosate | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Paraquat | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Simazine | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Trifluralin | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Organochlorines | DDD(p,p') | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | DDE(p,p') | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | DDT(p,p') | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Dicofol | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Dieldrin | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Endrin | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Methoxychlor | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| Organophosphates | Azinphos methyl | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Chlorpyrifos | 6 | 0 | 0 | 0 | 1 | 1 | 0 |
| | Demeton-s | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Diazinon | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Dichlorvos | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Dimethoate | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Disulfoton | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Malathion | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Methamidophos | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Methidathion | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Molinate | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Parathion, Methyl | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Phorate | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Phosmet | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Thiobencarb | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pyrethroids | Bifenthrin | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cyfluthrin, total | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cyhalothrin, lambda, total | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cypermethrin, total | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Esfenvalerate/Fenvalerate, total | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Permethrin, total | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sediment Pesticide | Bifenthrin | 0 | 0 | 0 | 2 | 0 | 0 | 0 |
| | Chlorpyrifos | 0 | 0 | 0 | 2 | 0 | 0 | 0 |
| | Cyfluthrin | 0 | 0 | 0 | 2 | 0 | 0 | 0 |
| | Cyhalothrin, lambda | 0 | 0 | 0 | 2 | 0 | 0 | 0 |

| Type | Analyte | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|---|
| | Cypermethrin | 0 | 0 | 0 | 2 | 0 | 0 | 0 |
| | Deltamethrin: Tralomethrin | 0 | 0 | 0 | 2 | 0 | 0 | 0 |
| | Esfenvalerate/ Fenvalerate | 0 | 0 | 0 | 2 | 0 | 0 | 0 |
| | Fenpropathrin | 0 | 0 | 0 | 2 | 0 | 0 | 0 |
| | Permethrin | 0 | 0 | 0 | 2 | 0 | 0 | 0 |
| Toxicity | *Ceriodaphnia dubia* | 7 | 0 | 0 | 2 | 3 | 1 | 0 |
| | *Pimephales promelas* | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | *Selenastrum capricornutum* | 8 | 0 | 0 | 3 | 3 | 3 | 3 |
| | *Hyalella azteca* | 3 | 0 | 0 | 2 | 2 | 2 | 2 |

**Table X-4. Kellogg Creek along Hoffman Ln Management Plan Monitoring schedule (2007-September 2014).**

| Site Name | Sample Date | Monitoring Type | Copper | Chlorpyrifos | *C. dubia* | *P. promelas* | *S. capricornutum* | *H. azteca* |
|---|---|---|---|---|---|---|---|---|
| Kellogg Creek along Hoffman Ln | 06/20/07 | Add. | | | | X | | |
| Kellogg Creek along Hoffman Ln | 09/25/07 | Add. | | | | X | | |
| Kellogg Creek along Hoffman Ln | 04/30/08 | Add. | | | X | | | |
| Kellogg Creek along Hoffman Ln | 07/08/08 | Add. | X | | | | | |
| Kellogg Creek along Hoffman Ln | 02/08/11 | MPM | X | X | X | | | |
| Kellogg Creek along Hoffman Ln | 03/08/11 | MPM | | | X | | | X |
| Kellogg Creek along Hoffman Ln | 04/12/11 | MPM | | | X | | X | |
| Kellogg Creek along Hoffman Ln | 05/24/11 | MPM | | | | | X | |
| Kellogg Creek along Hoffman Ln | 07/26/11 | MPM | X | | | | | |
| Kellogg Creek along Hoffman Ln | 08/23/11 | MPM | | | | | X | |
| Kellogg Creek along Hoffman Ln | 10/14/11 | MPM | | | | | | X |
| Kellogg Creek along Hoffman Ln | 02/14/12 | MPM | X | X | X | | | |
| Kellogg Creek along Hoffman Ln | 03/15/12 | MPM | | | X | | | X |
| Kellogg Creek along Hoffman Ln | 04/12/12 | MPM | | | X | | X | |
| Kellogg Creek along Hoffman Ln | 05/16/12 | MPM | | | | | X | |
| Kellogg Creek along Hoffman Ln | 07/17/12 | MPM | X | | | | | |
| Kellogg Creek along Hoffman Ln | 08/21/12 | MPM | | | | | X | |
| Kellogg Creek along Hoffman Ln | 09/21/12 | MPM | | | | | | X |
| Kellogg Creek along Hoffman Ln | 02/21/13 | MPM | X | X | X | | | |
| Kellogg Creek along Hoffman Ln | 03/19/13 | MPM | | | | | | X |
| Kellogg Creek along Hoffman Ln | 04/02/13 | MPM | | | | | X | |
| Kellogg Creek along Hoffman Ln | 05/21/13 | MPM | | | | | X | |
| Kellogg Creek along Hoffman Ln | 08/20/13 | MPM | | | | | X | |
| Kellogg Creek along Hoffman Ln | 09/17/13 | MPM | | | | | | X |
| Kellogg Creek along Hoffman Ln | 03/03/14 | MPM | | | | | | X |
| Kellogg Creek along Hoffman Ln | 04/15/14 | MPM | | | | | X | |
| Kellogg Creek along Hoffman Ln | 05/20/14 | MPM | | | | | X | |
| Kellogg Creek along Hoffman Ln | 08/19/14 | MPM | | | | | X | |
| Kellogg Creek along Hoffman Ln | 09/16/14 | MPM | | | | | | X |

Add. – Additional sampling
X – Constituent sampled for Management Plan Monitoring (MPM)

## Monitoring Results

In January through September 2014, MPM for water column toxicity to *S. capricornutum* and sediment toxicity to *H. azteca* occurred and there were no toxic samples. On August 22, 2014, the Coalition received approval to remove water column toxicity to *S. capricornutum* from the active management plan. The last time sediment toxicity to *H. azteca* occurred was in October 2011; with no exceedances in three years of monitoring, the Coalition will request to remove sediment toxicity from the site's active management plan.

The field parameters, pH and SC, were measured during all MPM events from January through September 2014; one exceedance of each upper WQTL limit occurred. The DO measurement at Kellogg Creek along Hoffman Ln (6.71 mg/L) on September 16, 2014 was reported as an exceedance after this constituent was approved for removal from the site subwatershed's management plan. However, based on the Fourth Edition of the Water Quality Control Plan (Basin Plan) for the Sacramento River and San Joaquin River Basins, the lower DO trigger limit of 5 mg/L should be utilized for Delta waterways that have a 'warm' beneficial use designation, and/or are not considered a resource for fisheries. Therefore, the Coalition reevaluated the DO measurements at the site and determined it was not considered an exceedance.

The SC measurement at Kellogg Creek along Hoffman Ln (804 µS/cm) on March 5, 2014 was reported as an exceedance after the Coalition petitioned to remove SC from the site subwatershed's management plan. However, the San Francisco Bay/Sacramento-San Joaquin Delta Basin Plan (Table 2, Page 13) indicates the WQTL for SC should be based on the seasonal criteria of 700 µS/cm from April through August, and 1,000 µS/cm from September through March. Therefore, the Coalition reevaluated the SC measurement at the site and determined it was not considered an exceedance.

Table X-5 is a tally of exceedances of WQTLs from 2005 through September 2014 for the management plan constituents (organized alphabetically by constituent priority). Table X-6 contains detections and WQTL exceedance results of all sampling events since the constituent became part of the site subwatershed management plan. A record of all exceedances in the Kellogg Creek site subwatershed since monitoring began is provided in Appendix II, Table X-A.

**Table X-5. Kellogg Creek management plan constituent exceedance tally (2005-September 2014).**

Exceedances that occurred during resampling for field parameters and toxicity are included in the tally. Exceedances are organized alphabetically by constituent priority. A complete list of exceedances can be found in Appendix II, Table IX-A.

| Monitoring Year | Active Management Plan Constituents | | | | | | | | | Removed Management Plan Constituents | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *H. azteca*, (%Control) | DDE (p,p'), >0.00059 µg/L | DDT (p,p'), >0.00059 µg/L | *E. coli*, >235 MPN/100 mL | pH, <6.5 and >8.5 units | *P. promelas*, (%Control) | Specific Conductivity, >700 µS/cm | Total Dissolved Solids, >450 mg/L | Chlorpyrifos, >0.015 µg/L | Copper (Total), Variable[1] or >1300 µg/L | *C. dubia*, (%Control) | Dissolved Oxygen, <7 mg/L | *S. capricornutum*, (%Control) |
| 2005 | 3 | NA | NA | 4 | 2 | 2 | 5 | 3 | 1 | NA | 1 | 2 | 1 |
| 2006 | 0 | 1 | 1 | 4 | 0 | 0 | 6 | 4 | 0 | NA | 1 | 4 | 0 |
| 2007 | 2 | 2 | 1 | 1 | 2 | 0 | 0 | 1 | 0 | 2 | 1 | 2 | 0 |
| 2008 | 2 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 3 | 4 |
| 2009 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2010 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2011 | 2 | NA | NA | NA | 4 | NA | 1 | NA | NA | 0 | 0 | 0 | 0 |
| 2012 | 0 | NA | NA | NA | 4 | NA | 0 | NA | NA | 0 | 0 | 0 | 0 |
| 2013 | 0 | NA | NA | NA | 3 | NA | 0 | NA | 0 | 0 | 0 | 0 | 0 |
| 2014* | 0 | NA | NA | NA | 1 | NA | 1 | NA | NA | NA | NA | 1 | 0 |
| **Overall Tally** | **9** | **3** | **2** | **9** | **17** | **2** | **13** | **8** | **1** | **3** | **3** | **12** | **5** |
| **Constituent Priority** | **D** | **E** | **E** | **E** | **E** | **E** | **E** | **E** | **A/B[R]** | **C[R]** | **D[R]** | **E[R]** | **D** |

NA – Not Applicable; monitoring did not occur for this constituent during the year.

[R] – Removed from active management plan.

*2014 includes January through September results only.

**Table X-6. Kellogg Creek site subwatershed monitoring results for priority A/B - D constituents since management plan initiation.**

Exceedance values are in bold. Resampling (RS) due to toxicity not included in table. MPM results after September 2014 not included in table (grey cells).

| | Month: | Feb | | Mar | Apr | May | Jun | Jul | Aug | | Sep | Oct |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **2007 NM (@ Hoffman Ln)** | Date: | 2/11/07 | 2/28/07 | NA | 4/11/07 | 5/22/07 | 6/12/07 | 7/10/07 | 8/7/07 | 8/9/07 | 9/4/07 | NA |
| | Chlorpyrifos (µg/L) | <0.003 | <0.003 | NA | <0.003 | <0.003 | <0.003 | <0.003 | <0.003 | NA | <0.003 | NA |
| | *C. dubia* toxicity (% Control) | 100 | 105 | NA | **50** | 100 | 100 | 95 | 100 | NA | 100 | NA |
| | *P. promelas* toxicity (% Control) | 95 | 100 | NA | 100 | 100 | 103 | 103 | 100 | NA | 103 | NA |
| | *H. azteca* toxicity (% Control) | NA | NA | NA | NA | NA | NA | NA | NA | **0** | NA | NA |
| **2007 MPM Add. (@ Hoffman Ln)** | Date: | NA | | NA | NA | NA | 6/20/07 | NA | NA | | 9/25/07 | NA |
| | *P. promelas* (% Control) | NA | | NA | NA | NA | NA | 100 | NA | | 100 | NA |
| **2008 NM (@ Hoffman Ln)** | Date: | NA | | 3/18/08 | 4/15/08 | 5/13/08 | 6/10/08 | 7/15/08 | 8/12/08 | 8/13/08 | 9/16/08 | NA |
| | Copper (µg/L) | NA | | NA | 3.1 | 4.3 | 4.4 | 2.5 | 2.1 | NA | 2.6 | NA |
| | Chlorpyrifos (µg/L) | NA | | NA | <0.003 | <0.003 | <0.003 | <0.003 | <0.003 | NA | <0.003 | NA |
| | *C. dubia* toxicity (% Control) | NA | | NA | 100 | 100 | 100 | 100 | 100 | NA | 100 | NA |
| | *P. promelas* toxicity (% Control) | NA | | NA | 103 | 103 | 98 | 100 | 105 | NA | 100 | NA |
| | *H. azteca* toxicity (% Control) | NA | | **29** | NA | NA | NA | NA | NA | 102 | NA | NA |
| **2008 MPM Add. (@ Hoffman Ln)** | Date: | NA | | NA | 4/30/08 | NA | NA | 7/8/08 | NA | | NA | NA |
| | Copper (µg/L) | NA | | NA | NA | NA | NA | 98 | NA | | NA | NA |
| | *C. dubia* (% Control) | NA | | NA | 95 | NA | NA | NA | NA | | NA | NA |
| **2011 MPM (@ Hoffman Ln)** | Date: | 2/8/11 | | 3/8/11 | 4/12/11 | 5/24/11 | NA | 7/26/11 | 8/23/11 | | 9/20/11 | 10/14/11 |
| | Copper, dissolved (µg/L) | Dry Site | | NA | NA | NA | NA | 1.1 | NA | | NA | NA |
| | Copper, total (µg/L) | Dry Site | | NA | NA | NA | NA | 7.2 | NA | | NA | NA |
| | Chlorpyrifos (µg/L) | Dry Site | | NA | NA | NA | NA | NA | NA | | NA | NA |
| | *C. dubia* toxicity (% Control) | Dry Site | | 100 | 100 | NA | NA | NA | NA | | NA | NA |
| | *S. capricornutum* toxicity (% Control) | NA | | NA | 1351 | 710 | NA | NA | 690 | | NA | NA |
| | *H. azteca* toxicity (% Control) | NA | | **78** | NA | NA | NA | NA | NA | | NA | **62** |
| **2012 MPM (@ Hoffman Ln)** | Date: | 2/14/12 | | 3/15/12 | 4/12/12 | 5/16/12 | 6/19/12 | 7/17/12 | 8/21/12 | | 9/18/12 | 10/16/12 |
| | Copper, dissolved (µg/L) | 1.3 | | NA | NA | NA | NA | 1.4 | NA | | NA | NA |
| | Copper, total (µg/L) | 1.9 | | NA | NA | NA | NA | 2.5 | NA | | NA | NA |
| | Chlorpyrifos (µg/L) | <0.003 | | NA | NA | NA | NA | NA | NA | | NA | NA |
| | *C. dubia* toxicity (% Control) | 100 | | 105 | 100 | NA | NA | NA | NA | | NA | NA |
| | *S. capricornutum* toxicity (% Control) | NA | | NA | 337 | 484 | NA | NA | 270 | | NA | NA |
| | *H. azteca* toxicity (% Control) | NA | | 92 | NA | NA | NA | NA | NA | | 101 | NA |
| **2013 MPM (@ Hoffman Ln)** | Date | 2/21/13 | | 3/19/13 | 4/2/13 | 5/21/13 | NA | NA | 8/20/13 | | 9/17/13 | NA |
| | Copper, dissolved (µg/L) | 2 | | NA | NA | NA | NA | NA | NA | | NA | NA |
| | Copper, total (µg/L) | 3.3 | | NA | NA | NA | NA | NA | NA | | NA | NA |
| | Chlorpyrifos (µg/L) | <0.003 | | NA | NA | NA | NA | NA | NA | | NA | NA |
| | *C. dubia* toxicity (% Control) | 100 | | NA | NA | NA | NA | NA | NA | | NA | NA |
| | *S. capricornutum* toxicity (% Control) | NA | | NA | 72 | 416 | NA | NA | 139 | | NA | NA |
| | *H. azteca* toxicity (% Control) | NA | | 97 | NA | NA | NA | NA | NA | | 98 | NA |
| **2014 MPM (@ Hoffman Ln)** | Date | NA | | 3/5/2014 | 4/15/14 | 5/20/14 | NA | NA | 8/19/14 | | 9/16/14 | |
| | *S. capricornutum* toxicity (% Control) | NA | | NA | 250 | 219 | NA | NA | 341 | | NA | |
| | *H. azteca* toxicity (% Control) | NA | | 100 | NA | NA | NA | NA | NA | | 96 | |

Add. – Additional monitoring conducted in 2007 and 2008 only.
MPM – Management Plan Monitoring.
NA – No monitoring occurred on this date for this constituent.
NM – Normal Monitoring

## Source Identification Outreach

A complete review of source identification and outreach is provided in the 2013 MPUR Appendix I including an analysis of the management plan constituents that were removed due to improved water quality (Pages 288-300). The Coalition evaluated PUR data and past monitoring results to determine sources of constituents listed in the Kellogg Creek along Hoffman Ln management plan.

Priority A/B, C, and D constituents are associated with pesticide applications to assist in determining potential sources of water quality impairments and focusing outreach efforts. However, all management plan constituents are discussed during focused outreach including management practices that are implemented to reduce agricultural discharge of constituents of concern.

The priority E constituents listed under the active management plan are DDE, DDT, *E. coli*, pH, SC, and TDS. The Coalition is not required to conduct MPM for priority E constituents; however, all constituents are discussed with growers during focused outreach and the Coalition believes informing growers of other water quality impairments will also address priority E constituents.

Focused outreach to document management practices and track implementation of new management practices began in 2012 and was completed in 2014. The Coalition contacted 10 targeted growers, farming 402 acres within the Kellogg Creek site subwatershed in 2012 (2013 MPUR, Page 66). Targeted growers already had management practices in place. The follow-up survey responses provided in the 2014 MPUR indicated targeted growers implemented new management practices that included reducing pesticide use and irrigation tailwater runoff and installing sprinkler and microirrigation systems.

## Evaluation

Overall, water quality has improved since focused outreach began in the site subwatershed. Due to continued improvements, chlorpyrifos, copper, DO, water column toxicity to *C. dubia* and *S. capricornutum* were removed from the site subwatershed's active management plan. The remaining constituents in the active management plan are DDE, DDT, *E. coli*, pH, SC, sediment toxicity to *H. azteca*, TDS, and water toxicity to *P. promelas*.

## Next Steps

General outreach, which will keep growers informed of water quality concerns and applicable management practices designed to improve water quality, will continue in the 2015 WY within the Kellogg Creek along Hoffman Ln site subwatershed. The site subwatershed is classified as a Represented site. Although MPM will continue, the Coalition will petition to remove sediment toxicity to *H. azteca* from the active management plan.

# XI. MORMON SLOUGH @ JACK TONE RD

## Overview

Mormon Slough @ Jack Tone Rd is one of the Coalition's fourth priority site subwatersheds. The Coalition completed focused outreach for the site subwatershed in 2014. The Coalition conducted MPM during months of past exceedances from 2011 through September 2014 and results indicate improved water quality. The Coalition received approval to remove *S. capricornutum* from the active management plan on August 22, 2014 (Table XI-1). The constituents remaining in the site's management plan are chlorpyrifos, DO, pH, and water column toxicity to *C. dubia*.

From January through September 2014, MPM occurred for chlorpyrifos and water column toxicity to *C. dubia* and *S. capricornutum* and no exceedances or toxicity occurred. Priority E constituents, DO and pH, were monitored during every MPM event through September 2014; two exceedances of the WQTL for DO and three exceedances of the WQTL for the upper limit of pH occurred.

In the 2015 WY, Mormon Slough @ Jack Tone Rd is classified as Represented site. As outlined in the 2014 MPU strategy for Represented sites, the Coalition will monitor for diuron and sediment toxicity to *H. azteca* based on past exceedances in the Zone 2 Core site, French Camp Slough @ Airport Way. The Coalition will also conduct MPM for chlorpyrifos and water column toxicity to *C. dubia*.

**Table XI-1. Mormon Slough @ Jack Tone Rd management plan constituents.**
Management plan initiation year refers to when the site and constituent are addressed in the SJCDWQC MPURs and in the Management Plan Progress Report sections of the Annual Reports.

| PRIORITY | CONSTITUENT | MANAGEMENT PLAN INITIATION YEAR | MANAGEMENT PLAN REMOVAL YEAR |
|---|---|---|---|
| A/B | Chlorpyrifos | 2007 | Active |
| D | *C. dubia* water column toxicity | 2009 | Active |
| E | Dissolved Oxygen | 2007 | Active |
| E | pH | 2009 | Active |
| **CONSTITUENT (REMOVED)** | | | |
| D | *S. capricornutum* water column toxicity | 2009 | 2014 |

## Description of Site Subwatershed

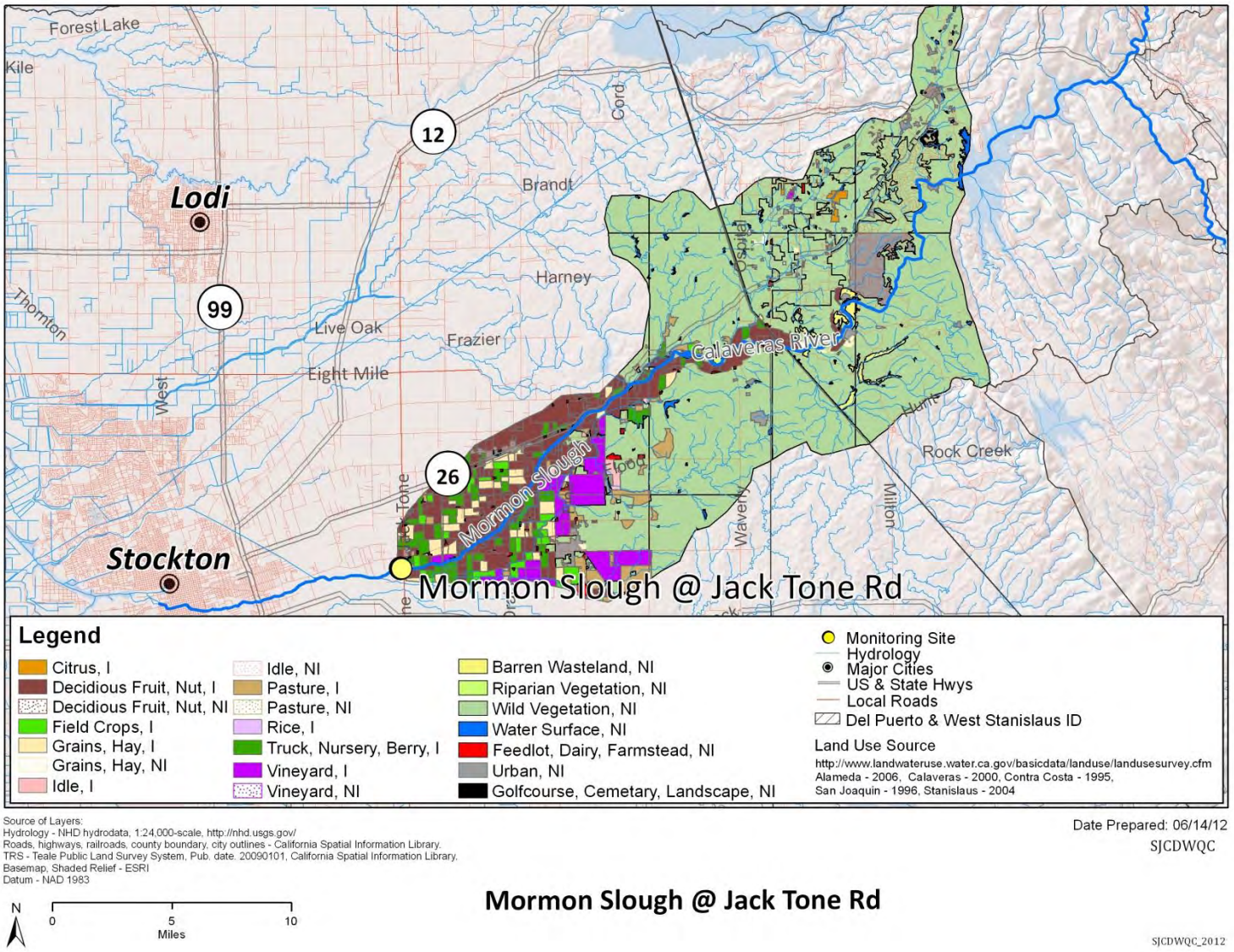
Mormon Slough @ Jack Tone Rd is a rotating Assessment Monitoring location within the French Camp Slough Zone (Zone 2) under the 2008 MRPP. This site is located on the eastern portion of San Joaquin County and extends upstream into Calaveras County (Table XI-2). This site subwatershed consists of 24,615 irrigated acres which primarily consist of deciduous trees with smaller amounts of vineyard, truck farm/nursery, and berry crops (Figure XI-1).

Mormon Slough is currently on California's 303(d) List of Impaired Waterbodies for the section from Stockton Diverting Canal to Bellota Weir-Calaveras River for chlorpyrifos and unknown water column toxicity. The section of Mormon Slough from the Stockton Diverting Canal to Commerce Street is also listed for pathogens (last updated in 2010).

**Table XI-2. Mormon Slough @ Jack Tone Rd site subwatershed sampling location coordinates.**

| Site Name | Station Code | Target Latitude | Target Longitude |
|---|---|---|---|
| Mormon Slough @ Jack Tone Rd | 544MSAJTR | 37.96470 | -121.14880 |

**Figure XI-1. Mormon Slough @ Jack Tone Rd site subwatershed land use map.**



## Subwatershed Monitoring History

Normal Monitoring began at Mormon Slough @ Jack Tone Rd during the irrigation season of 2006 and continued through September 2008 at which time the site became an Assessment Monitoring location; Assessment Monitoring last occurred in 2008 for this site subwatershed. No monitoring occurred from 2009 through 2010. Table XI-3 contains the number of events monitored per year and the constituents (by group) from 2008 through September 2014.

The Coalition initiated MPM at Mormon Slough @ Jack Tone Rd in 2008; actual MPM began in 2011. In an effort to source the chemicals that caused exceedances, additional MPM occurred for chlorpyrifos in 2008. In order to assess the efficacy of the Coalition's outreach strategy, MPM occurred for chlorpyrifos and toxicity to *C. dubia* from 2011 through September 2014 (Table XI-4). The last detections of chlorpyrifos was in 2011; load information for that constituent can be found in the 2014 MPUR, Appendix I, Table XI-7.Prior to its removal from the management plan on August 22, 2014, MPM for toxicity to *S. capricornutum* occurred from 2011 through July 2014.

**Table XI-3. Mormon Slough @ Jack Tone Rd sampling events and analyses per year.**

Only environmental samples are counted.

| Type | Analyte | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|---|
| Sampling Events | Events Scheduled | 13 | 0 | 0 | 5 | 5 | 5 | 5 |
| | Dry Sites | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Events Sampled | 13 | 0 | 0 | 5 | 5 | 4[1] | 5 |
| | | | | | | | | |
| Field and Physical Parameters | BOD | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Color | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Dissolved Oxygen | 0 | 0 | 0 | 5 | 5 | 4 | 5 |
| | Dissolved Solids | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | *E. coli* | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Grain size (sediment) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Hardness as CaCO3 | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | pH | 0 | 0 | 0 | 5 | 5 | 4 | 5 |
| | Specific Conductivity | 0 | 0 | 0 | 5 | 5 | 4 | 5 |
| | Suspended Solids | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Total Organic Carbon | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Total Organic Carbon (sediment) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Turbidity | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| Nutrients | Ammonia as N | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Nitrate + Nitrite as N | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Nitrate as N | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Nitrite as N | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Nitrogen, Total Kjeldahl | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Orthophosphate as P | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Phosphate as P | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| Metals (Dissolved) | Cadmium | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Copper | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Lead | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Nickel | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Zinc | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Metals (Total) | Arsenic | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Boron | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cadmium | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Copper | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Lead | 6 | 0 | 0 | 0 | 0 | 0 | 0 |

| Type | Analyte | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|---|
| | Molybdenum | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Nickel | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Selenium | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Zinc | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| Carbamates | Aldicarb | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Carbaryl | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Carbofuran | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Diuron | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Linuron | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Methiocarb | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Methomyl | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Oxamyl | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| Group A Pesticides | Aldrin | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Chlordane | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Endosulfan I | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Endosulfan II | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | HCH, alpha | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | HCH, beta | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | HCH, delta | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | HCH, gamma | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Heptachlor | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Heptachlor epoxide | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Toxaphene | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Herbicides | Atrazine | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cyanazine | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Glyphosate | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Paraquat | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Simazine | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Trifluralin | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Organochlorines | DDD(p,p') | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | DDE(p,p') | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | DDT(p,p') | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Dicofol | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Dieldrin | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Endrin | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Methoxychlor | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| Organophosphates | Azinphos methyl | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Chlorpyrifos | 9 | 0 | 0 | 4 | 4 | 3 | 4 |
| | Demeton-s | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Diazinon | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Dichlorvos | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Dimethoate | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Disulfoton | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Malathion | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Methamidophos | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Methidathion | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Molinate | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Parathion, Methyl | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Phorate | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Phosmet | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Thiobencarb | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pyrethroids | Bifenthrin | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cyfluthrin, total | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cyhalothrin, lambda, total | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cypermethrin, total | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Esfenvalerate/Fenvalerate, total | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Permethrin, total | 7 | 0 | 0 | 0 | 0 | 0 | 0 |

| Type | Analyte | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|---|
| Sediment Pesticides | Bifenthrin | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Chlorpyrifos | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cyfluthrin | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cyhalothrin, lambda | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cypermethrin | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Deltamethrin: Tralomethrin | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Esfenvalerate/ Fenvalerate | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Fenpropathrin | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Permethrin | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Toxicity | *Ceriodaphnia dubia* | 8 | 0 | 0 | 2 | 2 | 1 | 2 |
| | *Pimephales promelas* | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | *Selenastrum capricornutum* | 9 | 0 | 0 | 3 | 3 | 3 | 3 |
| | *Hyalella azteca* | 2 | 0 | 0 | 0 | 0 | 0 | 0 |

[1] – Site was not accessible during September due to construction; samples were not collected.

**Table XI-4. Mormon Slough @ Jack Tone Rd MPM schedule (2008-September 2014).**

| Site Name | Sample Date | Monitoring Type | Chlorpyrifos | *C. dubia* | *S. capricornutum* |
|---|---|---|---|---|---|
| Mormon Slough @ Jack Tone Rd | 05/07/08 | Add. | X | | |
| Mormon Slough @ Jack Tone Rd | 09/09/08 | Add. | X | | |
| Mormon Slough @ Jack Tone Rd | 04/12/11 | MPM | | | X |
| Mormon Slough @ Jack Tone Rd | 05/24/11 | MPM | X | X | X |
| Mormon Slough @ Jack Tone Rd | 07/26/11 | MPM | X | | X |
| Mormon Slough @ Jack Tone Rd | 08/23/11 | MPM | X | | |
| Mormon Slough @ Jack Tone Rd | 09/20/11 | MPM | X | X | |
| Mormon Slough @ Jack Tone Rd | 04/12/12 | MPM | | | X |
| Mormon Slough @ Jack Tone Rd | 05/16/12 | MPM | X | X | X |
| Mormon Slough @ Jack Tone Rd | 07/17/12 | MPM | X | | X |
| Mormon Slough @ Jack Tone Rd | 08/21/12 | MPM | X | | |
| Mormon Slough @ Jack Tone Rd | 09/18/12 | MPM | X | X | |
| Mormon Slough @ Jack Tone Rd | 04/02/13 | MPM | | | X |
| Mormon Slough @ Jack Tone Rd | 05/21/13 | MPM | X | X | X |
| Mormon Slough @ Jack Tone Rd | 07/16/13 | MPM | X | | X |
| Mormon Slough @ Jack Tone Rd | 08/20/13 | MPM | X | | |
| Mormon Slough @ Jack Tone Rd | 09/17/13 | MPM | X | X | |
| Mormon Slough @ Jack Tone Rd | 04/15/14 | MPM | | | X |
| Mormon Slough @ Jack Tone Rd | 05/20/14 | MPM | X | X | X |
| Mormon Slough @ Jack Tone Rd | 07/15/14 | MPM | X | | X |
| Mormon Slough @ Jack Tone Rd | 08/19/14 | MPM | X | | |
| Mormon Slough @ Jack Tone Rd | 09/16/14 | MPM | X | X | |

Add. – Additional sampling
X – Constituent sampled for Management Plan Monitoring (MPM)

## Monitoring Results

From January through September 2014, MPM occurred for chlorpyrifos and water column toxicity to *C. dubia* and *S. capricornutum;* no exceedances of the WQTL or toxicity occurred (Table XI-5). On August 22, 2014 the coalition received approval to remove *S. capricornutum* from the active management plan; therefore, toxicity to *S. capricornutum* was not monitored in the month of September 2014. The priority E constituents, DO and pH, were measured during all MPM events from January through September 2014. Two exceedances of the WQTL for DO occurred in August and September of 2014 and three exceedances of the upper WQTL for pH occurred in April, May, and July of 2014.

Table XI-5 is a tally of exceedances of WQTLs from 2006 through September 2014 for management plan constituents in the site subwatershed (organized alphabetically by constituent priority). Table XI-6 contains detections and WQTL exceedance results of all sampling events since the constituent became part of the site subwatershed management plan. A record of all exceedances in the site subwatershed since monitoring began is provided in Appendix II, Table XI-A.

**Table XI-5. Mormon Slough @ Jack Tone Rd management plan constituent exceedance tally (2006-September 2014).**

Exceedances that occurred during resampling for field parameters and toxicity are included in the tally. Exceedances are organized alphabetically by constituent priority. A complete list of exceedances can be found in Appendix II, Table XI-A.

| Monitoring Year | Management Plan Constituents | | | | |
|---|---|---|---|---|---|
| | Chlorpyrifos, >0.015 µg/L | *C. dubia*, (%Control) | *S. capricornutum*, (%Control) | Dissolved Oxygen, <7 mg/L | pH, <6.5 and >8.5 units |
| 2006 | 1 | 0 | 0 | 3 | 0 |
| 2007 | 1 | 1 | 1 | 3 | 0 |
| 2008 | 5 | 1 | 3 | 5 | 4 |
| 2011 | 1 | 0 | 0 | 0 | 2 |
| 2012 | 0 | 0 | 0 | 2 | 1 |
| 2013 | 0 | 0 | 0 | 1 | 2 |
| 2014 WY* | 0 | 0 | 0 | 2 | 3 |
| **Overall Tally** | **8** | **2** | **4** | **16** | **12** |
| **Constituent Priority** | **A/B** | **D** | **D** | **E** | **E** |

*2014 includes January through September results only.

**Table XI-6. Mormon Slough @ Jack Tone Rd site subwatershed monitoring results for priority A/B - D constituents since management plan initiation.**

Exceedance values are in bold. Resampling (RS) due to toxicity not included in table.

| | Month: | Jan | Apr | May | Jun | Jul | Aug | Sep |
|---|---|---|---|---|---|---|---|---|
| **2008 MPM (@ Jack Tone Rd)** | Date: | NA | NA | 5/7/08 | NA | NA | NA | 9/9/08 |
| | Chlorpyrifos µg/L | NA | NA | <0.003 | NA | NA | NA | **0.034** |
| **2008 NM (@ Jack Tone Rd)** | Date: | 1/23/08 | 4/15/08 | 5/13/08 | 6/10/08 | 7/15/08 | 8/12/08 | 9/16/08 |
| | Chlorpyrifos µg/L | 0.007 | **0.15** | **0.066** | <0.003 | **0.047** | **0.025** | **0.036** |
| **2011 MPM (@ Jack Tone Rd)** | Date: | NA | 4/12/11 | 5/24/11 | NA | 7/26/11 | 8/23/11 | 9/20/11 |
| | Chlorpyrifos µg/L | NA | NA | <0.003 | NA | <0.003 | <0.003 | **0.11** |
| | *C. dubia* toxicity (% Control) | NA | NA | 100 | NA | NA | NA | 100 |
| | *S. capricornutum* toxicity (% Control) | NA | 1323 | 637 | NA | 699 | NA | NA |
| **2012 MPM (@ Jack Tone Rd)** | Date: | NA | 4/12/12 | 5/16/12 | 6/19/12 | 7/17/12 | 8/21/12 | 9/18/12 |
| | Chlorpyrifos µg/L | NA | NA | <0.003 | NA | <0.003 | <0.003 | <0.003 |
| | *C. dubia* toxicity (% Control) | NA | NA | 100 | NA | NA | NA | 100 |
| | *S. capricornutum* toxicity (% Control) | NA | 237 | 155 | NA | 129 | NA | NA |
| **2013 MPM (@ Jack Tone Rd)** | Date | NA | 4/2/13 | 5/21/13 | NA | 7/16/13 | 8/20/13 | 9/17/13 |
| | Chlorpyrifos µg/L | NA | NA | <0.003 | NA | <0.003 | <0.003 | NA[1] |
| | *C. dubia* toxicity (% Control) | NA | NA | 100 | NA | NA | NA | NA |
| | *S. capricornutum* toxicity (% Control) | NA | 480 | 467 | NA | 264 | NA | NA |
| **2014 MPM (@ Jack Tone Rd)** | Date | NA | 4/15/14 | 5/20/14 | NA | 7/15/14 | 8/19/14 | 9/16/14 |
| | Chlorpyrifos µg/L | NA | NA | <0.003 | NA | <0.003 | <0.003 | <0.003 |
| | *C. dubia* toxicity (% Control) | NA | NA | 100 | NA | NA | NA | 100 |
| | *S. capricornutum* toxicity (% Control) | NA | 178 | 302 | NA | 319 | NA | NA |

MPM – Management Plan Monitoring.
NA – Not Applicable. No monitoring occurred on this date for this constituent.
NM – Normal Monitoring
[1] – Site was not accessible due to construction; samples were not collected

## Source Identification and Outreach

The Coalition evaluated PUR data and past monitoring results to determine the sources of constituents listed in the Mormon Slough @ Jack Tone Rd management plan. Sources for exceedances of the WQTLs for management plan constituents were evaluated in past year's site subwatershed appendices. From January through September 2014, MPM for chlorpyrifos and water column toxicity to *C. dubia* and *S. capricornutum* resulted in no exceedances or toxicity.

Priority E constituents, DO and pH, were measured during all MPM events through September 2014. Two exceedances of the WQTL for DO occurred and three exceedances of the WQTL for pH occurred. Exceedances of field parameters such as DO and pH are difficult to track and source because the values are non-conserved, and can fluctuate as water moves downstream. However, low flow in the waterway can cause exceedances of the WQTL for DO. Per the management plan strategy, the Coalition is not focusing on sources of priority E constituents at this time; the Coalition believes addressing high priority water quality issues will also address priority E constituents.

Focused outreach to document current management practices and track implementation of new management practices in the Mormon Slough @ Jack Tone Rd site subwatershed began in 2012 and continued through September 2014. The Coalition contacted 29 targeted growers farming 1,789 acres within the site subwatershed (2013 MPUR, Page 71) and current management practices were

documented in 2011. Targeted growers already had management practices in place. A final analysis of follow-up surveys indicate that reducing the use of chlorpyrifos and reducing tailwater volume were the most commonly implemented practices occurring on 51% and 31% of the acreage with new management practices, respectively. Installation of sprinklers or micro irrigation was the third most implemented practice at 15%.

## Evaluation

Focused outreach was completed in 2014 within the Mormon Slough @ Jack Tone Rd site subwatershed. The Coalition's focused outreach strategy improved water quality in the site subwatershed. There were no exceedances of the WQTL for chlorpyrifos, and no water column toxicity to *C. dubia* and *S. capricornutum* during years of focused outreach (Table XI-5). Improved water quality led to the removal of *S. capricornutum* from the management plan in August 2014.

## Next Steps

In the 2015 WY, Mormon Slough @ Jack Tone Rd is classified as Represented site. As outlined in the 2014 MPU strategy for Represented sites, the Coalition will monitor for diuron and sediment toxicity to *H. azteca* based on past exceedances in the Zone 2 Core site, French Camp Slough @ Airport Way. The Coalition will conduct MPM for chlorpyrifos and water column toxicity to *C. dubia*. Priority E constituents such as DO and pH will continue to be monitored during all monitoring events.

# XII. SAND CREEK @ HWY 4 BYPASS

## Overview

Sand Creek @ Hwy 4 Bypass is one of the Coalition's fourth priority site subwatersheds. Focused outreach to targeted growers occurred from 2012 through September 2014 and growers implemented new management practices in 2012 and 2013. To evaluate the effectiveness of outreach, MPM occurred during months of past exceedances from 2011 through September 2014. By demonstrating improved water quality, the Coalition received approval to remove chlorpyrifos, diazinon, and water toxicity to *C. dubia* from the site's active management plan on February 27, 2013. The Coalition received approval to remove disulfoton and water column toxicity to *S. capricornutum* from the site's active management plan on August 22, 2014. The remaining constituents in the subwatersheds management plan are DDE, DDT, dieldrin, DO, *E. coli*, SC, TDS, and sediment toxicity to *H. azteca* (Table XII-1).

From January through September 2014, MPM for disulfoton (prior to removal), water column toxicity to *S. capricornutum* (prior to removal), dieldrin, and sediment toxicity to *H. azteca* occurred. Field parameters, including DO and SC, were measured during all MPM events. Exceedances of the WQTLs for DO and SC are common in the Sand Creek @ Hwy 4 Bypass site subwatershed; from January through September 2014, exceedances for DO and SC occurred six times each.

In the 2015 WY, Sand Creek @ Hwy 4 Bypass is classified as a Represented site and MPM is scheduled to continue for dieldrin and sediment toxicity to *H. azteca*. Field parameters, including DO and SC, will continue to be monitored during all monitoring events.

**Table XII-1. Sand Creek @ Hwy 4 Bypass management plan constituents.**

Management plan initiation year refers to when the site and constituent are addressed in the SJCDWQC MPURs and in the Management Plan Progress Report sections of the Annual Reports.

| PRIORITY | CONSTITUENT | MANAGEMENT PLAN INITIATION YEAR | MANAGEMENT PLAN REMOVAL YEAR |
|---|---|---|---|
| D | *H. azteca* sediment toxicity | 2007 | Active |
| E | DDE | 2007 | Active |
| E | DDT | 2007 | Active |
| E | Dieldrin | 2007 | Active |
| E | Dissolved Oxygen | 2007 | Active |
| E | *E. coli* | 2007 | Active |
| E | Specific Conductivity | 2007 | Active |
| E | Total Dissolved Solids | 2007 | Active |
| **CONSTITUENT (REMOVED)** | | | |
| A/B | Chlorpyrifos | 2007 | 2013 |
| A/B | Diazinon | 2007 | 2013 |
| C | Disulfoton | 2009 | 2014 |
| D | *C. dubia* water column toxicity | 2007 | 2013 |
| D | *S. capricornutum* water column toxicity | 2009 | 2014 |

## Description of Site Subwatershed

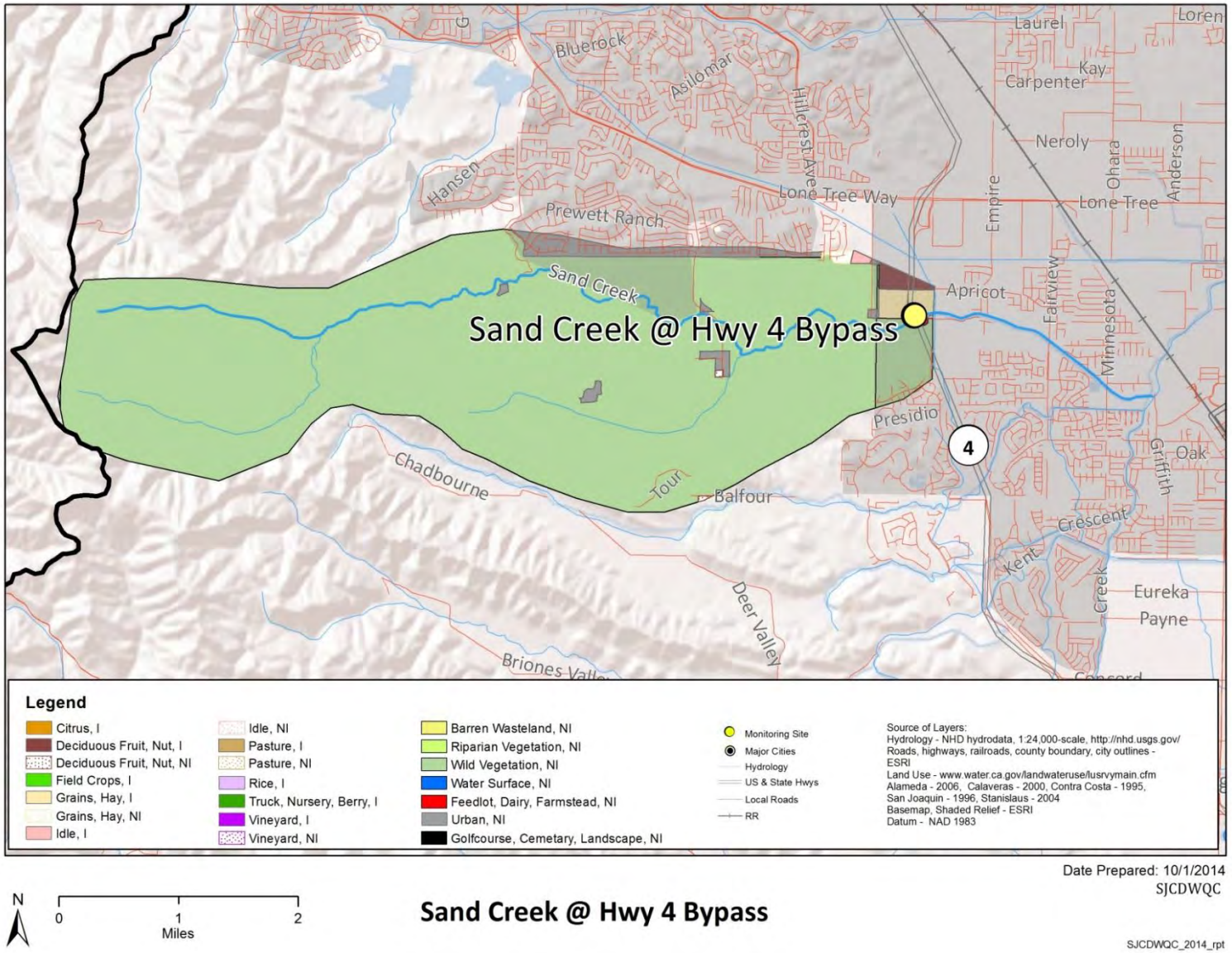
Sand Creek @ Hwy 4 Bypass is the only monitoring location within Zone 6; therefore, there is no rotating Assessment Monitoring location. Likewise, Zone 6 does not have a Core Monitoring location due to increased urbanization in Contra Costa County and lack of agriculture in the southern portion of the site subwatershed. The site is located west of Brentwood where the creek crosses Hwy 4 Bypass. The creek drains approximately 14.4 square miles of combined seasonal flow of the natural lands and tailwater return flow from lowland agriculture (Table XII-2). The site subwatershed consists of 402 irrigated acres which include primarily deciduous nuts and grains; a dairy/feedlot is located south of the site (Figure XII-1).

Sand Creek (tributary to Marsh Creek, Contra Costa County; partly in Delta Waterways, western portion) is listed on California's 303(d) List of Impaired Waterbodies for chlorpyrifos, DDE, DDT, dieldrin, *E. coli*, salinity, and unknown water column toxicity (last updated in 2010). The potential source of all the listed constituents is unknown.

**Table XII-2. Sand Creek @ Hwy 4 Bypass site subwatershed sampling location coordinates.**

| Site Name | Station Code | Target Latitude | Target Longitude |
|---|---|---|---|
| Sand Creek @ Hwy 4 Bypass | 544SCAHFB | 37.94750 | -121.74300 |

**Figure XII-1. Sand Creek @ Hwy 4 Bypass site subwatershed land use map.**



## Subwatershed Monitoring History

Normal Monitoring was initiated at Sand Creek @ Hwy 4 Bypass during the irrigation season of 2006 and continued through the irrigation season of 2008. Table XII-3 contains the number of events monitored per year and the constituents (by group) from 2008 through September of 2014 (see 2013 MPUR Appendix I, Table XII-3 for analytes sampled prior to 2008).

In an effort to source exceedances, additional MPM for chlorpyrifos, dieldrin, and water column toxicity to *C. dubia* occurred from 2007 through 2008 (Table XII-4). The Coalition conducted MPM during months of past exceedances from 2011 through September 2014 to evaluate the effectiveness of management practices. The last detections of chlorpyrifos, diazinon, dieldrin, and disulfoton occurred in 2006, 2008, 2012, and 2008, respectively; load information for those constituents can be found in the 2014 MPUR, Appendix I, Table XII-7. In 2012, there was construction on the State Route 4 Bypass Segment 2 (Lone Tree Way to Balfour Road) that was approximately 50 feet west of the monitoring location; since the site was still accessible, monitoring was conducted as scheduled.

**Table XII-3. Sand Creek @ Hwy 4 Bypass sampling events and analyses per year.**

Only environmental samples are counted.

| Type | Analyte | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|---|
| Sampling Events | Events Scheduled | 16 | 0 | 0 | 9 | 8 | 7 | 6 |
| | Dry Sites | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Events Sampled | 16 | 0 | 0 | 9 | 8 | 7 | 6 |
| | | | | | | | | |
| Field and Physical Parameters | BOD | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Color | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Dissolved Oxygen | 16 | 0 | 0 | 9 | 8 | 7 | 6 |
| | Dissolved Solids | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | *E. coli* | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Grain size (sediment) | 0 | 0 | 0 | 2 | 2 | 2 | 2 |
| | Hardness as CaCO3 | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | pH | 16 | 0 | 0 | 9 | 8 | 7 | 6 |
| | Specific Conductivity | 16 | 0 | 0 | 9 | 8 | 7 | 6 |
| | Suspended Solids | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Total Organic Carbon | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Total Organic Carbon (sediment) | 0 | 0 | 0 | 2 | 2 | 2 | 2 |
| | Turbidity | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| Nutrients | Ammonia as N | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Nitrate + Nitrite as N | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Nitrate as N | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Nitrite as N | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Nitrogen, Total Kjeldahl | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Orthophosphate as P | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Phosphate as P | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| Metals (Dissolved) | Cadmium | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Copper | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Lead | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Nickel | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Zinc | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Metals (Total) | Arsenic | 6 | 0 | 0 | 0 | 6 | 0 | 0 |
| | Boron | 6 | 0 | 0 | 0 | 6 | 0 | 0 |
| | Cadmium | 6 | 0 | 0 | 0 | 6 | 0 | 0 |
| | Copper | 6 | 0 | 0 | 0 | 6 | 0 | 0 |
| | Lead | 6 | 0 | 0 | 0 | 6 | 0 | 0 |

| Type | Analyte | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|---|
| | Molybdenum | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Nickel | 6 | 0 | 0 | 0 | 6 | 0 | 0 |
| | Selenium | 6 | 0 | 0 | 0 | 6 | 0 | 0 |
| | Zinc | 6 | 0 | 0 | 0 | 6 | 0 | 0 |
| Carbamates | Aldicarb | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Carbaryl | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Carbofuran | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Diuron | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Linuron | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Methiocarb | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Methomyl | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Oxamyl | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| Group A Pesticides | Aldrin | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Chlordane | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Endosulfan I | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Endosulfan II | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | HCH, alpha | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | HCH, beta | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | HCH, delta | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | HCH, gamma | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Heptachlor | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Heptachlor epoxide | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Toxaphene | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Herbicides | Atrazine | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cyanazine | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Glyphosate | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Paraquat | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Simazine | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Trifluralin | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Organochlorines | DDD(p,p') | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | DDE(p,p') | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | DDT(p,p') | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Dicofol | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Dieldrin | 9 | 0 | 0 | 0 | 3 | 3 | 3 |
| | Endrin | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Methoxychlor | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| Organophosphates | Azinphos methyl | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Chlorpyrifos | 9 | 0 | 0 | 2 | 2 | 0 | 0 |
| | Demeton-s | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Diazinon | 7 | 0 | 0 | 2 | 2 | 1 | 0 |
| | Dichlorvos | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Dimethoate | 7 | 0 | 0 | 2 | 2 | 0 | 0 |
| | Disulfoton | 7 | 0 | 0 | 3 | 3 | 3 | 3 |
| | Malathion | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Methamidophos | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Methidathion | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Molinate | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Parathion, Methyl | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Phorate | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Phosmet | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Thiobencarb | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pyrethroids | Bifenthrin | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cyfluthrin, total | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cyhalothrin, lambda, total | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cypermethrin, total | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Esfenvalerate/Fenvalerate, total | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Permethrin, total | 7 | 0 | 0 | 0 | 0 | 0 | 0 |

| Type | Analyte | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|---|
| Sediment Pesticide | Bifenthrin | 0 | 0 | 0 | 2 | 1 | 0 | 0 |
| | Chlorpyrifos | 0 | 0 | 0 | 2 | 1 | 0 | 0 |
| | Cyfluthrin | 0 | 0 | 0 | 2 | 1 | 0 | 0 |
| | Cyhalothrin, lambda | 0 | 0 | 0 | 2 | 1 | 0 | 0 |
| | Cypermethrin | 0 | 0 | 0 | 2 | 1 | 0 | 0 |
| | Deltamethrin: Tralomethrin | 0 | 0 | 0 | 2 | 1 | 0 | 0 |
| | Esfenvalerate/ Fenvalerate | 0 | 0 | 0 | 2 | 1 | 0 | 0 |
| | Fenpropathrin | 0 | 0 | 0 | 2 | 1 | 0 | 0 |
| | Permethrin | 0 | 0 | 0 | 2 | 1 | 0 | 0 |
| Toxicity | *Ceriodaphnia dubia* | 10 | 0 | 0 | 3 | 3 | 0 | 0 |
| | *Pimephales promelas* | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | *Selenastrum capricornutum* | 9 | 0 | 0 | 2 | 3 | 2 | 2 |
| | *Hyalella azteca* | 4 | 0 | 0 | 0 | 2 | 2 | 2 |

**Table XII-4. Sand Creek @ Hwy 4 Bypass site subwatershed MPM schedule (2007- September 2014).**

| Site Name | Sample Date | Monitoring Type | Chlorpyrifos | Diazinon | Dieldrin | Disulfoton | *C. dubia* | *S. capricornutum* | *H. azteca* |
|---|---|---|---|---|---|---|---|---|---|
| Sand Creek @ Hwy 4 Bypass | 06/20/07 | Add. | X | | X | | | | |
| Sand Creek @ Hwy 4 Bypass | 07/30/07 | Add. | | | | | X | | |
| Sand Creek @ Hwy 4 Bypass | 05/07/08 | Add. | X | | X | | X | | |
| Sand Creek @ Hwy 4 Bypass | 06/03/08 | Add. | X | | X | | X | | |
| Sand Creek @ Hwy 4 Bypass | 07/08/08 | Add. | | | | | X | | |
| Sand Creek @ Hwy 4 Bypass | 01/11/11 | MPM | | X | | | | | |
| Sand Creek @ Hwy 4 Bypass | 03/08/11 | MPM | | | | | | | X |
| Sand Creek @ Hwy 4 Bypass | 04/12/11 | MPM | | | | | | X | |
| Sand Creek @ Hwy 4 Bypass | 05/24/11 | MPM | X | | X | X | X | | |
| Sand Creek @ Hwy 4 Bypass | 06/28/11 | MPM | X | | X | X | X | | |
| Sand Creek @ Hwy 4 Bypass | 07/26/11 | MPM | | X | | | X | | |
| Sand Creek @ Hwy 4 Bypass | 08/23/11 | MPM | | | X | X | | X | |
| Sand Creek @ Hwy 4 Bypass | 10/14/11 | MPM | | | | | | | X |
| Sand Creek @ Hwy 4 Bypass | 01/17/12 | MPM | | X | | | | | |
| Sand Creek @ Hwy 4 Bypass | 03/15/12 | MPM | | | | | | | X |
| Sand Creek @ Hwy 4 Bypass | 04/12/12 | MPM | | | | | | X | |
| Sand Creek @ Hwy 4 Bypass | 05/16/12 | MPM | X | | X | X | X | | |
| Sand Creek @ Hwy 4 Bypass | 06/19/12 | MPM | X | | X | X | X | | |
| Sand Creek @ Hwy 4 Bypass | 07/17/12 | MPM | | X | | | X | | |
| Sand Creek @ Hwy 4 Bypass | 08/21/12 | MPM | | | X | X | | X | |
| Sand Creek @ Hwy 4 Bypass | 09/18/12 | MPM | | | | | | | X |
| Sand Creek @ Hwy 4 Bypass | 01/15/13 | MPM | | X | | | | | |
| Sand Creek @ Hwy 4 Bypass | 03/19/13 | MPM | | | | | | | X |
| Sand Creek @ Hwy 4 Bypass | 04/02/13 | MPM | | | | | | X | |
| Sand Creek @ Hwy 4 Bypass | 05/21/13 | MPM | | | X | X | | | |
| Sand Creek @ Hwy 4 Bypass | 06/18/13 | MPM | | | X | X | | | |
| Sand Creek @ Hwy 4 Bypass | 08/20/13 | MPM | | | X | X | | X | |
| Sand Creek @ Hwy 4 Bypass | 09/17/13 | MPM | | | | | | | X |
| Sand Creek @ Hwy 4 Bypass | 03/03/14 | MPM | | | | | | | X |
| Sand Creek @ Hwy 4 Bypass | 04/15/14 | MPM | | | | | | X | |
| Sand Creek @ Hwy 4 Bypass | 05/20/14 | MPM | | | X | X | | | |
| Sand Creek @ Hwy 4 Bypass | 06/17/14 | MPM | | | X | X | | | |
| Sand Creek @ Hwy 4 Bypass | 08/19/14 | MPM | | | X | X | | X | |
| Sand Creek @ Hwy 4 Bypass | 09/16/14 | MPM | | | | | | | X |

Add. – Additional sampling.
X – Constituent sampled for Management Plan Monitoring (MPM).

## Monitoring Results

From January through September 2014, MPM for disulfoton, water column toxicity to *S. capricornutum*, dieldrin, and sediment toxicity to *H. azteca* occurred at Sand Creek @ Hwy 4 Bypass. Disulfoton and dieldrin were each monitored in May, June, and August of 2014. Water column toxicity to *C. dubia* and sediment toxicity to *H. azteca* were each monitored twice. No exceedances or toxicity occurred for any high priority constituents (Table XII-5). The Coalition received approval to remove disulfoton and toxicity to *S. capricornutum* from the site's active management plan on August 22, 2014. The field parameters, DO and SC, were measured during all MPM events through September 2014. Exceedances of the WQTL for DO and SC occurred six times each.

Table XII-5 is a tally of exceedances of WQTLs from 2006 through September 2014 for management plan constituents in the site subwatershed (organized alphabetically by constituent priority). Table XII-6 contains detections and WQTL exceedance results of all sampling events since the constituent became part of the site subwatershed management plan. A record of all exceedances in the site subwatershed since monitoring began is provided in Appendix II, Table XII-A.

**Table XII-5. Sand Creek @ Hwy 4 Bypass management plan constituent exceedance tally (2006- September 2014).**

Exceedances that occurred during resampling for field parameters and toxicity are included in the tally. Exceedances are organized alphabetically by constituent priority. A complete list of exceedances can be found in Appendix II, Table XII-A.

| | Active Management Plan Constituents | | | | | | | | | | Removed Management Plan Constituents | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Monitoring Year | Disulfoton, >0.05 µg/L | *H. azteca*, (%Control) | *S. capricornutum*, (%Control) | DDE (p,p'), >0.00059 µg/L | DDT (p,p'), >0.00059 µg/L | Dieldrin, >0.00014 µg/L | Dissolved Oxygen, <7 mg/L | *E. coli*, >235 MPN/100 mL | Specific Conductivity, >700 µS/cm | Total Dissolved Solids, >450 mg/L | Chlorpyrifos, >0.015 µg/L | Diazinon, >0.1 µg/L | *C. dubia*, (%Control) |
| 2006 | 0 | 2 | 0 | 2 | 2 | 2 | 7 | 5 | 6 | 4 | 2 | 1 | 3 |
| 2007 | 0 | 4 | 0 | 1 | 0 | 0 | 6 | 5 | 14 | 8 | 0 | 0 | 0 |
| 2008 | 3 | 4 | 3 | 2 | 1 | 2 | 12 | 7 | 16 | 7 | 0 | 1 | 0 |
| 2011 | 0 | 2 | 0 | NA | NA | 1 | 6 | NA | 9 | NA | 0 | 0 | 0 |
| 2012 | 0 | 1 | 0 | NA | NA | 1 | 5 | NA | 7 | NA | 0 | 0 | 0 |
| 2013 | 0 | 1 | 0 | NA | NA | 0 | 6 | NA | 7 | NA | NA | 0 | NA |
| 2014 WY* | 0 | 0 | 0 | NA | NA | 0 | 6 | NA | 6 | NA | NA | NA | NA |
| **Overall Tally** | **3** | **14** | **3** | **5** | **3** | **6** | **48** | **17** | **65** | **19** | **2** | **2** | **3** |
| **Constituent Priority** | **C** | **D** | **D** | **E** | **E** | **E** | **E** | **E** | **E** | **E** | **A/B[R]** | **A/B[R]** | **D[R]** |

NA – Not Applicable; monitoring did not occur for this constituent during the year.
[R] – Removed from active management plan.
*2014 includes January through September results only.

**Table XII-6. Sand Creek @ Hwy 4 Bypass site subwatershed monitoring results for priority A/B - D constituents since management plan initiation.**

Exceedance values are in bold. Resampling (RS) due to toxicity not included in table. MPM results after September 2014 not included in table (grey cells).

| | Month: | Jan | Mar | Apr | May | Jun | Jul | Aug | | Sep | Oct |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **2007 MPM Add. (@ Hwy 4 Bypass)** | Date | NA | NA | NA | NA | 6/20/07 | 7/30/07 | NA | | NA | NA |
| | Chlorpyrifos µg/L | NA | NA | NA | NA | <0.003 | NA | NA | | NA | NA |
| | Dieldrin µg/L | NA | NA | NA | NA | <0.005 | NA | NA | | NA | NA |
| | *C. dubia,* toxicity (% Control) | NA | NA | NA | NA | NA | 100 | NA | | NA | NA |
| **2008 NM (@ Hwy 4 Bypass)** | Date | 1/23/08 | 3/18/08 | 4/15/08 | 5/13/08 | 6/10/08 | 7/15/08 | 8/12/08 | 8/13/08 | 9/16/08 | NA |
| | Chlorpyrifos µg/L | <0.003 | NA | <0.003 | <0.003 | <0.003 | <0.003 | <0.003 | NA | <0.003 | NA |
| | Dieldrin µg/L | <0.005 | NA | <0.005 | <0.005 | <0.005 | <0.005 | **0.0058** | NA | <0.005 | NA |
| | *C. dubia,* toxicity (% Control) | 100 | NA | 100 | 100 | NA | NA | 95 | NA | 100 | NA |
| | *H. azteca,* toxicity (% Control) | NA | **0** | NA | NA | NA | NA | NA | **2.13** | NA | NA |
| **2008 MPM Add. (@ Hwy 4 Bypass)** | Date | NA | NA | NA | 5/7/08 | 6/3/08 | 7/8/08 | NA | | NA | NA |
| | Chlorpyrifos µg/L | NA | NA | NA | <0.003 | <0.003 | NA | NA | | NA | NA |
| | Dieldrin µg/L | NA | NA | NA | **0.012** | <0.005 | NA | NA | | NA | NA |
| | *C. dubia,* toxicity (% Control) | NA | NA | NA | 100 | 100 | 100 | NA | | NA | NA |
| **2011 MPM (@ Hwy 4 Bypass)** | Date | 1/11/11 | 3/8/11 | 4/12/11 | 5/24/11 | 6/28/11 | 7/26/11 | 8/23/11 | | 9/20/11 | 10/14/11 |
| | Chlorpyrifos µg/L | NA | NA | NA | <0.003 | <0.003 | NA | NA | | NA | NA |
| | Diazinon µg/L | <0.004 | NA | NA | NA | NA | <0.004 | NA | | NA | NA |
| | Dieldrin µg/L | NA | NA | NA | **0.027** | <0.005 | NA | <0.005 | | NA | NA |
| | Disulfoton µg/L | NA | NA | NA | <0.02 | <0.02 | NA | <0.02 | | NA | NA |
| | *C. dubia,* toxicity (% Control) | NA | NA | NA | 100 | 105 | 100 | NA | | NA | NA |
| | *S. capricornutum*, toxicity (% Control) | NA | NA | 262 | NA | NA | NA | 611 | | NA | NA |
| | *H. azteca,* toxicity (% Control) | NA | **29** | NA | NA | NA | NA | NA | | NA | **79** |
| **2012 MPM (@ Hwy 4 Bypass)** | Date | 1/17/12 | 3/15/12 | 4/12/12 | 5/16/12 | 6/19/12 | 7/17/12 | 8/21/12 | | 9/18/12 | NA |
| | Chlorpyrifos µg/L | NA | NA | NA | <0.003 | <0.003 | NA | NA | | NA | NA |
| | Diazinon µg/L | <0.004 | NA | NA | NA | NA | <0.004 | NA | | NA | NA |
| | Dieldrin µg/L | NA | NA | NA | <0.005 | **0.096** | NA | <0.005 | | NA | NA |
| | Disulfoton µg/L | NA | NA | NA | <0.02 | <0.02 | NA | <0.02 | | NA | NA |
| | *C. dubia,* toxicity (% Control) | NA | NA | NA | 100 | 100 | 100 | NA | | NA | NA |
| | *S. capricornutum*, toxicity (% Control) | NA | NA | 381 | 486* | NA | NA | 198 | | NA | NA |
| | *H. azteca,* toxicity (% Control) | NA | **63** | NA | NA | NA | NA | NA | | 95 | NA |
| **2013 MPM (@ Hwy 4 Bypass)** | Date | 1/15/13 | 3/19/13 | 4/2/13 | 5/21/13 | 6/18/13 | NA | 8/20/13 | | 9/17/13 | NA |
| | Diazinon µg/L | <0.004 | NA | NA | NA | NA | NA | NA | | NA | NA |
| | Dieldrin µg/L | NA | NA | NA | <0.005 | <0.005 | NA | <0.005 | | NA | NA |
| | Disulfoton µg/L | NA | NA | NA | <0.02 | <0.02 | NA | <0.02 | | NA | NA |
| | *S. capricornutum*, toxicity (% Control) | NA | NA | 1011 | NA | NA | NA | 364 | | NA | NA |
| | *H. azteca,* toxicity (% Control) | NA | **90** | NA | NA | NA | NA | NA | | 92 | NA |
| **2014 MPM (@ Hwy 4 Bypass)** | Date | NA | 3/5/2014 | 4/15/14 | 5/20/14 | 6/17/14 | NA | 8/19/14 | | 9/16/14 | |
| | Dieldrin µg/L | NA | NA | NA | <0.005 | <0.005 | NA | <0.005 | | NA | |
| | Disulfoton µg/L | NA | NA | NA | <0.02 | <0.02 | NA | <0.02 | | NA | |
| | *S. capricornutum*, toxicity (% Control) | NA | NA | 161 | NA | NA | NA | 409 | | NA | |
| | *H. azteca,* toxicity (% Control) | NA | 96 | NA | NA | NA | NA | NA | | 98 | |

Add. – Additional monitoring conducted in 2007 and 2008 only.
MPM – Management Plan Monitoring.
NA – Not Applicable. No monitoring occurred on this date for this constituent.
NM – Normal Monitoring.
**S. capricornutum* samples were not collected for MPM; however, the laboratory analyzed the samples and the results were included in the table.

## Source Identification and Outreach

The Coalition evaluated PUR data and past monitoring results to determine the sources of constituents listed in the Sand Creek @ Hwy 4 Bypass management plan. Sourcing analyses for past exceedances of management plan constituents are evaluated in past years' site subwatershed appendices. From January through September 2014, MPM for disulfoton, water column toxicity to *S. capricornutum*, dieldrin, and sediment toxicity to *H. azteca* resulted in no exceedances or toxicity. Since there were no exceedances of sourceable constituents, a sourcing analysis was not included.

Exceedances of priority E constituents such as DO and SC are hard to source, but urbanization of the area likely played a role in the exceedances. Water for municipal and industrial use within the subwatershed area is supplied by Los Vaqueros Reservoir. The recycling salty water from the Delta to the Los Vaqueros reservoir and back to the creek could lead to the high levels of SC in the site subwatershed. It is possible that water quality impairments in site subwatershed are the result of urban influences that are common in newly developed areas.

Despite extensive urbanization and reductions in agriculture in the Sand Creek @ Hwy 4 Bypass site subwatershed, the Coalition continued with focused outreach in Zone 6. The Coalition contacted the single targeted grower representing 116 acres in the site subwatershed and documented management practices in 2011 (2013 MPUR, Pages 78). The grower indicated irrigation tailwater and storm water runoff occur on the 116 acres farmed; therefore, the Coalition encouraged the implementation of practices to improve management of irrigation tailwater and storm water runoff. Follow-up surveys indicated that in 2012, the grower intended to implement five of six recommended management practices. A final analysis indicated the grower installed a micro irrigation system, reduced runoff water volume using irrigation management, and reduced use of the pesticide types found in exceedances on 100% of the reported acres.

## Evaluation

The Coalition completed focused outreach in the Sand Creek @ Hwy 4 Bypass site subwatershed in 2014. Outreach efforts included meetings and mailings to educate growers about management practices and the importance of improving water quality. Chlorpyrifos, diazinon, disulfoton, water column toxicity to *C. dubia* and *S. capricornutum* were all removed from the active management plan over the past two years. From January through September 2014, MPM for disulfoton, dieldrin, and sediment toxicity to *H. azteca* occurred without any exceedances or toxicity. Reductions in agriculture and implementation of management practices on remaining irrigated lands have reduced negative impacts on water quality. Extensive urban development near the site could be contributing to remaining water quality impairments.

## Next Steps

In the 2015 WY, Sand Creek @ Hwy 4 Bypass is classified as a Represented site and MPM is scheduled to continue for dieldrin and sediment toxicity to *H. azteca*. Field parameters, including DO and SC, will continue to be monitored during all monitoring events. General outreach will continue to keep growers informed of water quality concerns and applicable management practices designed to improve water quality.

# HIGH PRIORITY SITE SUBWATERSHEDS (2013 – 2015)

# XIII. BEAR CREEK @ NORTH ALPINE RD

## Overview

Bear Creek @ North Alpine Rd is one of the Coalition's fifth priority site subwatersheds. The Coalition completed the second year of its focused management plan strategy in the site subwatershed. Water quality concerns were discussed and current management practices were documented. Growers in the site subwatershed were informed of water quality impairments and encouraged to prevent offsite movement of agricultural constituents. Constituents listed in the active management plan are chlorpyrifos, DO, *E. coli*, malathion, and pH (Table XIII-1).

From January through September 2014, MPM occurred for chlorpyrifos and malathion and no exceedances of the WQTLs occurred. The last time exceedances of the WQTLs for chlorpyrifos and malathion occurred were in October and September 2011, respectively. Priority E constituents, DO and pH, were monitored during all MPM events in through September 2014 and two exceedances of the WQTL for DO occurred.

In the 2015 WY, Bear Creek @ North Alpine Rd is classified as a Represented site. As outlined in the 2014 MPU strategy for Represented sites, the Coalition will monitor for water column toxicity to *S. capricornutum* based on past exceedances in the Zone 1 Core site, Mokelumne River @ Bruella Rd. Additionally, MPM is scheduled to occur for chlorpyrifos and malathion; field parameters will be measured during every monitoring event. The Coalition will analyze these results to evaluate the overall water quality in the site subwatershed.

**Table XIII-1. Bear Creek @ North Alpine Rd management plan constituents.**
Management plan initiation year refers to when the site and constituent are addressed in the SJCDWQC MPURs and in the Management Plan Progress Report sections of the Annual Reports..

| PRIORITY | CONSTITUENT | MANAGEMENT PLAN INITIATION YEAR | MANAGEMENT PLAN REMOVAL YEAR |
|---|---|---|---|
| A/B | Chlorpyrifos | 2012 | Active |
| C | Malathion | 2012 | Active |
| E | Dissolved Oxygen | 2009 | Active |
| E | pH | 2012 | Active |
| E | *E. coli* | 2012 | Active |

## Description of Site Subwatershed

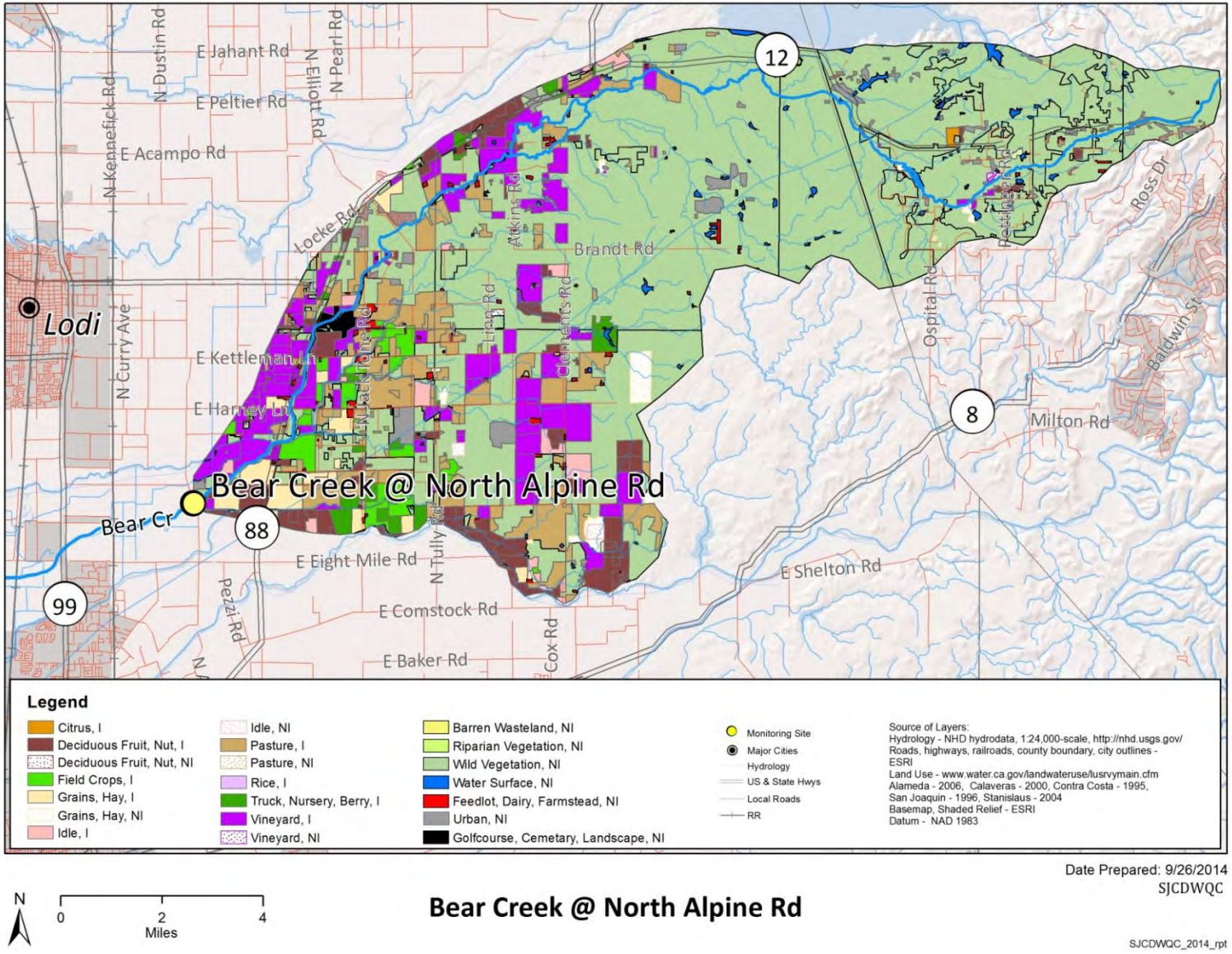
Bear Creek @ North Alpine Rd is a rotating Assessment Site in Zone 1 under the 2008 MRPP. The site is located on the northern edge of the Coalition region. Its boundary starts in the northeastern region of San Joaquin County and it contains portions of Calaveras County in its upstream region (Table XIII-2). The site consists of 19,642 irrigated acres that are primarily pasture, vineyards, deciduous orchards, field crops, grains and hay (Figure XIII-1).

Bear Creek is listed as a 303 (d) Impaired Waterbody for diazinon (updated in 2010).

**Table XIII-2. Bear Creek @ North Alpine Rd site subwatershed sampling location coordinates.**

| SITE NAME | STATION CODE | TARGET LATITUDE | TARGET LONGITUDE |
|---|---|---|---|
| Bear Creek @ North Alpine Rd | 531BCANAR | 38.07386 | -121.21215 |

**Figure XIII-1. Bear Creek @ North Alpine Rd site subwatershed land use map.**



## Subwatershed Monitoring History

Monitoring was initiated at Bear Creek @ North Alpine Rd in October 2008 and continued through 2009; Assessment Monitoring last occurred in 2011. Table XIII-3 contains the number of events monitored per year and the constituents (by group) from 2008 through September 2014.

In 2012, MPM for chlorpyrifos and malathion was initiated in the site subwatershed. Through September 2014, MPM for chlorpyrifos and malathion occurred during months of past exceedances (Table XIII-4). The last detections of chlorpyrifos or malathion occurred in 2011; load information for those constituents can be found in the 2014 MPUR, Appendix I, Table XIII-7.

**Table XIII-3. Bear Creek @ North Alpine Rd sampling events and analyses per year.**

Only environmental samples are counted.

| Type | Analyte | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|---|
| Sampling Events | Events Scheduled | 3 | 3 | 0 | 14 | 3 | 4 | 3 |
| | Dry Sites | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Events Sampled | 3 | 3 | 0 | 14 | 3 | 4 | 3 |
| | | | | | | | | |
| Field and Physical Parameters | BOD | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Color | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Dissolved Oxygen | 3 | 3 | 0 | 14 | 3 | 4 | 3 |
| | Dissolved Solids | 3 | 3 | 0 | 12 | 0 | 0 | 0 |
| | *E. coli* | 3 | 3 | 0 | 12 | 0 | 0 | 0 |
| | Grain size (sediment) | 0 | 0 | 0 | 2 | 0 | 0 | 0 |
| | Hardness as CaCO3 | 3 | 3 | 0 | 12 | 0 | 0 | 0 |
| | pH | 2 | 3 | 0 | 14 | 3 | 4 | 3 |
| | Specific Conductivity | 3 | 3 | 0 | 14 | 3 | 4 | 3 |
| | Suspended Solids | 3 | 3 | 0 | 12 | 0 | 0 | 0 |
| | Total Organic Carbon | 3 | 3 | 0 | 12 | 0 | 0 | 0 |
| | Total Organic Carbon (sediment) | 0 | 0 | 0 | 2 | 0 | 0 | 0 |
| | Turbidity | 3 | 3 | 0 | 12 | 0 | 0 | 0 |
| Nutrients | Ammonia as N | 3 | 3 | 0 | 12 | 0 | 0 | 0 |
| | Nitrate + Nitrite as N | 3 | 3 | 0 | 12 | 0 | 0 | 0 |
| | Nitrate as N | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Nitrite as N | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Nitrogen, Total Kjeldahl | 3 | 3 | 0 | 12 | 0 | 0 | 0 |
| | Orthophosphate as P | 3 | 3 | 0 | 12 | 0 | 0 | 0 |
| | Phosphate as P | 3 | 3 | 0 | 12 | 0 | 0 | 0 |
| Metals (Dissolved) | Cadmium | 3 | 3 | 0 | 12 | 0 | 0 | 0 |
| | Copper | 3 | 3 | 0 | 12 | 0 | 0 | 0 |
| | Lead | 3 | 3 | 0 | 12 | 0 | 0 | 0 |
| | Nickel | 3 | 3 | 0 | 12 | 0 | 0 | 0 |
| | Zinc | 3 | 3 | 0 | 12 | 0 | 0 | 0 |
| Metals (Total) | Arsenic | 3 | 3 | 0 | 12 | 0 | 0 | 0 |
| | Boron | 3 | 3 | 0 | 12 | 0 | 0 | 0 |
| | Cadmium | 3 | 3 | 0 | 12 | 0 | 0 | 0 |
| | Copper | 3 | 3 | 0 | 12 | 0 | 0 | 0 |
| | Lead | 3 | 3 | 0 | 12 | 0 | 0 | 0 |
| | Molybdenum | 3 | 3 | 0 | 12 | 0 | 0 | 0 |
| | Nickel | 3 | 3 | 0 | 12 | 0 | 0 | 0 |
| | Selenium | 3 | 3 | 0 | 12 | 0 | 0 | 0 |
| | Zinc | 3 | 3 | 0 | 12 | 0 | 0 | 0 |

| Type | Analyte | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|---|
| Carbamates | Aldicarb | 3 | 3 | 0 | 12 | 0 | 0 | 0 |
| | Carbaryl | 3 | 3 | 0 | 12 | 0 | 0 | 0 |
| | Carbofuran | 3 | 3 | 0 | 12 | 0 | 0 | 0 |
| | Diuron | 3 | 3 | 0 | 12 | 0 | 0 | 0 |
| | Linuron | 3 | 3 | 0 | 12 | 0 | 0 | 0 |
| | Methiocarb | 3 | 3 | 0 | 12 | 0 | 0 | 0 |
| | Methomyl | 3 | 3 | 0 | 12 | 0 | 0 | 0 |
| | Oxamyl | 3 | 3 | 0 | 12 | 0 | 0 | 0 |
| Group A Pesticides | Aldrin | 3 | 3 | 0 | 0 | 0 | 0 | 0 |
| | Chlordane | 3 | 3 | 0 | 0 | 0 | 0 | 0 |
| | Endosulfan I | 3 | 3 | 0 | 0 | 0 | 0 | 0 |
| | Endosulfan II | 3 | 3 | 0 | 0 | 0 | 0 | 0 |
| | HCH, alpha | 3 | 3 | 0 | 0 | 0 | 0 | 0 |
| | HCH, beta | 3 | 3 | 0 | 0 | 0 | 0 | 0 |
| | HCH, delta | 3 | 3 | 0 | 0 | 0 | 0 | 0 |
| | HCH, gamma | 3 | 3 | 0 | 0 | 0 | 0 | 0 |
| | Heptachlor | 3 | 3 | 0 | 0 | 0 | 0 | 0 |
| | Heptachlor epoxide | 3 | 3 | 0 | 0 | 0 | 0 | 0 |
| | Toxaphene | 3 | 3 | 0 | 0 | 0 | 0 | 0 |
| Herbicides | Atrazine | 3 | 3 | 0 | 12 | 0 | 0 | 0 |
| | Cyanazine | 3 | 3 | 0 | 12 | 0 | 0 | 0 |
| | Glyphosate | 3 | 3 | 0 | 12 | 0 | 0 | 0 |
| | Paraquat | 3 | 3 | 0 | 12 | 0 | 0 | 0 |
| | Simazine | 3 | 3 | 0 | 12 | 0 | 0 | 0 |
| | Trifluralin | 3 | 3 | 0 | 12 | 0 | 0 | 0 |
| Organochlorines | DDD(p,p') | 3 | 3 | 0 | 12 | 0 | 0 | 0 |
| | DDE(p,p') | 3 | 3 | 0 | 12 | 0 | 0 | 0 |
| | DDT(p,p') | 3 | 3 | 0 | 12 | 0 | 0 | 0 |
| | Dicofol | 3 | 3 | 0 | 12 | 0 | 0 | 0 |
| | Dieldrin | 3 | 3 | 0 | 12 | 0 | 0 | 0 |
| | Endrin | 3 | 3 | 0 | 12 | 0 | 0 | 0 |
| | Methoxychlor | 3 | 3 | 0 | 12 | 0 | 0 | 0 |
| Organophosphates | Azinphos methyl | 3 | 3 | 0 | 12 | 0 | 0 | 0 |
| | Chlorpyrifos | 3 | 3 | 0 | 12 | 2 | 3 | 2 |
| | Demeton-s | 3 | 3 | 0 | 12 | 0 | 0 | 0 |
| | Diazinon | 3 | 3 | 0 | 12 | 0 | 0 | 0 |
| | Dichlorvos | 3 | 3 | 0 | 12 | 0 | 0 | 0 |
| | Dimethoate | 3 | 3 | 0 | 12 | 0 | 0 | 0 |
| | Disulfoton | 3 | 3 | 0 | 12 | 0 | 0 | 0 |
| | Malathion | 3 | 3 | 0 | 12 | 2 | 3 | 3 |
| | Methamidophos | 3 | 3 | 0 | 12 | 0 | 0 | 0 |
| | Methidathion | 3 | 3 | 0 | 12 | 0 | 0 | 0 |
| | Molinate | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Parathion, Methyl | 3 | 3 | 0 | 12 | 0 | 0 | 0 |
| | Phorate | 3 | 3 | 0 | 12 | 0 | 0 | 0 |
| | Phosmet | 3 | 3 | 0 | 12 | 0 | 0 | 0 |
| | Thiobencarb | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pyrethroids | Bifenthrin | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cyfluthrin, total | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cyhalothrin, lambda, total | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cypermethrin, total | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Esfenvalerate/Fenvalerate, total | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sediment Pesticides | Permethrin, total | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Bifenthrin | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Chlorpyrifos | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cyfluthrin | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cyhalothrin, lambda | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cypermethrin | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| Type | Analyte | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|---|
| | Deltamethrin: Tralomethrin | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Esfenvalerate/ Fenvalerate | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Fenpropathrin | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Permethrin | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Toxicity | *Ceriodaphnia dubia* | 3 | 3 | 0 | 12 | 0 | 0 | 0 |
| | *Pimephales promelas* | 3 | 3 | 0 | 12 | 0 | 0 | 0 |
| | *Selenastrum capricornutum* | 3 | 3 | 0 | 12 | 0 | 0 | 0 |
| | *Hyalella azteca* | 0 | 0 | 0 | 2 | 0 | 0 | 0 |

**Table XIII-4. Bear Creek @ North Alpine Rd Management Plan Monitoring schedule (2012 – September 2014).**

| Site Name | Sample Date | Monitoring Type | Chlorpyrifos | Malathion |
|---|---|---|---|---|
| Bear Creek @ North Alpine Rd | 05/16/12 | MPM | | X |
| Bear Creek @ North Alpine Rd | 09/18/12 | MPM | X | X |
| Bear Creek @ North Alpine Rd | 10/16/12 | MPM | X | |
| Bear Creek @ North Alpine Rd | 01/15/13 | MPM | X | X |
| Bear Creek @ North Alpine Rd | 05/21/13 | MPM | | X |
| Bear Creek @ North Alpine Rd | 09/17/13 | MPM | X | X |
| Bear Creek @ North Alpine Rd | 10/15/13 | MPM | X | |
| Bear Creek @ North Alpine Rd | 01/28/14 | MPM | X | X |
| Bear Creek @ North Alpine Rd | 05/20/14 | MPM | | X |
| Bear Creek @ North Alpine Rd | 09/16/14 | MPM | X | X |

## Monitoring Results

From January through September 2014, MPM for chlorpyrifos and malathion resulted in no exceedances (Table XIII-5). The Coalition measured DO and pH during all MPM events for high priority constituents; exceedances of the WQTL for DO occurred in May and September 2014.

Table XIII-5 is a tally of exceedances of WQTLs from 2006 through September 2014 for management plan constituents in the site subwatershed (organized alphabetically by constituent priority). Table XIII-6 contains detections and WQTL exceedance results for all sampling events since the constituent became part of the site subwatershed management plan. A record of all exceedances in the site subwatershed since monitoring began is provided in Appendix II, Table XIII-A.

**Table XIII-5. Bear Creek @ North Alpine Rd management plan constituent exceedance tally (2008- September 2014).**

Exceedances that occurred during resampling for field parameters and toxicity are included in the tally. Exceedances are organized alphabetically by constituent priority. A complete list of exceedances can be found in Appendix II, Table XIII-A.

| Monitoring Year | Management Plan Constituents | | | | |
|---|---|---|---|---|---|
| | Chlorpyrifos, > 0.015 µg/L | Malathion, > 0 µg/L | Dissolved Oxygen, <7 mg/L | *E. coli*, >235 MPN/100 mL | pH, <6.5 and >8.5 units |
| 2008 | 0 | 0 | 3 | 1 | 0 |
| 2009 | 0 | 0 | 1 | 0 | 0 |
| 2011 | 3 | 3 | 4 | 1 | 2 |
| 2012 | 0 | 0 | 3 | NA | 0 |
| 2013 | 0 | 0 | 3 | NA | 0 |
| 2014 WY* | 0 | 0 | 2 | NA | 0 |
| **Overall Tally** | **3** | **3** | **16** | **2** | **2** |
| **Constituent Priority** | **A/B** | **C** | **E** | **E** | **E** |

NA – Not Applicable; monitoring did not occur for this constituent during the year.
*2014 includes January through September results only.

**Table XIII-6. Bear Creek @ North Alpine Rd site subwatershed monitoring results for priority A/B - D constituents since management plan initiation.**

Exceedance values are in bold. MPM results after September 2014 not included in table (grey cells).

| | Month: | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **2012 MPM (@ North Alpine Rd)** | Date | 1/17/12 | NA | NA | NA | 5/16/12 | NA | NA | NA | 9/18/12 | 10/16/12 | NA | NA |
| | Chlorpyrifos µg/L | <0.003 | NA | NA | NA | <0.003 | NA | NA | NA | <0.003 | <0.003 | NA | NA |
| | Malathion µg/L | 0 | NA | NA | NA | 0 | NA | NA | NA | 0 | 0 | NA | NA |
| **2013 MPM (@ North Alpine Rd)** | Date | 1/15/13 | NA | NA | NA | 5/21/13 | NA | NA | NA | 9/17/13 | 10/15/13 | NA | NA |
| | Chlorpyrifos µg/L | <0.003 | NA | NA | NA | NA | NA | NA | NA | <0.003 | <0.003 | NA | NA |
| | Malathion µg/L | <0.05 | NA | NA | NA | <0.05 | NA | NA | NA | <0.03 | NA | NA | NA |
| **2014 MPM (@ North Alpine Rd)** | Date | 1/28/14 | NA | NA | NA | 5/20/14 | NA | NA | NA | 9/16/14 | | | |
| | Chlorpyrifos µg/L | <0.003 | NA | NA | NA | NA | NA | NA | NA | <0.003 | | | |
| | Malathion µg/L | <0.05 | NA | NA | NA | <0.03 | NA | NA | NA | <0.03 | | | |

MPM – Management Plan Monitoring.
NA – Not Applicable. No monitoring occurred on this date for this constituent.
NM – Normal Monitoring

## Source Identification and Outreach

The Coalition evaluated PUR data and past monitoring results to determine the sources of constituents listed in the Bear Creek @ North Alpine Rd management plan. Sourcing analyses for past exceedances of management plan constituents are evaluated in past years' site subwatershed appendices. From January through September 2014, MPM for chlorpyrifos and malathion resulted in no exceedances. Since there were no exceedances of sourceable constituents, a sourcing analysis was not included.

Two exceedances of the lower WQTL of 7 mg/L for DO occurred at Bear Creek @ North Alpine Rd in May and September 2014. Exceedances of priority E constituents such as DO are difficult to source. There was no flow in the creek during May and September. These no flow conditions likely contributed to the low DO detected during monitoring.

Focused outreach to document current management practices and track implemented management practices began in 2013 and will end in 2015. The Coalition contacted seven targeted growers, farming 655 irrigated acres in the site subwatershed (2014 MPUR Performance Goals and Schedules section). In 2012, all targeted members in the Bear Creek @ North Alpine Rd site subwatershed had one or more management practices in place that were specific to runoff management or pesticide application management. Growers have since implemented management practices to further improve water quality in the site subwatershed. The most common management practices included reducing runoff water volumes and reducing use of pesticide types found in exceedances. Installation of sprinkler or micro irrigation and the use of center grass rows/grass waterways/grass filter strips were also favored management practices. The Coalition believes the implementation of certain management practices and increased grower awareness will continue to help improve water quality within the site subwatershed.

## Evaluation

In an effort to address water quality concerns, management practices were recommended to growers farming land with potential to drain directly to the creek. Applications of chlorpyrifos and malathion were reduced, and irrigation runoff management practices were implemented. Improvements in water quality are evident as the last exceedances of the WQTLs for chlorpyrifos and malathion occurred during Assessment Monitoring in 2011. Future monitoring of priority constituents without exceedances will result in removal of such constituents from the site subwatershed's management plan.

## Next Steps

In the 2015 WY, Bear Creek @ North Alpine Rd is classified as a Represented site. As outlined in the 2014 MPU strategy for Represented sites, the Coalition will monitor for water column toxicity to *S. capricornutum* based on past exceedances in the Zone 1 Core site, Mokelumne River @ Bruella Rd. Additionally, MPM is scheduled to occur for chlorpyrifos and malathion; field parameters will be measured during every monitoring event. The Coalition will analyze these results to evaluate the overall water quality in the site subwatershed. The Coalition will document follow-up survey responses and implemented management practices from targeted growers in 2015.

# XIV. ROBERTS ISLAND @ WHISKEY SLOUGH PUMP

## Overview

Roberts Island @ Whiskey Slough Pump is one of the Coalition's fifth priority site subwatersheds. The Coalition completed the second year of its focused management plan strategy in the site subwatershed. Water quality concerns were discussed and current management practices were documented. Growers in the site subwatershed were informed of water quality impairments and encouraged to prevent offsite movement of agricultural constituents.

Roberts Island @ Whiskey Slough Pump replaced Roberts Island Drain along House Rd and Roberts Island Drain @ Holt Rd as the Core site on January 12, 2012 because it is more representative of the entire island. The Roberts Island @ Whiskey Slough Pump management plan includes constituents that were listed in both the Roberts Island @ Holt Rd and Roberts Island Drain along House Rd management plans and includes chlorpyrifos, DDE, diuron, DO, *E. coli*, pH, SC, TDS, water column toxicity to *C. dubia* and *S. capricornutum,* and sediment toxicity to *H. azteca* (Table XIV-1).

From January through September 2014, MPM occurred for chlorpyrifos, diuron, water column toxicity to *C. dubia* and *S. capricornutum,* and sediment toxicity to *H. azteca*. Toxicity to *C. dubia* occurred once in July and toxicity to *S. capricornutum* occurred in February and April. In addition to MPM, Assessment Monitoring occurred on a monthly basis at Roberts Island @ Whiskey Slough Pump to monitor general water quality parameters. Monitoring through September 2014 resulted in exceedances of the WQTLs for DO (9), *E. coli* (1), SC (10), and TDS (9).

In 2015, the Coalition will conduct monitoring at Roberts Island @ Whiskey Slough Pump based on the monitoring strategy at a Core site, as described in the 2014 MPU. Additionally, MPM is scheduled for chlorpyrifos, diuron, water column toxicity to *C. dubia* and *S. capricornutum,* and sediment toxicity to *H. azteca*. Field parameters such as DO, pH, and SC will be measured during every monitoring event.

**Table XIV-1. Roberts Island @ Whiskey Slough Pump management plan constituents.**
Management plan initiation year refers to when the site and constituent are addressed in the SJCDWQC MPURs and in the Management Plan Progress Report sections of the Annual Reports.

| PRIORITY | CONSTITUENT | MANAGEMENT PLAN INITIATION YEAR | MANAGEMENT PLAN REMOVAL YEAR |
|---|---|---|---|
| A/B | Chlorpyrifos | 2007 | Active |
| C | Diuron | 2009 | Active |
| D | *C. dubia* water column toxicity | 2011 | Active |
| D | *H. azteca* sediment toxicity | 2007 | Active |
| D | *S. capricornutum* water column toxicity | 2009 | Active |
| E | DDE | 2007 | Active |
| E | Dissolved Oxygen | 2007 | Active |
| E | *E. coli* | 2007 | Active |
| E | pH | 2007 | Active |
| E | Specific Conductivity | 2007 | Active |
| E | Total Dissolved Solids | 2007 | Active |

## Description of Site Subwatershed

Roberts Island @ Whiskey Slough Pump is the Core site in Zone 4 under the 2008 MRPP. Roberts Island @ Whiskey Slough Pump replaced Roberts Island Drain along House Rd and Roberts Island Drain @ Holt Rd as the Core site on January 12, 2012 because it is more representative of the entire island (Table XIV-2). The site subwatershed consists of 11,716 irrigated acres and irrigated agriculture primarily includes asparagus, field crops, grains, alfalfa and pasture (Figure XIV-1). Roberts Island @ Whiskey Slough Pump drains all of Roberts Island north of Hwy 4 through a pump located along McDonald Road on the western edge of the island.

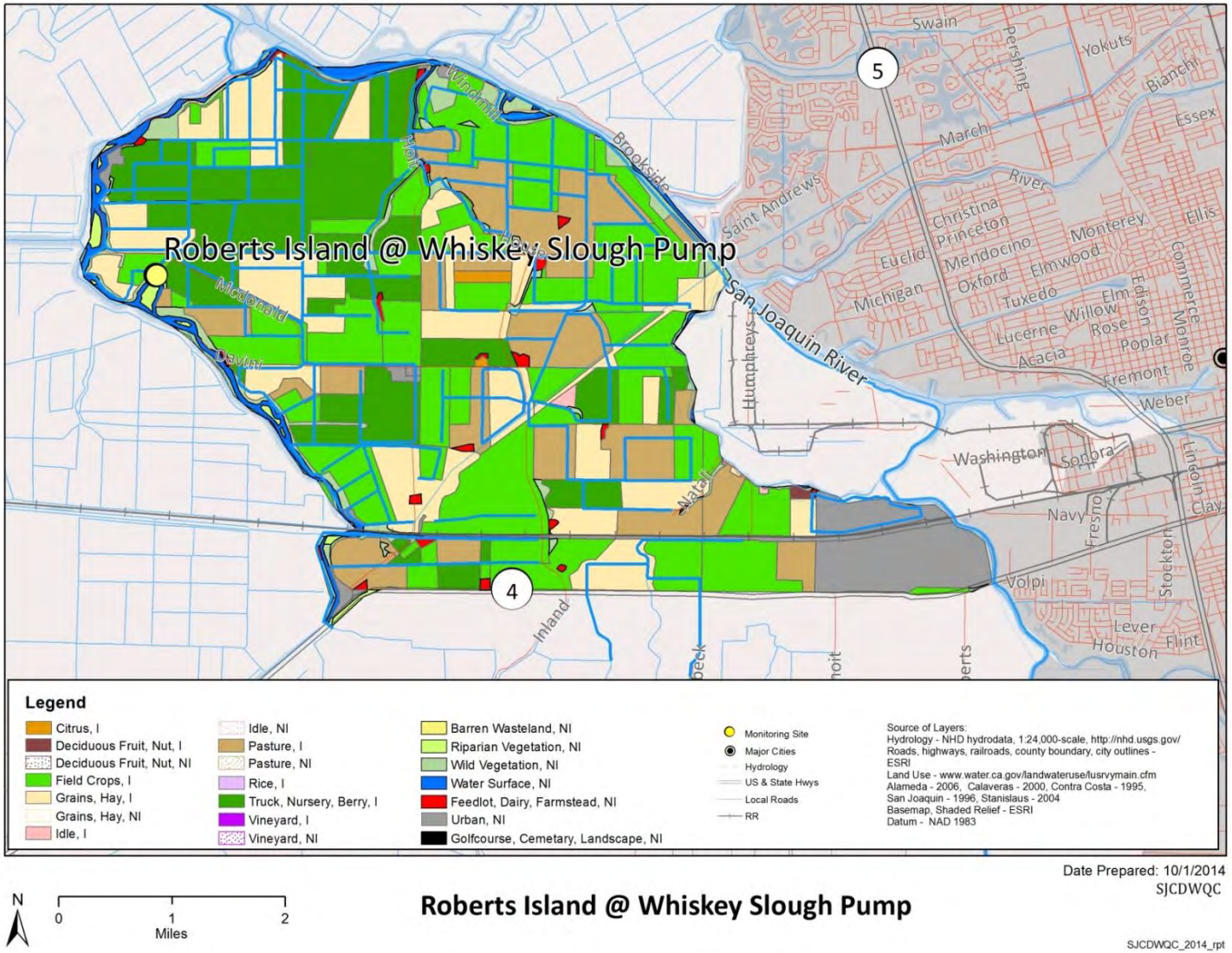
Roberts Island Drain is not considered impaired according to California's 303(d) List of Impaired Waterbodies. However, the represented TMDL subareas are listed as impaired (export area, central, southern and western portions) for chlorpyrifos, DDT, diazinon, electrical conductivity, group A pesticides, invasive species, mercury and unknown water column toxicity (303(d) list (last updated in 2010). The potential sources of the constituents are agriculture (chlorpyrifos, DDT, diazinon, EC and group A pesticides), unknown source (invasive species and unknown water column toxicity) and resource extraction (mercury).

**Table XIV-2. Roberts Island site subwatershed sampling location coordinates.**

| Site Name | Station Code | Target Latitude | Target Longitude |
|---|---|---|---|
| Roberts Island @ Whiskey Slough Pump | 544RIAWSP | 37.96737 | -121.46434 |
| Roberts Island Drain @ Holt Rd [DS] | 544RIDAHT | 37.95560 | -121.42230 |
| Roberts Island Drain along House Rd [US] | 544RIDAHR | 37.97020 | -121.40740 |

[US] Upstream site
[DS] Downstream site

**Figure XIV-1. Roberts Island @ Whiskey Slough Pump site subwatershed land use map.**



## Subwatershed Monitoring History

Normal Monitoring was conducted at Roberts Island Drain @ Holt Rd and Roberts Island Drain along House Rd, from May 2006 through September 2008. Monitoring at Roberts Island Drain @ Holt Rd continued through 2011. On January 12, 2012 monitoring at Roberts Island Drain @ Holt Rd and Roberts Island Drain along House Rd was discontinued because the sites were not representative of the entire island. Roberts Island @ Whiskey Slough Pump replaced these two sites as the Core site in Zone 4 in 2012. Details are included in the 2013 MPUR Appendix I (Page 354). Table XIV-3 contains the number of events and constituents monitored at all three sites (organized by group). In addition to MPM, Core Monitoring occurred at Roberts Island @ Whiskey Slough Pump in 2013.

The Coalition initiated MPM for high priority constituents at Roberts Island @ Whiskey Slough Pump in 2012 and continued through September 2014 during months of past exceedances (Table XIV- 4). The last detections of chlorpyrifos or diuron were at Roberts Island Drain @ Holt Rd in 2011 and 2008, respectively; load information for those constituents can be found in the 2014 MPUR, Appendix I, Table XIV-7.

**Table XIV-3. Roberts Island sampling events and analyses per year.**

Only environmental samples are counted.

| Type | Analyte | 544RIDAHR | | | 544RIDAHT | | | | | | 544RIAWSP | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2006 | 2007 | 2008 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
| Sampling Events | Events Scheduled | 5 | 12 | 13 | 5 | 13 | 15 | 12 | 12 | 14 | 12 | 12 | 10 |
| | Dry Sites | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Events Sampled | 5 | 12 | 13 | 5 | 13 | 15 | 12 | 12 | 14 | 12 | 12 | 10 |
| | | | | | | | | | | | | | |
| Field and Physical Parameters | BOD | 1 | 4 | 0 | 1 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Color | 5 | 8 | 7 | 5 | 8 | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Dissolved Oxygen | 5 | 12 | 13 | 5 | 13 | 15 | 12 | 12 | 14 | 12 | 12 | 10 |
| | Dissolved Solids | 5 | 8 | 7 | 5 | 8 | 10 | 12 | 12 | 12 | 12 | 12 | 9 |
| | *E. coli* | 5 | 8 | 7 | 5 | 8 | 10 | 12 | 12 | 12 | 12 | 12 | 9 |
| | Grain size (sediment) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 2 | 2 |
| | Hardness as CaCO3 | 0 | 0 | 6 | 0 | 0 | 6 | 0 | 0 | 12 | 0 | 0 | 9 |
| | pH | 5 | 12 | 13 | 5 | 13 | 15 | 12 | 12 | 14 | 12 | 12 | 10 |
| | Specific Conductivity | 5 | 12 | 13 | 5 | 13 | 15 | 12 | 12 | 14 | 12 | 12 | 10 |
| | Suspended Solids | 0 | 0 | 0 | 0 | 0 | 3 | 12 | 12 | 12 | 12 | 12 | 9 |
| | Total Organic Carbon | 5 | 8 | 7 | 5 | 8 | 10 | 12 | 12 | 12 | 12 | 12 | 9 |
| | Total Organic Carbon (sediment) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 2 | 2 |
| | Turbidity | 5 | 8 | 7 | 5 | 8 | 10 | 12 | 12 | 12 | 12 | 12 | 9 |
| Nutrients | Ammonia as N | 0 | 0 | 6 | 0 | 0 | 9 | 12 | 12 | 12 | 12 | 12 | 9 |
| | Nitrate + Nitrite as N | 0 | 0 | 0 | 0 | 0 | 3 | 12 | 12 | 12 | 12 | 12 | 9 |
| | Nitrate as N | 0 | 1 | 6 | 0 | 1 | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Nitrite as N | 0 | 1 | 6 | 0 | 1 | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Nitrogen, Total Kjeldahl | 0 | 0 | 6 | 0 | 0 | 9 | 12 | 12 | 12 | 12 | 12 | 9 |
| | Orthophosphate as P | 0 | 1 | 6 | 0 | 1 | 9 | 12 | 12 | 12 | 12 | 12 | 9 |
| | Phosphate as P | 0 | 0 | 6 | 0 | 0 | 9 | 12 | 12 | 12 | 12 | 12 | 9 |
| Metals (Dissolved) | Cadmium | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 0 | 0 | 9 |
| | Copper | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 0 | 0 | 9 |
| | Lead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 0 | 0 | 9 |
| | Nickel | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 0 | 0 | 9 |
| | Zinc | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 0 | 0 | 9 |
| Metals (Total) | Arsenic | 0 | 0 | 6 | 0 | 0 | 6 | 0 | 0 | 12 | 0 | 0 | 9 |
| | Boron | 0 | 0 | 6 | 0 | 0 | 6 | 0 | 0 | 12 | 0 | 0 | 9 |

| Type | Analyte | 544RIDAHR | | | 544RIDAHT | | | | | | 544RIAWSP | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2006 | 2007 | 2008 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
| | Cadmium | 0 | 0 | 6 | 0 | 0 | 6 | 0 | 0 | 12 | 0 | 0 | 9 |
| | Copper | 0 | 0 | 6 | 0 | 0 | 6 | 0 | 0 | 12 | 0 | 0 | 9 |
| | Lead | 0 | 0 | 6 | 0 | 0 | 6 | 0 | 0 | 12 | 0 | 0 | 9 |
| | Molybdenum | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 0 | 0 | 9 |
| | Nickel | 0 | 0 | 6 | 0 | 0 | 6 | 0 | 0 | 12 | 0 | 0 | 9 |
| | Selenium | 0 | 0 | 6 | 0 | 0 | 6 | 0 | 0 | 12 | 0 | 0 | 9 |
| | Zinc | 0 | 0 | 6 | 0 | 0 | 6 | 0 | 0 | 12 | 0 | 0 | 9 |
| Carbamates | Aldicarb | 5 | 8 | 7 | 5 | 8 | 7 | 0 | 0 | 12 | 0 | 0 | 9 |
| | Carbaryl | 5 | 8 | 7 | 5 | 8 | 7 | 0 | 0 | 12 | 0 | 0 | 9 |
| | Carbofuran | 5 | 8 | 7 | 5 | 8 | 7 | 0 | 0 | 12 | 0 | 0 | 9 |
| | Diuron | 5 | 8 | 7 | 5 | 8 | 7 | 0 | 0 | 12 | 2 | 2 | 9 |
| | Linuron | 5 | 8 | 7 | 5 | 8 | 7 | 0 | 0 | 12 | 0 | 0 | 9 |
| | Methiocarb | 5 | 8 | 7 | 5 | 8 | 7 | 0 | 0 | 12 | 0 | 0 | 9 |
| | Methomyl | 5 | 8 | 7 | 5 | 8 | 7 | 0 | 0 | 12 | 0 | 0 | 9 |
| | Oxamyl | 5 | 8 | 7 | 5 | 8 | 7 | 0 | 0 | 12 | 0 | 0 | 9 |
| Group A Pesticides | Aldrin | 0 | 0 | 0 | 0 | 0 | 3 | 12 | 0 | 0 | 0 | 0 | 0 |
| | Chlordane | 0 | 0 | 0 | 0 | 0 | 3 | 12 | 0 | 0 | 0 | 0 | 0 |
| | Endosulfan I | 0 | 0 | 0 | 0 | 0 | 3 | 12 | 0 | 0 | 0 | 0 | 0 |
| | Endosulfan II | 0 | 0 | 0 | 0 | 0 | 3 | 12 | 0 | 0 | 0 | 0 | 0 |
| | HCH, alpha | 0 | 0 | 0 | 0 | 0 | 3 | 12 | 0 | 0 | 0 | 0 | 0 |
| | HCH, beta | 0 | 0 | 0 | 0 | 0 | 3 | 12 | 0 | 0 | 0 | 0 | 0 |
| | HCH, delta | 0 | 0 | 0 | 0 | 0 | 3 | 12 | 0 | 0 | 0 | 0 | 0 |
| | HCH, gamma | 0 | 0 | 0 | 0 | 0 | 3 | 12 | 0 | 0 | 0 | 0 | 0 |
| | Heptachlor | 0 | 0 | 0 | 0 | 0 | 3 | 12 | 0 | 0 | 0 | 0 | 0 |
| | Heptachlor epoxide | 0 | 0 | 0 | 0 | 0 | 3 | 12 | 0 | 0 | 0 | 0 | 0 |
| | Toxaphene | 0 | 0 | 0 | 0 | 0 | 3 | 12 | 0 | 0 | 0 | 0 | 0 |
| Herbicides | Atrazine | 5 | 8 | 7 | 5 | 8 | 7 | 0 | 0 | 12 | 0 | 0 | 9 |
| | Cyanazine | 5 | 8 | 7 | 5 | 8 | 7 | 0 | 0 | 12 | 0 | 0 | 9 |
| | Glyphosate | 5 | 8 | 7 | 5 | 8 | 7 | 0 | 0 | 12 | 0 | 0 | 9 |
| | Paraquat | 5 | 8 | 7 | 5 | 8 | 7 | 0 | 0 | 12 | 0 | 0 | 9 |
| | Simazine | 5 | 8 | 7 | 5 | 8 | 7 | 0 | 0 | 12 | 0 | 0 | 9 |
| | Trifluralin | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 0 | 0 | 9 |
| Organochlorines | DDD(p,p') | 5 | 8 | 7 | 5 | 8 | 10 | 12 | 0 | 12 | 0 | 0 | 9 |
| | DDE(p,p') | 5 | 8 | 7 | 5 | 8 | 10 | 12 | 0 | 12 | 0 | 0 | 9 |
| | DDT(p,p') | 5 | 8 | 7 | 5 | 8 | 10 | 12 | 0 | 12 | 0 | 0 | 9 |
| | Dicofol | 5 | 8 | 7 | 5 | 8 | 10 | 12 | 0 | 12 | 0 | 0 | 9 |
| | Dieldrin | 5 | 8 | 7 | 5 | 8 | 10 | 12 | 0 | 12 | 0 | 0 | 9 |
| | Endrin | 5 | 8 | 7 | 5 | 8 | 10 | 12 | 0 | 12 | 0 | 0 | 9 |
| | Methoxychlor | 5 | 8 | 7 | 5 | 8 | 10 | 12 | 0 | 12 | 0 | 0 | 9 |
| Organophosphates | Azinphos methyl | 5 | 8 | 7 | 5 | 8 | 10 | 4 | 12 | 12 | 0 | 0 | 9 |
| | Chlorpyrifos | 5 | 8 | 7 | 5 | 8 | 10 | 4 | 12 | 12 | 12 | 12 | 9 |
| | Demeton-s | 0 | 0 | 0 | 0 | 0 | 3 | 4 | 12 | 12 | 0 | 0 | 9 |
| | Diazinon | 5 | 8 | 7 | 5 | 8 | 10 | 4 | 12 | 12 | 12 | 12 | 9 |
| | Dichlorvos | 0 | 0 | 0 | 0 | 0 | 3 | 4 | 12 | 12 | 0 | 0 | 9 |
| | Dimethoate | 5 | 8 | 7 | 5 | 8 | 10 | 4 | 12 | 12 | 0 | 0 | 9 |
| | Disulfoton | 5 | 8 | 7 | 5 | 8 | 10 | 4 | 12 | 12 | 0 | 0 | 9 |
| | Malathion | 5 | 8 | 7 | 5 | 8 | 10 | 4 | 12 | 12 | 0 | 0 | 9 |
| | Methamidophos | 5 | 8 | 7 | 5 | 8 | 10 | 4 | 0 | 12 | 0 | 0 | 9 |
| | Methidathion | 5 | 8 | 7 | 5 | 8 | 10 | 4 | 12 | 12 | 0 | 0 | 9 |
| | Molinate | 5 | 8 | 7 | 5 | 8 | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Parathion, Methyl | 5 | 8 | 7 | 5 | 8 | 10 | 4 | 12 | 12 | 0 | 0 | 9 |
| | Phorate | 5 | 8 | 7 | 5 | 8 | 10 | 4 | 12 | 12 | 0 | 0 | 9 |
| | Phosmet | 5 | 8 | 7 | 5 | 8 | 10 | 4 | 12 | 12 | 0 | 0 | 9 |
| | Thiobencarb | 5 | 8 | 7 | 5 | 8 | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pyrethroids | Bifenthrin | 5 | 8 | 7 | 5 | 8 | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cyfluthrin, total | 5 | 8 | 7 | 5 | 8 | 7 | 0 | 0 | 0 | 0 | 0 | 0 |

| Type | Analyte | 544RIDAHR | | | 544RIDAHT | | | | | | 544RIAWSP | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2006 | 2007 | 2008 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
| | Cyhalothrin, lambda, total | 5 | 9 | 7 | 5 | 10 | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cypermethrin, total | 5 | 8 | 7 | 5 | 10 | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Esfenvalerate/Fenvalerate, total | 5 | 8 | 7 | 5 | 8 | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Permethrin, total | 5 | 8 | 7 | 5 | 8 | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sediment Pesticides | Bifenthrin | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Chlorpyrifos | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cyfluthrin | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cyhalothrin, lambda | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cypermethrin | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Deltamethrin: Tralomethrin | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Esfenvalerate/ Fenvalerate | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Fenpropathrin | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Permethrin | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Toxicity | *Ceriodaphnia dubia* | 5 | 8 | 8 | 5 | 9 | 7 | 9 | 12 | 12 | 2 | 2 | 9 |
| | *Pimephales promelas* | 5 | 8 | 7 | 5 | 8 | 10 | 3 | 0 | 12 | 0 | 0 | 9 |
| | *Selenastrum capricornutum* | 5 | 8 | 9 | 5 | 9 | 10 | 0 | 0 | 12 | 4 | 4 | 9 |
| | *Hyalella azteca* | 1 | 3 | 3 | 2 | 2 | 2 | 0 | 0 | 2 | 2 | 2 | 2 |

**Table XIV-4. Roberts Island @ Whiskey Slough Pump Management Plan Monitoring schedule (2012-September 2014).**

| Site Name | Sample Date | Monitoring Type | Chlorpyrifos | Diuron | *C. dubia* | *S. capricornutum* | *H. azteca* |
|---|---|---|---|---|---|---|---|
| Roberts Island @ Whiskey Slough Pump | 01/17/12 | MPM | X | X | | X | |
| Roberts Island @ Whiskey Slough Pump | 02/14/12 | MPM | X | | | | |
| Roberts Island @ Whiskey Slough Pump | 03/15/12 | MPM | | | X | | X |
| Roberts Island @ Whiskey Slough Pump | 04/12/12 | MPM | | | | X | |
| Roberts Island @ Whiskey Slough Pump | 05/16/12 | MPM | | | | X | |
| Roberts Island @ Whiskey Slough Pump | 07/17/12 | MPM | | X | X | X | |
| Roberts Island @ Whiskey Slough Pump | 08/21/12 | MPM | X | | | | |
| Roberts Island @ Whiskey Slough Pump | 09/18/12 | MPM | X | | | | X |
| Roberts Island @ Whiskey Slough Pump | 01/15/13 | MPM | X | X | | X | |
| Roberts Island @ Whiskey Slough Pump | 02/21/13 | MPM | X | | | | |
| Roberts Island @ Whiskey Slough Pump | 03/19/13 | MPM | | | X | | X |
| Roberts Island @ Whiskey Slough Pump | 04/02/13 | MPM | | | | X | |
| Roberts Island @ Whiskey Slough Pump | 05/21/13 | MPM | | | | X | |
| Roberts Island @ Whiskey Slough Pump | 07/16/13 | MPM | | X | X | X | |
| Roberts Island @ Whiskey Slough Pump | 08/20/13 | MPM | X | | | | |
| Roberts Island @ Whiskey Slough Pump | 09/17/13 | MPM | X | | | | X |
| Roberts Island @ Whiskey Slough Pump | 01/28/14 | MPM | X | X | | X | |
| Roberts Island @ Whiskey Slough Pump | 02/11/14 | MPM | X | | | | |
| Roberts Island @ Whiskey Slough Pump | 03/03/14 | MPM | | | X | | X |
| Roberts Island @ Whiskey Slough Pump | 04/15/14 | MPM | | | | X | |
| Roberts Island @ Whiskey Slough Pump | 05/20/14 | MPM | | | | X | |
| Roberts Island @ Whiskey Slough Pump | 07/15/14 | MPM | | X | X | X | |
| Roberts Island @ Whiskey Slough Pump | 08/19/14 | MPM | X | | | | |
| Roberts Island @ Whiskey Slough Pump | 09/06/14 | MPM | X | | | | X |

## Monitoring Results

From January through September 2014, the Coalition conducted MPM for chlorpyrifos, diuron, water column toxicity to *C. dubia* and *S. capricornutum,* and sediment toxicity to *H. azteca*. Assessment Monitoring also occurred in the site subwatershed from January through September 2014. Toxicity to *C. dubia* occurred in July, resulting in 0% survival compared to the control. Toxicity to *S. capricornutum* occurred in February and April, resulting in 67% and 50% survival compared to the control, respectively. The Priority E constituents, DO, SC, and TDS were monitored during all events through September 2014. Exceedances of the WQTLs for DO and TDS occurred in 9 out of 10 sampling events through September 2014. Exceedances of the WQTL for SC occurred during every monitoring event through September 2014.

Table XIV-5 is a tally of exceedances of WQTLs from 2006 through September 2014 for management plan constituents in the site subwatershed (organized alphabetically by constituent priority). Table XIV-6 contains detections and WQTL exceedance results of all sampling events since the constituent became part of the site subwatershed management plan. Table XIV-7 contains the instantaneous loads for chlorpyrifos and diuron since monitoring began in the site subwatershed. A record of all exceedances in the Roberts Island site subwatershed since monitoring began is provided in Appendix II, Table XIV-A.

**Table XIV-5. Roberts Island management plan constituent exceedance tally (2006- September 2014).**
Exceedances that occurred during resampling for field parameters and toxicity are included in the tally. Exceedances are organized alphabetically by constituent priority. A complete list of exceedances can be found in Appendix II, Table XIV-A.

| Monitoring Year | Management Plan Constituents | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Chlorpyrifos, >0.015 µg/L | Diuron, >2 µg/L | *C. dubia*, (%Control) | *H. azteca*, (%Control) | *S. capricornutum*, (%Control) | DDE (p,p'), >0.00059 µg/L | Dissolved Oxygen, <7 mg/L | *E. coli*, >235 MPN/100 ml | pH, <6.5 and >8.5 units | Specific Conductivity, >700 µS/cm | Total Dissolved Solids, >450 mg/L |
| 2006 | 1 | 0 | 0 | 2 | 0 | 1 | 5 | 4 | 3 | 3 | 4 |
| 2007 | 0 | 1 | 1 | 2 | 1 | 2 | 12 | 3 | 0 | 14 | 9 |
| 2008 | 2 | 1 | 2 | 2 | 8 | 1 | 13 | 4 | 0 | 16 | 9 |
| 2009 | 0 | NA | 0 | NA | NA | 0 | 4 | 1 | 0 | 10 | 10 |
| 2010 | 0 | NA | 1 | NA | NA | NA | 4 | 3 | 0 | 12 | 11 |
| 2011 | 2 | 0 | 0 | 0 | 0 | 0 | 4 | 3 | 1 | 10 | 8 |
| 2012 | 0 | 0 | 0 | 0 | 0 | NA | 9 | 4 | 0 | 12 | 11 |
| 2013 | 0 | 0 | 0 | 0 | 0 | NA | 5 | 0 | 0 | 12 | 12 |
| 2014 WY* | 0 | 0 | 1 | 0 | 2 | 0 | 9 | 1 | 0 | 10 | 9 |
| **Overall Tally** | **5** | **2** | **5** | **6** | **11** | **4** | **65** | **23** | **4** | **99** | **79** |
| **Constituent Priority** | **A/B** | **C** | **D** | **D** | **D** | **E** | **E** | **E** | **E** | **E** | **E** |

NA – Not Applicable; monitoring did not occur for this constituent during the year.
*2014 includes January through September results only.

**Table XIV-6. Roberts Island site subwatershed monitoring results for priority A/B - D constituents since management plan initiation.**

Exceedance values are in bold. Resampling (RS) due to toxicity not included in table. MPM results after September 2014 not included in table (grey cells).

| | Month: | Jan | Feb | Mar | | Apr | May | Jun | Jul | Aug | Sep | Oct | | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **2009 NM (@ Holt Rd)[1]** | Date | 1/13/09 | 2/10/09 | 3/10/09 | | 4/14/09 | 5/12/09 | 6/9/09 | 7/14/09 | 8/11/09 | 9/15/09 | 10/6/09 | | 11/10/09 | 12/8/09 |
| | Chlorpyrifos (µg/L) | <0.003 | 0.0057 | <0.003 | | <0.003 | NA | NA | NA | NA | NA | NA | | NA | NA |
| **2010 NM (@ Holt Rd)[2]** | Date | 1/13/10 | 2/9/10 | 3/16/10 | | 4/13/10 | 5/11/10 | 6/8/10 | 7/13/10 | 8/10/10 | 9/7/10 | 10/12/10 | | 11/9/10 | 12/7/10 |
| | Chlorpyrifos (µg/L) | <0.003 | <0.003 | <0.003 | | <0.003 | <0.003 | <0.003 | <0.003 | <0.003 | 0.0074 | <0.003 | | <0.003 | <0.003 |
| **2011 NM (@ Holt Rd)** | Date | 1/11/11 | 2/8/11 | 3/8/11 | | 4/12/11 | 5/24/11 | 6/28/11 | 7/26/11 | 8/23/11 | 9/20/11 | 10/6/11 | 10/14/11 | 11/15/11 | 12/13/11 |
| | Chlorpyrifos (µg/L) | **0.016** | **0.016** | <0.003 | | <0.003 | <0.003 | <0.003 | <0.003 | <0.003 | <0.003 | <0.003 | NA | <0.003 | <0.003 |
| | Diuron (µg/L) | <0.2 | <0.2 | <0.2 | | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | NA | <0.2 | <0.2 |
| | *C. dubia* toxicity (% Control) | 100 | 100 | 100 | | 95 | 95 | 105 | 100 | 100 | 100 | 95 | NA | 95 | 80 |
| | *S. capricornutum* toxicity (% | 130 | 417 | 231 | | 135 | 221 | 197 | 1041 | 781 | 251 | 828 | NA | 421 | 131 |
| | *H. azteca* toxicity (% Control) | NA | NA | 100 | | NA | NA | NA | NA | NA | NA | NA | 105 | NA | NA |
| **2012 MPM (@ Whiskey Slough Pump)** | Date | 1/17/12 | 2/14/12 | 3/15/12 | | 4/12/12 | 5/16/12 | 6/19/12 | 7/17/12 | 8/21/12 | 9/18/12 | 10/16/12 | | 11/6/12 | 12/3/12 |
| | Chlorpyrifos (µg/L) | <0.003 | <0.003 | NA | | NA | NA | NA | NA | <0.003 | <0.003 | NA | | NA | NA |
| | Diuron (µg/L) | <0.2 | NA | NA | | NA | NA | NA | <0.2 | NA | NA | NA | | NA | NA |
| | *C. dubia* toxicity (% Control) | NA | NA | 105 | | NA | NA | NA | 100 | NA | NA | NA | | NA | NA |
| | *S. capricornutum* toxicity (% | 938 | NA | NA | | 139 | 228 | NA | 174 | NA | NA | NA | | NA | NA |
| | *H. azteca* toxicity (% Control) | NA | NA | 109 | | NA | NA | NA | NA | NA | 102 | NA | | NA | NA |
| **2013 MPM, NM (@ Whiskey Slough Pump)[3]** | Date | 1/15/13 | 2/21/13 | 3/19/13 | | 4/2/2013 | 5/21/13 | NA | 7/16/13 | 8/20/13 | 9/17/13 | 10/8/13 | | 11/19/13 | 12/17/13 |
| | Chlorpyrifos (µg/L) | <0.003 | <0.003 | NA | | NA | NA | NA | NA | <0.003 | <0.003 | <0.003 | | <0.003 | <0.003 |
| | Diuron (µg/L) | <0.2 | NA | NA | | NA | NA | NA | <0.2 | NA | NA | NA | | NA | NA |
| | *C. dubia* toxicity (% Control) | NA | NA | 100 | | NA | NA | NA | 100 | NA | NA | NA | | NA | NA |
| | *S. capricornutum* toxicity (% | 200 | NA | NA | | 247 | 565 | NA | 614 | NA | NA | NA | | NA | NA |
| | *H. azteca* toxicity (% Control) | NA | NA | 101 | | NA | NA | NA | NA | NA | 100 | NA | | NA | NA |
| **2014 MPM, NM (@ Whiskey Slough Pump)** | Date | 1/28/14 | 2/11/14 | 3/3/14 | 3/5/14 | 4/15/14 | 5/20/14 | 6/17/14 | 7/15/14 | 8/19/14 | 9/16/14 | | | | |
| | Chlorpyrifos (µg/L) | <0.003* | <0.003* | <0.003 | NA | <0.003 | <0.003 | <0.003 | <0.003 | <0.003 | <0.003 | | | | |
| | Diuron (µg/L) | <0.2* | <0.2 | <0.2 | NA | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | | | | |
| | *C. dubia* toxicity (% Control) | 100 | 100 | 100* | NA | 100 | 100 | 100 | **0** | 100 | 100 | | | | |
| | *S. capricornutum* toxicity (% | 533* | **67** | 108 | NA | **50*** | 111* | 152 | 183 | 270 | 103 | | | | |
| | *H. azteca* toxicity (% Control) | NA | NA | NA | 100* | NA | NA | NA | NA | NA | 98 | | | | |

[1]Roberts Island Drain @ Holt Rd was monitored for all constituents including chlorpyrifos during NM in 2009 until the April 8, 2009 MRPP monitoring modification. Monitoring according to the April 2009 modification began in May 2009.

[2]During 2010, Roberts Island Drain @ Holt Rd was a TMDL compliance location for the Central Delta Subarea portion of the Delta Waterways and samples were collected for chlorpyrifos and diazinon.

[3] During 2013, Core Monitoring occurred at Roberts Island @Whiskey Slough Pump and samples were collected monthly for chlorpyrifos and diazinon.

MPM – Management Plan Monitoring.

NA – Not Applicable. No monitoring occurred on this date for this constituent.

NM – Normal Monitoring.

## Source Identification and Outreach

The Coalition evaluated PUR data and considered past monitoring results at both Roberts Island Drain @ Holt Rd and Roberts Island Drain along House Rd to determine sources of constituents listed in the Roberts Island @ Whiskey Slough Pump management plan. Sourcing analyses for past exceedances of management plan constituents are evaluated in past years' site subwatershed appendices. Monitoring resulted in water column toxicity to *C. dubia* in July, and toxicity to *S. capricornutum* in February and April.

In July 2014, toxicity to *C. dubia* at Roberts Island Drain @ Holt Rd resulted in 0% survival compared to the control; TIE results indicated non-polar organic chemicals were the cause of toxicity. This toxicity coincided with an exceedance level detection of dichlorvos (organophosphate). A phase III TIE was performed and indicated that the dichlorvos concentration could account for most of the toxicity.

Toxicity to *S. capricornutum* occurred in February and April of 2014. February toxicity to *S. capricornutum* resulted in 67% growth compared to control, while April toxicity resulted in 50% growth. No TIE was conducted for either event, and therefore the cause of toxicity cannot be sourced. No exceedances of the WQTLs coincided with *S. capricornutum* toxicity in February or April. Irrigation tailwater and stormwater runoff could lead to non-polar organics and metals contamination in waterways.

Exceedances of priority E constituents such as DO, *E. coli*, SC, and TDS are difficult to source. The Coalition is not focusing on sources of priority E constituents at this time; the Coalition believes addressing other water quality issues will also address priority E constituents.

Focused outreach to document current management practices and track implementation of new management practices began in 2013 and will be complete in 2015. The Coalition contacted seven targeted growers farming 1,618 irrigated acres in the site subwatershed (2013 MPUR, Page 43). Existing management practices were documented and new management practices were implemented. The most common management practices implemented include reducing the use of the pesticides causing exceedances and reducing runoff water volume. The Coalition believes the implementation of certain management practices and increased grower awareness will continue to improve water quality within the site subwatershed.

## Evaluation

The Coalition conducted MPM for chlorpyrifos, diuron, water column toxicity to *C. dubia* and *S. capricornutum,* and sediment toxicity to *H. azteca* from 2012 through September 2014 and results indicate improvements in water quality. The Coalition's strategy is to encourage growers to reduce the offsite movement of agricultural constituents and reduce or eliminate water quality impairments. The PUR data indicates that applications of both chlorpyrifos and diuron are in decline in recent years within the site subwatershed. Constituents including chlorpyrifos, diuron, water column toxicity to *C. dubia*,

and pH were petitioned for removal from the active management plan. The removal status is currently pending and will be addressed upon further evaluation by the Regional Board.

## Next Steps

The Coalition will conclude its final year of focused outreach for the Roberts Island @ Whiskey Slough Pump site subwatershed in 2015 and will assess follow-up surveys with targeted growers and implemented management practices. In 2015, the Coalition will conduct monitoring at Roberts Island @ Whiskey Slough Pump based on the monitoring strategy at a Core site, as described in the 2014 MPU. Additionally, MPM is scheduled to occur for chlorpyrifos, diuron, water column toxicity to *C. dubia* and *S. capricornutum,* and sediment toxicity to *H. azteca*. Field parameters such as DO, pH, and SC will be measured during every monitoring event.

# XV. WALTHALL SLOUGH @ WOODWARD AVE

## Overview

Walthall Slough @ Woodward Ave is one of the Coalition's fifth priority site subwatersheds. The Coalition completed the second year of its focused management plan strategy in the site subwatershed. Water quality concerns were discussed and management practices were documented. Growers in the site subwatershed were informed of water quality impairments and encouraged to prevent offsite movement of agricultural constituents. The high priority constituents in the Walthall Slough @ Woodward Ave site subwatershed management plan are chlorpyrifos, nitrate/nitrite, and sediment toxicity to *H. azteca* (Table XV-1).

From January through September 2014, MPM for chlorpyrifos, HCH-delta, and sediment toxicity to *H. azteca* occurred during months of past exceedances and no exceedances or toxicity occurred. Core Monitoring also occurred on a monthly basis at Walthall Slough @ Woodward Ave. Additionally, this site is a TMDL compliance monitoring location for the Sacramento-San Joaquin Delta TMDL monitoring program. Monitoring for TMDL constituents of chlorpyrifos and diazinon occurred during February storm sampling and from May through August 2014. Monitoring from January through September 2014 resulted in exceedances of the WQTLs for DO (9), *E. coli* (1), SC (3), and TDS (2).

In 2015, the Coalition will conduct monitoring at Walthall Slough @ Woodward Ave based on the monitoring strategy at a Core site, as described in the 2014 MPU. In addition, MPM for chlorpyrifos and sediment toxicity to *H. azteca* will continue at the site during the 2015 WY.

**Table XV-1. Walthall Slough @ Woodward Ave management plan constituents.**
Management plan initiation year refers to when the site and constituent are addressed in the SJCDWQC MPURs and in the Management Plan Progress Report sections of the Annual Reports.

| PRIORITY | CONSTITUENT | MANAGEMENT PLAN INITIATION YEAR | MANAGEMENT PLAN REMOVAL YEAR |
|---|---|---|---|
| A/B | Chlorpyrifos | 2012 | Active |
| C | Nitrate + Nitrite as N | 2012 | Active |
| D | *H. azteca* sediment toxicity | 2011 | Active |
| E | Dissolved Oxygen | 2010 | Active |
| E | *E. coli* | 2010 | Active |
| E | HCH-delta | 2010 | Active |
| E | Specific Conductivity | 2010 | Active |
| E | Total Dissolved Solids | 2010 | Active |

## Description of Site Subwatershed

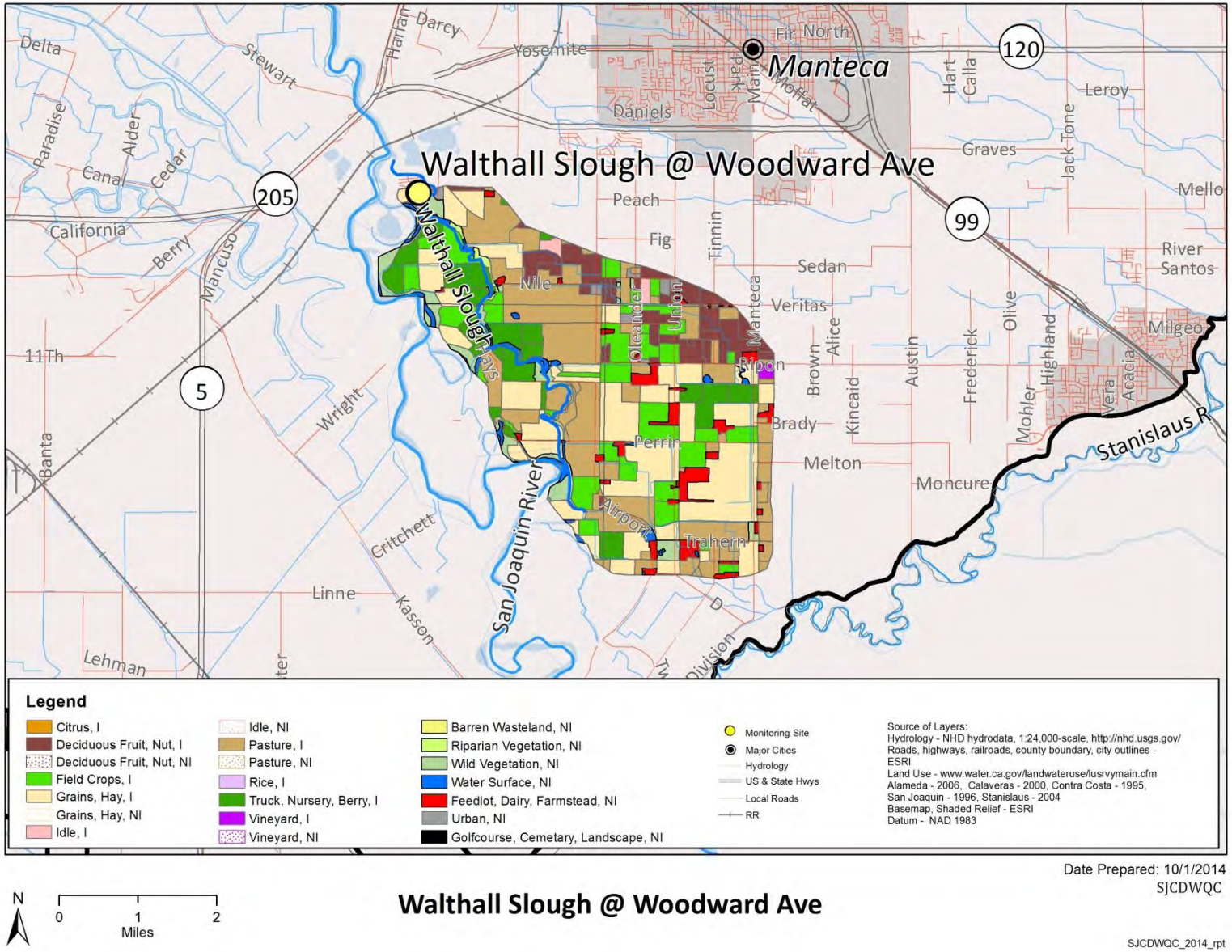
Walthall Slough @ Woodward Ave is the Core Monitoring location within Zone 5 under the 2008 MRPP. The site subwatershed consists of 8,426 irrigated acres which include pasture, field crops, truck/nursery/berry crops, fruits, nuts, grains/hay, and dairy (Figure XV-1). This site is located just upstream of a residential area at the confluence of Walthall Slough and the San Joaquin River and drains land to the south and to the east (Table XV-2).

Walthall Slough is not listed as a 303 (d) Impaired Waterbody in the state of California. However, the represented TMDL subareas in the eastern portion of the Delta Waterways are listed as impaired for chlorpyrifos, DDT, diazinon, group A pesticides, invasive species, mercury, and unknown water column toxicity.

**Table XV-2. Walthall Slough @ Woodward Ave site subwatershed sampling location coordinates.**

| Site Name | Station Code | Target Latitude | Target Longitude |
|---|---|---|---|
| Walthall Slough @ Woodward Ave | 544WSAWAV | 37.77046 | -121.29227 |

**Figure XV-1. Walthall Slough @ Woodward Ave site subwatershed land use map.**



## Subwatershed Monitoring History

Normal Monitoring began at Walthall Slough @ Woodward Ave in 2009 and continued through September 2014. Assessment Monitoring occurred during the 2009 and 2010 WYs; Core Monitoring began in October 2011 with Assessment Monitoring occurring every third year; the last Assessment Monitoring year was 2013. Table XV-3 contains the number of events monitored per year and the constituents (by group) from 2009 through September 2014 (see 2013 MPUR Appendix I, Table XV-3 for analytes sampled prior to 2008).

The Coalition initiated MPM in 2012 through September 2014 for chlorpyrifos, HCH-delta, and sediment toxicity to *H. azteca* (Table XV-4). The last detection of chlorpyrifos occurred in 2011; load information for those constituents can be found in the 2014 MPUR, Appendix I, Table XV-7.

**Table XV-3. Walthall Slough @ Woodward Ave sampling events and analyses per year.**
Only environmental samples are counted.

| TYPE | ANALYTE | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|
| Sampling Events | Events Scheduled | 13 | 12 | 12 | 12 | 13 | 10 |
| | Dry Sites | 0 | 0 | 0 | 0 | 0 | 0 |
| | Events Sampled | 13 | 12 | 12 | 12 | 13 | 10 |
| | | | | | | | |
| Field and Physical Parameters | BOD | 0 | 0 | 0 | 0 | 0 | 0 |
| | Color | 0 | 0 | 0 | 0 | 0 | 0 |
| | Dissolved Oxygen | 13 | 12 | 12 | 12 | 13 | 10 |
| | Dissolved Solids | 12 | 12 | 12 | 12 | 12 | 9 |
| | *E. coli* | 12 | 12 | 12 | 12 | 12 | 9 |
| | Grain size (sediment) | 2 | 2 | 0 | 2 | 2 | 2 |
| | Hardness as CaCO3 | 12 | 12 | 0 | 0 | 12 | 9 |
| | pH | 13 | 12 | 12 | 12 | 13 | 10 |
| | Specific Conductivity | 13 | 12 | 12 | 12 | 13 | 10 |
| | Suspended Solids | 12 | 12 | 12 | 12 | 12 | 9 |
| | Total Organic Carbon | 12 | 12 | 12 | 12 | 12 | 9 |
| | Total Organic Carbon (sediment) | 2 | 2 | 0 | 2 | 2 | 2 |
| | Turbidity | 12 | 12 | 12 | 12 | 12 | 9 |
| Nutrients | Ammonia as N | 12 | 12 | 12 | 12 | 12 | 9 |
| | Nitrate + Nitrite as N | 12 | 12 | 12 | 12 | 12 | 9 |
| | Nitrate as N | 0 | 0 | 0 | 0 | 0 | 0 |
| | Nitrite as N | 0 | 0 | 0 | 0 | 0 | 0 |
| | Nitrogen, Total Kjeldahl | 12 | 12 | 12 | 12 | 12 | 9 |
| | Orthophosphate as P | 12 | 12 | 12 | 12 | 12 | 9 |
| | Phosphate as P | 12 | 12 | 12 | 12 | 12 | 9 |
| Metals (Dissolved) | Cadmium | 12 | 12 | 0 | 0 | 12 | 0 |
| | Copper | 12 | 12 | 0 | 0 | 12 | 0 |
| | Lead | 12 | 12 | 0 | 0 | 12 | 0 |
| | Nickel | 12 | 12 | 0 | 0 | 12 | 0 |
| | Zinc | 12 | 12 | 0 | 0 | 12 | 0 |
| Metals (Total) | Arsenic | 12 | 12 | 0 | 0 | 12 | 0 |
| | Boron | 12 | 12 | 0 | 0 | 12 | 0 |
| | Cadmium | 12 | 12 | 0 | 0 | 12 | 0 |
| | Copper | 12 | 12 | 0 | 0 | 12 | 0 |
| | Lead | 12 | 12 | 0 | 0 | 12 | 0 |
| | Molybdenum | 12 | 12 | 0 | 0 | 12 | 0 |
| | Nickel | 12 | 12 | 0 | 0 | 12 | 0 |
| | Selenium | 12 | 12 | 0 | 0 | 12 | 0 |
| | Zinc | 12 | 12 | 0 | 0 | 12 | 0 |

| Type | Analyte | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|
| Carbamates | Aldicarb | 12 | 12 | 0 | 0 | 12 | 0 |
| | Carbaryl | 12 | 12 | 0 | 0 | 12 | 0 |
| | Carbofuran | 12 | 12 | 0 | 0 | 12 | 0 |
| | Diuron | 12 | 12 | 0 | 0 | 12 | 0 |
| | Linuron | 12 | 12 | 0 | 0 | 12 | 0 |
| | Methiocarb | 12 | 12 | 0 | 0 | 12 | 0 |
| | Methomyl | 12 | 12 | 0 | 0 | 12 | 0 |
| | Oxamyl | 12 | 12 | 0 | 0 | 12 | 0 |
| Group A Pesticides | Aldrin | 12 | 12 | 0 | 0 | 0 | 0 |
| | Chlordane | 12 | 12 | 0 | 0 | 0 | 0 |
| | Endosulfan I | 12 | 12 | 0 | 0 | 0 | 0 |
| | Endosulfan II | 12 | 12 | 0 | 0 | 0 | 0 |
| | HCH, alpha | 12 | 12 | 0 | 0 | 3 | 1 |
| | HCH, beta | 12 | 12 | 0 | 0 | 3 | 1 |
| | HCH, delta | 12 | 12 | 0 | 0 | 3 | 1 |
| | HCH, gamma | 12 | 12 | 0 | 0 | 3 | 1 |
| | Heptachlor | 12 | 12 | 0 | 0 | 0 | 0 |
| | Heptachlor epoxide | 12 | 12 | 0 | 0 | 0 | 0 |
| | Toxaphene | 12 | 12 | 0 | 0 | 0 | 0 |
| Herbicides | Atrazine | 12 | 12 | 0 | 0 | 12 | 0 |
| | Cyanazine | 12 | 12 | 0 | 0 | 12 | 0 |
| | Glyphosate | 12 | 12 | 0 | 0 | 12 | 0 |
| | Paraquat | 12 | 12 | 0 | 0 | 12 | 0 |
| | Simazine | 12 | 12 | 0 | 0 | 12 | 0 |
| | Trifluralin | 12 | 12 | 0 | 0 | 12 | 0 |
| Organochlorines | DDD(p,p') | 12 | 12 | 0 | 0 | 12 | 0 |
| | DDE(p,p') | 12 | 12 | 0 | 0 | 12 | 0 |
| | DDT(p,p') | 12 | 12 | 0 | 0 | 12 | 0 |
| | Dicofol | 12 | 12 | 0 | 0 | 12 | 0 |
| | Dieldrin | 12 | 12 | 0 | 0 | 12 | 0 |
| | Endrin | 12 | 12 | 0 | 0 | 12 | 0 |
| | Methoxychlor | 12 | 12 | 0 | 0 | 12 | 0 |
| Organophosphates | Azinphos methyl | 12 | 12 | 0 | 0 | 12 | 0 |
| | Chlorpyrifos | 12 | 12 | 12 | 12 | 12 | 6 |
| | Demeton-s | 12 | 12 | 0 | 0 | 12 | 0 |
| | Diazinon | 12 | 12 | 12 | 12 | 12 | 5 |
| | Dichlorvos | 12 | 12 | 0 | 0 | 12 | 0 |
| | Dimethoate | 12 | 12 | 0 | 0 | 12 | 0 |
| | Disulfoton | 12 | 12 | 0 | 0 | 12 | 0 |
| | Malathion | 12 | 12 | 0 | 0 | 12 | 0 |
| | Methamidophos | 12 | 12 | 0 | 0 | 12 | 0 |
| | Methidathion | 12 | 12 | 0 | 0 | 12 | 0 |
| | Molinate | 0 | 0 | 0 | 0 | 0 | 0 |
| | Parathion, Methyl | 12 | 12 | 0 | 0 | 12 | 0 |
| | Phorate | 12 | 12 | 0 | 0 | 12 | 0 |
| | Phosmet | 12 | 12 | 0 | 0 | 12 | 0 |
| | Thiobencarb | 0 | 0 | 0 | 0 | 0 | 0 |
| Pyrethroids | Bifenthrin | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cyfluthrin, total | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cyhalothrin, lambda, total | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cypermethrin, total | 0 | 0 | 0 | 0 | 0 | 0 |
| | Esfenvalerate/Fenvalerate, total | 0 | 0 | 0 | 0 | 0 | 0 |
| | Permethrin, total | 0 | 0 | 0 | 0 | 0 | 0 |
| Sediment Pesticide | Bifenthrin | 0 | 1 | 0 | 0 | 0 | 0 |
| | Chlorpyrifos | 0 | 1 | 0 | 0 | 0 | 0 |
| | Cyfluthrin | 0 | 1 | 0 | 0 | 0 | 0 |

| Type | Analyte | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|
| | Cyhalothrin, lambda | 0 | 1 | 0 | 0 | 0 | 0 |
| | Cypermethrin | 0 | 1 | 0 | 0 | 0 | 0 |
| | Deltamethrin: Tralomethrin | 0 | 1 | 0 | 0 | 0 | 0 |
| | Esfenvalerate/ Fenvalerate | 0 | 1 | 0 | 0 | 0 | 0 |
| | Fenpropathrin | 0 | 1 | 0 | 0 | 0 | 0 |
| | Permethrin | 0 | 1 | 0 | 0 | 0 | 0 |
| Toxicity | *Ceriodaphnia dubia* | 0 | 12 | 0 | 0 | 12 | 0 |
| | *Pimephales promelas* | 0 | 12 | 0 | 0 | 12 | 0 |
| | *Selenastrum capricornutum* | 0 | 12 | 0 | 0 | 12 | 0 |
| | *Hyalella azteca* | 0 | 2 | 0 | 2 | 2 | 2 |

**Table XV-4. Walthall Slough @ Woodward Ave Management Plan Monitoring schedule (2012-September 2014).**

| Site Name | Sample Date | Monitoring Type | Chlorpyrifos | HCH | *H. azteca* |
|---|---|---|---|---|---|
| Walthall Slough @ Woodward Ave | 03/15/12 | MPM | | | X |
| Walthall Slough @ Woodward Ave | 09/18/12 | MPM | X | | X |
| Walthall Slough @ Woodward Ave | 10/16/12 | MPM | X | | |
| Walthall Slough @ Woodward Ave | 01/15/13 | MPM | | X | |
| Walthall Slough @ Woodward Ave | 03/19/13 | MPM | | | X |
| Walthall Slough @ Woodward Ave | 09/17/13 | MPM | X | | X |
| Walthall Slough @ Woodward Ave | 10/15/13 | MPM | X | | |
| Walthall Slough @ Woodward Ave | 11/19/13 | MPM | | X | |
| Walthall Slough @ Woodward Ave | 12/17/13 | MPM | | X | |
| Walthall Slough @ Woodward Ave | 01/28/14 | MPM | | X | |
| Walthall Slough @ Woodward Ave | 03/03/14 | MPM | | | X |
| Walthall Slough @ Woodward Ave | 09/16/14 | MPM | X | | X |

## Monitoring Results

From January through September 2014, MPM for chlorpyrifos, HCH-delta, and sediment toxicity to *H. azteca* occurred during months of past exceedances. No exceedances of the WQTL occurred for high priority constituents through September 2014. The Coalition does not conduct MPM for nitrate; however, nitrate was monitored monthly from January through September 2014 under Core Monitoring and resulted in no exceedances. In addition, exceedances of priority E constituents, including DO (9), *E. coli* (1), SC (3), and TDS (2), occurred during monitoring (Table XV-5).

Table XV-5 is a tally of exceedances of WQTLs from 2006 through September 2014 for management plan constituents in the site subwatershed (organized alphabetically by constituent priority). Table XV-6 contains detections and WQTL exceedance results of all sampling events since the constituent became part of the site subwatershed management plan. Table XV-7 contains the instantaneous loads for chlorpyrifos and nitrate since monitoring began in the site subwatershed. A record of all exceedances in the site subwatershed since monitoring began is provided in Appendix II, Table XV-A.

**Table XV-5. Walthall Slough @ Woodward Ave management plan constituent exceedance tally (2009-September 2014).**

Exceedances that occurred during resampling for field parameters and toxicity are included in the tally. Exceedances are organized alphabetically by constituent priority. A complete list of exceedances can be found in Appendix II, Table XV-A.

| Monitoring Year | Management Plan Constituents | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Chlorpyrifos, >0.015 µg/L | Nitrate + Nitrite as N, >10 mg/L | *H. azteca*, (%Control) | Dissolved Oxygen, <7 mg/L | *E. coli*, >235 MPN/100 mL | HCH, delta, >0.0039 µg/L | Specific Conductivity, >700 µS/cm | Total Dissolved Solids, >450 mg/L |
| 2009 | 0 | 0 | 1 | 11 | 2 | 3 | 3 | 3 |
| 2010 | 0 | 1 | 1 | 6 | 2 | 0 | 3 | 1 |
| 2011 | 2 | 2 | NA | 8 | 1 | NA | 4 | 3 |
| 2012 | 0 | 1 | 0 | 11 | 0 | NA | 3 | 4 |
| 2013 | 0 | 3 | 0 | 9 | 0 | 0 | 3 | 4 |
| 2014 WY* | 0 | 0 | 0 | 9 | 1 | 0 | 3 | 2 |
| **Overall Tally** | **2** | **7** | **2** | **54** | **6** | **3** | **20** | **19** |
| **Constituent Priority** | **A/B** | **C** | **D** | **E** | **E** | **E** | **E** | **E** |

NA – Not Applicable; monitoring did not occur for this constituent during the year.
*2014 includes January through September results only.

**Table XV-6. Walthall Slough @ Woodward Ave site subwatershed monitoring results for priority A/B - D constituents and HCH –delta since management plan initiation.**

Exceedance values are in bold. Resampling (RS) due to toxicity not included in table. MPM results after September 2014 not included in table (grey cells).

| | Month: | Jan | Feb | Mar | | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **2012 MPM[1] (@ Woodward Ave)** | Date | 1/17/12 | 2/14/12 | 3/15/12 | | 4/12/12 | 5/16/12 | 6/19/12 | 7/17/12 | 8/21/12 | 9/18/12 | 10/16/12 | 11/6/12 | 12/3/12 |
| | Chlorpyrifos µg/L | <0.003 | <0.003 | <0.003 | | <0.003 | <0.003 | <0.003 | <0.003 | <0.003 | <0.003 | <0.003 | <0.003 | <0.003 |
| | *H. azteca*, toxicity (% Control) | NA | NA | 109 | | NA | NA | NA | NA | NA | 107 | NA | NA | NA |
| **2013 NM & MPM (@ Woodward Ave)** | Date | 1/15/13 | 2/21/13 | 3/19/13 | | 4/2/13 | 5/21/13 | 6/18/13 | 7/16/13 | 8/20/13 | 9/17/13 | 10/15/13 | 11/19/13 | 12/17/13 |
| | Chlorpyrifos µg/L | <0.003 | <0.003 | <0.003 | | <0.003 | <0.003 | <0.003 | <0.003 | <0.003 | <0.003 | <0.003 | <0.003 | <0.003 |
| | *H. azteca*, toxicity (% Control) | NA | NA | 99 | | NA | NA | NA | NA | NA | 98 | NA | NA | NA |
| | HCH-delta µg/L | <0.005 | NA | NA | | NA | NA | NA | NA | NA | NA | NA | <0.005 | <0.005 |
| **2014 NM & MPM (@ Woodward Ave)** | Date | 1/28/14 | 2/11/14 | 3/3/14 | 3/5/14 | 4/15/14 | 5/20/14 | 6/17/14 | 7/15/14 | 8/19/14 | 9/16/14 | | | |
| | Chlorpyrifos µg/L | NA | NA | NA | NA | NA | NA | NA | NA | NA | <0.003 | | | |
| | *H. azteca*, toxicity (% Control) | NA | NA | NA | 100 | NA | NA | NA | NA | NA | 107 | | | |
| | HCH-delta µg/L | <0.005 | NA | NA | NA | NA | NA | NA | NA | NA | NA | | | |

[1]Walthall Slough @ Woodward Ave is a TMDL compliance location representative of the San Joaquin River (Stanislaus River to Delta Boundary) 303(d) listed portion of the Delta Waterways. Samples are collected monthly (during either Core or Assessment Monitoring) at the site for chlorpyrifos and diazinon TMDL monitoring; compliance monitoring began at the site in 2009.

MPM – Management Plan Monitoring.

NA – Not Applicable. No monitoring occurred on this date for this constituent.

**Table XV-7. Walthall Slough @ Woodward Ave site subwatershed instantaneous load calculations for nitrate + nitrite as N.**

If discharge was unable to be measured or the analyte was ND, the result is not included in the table. Load information for chlorpyrifos can be found in in the 2014 MPUR, Appendix I, Table XV-7.

| Site Name | Analyte Name | Sample date | Discharge, CFS | Concentration | Concentration Unit | Loading Rate[1] | Loading Rate Unit |
|---|---|---|---|---|---|---|---|
| Walthall Slough @ Woodward Ave | Nitrate + Nitrite as N | 01/13/09 | 2.42 | 6.7 | mg/L | 459 | mg/sec |
| Walthall Slough @ Woodward Ave | Nitrate + Nitrite as N | 02/10/09 | 0 | 0.70 | mg/L | 0 | mg/sec |
| Walthall Slough @ Woodward Ave | Nitrate + Nitrite as N | 03/10/09 | 0 | 0.02 | mg/L | 0 | mg/sec |
| Walthall Slough @ Woodward Ave | Nitrate + Nitrite as N | 04/14/09 | 35.37 | 0.28 | mg/L | 280 | mg/sec |
| Walthall Slough @ Woodward Ave* | Nitrate + Nitrite as N | 04/14/09 | 35.37 | 0.33 | mg/L | 331 | mg/sec |
| Walthall Slough @ Woodward Ave* | Nitrate + Nitrite as N | 05/12/09 | 15.87 | 0.24 | mg/L | 108 | mg/sec |
| Walthall Slough @ Woodward Ave | Nitrate + Nitrite as N | 05/12/09 | 15.87 | 0.25 | mg/L | 112 | mg/sec |
| Walthall Slough @ Woodward Ave | Nitrate + Nitrite as N | 06/09/09 | 2.11 | 0.16 | mg/L | 10 | mg/sec |
| Walthall Slough @ Woodward Ave* | Nitrate + Nitrite as N | 06/09/09 | 2.11 | 0.11 | mg/L | 7 | mg/sec |
| Walthall Slough @ Woodward Ave | Nitrate + Nitrite as N | 07/14/09 | 16.90 | 1.0 | mg/L | 479 | mg/sec |
| Walthall Slough @ Woodward Ave* | Nitrate + Nitrite as N | 07/14/09 | 16.90 | 0.89 | mg/L | 426 | mg/sec |
| Walthall Slough @ Woodward Ave | Nitrate + Nitrite as N | 08/11/09 | 17.23 | 0.26 | mg/L | 127 | mg/sec |
| Walthall Slough @ Woodward Ave* | Nitrate + Nitrite as N | 08/11/09 | 17.23 | 0.21 | mg/L | 102 | mg/sec |
| Walthall Slough @ Woodward Ave* | Nitrate + Nitrite as N | 09/15/09 | 20.09 | 2.1 | mg/L | 1195 | mg/sec |
| Walthall Slough @ Woodward Ave | Nitrate + Nitrite as N | 09/15/09 | 20.09 | 2.2 | mg/L | 1252 | mg/sec |
| Walthall Slough @ Woodward Ave* | Nitrate + Nitrite as N | 10/06/09 | 27.16 | 0.74 | mg/L | 569 | mg/sec |
| Walthall Slough @ Woodward Ave | Nitrate + Nitrite as N | 10/06/09 | 27.16 | 0.78 | mg/L | 600 | mg/sec |
| Walthall Slough @ Woodward Ave* | Nitrate + Nitrite as N | 11/10/09 | 1.03 | 2.5 | mg/L | 73 | mg/sec |
| Walthall Slough @ Woodward Ave | Nitrate + Nitrite as N | 11/10/09 | 1.03 | 2.5 | mg/L | 73 | mg/sec |
| Walthall Slough @ Woodward Ave* | Nitrate + Nitrite as N | 12/08/09 | 2.37 | 4.0 | mg/L | 268 | mg/sec |
| Walthall Slough @ Woodward Ave | Nitrate + Nitrite as N | 12/08/09 | 2.37 | 4.0 | mg/L | 268 | mg/sec |
| Walthall Slough @ Woodward Ave* | Nitrate + Nitrite as N | 01/13/10 | 1.09 | 0.37 | mg/L | 11 | mg/sec |
| Walthall Slough @ Woodward Ave | Nitrate + Nitrite as N | 01/13/10 | 1.09 | 0.29 | mg/L | 9 | mg/sec |
| Walthall Slough @ Woodward Ave | Nitrate + Nitrite as N | 02/09/10 | 3.48 | 4.1 | mg/L | 404 | mg/sec |
| Walthall Slough @ Woodward Ave* | Nitrate + Nitrite as N | 02/09/10 | 3.48 | 4.3 | mg/L | 424 | mg/sec |
| Walthall Slough @ Woodward Ave | Nitrate + Nitrite as N | 03/16/10 | 3.95 | 5.7 | mg/L | 638 | mg/sec |
| Walthall Slough @ Woodward Ave* | Nitrate + Nitrite as N | 03/16/10 | 3.95 | 6.2 | mg/L | 693 | mg/sec |
| Walthall Slough @ Woodward Ave* | Nitrate + Nitrite as N | 04/13/10 | 5.15 | 1.2 | mg/L | 175 | mg/sec |
| Walthall Slough @ Woodward Ave | Nitrate + Nitrite as N | 04/13/10 | 5.15 | 1.2 | mg/L | 175 | mg/sec |
| Walthall Slough @ Woodward Ave* | Nitrate + Nitrite as N | 05/11/10 | 8.42 | 0.82 | mg/L | 196 | mg/sec |
| Walthall Slough @ Woodward Ave | Nitrate + Nitrite as N | 05/11/10 | 8.42 | 0.87 | mg/L | 208 | mg/sec |
| Walthall Slough @ Woodward Ave* | Nitrate + Nitrite as N | 06/08/10 | 16.27 | 0.78 | mg/L | 359 | mg/sec |
| Walthall Slough @ Woodward Ave | Nitrate + Nitrite as N | 06/08/10 | 16.27 | 0.83 | mg/L | 383 | mg/sec |
| Walthall Slough @ Woodward Ave* | Nitrate + Nitrite as N | 07/13/10 | 19.92 | 0.78 | mg/L | 440 | mg/sec |
| Walthall Slough @ Woodward Ave | Nitrate + Nitrite as N | 07/13/10 | 19.92 | 0.76 | mg/L | 429 | mg/sec |
| Walthall Slough @ Woodward Ave | Nitrate + Nitrite as N | 08/10/10 | 12.83 | 0.67 | mg/L | 243 | mg/sec |
| Walthall Slough @ Woodward Ave* | Nitrate + Nitrite as N | 08/10/10 | 12.83 | 0.72 | mg/L | 262 | mg/sec |
| Walthall Slough @ Woodward Ave | Nitrate + Nitrite as N | 09/07/10 | 17.91 | 0.70 | mg/L | 355 | mg/sec |
| Walthall Slough @ Woodward Ave* | Nitrate + Nitrite as N | 09/07/10 | 17.91 | 0.69 | mg/L | 350 | mg/sec |
| Walthall Slough @ Woodward Ave | Nitrate + Nitrite as N | 10/12/10 | 8.18 | 3.7 | mg/L | 857 | mg/sec |
| Walthall Slough @ Woodward Ave* | Nitrate + Nitrite as N | 10/12/10 | 8.18 | 5.2 | mg/L | 1204 | mg/sec |
| Walthall Slough @ Woodward Ave | Nitrate + Nitrite as N | 11/09/10 | 2.01 | 8.6 | mg/L | 489 | mg/sec |
| Walthall Slough @ Woodward Ave* | Nitrate + Nitrite as N | 11/09/10 | 2.01 | 8.8 | mg/L | 501 | mg/sec |
| Walthall Slough @ Woodward Ave* | Nitrate + Nitrite as N | 12/07/10 | 3.06 | 10 | mg/L | 867 | mg/sec |
| Walthall Slough @ Woodward Ave | Nitrate + Nitrite as N | 12/07/10 | 3.06 | 11 | mg/L | 953 | mg/sec |
| Walthall Slough @ Woodward Ave | Nitrate + Nitrite as N | 01/11/11 | 0 | 9.5 | mg/L | 0 | mg/sec |
| Walthall Slough @ Woodward Ave | Nitrate + Nitrite as N | 02/08/11 | 0 | 4.7 | mg/L | 0 | mg/sec |
| Walthall Slough @ Woodward Ave | Nitrate + Nitrite as N | 03/08/11 | 0 | 6.9 | mg/L | 0 | mg/sec |
| Walthall Slough @ Woodward Ave | Nitrate + Nitrite as N | 07/26/11 | 15.11 | 0.74 | mg/L | 317 | mg/sec |
| Walthall Slough @ Woodward Ave | Nitrate + Nitrite as N | 08/23/11 | 36.75 | 1.7 | mg/L | 1769 | mg/sec |
| Walthall Slough @ Woodward Ave | Nitrate + Nitrite as N | 09/20/11 | 42.40 | 0.88 | mg/L | 1057 | mg/sec |
| Walthall Slough @ Woodward Ave | Nitrate + Nitrite as N | 10/06/11 | 36.13 | 1.5 | mg/L | 1535 | mg/sec |

| Site Name | Analyte Name | Sample date | Discharge, CFS | Concentration | Concentration Unit | Loading Rate[1] | Loading Rate Unit |
|---|---|---|---|---|---|---|---|
| Walthall Slough @ Woodward Ave | Nitrate + Nitrite as N | 11/15/11 | 2.41 | 11 | mg/L | 751 | mg/sec |
| Walthall Slough @ Woodward Ave | Nitrate + Nitrite as N | 12/13/11 | 1.39 | 14 | mg/L | 551 | mg/sec |
| Walthall Slough @ Woodward Ave | Nitrate + Nitrite as N | 01/17/12 | 6.86 | 2.4 | mg/L | 466 | mg/sec |
| Walthall Slough @ Woodward Ave | Nitrate + Nitrite as N | 02/14/12 | 1.61 | 4.2 | mg/L | 191 | mg/sec |
| Walthall Slough @ Woodward Ave* | Nitrate + Nitrite as N | 03/15/12 | 2.66 | 0.91 | mg/L | 69 | mg/sec |
| Walthall Slough @ Woodward Ave | Nitrate + Nitrite as N | 03/15/12 | 2.66 | 0.92 | mg/L | 69 | mg/sec |
| Walthall Slough @ Woodward Ave | Nitrate + Nitrite as N | 04/12/12 | 16.56 | 0.5 | mg/L | 234 | mg/sec |
| Walthall Slough @ Woodward Ave | Nitrate + Nitrite as N | 05/16/12 | 10.71 | 0.31 | mg/L | 94 | mg/sec |
| Walthall Slough @ Woodward Ave | Nitrate + Nitrite as N | 06/19/12 | 17.25 | 1.2 | mg/L | 586 | mg/sec |
| Walthall Slough @ Woodward Ave | Nitrate + Nitrite as N | 07/17/12 | 15.00 | 0.52 | mg/L | 221 | mg/sec |
| Walthall Slough @ Woodward Ave | Nitrate + Nitrite as N | 08/21/12 | 4.74 | 0.086 | mg/L | 12 | mg/sec |
| Walthall Slough @ Woodward Ave | Nitrate + Nitrite as N | 09/18/12 | 15.99 | 1.4 | mg/L | 634 | mg/sec |
| Walthall Slough @ Woodward Ave | Nitrate + Nitrite as N | 10/16/12 | 14.27 | 1.5 | mg/L | 606 | mg/sec |
| Walthall Slough @ Woodward Ave | Nitrate + Nitrite as N | 11/06/12 | 1.80 | 5.4 | mg/L | 275 | mg/sec |
| Walthall Slough @ Woodward Ave | Nitrate + Nitrite as N | 12/03/12 | 4.45 | 12 | mg/L | 1512 | mg/sec |
| Walthall Slough @ Woodward Ave* | Nitrate + Nitrite as N | 01/15/13 | 14.84 | 5.9 | mg/L | 2479 | mg/sec |
| Walthall Slough @ Woodward Ave | Nitrate + Nitrite as N | 01/15/13 | 14.84 | 5.8 | mg/L | 2437 | mg/sec |
| Walthall Slough @ Woodward Ave | Nitrate + Nitrite as N | 02/21/13 | 1.79 | 15 | mg/L | 760 | mg/sec |
| Walthall Slough @ Woodward Ave* | Nitrate + Nitrite as N | 02/21/13 | 1.79 | 14 | mg/L | 710 | mg/sec |
| Walthall Slough @ Woodward Ave* | Nitrate + Nitrite as N | 03/19/13 | 23.39 | 2.8 | mg/L | 1855 | mg/sec |
| Walthall Slough @ Woodward Ave | Nitrate + Nitrite as N | 03/19/13 | 23.39 | 2.8 | mg/L | 1855 | mg/sec |
| Walthall Slough @ Woodward Ave | Nitrate + Nitrite as N | 04/02/13 | 27.58 | 2.8 | mg/L | 2187 | mg/sec |
| Walthall Slough @ Woodward Ave* | Nitrate + Nitrite as N | 04/02/13 | 27.58 | 2.8 | mg/L | 2187 | mg/sec |
| Walthall Slough @ Woodward Ave | Nitrate + Nitrite as N | 05/21/13 | 17.86 | 4.1 | mg/L | 2074 | mg/sec |
| Walthall Slough @ Woodward Ave* | Nitrate + Nitrite as N | 05/21/13 | 17.86 | 3.7 | mg/L | 1871 | mg/sec |
| Walthall Slough @ Woodward Ave* | Nitrate + Nitrite as N | 06/18/13 | 11.58 | 1.4 | mg/L | 459 | mg/sec |
| Walthall Slough @ Woodward Ave | Nitrate + Nitrite as N | 06/18/13 | 11.58 | 1.4 | mg/L | 459 | mg/sec |
| Walthall Slough @ Woodward Ave | Nitrate + Nitrite as N | 07/16/13 | 18.27 | 0.98 | mg/L | 507 | mg/sec |
| Walthall Slough @ Woodward Ave* | Nitrate + Nitrite as N | 07/16/13 | 18.27 | 0.97 | mg/L | 502 | mg/sec |
| Walthall Slough @ Woodward Ave* | Nitrate + Nitrite as N | 08/20/13 | 15.54 | 1.7 | mg/L | 748 | mg/sec |
| Walthall Slough @ Woodward Ave | Nitrate + Nitrite as N | 08/20/13 | 15.54 | 1.7 | mg/L | 748 | mg/sec |
| Walthall Slough @ Woodward Ave* | Nitrate + Nitrite as N | 09/17/13 | 9.75 | 3.6 | mg/L | 994 | mg/sec |
| Walthall Slough @ Woodward Ave | Nitrate + Nitrite as N | 09/17/13 | 9.75 | 3.5 | mg/L | 966 | mg/sec |
| Walthall Slough @ Woodward Ave* | Nitrate + Nitrite as N | 10/08/13 | 16.61 | 0.57 | mg/L | 268 | mg/sec |
| Walthall Slough @ Woodward Ave | Nitrate + Nitrite as N | 10/08/13 | 16.61 | 1.7 | mg/L | 800 | mg/sec |
| Walthall Slough @ Woodward Ave | Nitrate + Nitrite as N | 11/19/13 | 0 | 12 | mg/L | 0 | mg/sec |
| Walthall Slough @ Woodward Ave* | Nitrate + Nitrite as N | 11/19/13 | 0 | 13 | mg/L | 0 | mg/sec |
| Walthall Slough @ Woodward Ave | Nitrate + Nitrite as N | 12/17/13 | 0.90 | 16 | mg/L | 408 | mg/sec |
| Walthall Slough @ Woodward Ave* | Nitrate + Nitrite as N | 12/17/13 | 0.90 | 15 | mg/L | 382 | mg/sec |
| Walthall Slough @ Woodward Ave | Nitrate + Nitrite as N | 01/28/14 | 12.70 | 2.7 | mg/L | 971 | mg/sec |
| Walthall Slough @ Woodward Ave | Nitrate + Nitrite as N | 02/11/14 | 2.21 | 1.1 | mg/L | 69 | mg/sec |
| Walthall Slough @ Woodward Ave | Nitrate + Nitrite as N | 05/20/14 | 12.97 | 0.66 | mg/L | 242 | mg/sec |
| Walthall Slough @ Woodward Ave | Nitrate + Nitrite as N | 06/17/14 | 10.61 | 0.48 | mg/L | 144 | mg/sec |
| Walthall Slough @ Woodward Ave | Nitrate + Nitrite as N | 07/15/14 | 6.13 | 0.22 | mg/L | 38 | mg/sec |
| Walthall Slough @ Woodward Ave | Nitrate + Nitrite as N | 08/19/14 | 7.69 | 1.2 | mg/L | 261 | mg/sec |
| Walthall Slough @ Woodward Ave | Nitrate + Nitrite as N | 09/16/14 | 6.75 | 2.3 | mg/L | 440 | mg/sec |

[1] Load = Discharge (cfs) X 28.317L/ft3 X Concentration (µg/L). To convert a concentration measured in mg/L to µg/L multiply by 1000. The load values calculated represent instantaneous loads only, and should not be used to extrapolate loading over any period of time.

*Field Duplicate

## Source Identification and Outreach

The Coalition evaluated PUR data and past monitoring results to determine the sources of constituents listed in the Walthall Slough @ Woodward Ave management plan. Sourcing analyses for past exceedances of management plan constituents are evaluated in past years' site subwatershed appendices. From January through September 2014, MPM for chlorpyrifos, HCH-delta, and sediment toxicity to *H. azteca* resulted in no exceedances. Since there were no exceedances of sourceable constituents, a sourcing analysis was not included.

From January through September 2014, exceedances of the WQTLs for DO (9), *E. coli* (1), SC (3), and TDS (2) occurred. Exceedances of physical parameters (DO, SC, and TDS) are difficult to source. Although DO, *E. coli*, SC, and TDS will remain low priority, the Coalition will continue to collect monitoring data for these constituents during Core Monitoring. Priority E constituents are discussed during targeted outreach and will continue to be discussed at annual grower meetings.

In 2014, Walthall Slough @ Woodward Ave completed its second year as a high priority site subwatershed. Focused outreach to document current management practices and track implemented management practices began in 2013 and will be complete in 2015. The Coalition contacted eight targeted growers that operate farms adjacent to the waterway farming 1,490 acres within the site subwatershed (2014 MPUR, Page 65). Existing management practices were documented and new management practices were implemented. Common management practices implemented include reducing the use of the pesticide types found in exceedances, reducing runoff water volume, and installing sprinkler or micro irrigation. The Coalition believes the implementation of management practices and increased grower awareness will continue to improve water quality within the site subwatershed.

## Evaluation

Walthall Slough @ Woodward Ave is a fifth priority site subwatershed. Grower surveys documenting current and implemented management practices are complete. Monitoring and PUR data indicates that reductions in pesticide use and management practices are contributing to improved water quality. Exceedances are decreasing in the site subwatershed; no exceedances of the WQTL for chlorpyrifos, nitrate, sediment toxicity to *H. azteca*, and HCH-delta occurred through September 2014 MPM. Completion of focused outreach in the site subwatershed will continue to improve water quality concerns relative to these constituents. Future monitoring of priority constituents without exceedances will result in removal of such constituents from the site subwatershed's management plan.

## Next Steps

In 2015, the Coalition will conduct monitoring at Walthall Slough @ Woodward Ave based on the monitoring strategy at a Core site, as described in the 2014 MPU. In addition, MPM for chlorpyrifos and sediment toxicity to *H. azteca* will continue at the site during the 2015 WY. Field parameters will be measured during every monitoring event. TMDL compliance monitoring for chlorpyrifos and diazinon is also scheduled during one storm event and from May through August.

# HIGH PRIORITY SITE SUBWATERSHEDS (2014 – 2016)

# XVI. DRAIN @ WOODBRIDGE RD

## Overview

Drain @ Woodbridge Rd is a sixth priority site subwatershed. Monitoring at Drain @ Woodbridge Rd was initiated in October 2008 and continued through 2010; Assessment Monitoring last occurred in 2010. The Coalition began focused outreach and MPM for high priority constituents as part of the management plan strategy in 2014, and will continue through 2016. Water quality concerns were discussed and management practices were documented. Growers in the site subwatershed were informed of water quality impairments and encouraged to prevent offsite movement of agricultural constituents.

The active management plan constituents for Drain @ Woodbridge Rd are chlorpyrifos, arsenic, DO, *E. coli*, SC, and TDS (Table XVI-1). MPM for chlorpyrifos occurred in April 2014; no exceedance occurred.

In 2015, Drain @ Woodbridge is classified as a Represented site. As outlined in the 2014 MPU strategy for Represented sites, the Coalition will monitor for sediment toxicity to *H. azteca* based on past exceedances in the Zone 3 Core site, Terminous Tract Drain @ Hwy 12. Additionally, the Coalition will continue to conduct MPM for chlorpyrifos.

**Table XVI-1. Drain @ Woodbridge Rd management plan constituents.**

Management plan initiation year refers to when the site and constituent are addressed in the SJCDWQC MPURs and in the Management Plan Progress Report sections of the Annual Reports.

| Priority | Constituent | Management Plan Initiation Year | Management Plan Removal Year |
|---|---|---|---|
| A/B | Chlorpyrifos | 2011 | Active |
| E | Arsenic | 2009 | Active |
| E | Dissolved Oxygen | 2009 | Active |
| E | *E. coli* | 2011 | Active |
| E | Specific Conductivity | 2009 | Active |
| E | Total Dissolved Solids | 2009 | Active |

## Description of Site Subwatershed

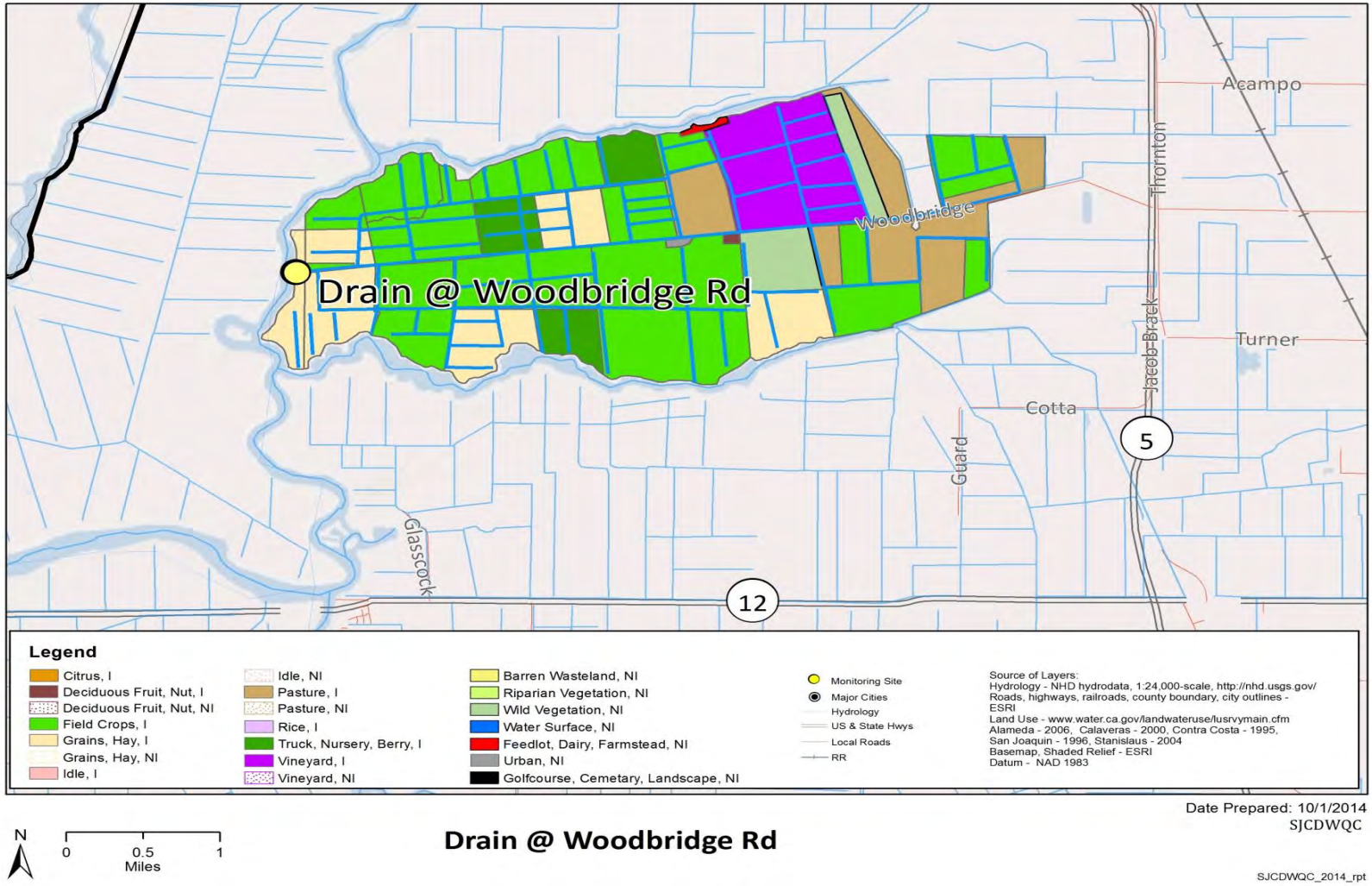
Drain @ Woodbridge Rd is rotating Assessment Site in Zone 3 under the 2008 MRPP. This site is located on the northern side of the Coalition region. Water from the drain is pumped to the Mokelumne River close to the sample location. The site drains an area of land to the east between Hog Slough and Sycamore Slough (Table XVI-2). Land use in the site subwatershed includes 4,540 irrigated acres, of which the primary irrigated agriculture is a combination of field crops, truck/nursery/berry crops, vineyards, pasture, grains/hay, and dairy (Figure XVI-1).

The drain that empties into the Mokelumne River is not considered an impaired waterbody on California's 303(d) List of Impaired Waterbodies (last updated in 2010). However, the represented TMDL subareas in the Delta Waterways (central and eastern portions) where the site drains are listed for chlorpyrifos, DDT, diazinon, group A pesticides, invasive species, mercury, and unknown water column toxicity.

**Table XVI-2. Drain @ Woodbridge Rd site subwatershed sampling location coordinates.**

| Site Name | Station Code | Target Latitude | Target Longitude |
|---|---|---|---|
| Drain @ Woodbridge Rd | 544DAWRXX | 38.15256 | -121.50095 |

**Figure XVI-1. Drain @ Woodbridge Rd site subwatershed land use map.**



## Subwatershed Monitoring History

Monitoring began in October 2008 and continued through 2010. Assessment Monitoring last occurred at the site in 2010; Table XVI-3 contains the number of events monitored per year and the constituents (by group) from 2008 through September 2014. The Coalition initiated MPM for chlorpyrifos in 2013, and was again monitored in April 2014 (Table XVI-4).

**Table XVI-3. Drain @ Woodbridge Rd sampling events and analyses per year.**

Only environmental samples are counted.

| Type | Analyte | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|---|
| Sampling Events | Events Scheduled | 3 | 3 | 12 | 0 | 0 | 1 | 1 |
| | Dry Sites | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Events Sampled | 2[1] | 3 | 12 | 0 | 0 | 1 | 1 |
| | | | | | | | | |
| Field and Physical Parameters | BOD | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Color | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Dissolved Oxygen | 2 | 3 | 12 | 0 | 0 | 1 | 1 |
| | Dissolved Solids | 2 | 3 | 12 | 0 | 0 | 0 | 0 |
| | *E. coli* | 2 | 3 | 12 | 0 | 0 | 0 | 0 |
| | Grain size (sediment) | 0 | 0 | 2 | 0 | 0 | 0 | 0 |
| | Hardness as CaCO3 | 2 | 3 | 12 | 0 | 0 | 0 | 0 |
| | pH | 2 | 3 | 12 | 0 | 0 | 1 | 1 |
| | Specific Conductivity | 2 | 3 | 12 | 0 | 0 | 1 | 1 |
| | Suspended Solids | 2 | 3 | 12 | 0 | 0 | 0 | 0 |
| | Total Organic Carbon | 2 | 3 | 12 | 0 | 0 | 0 | 0 |
| | Total Organic Carbon (sediment) | 0 | 0 | 2 | 0 | 0 | 0 | 0 |
| | Turbidity | 2 | 3 | 12 | 0 | 0 | 0 | 0 |
| Nutrients | Ammonia as N | 2 | 3 | 12 | 0 | 0 | 0 | 0 |
| | Nitrate + Nitrite as N | 2 | 3 | 12 | 0 | 0 | 0 | 0 |
| | Nitrate as N | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Nitrite as N | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Nitrogen, Total Kjeldahl | 2 | 3 | 12 | 0 | 0 | 0 | 0 |
| | Orthophosphate as P | 2 | 3 | 12 | 0 | 0 | 0 | 0 |
| | Phosphate as P | 2 | 3 | 12 | 0 | 0 | 0 | 0 |
| Metals (Dissolved) | Cadmium | 2 | 3 | 12 | 0 | 0 | 0 | 0 |
| | Copper | 2 | 3 | 12 | 0 | 0 | 0 | 0 |
| | Lead | 2 | 3 | 12 | 0 | 0 | 0 | 0 |
| | Nickel | 2 | 3 | 12 | 0 | 0 | 0 | 0 |
| | Zinc | 2 | 3 | 12 | 0 | 0 | 0 | 0 |
| Metals (Total) | Arsenic | 2 | 3 | 12 | 0 | 0 | 0 | 0 |
| | Boron | 2 | 3 | 12 | 0 | 0 | 0 | 0 |
| | Cadmium | 2 | 3 | 12 | 0 | 0 | 0 | 0 |
| | Copper | 2 | 3 | 12 | 0 | 0 | 0 | 0 |
| | Lead | 2 | 3 | 12 | 0 | 0 | 0 | 0 |
| | Molybdenum | 2 | 3 | 12 | 0 | 0 | 0 | 0 |
| | Nickel | 2 | 3 | 12 | 0 | 0 | 0 | 0 |
| | Selenium | 2 | 3 | 12 | 0 | 0 | 0 | 0 |
| | Zinc | 2 | 3 | 12 | 0 | 0 | 0 | 0 |
| Carbamates | Aldicarb | 2 | 3 | 12 | 0 | 0 | 0 | 0 |
| | Carbaryl | 2 | 3 | 12 | 0 | 0 | 0 | 0 |
| | Carbofuran | 2 | 3 | 12 | 0 | 0 | 0 | 0 |
| | Diuron | 2 | 3 | 12 | 0 | 0 | 0 | 0 |
| | Linuron | 2 | 3 | 12 | 0 | 0 | 0 | 0 |
| | Methiocarb | 2 | 3 | 12 | 0 | 0 | 0 | 0 |
| | Methomyl | 2 | 3 | 12 | 0 | 0 | 0 | 0 |
| | Oxamyl | 2 | 3 | 12 | 0 | 0 | 0 | 0 |

| Type | Analyte | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|---|
| Group A Pesticides | Aldrin | 2 | 3 | 0 | 0 | 0 | 0 | 0 |
| | Chlordane | 2 | 3 | 0 | 0 | 0 | 0 | 0 |
| | Endosulfan I | 2 | 3 | 0 | 0 | 0 | 0 | 0 |
| | Endosulfan II | 2 | 3 | 0 | 0 | 0 | 0 | 0 |
| | HCH, alpha | 2 | 3 | 0 | 0 | 0 | 0 | 0 |
| | HCH, beta | 2 | 3 | 0 | 0 | 0 | 0 | 0 |
| | HCH, delta | 2 | 3 | 0 | 0 | 0 | 0 | 0 |
| | HCH, gamma | 2 | 3 | 0 | 0 | 0 | 0 | 0 |
| | Heptachlor | 2 | 3 | 0 | 0 | 0 | 0 | 0 |
| | Heptachlor epoxide | 2 | 3 | 0 | 0 | 0 | 0 | 0 |
| | Toxaphene | 2 | 3 | 0 | 0 | 0 | 0 | 0 |
| Herbicides | Atrazine | 2 | 3 | 12 | 0 | 0 | 0 | 0 |
| | Cyanazine | 2 | 3 | 12 | 0 | 0 | 0 | 0 |
| | Glyphosate | 2 | 3 | 12 | 0 | 0 | 0 | 0 |
| | Paraquat | 2 | 3 | 12 | 0 | 0 | 0 | 0 |
| | Simazine | 2 | 3 | 12 | 0 | 0 | 0 | 0 |
| | Trifluralin | 2 | 3 | 12 | 0 | 0 | 0 | 0 |
| Organochlorines | DDD(p,p') | 2 | 3 | 12 | 0 | 0 | 0 | 0 |
| | DDE(p,p') | 2 | 3 | 12 | 0 | 0 | 0 | 0 |
| | DDT(p,p') | 2 | 3 | 12 | 0 | 0 | 0 | 0 |
| | Dicofol | 2 | 3 | 12 | 0 | 0 | 0 | 0 |
| | Dieldrin | 2 | 3 | 12 | 0 | 0 | 0 | 0 |
| | Endrin | 2 | 3 | 12 | 0 | 0 | 0 | 0 |
| | Methoxychlor | 2 | 3 | 12 | 0 | 0 | 0 | 0 |
| Organophosphates | Azinphos methyl | 2 | 3 | 12 | 0 | 0 | 0 | 0 |
| | Chlorpyrifos | 2 | 3 | 12 | 0 | 0 | 1 | 1 |
| | Demeton-s | 2 | 3 | 12 | 0 | 0 | 0 | 0 |
| | Diazinon | 2 | 3 | 12 | 0 | 0 | 0 | 0 |
| | Dichlorvos | 2 | 3 | 12 | 0 | 0 | 0 | 0 |
| | Dimethoate | 2 | 3 | 12 | 0 | 0 | 0 | 0 |
| | Disulfoton | 2 | 3 | 12 | 0 | 0 | 0 | 0 |
| | Malathion | 2 | 3 | 12 | 0 | 0 | 0 | 0 |
| | Methamidophos | 2 | 3 | 12 | 0 | 0 | 0 | 0 |
| | Methidathion | 2 | 3 | 12 | 0 | 0 | 0 | 0 |
| | Parathion, Methyl | 2 | 3 | 12 | 0 | 0 | 0 | 0 |
| | Phorate | 2 | 3 | 12 | 0 | 0 | 0 | 0 |
| | Phosmet | 2 | 3 | 12 | 0 | 0 | 0 | 0 |
| | Thiobencarb | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pyrethroids | Bifenthrin | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cyfluthrin, total | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cyhalothrin, lambda, total | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cypermethrin, total | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Esfenvalerate/Fenvalerate, total | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Permethrin, total | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sediment Pesticides | Bifenthrin | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Chlorpyrifos | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cyfluthrin | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cyhalothrin, lambda | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cypermethrin | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Deltamethrin: Tralomethrin | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Esfenvalerate/ Fenvalerate | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Fenpropathrin | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Permethrin | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Toxicity | *Ceriodaphnia dubia* | 2 | 3 | 12 | 0 | 0 | 0 | 0 |
| | *Pimephales promelas* | 2 | 3 | 12 | 0 | 0 | 0 | 0 |
| | *Selenastrum capricornutum* | 2 | 3 | 12 | 0 | 0 | 0 | 0 |
| | *Hyalella azteca* | 0 | 0 | 2 | 0 | 0 | 0 | 0 |

[1]Sampling at Drain @ Woodbridge was scheduled three times in 2008; however, December samples were not collected due to no access.

**Table XVI-4. Drain @ Woodbridge Rd site subwatershed Management Plan Monitoring schedule (2014).**

| Site Name | Sample Date | Monitoring Type | Chlorpyrifos |
|---|---|---|---|
| Drain @ Woodbridge Rd | 4/15/2014 | MPM | X |

## Monitoring Results

Drain @ Woodbridge Rd was monitored for chlorpyrifos twice in 2008, three times in 2009, and every month in 2010 during Assessment Monitoring; one exceedances of the WQTL occurred in 2010 (Table XVI-5). Chlorpyrifos was added to the subwatershed management plan in 2011 after the single exceedance of the WQTL occurred in April 2010; MPM was initiated in 2013. The Coalition conducted MPM in April 2014, and there was no detection of chlorpyrifos.

Arsenic, DO, *E. coli*, SC, and TDS are priority E constituents monitored at Drain @ Woodbridge Rd; arsenic, *E. coli,* and TDS were monitored 17 times from 2008 through 2010, and field parameters were monitored during every monitoring event. From January through September 2014, there were exceedances of the WQTLs for SC (1) and DO (1) during the April MPM sampling event (Table XVI-5).

Table XVI-5 is a tally of exceedances of WQTLs from 2006 through September 2014 for management plan constituents in the Drain @ Woodbridge Rd site subwatershed (organized alphabetically by constituent priority). Table XVI-6 contains detections and WQTL exceedance results of all sampling events since the constituent became part of the site subwatershed management plan. Drain @ Woodbridge Rd is too deep to measure discharge and therefore no instantaneous loads are calculated for chlorpyrifos. A record of all exceedances in the Drain @ Woodbridge Rd site subwatershed since monitoring began is provided in Appendix II, Table XVI-A.

**Table XVI-5. Drain @ Woodbridge Rd management plan constituent exceedance tally (2008-September 2014).**

Exceedances that occurred during resampling for field parameters and toxicity are included in the tally. Exceedances are organized alphabetically by constituent priority. A complete list of exceedances can be found in Appendix II, Table XVI-A.

| Monitoring Year | Chlorpyrifos, > 0.015 µg/L | Arsenic, >10 µg/L | Dissolved Oxygen, >7 mg/L | *E. coli*, >235 MPN/100 mL | Specific Conductivity, >700 µS/cm | Total Dissolved Solids, >450 mg/L |
|---|---|---|---|---|---|---|
| 2008 | 0 | 2 | 2 | 1 | 2 | 2 |
| 2009 | 0 | 3 | 2 | 0 | 3 | 3 |
| 2010 | 1 | 9 | 12 | 1 | 11 | 10 |
| 2013 | 0 | NA | 1 | NA | 0 | NA |
| 2014* | 0 | NA | 1 | NA | 1 | NA |
| **Overall Tally** | **1** | **14** | **18** | **2** | **17** | **15** |
| **Constituent Priority** | **A/B** | **E** | **E** | **E** | **E** | **E** |

NA – Not Applicable; monitoring did not occur for this constituent during the year.
*2014 includes January through September results only.

**Table XVI-6. Drain @ Woodbridge Rd site subwatershed monitoring results for priority A/B - D constituents since management plan initiation.**

Exceedance values are in bold. MPM results after September 2014 not included in table (grey cells).

| | Month: | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **2008 NM (@ Woodbridge Rd)** | Date: | NA | NA | NA | NA | NA | NA | NA | NA | NA | 10/14/08 | 11/4/08 | NA |
| | Chlorpyrifos | NA | NA | NA | NA | NA | NA | NA | NA | NA | <0.003 | <0.003 | NA |
| **2009 NM (@ Woodbridge Rd)** | Date: | 1/13/09 | 2/10/09 | 3/10/09 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | Chlorpyrifos | <0.003 | <0.003 | <0.003 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| **2010 NM (@ Woodbridge Rd)** | Date: | 1/13/10 | 2/9/10 | 3/16/10 | 4/13/10 | 5/11/10 | 6/8/10 | 7/13/10 | 8/10/10 | 9/7/10 | 10/12/10 | 11/9/10 | 12/7/10 |
| | Chlorpyrifos | <0.003 | <0.003 | <0.003 | **0.029** | <0.003 | <0.003 | <0.003 | <0.003 | 0.007 | <0.003 | <0.003 | <0.003 |
| **2013 MPM (@ Woodbridge Rd)** | Date: | NA | NA | NA | 4/2/13 | NA | NA | NA | NA | NA | NA | NA | NA |
| | Chlorpyrifos | NA | NA | NA | <0.003 | NA | NA | NA | NA | NA | NA | NA | NA |
| **2014 MPM (@ Woodbridge Rd)** | Date: | NA | NA | NA | 4/15/14 | NA | NA | NA | NA | NA | | | |
| | Chlorpyrifos | NA | NA | NA | <0.003 | NA | NA | NA | NA | NA | | | |

MPM – Management Plan Monitoring.
NA – Not Applicable. No monitoring occurred on this date for this constituent.
NM – Normal Monitoring

## Source Identification and Outreach

The Coalition evaluated PUR data and past monitoring results to determine the sources of constituents listed in the Drain @ Woodbridge management plan. Sourcing analyses for past exceedances of management plan constituents are evaluated in past years' site subwatershed appendices. From January through September 2014, there were no detections of chlorpyrifos during MPM. Since there were no exceedances of sourceable constituents, a sourcing analysis was not included.

The priority E constituents listed under the Drain @ Woodbridge Rd site subwatershed active management plan are arsenic, DO, *E. coli*, SC, and TDS. Priority E constituents are difficult to source. The Coalition is not required to conduct MPM for priority E constituents; however, all constituents are discussed with growers during focused outreach and the Coalition believes informing growers of other water quality impairments will also address priority E constituents.

The Coalition conducted general outreach and education in the Drain @ Woodbridge Rd site subwatershed, which included general management practices surveys, mailings, quarterly updates, and annual meetings. Focused outreach to document current management practices and track implementation of new management practices began in 2014 and will conclude in 2016. Management practices are documented for the acreage identified as having direct drainage in this site subwatershed (33% acreage identified as having direct drainage). The Coalition initiated outreach with four targeted growers and conducted a grower meeting on February 5, 2014. Surveys of current management practices (2013) as well as planned management practices (2014) will be summarized in the 2015 Annual Report. Follow-up contacts with growers who indicate on their survey that they plan to implement additional practices in 2014 will take place in early 2015. A final analysis of the sixth priority site subwatersheds management practices will be included in the 2016 Annual Report.

## Evaluation

It is evident that growers became aware of water quality concerns during general outreach and took certain actions to address these impairments. No exceedances of the chlorpyrifos WQTL occurred since 2010.

## Next Steps

In 2015, Drain @ Woodbridge is classified as a Represented site. As outlined in the 2014 MPU strategy for Represented sites, the Coalition will monitor for sediment toxicity to *H. azteca* based on past exceedances in the Zone 3 Core site, Terminous Tract Drain @ Hwy 12. Additionally, the Coalition will continue to conduct MPM for chlorpyrifos. The Coalition will document current management plan practices in 2014 and growers should begin implementing new management practices in the irrigation season of 2014 in an effort to further improve water quality. Monitoring results will allow the Coalition to evaluate the effectiveness of its focused management plan strategy in the site subwatershed; the Coalition will present these conclusions in the 2016 Annual Report.

# HIGH PRIORITY SITE SUBWATERSHEDS (2015-2017)

# XVII. EMPIRE TRACT @ 8 MILE RD

## Overview

Empire Tract @ 8 Mile Rd is a seventh priority site subwatershed. Empire Tract @ 8 Mile Rd replaced Drain to Bishop Cut @ North Rio Blanco Rd as an Assessment site in Zone 3. Monitoring at Empire Tract @ 8 Mile Rd was initiated in July 2013 and continued through June 2014; Assessment Monitoring last occurred in June 2014. The Coalition will conduct focused outreach and MPM for high priority constituents as part of the management plan strategy from 2015 through 2017.

In 2015, Empire Tract @ 8 Mile Rd is classified as a Represented site. As outlined in the strategy for Represented sites in the 2014 MPU, the Coalition will monitor for chlorpyrifos and sediment toxicity to *H. azteca* based on past exceedances in the Zone 3 Core site, Terminous Tract Drain @ Hwy 12. The active management plan constituents are arsenic, DO, *E.* coli, SC, and TDS (Table XVI-1). The Coalition has not initiated MPM at this site subwatershed.

**Table XVII-1. Empire Tract @ 8 Mile Rd management plan constituents.**
Management plan initiation year refers to when the site and constituent are addressed in the SJCDWQC MPURs and in the Management Plan Progress Report sections of the Annual Reports.

| Priority | Constituent | Management Plan Initiation Year | Management Plan Removal Year |
|---|---|---|---|
| E | Arsenic | 2014 | Active |
| E | Dissolved Oxygen | 2014 | Active |
| E | *E. coli* | 2015 | Active |
| E | Specific Conductivity | 2015 | Active |
| E | Total Dissolved Solids | 2014 | Active |

## Description of Site Subwatershed

Empire Tract @ 8 Mile Rd is an Assessment site in Zone 3. The Coalition conducted Assessment Monitoring at Empire Tract @ 8 Mile Rd through June 2014.

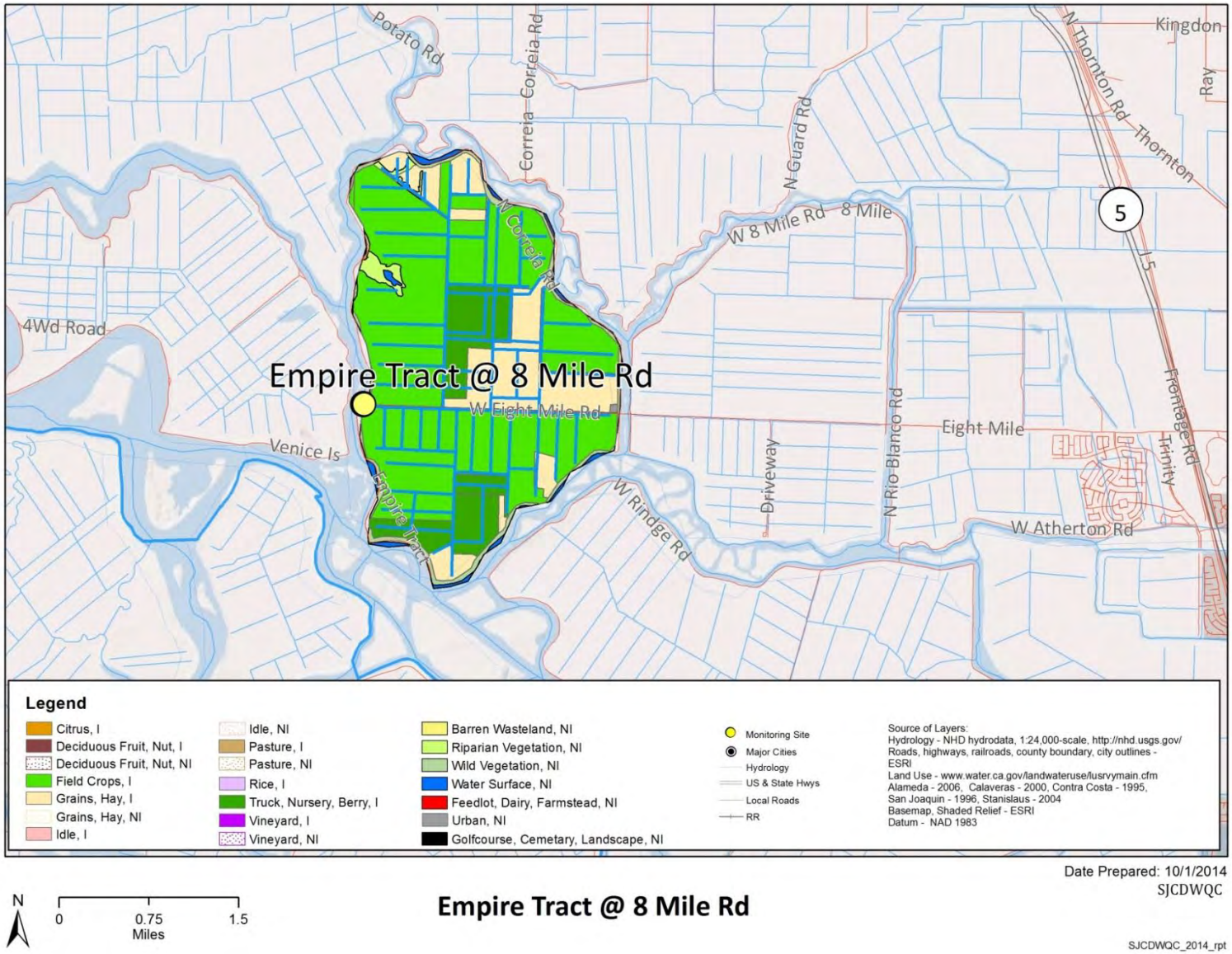
Empire Tract @ 8 Mile Rd located on the southern side of the Zone 3 boundary. This site subwatershed represents all of Empire Tract and the sample site is located at the western pumping station on 8 Mile Rd. The pump drains water into Little Connection Slough which in turn drains into Potato Slough and then the San Joaquin River (Table XVI-2). The land use in the site subwatershed includes 3,388 acres of irrigated agriculture. Primary agriculture in the site subwatershed is row crops, grains, and truck/nursery/berry crops.

The drain on Empire Tract is not considered an impaired waterbody on California's 303(d) List of Impaired Waterbodies (last updated in 2010).

**Table XVII-2. Empire Tract @ 8 Mile Rd site subwatershed sampling location coordinates.**

| Site Name | Station Code | Target Latitude | Target Longitude |
|---|---|---|---|
| Empire Tract @ 8 Mile Rd | 544ETAEMR | 38.06012 | -121.49912 |

**Figure XVII-1. Empire Tract @ 8 Mile Rd site subwatershed land use map.**



## Subwatershed Monitoring History

Empire Tract @ 8 Mile Rd was classified as an Assessment site in Zone 3 in from July 2013 through June 2014. Monitoring began in July 2013 and continued through June 2014. Assessment Monitoring last occurred at the site in June 2014; Table XVI-3 contains the number of events monitored per year and the constituents (by group) from 2013 through June 2014. The Coalition has not initiated MPM at this site subwatershed.

**Table XVII-3. Empire Tract @ 8 Mile Rd sampling events and analyses per year.**

Only environmental samples are counted.

| TYPE | ANALYTE | 2013 | 2014 |
|---|---|---|---|
| Sampling Events | Events Scheduled | 7 | 7 |
| | Dry Sites | 0 | 0 |
| | Events Sampled | 7 | 7 |
| | | | |
| Field and Physical Parameters | BOD | 0 | 0 |
| | Color | 0 | 0 |
| | Dissolved Oxygen | 7 | 7 |
| | Dissolved Solids | 6 | 6 |
| | *E. coli* | 6 | 6 |
| | Grain size (sediment) | 1 | 1 |
| | Hardness as CaCO3 | 6 | 6 |
| | pH | 7 | 7 |
| | Specific Conductivity | 7 | 7 |
| | Suspended Solids | 6 | 6 |
| | Total Organic Carbon | 6 | 6 |
| | Total Organic Carbon (sediment) | 1 | 1 |
| | Turbidity | 6 | 6 |
| Nutrients | Ammonia as N | 6 | 6 |
| | Nitrate + Nitrite as N | 6 | 6 |
| | Nitrate as N | 0 | 0 |
| | Nitrite as N | 0 | 0 |
| | Nitrogen, Total Kjeldahl | 6 | 6 |
| | Orthophosphate as P | 6 | 6 |
| | Phosphate as P | 6 | 6 |
| Metals (Dissolved) | Cadmium | 6 | 6 |
| | Copper | 6 | 6 |
| | Lead | 6 | 6 |
| | Nickel | 6 | 6 |
| | Zinc | 6 | 6 |
| Metals (Total) | Arsenic | 6 | 6 |
| | Boron | 6 | 6 |
| | Cadmium | 6 | 6 |
| | Copper | 6 | 6 |
| | Lead | 6 | 6 |
| | Molybdenum | 6 | 6 |
| | Nickel | 6 | 6 |
| | Selenium | 6 | 6 |
| | Zinc | 6 | 6 |
| Carbamates | Aldicarb | 6 | 6 |
| | Carbaryl | 6 | 6 |
| | Carbofuran | 6 | 6 |
| | Diuron | 6 | 6 |
| | Linuron | 6 | 6 |
| | Methiocarb | 6 | 6 |
| | Methomyl | 6 | 6 |

| Type | Analyte | 2013 | 2014 |
|---|---|---|---|
| | Oxamyl | 6 | 6 |
| Group A Pesticides | Aldrin | 0 | 0 |
| | Chlordane | 0 | 0 |
| | Endosulfan I | 0 | 0 |
| | Endosulfan II | 0 | 0 |
| | HCH, alpha | 0 | 0 |
| | HCH, beta | 0 | 0 |
| | HCH, delta | 0 | 0 |
| | HCH, gamma | 0 | 0 |
| | Heptachlor | 0 | 0 |
| | Heptachlor epoxide | 0 | 0 |
| | Toxaphene | 0 | 0 |
| Herbicides | Atrazine | 6 | 6 |
| | Cyanazine | 6 | 6 |
| | Glyphosate | 6 | 6 |
| | Paraquat | 6 | 6 |
| | Simazine | 6 | 6 |
| | Trifluralin | 6 | 6 |
| Organochlorines | DDD(p,p') | 6 | 6 |
| | DDE(p,p') | 6 | 6 |
| | DDT(p,p') | 6 | 6 |
| | Dicofol | 6 | 6 |
| | Dieldrin | 6 | 6 |
| | Endrin | 6 | 6 |
| | Methoxychlor | 6 | 6 |
| Organophosphates | Azinphos methyl | 6 | 6 |
| | Chlorpyrifos | 6 | 6 |
| | Demeton-s | 6 | 6 |
| | Diazinon | 6 | 6 |
| | Dichlorvos | 6 | 6 |
| | Dimethoate | 6 | 6 |
| | Disulfoton | 6 | 6 |
| | Malathion | 6 | 6 |
| | Methamidophos | 6 | 6 |
| | Methidathion | 6 | 6 |
| | Parathion, Methyl | 6 | 6 |
| | Phorate | 6 | 6 |
| | Phosmet | 6 | 6 |
| | Thiobencarb | 0 | 0 |
| Pyrethroids | Bifenthrin | 0 | 0 |
| | Cyfluthrin, total | 0 | 0 |
| | Cyhalothrin, lambda, total | 0 | 0 |
| | Cypermethrin, total | 0 | 0 |
| | Esfenvalerate/Fenvalerate, total | 0 | 0 |
| | Permethrin, total | 0 | 0 |
| Sediment Pesticides | Bifenthrin | 1 | 1 |
| | Chlorpyrifos | 1 | 1 |
| | Cyfluthrin | 1 | 1 |
| | Cyhalothrin, lambda | 1 | 1 |
| | Cypermethrin | 1 | 1 |
| | Deltamethrin: Tralomethrin | 1 | 1 |
| | Esfenvalerate/ Fenvalerate | 1 | 1 |
| | Fenpropathrin | 1 | 1 |
| | Permethrin | 1 | 1 |
| Toxicity | *Ceriodaphnia dubia* | 7 | 6 |
| | *Pimephales promelas* | 7 | 6 |
| | *Selenastrum capricornutum* | 7 | 6 |

| Type | Analyte | 2013 | 2014 |
|---|---|---|---|
| | *Hyalella azteca* | 1 | 1 |

## Monitoring Results

Arsenic, DO, *E. coli*, SC, and TDS are priority E constituents monitored at Empire Tract @ 8 Mile Rd. Arsenic, *E. coli,* and TDS were monitored 12 times from July 2013 through June 2014, and field parameters were monitored during every monitoring event. Arsenic was added to the management plan in 2014 after two exceedances occurred in 2013. Exceedances of the WQTL for DO occurred every month of monitoring during the 2013 WY, and during the months of January, February, March, May, and June in 2014. The Coalition added DO to the Empire Tract @ 8 Mile Rd management plan in 2014. An exceedance of the WQTL for *E. coli* occurred once in 2013 and once in 2014; and therefore it will be added to the site's management plan in 2015. The Coalition will add SC to the site's management plan in 2015 after exceedances of the WQTL occurred during the months of February, March, May, and June of 2014. The Coalition added TDS to the management plan in 2014 after two exceedances occurred in 2013. Exceedances of the WQTL for TDS continued to occur every month of monitoring from January through June 2014 (Table XVI-4).

Table XVI-5 is a tally of exceedances of WQTLs from July 2013 through June 2014 for management plan constituents in the Empire Tract @ 8 Mile Rd site subwatershed (organized alphabetically by constituent priority). A record of all exceedances in this site subwatershed since monitoring began is provided in Appendix II, Table XVI-A.

**Table XVII-4. Empire Tract @ 8 Mile Rd management plan constituent exceedance tally (July 2013-June 2014).** Exceedances that occurred during resampling for field parameters and toxicity are included in the tally. Exceedances are organized alphabetically by constituent priority. A complete list of exceedances can be found in Appendix II, Table XVI-A.

| Monitoring Year | Arsenic, >10 µg/L | Dissolved Oxygen, >7 mg/L | *E. coli*, >235 MPN/100 mL | Total Dissolved Solids, >450 mg/L |
|---|---|---|---|---|
| 2013 | 3 | 7 | 1 | 2 |
| 2014* | 4 | 5 | 1 | 6 |
| **Overall Tally** | **7** | **12** | **2** | **8** |
| **Constituent Priority** | **E** | **E** | **E** | **E** |

NA – Not Applicable; monitoring did not occur for this constituent during the year.
*2014 includes January through June results only.

## Source Identification

The Coalition evaluated PUR data and past monitoring results to determine the sources of constituents listed in the Empire Tract @ 8 Mile Rd management plan. Sources for exceedances of the WQTL for

management plan constituents are evaluated in past years' site subwatershed appendix. There are no high priority constituents in the Empire Tract @ 8 Mile Rd site subwatershed management plan.

### *Priority E Constituents*

The priority E constituents listed under the Empire Tract @ 8 Mile Rd site subwatershed active management plan are arsenic, DO, *E. coli*, SC, and TDS. Priority E constituents are difficult to source. Per the management plan strategy, the Coalition is not focusing on sources of priority E constituents at this time; the Coalition believes addressing other water quality issues will also address priority E constituents.

## Outreach

The Coalition will conduct general outreach and education in the Empire Tract @ 8 Mile Rd site subwatershed beginning in 2015. General outreach and education includes general management practices surveys to establish a baseline of current management practices, mailings, quarterly updates and annual meetings. The Coalition's strategy for conducting outreach in high priority subwatersheds is described in the Management Practices Tracking Strategy sections of the 2015 Annual Report. Outreach focuses on applied pesticides (priority constituents A/B and C), but the Coalition will review and discuss all constituents impairing water quality in the subwatershed, including priority D and priority E constituents. The Coalition believes management practices designed to address the offsite movement of applied pesticides will also reduce toxicity and priority E exceedances in the waterway.

## Evaluation

Growers will begin to implement management practices during the irrigation season of 2015. The Coalition will not initiate MPM in the 2015 WY because Empire Tract @ 8 Mile Rd only has management plans for priority E constituents. The Coalition does not conduct MPM for priority E constituents except for field parameters, which are collected each time monitoring occurs. During grower outreach meetings, priority E exceedances will be addressed although no meetings will be held specifically for these constituents. Normal monitoring will be the only evaluation tool available to assess management of these constituents.

## Next Steps

Empire Tract @ 8 Mile Rd site subwatershed is a high priority site subwatershed 2015 through 2017. The Coalition will document current management plan practices in 2015 and promote the implementation of new management plan practices in an effort to further improve water quality if needed. In 2015, Empire Tract @ 8 Mile Rd is classified as a Represented site. As outlined in the strategy for Represented sites in the 2014 MPU, the Coalition will monitor for chlorpyrifos and sediment toxicity to *H. azteca* based on past exceedances in the Zone 3 Core site, Terminous Tract Drain @ Hwy 12. The active management plan constituents are arsenic, DO, *E.* coli, SC, and TDS. The Coalition has not initiated MPM at this site subwatershed.