East San Joaquin
WATER QUALITY COALITION
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June 5, 2014

Pamela Creedon, Executive Officer
Central Valley Regional Water Quality Control Board
11020 Sun Center Drive, #200
Rancho Cordova, CA 95670-6114

Dear Ms. Creedon,

The East San Joaquin Water Quality Coalition (Coalition) is submitting a request to remove monitoring requirements for specific constituents from applicable site subwatershed management plans and therefore from the site's Management Plan Monitoring (MPM) schedule. The WDR Attachment B, Appendix MRP-1, Section III, Pages 8 and 9 outline the process for requesting removal of constituents from site subwatershed management plans:

1. Demonstration through evaluation of monitoring data that the water quality impairment is no longer occurring (i.e., 3 or more years with no exceedances during the times of the year when previous exceedances occurred) or demonstrated compliance with the WDR's surface and groundwater receiving water limitations.
2. Documentation of education and outreach to applicable members in the watershed where water quality impairment occurred.
3. Documentation of member implementation of management practices that address water quality exceedance.
4. Demonstration management practices implemented by members are effective in addressing water quality impairment.

The basis for the request is 1) three years of monitoring at a site subwatershed with no exceedances of a specific constituent indicating improved water quality due to implemented management practices by growers in the applicable site subwatersheds, and/or 2) reevaluation of WQTLs for dissolved oxygen (DO). If approved, the Coalition will remove site specific constituents from management plans in:

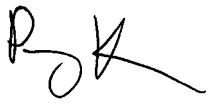
- Cottonwood Creek @ Rd 20 (DO and lead)
- Dry Creek @ Rd 18 (chlorpyrifos and DO)
- Dry Creek @ Wellsford Rd (chlorpyrifos and *C. dubia* water column toxicity)
- Duck Slough @ Gurr Rd (DO and copper)
- Highline Canal @ Hwy 99 (*C. dubia* water column toxicity, and *H. azteca* sediment toxicity)
- Highline Canal @ Lombardy Rd (*H. azteca* sediment toxicity)
- Hilmar Drain @ Central Ave (DO)
- Merced River @ Santa Fe (chlorpyrifos, Lead, and *C. dubia* water column toxicity)
- Miles Creek @ Reilly Rd (DO)
- Prairie Flower Drain @ Crows Landing Rd (*H. azteca* sediment toxicity)
- Unnamed Drain @ Hwy 140 (DO)

The request to remove sediment toxicity to *H. azteca* from management plans at Highline Canal @ Hwy 99, Highline Canal @ Lombardy Rd, and Prairie Flower Drain @ Crows Landing Rd is based on the October 15, 2013 letter from the Regional Board indicating sediment toxicity management plans would be complete "once 2013 monitoring is completed, if no additional exceedances occur…".

In addition, the Coalition reevaluated all past reported exceedances of the WQTL for DO based on the criteria outlined in the *Fourth Edition of the Water Quality Control Plan (Basin Plan) for the Sacramento and San Joaquin River Basins*. The Basin Plan indicates the lower DO trigger limit of 5 mg/L can be utilized for Delta waterways that are considered 'warm' and/or not considered a resource for fisheries (Page III-5). The Coalition assessed the exceedances for DO (including upstream sites) to determine if 1) the total number of previously reported exceedances for DO at a site would change, and 2) the reduced number of exceedances would mean the site no longer requires a management plan. The letter below includes details on each site in which an update to the WQTL for DO would affect the management plan for the site; sites were assessed on a case-by-case scenario.

Supporting documentation for this request is included on the following pages.

Submitted respectfully,



Parry Klassen
Executive Director
East San Joaquin Water Quality Coalition

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# INTRODUCTION

Management Plan Monitoring (MPM) is conducted as part of the Coalition's management plan strategy to identify contaminant sources and evaluate the effectiveness of management practices in improving water quality. When sources of water quality impairments are identified, the constituents causing impairments are listed in the site's management plan. Management plans are required as a result of a single exceedance of the Water Quality Trigger Limit (WQTL) of a Total Maximum Daily Load (TMDL) constituent (Specific conductance (SC), boron, chlorpyrifos, and diazinon), or more than one exceedance of a WQTL of other constituents. When an exceedance of the WQTL for a management plan constituent does not occur for three or more years at a site, the Coalition may send a letter to the Regional Board petitioning to remove the constituent from the site's management plan. As of May 1, 2014, there are 27 sites located in the ESJWQC region with constituents listed in management plans.

When a constituent becomes the focus of the ESJWQC Management Plan, the Coalition initiates actions to eliminate the exceedances. The Coalition identifies potential sources of the exceedances, contacts those growers directly to arrange meetings on their farm, conducts initial and follow-up surveys with those growers to identify if any additional management practices are needed and then to determine if those practices were implemented, and monitoring to determine if the implemented practices are effective in eliminating the discharges responsible for the exceedances. The ESJWQC Management Plan (submitted, awaiting approval) describes this process in detail. This process of sourcing, outreach, and monitoring was started in 2008 and sufficient water quality data for a subset of site subwatersheds have been collected to document improved water quality. Therefore, the Coalition is requesting the removal of 18 constituents in 11 site subwatersheds (Table 1).

**Table 1. ESJWQC management plan completion sites and constituents.**

| Site Subwatershed | 2014 WY Monitoring | Years of Focused Outreach | DO | Copper | Lead | Chlorpyrifos | *C. dubia* Toxicity | *H. azteca* Toxicity | Total |
|---|---|---|---|---|---|---|---|---|---|
| Cottonwood Creek @ Rd 20 | Core | 2010-2012 | X | | X | | | | 2 |
| Dry Creek @ Rd 18 | Represented | 2011-2013 | X | | | X | | | 2 |
| Dry Creek @ Wellford Rd | Core | 2008-2010 | | | | X | X | | 2 |
| Duck Slough @ Gurr Rd | Core | 2010-2012 | X | X | | | | | 2 |
| Highline Canal @ Hwy 99 | Core | 2010-2012 | | | | | X | X | 2 |
| Highline Canal @ Lombardy Rd | Represented | 2013-2015 | | | | | | X | 1 |
| Hilmar Drain @ Central Ave | Represented | 2012-2014 | X | | | | | | 1 |
| Merced River @ Santa Fe | Core | 2013-2015 | | | X | X | X | | 3 |
| Miles Creek @ Reilly Rd | Represented | 2013-2015 | X | | | | | | 1 |
| Prairie Flower Drain @ Crows Landing Rd | Core | 2008-2010 | | | | | | X | 1 |
| Unnamed Drain @ Hwy 140 | Represented | 2016-2018 | X | | | | | | 1 |
| | | Total | 6 | 1 | 2 | 3 | 3 | 3 | 18 |

# UPDATES TO COALITION MONITORING PLAN

This report includes monitoring results through March 2014 with the exception of field parameters and toxicity (results through May 2014). The Coalition will report all monitoring results for the 2014 WY in the May 2015 Annual Report.

On April 17, 2012 the Coalition was approved to temporarily suspend monitoring at Core and Management Plan Monitoring (MPM) sites. In addition, the Coalition was approved to reduce the number of constituents monitored at Assessment Monitoring sites by eliminating analyses for Group A, paraquat, glyphosate, total Kjeldahl nitrogen, total phosphorus (as P), *E. coli* and all metals except copper and zinc for the remainder of 2012. Coalition monitoring occurred as scheduled from January through March 2012. There was no MPM at sites from April through December 2012 unless Assessment Monitoring was occurring at the site in 2012. In April 2012, all schedules were revised to accommodate the reduced monitoring.

## Reevaluation of WQTLs for Dissolved Oxygen

Of the 27 ESJWQC sites in management plans, there is a management plan for dissolved oxygen (DO) at 18 sites. Dissolved oxygen is a non-conserved constituent and concentrations of DO can fluctuate due to seasonal and diurnal processes occurring in the water column and sediment. The majority of the waterbodies located in the ESJWQC region have characteristics that are applicable to those outlined in the *Fourth Edition of the Water Quality Control Plan (Basin Plan) for the Sacramento and San Joaquin Basins* that would permit lowering the WQTL from 7 mg/L for DO to 5 mg/L (Page III-5). Only three tributary sites (Bear Creek @ Kibby Rd, Merced River @ Santa Fe, and Rodden Creek @ Rodden Rd) in the ESJWQC region are considered waterbodies with beneficial uses to cold or spawning habitat and therefore require the WQTL of 7 mg/L for DO. The Coalition has used 7.0 mg/L for all waterbodies when determining whether an exceedance has occurred. The majority of the waterbodies located in the ESJWQC region have characteristics that would permit lowering the WQTL from 7 mg/L for DO to 5 mg/L. The 5.0 mg/L objective can be applied to those waterbodies that are assigned the warm beneficial use in the Basin Plan, or that are assigned the warm beneficial use through application of the tributary rule. The Basin Plan language for application of the tributary rule is:

"Beneficial uses of any specifically identified water body generally apply to its tributary streams, except as provided below:

- MUN, COLD, MIGR and SPWN do not apply to Old Alamo Creek (Solano County) from its headwaters to the confluence with New Alamo Creek
- MUN and the human consumption of aquatic organisms do not apply to Sulphur Creek (Colusa County) from Schoolhouse Canyon to the confluence with Bear Creek

In some cases a beneficial use may not be applicable to the entire body of water. In these cases the Regional Water Board's judgment will be applied. It should be noted that it is impractical to list every

surface water body in the Region. For unidentified waterbodies, the beneficial uses will be evaluated on a case-by-case basis."

The application of the 5.0 mg/L objective is applicable to Cottonwood Creek, Ash Slough, Berenda Slough, and Dry Creek (all Madera County) for the following reasons:

- The four water bodies in Madera County are ephemeral and only hold water for a brief period in the winter when rainfall is sufficient to generate runoff or when being used as a conveyance for irrigation water
- When water is present, it reaches the Eastside Bypass, the most immediate downstream water body, only rarely. In the history of the ILRP, there have been no flows that have moved down any of these water bodies and reached the Eastside Bypass
- The Eastside Bypass confluences with Bear Creek, downstream of Sack dam and upstream of the Merced River.
- Although there is a Cold beneficial use assigned to Reach 4 of the San Joaquin River which runs from Sack Dam to Bear Creek, this reach of the SJR is generally dry except when extremely high flow spills over Sack Dam. Water from the upstream SJR is routed to the Eastside Bypass at Sack Dam, which can then be routed to the Mariposa Bypass and if any flow remains, back to the SJR. Any flow remaining in the Eastside Bypass (after routing to Mariposa Bypass) is routed to Bear Creek and then returns to the SJR. Therefore, the Cold beneficial use assigned to Reach 4 can never be realized.
- The two major water bodies in Madera County are the Fresno River and Chowchilla River. They also confluence with the Eastside Bypass but similar to the other four water bodies, do not hold water unless there are extremely heavy storms that generate significant runoff, or are used as conveyance structures for irrigation deliveries. Both waterbodies have assigned beneficial uses in the Basin Plan and have been assigned only a Warm beneficial use, not a Cold beneficial use.

For these reasons, the Coalition will apply the 5.0 mg/L WQTL to Cottonwood Creek, Ash Slough, Berenda Slough, and Dry Creek in Madera County when determining if exceedances occur.

In addition, the Coalition monitors 12 constructed agricultural conveyance structures/drains that have been assigned beneficial uses through the tributary rule. Many of these structures are concrete and are not meant to be habitat for any aquatic life. The remaining structures are mud channels that are maintained to be free of aquatic vegetation that might impede flows. These structures are property of various irrigation districts and may or may not contain water as determined by demand for irrigation water. Irrigation districts can at any time, alter the channels by lining them with concrete or any other structure meant to reduce or eliminate infiltration of water. Beneficial uses should not be assigned to constructed agricultural conveyance/drain structures by the tributary rule. Neither the 5.0 mg/L nor the 7.0 mg/L objectives are appropriate to apply to these waterbodies. Consequently, the Coalition will not maintain DO management plans for Hatch Drain, Hilmar Drain, Highline Canal, Howard Lateral, McCoy Lateral, Westport Drain, Levee Drain, Lateral 2 ½, Unnamed Drain (@ Highway 140), Prairie Flower Drain, Mootz Drain, and Livingston Drain.

Justifications for removing DO from management plans at Cottonwood Creek @ Rd 20, Dry Creek @ Rd 18, Duck Slough @ Gurr Rd, Hilmar Drain @ Central Ave, Miles Creek @ Reilly Rd, and Unnamed Drain @ Hwy 140 based on Basin Plan criteria are provided in the sections below. Each site subwatershed explanation includes a table (if applicable) of previously reported exceedances of DO which would no longer be considered exceedances based on the criteria for WQTLs outlined in the Basin Plan.

The Coalition is requesting removal of DO and numerous additional constituents from management plans at several locations in the Coalition region. To support the Coalition's request, data are provided for each constituent documenting improvement in water quality due to successful outreach and education. The section key below outlines the requirements for management plan completion and corresponding sections per each site subwatershed as stated in the WDR:

### Section Key

| Requirements for Management Plan Completion: as outlined in the Waste Discharge Requirements General Order (WDR or General Order) for Growers within the Eastern San Joaquin River Watershed (Order No. R5-2012-0116-R1) | Section Name/Location – Annual Report |
|---|---|
| 1. Demonstration through evaluation of monitoring data that the water quality impairment is no longer occurring (i.e., 3 or more years with no exceedances during the times of the year when previous exceedances occurred) or demonstrated compliance with the WDR's surface and groundwater receiving water limitations. | • Subwatershed Overview and Monitoring History,<br>• Constituent Monitoring Results and Sourcing (including review of PUR data) |
| 2. Documentation of education and outreach to applicable members in the watershed where water quality impairment occurred. | • Summary of Outreach |
| 3. Documentation of member implementation of management practices that address the water quality exceedance. | • Management Practices Implemented |
| 4. Demonstration that the management practices implemented by members are effective in addressing the water quality impairment. | • Justification for Removal- review of how the Coalition has met the requirements for removal as outlined in the WDR Attachment B, Appendix MRP-1, Section III, Pages 8 and 9.<br>• Future Monitoring |

# SUPPORTING DOCUMENTATION FOR MANAGEMENT PLAN COMPLETION

## COTTONWOOD CREEK @ RD 20

### 1. Demonstration through evaluation of monitoring data that water quality impairment is no longer occurring

**Constituents Requested for Management Plan Completion:**

- Dissolved Oxygen
- Lead (Total and Dissolved)

#### *Subwatershed Overview and Monitoring History*

Monitoring at Cottonwood Creek @ Rd 20 began during the storm season of 2005 and has continued since then. In 2006, 2007, and 2008 irrigation and storm monitoring took place. Cottonwood Creek @ Rd 20 was monitored for Core constituents beginning in the fall of 2008 through the fall 2013 with Assessment Monitoring occurring in 2011. During 2014, all constituents are monitored monthly as part of Core site monitoring. The upstream location (Cottonwood Creek @ Hwy 145) was sampled during the irrigation season of 2008.

The Coalition began conducting outreach and education in the Cottonwood Creek @ Rd 20 site subwatershed in 2007. Focused outreach in Cottonwood Creek @ Rd 20 occurred from 2010 through 2012. The Coalition identified growers with the greatest likelihood of contributing to the water quality impairments, and contacted these growers in 2009 and 2010 to document existing management practices. When applicable the Coalition encouraged the implementation of additional management practices designed to eliminate water quality impairments. The Coalition followed up with targeted growers to determine which additional management practices were implemented.

#### *Constituent Monitoring Results and Sourcing*

**Dissolved Oxygen**

Dissolved oxygen is a non-conserved constituent meaning that it can increase or decrease as water moves downstream. Source identification is not possible in the same way as it is for constituents such as pesticides. Stream processes generate or remove dissolved oxygen to/from the water column or sediment with no external inputs of agricultural constituents. Even in pristine watersheds, exceedances of DO may occur during normal diurnal stream processes. Processes affecting DO in waterways include stream flow, fluctuations in temperature, loss of vegetation around streams, as well as excessive nutrients. During education and outreach, growers in the Coalition region receive recommendations designed to prevent the offsite movement of constituents and sediment into the waterway by reducing irrigation tailwater and storm water runoff. As the volume of discharge from fields to surface waters decreases, flows decrease which can also result in lower DO in these waterbodies.

Dissolved oxygen has been monitored 73 times between Cottonwood Creek @ Rd 20 and Cottonwood Creek @ Hwy 145. Measurements of DO were reported as exceedances of the 7 mg/L WQTL 22 times; 21 occurred at Cottonwood Creek @ Rd 20 and one occurred at the upstream site Cottonwood Creek @ Hwy 145 (Table 2). Dissolved oxygen was placed in the management plan for Cottonwood Creek @ Rd 20 after the second exceedance (5.70 mg/L) occurred in June 2005. Only one of the 22 DO concentrations reported as exceedances (August 2007; 3.95 mg/L) was below the Basin Plan criterion (5 mg/L) for the waterbody. All other reported exceedances of DO at Cottonwood Creek @ Rd 20 through April 2014 ranged from 5.17 to 6.95 mg/L. Since the August 2007 exceedance, 21 exceedances would not be considered exceedances based on the criterion of 5.0 mg/L for DO (Table 2). The Coalition requests that DO to be removed from the Cottonwood Creek @ Rd 20 management plan since there have not be two exceedances of the 5mg/L WQTL within a three year period.

**Table 2. Reported and reevaluated exceedances for DO based on WQTL criteria in Basin Plan.**
Previous DO WQTL was 7mg/L; DO WQTL based on the Basin Plan requirements is 5 mg/L.

| Monitoring Site | Sample Date | Exceedance Reported for DO |
|---|---|---|
| Cottonwood Creek @ Rd 20 | 3/21/2005 | 5.60 |
| | 6/14/2005 | 5.70 |
| | 7/12/2005 | 5.17 |
| | 9/20/2005 | 6.50 |
| | 5/16/2006 | 5.71 |
| | 6/13/2006 | 6.90 |
| | 7/11/2006 | 6.51 |
| | 8/8/2006 | 6.95 |
| | 9/12/2006 | 6.11 |
| | 5/29/2007 | 6.55 |
| | 8/21/2007 | 6.81 |
| | 8/26/2008 | 6.83 |
| | 5/19/2009 | 6.72 |
| | 4/20/2010 | 6.36 |
| | 7/20/2010 | 6.80 |
| | 8/17/2010 | 6.04 |
| | 9/14/2010 | 6.44 |
| | 4/19/2011 | 6.70 |
| | 7/9/2013 | 5.28 |
| | 9/10/2013 | 5.34 |
| *Cottonwood @ Hwy 145* | *8/26/2008* | *6.45* |

## Lead

Lead is a legacy contaminant from various sources, such as old applications of lead arsenate pesticides, deposition from leaded gasoline, and disposal of lead-containing products including paints, electronic components, lead pipes, and batteries. Since lead arsenate pesticide use was banned before the PUR data system was initiated, no data exist to assist in the sourcing of past agricultural applications of lead. Given the number of potential sources and since lead is no longer applied for agricultural use, the Coalition categorized lead as low priority for outreach and monitoring. In October 2008, the Coalition began analyzing for both the total and hardness-based dissolved fractions of metals to better characterize contamination in the water column. Dissolved metals more adequately reflect the

bioavailable, and therefore the toxic fraction in the water column. Since the Coalition adopted this method for analyzing dissolved metals, exceedances of the hardness based WQTLs of metals have declined. This decline in exceedances of metals demonstrates that the analysis of dissolved metals improved the capabilities of the Coalition to effectively address water quality impairments associated with metals in the water column.

The Coalition has monitored for lead at the site 35 times. Samples collected from the Cottonwood Creek @ Rd 20 site subwatershed had concentrations of lead that exceeded the hardness based WQTL once in 2006 (June) and twice in 2008 (January, February). Since the last exceedance in February 2008, the Coalition monitored Cottonwood Creek @ Rd 20 for lead 23 times (during 2011 Assessment Monitoring, and during MPM in 2013 and 2014). If the June monitoring data indicate an exceedance of the hardness based WQTL for lead at the site, the Coalition will be notify the Regional Board.

## 2. Documentation of education and outreach to members where water quality impairment occurred

### *Summary of Outreach*

The Coalition initiated outreach in 2007 and has taken several actions to address water quality impairments in the Cottonwood Creek @ Rd 20 site subwatershed. The Coalition conducted individual meetings with 25 growers in 2009 and 2010 to review each grower's operation and document current management practices as well as discuss water quality impairments. Management practices were recommended to eliminate agricultural discharges. All targeted growers were contacted again in 2011 to determine if recommended and/or new practices were implemented.

The Coalition continues to provide outreach to all members within the Cottonwood Creek @ Rd 20 subwatershed. Through grower notifications and meetings, the Coalition informs members of monitoring results, management practices to eliminate water quality impairments, availability of funding for management practice implementation, results of studies of management practice efficacy, and management practice implementation and tracking activities. In addition, Cottonwood Creek @ Rd 20 remains a high priority subwatershed for other constituents and outreach continues with growers who have the greatest likelihood of contributing to exceedances.

## 3. Documentation of member implementation of management practices to address water quality exceedance

The complete analysis of management practices implemented in the Cottonwood Creek @ Rd 20 site subwatershed was reported in the ESJWQC 2012 MPUR. That analysis is described in the section below.

The Coalition received completed surveys from 25 targeted growers representing 45% of the acreage with the potential to drain directly to the creek. The 25 members were surveyed for management practices currently implemented across 5,768 acres. One grower sold their property and therefore follow-up surveys were completed by 24 of the 25 initial contacts.

The primary way that lead from Coalition member parcels could reach the waterway is through the discharge of sediment containing lead. Coalition members in the Cottonwood Creek @ Rd 20 site subwatershed primarily farm orchards and vineyards (Figure 1). A large portion of the creek is bordered by berms, which prevent discharge to the creek and less than 20% of the acreage has irrigation runoff (Figure 1). The vast majority of recommended practices are to reduce spray drift. However, Coalition representatives also recommended storm water runoff management and prevention practices, including installation of 10 foot wide filter strips around field perimeters.

### Irrigation Water Management

Growers were almost evenly split between those who reported utilizing microirrigation and/or sprinklers to irrigate (56%) and who reported utilizing surface (flood) irrigation (52%; Table 3). However, the 52% of respondents using flood irrigation accounted for only 36% of the acreage. In addition, a single grower farming 695 acres uses surface, sprinkler, and microirrigation techniques (all irrigation systems are associated with the enrolled acreage). All respondents irrigate based on actual moisture levels and crop needs rather than on a set schedule, and the majority of growers (80%) farm laser leveled fields (Table 3).

### Storm Water Drainage

The majority of respondents indicated no storm water drainage (68%) from their property. Five respondents indicated storm water drainage would occur only in 100 year storms, and three growers reported storm water drainage when the soil is saturated. Several growers implemented management practices designed to reduce storm water drainage, including growers who reported no drainage from their property (Table 3, How are you able to manage storm drainage?). Six growers pump or drain discharge into waterways and are unable to control timing, two growers are able to control timing of pumping or discharge, two growers utilize a recirculation/tailwater return system, and one grower utilizes a settling pond.

### Erosion & Sediment Management

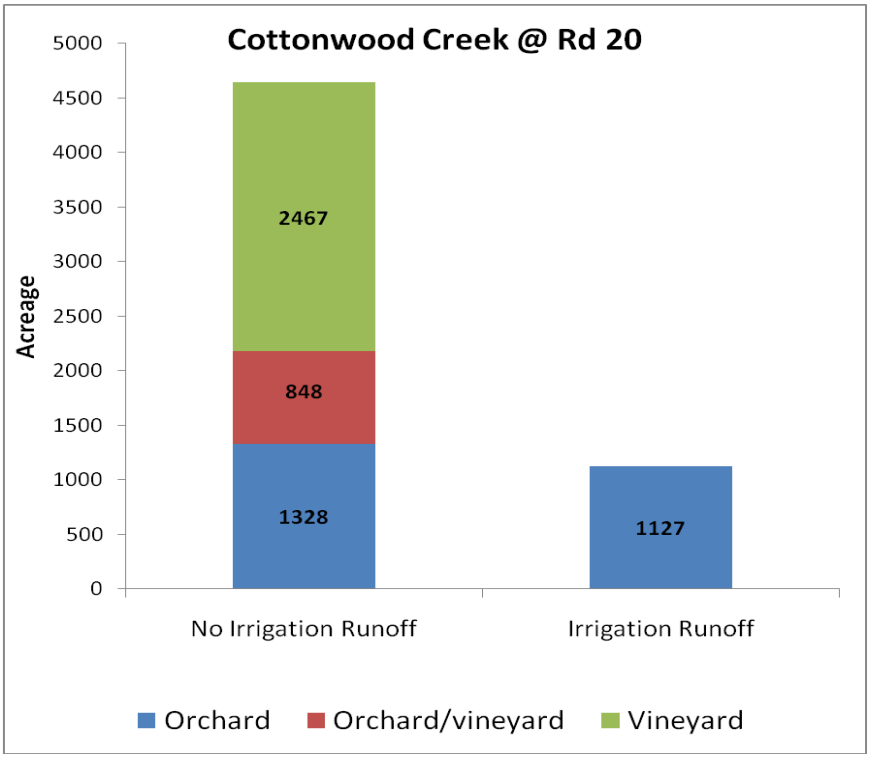
All respondents indicated that they control erosion and sediment movement by some means.

**Table 3. Cottonwood Creek@ Rd 20 subwatershed current management practices (2010).**

| Checklist | Question | Answer | Count of Answers | % Respondents | Sum of Associated Acreage |
|---|---|---|---|---|---|
| Section 1: Irrigation Water Management | Irrigation management practices: | Laser leveled fields | 20 | 80% | 4283 |
| | | Recirculation - Tailwater return system | 2 | 8% | 510 |
| | | Use drainage basins (sediment ponds) to capture and retain runoff | 1 | 4% | 96 |
| | Irrigation System | Microirrigation | 11 | 44% | 4126 |
| | | Sprinkler | 3 | 12% | 938 |
| | | Surface | 13 | 52% | 2096 |
| | Which do you base your irrigation schedule on: | Actual Moisture Levels in soil/crop needs | 25 | 100% | 5770 |
| Section 2: Storm Drainage | How are you able to manage storm drainage? | No Storm Drainage | 12 | 48% | 2167 |
| | | Pump/Drain into waterway & able to control timing | 2 | 8% | 944 |

| Checklist | Question | Answer | Count of Answers | % Respondents | Sum of Associated Acreage |
|---|---|---|---|---|---|
| | | Pump/Drain into waterway & unable to control timing | 6 | 24% | 2194 |
| | | Recirculation - Tailwater return system | 2 | 8% | 510 |
| | | Settling Pond | 1 | 4% | 414 |
| | When do you have storm water draining from your field? | After soil is saturated-late winter | 3 | 12% | 1127 |
| | | No Storm Drainage | 17 | 68% | 2467 |
| | | Only in heavy (100 year) storms | 5 | 20% | 2176 |
| Section 3: Erosion & Sediment Management | Sediment management practices: | Grass Row Centers (Orchards, Vineyards) | 21 | 84% | 5326 |
| | | Maintain vegetated filter strips around field perimeter at least 10' wide | 13 | 52% | 2849 |
| | | Vegetation is planted along or allowed to grow along ditches | 6 | 24% | 2332 |
| | Do you apply herbicides during winter months? | Diuron (Karmex) | 1 | 4% | 80 |
| | | Do not apply | 2 | 8% | 130 |
| | | Glyphosate (Round-Up) | 19 | 76% | 4899 |
| | | Goal | 13 | 52% | 3592 |
| | | Other | 9 | 36% | 1278 |
| | | Paraquat (Gramaxone) | 9 | 36% | 3561 |
| | | Simazine (Princep) | 6 | 24% | 773 |
| | If waterway crosses or borders pasture, how is livestock managed? | N/A - Not Pasture | 23 | 92% | 5630 |
| | | Riparian vegetation prevents livestock access to water | 1 | 4% | 80 |
| | | Waterway is fenced | 1 | 4% | 80 |
| Section 4: Pest Management | Spray management practices: | Adjust spray nozzles to match crop canopy profile | 25 | 100% | 5770 |
| | | Outside nozzles shut off when spraying outer rows next to sensitive sites | 23 | 92% | 5606 |
| | | Spray areas close to waterbodies when the wind is blowing away from them | 23 | 92% | 4663 |
| | | Use air blast applications when wind is between 3-10 mph and upwind of a sensitive site | 20 | 80% | 5195 |
| | | Uses of nozzles that provide largest effective droplet size to minimize drift | 25 | 100% | 5770 |
| | Have you considered alternative strategies to using diazinon or chlorpyrifos either during the dormant or growing season? | N/A | 22 | 88% | 4831 |
| | | Yes | 3 | 12% | 939 |
| | How often is spray equipment calibrated? | Once per month | 3 | 12% | 107 |
| | | Once per year | 3 | 12% | 149 |
| | | Prior to each application | 19 | 76% | 5514 |
| Section 5: Dormant Spray Management | Dormant spray management practices: | Check weather conditions prior to spraying | 2 | 8% | 614 |
| | | Maintain setback zones | 2 | 8% | 614 |
| | Do you apply when soil moisture is at field capacity? | No | 2 | 8% | 614 |
| | Have you been informed of DPR's Dormant Spray Regulations? | Yes | 2 | 8% | 614 |
| | How many acres are sprayed with dormant pesticides? | 461 Acres | 1 | 4% | 461 |
| | | 56 Acres | 1 | 4% | 153 |
| | | No Dormant Sprays | 23 | 92% | 5156 |
| | Prior to applying winter dormant sprays, what is the condition of your orchard floor? | Some vegetation | 1 | 4% | 153 |
| | | Vegetated Cover w/Sprayed Berms | 1 | 4% | 461 |

**Figure 1. Cottonwood Creek@ Rd 20 crop acreage information from member surveys (2010).**




## *Summary of Implemented Management Practices (2010/2011)*

Table 4 presents a comparison of Coalition recommended management practices and newly implemented management practices for the Cottonwood Creek @ Rd 20 subwatershed. Newly implemented management practices within Cottonwood Creek include maintaining filter strips at least 10 feet wide around field perimeters, and using less water during surface irrigation. Growers implemented all recommended practices as well as practices that were not specifically recommended for their operations, accounting for 1,917 acres without irrigation drainage within the Cottonwood Creek subwatershed (Table 4). Figure 2 provides each of the newly implemented management practices as a percentage of the overall acreage.

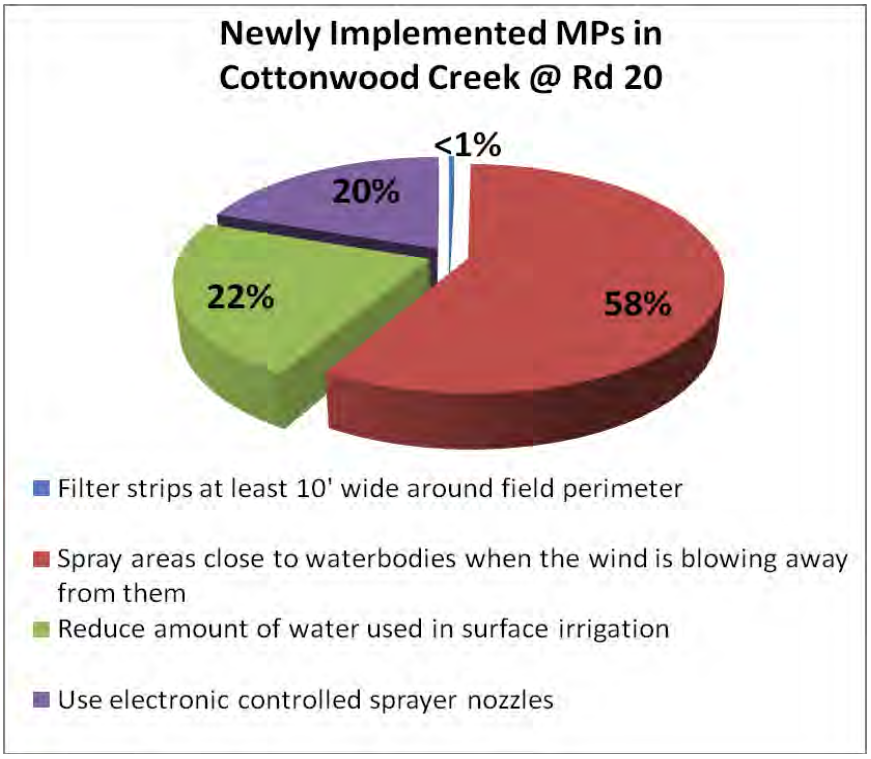
**Table 4. Comparison of recommended MPs and implemented MPs in Cottonwood Creek @ Rd 20 site subwatershed.**

| Management Practice (Separated by No Drainage vs Drainage) | Recommended Practices | | Implemented Practices | | % Recommended Acreage with Implemented Practices |
|---|---|---|---|---|---|
| | # Growers | Acres | # Growers | Acres | |
| **No irrigation drainage from property** | | | | | |
| Filter strips at least 10' wide around field perimeter | 1 | 8 | 1 | 8 | 100% |
| Spray areas close to waterbodies when the wind is blowing away from them | 2 | 1,107 | 2 | 1,107 | 100% |
| Use electronic controlled sprayer nozzles | 0 | 0 | 3 | 375[1] | NA |
| Reduce amount of water used in surface irrigation | 0 | 0 | 1 | 427[1] | NA |
| | | | | | |
| **Total Acreage with 1 or more Recommended Practices** | | | | | **1,115** |
| **Total Acreage with 1 or More Implemented Practices** | | | | | **1,917** |
| **Percent Of Acreage of Implemented Practices compared to Acreage of Recommended Practices[2]** | | | | | **172%** |

[1]Management practice not specifically recommended by Coalition representative for grower's operation.
[2]Percentages over 100% are due to multiple management practices implemented across the same parcel.
NA – Not applicable; no recommendations for the management practice in the subwatershed.

**Figure 2. Percentage of acreage represented by newly implemented management practices in Cottonwood Creek @ Rd 20.**

All members that implemented new practices have no irrigation drainage.



## 4. Demonstration management practices implemented by members are effective in addressing water quality impairment

### *Justification for Removal*

The Coalition's focused management practice outreach and tracking strategy is effective at improving water quality. Monitoring results indicate three years of monitoring with no exceedances of the WQTLs for lead (total and dissolved). Based on grower surveys and follow-up results, targeted growers in the Cottonwood Creek @ Rd 20 subwatershed implemented management practices and improved water quality as reflected by the absence of exceedances of lead. Therefore, the Coalition requests the removal of lead from the Cottonwood Creek @ Rd 20 management plan and MPM schedule. Cottonwood Creek @ Rd 20 is a Core site during the 2014 Water Year (WY) and monitoring for lead will occur four times a year during two storm and two irrigation events as outlined in the MPU.

Under the proposed 5 mg/L WQTL for DO, results indicate only one exceedance of the WQTL for DO (August 2007; 3.95 mg/L). All other measurements of DO at Cottonwood Creek @ Rd 20 through May 2014 ranged from 5.17 to 6.95 mg/L. Because there has been only one exceedance of the WQTL, the Coalition requests that DO be removed from the Cottonwood Creek @ Rd 20 management plan and MPM schedule.

### *Future Monitoring*

As indicated in the WDR, Cottonwood Creek @ Rd 20 is one of the Core sites in Zone 6. During the 2014 WY, Core site monitoring and MPM will occur according to the schedules outlined in the MPU; MPM is scheduled for copper based on months of past exceedances and review of PUR data, and lead (during two storm and two irrigation events). Monthly monitoring for all constituents will occur as part of Core site monitoring during 2014 and 2015. Field parameters (DO, pH, and SC) are measured during every monitoring event.

# DRY CREEK @ RD 18

## 1. Demonstration through evaluation of monitoring data that water quality impairment is no longer occurring

**Constituents Requested for Management Plan Completion:**

- Chlorpyrifos
- Dissolved Oxygen

### *Subwatershed Overview and Monitoring History*

Dry Creek @ Rd 18 is a Represented site in the Cottonwood Creek @ Rd 20 Zone (Zone 6). Monitoring at Dry Creek @ Rd 18 was initiated during the irrigation season of 2005 and continued through the irrigation season of 2008. From 2011 through winter 2012, MPM occurred during months of past exceedances and Assessment Monitoring took place in 2013. The Dry Creek @ Rd 18 subwatershed includes an upstream location (Dry Creek @ Rd 22) which was sampled for management plan constituents during 2008.

Focused outreach in Dry Creek @ Rd 18 occurred from 2011 through 2013. The Coalition identified growers with the greatest likelihood of contributing to the water quality impairments. The Coalition contacted these growers in 2010 and 2011 to document existing management practices and encouraged the implementation of additional management practices designed to eliminate water quality impairments. The Coalition followed up with targeted growers to determine which additional management practices were implemented.

### *Constituent Monitoring Results and Sourcing*

**Dissolved Oxygen**

The dynamics of DO concentrations have been discussed above. Dissolved Oxygen has been measured 61 times at Dry Creek @ Rd 18 and seven times at Dry Creek @ Rd 22. Six exceedances of the 7 mg/L WQTL for DO were reported. Five of the six exceedances were from Dry Creek @ Rd 18 and one from upstream monitoring at Dry Creek @ Rd 22 (Table 5). However, only one DO concentration (September 2008; 3.97 mg/L) fell below 5 mg/L. All other measurements of DO reported as exceedances ranged between 5.17 and 6.54 mg/L. Since the September 2008 exceedance, DO has been monitored 25 times at Dry Creek @ Rd 18.

Five measurements of DO were reported as exceedances that are not exceedances based on the 5 mg/L criterion (Table 5). The Coalition requests for DO to be removed from the Dry Creek @ Rd 18 management plan since there have not been two exceedances of the DO 5mg/L WQTL within a three year period.

**Table 5. Reported and reevaluated exceedances for DO based on WQTL criteria in Basin Plan.**
Previous DO WQTL was 7mg/L; DO WQTL based on the Basin Plan requirements is 5 mg/L.

| Monitoring Site | Sample Date | Exceedance Reported for DO |
|---|---|---|
| Dry Creek @ Rd 18 | 9/12/2006 | 5.61 |
| | 8/26/2008 | 5.82 |
| | 8/28/2008 | 5.62 |
| | 8/13/2013 | 6.54 |
| | 9/10/2013 | 5.17 |

### Chlorpyrifos

The Regional Board established a TMDL for chlorpyrifos for the ESJWQC region (Lower San Joaquin River Chlorpyrifos and Diazinon TMDL). Consequently, chlorpyrifos is considered one of the highest priority constituents under the Coalition's Management Plan. The Coalition has monitored for chlorpyrifos 35 times at Dry Creek @ Rd 18. Exceedances of the WQTL for chlorpyrifos occurred three times in samples collected from Dry Creek @ Rd 18: once in 2006 (July), once in 2007 (April), and once in 2008 (February).

Since the last exceedances in February 2008, the Coalition has monitored for chlorpyrifos 20 times. The end of three years of monitoring with no exceedances was February 2013. The PUR data indicate chlorpyrifos use in the Dry Creek @ Rd 18 site subwatershed has fluctuated since the 2008 exceedance. The year with highest chlorpyrifos use was 2010 (2,423 lbs AI across 1291 acres of grapes, citrus and nuts); the lowest use was in 2008 (429 lbs AI across 220 acres of almonds). Chlorpyrifos use in 2013 increased again due to a pest outbreak (2304 lbs AI across 912 acres of grapes, citrus and nuts); however, no exceedances occurred.

## 2. Documentation of education and outreach to members where water quality impairment occurred

### *Summary of Outreach*

The Coalition initiated outreach in 2007 and has taken several actions to address water quality impairments in the Dry Creek @ Rd 18 site subwatershed. Focused outreach in Dry Creek @ Rd 18 occurred from 2011 through 2013. The Coalition conducted individual meetings with 17 growers in 2010 and 2011 to discuss water quality impairments, review each grower's operation and document current management practices. The Coalition recommended additional management practices to some growers. Targeted growers who indicated they would implement new management practices were contacted again to determine if recommended and/or new practices were implemented.

The Coalition continues to provide outreach to all members within the Dry Creek @ Rd 18 site subwatershed. Through grower notifications and meetings, the Coalition informs members of water quality results, management practices to eliminate water quality impairments, availability of funding for management practice implementation, results of studies of management practice efficacy, and management practice implementation and tracking activities. In addition, Dry Creek @ Rd 18 remains a

high priority subwatershed for other constituents and outreach continues with growers who have the greatest likelihood of contributing to exceedances.

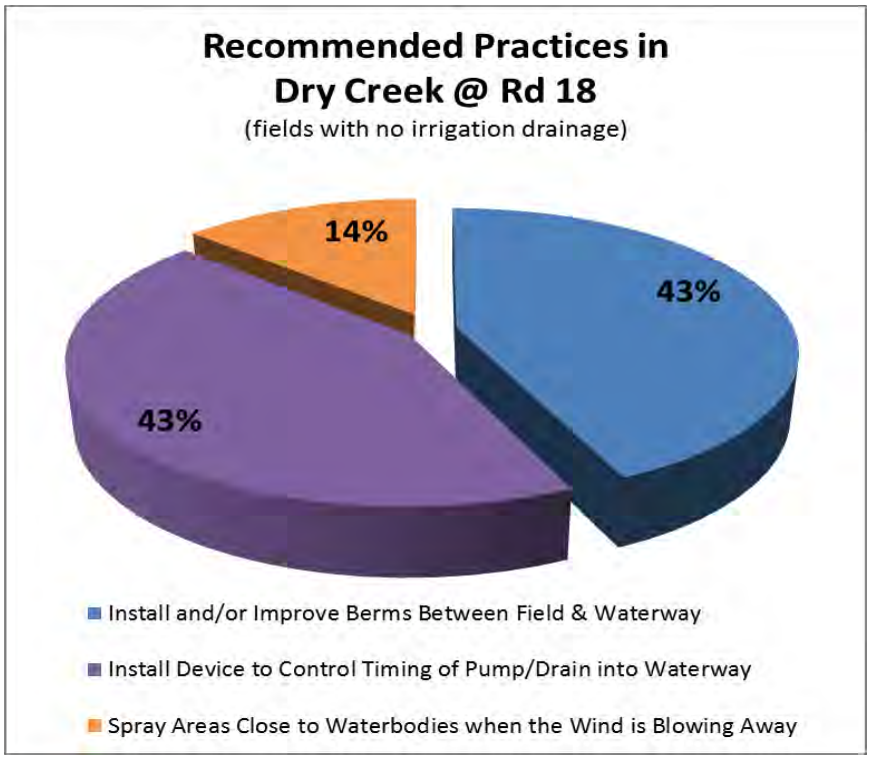
## 3. Documentation of member implementation of management practices to address water quality exceedance

The complete analysis of management practices implemented in the Dry Creek @ Rd 18 site subwatershed was reported in the ESJWQC 2013 MPUR. Results from that analysis are described in the section below.

The Coalition contacted 17 targeted growers who farm 4,710 acres within the Dry Creek @ Rd 18 site subwatershed. Management practices were documented for 53% of the acreage identified as having direct drainage. The Coalition met individually with growers to discuss water quality concerns, document current management practices, and recommend additional practices. The majority of targeted growers implement several irrigation, erosion and sediment, and pest management practices; one or more management practices are currently implemented on all 4,710 acres. The Coalition reported current management practices for the site subwatershed in the 2012 MPUR (pages 107-112). The Coalition recommended additional practices designed to manage spray drift and potential storm water runoff to 524 acres (Figure 3). In 2012, the Coalition contacted the three growers who received recommendations to implement additional practices to document the newly implemented management practices.

**Figure 3. Percentage of acreage represented by recommended management practices in Dry Creek @ Rd 18 (2012).**

Parcels with no irrigation drainage.




## *Summary of Implemented Management Practices (2011/2012)*

Table 6 presents a comparison of recommended management practices and newly implemented management practices for the Dry Creek @ Rd 18 site subwatershed. Growers implemented all practices recommended by Coalition representatives as well as additional practices not specifically recommended (Table 6, Figure 4). The implemented management practices include management of spray drift, irrigation tailwater management, and storm water runoff.

The Coalition contacted three growers for follow-up, and two of the three indicated no irrigation tailwater leaves their fields. The two growers with no irrigation drainage installed practices designed to prevent spray drift and improve management of potential storm water runoff. The practices include installing a device that controls the timing of discharge, installing and/or improving berms between fields and waterways, and spraying areas close to waterbodies when the wind is blowing away from the fields (Figure 4).

The third grower contacted for follow-up indicated irrigation drainage occurred from their property in 2012, but reported no irrigation drainage from their fields during initial contact in 2011. The grower implemented practices to improve the management of irrigation tailwater and possible storm water runoff from 189 acres. The grower installed a device that controls the timing of discharge, installed

and/or improved berms between fields and waterways, and reduced the amount of water used during surface irrigation (Figure 5).

**Table 6. Comparison of recommended and implemented management practices in the Dry Creek @ Rd 18 site subwatershed.**

| Management Practice | Recommended Practices | | Implemented Practices | | % Recommended Acreage with Implemented Practices |
|---|---|---|---|---|---|
| | # Growers | Acres | # Growers | Acres | |
| **No irrigation drainage from property** | | | | | |
| Install and/or improve berms between field & waterway | 1 | 213 | 1 | 213 | 100% |
| Install Device to Control Timing of Pump/Drain into Waterway | 1 | 213 | 1 | 213 | 100% |
| Spray areas close to waterbodies when the wind is blowing away from them | 1 | 122 | 1 | 122 | 100% |
| **Yes, irrigation drainage from property** | | | | | |
| Install and/or improve berms between field & waterway | 1 | 189 | 1 | 189 | 100% |
| Install Device to Control Timing of Pump/Drain into Waterway | 1 | 189 | 1 | 189 | 100% |
| Reduce amount of water used in surface irrigation[1] | 0 | 0 | 1 | 189 | NA |

[1]Management practice not specifically recommended by Coalition representative for grower's operation.

**Figure 4. Percentage of acreage represented by newly implemented management practices in Dry Creek @ Rd 18.**

Parcels with no irrigation drainage.

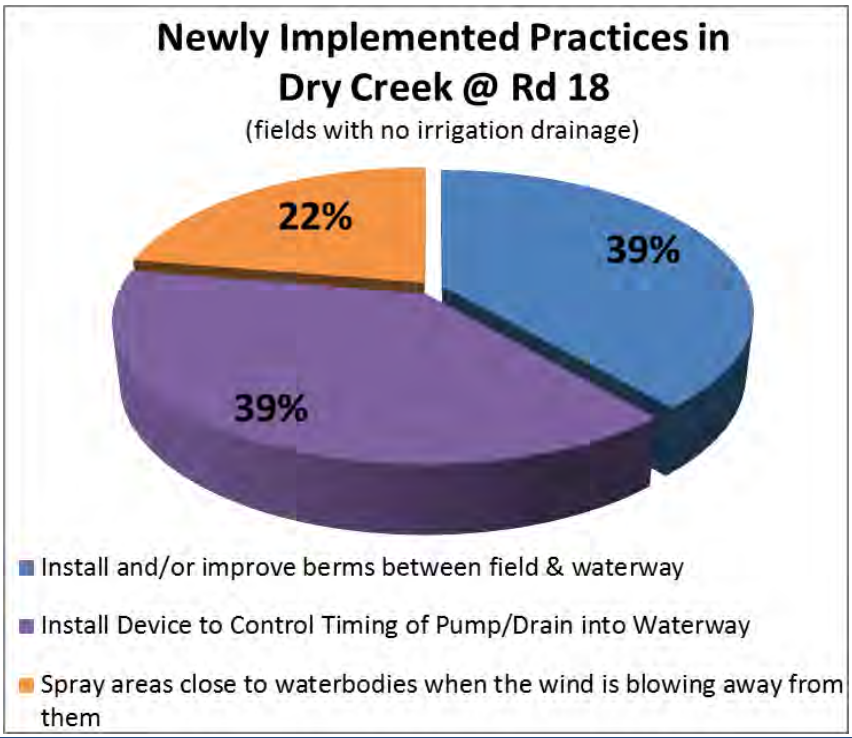
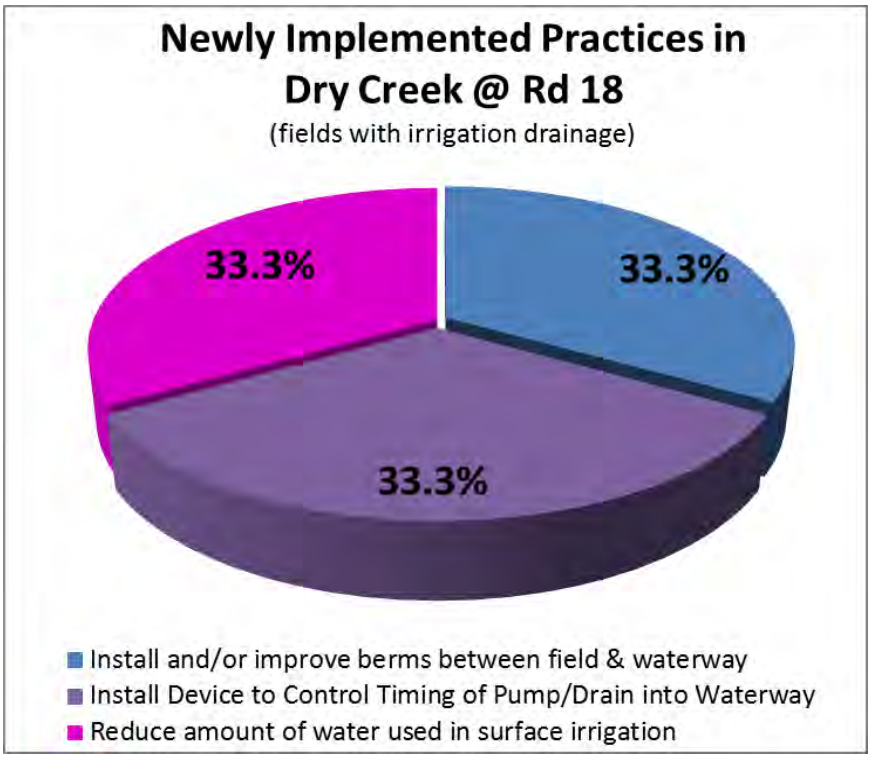


**Figure 5. Percentage of acreage represented by newly implemented management practices in Dry Creek @ Rd 18.**

Parcels with irrigation drainage.




## 4. Demonstration management practices implemented by members are effective in addressing water quality impairment

### *Justification for Removal*

The Coalition's focused management practice outreach and tracking strategy is effective at improving water quality. Monitoring results indicate three years of monitoring with no exceedances of the WQTL for chlorpyrifos. Therefore, the Coalition requests that chlorpyrifos be removed from the Dry Creek @ Rd 18 site subwatershed management plan and MPM schedule.

### *Future Monitoring*

As indicated in the WDR, Dry Creek @ Rd 18 is a Represented site within Zone 6. During the 2014 WY, monitoring will occur according to the schedules outlined in the MPU; MPM is scheduled for chlorpyrifos, diuron, copper, lead, water column toxicity to *S. capricornutum*, and sediment toxicity to *H. azteca* based on months of past exceedances and review of PUR data. Field parameters (DO, pH, and SC) are measured during every monitoring event.

# DRY CREEK @ WELLSFORD RD

## 1. Demonstration through evaluation of monitoring data that water quality impairment is no longer occurring

**Constituents Requested for Management Plan Completion:**

- Chlorpyrifos
- *Ceriodaphnia dubia* water column toxicity

### *Subwatershed Overview and Monitoring History*

Monitoring at Dry Creek @ Wellsford Rd was initiated during the storm season of 2005 and has continued since then. Assessment Monitoring at this site occurred in 2011. During the 2014 WY, all constituents are monitored monthly as part of Core site monitoring. Management Plan Monitoring began at the site in 2009 and has continued through 2014. The Dry Creek @ Wellford Rd subwatershed includes an upstream location (Dry Creek @ Waterford Rd) where additional monitoring occurred in 2007.

The Coalition began conducting outreach and education in the Dry Creek @ Wellsford Rd site subwatershed in 2007. Focused outreach occurred in Dry Creek @ Wellsford Rd from 2008 through 2010. The Coalition identified growers with the greatest likelihood of contributing to the water quality impairments. The Coalition contacted these growers in 2008 to document existing management practices and encouraged the implementation of additional management practices. The Coalition followed up with targeted growers in 2009 to determine if additional management practices were implemented.

### *Constituent Monitoring Results and Sourcing*

**Chlorpyrifos**

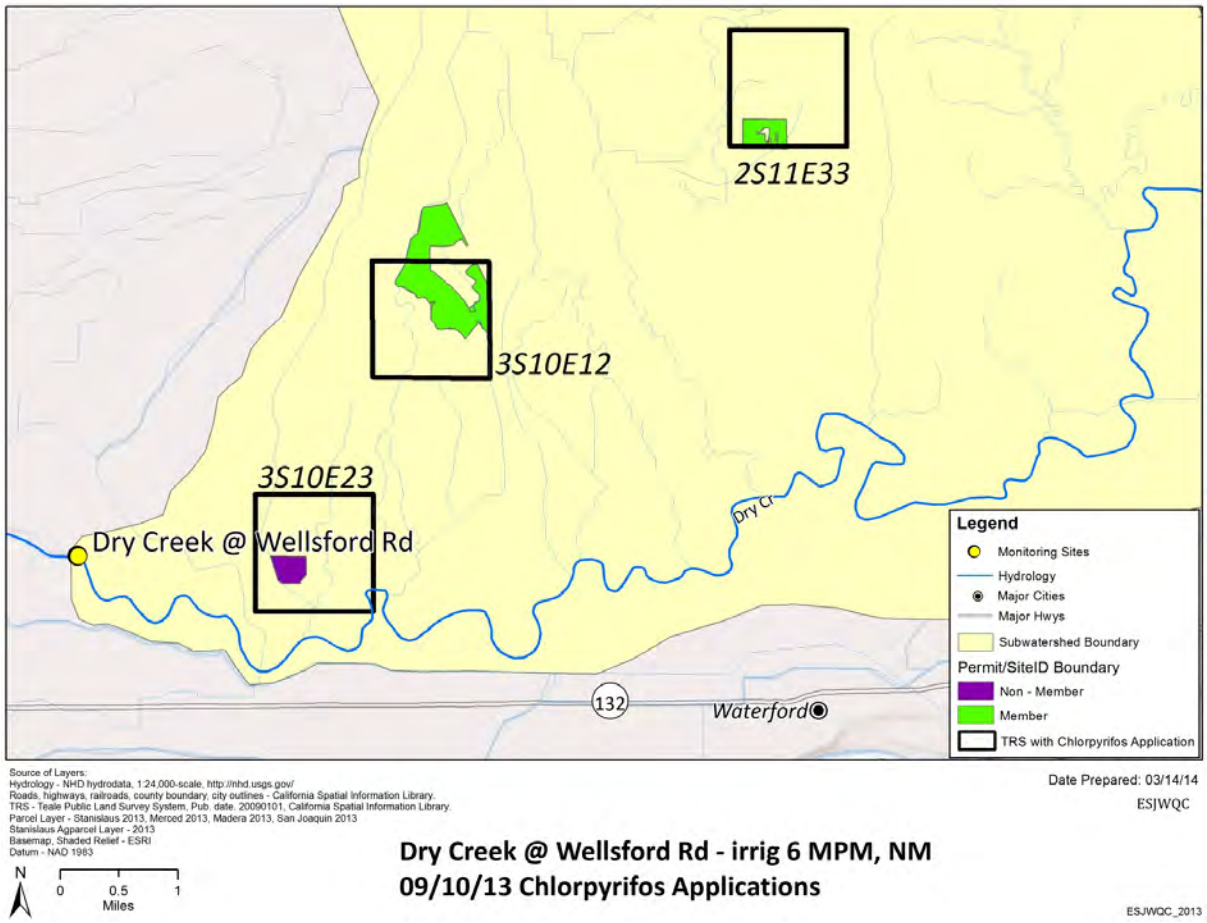
Exceedances of the WQTL for chlorpyrifos have occurred 10 times in samples collected from Dry Creek @ Wellsford Rd, once in 2005 (August), twice in 2006 (July and August), twice in 2007 (July and September), once in 2008 (July), once in 2009 (August), once in 2010 (July), and twice in 2013 (September and October). The two exceedances in 2013 were associated with non-member applications of chlorpyrifos next to the creek. Since the July 2010 exceedance, the Coalition has monitored for chlorpyrifos 22 times (during 2011 Assessment Monitoring, 2013 MPM, and 2014 Core site monitoring –results through April 2014). The PUR data indicate chlorpyrifos use in the Dry Creek @ Wellsford Rd site subwatershed has fluctuated since the first exceedance in 2005. The year with highest chlorpyrifos use was 2012 (10,918 lbs AI across 6782 acres of almonds, corn, grapes, and walnuts); the lowest use since outreach began was in 2011 (3359 lbs AI on 2183 acres of almonds, apple, corn, grapes, and walnuts).

Both exceedances that occurred during 2013 (September and October) were due to non-member applications of chlorpyrifos. The PUR data associated with the September 10, 2013 exceedance indicated that from August 24, 2013 through September 10, 2013 a total of 11 applications (products include Drexel, Lorsban and Warhawk) ranging between 0.31 and 80.80 lbs AI were applied. Applications of 280 lbs AI on 214 acres of corn and walnut crops were associated with the September exceedance. In addition, applications were made by ground and aerial spray methods where it is possible for chlorpyrifos to enter the waterway via drift. Two of the three parcels with applications associated with this exceedance (corn and walnuts) are farmed by Coalition members; however, these parcels are located near the outer boundary of the subwatershed are most likely too far (more than 2 miles) away from Dry Creek to have contributed to the exceedance (Figure 6). The Coalition traced the cause of the exceedance to a parcel next to the waterbody which has a much higher likelihood of draining directly to the creek and a higher potential for spray drift reaching the creek. Chlorpyrifos applications to corn were made to this non-member parcel located within a mile of the creek and along a canal/lateral that drains directly to Dry Creek (Figure 6).

The Coalition queried the PUR database for applications associated with the exceedance of the WQTL for chlorpyrifos that occurred October 15, 2013. Only one application occurred within the 30 day timeframe associated with this exceedance (163 lbs AI across 162 acres of alfalfa). This application was made by a non-member and was also a dairy.

The end of three years of monitoring with no exceedances is July 2014; however, the Coalition anticipates those laboratory data to become available before the Regional Board reviews this letter and therefore is requesting that the constituent be removed from a management plan once July data has been reviewed. If the July monitoring data indicate an exceedance of the WQTL for chlorpyrifos at the site, the Coalition will notify the Regional Board.

**Figure 6. Dry Creek @ Wellsford Rd chlorpyrifos applications associated with September 10, 2013 exceedance.**




### *Ceriodaphnia dubia* water column toxicity

*C. dubia* water column toxicity can be caused by pesticides. The Dry Creek @ Wellford Rd subwatershed has been monitored for *C. dubia* water column toxicity 50 times since 2005. Two instances of *C. dubia* toxicity in the Dry Creek @ Wellford Rd site subwatershed have occurred since the Coalition began monitoring at the site, once in 2005 (February, 80% survival compared to the control) and once in 2006 (September, 70% survival compared to the control). Resampling did not occur in 2005, and no toxicity occurred during the 2006 resampling event. Due to minimal mortality, TIEs were not conducted on either of the toxic samples. There were no detections of pesticides during either sampling event and therefore there is little evidence to determine the cause of toxicity for either event.

Since the last toxicity to *C. dubia* in September 2006, the Coalition has sampled 35 times, without any toxicity. Since the September 2006 toxicity, the Coalition has completed 3 years of monitoring with no toxicity to *C. dubia* (2007, 2008, and 2011) and requests the constituent be removed from management plan. The Coalition will sample for toxicity to *C. dubia* during Core site monitoring at Dry Creek @ Wellsford Rd on a monthly basis during the 2014 and 2015 WYs.

## 2. Documentation of education and outreach to members where water quality impairment occurred

### *Summary of Outreach*

The Coalition initiated outreach in 2007 and has taken several actions to address water quality impairments in the Dry Creek @ Wellsford Rd site subwatershed. The Coalition conducted individual meetings with 22 growers in 2009 and 2010 and three growers in 2011 to discuss water quality impairments, review each grower's operation, and document current management practices. Management practices were recommended to several growers. All targeted growers were contacted again to determine if recommended and/or new practices were implemented. As a result of outreach, targeted growers have made adjustments to their operations, including implementing new management practices.

The Coalition continues to provide outreach to all members within the subwatershed. Through grower notifications and grower meetings, the Coalition informs members of water quality results, relevant management practices that can eliminate water quality impairments, availability of funding to assist in the implementation of management practices, results of studies of management practice efficacy, and management practice implementation and tracking activities. In addition, this subwatershed remains a high priority subwatershed for other constituents and outreach continues with growers who have the greatest likelihood of contributing to those exceedances.

## 3. Documentation of member implementation of management practices to address water quality exceedance

The complete analysis of management practices implemented in the Dry Creek @ Wellsford Rd site subwatershed was reported in the ESJWQC 2011 MPUR. Results from that analysis are described in the section below.

Between 2009 and 2010, the Coalition contacted 25 targeted growers who farm 6,392 acres within the Dry Creek @ Wellsford subwatershed. This includes a single grower who had recently joined the Coalition and was added to the targeted grower list in 2010 although the Coalition had already completed initial contacts with all other growers. A summary of currently implemented and recommended management practices for the Dry Creek @ Wellsford Rd subwatershed can be found in the 2011 MPUR (pages 57-60).

Twenty-three growers participated in follow-up contacts. Two of the 25 targeted growers who participated in initial contacts are no longer farming their parcel(s) and therefore no follow-up contacts were conducted with these growers. A preliminary analysis of follow-up contacts with 22 growers can be located in the 2011 MPUR (pages 71-73). However, the single grower that was initially contacted in 2010 was contacted again in 2011 to determine if new management practices were implemented in 2010 and/or 2011.

## *Summary of Implemented Management Practices (2009-2011)*

Table 7 provides acreage totals for recommended management practices compared to newly implemented management practices from 2009, 2010 and 2011 for the Dry Creek @ Wellsford Rd subwatershed. Figure 8 includes each newly implemented management practice as a percentage of the overall acreage. All recommended practices were for parcels with no irrigation drainage; implemented practices occurred on land with and without drainage (Table 7). Overall, newly implemented management practices include shutting off outside nozzles when spraying outer rows next to surface water, constructing drainage basins/sediment ponds, maintaining filter strips at least 10 feet wide around field perimeters, allowing grass to grow in the centers of orchard rows, using recirculation/tailwater return systems, and using less water during surface irrigation (Table 7, Figure 7). In addition, some growers indicated they implemented management practices that were not recommended by the Coalition. These practices were implemented on 2,586 acres (Table 7).

All practices recommended to growers in the Dry Creek @ Wellsford Rd subwatershed were either implemented or were no longer applicable for a grower's operation. Three growers farming 524 acres received the recommendation to shut off outside nozzles when spraying outer rows next to sensitive sites, and all three growers implemented this additional practice (Table 7). One member farming 45 acres of orchards indicated in the follow-up contact that the drainage ditches around the fields were removed and therefore the management practice to plant or allow vegetation to grow along the ditches was no longer applicable. The same grower informed Coalition representatives during follow-up contact that he continues to maintain vegetation buffer strips around the perimeter of fields.

In addition to recommended management practices, several other members indicated that they implemented new management practices between 2009 and 2011 without any specific recommendations from the Coalition (Table 7). One grower, farming 107 acres, now allows grass to grow in the center of his orchard rows as a result of discussions with Coalition representatives. Two growers, farming 443 acres, installed recirculation/tailwater return systems on their properties. A single grower farming 121 acres constructed a drainage basin/sediment pond. Another grower farming 28 acres installed filter strips at least 10 feet wide around their field perimeter, and one grower with 162 acres reduced the amount of water used during surface irrigation.

Question 17 of the follow-up survey allows growers the opportunity to record implemented management practices that were not recommended by the Coalition (2011 MPUR, page 69 and Table 18). Five growers farming 1,201 acres specified that they implemented new management practices between 2009 and 2011. One of these growers, farming 121 acres, increased the size of berms between his fields and Dry Creek to better manage storm water runoff. The other four growers did not specify the type of management practice implemented. In addition, one grower farming 2,450 acres with irrigation drainage also indicated he implemented new management practices not discussed with the Coalition (Table 7).

**Table 7. Comparison of recommended MPs and implemented MPs in Dry Creek @ Wellsford Rd.**

| Management Practice (Separated by No Drainage vs Drainage) | Recommended Practices | | Implemented Practices | | % Recommended Acreage with Implemented Practices[4] |
|---|---|---|---|---|---|
| | # Growers | Acres | # Growers | Acres | |
| **No irrigation drainage from property** | | | | | |
| Shut off outside nozzles when spraying outer rows next to sensitive sites | 3 | 524 | 3 | 524 | 100% |
| Vegetation is planted along or allowed to grow in ditches | 1 | 45 | 0 | 0 | 0% |
| Drainage Basins (Sediment Ponds)[1] | 0 | 0 | 1[2] | 121[2] | NA |
| Filter strips at least 10' wide around field perimeter | 0 | 0 | 1[2] | 28[2] | NA |
| Grass row centers | 0 | 0 | 1[2] | 107[2] | NA |
| Recirculation - Tailwater return system[1] | 0 | 0 | 2[2] | 443[2] | NA |
| Reduce amount of water used in surface irrigation | 0 | 0 | 1[2] | 162[2] | NA |
| Other (Not specified)[3] | NA | NA | 5[2] | 1,201[2] | NA |
| **Yes, irrigation drainage from property** | | | | | |
| Other (Not specified)[3] | NA | NA | 1 | 2,450 | NA |
| | | | | | |
| **Total Acreage with 1 or more Recommended Practices** | | | | | **569** |
| **Total Acreage with 1 or More Implemented Practices** | | | | | **5,036** |
| **Percent Of Acreage of Implemented Practices compared to Acreage of Recommended Practices[5]** | | | | | **885%** |

[1] Practices apply to storm drainage

[2] Management practice not specifically recommended by Coalition representative for grower's operation

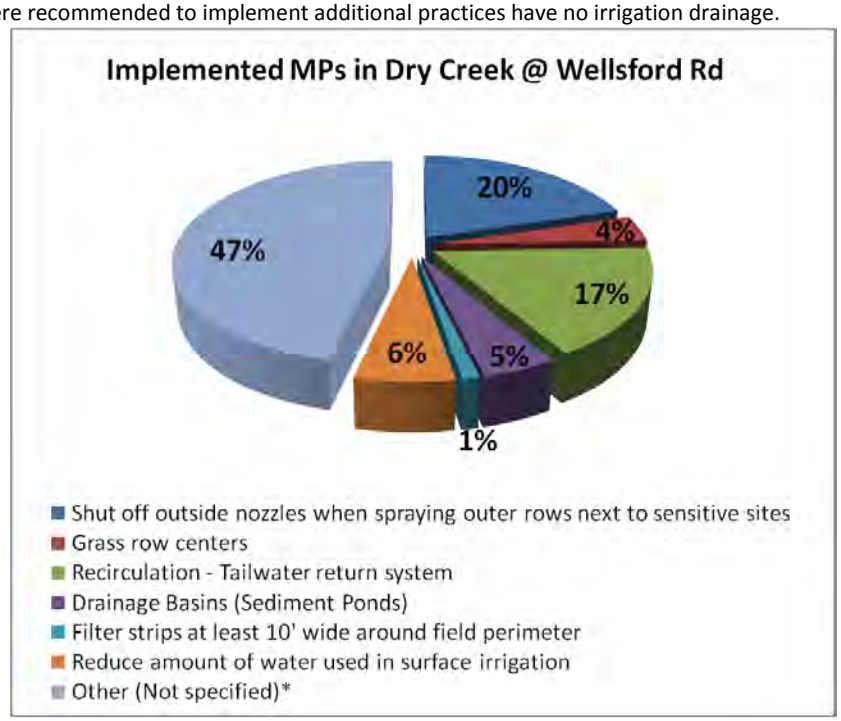
[3] If growers implemented management practices other than those asked about during Coalition follow-up, they were instructed to indicate so and provide a summary/explanation.

[4] Compared to the acreage associated with recommended practices. If there were no recommended practices but a grower implemented the new practice, this is noted with an NA for Not Applicable.

[5] Percentages over 100% are due to multiple management practices implemented across the same parcel.

**Figure 7. Percentage of acreage represented by newly implemented (2009/2010) management practices (MPs) for Dry Creek @ Wellsford Rd.**

All members that were recommended to implement additional practices have no irrigation drainage.




*Other (Not specified) – Refers to implemented MPs other than those specifically asked about during Coalition follow-up.

## 4. Demonstration management practices implemented by members are effective in addressing water quality impairment

### *Justification for Removal*

The Coalition's focused management practice outreach and tracking strategy is effective at improving water quality. Monitoring results indicate three years of monitoring with no toxicity to *C. dubia* and three years of monitoring with no exceedances of the WQTL for chlorpyrifos (as indicated by the PUR data, applications associated with the September and October 2013 exceedances were due to non-member applications). Based on focused outreach surveys and follow-up results, targeted growers implemented management practices and water quality improved. Therefore the Coalition requests that *C. dubia* water column toxicity and chlorpyrifos be removed from the Dry Creek @ Wellford Rd management plant and MPM schedule.

### *Future Monitoring*

As indicated in the WDR, Dry Creek @ Wellsford Rd is the Core site for Zone 1. During the 2014 WY, Core site monitoring and MPM will occur according to the schedules outlined in the MPU; MPM is scheduled for chlorpyrifos and sediment toxicity to *H. azteca* based on months of past exceedances and review of PUR data. Monthly monitoring for all constituents will occur as part of Core site monitoring during 2014 and 2015.

# DUCK SLOUGH @ GURR RD

## 1. Demonstration through evaluation of monitoring data that water quality impairment is no longer occurring

**Constituents Requested for Management Plan Completion:**

- Dissolved Oxygen
- Copper (Total and Dissolved)

### *Subwatershed Overview and Monitoring History*

Monitoring at Duck Slough @ Gurr Rd began during the irrigation season of 2004 and has continued since then. In 2006, 2007, and 2008 irrigation and storm monitoring occurred, Core Monitoring occurred in 2010, a portion of 2012, and 2013. In 2011, Assessment Monitoring was conducted and during the 2014 WY, all constituents are monitored monthly as part of Core site monitoring. Upstream monitoring occurred at Duck Slough @ Hwy 59 and North Slough @ Hwy 59 in 2008 (July and September) for MPM constituents and ended after September 2008 monitoring.

The Coalition began conducting outreach and education in the Duck Slough @ Gurr Rd site subwatershed in 2007. Focused outreach in Duck Slough @ Gurr Rd occurred from 2010 through 2012. The Coalition identified growers with the greatest likelihood of contributing to the water quality impairments. The Coalition contacted these growers in 2009 and 2010 to document existing management practices and encourage the implementation of additional management practices. The Coalition followed up with targeted growers in 2011 to determine which additional management practices were implemented.

### *Constituent Monitoring Results and Sourcing*

**Dissolved Oxygen**

A discussion of DO dynamics in surface water has been provided above. Low DO can be a result of low flow, elevated water temperature, or excessive nutrients leading to high Biological Oxygen Demand (BOD).

Monitoring for DO at Duck Slough @ Gurr Rd occurred from 2004 through 2014 (results through April). Dissolved Oxygen has been sampled 114 times at Duck Slough @ Gurr Rd and three times at Duck Slough @ Hwy 59. Eleven exceedances of the 7 mg/L WQTL for DO were reported from Duck Slough @ Gurr Rd; eight from Duck Slough @ Gurr Rd and three from the upstream site Duck Slough @ Hwy 59. Four of the 11 reported DO concentrations fell below 5 mg/L, one from Duck Slough @ Gurr Rd in September 2013 and three from Duck Slough @ Hwy 59 in 2008. However, no exceedances of DO occurred at the downstream location during the 2008 monitoring events illustrating the dynamic nature of DO in these systems (Table 11). Based on these monitoring results and a new exceedance criterion of 5.0 mg/L, only one measurement of DO should be considered an exceedance (September 2013), and the

Coalition requests that DO be removed from management plan at the site. Seven of the 11 reported exceedances of the DO objective should no longer be considered exceedances (Table 8).

**Table 8. Reported and reevaluated exceedances for DO based on WQTL criteria in Basin Plan.**
Previous DO WQTL was 7mg/L; DO WQTL based on the Basin Plan requirements is 5 mg/L.

| Monitoring Site | Sample Date | Exceedance Reported for DO |
|---|---|---|
| Duck Slough @ Gurr Rd | 7/12/2006 | 6.18 |
| | 9/13/2006 | 5.53 |
| | 6/19/2007 | 5.85 |
| | 3/15/2011 | 6.78 |
| | 7/9/2013 | 6.62 |
| | 8/13/2013 | 6.56 |
| | 12/10/2013 | 6.83 |

## Copper

There are a number of possible sources of copper in waterbodies within the Coalition region. Copper is applied as a fungicide to a variety of vegetable crops, grains, and fruit and nut orchards in forms such as copper hydroxide, copper sulfide, and copper oxide. Copper can also enter drainage systems from sources other than agriculture. Copper is commonly used by dairies and can also enter waterbodies through the weathering of rocks and soils. Automobile components may also contain copper and the wearing of brakes can add substantial amounts of copper to surface waters that pass through urban areas. A definitive source for copper has not been clearly identified in the Coalition region; however, there are four potential sources including 1) recent agricultural applications that move to surface waters either through storm/irrigation tailwater runoff or spray drift, 2) dairy uses of copper sulfate in footbaths discharged to surface waters, 3) resuspension of historic copper from upstream mining, brake pads and other anthropogenic uses, and 4) copper used for algae and aquatic weed control in irrigation supply ditches.

In October 2008, the Coalition began analyzing for both total metals and the dissolved fraction of metals to better characterize contamination in the water column. Dissolved metals more accurately reflect the bioavailable, and therefore the toxic fraction in the water column. Since the Coalition began analyzing for dissolved metals, exceedances of the hardness based WQTLs of metals have declined.

Monitoring for copper at Duck Slough @ Gurr Rd has resulted in nine exceedances of the hardness based WQTL for copper. Of these exceedances, eight were based on the measurement of total copper. These exceedances occurred in 2006 (June, July), 2007 (February, February, June, June), and 2008 (January, February). An exceedance of the WQTL for the dissolved fraction for copper occurred in May 2009. Since the May 2009 exceedance, copper has been monitored 29 times during Normal Monitoring and MPM with no exceedances (data through February 2014). The PUR data indicate that the year of lowest copper use in the Duck Slough @ Gurr Rd site subwatershed was 2009 (1,950 lbs AI across 591 acres of row crops, nuts and cherries) while the highest copper use was 2011 (7,348 lbs AI across 3,250 acres of almonds, cherries and grapes). There has been a slight decline in copper use from 2011 through 2013 (7,348 lbs AI, 6,675 lbs AI, and 5,974 lbs AI; respectively).

The May 2013 MPM event for copper concluded three years of monitoring with no copper exceedances at Duck Slough @ Gurr Rd. The Coalition collected eight additional months of copper monitoring data at Duck Slough @ Gurr Rd including monitoring through April 2014 with no exceedances.

## 2. Documentation of education and outreach to members where water quality impairment occurred

### *Summary of Outreach*

The Coalition initiated outreach in 2007 and has since taken several actions to address water quality concerns in the Duck Slough @ Gurr Rd subwatershed. The Coalition conducted individual meetings with six targeted growers in 2010 to discuss water quality impairments, review each grower's farming operation, and document current management practices. The Coalition encouraged growers to evaluate their farming operations to eliminate offsite movement of pesticides and recommended several management practices. All six targeted growers were contacted again in 2011 to determine if recommended and/or new practices were implemented.

The Coalition continues to provide outreach to all members within the Duck Slough @ Gurr Rd site subwatershed. Through grower notifications and meetings, the Coalition informs members of water quality results, relevant management practices to address water quality concerns, availability of funding for management practice implementation, results of studies of management practice efficacy, and management practice implementation and tracking activities. In addition, Duck Slough @ Gurr Rd remains a high priority subwatershed for other constituents and outreach continues with growers who have the greatest likelihood of contributing to exceedances.

## 3. Documentation of member implementation of management practices to address water quality exceedance

The complete analysis of management practices implemented in the Duck Slough @ Gurr Rd site subwatershed was reported in the ESJWQC 2012 MPUR. Results from that analysis are described in the section below.

The Coalition contacted six targeted growers who farm 46% of the total direct drainage area within the Duck Slough @ Gurr Rd subwatershed. The six members could drain directly to Duck Slough (including the potential for spray drift), were currently farming, and reported pesticide use of high priority constituents. All six growers completed initial contact and follow-up surveys (Table 9).

### *Summary of Current and Recommended Management Practices (2009/2010)*

The Duck Slough @ Gurr Rd subwatershed is dominated by field/row crops 80% of which could return irrigation tailwater to Duck Slough (Figure 8). Coalition representatives recommended installing a recirculation/tailwater return system, constructing a drainage basin/sediment pond to reduce runoff and using PAM during irrigation to reduce furrow erosion (Figure 9). When applicable, additional

recommendations (including spraying areas close to waterbodies when wind is blowing away from them) were made by the Coalition (Figure 9).

### Irrigation Water Management

All growers surveyed in the Duck Slough watershed indicated they surface irrigate (Table 25). All growers laser level their fields, 67% use recirculation/tailwater return systems and 50% use sediment retention ponds to prevent discharges to surface waters (Table 9).

### Storm Water Drainage

Thirty-three percent of respondents reported no storm water drainage and 67% report that they would drain only during 100 year storms. Half of the growers representing 66% of the acreage indicated they pump storm water to surface waters and are able to control the timing; one grower pumps to surface waters but cannot control the timing. Fifty percent of the targeted acreage in Duck Slough @ Gurr Rd has a recirculation/tailwater return system and/or settling pond installed (Table 9).

### Erosion & Sediment Management

All respondents indicated they control erosion and sediment delivery by some means (Table 9).

**Table 9. Duck Slough @ Gurr Rd subwatershed current management practices (2010).**

| Checklist | Question | Answer | Count of Answers | % Respondents | Sum of Acreage |
|---|---|---|---|---|---|
| Section 1: Irrigation Water Management | Irrigation management practices: | Laser leveled fields | 6 | 100% | 2656 |
| | | Recirculation - Tailwater return system | 4 | 67% | 1845 |
| | | Use drainage basins (sediment ponds) to capture and retain runoff | 3 | 50% | 1754 |
| | Irrigation System | Surface | 6 | 100% | 2656 |
| | Which do you base your irrigation schedule on: | Actual Moisture Levels in soil/crop needs | 6 | 100% | 2656 |
| Section 2: Storm Drainage | How are you able to manage storm drainage? | No Storm Drainage | 2 | 33% | 280 |
| | | Pump/Drain into waterway & able to control timing | 3 | 50% | 1754 |
| | | Pump/Drain into waterway & unable to control timing | 1 | 17% | 91 |
| | | Recirculation - Tailwater return system | 2 | 33% | 1309 |
| | | Settling Pond | 2 | 33% | 1309 |
| | When do you have storm water draining from your field? | No Storm Drainage | 2 | 33% | 811 |
| | | Only in heavy (100 year) storms | 4 | 67% | 1845 |
| Section 3: Erosion & Sediment Management | Sediment management practices: | Maintain vegetated filter strips around field perimeter at least 10' wide | 1 | 17% | 189 |
| | | Vegetation is planted along or allowed to grow along ditches | 5 | 83% | 2211 |
| | Do you apply herbicides during winter months? | Diuron (Karmex) | 1 | 17% | 484 |
| | | Do not apply | 1 | 17% | 622 |
| | | Glyphosate (Round-Up) | 2 | 33% | 536 |
| | | Other | 4 | 67% | 1845 |
| | | Paraquat (Gramaxone) | 3 | 50% | 1105 |
| | If waterway crosses or borders pasture, how is livestock managed? | N/A - Not Pasture | 6 | 100% | 2656 |
| Section 4: Pest Management | Spray management practices: | Adjust spray nozzles to match crop canopy profile | 6 | 100% | 2656 |
| | | Outside nozzles shut off when spraying outer rows next to sensitive sites | 1 | 17% | 445 |

| Checklist | Question | Answer | Count of Answers | % Respondents | Sum of Acreage |
|---|---|---|---|---|---|
| | | Spray areas close to waterbodies when the wind is blowing away from them | 5 | 83% | 2565 |
| | | Uses of nozzles that provide largest effective droplet size to minimize drift | 6 | 100% | 2656 |
| | Have you considered alternative strategies to using diazinon or chlorpyrifos either during the dormant or growing season? | N/A | 6 | 100% | 2656 |
| | How often is spray equipment calibrated? | Once per month | 1 | 17% | 445 |
| | | Prior to each application | 5 | 83% | 2211 |
| Section 5: Dormant Spray Management | How many acres are sprayed with dormant pesticides? | No Dormant Sprays | 6 | 100% | 2656 |

**Figure 8. Duck Slough @ Gurr Rd crop acreage information from member surveys (2010).**

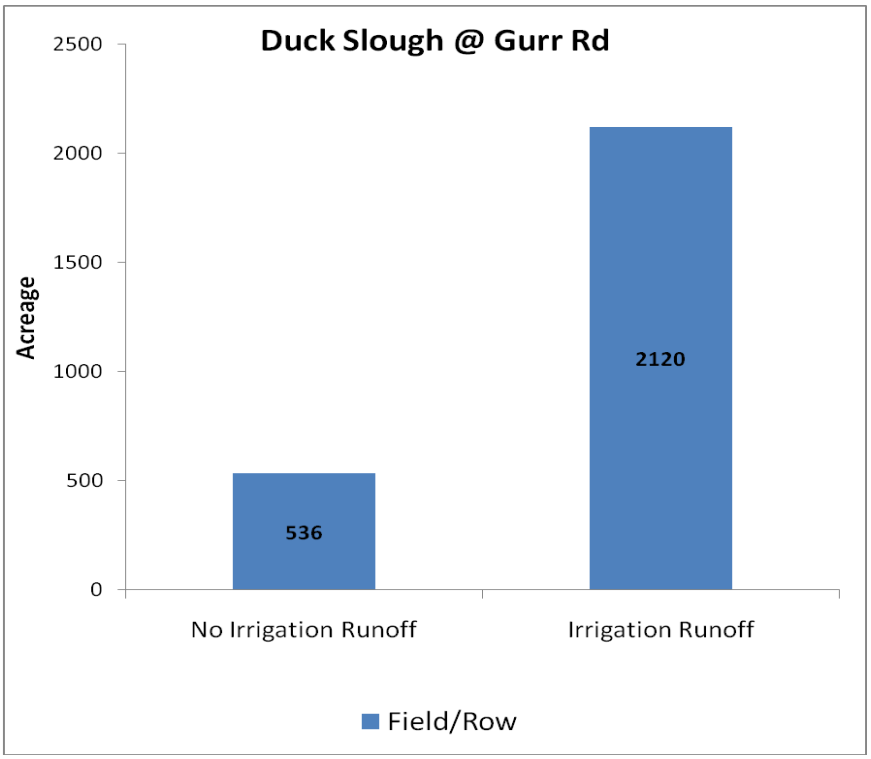
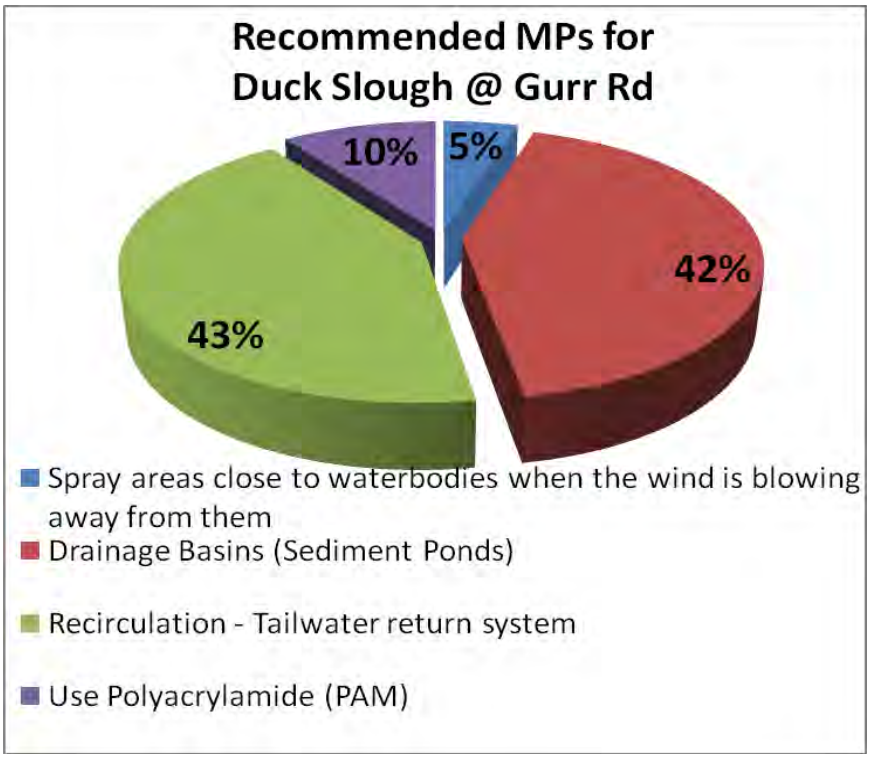


**Figure 9. Percent of acreage represented by recommended management practices for Duck Slough @ Gurr Rd.** Recommended practices are associated with parcels with irrigation drainage.




## *Summary of Implemented (2010/2011) Management Practices*

Table 10 provides a comparison of recommended management practices and newly implemented management practices for growers in the Duck Slough subwatershed. Growers in the Duck Slough subwatershed were able to implement management practices that focused on spray drift management including spraying areas close to waterbodies when the wind is blowing away from them and shutting off outside nozzles when spraying outer rows next to sensitive sites (Table 10, Figure 10). Growers implemented recommended practices as well as practices that were not recommended for their operations (accounting for 713 acres of land with and without irrigation drainage). Figure 10 displays each of the newly implemented management practices as a percentage of the overall acreage.

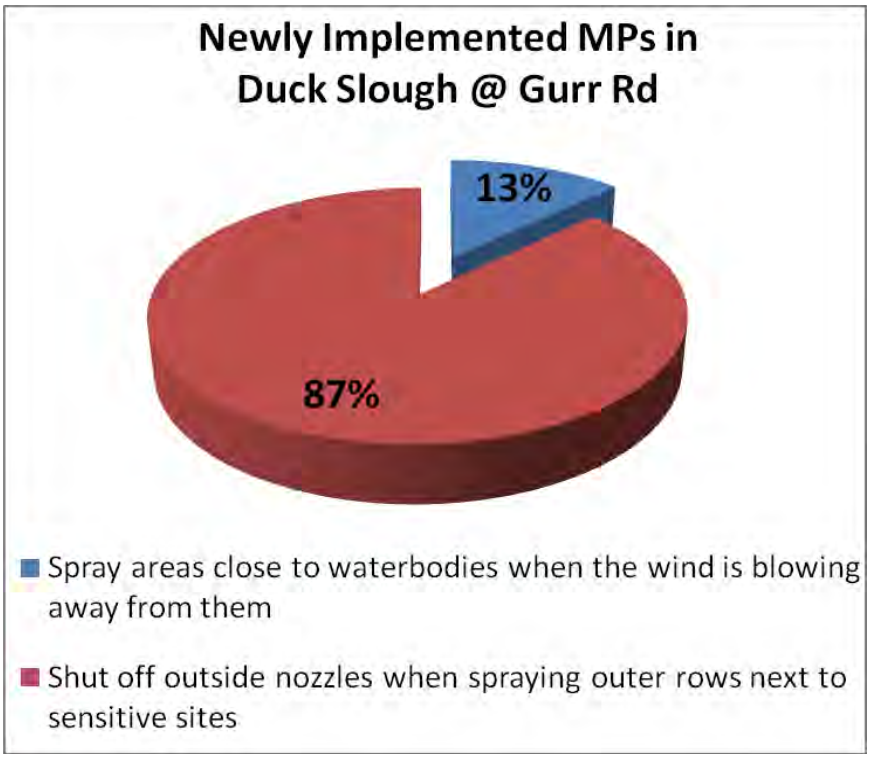
**Table 10. Comparison of recommended MPs and implemented MPs in Duck Slough @ Gurr Rd site subwatershed.**

| Management Practice (Separated by No Drainage vs Drainage) | Recommended Practices | | Implemented Practices | | % Recommended Acreage with Implemented Practices |
|---|---|---|---|---|---|
| | # Growers | Acres | # Growers | Acres | |
| **No irrigation drainage from property** | | | | | |
| Spray areas close to waterbodies when the wind is blowing away from them | 1 | 91 | 1 | 91 | 100% |
| **Yes, irrigation drainage from property** | | | | | |
| Drainage Basins (Sediment Ponds) | 2 | 811 | 0 | 0 | 0% |
| Recirculation - Tailwater return system | 2 | 811 | 0 | 0 | 0% |

| Management Practice (Separated by No Drainage vs Drainage) | Recommended Practices | | Implemented Practices | | % Recommended Acreage with Implemented Practices |
|---|---|---|---|---|---|
| | # Growers | Acres | # Growers | Acres | |
| Use Polyacrylamide (PAM) | 1 | 189 | 0 | 0 | 0% |
| Shut off outside nozzles when spraying outer rows next to sensitive sites | 0 | 0 | 1 | 622[1] | NA |
| | | | | | |
| Total Acreage with 1 or more Recommended Practices | | | | | 1,902 |
| Total Acreage with 1 or More implemented Practices | | | | | 713 |
| Percent Of Acreage of Implemented Practices compared to Acreage of Recommended Practices[2] | | | | | 37% |

[1]Management practice not specifically recommended by Coalition representative for grower's operation.
[2]Percentages over 100% are due to multiple management practices implemented across the same parcel.
NA – Not applicable; no recommendations for the management practice in the subwatershed.

**Figure 10. Percentage of acreage represented by newly implemented management practices for Duck Slough @ Gurr Rd.**




All growers who did not implement recommended management practices indicated they had no available resources to do so. One grower was unable to install the recommended recirculation/tailwater return system and drainage basin/sediment pond on his 622 acre property. However, the same grower indicated on his follow-up survey that he began to shut off outside nozzles when spraying outer rows next to sensitive sites (Table 10).

The Coalition will continue to notify its members about accessible funding and encourage them to take advantage of the opportunities.

## 4. Demonstration management practices implemented by members are effective in addressing water quality impairment

### *Justification for Removal*

The Coalition's focused management practice outreach and tracking strategy is effective at improving water quality. Monitoring results indicate three years of monitoring with no exceedances of the WQTLs for copper (total and dissolved). Based on focused outreach surveys and follow-up results, targeted growers in the Duck Slough @ Gurr Rd site subwatershed implemented management practices and improved water quality as reflected by the absence of exceedances of the copper WQTL. Therefore, the Coalition requests the removal of copper from the Duck Slough @ Gurr Rd site subwatershed management plan and MPM schedule.

Seven measurements of DO were reported as exceedances that are no longer considered exceedances when using the 5.0 mg/L objective (Table 8). Four of the DO concentrations reported would be considered exceedances of the 5 mg/L WQTL for DO, but three of the four were from the upstream site (Duck Slough @ Hwy 59) and occurred concurrently with a concentration of DO above the objective at the downstream site (Table 11). The only exceedance of DO below the 5 mg/L objective at Duck Slough @ Gurr Rd occurred in September 2013 and therefore DO should not be included in the Duck Slough @ Gurr Rd management plan. Therefore, the Coalition requests that DO be removed for the Duck Slough @ Gurr Rd management plan and MPM schedule.

**Table 11. Reported and reevaluated exceedances for DO based on WQTL criteria in Basin Plan.**
Previous DO WQTL was 7mg/L; DO WQTL based on the Basin Plan requirements is 5 mg/L.

| Sample Date | Duck Slough @ Gurr Rd DO (mg/L) Measurements | Duck Slough @ Hwy 59 DO (mg/L) Measurements |
|---|---|---|
| 6/24/2008 | 8.15 | 4.22 |
| 7/29/2008 | 8.34 | 4.83 |
| 9/30/2008 | 8.62 | 3.33 |

### *Future Monitoring*

As indicated in the WDR, Duck Slough @ Gurr Rd is the Core site for Zone 5. During the 2014 WY, Core site monitoring and MPM will occur according to the schedules outlined in the MPU. MPM is scheduled for copper (December through February and April through September), lead (January, February, and April through September), toxicity to *C. dubia* (February and March), and sediment toxicity to *H. azteca* (September). Monthly monitoring for all constituents will occur as part of Core site monitoring during 2014 and 2015. Field parameters (DO, pH, and SC) are measured during every monitoring event.

# HIGHLINE CANAL @ HIGHWAY 99

## 1. Demonstration through evaluation of monitoring data that water quality impairment is no longer occurring

**Constituents Requested for Management Plan Completion:**

- *Ceriodaphnia dubia* water column toxicity
- *Hyalella azteca* sediment toxicity

### *Subwatershed Overview and Monitoring History*

Monitoring at Highline Canal @ Hwy 99 began during the irrigation season of 2005 and has continued since then. Core Monitoring took place at the site from October 2008 through 2010, a portion of 2012, and 2013. Assessment Monitoring occurred at the site in 2011. In addition, MPM occurred at the Highline Canal @ Hwy 99 site subwatershed from 2007 through 2014. During the 2014 WY, all constituents are monitored monthly as part of Core site monitoring.

The Coalition began conducting outreach and education in the Highline Canal @ Hwy 99 site subwatershed in 2007. Focused outreach in Highline Canal @ Hwy 99 occurred from 2010 through 2012. The Coalition contacted the growers in 2009 and 2010 to document their existing management practices and encourage the implementation of additional management practices designed to eliminate water quality impairments. The Coalition followed up with targeted growers in 2011 to determine which additional management practices were implemented.

### *Constituent Monitoring Results and Sourcing*

**_Ceriodaphnia dubia_ water column toxicity**

*C. dubia* water column toxicity is indicative of pesticides in the water. There have been three instances of *C. dubia* toxicity in the Highline Canal @ Hwy 99 site subwatershed: May 2005 (47% survival compared to the control), March 2006 (0% survival compared to the control), and September 2006 (67% survival compared to the control). Resampling during May 19, 2005 resulted in toxicity with 0% survival compared to the control. Toxicity was not persistent during the March and September 2006 resamples. The TIE results were inconclusive. Samples collected from the March 2006 event had detections of chlorpyrifos and diazinon but no exceedances of the respective WQTLs. There were no detections of chlorpyrifos and/or diazinon associated with the May 2005 or September 2006 toxicities. After three years of monitoring with no exceedances of the WQTL for chlorpyrifos, the Coalition was approved in 2012 to remove chlorpyrifos from the management plan (approval May 30, 2012).

Since the last toxicity in September 2006, the Coalition has monitored for *C. dubia* toxicity at Highline Canal @ Hwy 99 for more than three years with no toxicity during Normal Monitoring (2007 and 2008), Assessment Monitoring (2011), MPM (2013), or Core site monitoring (January through May 2014). Therefore, the Coalition requests that monitoring for *C. dubia* toxicity be removed from the management plan at Highline Canal @ Hwy 99.

### *Hyalella azteca* sediment toxicity

The Coalition has sampled Highline Canal @ Hwy 99 for toxicity to *H. azteca* 18 times since monitoring began in 2005. Toxicity to *H. azteca* has occurred six times (two resampling events) at Highline Canal @ Hwy 99 in September 2005 (90% compared to the control), in August and September (resample) 2006 (90% and 80% compared to the control; respectively), and in March, August, and October (resample) 2008 (90%, 94%, and 92% compared to the control; respectively). Of the six toxic samples, only the September 2006 sample (80% compared to the control) was considered ecologically significant since the percent survival of *H. azteca* compared to the control in sediment collected from the five other events was greater than 80%. Since the last sediment toxicity in October 2008, the Coalition has monitored Highline Canal @ Hwy 99 six times for sediment toxicity to *H. azteca*. The most recent monitoring event took place in March 2014 and no toxicity occurred. September 2013 was the end of three years of monitoring during months of past exceedances.

## 2. Documentation of education and outreach to members where water quality impairment occurred

### *Summary of Outreach*

The Coalition initiated outreach in 2007 and has taken several actions to address water quality impairments in the Highline Canal @ Hwy 99 site subwatershed. The Coalition conducted individual meetings with 10 growers in 2009 and 2010 to review each grower's operation and document their existing management practices as well as discuss water quality concerns. Management practices were recommended to eliminate agricultural discharges. Targeted growers were contacted again the next year to determine if recommended and/or new practices were implemented.

The Coalition continues to provide outreach to all members within the Highline Canal @ Hwy 99 site subwatershed. Through grower notifications and meetings, the Coalition informs members of water quality results, management practices to eliminate water quality impairments, availability of funding for management practice implementation, results of studies of management practice efficacy, and management practice implementation and tracking activities. In addition, Highline Canal @ Hwy 99 site subwatershed remains a high priority subwatershed for other constituents. The Coalition initiated focused outreach at the upstream Highline Canal @ Lombardy Rd subwatershed in 2013, which should lead to further improvement of the water quality within the downstream reach of Highline Canal.

## 3. Documentation of member implementation of management practices to address water quality exceedance

The complete analysis of management practices implemented in the Highline Canal @ Hwy 99 site subwatershed was reported in the ESJWQC 2012 MPUR. Results from that analysis are described in the section below.

The Coalition contacted and received completed surveys from 10 targeted growers farming 33% of the direct drainage acreage within the Highline Canal @ Hwy 99 subwatershed. Of the 10 targeted growers,

one grower dropped their Coalition membership and one grower discontinued enrolling parcels within the Highline Canal subwatershed. Consequently, eight growers completed follow-up surveys (Table 12).

## *Summary of Current and Recommended Management Practices (2009/2010)*

Targeted growers in the Highline Canal @ Hwy 99 subwatershed primarily farm orchards, with some field/row crops. All growers reported no irrigation drainage from their properties in 2009 and 2010 (Figure 11). Highline Canal is an elevated canal and only a few parcels are able to pump water into the canal suggesting that spray drift would be the primary method for pesticides to reach the water. Therefore, Coalition representatives recommended three spray drift management practices to growers: spraying areas close to waterbodies when the wind is blowing away from them, using air blast applications when wind is between three and 10 mph, and using nozzles that provide the largest effective droplet size to minimize drift (Figure 12). Since targeted parcels in the Highline Canal do not drain, the Coalition believes eliminating spray drift is the most effective method to improve water quality in the canal.

### Erosion & Sediment Management / Storm Drainage

All respondents indicated they control erosion and sediment discharge by some means. Two growers indicated they have storm water discharge only in the case of a heavy 100-year storm (Table 12).

### Dormant Sprays

Three members farming 215 acres apply dormant sprays (Table 12). All three were informed of DPRs Dormant Spray Regulations and allow vegetation cover to grow prior to spraying.

### Pest Management

Half of the respondents indicated they considered alternatives to using diazinon or chlorpyrifos during the growing season, and the other half indicated the question is not applicable to their operation. Seven respondents indicated they calibrate their nozzles prior to each application, and two growers calibrate their nozzles once a year; one grower did not respond. The majority of growers took numerous steps to manage their spray drift including adjusting spray nozzles to match the canopy profile (90%), shutting outside nozzles when spraying outer two rows (90%), spraying areas close to waterbodies when the wind is blowing away from them (80%), using air blast applications when wind is between three to 10 mph (30%), and using nozzles that provide the largest effective droplet size to minimize drift (80%, Table 12).

**Table 12. Highline Canal @ Hwy 99 subwatershed current management practices (2010).**

| Checklist | Question | Answer | Count of Answers | % Respondents | Sum of Associated Acreage |
|---|---|---|---|---|---|
| Section 1: Irrigation Water Management | Irrigation management practices: | Laser leveled fields | 6 | 60% | 201 |
| | Irrigation System | Microirrigation | 4 | 40% | 226 |
| | | Sprinkler | 8 | 80% | 277 |
| | | Surface | 2 | 20% | 181 |
| | Which do you base your irrigation schedule on: | Actual Moisture Levels in soil/crop needs | 3 | 30% | 90 |
| | | Irrigation District Deliveries | 6 | 60% | 253 |

| Checklist | Question | Answer | Count of Answers | % Respondents | Sum of Associated Acreage |
|---|---|---|---|---|---|
| Section 2: Storm Drainage | How are you able to manage storm drainage? | No Storm Drainage | 8 | 80% | 218 |
| | When do you have storm water draining from your field? | No Storm Drainage | 8 | 80% | 323 |
| | | Only in heavy (100 year) storms | 2 | 20% | 45 |
| Section 3: Erosion & Sediment Management | Sediment management practices: | Grass Row Centers (Orchards, Vineyards) | 6 | 60% | 247 |
| | | Maintain vegetated filter strips around field perimeter at least 10' wide | 4 | 40% | 169 |
| | | Vegetation is planted along or allowed to grow along ditches | 5 | 50% | 153 |
| | Do you apply herbicides during winter months? | Do not apply | 5 | 50% | 140 |
| | | Glyphosate (Round-Up) | 3 | 30% | 148 |
| | | Goal | 1 | 10% | 121 |
| | | Other (product unknown) | 1 | 10% | 60 |
| | | Paraquat (Gramaxone) | 2 | 20% | 141 |
| | If waterway crosses or borders pasture, how is livestock managed? | N/A - Not Pasture | 10 | 100% | 368 |
| Section 4: Pest Management | Spray management practices: | Adjust spray nozzles to match crop canopy profile | 9 | 90% | 337 |
| | | Outside nozzles shut off when spraying outer rows next to sensitive sites | 9 | 90% | 337 |
| | | Spray areas close to waterbodies when the wind is blowing away from them | 8 | 80% | 312 |
| | | Use air blast applications when wind is between 3-10 mph and upwind of a sensitive site | 3 | 30% | 47 |
| | Spray management practices: | Use electronic controlled sprayer nozzles | 1 | 10% | 20 |
| | | Uses of nozzles that provide largest effective droplet size to minimize drift | 8 | 80% | 216 |
| Section 4: Pest Management | Have you considered alternative strategies to using diazinon or chlorpyrifos either during the dormant or growing season? | N/A | 5 | 50% | 102 |
| | | Yes | 5 | 50% | 266 |
| | How often is spray equipment calibrated? | Once per year | 2 | 20% | 70 |
| | | Prior to each application | 7 | 70% | 267 |
| Section 5: Dormant Spray Management | Dormant spray management practices: | Check weather conditions prior to spraying (i.e. storm status) | 2 | 20% | 181 |
| | | Maintain setback zones | 2 | 20% | 181 |
| | Do you apply when soil moisture is at field capacity? | N/A | 1 | 10% | 20 |
| | | No | 2 | 20% | 181 |
| | Have you been informed of DPR's Dormant Spray Regulations? | Yes | 3 | 30% | 201 |
| | How many acres are sprayed with dormant pesticides? | 120 Acres | 1 | 10% | 121 |
| | | 35 Acres | 1 | 10% | 20 |
| | | 60 Acres | 1 | 10% | 60 |
| | | No Dormant Sprays | 7 | 70% | 167 |
| | Prior to applying winter dormant sprays, what is the condition of your orchard floor? | Vegetative cover | 3 | 30% | 201 |

**Figure 11. Highline Canal @ Hwy 99 crop acreage information from member surveys (2010).**

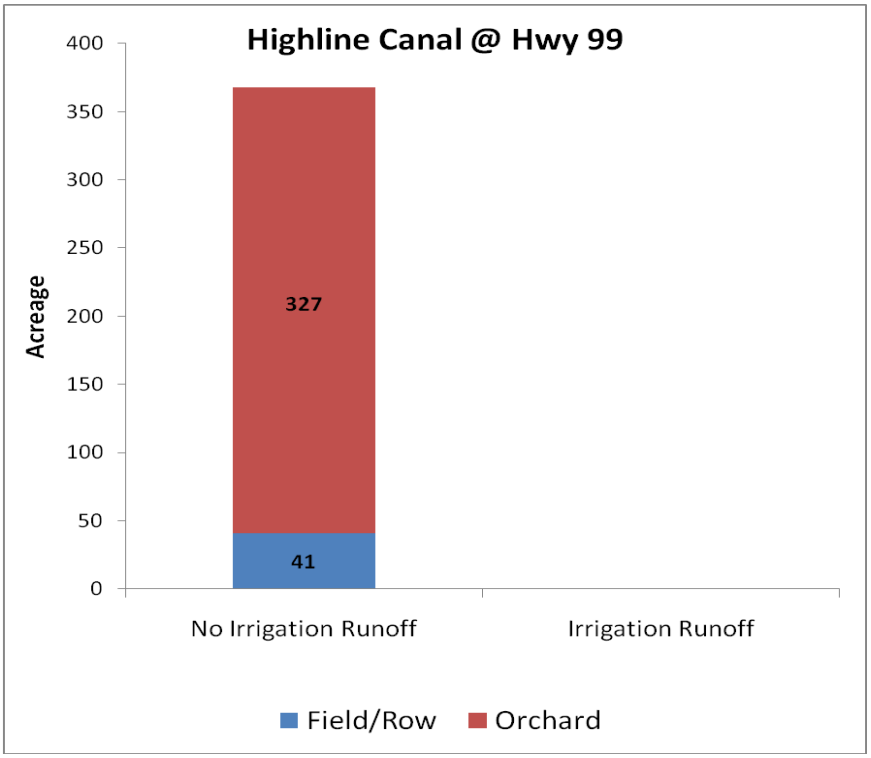
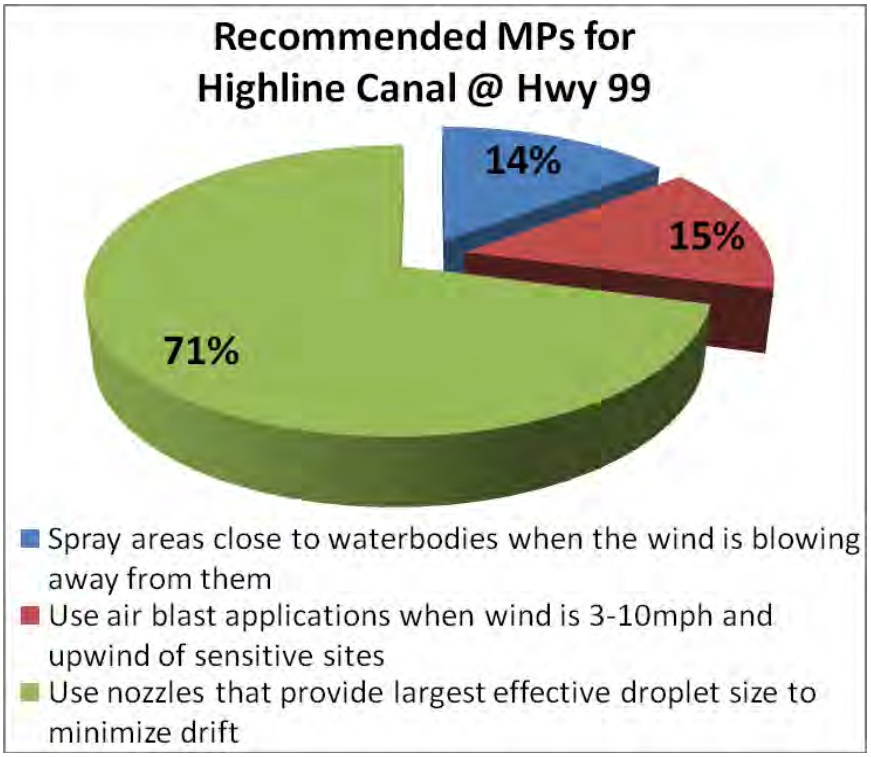



**Figure 12. Percent acreage represented by recommended management practices for Highline Canal @ Hwy 99.** Additional practices were recommended to parcels without irrigation drainage.



## *Summary of Implemented Management Practices (2010/2011)*

Table 13 presents a comparison of recommended management practices and newly implemented management practices for the Highline Canal @ Hwy 99 subwatershed. Newly implemented management practices include all recommended practices and practices not recommended by the Coalition. New practices were implemented on 368 acres and include spraying areas close to waterbodies when the wind is blowing away from them, using air blast applications when wind is between three and 10 mph and upwind of sensitive sites, using nozzles that provide largest effective droplet size to minimize drift, and using less water during surface irrigation (Table 13).

A single grower reported irrigation drainage during 2010. For parcels without irrigation drainage, newly implemented practices include reducing the amount of water used in surface irrigation, using air blast applications when the wind is 3-10 mph and upwind of sensitive sites and spraying areas close to waterbodies when the wind is blowing away from them (Figure 13). For parcels with irrigation drainage, growers reduced water use during irrigation and utilized nozzles that provided the largest effective droplet size (Figure 14).

**Table 13. Comparison of recommended MPs and implemented MPs in Highline Canal @ Hwy 99.**

| Management Practice | Recommended Practices | | Implemented Practices | | % Recommended Acreage with Implemented Practices |
|---|---|---|---|---|---|
| | # Growers | Acres | # Growers | Acres | |
| **No irrigation drainage from property** | | | | | |
| Spray areas close to waterbodies when the wind is blowing away from them | 1 | 25 | 1 | 25 | 100% |
| Use air blast applications when wind is 3-10 mph and upwind of sensitive sites | 1 | 25 | 1 | 25 | 100% |
| Reduce amount of water used in surface irrigation | 0 | 0 | 2 | 76[1] | NA |
| **Yes, irrigation drainage from property** | | | | | |
| Use nozzles that provide largest effective droplet size to minimize drift | 1 | 121 | 1 | 121 | 100% |
| Reduce amount of water used in surface irrigation | 0 | 0 | 1 | 121[1] | NA |
| | | | | | |
| **Total Acreage with 1 or more Recommended Practices** | | | | | **171** |
| **Total Acreage with 1 or More Implemented Practices** | | | | | **368** |
| **Percent Of Acreage of Implemented Practices compared to Acreage of Recommended Practices[2]** | | | | | **215%** |

[1]Management practice not specifically recommended by Coalition representative for grower's operation.
[2]Percentages over 100% are due to multiple management practices implemented across the same parcel.
NA – Not applicable; no recommendations for the management practice in the subwatershed.

**Figure 13. Percentage newly implemented management practice acreage for parcels with no irrigation drainage.**

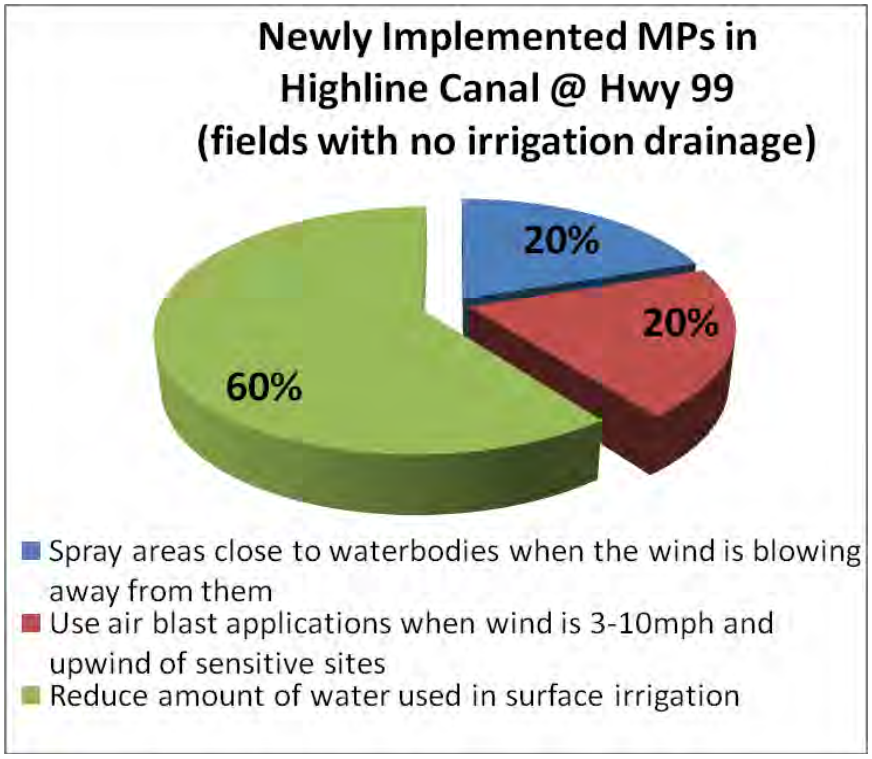
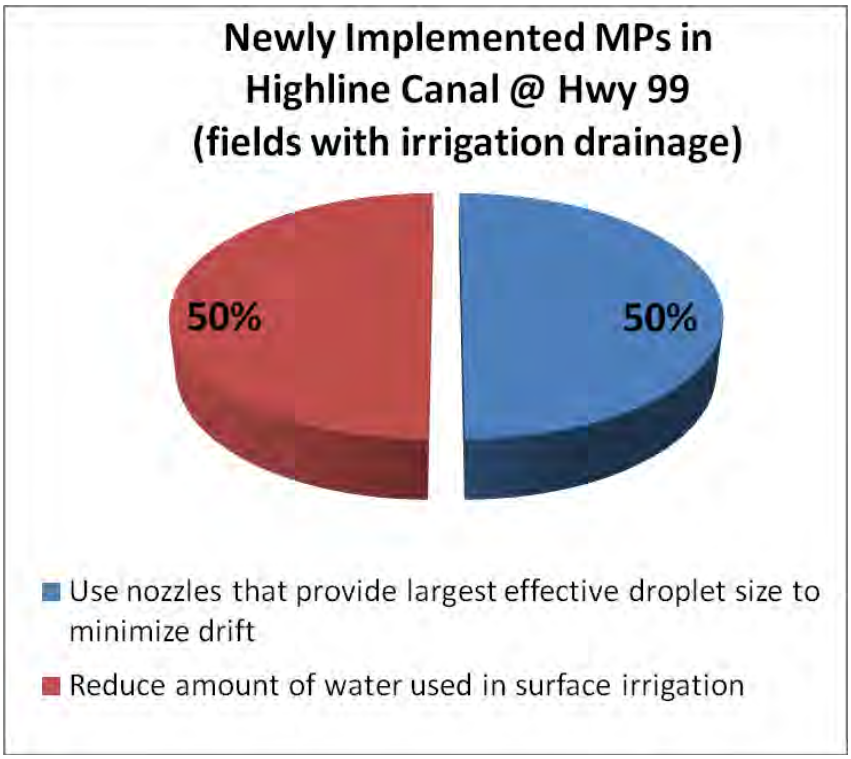



**Figure 14. Percentage newly implemented management practice acreage for parcels with irrigation drainage.**



## 4. Demonstration management practices implemented by members are effective in addressing water quality impairment

### *Justification for Removal*

Monitoring results indicate three years with no water column toxicity to *C. dubia* or sediment toxicity to *H. azteca*. In addition, the October 15, 2013 letter from the Regional Board stated that "once 2013 monitoring is completed, and if no additional exceedances occur the sediment toxicity can be petitioned for removal from the management plan at Highline Canal @ Hwy 99." The Coalition completed 2013 monitoring for sediment toxicity and no toxicity occurred. Based on the monitoring results detailed above, the Coalition requests that both *C. dubia* water column toxicity and *H. azteca* sediment toxicity be removed from the Highline Canal @ Hwy 99 management plan. Monitoring during the 2014 WY for all constituents will provide the Coalition with data to continue to evaluate water quality in the Highline Canal @ Hwy 99 subwatershed.

### *Future Monitoring*

As indicated in the WDR, Highline Canal @ Hwy 99 is one of the Core sites for Zone 3. During the 2014 WY, Core site monitoring and MPM will occur according to the schedules outlined in the MPU. Monthly monitoring for all constituents will occur as part of Core site monitoring during both 2014 and 2015.

# HIGHLINE CANAL @ LOMBARDY RD

## 1. Demonstration through evaluation of monitoring data that water quality impairment is no longer occurring

**Constituents Requested for Management Plan Completion:**

- *Hyalella azteca* sediment toxicity

### *Subwatershed Overview and Monitoring History*

Highline Canal @ Lombardy Rd is located upstream of the Highline Canal @ Hwy 99 site. Monitoring was initiated at this site during the 2005 storm season and continued through the 2008 irrigation season. Additional MPM occurred at the site in 2007 and 2008, and MPM during months of past exceedances was conducted in 2009, 2010, 2013, and 2014. Assessment Monitoring occurred at Highline Canal @ Lombardy Rd in 2011 and 2012.

The Coalition began conducting outreach and education in 2007. Focused outreach in Highline Canal @ Lombardy Rd began in 2013 and is ongoing through 2015. The Coalition identified growers with the greatest likelihood of contributing to water quality impairments. The Coalition initiated contacts with these targeted growers in 2013 to document existing management practices and to encourage the implementation of additional management practices designed to eliminate water quality impairments. The Coalition is in the process of following up with targeted growers to determine which additional management practices were implemented; results from follow-up contacts will be reported in the 2015 Annual Report due May 1, 2015.

### *Constituent Monitoring Results and Sourcing*

***Hyalella azteca* sediment toxicity**

The Coalition has sampled Highline Canal @ Lombardy Rd for toxicity to *H. azteca* 16 times since monitoring began in 2005. Toxicity to *H. azteca* occurred seven times at Highline Canal @ Lombardy Rd; during May 2005 and 2006 (74% and 50% compared to the control; respectively), August and September (resample) 2007 (92% and 55% compared to the control; respectively), and March, August, and October (resample) 2008 (91%, 62% and 82% compared to the control; respectively). Of the toxic samples, toxicity was persistent twice. Since the toxicity in October 2008, the Coalition has monitored Highline Canal @ Lombardy Rd seven times for sediment toxicity to *H. azteca*. The most recent monitoring event took place in March 2014 and no toxicity occurred.

## 2. Documentation of education and outreach to members where water quality impairment occurred

### *Summary of Outreach*

As mentioned above, the Coalition initiated general outreach in 2007 and has taken several actions to address water quality impairments in the Highline Canal @ Lombardy Rd subwatershed. The Coalition

conducted individual meetings with 22 growers in 2013 to discuss water quality impairments, review each grower's operation, and document current management practices. Management practices were recommended to eliminate agricultural discharges. The Coalition is in the process of following up with targeted growers to determine which additional management practices were implemented and those results will be reported in the 2015 Annual Report due May 1, 2015. The Coalition continues to provide outreach to all members within the Highline Canal @ Lombardy Rd subwatershed.

## 3. Documentation of member implementation of management practices to address water quality exceedance

The complete analysis of management practices implemented in the Highline Canal @ Lombardy Rd site subwatershed will be provided in the ESJWQC May 1, 2015 Annual Report. A preliminary analysis is described in the section below.

The Coalition completed initial contacts with the 20 targeted growers farming 4,226 acres within the Highline Canal @ Lombardy Rd site subwatershed. Management practices were documented for 46% of the acreage identified as having direct drainage. Coalition representatives discussed water quality concerns, the importance of preventing the offsite movement of all agricultural constituents, and recommend additional management practices to be implemented to eight growers.

Table 14 lists all the management practices recorded as implemented in the Highline Canal @ Lombardy Rd site subwatershed at this time. The Coalition will provide an analysis of all follow-up survey results in the 2015 Annual Report.

### *Summary of Current Management Practices (2013)*

All parcels surveyed in the site subwatershed contain field/row crops and orchards; 100% of the parcels reported no irrigation runoff (Figure 15).

#### Irrigation Water Management

The majority of the growers use drip or microspray (60%) and the remaining growers use a variety of flood, sprinkler and/or surface irrigation.

Twelve growers employed irrigation management practices such as laser leveled fields, utilizing recirculation/ tailwater return systems to manage irrigation runoff and/or drainage basins (sediment ponds) to capture and retain runoff. The growers all irrigate based on the actual moisture levels in the soil and crop needs and based on irrigation district deliveries (Table 14).

#### Storm Drainage

Seventy percent of the targeted growers, whose properties account for 76% of the acreage, report no storm water discharge and 30% of growers report that storm water runoff from fields can occur after the soil is saturated in late winter. All parcels with storm drainage have at least one management practice implemented to manage storm water runoff, either berms between the field and waterway, recirculation/ tailwater return systems and/or settling ponds (Table 14). The Coalition recommended to

one grower who farms 574 acres to install a device to control timing of pump/drain into the waterway (Figure 16).

### Erosion & Sediment Management

Seventeen growers implement one or more erosion and sediment management practices, including constructing wetlands, maintaining filter strips at least 10 feet wide around field perimeters, grass row centers, and planting vegetation along ditches (Table 14).

### Pest Management

Nineteen growers reported that they implement several spray management practices including calibrating equipment prior to every application, adjusting spray nozzles to match crop canopy profiles, shutting off outside nozzles when spraying outer rows next to sensitive sites, spraying areas close to waterbodies when the wind is blowing away from the waterbody, using air blast applications when the wind is between 3-10 mph and spraying takes place upwind of sensitive sites, and using nozzles that provide the largest effective droplet size to minimize drift. In addition, 13 growers also considered alternative strategies to using diazinon or chlorpyrifos (Table 14). The Coalition recommended additional spray management practices to eight growers (Figure 16).

### Dormant Spray Management

Of the 20 targeted growers, only seven reported applying pesticides to dormant orchards; however, all seven growers check weather conditions prior to spraying and five maintain setback zones. Additionally, four of the seven fields have vegetative cover/vegetative cover with sprayed berms or some vegetation prior to applications (Table 14).

**Table 14. Highline Canal @ Lombardy Rd site subwatershed current management practices (2013).**

| Checklist | Question | Answer | Count of Answers | % Respondents | Sum of Associated Acreage |
|---|---|---|---|---|---|
| Section 1: Irrigation Water Management | Irrigation management practices: | Laser leveled fields | 7 | 35% | 400 |
| | | Recirculation - Tailwater return system | 2 | 10% | 1815 |
| | | Use drainage basins (sediment ponds) to capture and retain runoff | 4 | 20% | 1717 |
| | Irrigation System | Microirrigation | 12 | 60% | 4310 |
| | | Other: Drip | 3 | 15% | 269 |
| | | Other: Flood | 1 | 5% | 59 |
| | | Sprinkler | 4 | 20% | 200 |
| | | Surface | 3 | 15% | 364 |
| | Which do you base your irrigation schedule on: | Actual Moisture Levels in soil/crop needs | 20 | 100% | 4914 |
| | | Irrigation District Deliveries | 1 | 5% | 59 |
| Section 2: Storm Drainage | How are you able to manage storm drainage? | Berms Between Field & Waterway (Install and/or Improve) | 5 | 25% | 2656 |
| | | No Storm Drainage | 14 | 70% | 3227 |
| | | Pump/Drain into waterway & unable to control timing | 1 | 5% | 43 |
| | | Recirculation - Tailwater return system (Storm Drainage Management) | 2 | 10% | 1815 |
| | | Settling Pond | 2 | 10% | 2015 |
| | When do you have storm water draining from your field? | After soil is saturated-late winter | 6 | 30% | 1687 |
| | | No Storm Drainage | 14 | 70% | 3226 |
| Section 3: Erosion & Sediment Management | Do you apply herbicides during winter months? | Do not apply | 4 | 20% | 987 |
| | | Glyphosate (Round-Up) | 15 | 75% | 3868 |
| | | Goal | 12 | 60% | 2818 |
| | | Other: Prowl, Surtlan | 2 | 10% | 72 |
| | | Paraquat (Gramaxone) | 6 | 30% | 1236 |
| | | Simazine (Princep) | 2 | 10% | 72 |
| | If waterway crosses or borders pasture, how is livestock managed? | N/A - Not Pasture | 20 | 100% | 4914 |
| | Sediment management practices: | Constructed wetlands | 1 | 5% | 115 |
| | | Grass Row Centers (Orchards, Vineyards) | 16 | 80% | 4593 |
| | | Maintain vegetated filter strips around field perimeter at least 10' wide | 5 | 25% | 1290 |
| | | Vegetation is planted along or allowed to grow along ditches | 7 | 35% | 2054 |
| Section 4: Pest Management | Have you considered alternative strategies to using diazinon or chlorpyrifos either during the dormant or growing season? | N/A | 4 | 20% | 911 |
| | | No | 3 | 15% | 462 |
| | | Yes | 13 | 65% | 3540 |
| | How often is spray equipment calibrated? | Never | 2 | 10% | 60 |
| | | Once per year | 2 | 10% | 72 |
| | | Prior to each application | 16 | 80% | 4782 |
| | Spray management practices: | Adjust spray nozzles to match crop canopy profile | 18 | 90% | 4711 |
| | | Outside nozzles shut off when spraying outer rows next to sensitive sites | 19 | 95% | 4901 |
| | | Spray areas close to waterbodies when the wind is blowing away from them | 12 | 60% | 4394 |

| Checklist | Question | Answer | Count of Answers | % Respondents | Sum of Associated Acreage |
|---|---|---|---|---|---|
| | | Use air blast applications when wind is between 3-10 mph and upwind of a sensitive site | 10 | 50% | 3381 |
| | | Uses of nozzles that provide largest effective droplet size to minimize drift | 19 | 95% | 4901 |
| Section 5: Dormant Spray Management | Do you apply when soil moisture is at field capacity? | N/A | 2 | 10% | 103 |
| | | No | 5 | 25% | 2077 |
| | Dormant spray management practices: | Check weather conditions prior to spraying (i.e. storm status) | 7 | 35% | 2180 |
| | | Maintain setback zones | 5 | 25% | 2108 |
| | Have you been informed of DPR's Dormant Spray Regulations? | N/A | 5 | 25% | 518 |
| | | Yes | 2 | 10% | 1662 |
| | How many acres are sprayed with pesticides to dormant orchards? | 305 Acres | 1 | 5% | 305 |
| | | 31 Acres | 1 | 5% | 66 |
| | | 36 Acres | 3 | 15% | 109 |
| | | 80 Acres | 1 | 5% | 75 |
| | | 820 Acres | 1 | 5% | 1625 |
| | | No Dormant Sprays | 13 | 65% | 2734 |
| | Prior to applying winter dormant sprays, what is the condition of your orchard floor? | No Vegetation & Not Disked | 3 | 15% | 109 |
| | | Some vegetation | 1 | 5% | 75 |
| | | Vegetated Cover w/Sprayed Berms | 1 | 5% | 66 |
| | | Vegetative cover | 2 | 10% | 1930 |

**Figure 15. Highline Canal @ Lombardy Rd crop acreage information from member surveys (2013).**

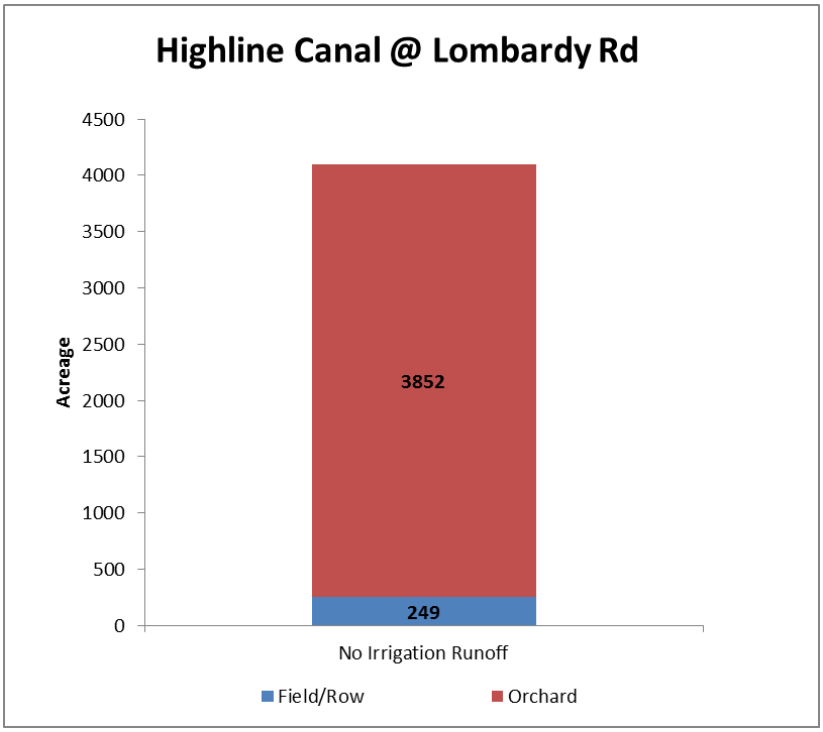
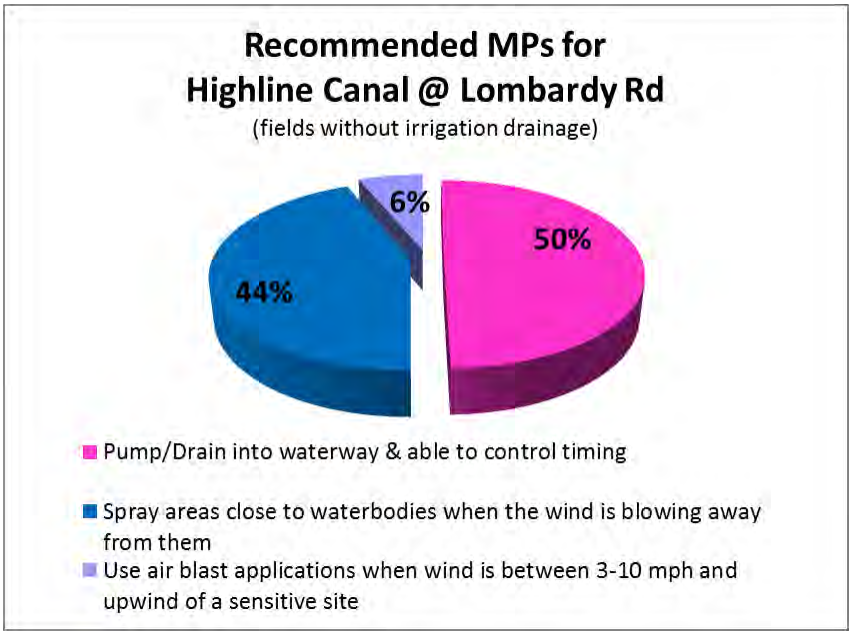



**Figure 16. Highline Canal @ Lombardy Rd recommended management practice (2013) acreage percentage for members without irrigation drainage.**



## 4. Demonstration management practices implemented by members are effective in addressing water quality impairment

### *Justification for Removal*

The Coalition's focused management practice outreach and tracking strategy is effective at improving water quality. Monitoring results indicate three years without sediment toxicity to *H. azteca*. The October 15, 2013 approval letter from the Regional Board stated that "once 2013 monitoring is completed, and if no additional exceedances occur the sediment toxicity can be petitioned for removal from the management plan at Highline Canal @ Lombardy Rd." As no exceedances occurred in 2013 or in March 2014, the Coalition requests removal of this constituent from the Highline Canal @ Lombardy Rd management plan.

The Coalition believes its continued contact with growers who have the greatest potential to impact water quality will prevent future *H. azteca* sediment toxicity exceedances.

### *Future Monitoring*

As indicated in the WDR, Highline Canal @ Lombardy Rd is a Represented Site within Zone 3. During the 2014 WY, Represented site monitoring and MPM will occur according to the schedules outlined in the MPU; MPM is scheduled for copper, lead, and toxicity to *S. capricornutum* and *H. azteca* based on months of past exceedances and review of PUR data.

# HILMAR DRAIN @ CENTRAL AVE

## 1. Demonstration through evaluation of monitoring data that water quality impairment is no longer occurring

**Constituents Requested for Management Plan Completion:**

- Dissolved Oxygen

### *Subwatershed Overview and Monitoring History*

Normal Monitoring at the site subwatershed began in 2005 and continued through 2008. Management Plan Monitoring occurred at the site in 2009, 2012, 2013, and 2014. This subwatershed includes two upstream locations, Hilmar Drain @ Mitchell Rd and Reclamation Drain @ Williams Ave, which were monitored in July 2008 as part of MPM.

The Coalition began conducting outreach and education in the Hilmar Drain @ Central Ave subwatershed in 2007. Focused outreach in Hilmar Drain @ Central Ave occurred from 2012 through 2014. In 2012, the Coalition identified and contacted three growers to document existing management practices and encouraged the implementation of additional management practices. The Coalition followed up with targeted growers in 2013 to determine which management practices were implemented.

### *Constituent Monitoring Results and Sourcing/ Justification for Removal*

**Dissolved Oxygen**

A discussion of DO dynamics in surface water has been provided above. Low DO can be a result of low flow, elevated water temperature, or excessive nutrients leading to high BOD.

Eight DO concentrations were reported as exceedances of the 7 mg/L objective. Of the eight, six occurred at Hilmar Drain @ Central Ave and two occurred at the upstream site (Hilmar Drain @ Mitchell Rd). The DO measurements ranged from 1.81 to 6.93 mg/L.

Hilmar Drain @ Central Ave is one of 12 constructed agricultural conveyance structures/drains the Coalition monitors that have been assigned beneficial uses through the tributary rule. Many of these structures are concrete and are not meant to be habitat for any aquatic life. The remaining structures are mud channels that are maintained to be free of aquatic vegetation that might impede flows. These structures are property of various irrigation/reclamation districts and may or may not contain water as determined by demand for irrigation water. Irrigation districts can at any time, alter the channels by lining them with concrete or any other structure meant to reduce or eliminate infiltration of water. Beneficial uses should not be assigned to constructed agricultural conveyance/drain structures by the tributary rule. Neither the 5.0 mg/L nor the 7.0 mg/L objectives are appropriate to apply to these waterbodies. Consequently, the Coalition will not maintain DO management plans for Hilmar Drain @

Central Ave and requests that DO be removed from the sites management plan and that any DO measurement reported in the past not be considered an exceedance.

### *Future Monitoring*

As indicated in the WDR, Hilmar Drain @ Central Ave is a Represented Site within Zone 2. During the 2014 WY, Represented site monitoring and MPM will occur according to the schedules outlined in the MPU; MPM is scheduled to occur for copper, diuron, and toxicity to *S. capricornutum* and *H. azteca*. Represented site monitoring is scheduled to occur for dimethoate. Field parameters (DO, SC, and pH) are measured during each monitoring event.

# MERCED RIVER @ SANTA FE

## 1. Demonstration through evaluation of monitoring data that water quality impairment is no longer occurring

**Constituents Requested for Management Plan Completion:**

- Chlorpyrifos
- Lead
- *Ceriodaphnia dubia* water column toxicity

### *Subwatershed Overview and Monitoring History*

Normal Monitoring at Merced River @ Santa Fe began in 2004 and continued through October 2008. The site was then monitored for Core constituents until it rotated into Assessment Monitoring in 2011, Core Monitoring resumed for a portion of 2012 and during 2013. Management Plan Monitoring was initiated in the site subwatershed in 2005. Additional MPM occurred for chlorpyrifos and toxicity to *C. dubia* in 2008 and MPM occurred during months of past exceedances from 2009 through present. During the 2014 WY, all constituents are monitored monthly as part of Core site monitoring. The Merced River @ Santa Fe site subwatershed includes an upstream location, Dry Creek @ Oakdale Rd; monitoring for chlorpyrifos occurred at Dry Creek @ Oakdale Rd from November 2009 through January 2010.

The Coalition began conducting outreach and education in the Merced River @ Santa Fe subwatershed in 2007. Focused outreach in Merced River @ Santa Fe began in 2013 and is ongoing through 2015. The Coalition identified growers with the greatest likelihood of contributing to the water quality impairments. The Coalition contacted these growers in 2013 to document existing management practices and encouraged the implementation of additional management practices. The Coalition is in the process of following up with targeted growers to determine which additional management practices were implemented and those results will be reported in the 2015 Annual Report due May 1, 2015.

### *Constituent Monitoring Results and Sourcing*

**Chlorpyrifos**

The Coalition has monitored for chlorpyrifos 58 times at Merced River @ Santa Fe. Exceedances of the WQTL for chlorpyrifos occurred three times in samples collected from Merced River @ Santa Fe: once during irrigation sampling in 2007 (July), and twice in 2008 (January storm sampling and November).

Since the November 2008 exceedance, the Coalition has monitored for chlorpyrifos 26 times in Merced River @ Santa Fe with no exceedances. The PUR data indicate chlorpyrifos use in the Merced River @ Sana Fe site subwatershed has declined significantly since the 2008 exceedance. The year with highest chlorpyrifos use was 2008 (7,699 lbs AI across 4,793 acres of alfalfa, corn, grapes, and nuts); the lowest use was in 2013 (2,266 lbs AI across 1,482 alfalfa, corn, grapes, and nuts). The end of three years of monitoring with no exceedances was November 2013.

### Lead

In October 2008, the Coalition began analyzing for both the total lead and the dissolved fraction of metals to better characterize contamination in the water column. Dissolved metals more adequately reflect the bioavailable, and therefore the toxic fraction in the water column. Since the Coalition adopted this method for analyzing dissolved metals, exceedances of the hardness based WQTLs of metals have declined.

The Coalition has monitored for lead at Merced River @ Santa Fe a total of 63 times. Exceedances of the hardness based WQTL for lead occurred once in 2007 (February) and once in 2008 (January). Since the last exceedance, the Coalition has monitored Merced River @ Santa Fe for lead 49 times (during Normal Monitoring in 2008, during Assessment Monitoring in 2011, and MPM in 2014). The end of three years of monitoring during months of past exceedances was February 2014.

### *Ceriodaphnia dubia* water column toxicity

*C. dubia* water column toxicity is indicative of pesticides in the water column. There have been four instances of water column toxicity to *C. dubia* in the Merced River @ Santa Fe subwatershed; twice in 2004 (July, 79% survival compared to the control and August, 42% survival compared to the control), once in 2006 (March, 35% survival compared to the control), and once in 2008 (January, 0% survival compared to the control). Toxicity was persistent only in the January 2008 resample (0% survival compared to the control). A TIE conducted for the January 2008 toxicity concluded that organophosphate insecticides were the probable cause of toxicity. An exceedance of the WQTL for chlorpyrifos (0.59 µg/L) did occur during January 2008 and toxicity was persistent in the resample. No other detections of chlorpyrifos or diazinon were associated with the other *C. dubia* toxicities.

Since the January 2008 toxicity, the Coalition has monitored Merced River @ Santa Fe for water column toxicity to *C. dubia* 28 times (results through March 2014). Three years of monitoring with no toxicity to *C. dubia* concluded January 2013; since then the Coalition has monitored five more times with no instance of toxicity.

## 2. Documentation of education and outreach to members where water quality impairment occurred

### *Summary of Outreach*

As mentioned above, the Coalition initiated general outreach in 2007 and has taken several actions to address water quality impairments in the Merced River @ Santa Fe subwatershed. Through Coalition mailings and meetings/workshops, growers were made aware of downstream water and sediment quality impairments as well as the importance of implementing management practices on their farms. During outreach the Coalition encourages growers to evaluate their farming operations in order to eliminate offsite movement of pesticides. The Coalition began its first year of high priority focused outreach in the Merced River @ Santa Fe subwatershed in 2013. Initial contacts were conducted with 13 targeted growers. The Coalition is in the process of following up with targeted growers to determine which additional management practices were implemented and those results will be reported in the

2015 Annual Report due May 1, 2015. Focused outreach will continue with growers with the greatest likelihood of contributing to those exceedances.

## 3. Documentation of member implementation of management practices to address water quality exceedance

The complete analysis of management practices implemented in the Merced River @ Santa Fe site subwatershed will be provided in the ESJWQC May 1, 2015 Annual Report. Preliminary results from that analysis are described in the section below.

The Coalition completed initial contacts with the twelve targeted growers farming 4,151 acres within the Merced River @ Santa Fe site subwatershed. Management practices were documented for 34% of the acreage identified as potentially having direct drainage. Coalition representatives discussed local water quality concerns and the importance of preventing the offsite movement of all agricultural constituents and recommend additional management practices.

Table 15 lists all the management practices recorded as implemented in the Merced River @ Santa Fe site subwatershed at this time. The Coalition will provide an analysis of all follow-up survey results in the 2015 Annual Report.

### *Summary of Current Management Practices (2013)*

The majority of the targeted acreage in the site subwatershed is vineyards and orchards (Figure 17). Twenty-nine percent of the acreage is field/row crops (1,755 acres, Figure 17). Irrigation tailwater runoff occurs from one hundred percent of the vineyards and sixty-six percent of the field/row crops. However, all operators of orchards reported no irrigation drainage (Figure 17).

#### Irrigation Water Management

Growers in the site subwatershed employ a mixture of irrigation systems on their parcels. The majority of growers use microirrigation techniques (58%, Table 15), although growers also use either sprinklers or surface irrigation. Nine growers have laser leveled fields and all but one grower irrigates according to moisture levels in the soil and crop needs. Three growers, accounting for 40% of the acreage, utilize recirculation/ tailwater return systems to manage irrigation runoff. Four growers, representing 44% of the acreage, installed drainage basins (sediment ponds) to capture and retain runoff (Table 15).

#### Storm Drainage

All growers reported no storm drainage on their fields. However, three growers placed berms between the field and waterway, built recirculation/ tailwater return systems, and/or settling ponds to manage any storm water runoff (Table 15).

#### Erosion & Sediment Management

The growers in the site subwatershed have at least one of the following sediment and erosion practices installed: grass row centers, vegetated filter strips at least 10 feet wide around field perimeter, and

vegetation maintained along ditches. Nine growers apply herbicides during the winter; all nine growers implement at least two sediment and erosion management practices (Table 15).

### Pest Management

Targeted growers implement several spray management practices including calibrating prior to each spray application, adjusting spray nozzles to match the canopy profile, shutting off outside nozzles when spraying outer rows next to sensitive sites (92% of growers), spraying areas close to waterbodies when the wind is blowing away from them (33% of growers), and using nozzles that provide the largest effective droplet size to minimize drift (83% of growers). Ten growers have considered alternative strategies to applying chlorpyrifos and diazinon (Table 15). For seven growers, the Coalition recommended to spray areas close to waterbodies when the wind is blowing away from them (Figure 18).

### Dormant Spray Management

Nine growers do not apply pesticides to dormant orchards. The remaining growers apply pesticides to 1,125 acres of dormant orchards. The three growers applying pesticides to dormant orchards implement several management practices during dormant sprays, including checking the weather condition, maintaining setback zones and ensuring soil moisture is not at field capacity. Additionally, fields have vegetative cover prior to applications (Table 15).

**Table 15. Merced River @ Santa Fe site subwatershed current management practices (2013).**

| Checklist | Question | Answer | Count of Answers | % Respondents | Sum of Associated Acreage |
|---|---|---|---|---|---|
| Section 1: Irrigation Water Management | Irrigation management practices: | Laser leveled fields | 9 | 75% | 4252 |
| | | Recirculation - Tailwater return system | 3 | 25% | 1659 |
| | | Use drainage basins (sediment ponds) to capture and retain runoff | 4 | 33% | 1845 |
| | | Use of Polyacrylamide (PAM) to increase water infiltration and reduce furrow erosion | 1 | 8% | 90 |
| | Irrigation System | Microirrigation | 7 | 58% | 4186 |
| | | Sprinkler | 5 | 42% | 1877 |
| | | Surface | 4 | 33% | 2636 |
| | Which do you base your irrigation schedule on: | Actual Moisture Levels in soil/crop needs | 11 | 92% | 5154 |
| | | Irrigation District Deliveries | 2 | 17% | 1926 |
| Section 2: Storm Drainage | How are you able to manage storm drainage? | Berms Between Field & Waterway (Install and/or Improve) | 2 | 17% | 2458 |
| | | No Storm Drainage | 12 | 100% | 6035 |
| | | Recirculation - Tailwater return system (Storm Drainage Management) | 2 | 17% | 1569 |
| | | Settling Pond | 3 | 25% | 1755 |
| | When do you have storm water draining from your field? | No Storm Drainage | 12 | 100% | 6035 |
| Section 3: Erosion & Sediment Management | Do you apply herbicides during winter months? | Do not apply | 3 | 25% | 2931 |
| | | Glyphosate (Round-Up) | 9 | 75% | 3104 |
| | | Goal | 6 | 50% | 2010 |
| | | Other: Rely | 1 | 8% | 30 |
| | If waterway crosses or borders pasture, how is livestock managed? | N/A - Not Pasture | 12 | 100% | 6035 |
| | Sediment management practices: | Grass Row Centers (Orchards, Vineyards) | 10 | 83% | 4466 |
| | | Maintain vegetated filter strips around field perimeter at least 10' wide | 10 | 83% | 3628 |
| | | Vegetation is planted along or allowed to grow along | 12 | 100% | 6035 |

| Checklist | Question | Answer | Count of Answers | % Respondents | Sum of Associated Acreage |
|---|---|---|---|---|---|
| | | ditches | | | |
| Section 4: Pest Management | Have you considered alternative strategies to using diazinon or chlorpyrifos either during the dormant or growing season? | N/A | 2 | 17% | 41 |
| | | Yes | 10 | 83% | 5994 |
| | How often is spray equipment calibrated? | Never | 1 | 8% | 22 |
| | | Prior to each application | 11 | 92% | 6013 |
| | Spray management practices: | Adjust spray nozzles to match crop canopy profile | 11 | 92% | 6013 |
| | | Outside nozzles shut off when spraying outer rows next to sensitive sites | 11 | 92% | 6013 |
| | | Spray areas close to waterbodies when the wind is blowing away from them | 4 | 33% | 4064 |
| | | Use air blast applications when wind is between 3-10 mph and upwind of a sensitive site | 7 | 58% | 2474 |
| | | Uses of nozzles that provide largest effective droplet size to minimize drift | 10 | 83% | 4968 |
| Section 5: Dormant Spray Management | Do you apply when soil moisture is at field capacity? | N/A | 1 | 8% | 881 |
| | | No | 2 | 17% | 798 |
| | Dormant spray management practices: | Check weather conditions prior to spraying (i.e. storm status) | 2 | 17% | 971 |
| | | Maintain setback zones | 1 | 8% | 90 |
| | Have you been informed of DPR's Dormant Spray Regulations? | Yes | 3 | 25% | 1679 |
| | How many acres are sprayed with pesticides on dormant orchards? | 685 Acres | 1 | 8% | 881 |
| | | 90 Acres | 1 | 8% | 90 |
| | | No Dormant Sprays | 9 | 75% | 4356 |
| | | 350 Acres | 1 | 8% | 708 |
| | Prior to applying winter dormant sprays, what is the condition of your orchard floor? | Some vegetation | 1 | 8% | 881 |
| | | Vegetative cover | 2 | 17% | 798 |

**Figure 17. Merced River @ Santa Fe crop acreage information from member surveys (2013).**

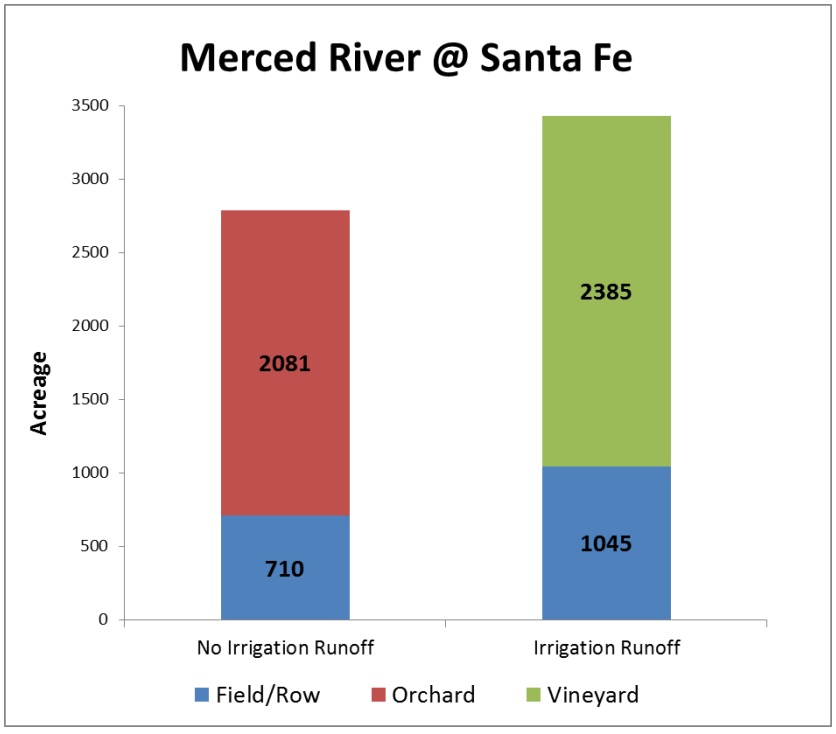
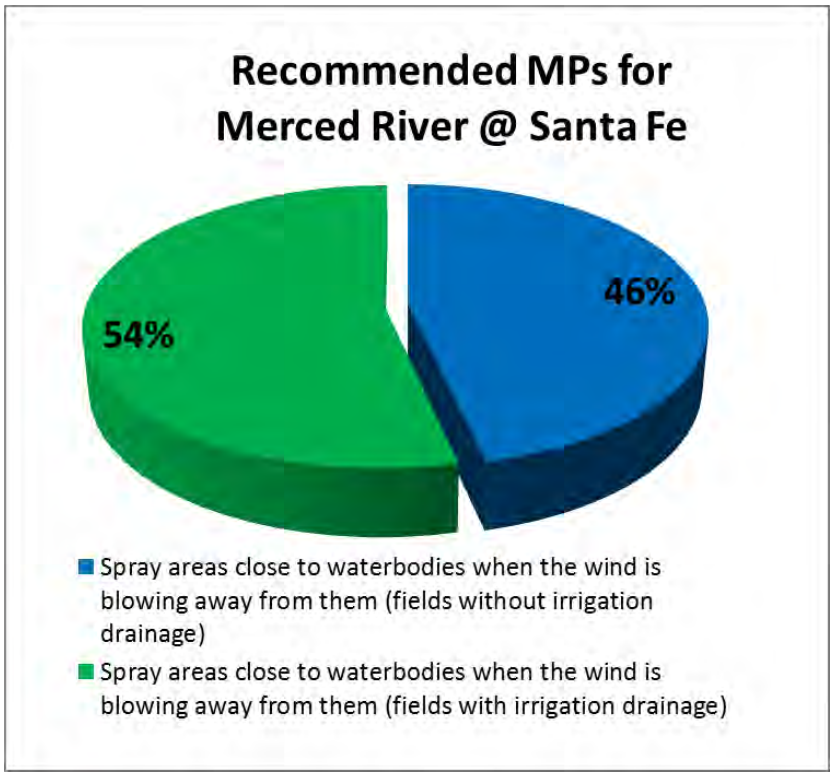


**Figure 18. Merced River @ Santa Fe recommended management practice (2013) acreage percentage for members with and without irrigation drainage.**




## 4. Demonstration management practices implemented by members are effective in addressing water quality impairment

### *Justification for Removal*

Monitoring results indicate three years of monitoring with no exceedances of the WQTLs for lead, chlorpyrifos, or toxicity to *C. dubia*. Therefore, the Coalition requests that these constituents be removed from the Merced River @ Santa Fe management plan and MPM schedule. The Coalition believes its continued contact with growers who have the greatest potential to impact water quality through focused outreach will prevent future exceedances.

### *Future Monitoring*

As indicated in the WDR, Merced River @ Santa Fe is the Core site for Zone 4. During the 2014 WY, Core site monitoring and MPM will occur according to the schedules outlined in the MPU; MPM is scheduled for lead, chlorpyrifos, and water column toxicity to *C. dubia* based on months of past exceedances and review of PUR data. Monthly monitoring for all constituents will occur as part of Core site monitoring during 2014 and 2015.

# MILES CREEK @ REILLY RD

## 1. Demonstration through evaluation of monitoring data that water quality impairment is no longer occurring

**Constituents Requested for Management Plan Completion:**

- Dissolved Oxygen

### *Subwatershed Overview and Monitoring History*

Monitoring at Miles Creek @ Reilly Rd took place from 2007 through 2010 and Assessment Monitoring occurred in 2013. Dissolved oxygen has been monitored during every sampling event at the site.

The Coalition began conducting outreach and education in the Miles Creek @ Reilly Rd site subwatershed in 2007 and it continues to the present. Focused outreach in Miles Creek @ Reilly Rd began in 2013 and is ongoing through 2015. The Coalition identified growers with the greatest likelihood of contributing to the water quality impairments. The Coalition contacted these growers in 2013 to document existing management practices and encouraged the implementation of additional management practices designed to eliminate water quality impairments. The Coalition is in the process of following up with targeted growers to determine which additional management practices were implemented and those results will be reported in the 2015 Annual Report due May 1, 2015. The Coalition continues to provide outreach to all members within the Miles Creek @ Reilly Rd subwatershed.

### *Constituent Monitoring Results and Sourcing*

**Dissolved Oxygen**

A discussion of DO dynamics in surface water has been provided above. Low DO can be a result of low flow, elevated water temperature, or excessive nutrients leading to high BOD.

Eleven measurements of DO have been reported as exceedances of the 7 mg/L WQTL at the Miles Creek @ Reilly Rd subwatershed. Of these 11, two DO concentrations were below the Basin Plan objective for this waterbody (5 mg/L), one in June 2008 (4.76 mg/L) and one in September 2013 (4.97 mg/L). The other nine measurements of DO ranged between 5.33 and 6.93 mg/L and should not be considered exceedances (Table 16). The Coalition requests for DO to be removed from the Miles Creek @ Reilly Rd management plan since there have not be two exceedances of the 5mg/L WQTL for DO within a three year period.

**Table 16. Reported and reevaluated exceedances for DO based on WQTL criteria in Basin Plan.**

Previous DO WQTL was 7mg/L; DO WQTL based on the Basin Plan requirements is 5 mg/L.

| Monitoring Site | Sample Date | Exceedance Reported for DO |
|---|---|---|
| Miles Creek @ Reilly Rd | 7/29/2008 | 5.34 |
| | 8/5/2008 | 6.93 |
| | 8/26/2008 | 5.86 |
| | 8/28/2008 | 5.33 |
| | 9/30/2008 | 6.34 |
| | 4/21/2009 | 6.30 |
| | 7/21/2009 | 6.45 |
| | 8/18/2009 | 6.58 |
| | 9/22/2009 | 6.35 |

## 4. Demonstration management practices implemented by members are effective in addressing water quality impairment

### *Justification for Removal*

Only two exceedances of the 5.0 mg/L DO objective have occurred, one in June 2008 (4.76 mg/L) and one in September 2013 (4.97 mg/L). All other measurements of DO at Miles Creek @ Reilly Rd were above 5.0 mg/L (Table 16). The Coalition requests for DO to be removed from the Miles Creek @ Reilly Rd management plan since there have not be two exceedances of the 5mg/L WQTL for DO within a three year period.

### *Future Monitoring*

As indicated in the WDR, Miles Creek @ Reilly Rd is one of the Represented sites in Zone 5. During the 2014 WY, MPM will occur according to the schedules outlined in the MPU; MPM is scheduled for copper, lead, chlorpyrifos, and toxicity to *C. dubia*, *S. capricornutum*, and *H. azteca* based on months of past exceedances and review of PUR data. Field parameters (DO, pH, and SC) are measured during every monitoring event.

# PRAIRIE FLOWER DRAIN @ CROWS LANDING RD

## 1. Demonstration through evaluation of monitoring data that water quality impairment is no longer occurring

**Constituents Requested for Management Plan Completion:**

- *Hyalella azteca* sediment toxicity

### *Subwatershed Overview and Monitoring History*

Monitoring at Prairie Flower Drain @ Crows Landing Rd was initiated during the storm season of 2005 and has continued since then. Assessment Monitoring at this site occurred in 2011 and MPM was initiated at the site during the 2007 irrigation season and again from 2009 through 2014. During the 2014 WY, all constituents are monitored monthly as part of Core site monitoring. Upstream monitoring at Prairie Flower Drain @ Morgan Rd occurred during the irrigation season of 2008 for chlorpyrifos, nitrate, and toxicity to *C. dubia* and *P. promelas*.

The Coalition began conducting outreach and education in the Prairie Flower Drain @ Crows Landing Rd site subwatershed in 2007. Focused outreach in Prairie Flower Drain @ Crows Landing Rd occurred from 2008 through 2010. The Coalition contacted targeted growers in 2009 to document their current management practices and encourage the implementation of additional practices designed to eliminate water quality impairments. The Coalition then followed up with targeted growers to determine which additional management practices were implemented.

### *Constituent Monitoring Results and Sourcing*

***Hyalella azteca* sediment toxicity**

The Coalition has sampled Prairie Flower Drain @ Crows Landing Rd for toxicity to *H. azteca* a total of 21 times since monitoring began in 2005. Toxicity to *H. azteca* occurred six times at Prairie Flower Drain @ Crows Landing Rd; once in September 2005 (86% compared to the control), once in May 2006 (92% compared to the control), August and September 2007 during resampling events (59% and 17% compared to the control; respectively), and August and October 2008 during resampling event (90% and 86% compared to the control; respectively). Of the six toxic samples, toxicity was persistent twice. Since the last sediment toxicity in October 2008, the Coalition has monitored Prairie Flower Drain @ Crows Landing Rd seven times with no sediment toxicity.

## 2. Documentation of education and outreach to members where water quality impairment occurred

### *Summary of Outreach*

The Coalition initiated outreach in 2007 and has taken several actions to address water quality impairments in the Prairie Flower Drain @ Crows Landing Rd site subwatershed. The Coalition conducted individual meetings with 11 growers in 2009 to review each grower's operation and

document their current management practices as well as discuss water quality impairments, including *H. azteca* sediment toxicity. The Coalition encouraged growers to evaluate their farming operations in order to eliminate offsite movement of pesticides, and management practices were recommended if they could be effective in reducing agricultural discharges. Targeted growers were contacted the next year to determine if recommended and/or new practices were implemented.

The Coalition continues to provide outreach to all members within the Prairie Flower Drain @ Crows Landing Rd site subwatershed. Through grower notifications and meetings, the Coalition informs members about water quality results, relevant management practices that eliminate water quality impairments, availability of funding for management practice implementation, results of studies of management practice efficacy, and management practice implementation and tracking activities. In addition, this subwatershed remains a high priority subwatershed for other constituents and focused outreach continues with growers who have the greatest likelihood of contributing to those exceedances.

## 3. Documentation of member implementation of management practices to address water quality exceedance

The complete analysis of management practices implemented in the Prairie Flower Drain @ Crows Landing Rd site subwatershed was reported in the ESJWQC 2011 and 2012 MPURs. Results from these analyses are described in the section below.

The Coalition contacted 11 targeted growers within the Prairie Flower Drain @ Crows Landing Rd subwatershed that were identified as having the potential to drain directly to the drain, were currently farming, and had reported pesticide use of constituents capable of causing sediment toxicity. The 11 members farm approximately 865 acres within the Prairie Flower Drain subwatershed which covers 4,097 acres. The acreage not included in contacts is primarily in dairies. The Coalition noticed when reviewing results from initial surveys in the 2010 MPUR (page 55-56 and 58, respectively) that one grower's responses were accidently omitted and only 10 of the 11 grower responses were included in the analysis. The following summary of initial survey results reflects responses from the 11 targeted growers.

Prairie Flower Drain is dominated by field/row crops and dairy acreage. A majority of the parcels farmed by targeted growers were determined to have irrigation drainage (95%, Figure 19). Of those surveyed in the Prairie Flower Drain watershed, 91% of the respondents with slightly over 95% of the acreage used flood irrigation and there was no reported use of drip or microspray systems (Table 17). However, 73% used laser leveled fields, 55% used recirculation systems, 18% used sediment retention ponds and 18% used polyacrilamide (PAM) to reduce erosion and prevent discharges to surface waters (Table 17). Only 55% of the respondents irrigated based on soil moisture levels and 36% did not respond (Table 17).

There is a mixture of respondents that have storm water drainage when the soil is saturated in late winter (27%) and/or in 100 year storms (9%), see Table 17. Three respondents (27%) indicated that there was no storm water drainage from the property, and 36% did not respond (Table 17). Twenty-seven percent of the respondents indicated they pump storm water to the drain and could not control

the timing but do use a settling pond to hold storm water. All respondents indicated that they controlled erosion and sediment delivery by some means (Table 17).

Two respondents indicated they had considered alternatives to using diazinon or chlorpyrifos during the growing season and nine respondents indicated that the question was not applicable to their operation. All respondents indicated that they did not use dormant sprays. All respondents indicated that they calibrated their nozzles prior to each application (Table 17). The majority took numerous steps to manage their spray drift including adjusting spray nozzles to match the canopy profile (91%), shutting outside nozzles when spraying outer two rows (64%), spraying areas close to waterbodies when the wind is blowing away from them (100%), using air blast applications when wind is between 3-10 mph (45%), and using nozzles that provide largest effective droplet size (100%), see Table 17.

The management practices recommended to these farmers included controlling the timing of pumping/draining into the waterway, planting vegetation in the ditches, utilizing recirculation / tailwater return systems and drainage basins/sediment ponds, and using PAM during irrigation (Figure 20). These management practices all seek to address the irrigation drainage and storm water runoff that are the primary cause of impaired water quality in the Prairie Flower Drain subwatershed.

**Figure 19. Prairie Flower Drain @ Crows Landing Rd crop acreage information from member surveys based on crop type and irrigation runoff (2008).**
No additional initial contacts were made in 2009.

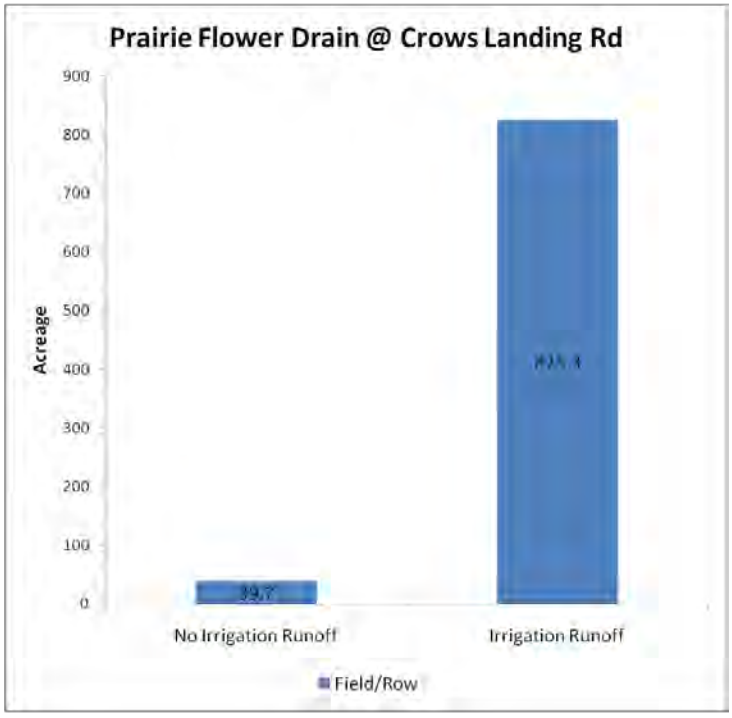


**Figure 20. Percentage of acreage represented by each recommended management practice for Prairie Flower Drain @ Crows Landing Rd.**
All members that were recommended to implement additional practices have irrigation drainage.

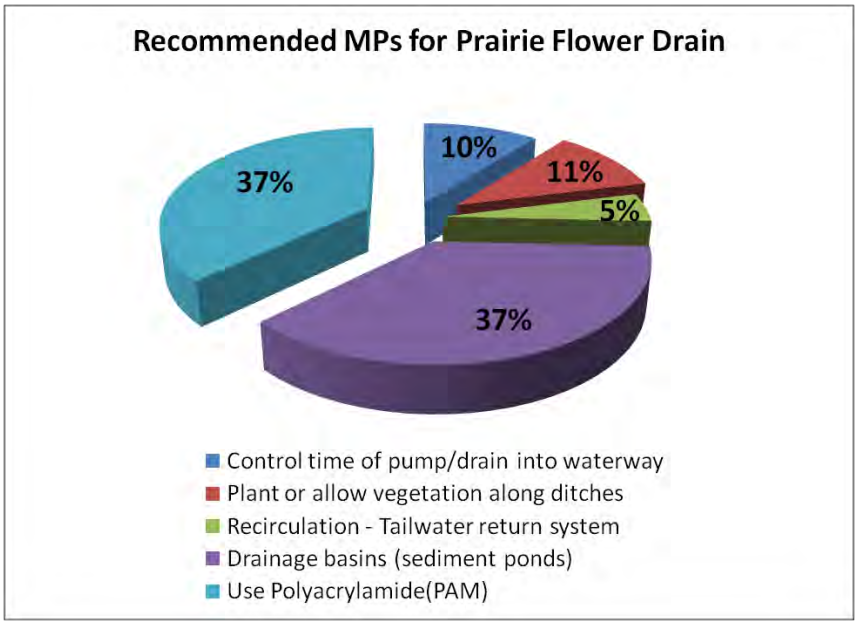



Table 17 compares Coalition recommended management practices to management practices implemented in 2009 and 2010 in the Prairie Flower Drain subwatershed. All recommended practices were for properties with irrigation drainage. Overall, management practices implemented in 2009 and 2010 include installing devices to control discharge, using less water during surface irrigation, using PAM to reduce furrow erosion and decrease discharges to surface waters, and constructing drainage basins/sediment ponds. These practices were implemented on 991.8 acres (Figure 21).

Two growers, representing a combined 76.9 acres, received recommendations to allow vegetation to grow along a drainage ditch and to install a gate to control the timing of discharge from the drainage ditch; both growers failed to implement the management practices. The growers both indicated the management practices were no longer applicable for their operations, but did not provide the Coalition with any details as to why.

The Coalition recommended using PAM to a single grower, operating 270.9 acres, to control irrigation runoff and sediment discharge. The Coalition also recommended installing a drainage basin /sediment pond to capture excess runoff (Table 17). The Coalition documented that the grower installed a device to control discharge and has reduced the amount of water used during surface irrigation (Table 17). Therefore, the grower did not use PAM as recommended, but did implement additional practices to reduce irrigation runoff. In addition, the grower plans to develop a recirculation/tailwater return system in the upcoming years and would like to laser level their fields; however, they have no resources to do so at this time.

The final grower that received a recommendation for a recirculation/tailwater return system explained they did not install the system because the 34-acre property was being sold (Table 17).

One grower in the Prairie Flower Drain subwatershed implemented management practices in 2009 and 2010 without specific recommendations from the Coalition. One grower farming 150 acres began to use PAM during irrigation, installed a device to control discharge, and constructed a drainage basin/sediment retention pond (Table 17).

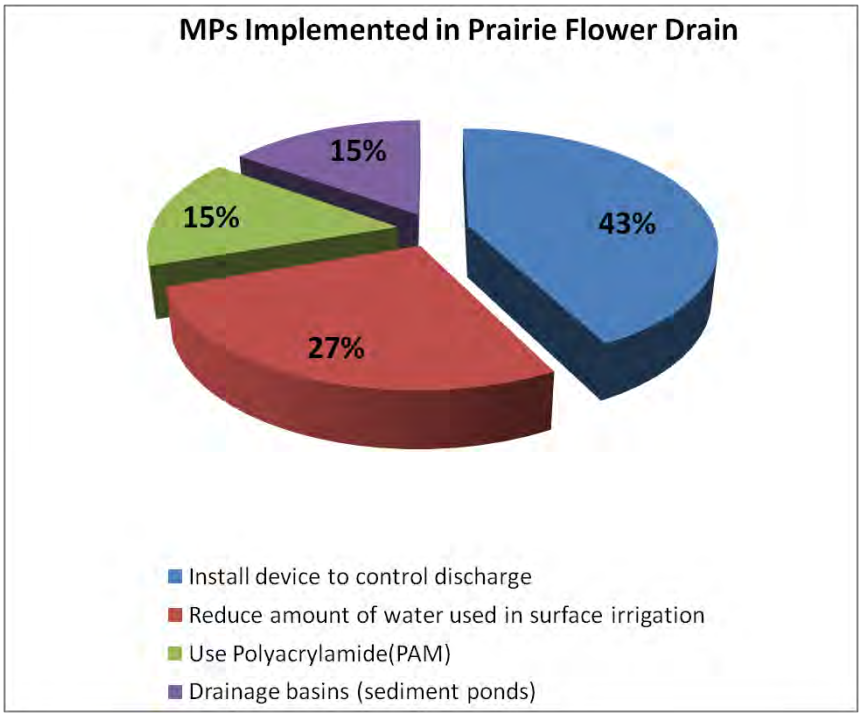
Some growers indicated no irrigation drainage from their properties during 2009 and 2010. Two growers, farming 91 acres, indicated during follow-up contacts they installed devices to control the timing of discharge (storm water drainage) on their properties without recommendation from the Coalition (Table 17). The growers were the only landowners to implement new management practices to properties with no irrigation drainage (Table 17). Both growers have laser leveled their fields in the past and have used a recirculation / tailwater return system since prior to 2005. Since Coalition general outreach began in 2005, both growers now allow vegetation to grow along drainage ditches and shut off outside nozzles when spraying outer rows next to sensitive areas.

**Table 17. Comparison of recommended MPs and implemented MPs in Prairie Flower Drain @ Crows Landing Rd site subwatershed.**

| Management Practice | Acreage: Recommended Practices | Acreage: Implemented Practices | Percent of Recommended Acreage with Implemented Practices |
|---|---|---|---|
| **No irrigation drainage from property** | | | |
| Install device to control discharge[1] | 0 | 91 | NA |
| **Total (no drainage)** | **0** | **91** | **NA** |
| **Yes, irrigation drainage from property** | | | |
| Install device to control discharge | 76.9 | 420.9[2] | 547% |
| Plant or allow vegetation along ditches | 76.9 | 0 | 0% |
| Drainage basins (sediment ponds) | 270.9 | 150[2] | 55% |
| Use Polyacrylamide(PAM) | 270.9 | 150[2] | 55% |
| Reduce amount of water used in surface irrigation | 0 | 270.9[2] | NA |
| Recirculation - Tailwater return system | 34 | 0 | 0% |
| **Total (drainage)** | **729.6** | **991.8** | **136%** |

[1] Practices apply to storm drainage
[2] Management practice not specifically recommended by Coalition representative for grower's operation
NA – Not applicable; no recommendations for the management practice in the subwatershed and was not indicated as implemented by surveyed growers

**Figure 21. Percentage of acreage represented by newly implemented (2009/2010) management practices for Prairie Flower Drain @ Crows Landing Rd.**
All members that were recommended to implement additional practices have irrigation drainage.




## 4. Demonstration management practices implemented by members are effective in addressing water quality impairment

### *Justification for Removal*

Monitoring results indicate more than three years with no *H. azteca* sediment toxicity. The October 15, 2013 letter from the Regional Board stated that "once 2013 monitoring is completed, and if no additional exceedances occur the sediment toxicity can be petitioned for removal from the management plan at Prairie Flower Drain @ Crows Landing Rd." The Coalition completed 2013 sediment monitoring and no toxicity occurred. Sediment toxicity was monitored again in March 2014 and no toxicity occurred.

Management Plan Monitoring results indicate more than three years with no *H. azteca* sediment toxicity. Therefore, the Coalition requests that *H. azteca* sediment toxicity be removed from the Prairie Flower Drain @ Crows Landing Rd management plan and MPM schedule. Prairie Flower Drain @ Crows Landing Rd is a Core site and therefore 2014 WY monitoring for all constituents (including sediment toxicity monitoring) will occur and will provide the Coalition with data to continue to evaluate water quality in the Prairie Flower Drain @ Crows Landing Rd site subwatershed. The Coalition believes its outreach within the site subwatershed will continue to keep growers aware of water quality impairments due to agriculture.

## *Future Monitoring*

As indicated in the WDR, Prairie Flower Drain @ Crows Landing Rd is one of the Core sites for Zone 2. During the 2014 WY, Core site monitoring and MPM will occur according to the schedules outlined in the MPU; MPM is scheduled for molybdenum, dimethoate, and toxicity to *C. dubia, P. promelas*, *S. capricornutum*, and *H. azteca* based on months of past exceedances and review of PUR data. Monthly monitoring for all constituents will occur as part of Core site monitoring during 2014 and 2015.

# UNNAMED DRAIN @ HWY 140

## 1. Demonstration through evaluation of monitoring data that water quality impairment is no longer occurring

**Constituents Requested for Management Plan Completion:**

- Dissolved Oxygen

### *Subwatershed Overview and Monitoring History*

The Coalition began monitoring at Unnamed Drain @ Hwy 140 during 2013 Assessment Monitoring. Unnamed Drain @ Hwy 140 was placed in a management plan for DO after the second exceedance of the 7 mg/L WQTL for DO occurred during 2013 monitoring.

The site subwatershed was placed in a management plan for other constituents based on 2013 monitoring results and the site was added to the schedule for focused outreach and education during 2016 through 2018. The Coalition actively conducts general outreach in the Unnamed Drain @ Hwy 140 site subwatershed. In 2015, the Coalition will develop a targeted grower list and these growers will be contacted individually in 2016 to document existing management practices and encourage the implementation of additional management practices designed to eliminate water quality impairments. The Coalition follows up with growers the following year to determine which additional management practices were implemented. A full analysis of these results will be reported in the Coalition's 2018 Annual Report on May 1.

### *Constituent Monitoring Results and Sourcing/ Justification for Removal*

**Dissolved Oxygen**

A discussion of DO dynamics in surface water has been provided above. Low DO can be a result of low flow, elevated water temperature, or excessive nutrients leading to high BOD.

Unnamed Drain @ Hwy 140 was placed in a management plan after two measurements of DO were reported as exceedances of the 7 mg/L WQTL for DO in May (5.79 mg/L) and July (5.70 mg/L) 2013. One other measurement of DO in November 2013 (6.86 mg/L) was reported as an exceedance. Since November 2013, the Coalition has monitored 6 times for DO in the site subwatershed with no other measurements being reported as exceedances. The DO measurements reported as exceedances ranged from 5.70 to 6.86 mg/L and should not be considered exceedances based on the reasoning outlined below.

Unnamed Drain @ Hwy 140 is one of 12 constructed agricultural conveyance structures/drains the Coalition monitors that have been assigned beneficial uses through the tributary rule. Many of these structures are concrete and are not meant to be habitat for any aquatic life. The remaining structures

are mud channels that are maintained to be free of aquatic vegetation that might impede flows. These structures are property of various irrigation districts and may or may not contain water as determined by demand for irrigation water. Irrigation districts can at any time, alter the channels by lining them with concrete or any other structure meant to reduce or eliminate infiltration of water. Beneficial uses should not be assigned to constructed agricultural conveyance/drain structures by the tributary rule. Neither the 5.0 mg/L nor the 7.0 mg/L objectives are appropriate to apply to these waterbodies. Consequently, the Coalition will not maintain DO management plans for Unnamed Drain @ Hwy 140 and requests that DO be removed from the site's management plan and that any DO measurement reported in the past not be considered an exceedance.

### *Future Monitoring*

As indicated in the WDR, Unnamed Drain @ Hwy 140 is a Represented Site within Zone 4. Monitoring occurs at Unnamed Drain @ Hwy 140 according to the schedules outlined in the MPU. No monitoring is scheduled at the site during 2014. Field parameters (DO, pH, and SC) are measured during every monitoring event.