



Management Plan Completion Request

East San Joaquin Water Quality Coalition

Central Valley Regional Water Board

November 1, 2018

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INTRODUCTION

Management Plan Monitoring (MPM) is conducted as part of the East San Joaquin Water Quality Coalition's (ESJWQC or Coalition) management plan strategy to identify contaminant sources and evaluate the effectiveness of management practices in improving water quality. 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 within a three-year period for any other constituent. When a constituent becomes the focus of the ESJWQC Management Plan, the Coalition initiates focused outreach and conducts MPM during months of high pesticide use.

With the adoption of the Waste Discharge Requirements General Order for Growers within the Eastern San Joaquin River Watershed (Order No. R5-2012-0016-R4; hereafter, WDR or Order), the frequency of monthly monitoring and the scheduling of MPM during months of past exceedances were modified as described in WDR Attachment A page 14, "The previous requirement to monitor monthly resulted in monitoring during months in which no problems would be expected and infrequent monitoring during peak periods when potential problems could occur. The third-party will be required to evaluate pesticide use patterns and peak times when pesticides from irrigated agriculture operations may cause problems in surface water. Based on that evaluation, the third-party will propose a frequency and time period to conduct monitoring that will adequately characterize surface waters receiving irrigated agricultural waste discharges."

Therefore, the MPM schedules proposed/approved in the Coalition's Monitoring Plan Update (MPU) reports are based on months of peak pesticide use. Furthermore, page 9 of the WDR Appendix MRP-1 indicates, "demonstration of management plan completion must include consideration of periods of peak use and/or periods when a parameter is likely to be present." Appendix I of this letter includes tabulated results for all monitoring that has taken place within three years for the constituents and sites in this request. In some cases, monitoring is scheduled during months of past exceedances because of high pesticide use during those months, in other cases, applications of pesticides shift to different months and monitoring is adjusted according to the patterns in pesticide use.

Through evaluation of monitoring results and management practice data, the Coalition determined there is enough evidence of water quality improvements to request the completion of seven management plans from five site subwatersheds (Table 1).

Table 1. ESJWQC sites and constituents proposed for management plan completion.

SITE SUBWATERSHED	YEARS OF FOCUSED OUTREACH	CHLORPYRIFOS	MALATHION	C. DUBIA	S. CAPRICORNUTUM	H. AZTECA	TOTAL
Deadman Creek @ Hwy 59	2012-2014	X					1
Duck Slough @ Gurr Rd	2010-2012; 2016-2018	X	X	X			3
Hatch Drain @ Tuolumne Rd	2013-2015					X	1
Highline Canal @ Hwy 99	2010-2012; 2016-2018				X		1
Highline Canal @ Lombardy Rd					X		1
	Total	2	1	2	2	1	7

To support the Coalition’s request, tabulated monitoring results per each site/constituent for the required three years of monitoring with no exceedances are provided in an Excel file (Appendix I). Charts for all Pesticide Use Report (PUR) data for agriculturally applied constituents are included in Appendix II. The section key below outlines the requirements for management plan completion as stated in the WDR and where the contents can be found in the corresponding sections per each site subwatershed (Table 2).

Table 2. Management plan completion section key.

Requirements for Management Plan Completion	Associated Section Name/Location
<ul style="list-style-type: none"> 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 times of the year when previous exceedances occurred) or demonstrated compliance with the WDR’s surface and groundwater limitations. 	<ul style="list-style-type: none"> Site Subwatershed Overview and Monitoring History, Constituent Monitoring Results and Sourcing.
<ul style="list-style-type: none"> Documentation of education and outreach to applicable members in the watershed where water quality impairments occurred. 	<ul style="list-style-type: none"> Summary of Outreach
<ul style="list-style-type: none"> Documentation of member implementation of management practices that address the water quality exceedance. 	<ul style="list-style-type: none"> Management Practices Implemented
<ul style="list-style-type: none"> Demonstration that the management practices implemented by members are effective in addressing the water quality impairment. 	<ul style="list-style-type: none"> Justification for Removal Future Monitoring

SUPPORTING DOCUMENTATION FOR MANAGEMENT PLAN COMPLETION

DEADMAN CREEK @ HWY 59

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

Constituents Requested for Management Plan Completion:

- Chlorpyrifos

Site Subwatershed Overview and Monitoring History

Deadman Creek @ Hwy 59 is a Represented site located in Zone 5. Monitoring was initiated at the site in the irrigation season of 2006 and has continued through the 2018 WY. The site was monitored for the full suite of constituents from 2011 through 2012 for Assessment Monitoring. Management Plan Monitoring for chlorpyrifos occurred from 2012 through the 2018 WY during months of high chlorpyrifos use and months of past exceedances.

Constituent Monitoring Results and Sourcing

Monitoring results used to justify management plan completion due to three years of monitoring with no exceedances are included in Appendix I (2006 through September 2018). A PUR chart indicating past applications of chlorpyrifos in the site subwatershed is included in Appendix II.

There have been six exceedances of the WQTL for chlorpyrifos at Deadman Creek @ Hwy 59 in September 2006 (0.059 µg/L), August 2007 (0.038 µg/L), August and September 2008 (0.14 and 0.069 µg/L; respectively), and in April and September 2011 (0.016 and 0.049 µg/L; respectively). Toxicity did not coincide with any of the exceedances.

Since the last exceedance of the WQTL for chlorpyrifos in September 2011, the Coalition has monitored for chlorpyrifos 36 times with no detections; the site was dry for 16 of the 36 monitoring events. The end of three years monitoring with no exceedances was September 2014. In addition to the required three years of monitoring for management plan completion, sampling for chlorpyrifos continued through the 2018 WY and no exceedances occurred.

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

Summary of Outreach

The Coalition conducted focused outreach from 2012 through 2014 in the Deadman Creek @ Hwy 59 site subwatershed. In 2012, the Coalition contacted eight targeted growers farming 3,414 irrigated acres in the site subwatershed. Management practices were documented for 30% of the acreage identified as having direct drainage or the potential to impact water quality through spray drift. Coalition representatives discussed local water quality concerns and the importance of preventing the offsite movement of all agricultural constituents. The Coalition followed up with the growers in 2013 to determine if recommended and/or new practices were implemented.

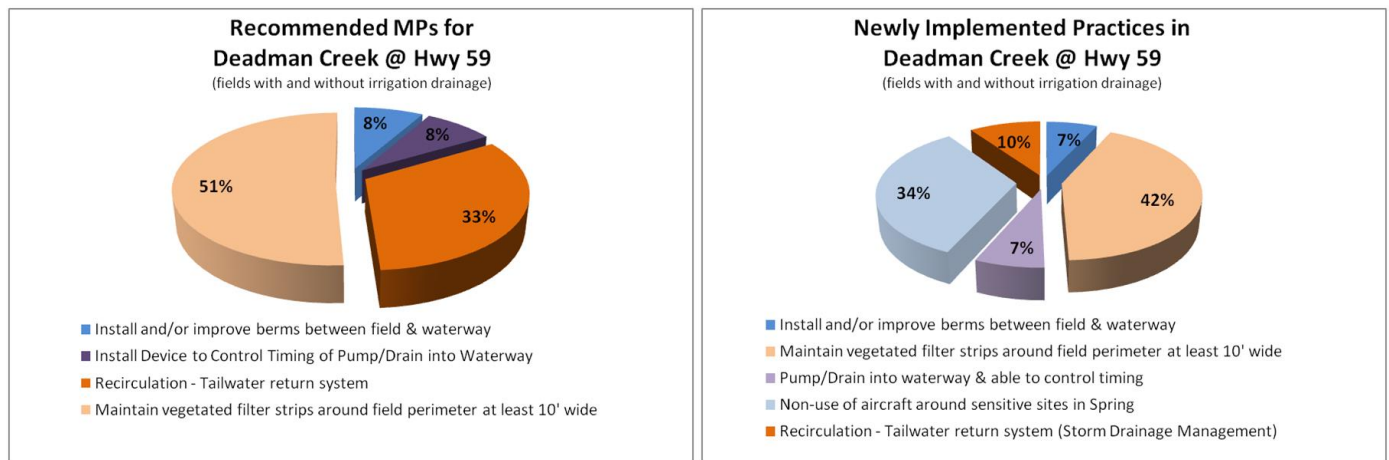
3. Documentation of member implementation of management practices to address water quality exceedance

The complete analysis of management practices implemented in the Deadman Creek @ Hwy 59 site subwatershed can be found in the ESJWQC 2014 Annual Report. Results from that analysis are summarized in the section below.

Management Practices Implemented

During individual meetings with targeted growers, Coalition representatives recommended additional management practices to five growers to improve irrigation tailwater and stormwater management and to reduce erosion and offsite movement of sediment (Figure 1). Four of the five growers implemented all recommended management practices and the fifth grower implemented a new practice not recommended by the Coalition (non-use of aircraft around sensitive sites; Figure 1).

Figure 1. Percent of acreage represented by recommended and implemented management practices in the Deadman Creek @ Hwy 59 site subwatershed.



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

Justification for Removal

The Coalition’s focused outreach and management practice tracking strategy continues to be effective at improving water quality as indicated by zero exceedances of the WQTL for chlorpyrifos in the Deadman Creek @ Hwy 59 site subwatershed in three or more years (Table 3). PUR data indicate a steady decline in chlorpyrifos use within the site subwatershed (Appendix II). Furthermore, the site is frequently dry (Table 3). Dry site conditions could result from low precipitation and/or improved water management practices by growers to reduce discharge.

Targeted growers contacted during focused outreach from 2012 through 2014 implemented practices designed to reduce water quality impairments. The Coalition believes the decline in chlorpyrifos use and seven years with no exceedances of the WQTL for chlorpyrifos from 2012 through 2018 (four more years than required in the WDR for management plan completion) is evidence of successful management practice implementation and improved water quality. Therefore, the Coalition requests that the management plan and MPM be approved for completion for chlorpyrifos at Deadman Creek @ Hwy 59 site subwatershed.

Table 3. Deadman Creek @ Hwy 59 chlorpyrifos monitoring history from 2006 through the 2017 WY.

Black cells indicate exceedances, grey cells indicate monitoring occurred, and spotted cells indicate the site was dry. Months with blue fill indicate months of peak use based on last three years of chlorpyrifos use.

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2006									0.059			
2007								0.038				
2008								0.14	0.069			
2009												
2010												
2011				0.016					0.049			
2012												
2013												
2014												
2015												
2016												
2017												
2018												2019 WY

Future Monitoring

During the 2019 WY, monitoring at Deadman Creek @ Hwy 59 is scheduled as outlined in the Coalition’s MPU (approved September 21, 2018) for chlorpyrifos. Monitoring will

occur as scheduled until the approval of management plan completion is received from the Regional Board.

DUCK SLOUGH @ GURR RD

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

Constituent Requested for Management Plan Completion:

- Chlorpyrifos
- Malathion
- Water column toxicity to *C. dubia*

Site Subwatershed Overview and Monitoring History

Duck Slough @ Gurr Rd is one of the rotating Core and Represented sites located in Zone 5. Every third year the site represents the Core site in Zone 5. Monitoring began during the irrigation season of 2004 and continued through the 2018 WY. The site was monitored for the full suite of constituents in 2011 for Assessment Monitoring. During the 2014 WY, 2015 WY, and 2018 WY the site was monitored as the Core site. Management Plan Monitoring was initiated in 2010 and continued through the 2018 WY. In 2012, MPM did not take place at the site due to temporary MPM suspension from April through December.

Constituent Monitoring Results and Sourcing

Monitoring results used to justify management plan completion due to three years of monitoring with no exceedances are included in Appendix I. A PUR chart indicating past applications of chlorpyrifos and malathion in the site subwatershed is included in Appendix II.

Chlorpyrifos

There have been three exceedances of the WQTL for chlorpyrifos at Duck Slough @ Gurr Rd: in July 2004 (0.045 µg/L), March 2014 (0.053 µg/L), and July 2015 (0.19 µg/L).

Toxicity to *C. dubia* corresponded with the March 2014 and July 2015 exceedances, resulting in 75% and 0% survival compared to the controls; respectively.

Since the last exceedance of the WQTL for chlorpyrifos in July 2015, the Coalition has monitored for chlorpyrifos 12 times with no detections. The end of the required three years of monitoring with no exceedances was July 2018.

Malathion

Since monitoring began in 2004, exceedances of the WQTL for malathion occurred twice in samples collected at Duck Slough @ Gurr Rd: in April 2014 (0.12 µg/L) and March 2015 (2.00 µg/L). Toxicity to *C. dubia* corresponded with the March 2015 exceedance, resulting in 0% survival compared to the control.

Since the last exceedance of the WQTL for malathion in March 2015, the Coalition monitored for malathion 15 times with no detections. The end of three years monitoring with no exceedances was March 2018.

Water column toxicity to *C. dubia*

There have been seven instances of water column toxicity to *C. dubia* in samples collected from Duck Slough @ Gurr Rd: in February and March 2006 (37% and 42% survival compared to the control; respectively), March 2013 (0% survival), March 2014 (75% survival), March 2015 (0% survival), and June and July 2015 (75% and 0% survival). Toxic samples collected in March 2014 and July 2015 were associated with exceedances of the WQTL for chlorpyrifos and samples collected in March 2015 were associated with an exceedance of malathion.

Since the last toxicity in July 2015, the Coalition has monitored for water column toxicity to *C. dubia* 21 times. The end of three years monitoring with no exceedances was July 2018.

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

Summary of Outreach

The Coalition conducted focused outreach in the Duck Slough @ Gurr Rd site subwatershed with targeted members from 2010 through 2012. In 2010, the Coalition contacted six targeted growers representing 2,656 irrigated acres. Management practices were documented for 46% of the acreage identified as having direct drainage or the potential to impact water quality through spray drift. The Coalition conducted a second round of focused outreach in the Duck Slough @ Gurr Rd site subwatershed from 2016 through 2018 due to chlorpyrifos exceedances. In 2016, the Coalition contacted eight members representing 5,391 irrigated acres. Management practices were documented for 32% of the acreage. During both rounds of focused outreach Coalition representatives discussed local water quality concerns, the importance of preventing the offsite movement of all agricultural constituents. The implementation of additional management practices was recommended to all six members in 2010, no additional practices were recommended to members in 2016. The Coalition followed up with the growers in 2011 to determine if recommended and/or new practices were implemented.

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

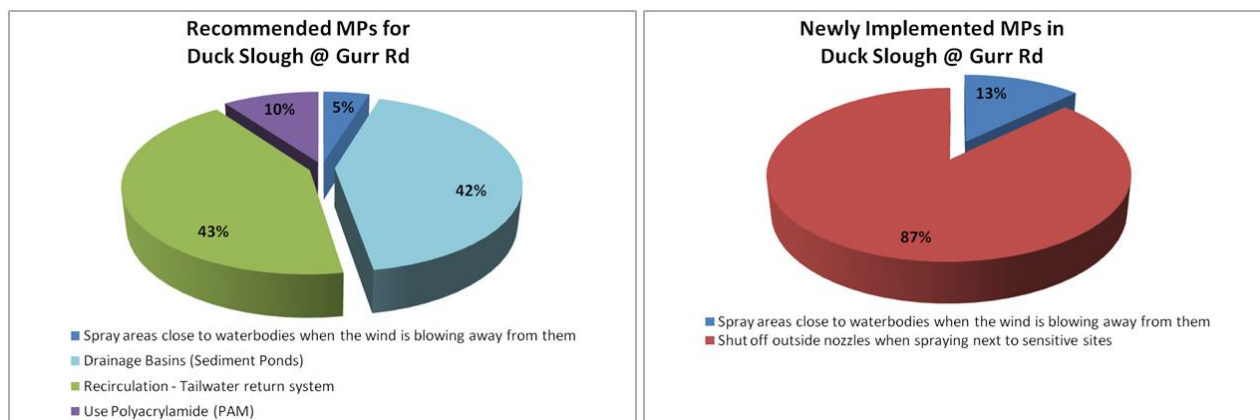
The complete analysis of management practices implemented in the Duck Slough @ Gurr Rd site subwatershed can be found in the ESJWQC April 1, 2012 MPUR and the May 1,

2018 Annual Report (AMR). Results from that analysis are summarized in the section below.

Management Practices Implemented

During individual meetings with targeted members in 2010, Coalition representatives recommended management practices to all six targeted growers. Follow-up surveys indicated one grower implemented the recommended management practice of spraying areas close to the waterbody when the wind is blowing away. The five other growers indicated no change in implemented management practices (Figure 2). One grower implemented practices that were not recommended for their operations (shutting off outside nozzles when spraying outer rows next to sensitive sites). Overall, as a result of focused outreach, 37% of the acreage targeted during focused outreach had recommended management practices implemented.

Figure 2. Percent of acreage represented by recommended and implemented management practices in the Duck Slough @ Gurr Rd site subwatershed.



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

Justification for Removal

The Coalition's focused outreach and management practice tracking strategy continues to be effective at improving water quality as indicated by zero exceedances of the WQTLs for chlorpyrifos and malathion and no toxicity to *C. dubia* in the Duck Slough @ Gurr Rd site subwatershed in three or more years (Table 4 through Table 6). Furthermore, PUR data indicate a decline in chlorpyrifos and malathion within the site subwatershed (Appendix II).

Growers contacted during focused outreach from 2010 through 2012 implemented practices designed to prevent spray drift to sensitive areas. In addition, the Coalition met

with eight growers in the site subwatershed from 2016 through 2018 to provide an update on water quality exceedances and review management practices. The Coalition requests that the management plans and MPM be approved for completion for malathion, chlorpyrifos, and toxicity to *C. dubia* at Duck Slough @ Gurr Rd site subwatershed.

Table 4. Duck Slough @ Gurr Rd chlorpyrifos monitoring history from 2004 through the 2018 WY.

Black cells indicate exceedances, grey cells indicate a sample was collected, and spotted cells indicate the site was dry. Months with blue fill indicate months of peak use based on last three years of chlorpyrifos use.

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2004							0.045					
2005												
2006												
2007												
2008												
2009												
2010												
2011												
2012												
2013												
2014			0.053									
2015							0.19					
2016												
2017												
2018												2019 WY

Table 5. Duck Slough @ Gurr Rd malathion monitoring history from 2004 through the 2018 WY.

Black cells indicate exceedances, grey cells indicate a sample was collected, and spotted cells indicate the site was dry. Months with blue fill indicate months of peak use based on last three years of malathion use.

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2004												
2005												
2006												
2007												
2008												
2009												
2010												
2011												
2012												
2013												
2014				0.12								
2015			2.00									
2016												
2017												
2018												2019 WY

Table 6. Duck Slough @ Gurr Rd C. dubia toxicity monitoring history from 2004 through the 2018 WY.

Black cells indicate exceedances, grey cells indicate a sample was collected, and spotted cells indicate the site was dry.

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2004												
2005												
2006		37%	42%									
2007												
2008												
2009												
2010												
2011												
2012												
2013			0%									
2014			75%									
2015			0%			75%	0%					
2016												
2017												
2018										2019 WY		

Future Monitoring

During the 2019 WY, MPM at Duck Slough @ Gurr Rd for chlorpyrifos, malathion, and toxicity to *C. dubia* is scheduled as outlined in the Coalition’s MPU (approved September 21, 2018). Monitoring will occur as scheduled until the approval of management plan completion is received.

HATCH DRAIN @ TUOLUMNE RD

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

Constituent Requested for Management Plan Completion:

- Sediment toxicity to *H. azteca*

Site Subwatershed Overview and Monitoring History

Hatch Drain @ Tuolumne Rd is a Represented site located in Zone 2. Monitoring began in 2007, continued through October 2008, and resumed from 2013 through the 2018 WY. From 2013 through the 2018 WY, MPM for sediment toxicity to *H. azteca* occurred.

Constituent Monitoring Results and Sourcing

Monitoring results used to justify management plan completion due to three years of monitoring with no exceedances are included in Appendix I (2007 through the 2018 WY).

Since monitoring began in 2007, sediment toxicity to *H. azteca* occurred six times in samples collected at Hatch Drain @ Tuolumne Rd: in August 2007 (0% survival compared to the control), March 2008 (0% survival), August 2008 (0% survival), March 2013 (72% survival), and March and September 2014 (56% and 52% survival; respectively).

Additional chemistry analysis was conducted on March 2013 and both 2014 toxic sediment samples and indicated detections of bifenthrin, chlorpyrifos, lambda-chyhalothrin, cypermethrin, permethrin, and esfenvalerate.

Since the last sediment toxicity in September 2014, the Coalition monitored for sediment toxicity eight times with no instances of toxicity. The end of three years of monitoring with no toxicity was September 2017; the Coalition collected an additional year of sediment samples during the 2018 WY.

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

Summary of Outreach

The Coalition conducted focused outreach in the Hatch Drain @ Tuolumne Rd site subwatershed from 2013 through 2015. In 2013, the Coalition contacted a single grower representing 36 irrigated acres. Management practices were documented for 13% of the acreage identified as having direct drainage or the potential to impact water quality through spray drift. Coalition representatives discussed local water quality concerns, the importance of preventing the offsite movement of all agricultural constituents, and recommended implementing one additional management practice. The Coalition followed up with the grower in 2014 to determine if recommended and/or new practices were implemented.

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

The complete analysis of management practices implemented in the Hatch Drain @ Tuolumne Rd site subwatershed can be found in the ESJWQC 2015 Annual Report. Results from that analysis are summarized in the section below.

Management Practices Implemented

During the individual meetings with targeted growers, Coalition representatives recommended one additional management practice to spray areas close to waterbodies when the wind is blowing away from them. The follow-up survey indicated the recommended management practice was implemented.

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

Justification for Removal

The Coalition's focused outreach and management practice tracking strategy has been effective in the Hatch Drain @ Tuolumne Rd at improving water quality as indicated by no toxicity to *H. azteca* in three or more years (Table 7). Based on focused outreach surveys and follow-up results, targeted growers implemented management practices and water quality improved. The Coalition requests that the management plan and MPM be approved for completion for sediment toxicity to *H. azteca* at Hatch Drain @ Tuolumne Rd site subwatershed.

Table 7. Hatch Drain @ Tuolumne Rd *H. azteca* sediment toxicity monitoring history from 2007 through the 2018 WY.

Black cells indicate exceedances, grey cells indicate a sample was collected, and spotted cells indicate the site was dry.

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2007								0%	RS			
2008			0%					0%		RS		
2009-2012												
2013			72%									
2014			56%						52%			
2015												
2016												
2017												
2018											2019 WY	

Future Monitoring

During the 2019 WY, monitoring is scheduled at Hatch Drain @ Tuolumne Rd as outlined in the Coalition’s MPU (approved September 21, 2018) for sediment toxicity to *H. azteca*. Monitoring will occur as scheduled until the approval of management plan completion is received.

HIGHLINE CANAL @ HWY 99

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

Constituent Requested for Management Plan Completion:

- Water column toxicity to *S. capricornutum*

Site Subwatershed Overview and Monitoring History

Highline Canal @ Hwy 99 is the Core site located in Zone 3. Monitoring was initiated during the irrigation season of 2005 and continued through the 2018 WY. All constituents were monitored monthly during 2011 Assessment Monitoring. From the 2014 WY through the 2018 WY the site was monitored monthly for Core site constituents. Management Plan Monitoring for toxicity to *S. capricornutum* was initiated in 2008 and continued through the 2018 WY. In 2012, MPM did not take place at the site due to temporary MPM suspension from April through December.

Constituent Monitoring Results and Sourcing

Monitoring results used to justify management plan completion due to three years of monitoring with no toxicity are included in Appendix I (2005 through the 2018 WY).

Eight samples collected from Highline Canal @ Hwy 99 were toxic to *S. capricornutum*: in March 2006 (2% growth compared to the control), February, April, and May of 2008 (72%, 63%, 76% growth; respectively), February 2013 (12% growth), June and July 2014 (36% and 40% growth; respectively), and July 2015 (63% growth).

A Toxicity Identification Evaluation (TIE) was initiated on three of the toxic samples collected on February 12, 2013, June 10, 2014, and July 8, 2014. The samples collected in February 2013 lost toxicity and the TIE could not be performed. However, TIE results from the June and July 2014 samples indicated non-polar organics and metals were the source of observed toxicity. None of the samples that resulted in toxicity to *S. capricornutum* coincided with any exceedances of non-polar organic chemical. Only one sample had concentrations in exceedance of the hardness based WQTL for copper and coincided with toxicity to *S. capricornutum* on February 28, 2008.

Since the last toxicity in July 2015, the Coalition monitored for toxicity to *S. capricornutum* 34 times with no instances of toxicity. The end of three years of monitoring with no toxicity was July 2018.

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

Summary of Outreach

The Coalition conducted focused outreach in the Highline Canal @ Hwy 99 site subwatershed from 2010 through 2012. In 2010, the Coalition contacted 10 targeted members representing 367 irrigated acres and management practices were documented for 33% of the acreage identified as having direct drainage or the potential to impact water quality through spray drift. The Coalition conducted a second round of focused outreach in the Highline Canal @ Hwy 99 site subwatershed from 2016 through 2018 due to recent toxicity and chlorpyrifos exceedances. In 2016, the Coalition contacted seven members representing 177 irrigated acres. Management practices were documented for 2% of the acreage. During both rounds of focused outreach Coalition representatives discussed local water quality concerns, the importance of preventing the offsite movement of all agricultural constituents. Coalition representatives did not make any specific recommendations to targeted members in 2010 or 2016. In 2011, the Coalition followed up with all targeted members to see if any additional management practices were implemented based on discussions with representatives.

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

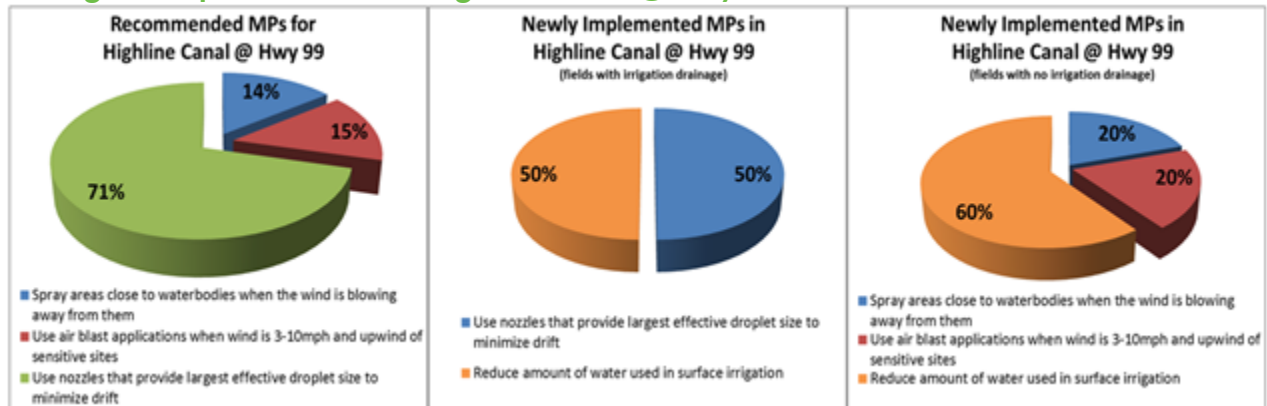
The complete analysis of management practices implemented in the Highline Canal @ Hwy 99 site subwatershed can be found in the ESJWQC April 1, 2012 MPUR and the May 1, 2018 AMR. Results from that analysis are summarized in the section below.

Management Practices Implemented

During the 2010 individual meetings with targeted growers, Coalition representatives discussed 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. Eight targeted growers completed follow-up surveys (two members dropped out of Coalition) and indicated management practices encouraged at the meetings were implemented.

For parcels with irrigation drainage, growers reduced water use during irrigation (50% acreage) and utilized nozzles that provided the largest effective droplet size (50% acreage; Figure 3). For parcels without irrigation drainage, newly implemented practices include reducing the amount of water used in surface irrigation (60% acreage), using air blast applications when the wind is 3-10 mph and upwind of sensitive sites (20% acreage), and spraying areas close to waterbodies when the wind is blowing away from them (20% acreage; Figure 3).

Figure 3. Percent of acreage represented by recommended and implemented management practices in the Highline Canal @ Hwy 99 site subwatershed.



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

Justification for Removal

The Coalition’s focused outreach and management practice tracking strategy has been effective at improving water quality as indicated by no toxicity to *S. capricornutum* in the Highline Canal @ Hwy 99 site subwatershed in three or more years (Table 8). Based on focused outreach surveys and follow-up results, targeted growers implemented management practices and water quality improved. The Coalition requests that the management plan and MPM be approved for completion for water column toxicity to *S. capricornutum* at Highline Canal @ Hwy 99.

Table 8. Highline Canal @ Hwy 99 *S. capricornutum* toxicity monitoring history from 2007 through the 2018 WY.

Black cells indicate exceedances, grey cells indicate a sample was collected, and spotted cells indicate the site was dry.

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2005												
2006			2%									
2007												
2008		72%		63%	76%							
2009												
2010												
2011												
2012												
2013		12%										
2014						36%	40%					
2015							63%					
2016												
2017												
2018												2019 WY

Future Monitoring

During the 2019 WY, MPM at Highline Canal @ Hwy 99 for toxicity to *S. capricornutum* is scheduled as outlined in the Coalition's MPU (approved September 21, 2018). Monitoring will occur as scheduled until the approval of management plan completion is received.

HIGHLINE CANAL @ LOMBARDY RD

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

Constituent Requested for Management Plan Completion:

- Water column toxicity to *S. capricornutum*

Site Subwatershed Overview and Monitoring History

Highline Canal @ Lombardy Rd is a Represented site located in Zone 3 and is located upstream of the monitoring site Highline Canal @ Hwy 99. Monitoring began during the 2005 storm season and continued through September 2015. Assessment Monitoring occurred in the site subwatershed in 2011 and 2012 where all constituents were monitored monthly with the exception of 2012 where MPM and monitoring for certain constituents was temporarily suspended. Management Plan Monitoring for toxicity to *S. capricornutum* was initiated in 2008 and continued through the 2015 WY. As of the 2016 WY, all management plan constituents are assessed through monitoring at Highline Canal @ Hwy 99.

Constituent Monitoring Results and Sourcing

Monitoring results used to justify management plan completion due to three years of monitoring with no toxicity are included in Appendix I (2005 through the 2015 WY).

Since monitoring began in 2005, water column toxicity to *S. capricornutum* occurred seven times in samples collected at Highline Canal @ Lombardy Rd: in August 2005 (80% survival compared to the control), March 2006 (30% survival), February 2007 (70% survival), May 2008 (53% survival), April 2011 (8% survival), and September 2012 and 2015 (45% and 75% survival; respectively).

The TIEs were initiated on four of the toxic samples with survival less than 50% compared to the control. Three of the samples lost toxicity prior to the TIE being initiated. One TIE conducted on the March 2006 samples indicated non-polar organics and cationic metals as the source of toxicity. One sample in exceedance of the WQTL for diuron coincided with toxicity to *S. capricornutum* in samples collected on February 28, 2007.

Since the last toxicity in September 2015, the Coalition stopped monitoring at Highline Canal @ Lombardy Rd as part of the Delta Regional Monitoring Program financial swap. The Coalition continued conducting MPM for toxicity to *S. capricornutum* at the downstream site, Highline Canal @ Hwy 99. The Coalition has monitored for toxicity to *S. capricornutum* 31 times since September 2015 with no instances of toxicity. The end of three years of monitoring with no toxicity was September 2018.

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

Summary of Outreach

The Coalition conducted focused outreach in the Highline Canal @ Lombardy Rd site subwatershed from 2013 through 2015. In 2013, the Coalition contacted 20 growers representing 4,226 irrigated acres. Management practices were documented for 46% of the acreage identified as having direct drainage or the potential to impact water quality through spray drift. Coalition representatives provided recommendations for additional management practices to eight growers. The Coalition followed up with growers in 2014 to determine if recommended and/or new practices were implemented.

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

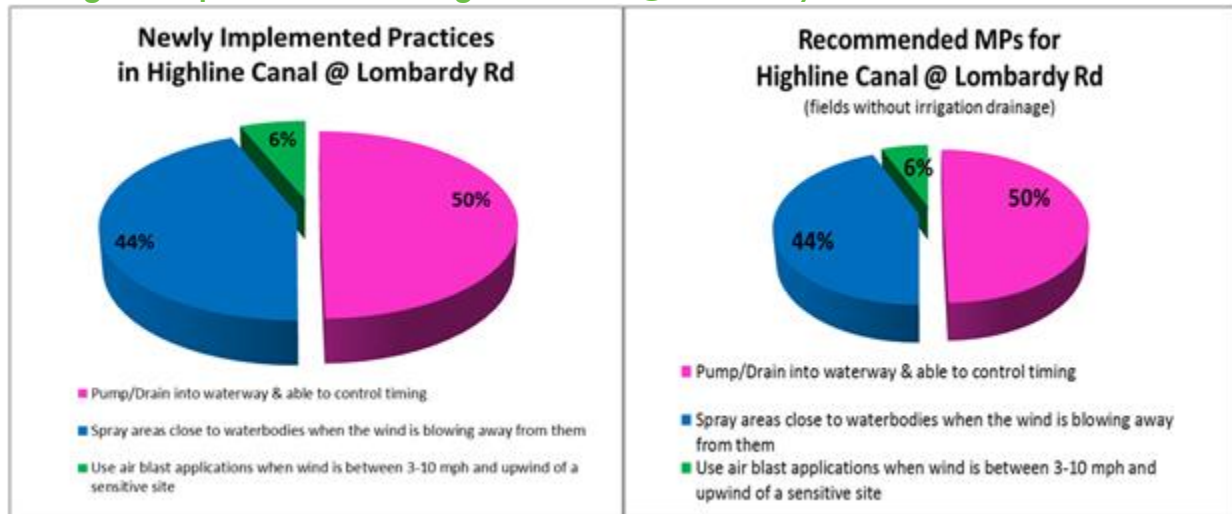
The complete analysis of management practices implemented in the Highline Canal @ Lombardy Rd site subwatershed can be found in the ESJWQC 2015 Annual Report. Results from that analysis are summarized in the section below.

Management Practices Implemented

During the individual meetings with targeted growers, Coalition representatives recommended three additional management practices to eight growers. The follow-up surveys indicated the recommended management practices were implemented.

Newly implemented practices include spraying areas close to waterbodies when the wind is blowing away from them (44% acreage), using air blast applications when wind is between 3-10 mph and upwind of a sensitive site (6% acreage), and installing a device to control timing of pump/drain into waterway (50% acreage; Figure 4).

Figure 4. Percent of acreage represented by recommended and implemented management practices in the Highline Canal @ Lombardy Rd site subwatershed.



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

Justification for Removal

The Coalition’s focused outreach and management practice tracking strategy has been effective at improving water quality as indicated by no toxicity to *S. capricornutum* in the Highline Canal @ Hwy 99 site subwatershed in three or more years (Table 9). Based on focused outreach surveys and follow-up results, targeted growers implemented management practices and water quality improved. The Coalition requests that the management plan and MPM be approved for completion for water column toxicity to *S. capricornutum* at Highline Canal @ Lombardy Rd.

Table 9. Highline Canal @ Lombardy Rd *S. capricornutum* toxicity monitoring history from 2007 through the 2017 WY.

Black cells indicate exceedances, grey cells indicate a sample was collected, and spotted cells indicate the site was dry.

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2005								80%				
2006			30%									
2007		70%										
2008					53%							
2009												
2010												
2011				8%								
2012									45%			
2013												
2014												
2015									75%			
2016- Hwy 99												
2017 - Hwy 99												
2018 - Hwy 99										2019 WY		

Future Monitoring

During the 2019 WY, monitoring is not scheduled to occur at Highline Canal @ Lombardy Rd as outlined in the Coalition’s MPU (approved September 21, 2018). Monitoring will occur as scheduled at Highline Canal @ Hwy 99 for toxicity to *S. capricornutum* until the approval of management plan completion is received.