
Central Valley Regional Water Quality Control Board

2 March 2015

David Guy, President
Northern California Water Association
455 Capitol Mall # 335
Sacramento, CA 95814

MANAGEMENT PLAN FOR CHLORPYRIFOS IN THE LOWER SNAKE RIVER

Thank you for your 20 May 2014 request to approve completion of the Management Plan for chlorpyrifos in the Lower Snake River in the Butte-Yuba-Sutter County Subwatershed of the Sacramento Valley Water Quality Coalition (Coalition). The Coalition's primary basis for the request is that the Lower Snake River has been determined to meet the water quality objective for chlorpyrifos and extensive outreach efforts and management practices have been effective in controlling the discharge of chlorpyrifos.

The Management Plan for chlorpyrifos in the Lower Snake River was triggered by two exceedances in 2008. Since the last exceedance in August 2008, there have been no exceedances of chlorpyrifos in the 32 sample events conducted from 2010 through 2014. The Coalition has documented extensive outreach and education to members, and growers have implemented management practices to reduce the risk of transport of chlorpyrifos to surface waters. The lack of chlorpyrifos exceedances since 2008 demonstrates the effectiveness of the management practices in resolving the water quality problem. For these reasons, I have determined that this Management Plan for chlorpyrifos in the Lower Snake River is complete. The Coalition should continue to collect and analyze samples from the Lower Snake River, one of the Coalition's Representative monitoring sites, according to the regular monitoring schedule.

If you have any questions regarding this approval letter, please contact Lynn Coster at Lynn.Coster@waterboards.ca.gov or (530) 224-2437.

Original Signed By

Pamela C. Creedon
Executive Officer

Enclosures: Staff review of the request to complete management plan for chlorpyrifos

cc: Bruce Houdesheldt, Northern California Water Association
Claus Suverkropp, Larry Walker Associates



Central Valley Regional Water Quality Control Board

TO: Susan Fregien
Senior Environmental Scientist
Irrigated Lands Regulatory Program

FROM: Lynn Coster
Environmental Scientist
MONITORING AND IMPLEMENTATION UNIT
IRRIGATED LANDS REGULATORY PROGRAM

DATE: 22 January 2015

SUBJECT: MANAGEMENT PLAN FOR CHLORPYRIFOS IN THE LOWER SNAKE RIVER

The Sacramento Valley Water Quality Coalition (Coalition) is required to implement management plans for constituents that exceed water quality objectives at the same site more than once in a three-year period (Order R5-2014-0030). On 20 May 2014 the Coalition submitted a request to approve completion of the chlorpyrifos management plan for the Lower Snake River in the Butte-Yuba-Sutter Subwatershed. The request is based upon the Coalition's findings that the Lower Snake River is meeting the water quality objective for chlorpyrifos. Additional factors to support the request include the extensive outreach efforts implemented in the subwatershed and the award of grant funding to augment and expand implementation of management practices to control the discharge of chlorpyrifos and other agricultural pesticides.

Based on the requirements in Order R5-2014-0030, management plans may be completed in one of two ways: irrigated agriculture is demonstrated not to be causing or contributing to the water quality problem, or the improved management practices have resolved the water quality problem and the water quality data show at least three years of compliance.

Staff evaluation of evidence presented to support the request:

Monitoring data. The management plan for chlorpyrifos in the Lower Snake River was triggered by two exceedances in July and August of 2008 (Figure 1). Toxicity to *Ceriodaphnia dubia* (60% survival) was also observed in the August 2008 sample. The detected concentration of chlorpyrifos (0.0343 µg/L) was sufficient to account for the observed reduction of *Ceriodaphnia* survival. No other pesticides were detected in the sample, and based on these results chlorpyrifos was identified as the likely cause of the observed toxicity.

There have been no exceedances of chlorpyrifos in the 32 sample events conducted since the last exceedance in August 2008. Two detections of chlorpyrifos above the reporting limit were observed in September 2011 (0.0037 µg/L) and July 2012 (0.0024 µg/L), both well below the Basin Plan water quality objective of 0.015 µg/L.

Two *Ceriodaphnia dubia* exceedances were observed in 23 sample events since the August 2008 exceedance (Figure 2). In September 2008 (5% survival) and August 2011 (10%

survival) toxicity to *Ceriodaphnia dubia* was observed. In both cases, Toxicity Identification Evaluation (TIE) procedures did not identify a specific cause for the toxicity, and no exceedances or detections of chlorpyrifos were observed in concurrent monitoring.

Potential sources. The 2011 Source Evaluation Report concluded that agriculture was the likely source of the chlorpyrifos exceedances. Few non-agricultural uses of chlorpyrifos were reported in Butte and Sutter counties during the period of the exceedances and were unlikely to have contributed. The primary use of chlorpyrifos in the drainage is on walnuts during the irrigation season. Almonds account for the majority of the remaining applications, with lesser amounts applied to prunes, peaches, and pecans.

Evaluation of pesticide use data confirmed the application of chlorpyrifos in the month prior to each noted exceedance. This data also showed that the use of chlorpyrifos has remained consistent in the Wadsworth drainage and in the drainages represented by the Lower Snake River monitoring site (Figure 2). Analysis and interpretation of the pesticide use reporting (PUR) information took into account the method of application, solubility and potential for runoff. Based on the timing of use during the irrigation season, the primary methods of transport to surface waters were irrigation tailwater discharges and spray drift from aerial or airblast ground applications.

Third-party outreach and management practice implementation. The Coalition identified 34 individual high-priority parcels in the Wadsworth drainage. Twenty-nine growers who reported the application of chlorpyrifos in the Lower Snake River drainage from 2007 to 2011 were contacted by phone in March 2012 to inform them of the exceedances and to survey them regarding current and planned management practice implementation. The focus of the outreach was on the method and timing of chlorpyrifos applications during the irrigation season in order to meet the goal of reducing future exceedances.

The Sutter County Resource Conservation District (RCD) conducted extensive outreach and education throughout Sutter and Yuba counties. Five workshops on irrigation water management were hosted in 2011 and 2012. Minimizing overwatering and tailwater runoff are key to eliminating chlorpyrifos exceedances during the irrigation season. In the fall of 2012, the RCD visited 53 growers to promote proper irrigation water management.

In 2012, the Lower Snake River Watershed in Sutter County received funding through the Delta Bay Initiative for Environmental Quality Incentives Program projects. Twenty-one contracts were funded to convert flood irrigation systems to solid-set or micro-drip sprinkler systems in 2012. Producers were required to implement irrigation water management practices under the contracts. Funding was scheduled to continue in 2013.

Staff recommendation:

Credible evidence is provided to support that chlorpyrifos is no longer a water quality problem in the Lower Snake River and its represented drainages. Although no monitoring was conducted in 2009, over four years of monitoring data has been collected with no chlorpyrifos exceedances since those that triggered the management plan in 2008. Samples were collected during the irrigation season, when the initial exceedances occurred, and all results complied with the Basin Plan water quality objective limit of 0.015 µg/L.

Sufficient measures have been taken to prevent future chlorpyrifos exceedances in the Lower Snake River and its represented drainages. The Coalition has documented extensive third-party education and outreach to members. Management practices have been addressed and implemented to convert flood irrigation to drip/micro-sprinkler systems and to reduce the risk of transport of chlorpyrifos to surface waters. Detailed results from grower surveys were provided which focus on preventing aerial drift and reducing irrigation runoff. The lack of chlorpyrifos exceedances observed since 2008 demonstrates the effectiveness of the management practices being implemented.

The Lower Snake River (LSNKR) is one of the Coalition’s Representative monitoring sites and will continue to be monitored regularly for those parameters set forth in the Monitoring and Reporting Program of Order R5-2014-0030. Chlorpyrifos monitoring is likely to be continued based on the Order’s stipulation that monitoring for pesticides is required in areas where it is applied and has the potential to impact water quality.

Figures and Tables

Figure 1

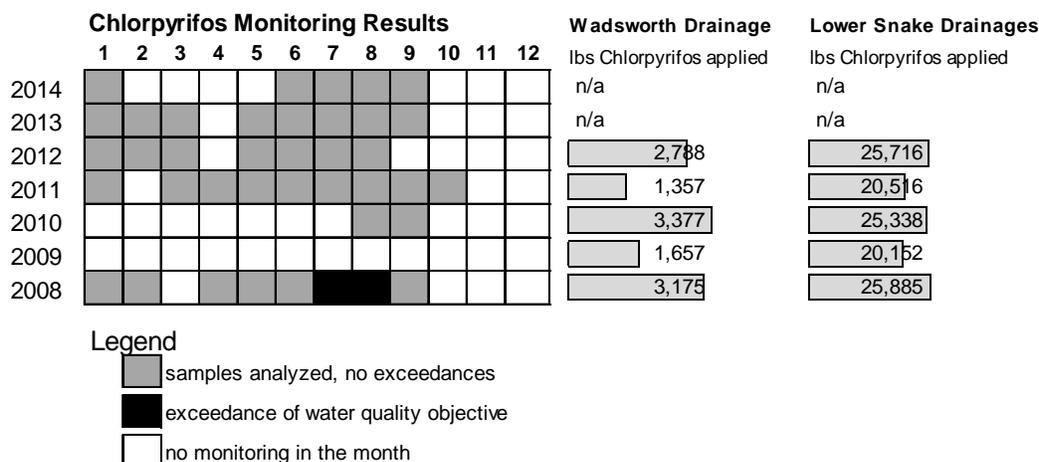


Figure 1. Monitoring results for chlorpyrifos in Lower Snake and pesticide use report (PUR) data for chlorpyrifos in the Wadsworth and Lower Snake drainages. Results of monitoring are shown by year (rows) and month (columns). Each cell represents one month, and the cell fill indicates if monitoring took place and if results were in compliance with the water quality objective. PUR data (pounds of active ingredient (AI) applied) are shown for each year.

Figure 2

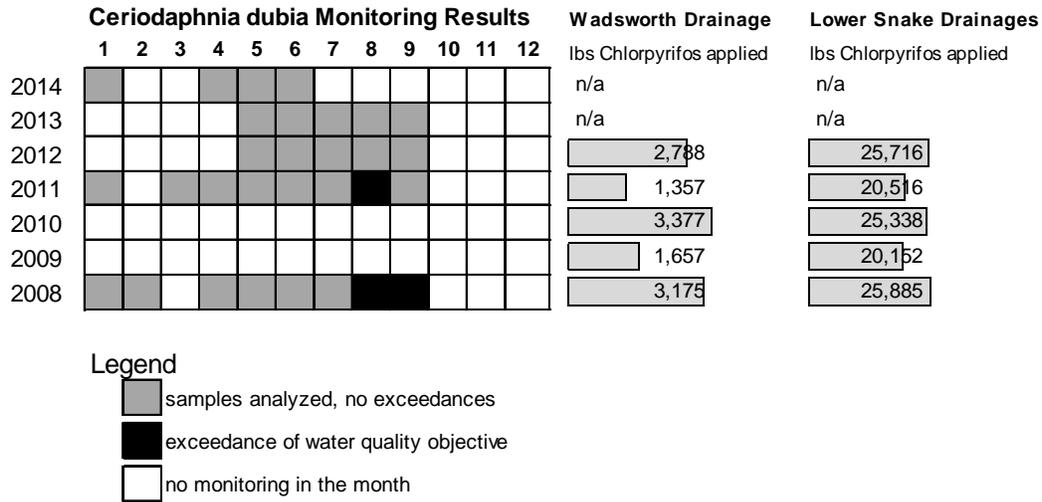


Figure 2. Monitoring results for *Ceriodaphnia dubia* in Lower Snake and pesticide use report (PUR) data for chlorpyrifos in the Wadsworth and Lower Snake drainages. Results of monitoring are shown by year (rows) and month (columns). Each cell represents one month, and the cell fill indicates if monitoring took place and if results were in compliance with the water quality objective. PUR data (pounds of active ingredient (AI) applied) are shown for each year.