
Central Valley Regional Water Quality Control Board

11 February 2015

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

COMPLETION OF MANAGEMENT PLAN FOR SEDIMENT TOXICITY IN COSUMNES RIVER

Thank you for your 17 July 2013 request to approve completion of the *Hyallela azteca* sediment toxicity Management Plan for Cosumnes River in the Sacramento-Amador Subwatershed of the Sacramento Valley Water Quality Coalition (Coalition). The Coalition's primary basis for the request is that agricultural sources did not contribute to the exceedances, and that reductions in survival of the test organism were low.

The information provided in the coalition's request letter and the attached staff memorandum support the conclusion that 93% survival is not a toxic result. Therefore, based on the lack of sediment toxicity since 2005, I approve the completion of management plan for sediment toxicity in the Cosumnes River. The coalition should continue to collect and analyze samples for sediment toxicity and chemistry according to its regular monitoring schedule for the Cosumnes River.

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 sediment toxicity

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**

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Environmental Scientist
**MONITORING AND IMPLEMENTATION UNIT
IRRIGATED LANDS REGULATORY PROGRAM**

DATE: 22 January 2015

SUBJECT: MANAGEMENT PLAN FOR SEDIMENT TOXICITY IN COSUMNES RIVER

On 17 July 2013, the Sacramento Valley Water Quality Coalition (Coalition) submitted a request to approve completion of the *Hyalella azteca* toxicity management plan for the Cosumnes River in the Sacramento Amador Subwatershed. The request for management plan completion is based upon the Coalition's finding that agricultural sources do not contribute to the observed exceedances, and that the sediment toxicity was observed at very low levels that may not be considered ecologically significant.

The management plan for sediment toxicity in the Cosumnes River was triggered by exceedances in June and September 2005, when survival of the test organism in samples from the monitoring site was statistically different from control samples (8% and 15% lower, respectively). Sediment samples did not exhibit toxicity when monitored from 2008 through 2012 (Figure 1). Survival of the test organism in Cosumnes River samples was 7% lower than in the control in April 2013. While specific causes or contributing sources of the sediment toxicity could not be definitively identified, the evidence is not sufficient to rule out agricultural sources.

Staff evaluation of evidence presented to support the request:

- a) Other than a single exceedance of dissolved copper, there were no exceedances of monitored pesticides or water column toxicity in Cosumnes River samples tested from 2005 through 2014. However, the Coalition does not monitor for pyrethroids in the water column, and sediment chemistry results are available only for two samples collected for the Statewide Stream Pollution Trends (SPoT) Monitoring Program. Pesticides detected in sediments were DDE and DDT in July 2008, and bifenthrin and λ -cyhalothrin in September 2010 (CEDEN data); all results were below the reporting limits, and samples were not toxic to the test organism. Finally, the absence of water column toxicity does not inform of the presence of compounds or processes that cause toxicity in sediments.

b) The Coalition prepared summaries of pesticides (monitored and non-monitored) used in two months prior to the observed sediment toxicity. The analysis and interpretation of the pesticide use reporting (PUR) information took into account amount applied, acreage treated, the chemical characteristics (persistence in sediment, solubility and partitioning) and relative risk based on toxicity information of compounds. Based on the evaluation of the PUR, chlorpyrifos and multiple pyrethroids in agricultural applications could have caused or contributed to sediment toxicity (hydrophobic and relatively persistent):

- **92% survival on 6/7/2005:** chlorpyrifos, permethrin, esfenvalerate, bifenthrin
- **85% survival on 9/6/2005:** chlorpyrifos, fenpropathrin, esfenvalerate, λ -cyhalothrin, bifenthrin, propargite
- **93% survival on 4/18/2013:** pesticide use information not yet available.

The test result from April 2013 was originally reported as an exceedance of the toxicity objective (Figure 1). However, the current recommended SWAMP protocol (SWAMP Toxicity Workgroup Recommendation: August 27, 2014) for declaring a given sample toxic states the organism response must be (1) statistically significant (at the alpha level) compared to the control sample using a t-test statistical comparison and (2) greater than the threshold value of 20% (i.e., the Percent Effect is >20%). In this case, the organism response was 93% as compared to control. The result was statistically significant, but the percent effect was only 7%. Therefore, the test is not deemed an exceedance

- c) Rural residential runoff was speculated as a potential non-agricultural source of toxicity. Presence of other potential sources does not preclude an agricultural cause of sediment toxicity.
- d) The observed mortality was of low magnitude and could have been a false positive result in each case due to low variability in sample and control replicates. While the magnitude of the mortality was low, there are no critical toxicity thresholds currently identified for the Irrigated Lands Regulatory Program, and any statistically significant difference from the control has been considered an exceedance of the narrative water quality objective for toxicity.

Staff recommendation:

Although specific causes or sources of toxicity could not be identified, agriculture cannot be definitely ruled out as source or a contributing cause of toxicity. However, staff recommends approving the completion of the management plan based on the lack of sediment toxicity and the lack of detected pesticides since 2005. The Cosumnes River is a part of the Coalition's representative monitoring site network and will continue to be monitored regularly for sediment toxicity.

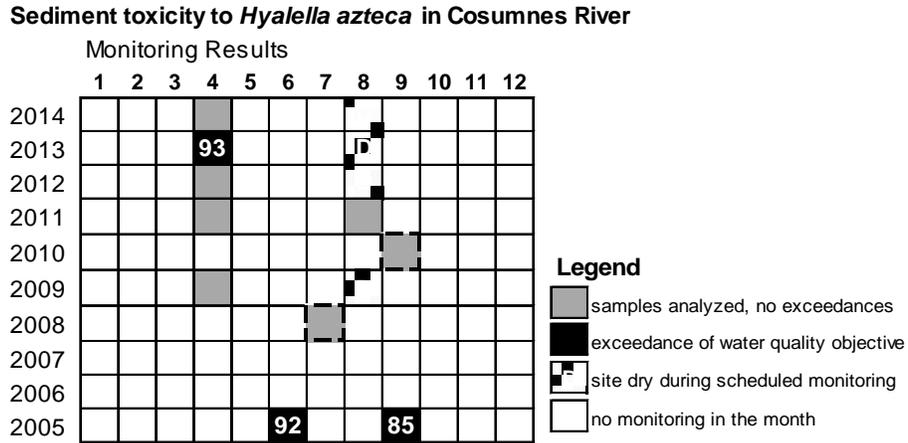


Figure 1. Monitoring results for sediment toxicity to *Hyalella azteca* in Cosumnes River at Twin Cities Bridge/Road. Results of monitoring are shown by year (rows) and month (columns). Each cell represents one month, and the cell fill indicates whether monitoring took place and if results were in compliance with the water quality objectives (dashed cell border indicates results from 2008 and 2010 Statewide Stream Pollution Trends Study, data retrieved from CEDEN). For exceedances, the survival of the test organism is shown as percent of the control. The site is frequently dry in late summer.