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April 1, 2013

Pamela Creedon, Executive Director
Central Valley Regional Water Quality Control Board
10200 Sun Center Drive, Suite 200
Rancho Cordova, CA 95670-6114

The Sacramento Valley Water Quality Coalition (Coalition) and Solano Subwatershed respectfully request your determination that the malathion Management Plan for the Ulatis Creek be deemed complete. The primary basis for this request is that Ulatis Creek has been determined to meet the Water Quality Objectives (WQOs) for malathion. Additional factors supporting the request include the extensive outreach conducted in the subwatershed and focused in the represented drainage area, including the pursuit and award of Natural Resources Conservation Service (NRCS) cost-share funding to further augment and expand implementation of management practices to manage discharges of malathion and other agricultural pesticides.

BACKGROUND FOR MANAGEMENT PLAN REQUIREMENT

The Ulatis Creek monitoring location at Brown Road (UCBRD) is a representative monitoring site in the Cache Slough drainage. In addition, this site represents the Sacramento River drainage in the Solano Subwatershed of the SVWQC. The management plan requirement for malathion was triggered by exceedances observed in April and August 2007.

DATA AND EXCEEDANCES

Relevant monitoring data for malathion are provided in Table 1. The monitoring results indicate the following:

- A total of 49 sample events have been conducted for malathion in Ulatis Creek. There have been *three* (3) detections of malathion, all observed in 2007. Based on a prohibition of detection of malathion in the *Water Quality Control Plan (Basin Plan) For The Sacramento River and San Joaquin River Basins* (4th Edition, 2007 and unchanged in the 2011 edition), each of the three exceedances is considered an exceedance of Basin Plan water quality objectives (WQOs). These results include all of the Coalition's ILRP data and four additional events collected by UC Davis for the RWQCB's ILRP monitoring.
- There have been no detections or exceedances in the 33 samples collected over 29 sample events from 2008 to 2012, since the last malathion detection in December 2007.
- All detected results were less than 0.02 µg/L. This is lower than the method detection limit of 0.03 µg/L for the Central Valley Water Quality Control Board (CVRWQCB) Irrigated Lands Regulatory Program (ILRP) monitoring, and these concentrations would not have been detected and considered exceedances if the samples were analyzed by other less sensitive methods that meet ILRP quality requirements or collected by the CVRWQCB's own monitoring program.

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- Detected results were also well below concentrations expected to cause toxicity in sensitive invertebrate species. Results in U.S. EPA's ECOTOX database[1] indicate that 2-day LC50s for *Ceriodaphnia* range from 0.58 µg/L to 3.35 µg/L, with an average LC50 greater than 1.7 µg/L.
- There has been only one observed case of significant toxicity to *Ceriodaphnia* in Ulatis Creek samples (March 2006, Table 1), and there was no malathion detected in the associated sample. There have been no cases of toxicity attributed to malathion in Ulatis Creek (or any other water bodies sampled by the Coalition for the ILRP).

The three detections of malathion in Ulatis Creek occurred in April, August and December 2007. Significantly, 2007 marked the year that the lowest number of acres of agricultural crops were treated with malathion for the seven year period 2005-2011 (Figure 1). In fact in 2008, the year after the exceedances, there was a significant increase in use of malathion, due to County Agriculture Department requirements for med-fly treatments. Since the use of malathion has continued in the five years since the three detections in 2007 and we have not seen any detections at any of our sites, we conclude that the practices that growers and applicators are implementing are sufficient.

Overall, these monitoring data indicate that malathion is (1) currently meeting water quality objectives, (2) is not a chronic problem in Ulatis Creek, and (3) that management practices in the Cache Slough drainage and larger represented area are already adequate to prevent exceedances of the Basin Plan narrative prohibitions of detection of malathion and potential contributions to toxicity.

SUMMARY OF EVALUATIONS SUPPORTING REQUEST

The following evaluations and factors support this request:

Assessment of Compliance with Water Quality Objectives	• No detections since December 2007 (33 samples, 29 events over 5 years), even in years with similar or increased use. • All detected concentrations would have been in compliance (below detection) if monitored by different analytical methods that still met the ILRP QA requirements.
Lack of agricultural contribution to toxicity	• Detected concentrations were all well below concentrations known to cause or substantially contribute to toxicity in sensitive invertebrate species.
Outreach and Education	• Extensively conducted to increase awareness of issues for this management plan and other management plans in the represented drainages.
Implemented Practices	• Already adequate to prevent malathion exceedances (based on monitoring results, survey results, and use patterns). • Increased implementation for other management plans and NRCS grant projects will further reduce risks of malathion exceedances.

[1] U.S. Environmental Protection Agency. 2013. ECOTOX User Guide: ECOTOXicology Database System. Version 4.0. Available: http:/www.epa.gov/ecotox/

SOURCE EVALUATIONS

An evaluation of potential sources contributing to malathion exceedances in Ulatis Creek was completed in 2010[2]. The source evaluation included analysis of pesticide use reporting data (PUR) from the California Department of Pesticide Regulation (CDPR) and the Solano County Agriculture Department. Conclusions of the source evaluations included:

- Alfalfa, watermelon, and nursery plants account for the majority of agricultural applications relevant to the observed exceedances. These crops should be the priority for outreach.
- Non-agricultural uses of malathion for structural pest control had some potential to have caused or contributed to observed exceedances. It is highly probable that urban and rural residential uses also represent a significant non-agricultural source of malathion in the drainage (especially through urban runoff). If management of malathion exceedances is considered necessary, these sources should also be targeted for outreach and management by the Regional Water Board.
- Based on evaluations of reported pesticide applications and predominant crops in the drainage, agriculture is a potential contributing source of the observed malathion exceedances. The next Management Plan step was to survey Coalition members farming on high-priority parcels in the drainage. Coalition members were surveyed for crop type, pesticide use, and management practice implementation. Based on the conclusions of the source evaluation report, practices relevant to the method and timing of malathion application were the focus. The results of this survey were used to determine the current degree of management practice implementation and to establish appropriate goals for implementation.

OUTREACH AND EDUCATION

Outreach and education efforts are not specifically cited as a basis for this request. However, growers in the subwatershed have been made aware of the management plan, the consequences of any detections of malathion, transport and transfer pathways, and recommended management practices. In addition to direct communication in 2010-2011 with 23 registered users of malathion, Dixon/Solano RCD Water Quality Coalition Staff, Solano County Agricultural Commissioner and University of California Cooperative Extension Farm Advisor have continued to include information on the water quality risks, recommended practices and the special circumstances regarding regulation of malathion detections in our outreach activities. Outreach specific to the malathion management plan was conducted in tandem with outreach for diuron and chlorpyrifos management plans in this watershed as well as the sediment toxicity management plan in the Z-Drain watershed. The combined outreach for these management plans has reached all of the Dixon-Solano subwatershed membership (currently 594 members) by newsletter, as well as the earlier direct telephone contacts with all malathion users in the represented drainages. We believe that increased awareness of the growers and applicators has contributed to changes in practices and reduced malathion discharges from agriculture, as evidenced by the lack of detections since December 2007.

SURVEYS

The degree to which management practices are implemented in the drainage was initially evaluated through surveys of selected high priority growers along Ulatis Creek in 2009, and a

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[2] *Source Evaluation Report: Malathion in Ulatis Creek*. Sacramento Valley Water Quality Coalition. March 2010

report[3] summarizing these results was prepared and submitted to the Water Board in 2011. Nineteen individual high-priority parcels (seven members with 1,200 total acres) were identified representing the acreage with the highest potential to contribute to observed exceedances in this initial survey. Based on the responses from the initial targeted survey, it was concluded that most growers in the Ulatis Creek watershed are implementing adequate best management practices to protect surface water quality.

- Awareness of IPM pesticide management practices, use of PCAs, and appropriate training were universally high, as was implementation of practices to control and minimize overspray and drift.
- Most growers implemented at least one type of relevant irrigation management and drainage practice and projected installing more within two years. The majority of growers indicated having storm runoff from their fields only in heavy rainstorms.
- Most operations also implemented additional practices to minimize discharge of pesticides in irrigation and storm runoff (e.g., sediment traps, vegetated ditches, tailwater returns systems).

A second survey of a broader cross-section of agricultural operations in the represented drainages (46 members with >63,000 total acres) was completed in March 2013 and is now being compiled for the evaluation of implementation of practices for the chlorpyrifos management plan (the practices are also relevant to this malathion management plan). Preliminary results indicate very high levels of awareness of issues related to pesticide exceedances, as well as high levels of implementation of management practices to reduce and eliminate these exceedances. The Dixon/Solano Coalition will compile a summary of implemented practices that will be included in the 2014 Management Plan Progress Report.

MANAGEMENT PRACTICES

Based on the monitoring results, management practices in the drainage appear adequate to prevent discharges of malathion to surface waters, and implementation of additional practices is not specifically cited as a basis for this request. However, we believe that the lack of malathion detections since December 2007 can be attributed at least in part to changes in practices as a result of increased awareness of the growers and applicators. A summary of the surveys documenting the current degree of implementation in the represented drainages will be included in the 2014 Management Plan Progress Report, as stated previously in the **SURVEYS** section of this letter.

OTHER RELEVANT INFORMATION

Implementation of additional practices is currently being pursued as part of management plans for chlorpyrifos and diuron in the same represented drainages addressed by the malathion management plan. Most of these goals are to be attained at the end of two years of Coalition outreach and technical support. Additional implementation of relevant practices will also occur in 2014-2016 through the NRCS EQIP cost-share program. The NRCS Dixon Service Center pursued and received $500,000 in additional Environmental Quality incentives Program (EQIP) Funding specifically to assist local growers in addressing water quality issues related to

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[3] *Grower Survey Report: Ulatis Creek*. Prepared for Sacramento Valley Water Quality Coalition By The Coalition for Urban/Rural Environmental Stewardship. 2011.

pesticide exceedances. As of March 15th, more than 20 individuals have submitted applications for cost-share assistance with management practice implementation. Although it does not appear necessary to control and prevent malathion exceedances, the additional implementation of practices will further reduce the risks of malathion use in the represented drainages.

CONCLUSIONS

Based on the monitoring results summarized above, Ulatis Creek is meeting the Central Valley Basin Plan water quality objective for malathion and has done so for the last 5 years. Based on the findings presented in this request, we conclude that agricultural practices have been and continue to be sufficient to prevent discharges of malathion to Ulatis Creek. Additionally, ongoing management plans for diuron and chlorpyrifos continue to pursue implementation of additional practices and NRCS EQIP grants have been awarded to augment management practices in the represented drainages that will further reduce the risk of malathion discharges and exceedances in regional surface waters.

As specified in the SVWQC's Criteria for Completion of a Management Plan, we respectfully request that you make a determination of the completeness of this management plan.

Sincerely,

David J. Guy
President
Northern California Water Association

Cc: Joe Karkoski
Susan Fregien
Mark Cady
John Currey
Kelly Huff
Bruce Houdesheldt
Claus Suverkropp

TABLES AND FIGURES

Table 1. Monitoring results for malathion in Ulatis Creek water samples

Event	Sample Date	Sample Replicate	Malathion, µg/L	*Ceriodaphnia* survival, % of control	Notes
9	2006-Feb-28	1	ND (<0.005)	100	
9	2006-Feb-28	2	ND (<0.005)	93.3	
10	2006-Mar-16	1	ND (<0.003)	75	(1)
12	2006-May-26	1	ND (<0.003)	100	
13	2006-Jun-22	1	ND (<0.003)	100	
14	2006-Jul-20	1	ND (<0.003)	111.1	
15	2006-Aug-17	1	ND (<0.003)	111.1	
16	2006-Sep-22	1	ND (<0.003)	105.3	
17	2007-Feb-12	1	ND (<0.003)	100	
19	2007-Apr-17	1	0.012		(2)
20	2007-May-15	1	ND (<0.003)		
21	2007-Jun-20	1	ND (<0.003)		
–	2007-Jun-28	1	ND (<0.03)		(3)
–	2007-Jul-10	1	ND (<0.03)		(3)
22	2007-Jul-17	1	ND (<0.003)		
–	2007-Jul-24	1	ND (<0.03)		(3)
–	2007-Aug-08	1	ND (<0.03)		(3)
23	2007-Aug-21	1	0.018		(2)
24	2007-Sep-19	1	ND (<0.003)		
25	2007-Dec-19	1	0.01	90	(2)
26	2008-Jan-28	1	ND (<0.003)	105.3	
27	2008-Feb-21	1	ND (<0.003)	105.3	
28	2008-Apr-21	1	ND (<0.003)	100	
28	2008-Apr-21	2	ND (<0.003)		
29	2008-May-19	1		100	
29	2008-May-21	1	ND (<0.003)		
30	2008-Jun-17	1	ND (<0.003)	100	
31	2008-Jul-14	1	ND (<0.003)	90	
32	2008-Aug-18	1	ND (<0.003)	100	
33	2008-Sep-15	1	ND (<0.003)	100	
37	2009-Mar-19	1	ND (<0.003)		
38	2009-Apr-20	1	ND (<0.003)		
		2	ND (<0.003)		
39	2009-May-19	1	ND (<0.003)		
		2	ND (<0.003)		
40	2009-Jun-16	1	ND (<0.003)		
41	2009-Jul-21	1	ND (<0.003)		
42	2009-Aug-18	1	ND (<0.003)		
43	2009-Sep-22	1	ND (<0.003)		

Event	Sample Date	Sample Replicate	Malathion, µg/L	*Ceriodaphnia* survival, % of control	Notes
60	2011-Feb-15	1	ND (<0.003)	100	
61	2011-Mar-15	1	ND (<0.003)	111	
62	2011-Apr-20	1	ND (<0.003)	100	
63	2011-May-17	1	ND (<0.003)	100	
64	2011-Jun-21	1	ND (<0.003)	100	
65	2011-Jul-19	1	ND (<0.003)	100	
66	2011-Aug-16	1	ND (<0.003)	95	
67	2011-Sep-20	1	ND (<0.003)	100	
73	2012-Mar-14	1	ND (<0.003)		
74	2012-Apr-17	1	ND (<0.003)		
75	2012-May-15	1	ND (<0.003)		
76	2012-Jun-19	1	ND (<0.003)		
76	2012-Jun-19	2	ND (<0.003)		
77	2012-Jul-17	1	ND (<0.003)		
78	2012-Aug-21	1	ND (<0.003)		

1 Significant toxicity
2 Exceedance of detection prohibition
3 UCD-RWQCB Monitoring Data
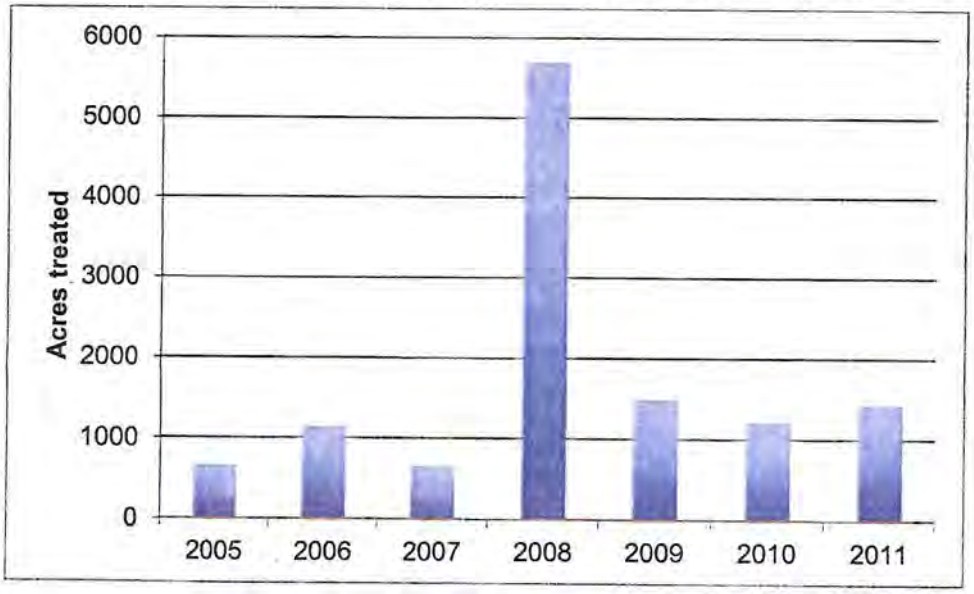
Figure 1. Annual malathion use by agriculture in Solano County, total acres treated