

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

REGIONAL WATER QUALITY CONTROL BOARD  
CENTRAL VALLEY REGION

AMENDMENTS TO THE WATER QUALITY CONTROL PLAN FOR  
THE SACRAMENTO RIVER AND  
SAN JOAQUIN RIVER BASINS

FOR

THE CONTROL OF DIAZINON AND CHLORPYRIFOS RUNOFF  
INTO THE SACRAMENTO AND FEATHER RIVERS

*APPENDIX E*

PEER REVIEW EVALUATION

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## PEER REVIEW SUMMARY

Staff has determined that the scientific portions and scientific basis of the proposed Amendment to control discharges of diazinon and chlorpyrifos into the Sacramento and Feather Rivers are based on source material that has already been peer reviewed. The proposed Amendment is itself just a new application of earlier, adequately peer reviewed work products, specifically, the 2005 San Joaquin River (Resolution No. R5-2005-0138) and 2006 Delta (Resolution No. R5-2006-0061) Basin Plan Amendments to Control Diazinon and Chlorpyrifos. The proposed amendment does not depart from the scientific approach of the other Basin Plan Amendments from which it is derived. Therefore, the proposed amendment has already satisfied the peer review requirement of HSC 57004 and does not require additional peer review. The State Water Resource Control Board's (State Water Board) peer review coordinator concurs with staff's assessment. . A copy of the evaluation letter and the State Water Board Coordinator's response are attached following this summary.

The remainder of this section is a summary of the peer review comments received on previous Basin Plan amendments. Only the main thrust of the comment is summarized and the reader is referred to the source reports for additional background information about the comment. Also, only comments which are applicable to the proposed amendment and which require staff response will be summarized.

The peer reviewers were generally supportive of the scientific basis of the previous San Joaquin River and Delta Basin Plan Amendments, upon which this proposed Amendment is based. Those comments supportive of the scientific basis of the proposed Amendment do not require a response and will not be summarized. In addition, some comments are not applicable to the proposed amendment. For example, comments about the Delta Basin Plan Amendment on how to assess compliance within a tidal delta are not relevant to the Sacramento and Feather Rivers, which are not tidally influenced in the project area. Finally, comments that are very similar or were discussed in multiple peer reviews (i.e. additivity), will only be discussed once below.

Where appropriate, comments from the peer review of the previous Basin Plan amendments have been reviewed and incorporated into this staff report as

described below. Where staff disagrees with a peer review comment, an explanation of staff's position is provided below.

***Thomas M. Holsen PhD., Director Environmental Manufacturing Management Program, Department of Civil and Environmental Engineering, Clarkson University.***

**COMMENT 1:** Monitoring for Toxicity is critical given the likelihood that other pollutants will be present

**RESPONSE 1:** Monitoring Goal 6 of the existing Basin Plan language includes language identifying toxicity monitoring goals.

**COMMENT 2:** The potential additive and synergistic effect on diazinon and chlorpyrifos of other pollutants (esp. atrazine, cyanazine and hexazinone) should be addressed in the amendment.

**RESPONSE 2:** Additivity with other compounds is discussed in Section 5.1.5. In regards to the specific pesticides referenced, McClure et al. 2006 found that the level at which additive and synergistic affects was seen was at levels significantly higher than what is observed in the environment. A similar assertion was provided in the Peer Review Comments of Dr. Felsot (See Comment 6 below).

**COMMENT 3:** The role of atmospheric deposition of diazinon and chlorpyrifos should be considered in the staff report.

**RESPONSE 3:** The staff report includes a discussion of the role of atmospheric deposition in Section 2.0.

***Allan Felsot, PhD., Professor and Extension Specialist,  
Department of Entomology, Washington State University &  
College of Agriculture Food and Environmental Quality Lab.***

Dr. Felsot was involved in the peer review for both the Delta and the San Joaquin River Amendments. Relevant comments from both peer reviews are included below.

**COMMENT 4:** The monitoring plan should not preclude providing a strong incentive for agricultural dischargers to show progress in implementing management practices recommended for meeting the TMDL requirements. One such incentive could be tying the sampling frequency to implementation of best management practices.

**RESPONSE 4:** This comment was made in the context of a complex Delta Hydrology where numerous sampling sites would be required to demonstrate compliance with the objectives. However, the principles do apply to the Sacramento and Feather River, though to a lesser extent. The hydrology of the Sacramento and Feather Rivers is less complex and does not require the same level of monitoring burden required for the Delta. Section 3.0 of this staff report provides the proposed Basin Plan monitoring language and Section 8.0 discusses the rationale for the proposed language. One of the monitoring goals is to provide sufficient information to determine the effectiveness of management practices and strategies to reduce off-site migration of diazinon and chlorpyrifos. This goal would not preclude reduced monitoring if growers are successful in controlling pesticide concentrations through the use of management practices.

**COMMENT 5:** In regards to monitoring goal 5, alternative pesticides and water quality, it is reasonable to first monitor changes in pesticide use pattern prior rather than recommend monitoring for alternative pesticides. Specifically, IPM guidance suggests that pyrethroids are not necessarily a substitute for dormant OP Pesticides. And other pesticides are unlikely to be as problematic due to the high toxicity of Chlorpyrifos.

**RESPONSE 5:** As discussed in Section 8.0, fulfilling monitoring goal 5 would certainly include reviewing use data. However, additional monitoring is appropriate. DPR use-data indicates that pyrethroids are used in the dormant season, therefore pyrethroid monitoring is recommended. Toxicity testing is needed to verify the presence or absence of any potential toxic effects of alternative products used in the Sacramento and Feather River Watersheds. Monitoring goal 5 provides broad direction on the purpose and goal of the monitoring. The goal does not preclude adjusting the timing and amount of monitoring based on changes in pesticide use data and monitoring results.

**COMMENT 6:** Dr. Felsot commented on staff's approach to additivity and interactions with other compounds in both the San Joaquin River and the Delta Amendments. In the San Joaquin River Amendment, Dr. Felsot suggested that the additivity formula was inappropriate to use and

recommended an alternative formula. As part of the response to that comment, staff demonstrated how the recommended replacement method was mathematically equivalent to the Basin Plan additivity formula. This comparison is discussed in Section 5.1.5 of this staff report, and the mathematical demonstration is reproduced in Appendix D.

In the Delta Amendment, Dr. Felsot agreed that from a risk management perspective the Basin Plan additivity formula is reasonable. However, he remarked that the water quality objectives are quite protective of nearly every aquatic invertebrate in the toxicity databases. Therefore, concerns about additivity with other contaminants seemed inappropriate at the prevalent residue levels of the subject OPs.

Dr. Felsot suggested that if synergism is a concern, then antagonism should also be considered as a likely hypothesis. He went on to summarize several studies on synergism between OPs and other pesticides, and noted that the concentration of the secondary compound is typically unrealistically high. Dr. Felsot asserted that if appropriate BMPs are implemented to prevent OP insecticide translocation to surface waters, then the issue of additivity and synergism is moot and no additional testing or monitoring for synergistic interactions should be required.

**RESPONSE 6:** The Peer Reviewer was supportive of the application of the additivity formula. Additivity between diazinon and chlorpyrifos is discussed in Section 5.1.5. Central Valley Waterways including the Sacramento and Feather Rivers often have multiple co-occurring pesticides and other pollutants. The potential toxic effects of these pollutant combinations are not fully understood at this time. In order to ensure that diazinon and/or chlorpyrifos are not contributing to a toxic effect in exceedance of our Basin Plan's narrative toxicity objective, the goal of monitoring for these toxic effects was kept in the proposed Basin Plan Amendment. Toxicity testing would be sensitive to antagonistic effects as well as synergistic effects. Mention of antagonistic effects is included Section 8.0 of the staff report in the discussion of Monitoring goal 6 in the monitoring section of the staff report.1