

## **Review and comment of**

### ***“Water and Sediment Quality Criteria Report for Esfenvalerate. Phase III: Application of the pesticide water and sediment water quality criteria methodologies”***

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#### **Objective**

The University of California, Davis has developed two new methodologies for deriving freshwater water and sediment quality criteria. These methodologies were put into practice to derive aquatic life criteria for a number of pesticides of concern in the Sacramento River and San Joaquin River watersheds, California. This report describes the procedures used to derive the water and sediment quality criteria for esfenvalerate. Although the methods used to derive these quality criteria are based on well grounded, previously accepted methodologies and approaches, there is a lack of critically important data for esfenvalerate which prevents a proper analysis from being conducted.

#### **Overall Impression**

Considering the high degree of uncertainty, lack of available data for calculating criteria, and the reliance on an assessment factor approach rather than development of SSDs, it is recommended that the BSQC's for esfenvalerate not be calculated unless and until sufficient data is available.

#### **General Comments**

- Title, and throughout the report – I don't believe the word 'criteria' should be used as criteria are policy determined values. A better word might be benchmarks or objectives
- Section 7 – this report makes a lot of mention of other reports throughout the manuscript, and it causes the reader to have to do a lot of searching. In some cases the reader is referred to previous reports for descriptions of methods or background on an issue. This document should be self-sufficient. Perhaps details for examples and calculations can be made more accessible in an appendix.

- Page 8, Figure 3 – ‘percentile’ spelled incorrectly
- Page 8, section 7.2 – before any calculations are conducted, a clear understanding needs to be conveyed to the audience what the term ‘interim’ means here. How is uncertainty accounted for? Also, it should be noted that these ‘interim’ values are not appropriate for regulatory use.
- Page 8, section 7.2 – change bifenthrin to esfenvalerate
- Page 8, section 7.2 – there are a number of concerns with using the assessment factor approach when data is limited. Please see review from Hall, Lenwood of the University California, Davis Phase II methodology report.
- Section 7.2 and 8.2 – I disagree with the calculation of BSQC with such a small data and sample size. The apparent strength in the Phase II UCDSM is that it is based on statistical approaches from other programs, adapted to sediments. The SMAV and AFs are very uncertain for such small sample sizes and will likely results in criteria that are highly over protective. The approach should be to establish stronger and more robust data sets for the criteria calculation.
- Section 9.2 – Is this section needed? The authors state that *no studies on aquatic organisms were identified in the literature that could provide quantitative means to consider mixtures of esfenvalerate with other classes of pesticides*. The paragraph that this statement is included in should be sufficient.
- Page 14, middle paragraph – Although PBO is a widely used additive, I don’t know of any examples were PBO is monitored in environmental monitoring studies. Do you have any information about its environmental fate? More information about the fate of PBO is needed here to make this section relevant.
- Page 14, second paragraph, line 5 – replace ‘a’ with ‘and’
- Page 16-17, last paragraph – The authors state, *It should be noted that there are no data available for Hyalella azteca, which is known as a species that is particularly sensitive to pyrethroids. It is not clear if the WQC would be protective of these amphipods*. This data would be particularly important to have, as lab-reared *Hyalella* are shown to be quite sensitive to pyrethroids. Also, *Hyalella* is known to exist as a species complex with different characteristics depending on source. There are several papers about this issue and perhaps it should be discussed here. Lacking this data makes the data set used for quality criteria determination rather weak.
- Page 17, last paragraph, line15 – add ‘for’ to the end of this line before ‘benthic’ and add ‘at’ before 10.

- Section 10.3 – given the lack of chronic data for crustaceans and insects (and the uncertainty contained in the BSQC), an endangered species assessment should not be carried out.
- Section 12.1 – how will these assumptions, limitation and uncertainties be used in developing potential policy?
- Section 12.1 – there is a call for a discussion for uncertainty, but there has not been any guidance provided on how that should be done. Was an uncertainty analysis performed?
- Section 12.1 – the authors point out here a number of flaws in the determination of the quality criteria, namely the lack of data, which forces the authors to use alternative methods to develop the criteria. Larger, more diverse data sets must be developed and evaluated before these criteria are used as regulatory values. With such sparse data, why was esfenvalerate chosen for the application of the methodologies developed in Phase II?
- Section 12.3 – remove *The final water quality criteria statement is: This comes off as too final and may be interpreted as to be included in regulatory decision processes.*
- Section 12.3, paragraph 3 – *Although the criteria were derived to be protective of aquatic life in the Sacramento and San Joaquin Rivers, these criteria would be appropriate for any freshwater ecosystem in North America, unless species more sensitive than are represented by the species examined in the development of the present criteria are likely to occur in the ecosystem of interest.* Because of the lack of sensitive species data, this statement is too broad. Until sensitive species like *Hyaella* are examined, this blanket type statement should not be made.
- Appendix A – Toxicity data summaries. The data quality scoring system that is presented seems to be subjective based on the individual reviewer. These reviews can be subjective on a number of different levels, and caution needs to be taken with discarding potentially useful data.
- Appendix A – for a number of studies (at least 2), there was a deduction of 7.5 points for “control description not reported.” It needs to be made clear exactly what this means, as it seems unlikely that these otherwise sound studies (denoted as RR in this scoring system) would not report control data. Would this not be an automatic basis for a downgraded reliability rating? How is the 7.5 determined? See above comment for subjectivity potential.

## Conclusions

Insufficient data is available to determine if the esfenvalerate criteria are over protective or under protective. Due to the lack of available data for calculating criteria, it is recommended that this report not be accepted at this time. Any criteria calculation methodology needs to be based on species sensitivity distributions rather than on an assessment factor approach. Because of these uncertainties, the values reported here should be reported as sediment quality benchmarks,

rather than sediment quality criteria. These criteria should not be calculated unless and until sufficient data is available to do so.