



CVCWA

CENTRAL VALLEY CLEAN WATER ASSOCIATION
Formerly the Central Valley Wastewater Manager's Association

Representing Over Forty Wastewater Agencies

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May 18, 2007

Mr. Joe Karkoski
Sacramento River Watershed – TMDL Division
Regional Water Quality Control Board
Central Valley Region
11020 Sun Center Drive, #200
Rancho Cordova, CA 95670-6114

SUBJECT: Pesticide Criteria Derivation Method

Dear Mr. Karkoski:

The Central Valley Clean Water Association (“CVCWA”) has reviewed the proposed methodology for derivation of new pesticide water quality criteria for the protection of aquatic life in the Sacramento and San Joaquin River Basins. This methodology was proposed in the Phase II report, *Development of a Basin Plan Amendment for the Control of Pesticide Discharges*. CVCWA’s member agencies may potentially receive NPDES effluent limitations and/or receiving water limitations based on pesticide criteria developed from the proposed methodology. As such, CVCWA’s member agencies have a vested interest in the methodology being developed.

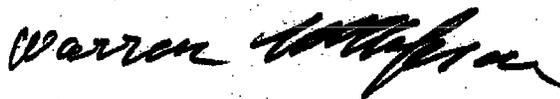
To assist CVCWA in its review of the methodology, CVCWA has consulted with Mr. Claus Suverkropp from Larry Walker Associates. Mr Suverkropp is an expert in aquatic toxicology, statistics and the derivation of water quality criteria. In general, CVCWA is concerned that the proposed methodology creates a process to rely on fewer data points to establish water quality criteria. The establishment of water quality criteria must be a scientifically robust process that includes a high quality and robust data set. The derivation of criteria with less data may result in lower water quality criteria that are overly conservative. More specific comments are provided in the attached technical memorandum as prepared by Mr. Suverkropp.

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Furthermore, CVCWA must express its fundamental concerns with the development of water quality criteria outside of the legally required process established by the Porter-Cologne Water Quality Control Act. For all intensive purposes, the Regional Water Quality Control Board ("Regional Board") is developing a process that equates to the establishment of water quality objectives. Thus, the Regional Board is legally required to comply with sections 13241 and 13242 of the California Water Code for each criteria/objective that is derived from this methodology. At this time, CVCWA has yet to see how the Regional Board intends to comply with Water Code sections 13241 and 13242 when utilizing this methodology.

CVCWA appreciates the opportunity to comment on this process. If you have any questions, please do not hesitate to call me at (530) 886-4911.

Sincerely,



Warren Tellefson
Executive Officer

Attachment: Claus Suverkropp's Memorandum
WT/jp

Memorandum

L A R R Y
W A L K E R



ASSOCIATES

DATE: May 18, 2007

TO: Joe Karkoski, Central Valley Water
Quality Control Board

CC: Robert Seyfried, SRCSD
Jerry Troyan, SRCSD

SUBJECT: Pesticide Criteria Derivation Method

CLAUS SUVERKROPP

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The purpose of this memorandum is to provide technical comments regarding the proposed methodology for derivation of new pesticide water quality criteria for the protection of aquatic life in the Sacramento and San Joaquin River Basins. This method was proposed in the Phase II report, Development of a Basin Plan Amendment for the Control of Pesticide Discharges.

COMMENTS

Risk Assessment Procedures

The Risk Evaluation process is a very coarse screening procedure with some significant technical shortcomings. Specifically, the procedure relies largely on total pounds of pesticides applied and total acres as risk measures. These are not meaningful indicators of relative pesticide risk without considering application rates or effectiveness of the active ingredients. However, since it is used primarily as a screen to eliminate pesticides of relatively low concern, these shortcomings may not be a major concern in the overall criteria development process. It is important to be clear that this is merely a screening process and that it is not really objective, since it relies on arbitrary judgments of relative risk. It should also be made clear that the Risk Rankings are not a regulatory assessment and only provide a focus for the criteria development process. In this context, the shortcomings of the ranking methods are less important. It should also be clarified that the final selection of pesticides for criteria development involves considerable subjectivity, with some pesticides being added based on "Best Professional Judgment" that otherwise would not have made the cut based solely on their more objective rankings.

As a follow-up to the Risk Assessment process, the Water Board should also verify whether “high use” and “high risk” pesticides (as defined by the Risk Assessment screening) have been detected in Central Valley surface waters at concentrations hypothesized to cause toxicity, and evaluate whether these concentrations actually caused toxicity.

Aquatic Life Use Assessment

The Aquatic Life Use Assessment is essentially based on evidence of presence/absence of any aquatic life. The main inputs for this evaluation were the stream names, bioassessment data from multiple sources, and critical salmonid habitat data from NOAA. The outcome of this assessment is that *any* natural stream with *any* evidence of any current or past aquatic life will be regulated based on Aquatic Life Beneficial Uses (e.g., COLD, WARM, migration, spawning). More than 700 named “Natural Streams” were identified in the Central Valley based primarily on naming conventions (e.g., river, creek, and slough vs. drain or canal). The evaluation is intended to exclude constructed agricultural drains, primarily because this was outside of the scope for the project. Because stream names were the only basis used to identify natural streams, Water Board staff should verify that “sloughs” are natural streams, because “slough” has sometimes been applied to name water bodies constructed for drainage.

Data Selection and Evaluation for Water Quality Criteria Development

The proposed criteria development process includes detailed guidelines for collection and review of the toxicity data. This appears generally to be reasonable and well-thought out. Overall, it provides for an structured and objective process to evaluate the data that are used in the criteria development. However, some elements of the evaluation will exclude data that were previously considered adequate for criteria development by USEPA (as demonstrated by the chlorpyrifos example), and are useful in establishing the toxicity distribution. This will generally result in fewer data being used and therefore lower criteria (due to increased extrapolation at the sensitive end of the toxicity distribution).

Criterion Derivation

There are a number of technical problems with Criterion Derivation procedure that should be addressed before applying the criteria derivation process to pesticides. This is of additional concern because of the potential for the Water Board to use this same methodology to generate new criteria for non-pesticide parameters. There is nothing specific to pesticides in the criteria derivation procedure, and based on the proposed method, new criteria derived with this method can be expected to result in lower criteria much more often than not. When the potential for application of arbitrary safety factors (assessment factors or AFs) is combined with the relatively small amount of data available for most newer pesticides, it is a very likely that the proposed criteria development process will generate some very low and inappropriate pesticide criteria. Similarly, the provisions in the proposed method would result in lowered values for many other parameters which the Water Board may subsequently attempt to apply by replacing well-established criteria, or through interpretation of narrative criteria already in the Basin Plan.

Much of the actual criterion derivation is consistent with the USEPA methodology. However there are a number of problematic deviations from the USEPA methodology that compromise the technical and scientific validity of the proposed criteria derivation method. Specific technical issues are discussed below.

1. The proposed method explicitly provides procedures for derivation of criteria based on insufficient data. It accomplishes this by requires the use of arbitrary “Assessment Factors” (AF) to generate criteria for toxicity data sets with results for only one to five species. The problem of the lack of a valid scientific basis for specific AFs is trivial compared to the problem of generating criteria with insufficient data. Fewer than 4 toxicity values simply isn’t a valid basis to derive a scientifically defensible criterion. EPA’s minimum of 8 Genus Mean Acute Values (GMAV) or Species Mean Acute Values (SMAV) in this case, is a more reasonable amount of data – although still not adequate for accurate definition of the overall distribution, it provides a reasonable compromise between certainty and the cost of generating criteria. It was suggested by Water Board staff at an April 18, 2007 workshop that the low data requirement threshold (one value) serves to motivate regulated entities (e.g., pesticide registrants and permittees) to generate additional data to avoid the AFs and overly-stringent criteria. This is not appropriate or an adequate scientific rationale for deriving criteria based on insufficient data.
2. The proposed procedure allows use of the Species Sensitivity Distribution (SSD) method to generate criteria for pesticide data sets with as few as 5 species. This is simply not enough data to adequately characterize a distribution. See also previous comment.
3. The proposed procedure uses the Burr III type distribution for the SSD and uses the entire distribution to estimate the 5th percentile (instead of focusing on the most sensitive species). In contrast to the USEPA method, this allows greater influence on the criterion by relatively insensitive species, and requires the data set to conform to the underlying distribution assumption. The Burr III distribution’s behavior should be evaluated to determine its performance with small data sets, and the potential effects on criteria of “outliers” and censored data. Although the Burr III family of distributions is fairly robust, this assumption requires a unimodal distribution without outliers to correctly estimate the 5th percentile. The derivation method would be improved by focusing on the sensitive end of the sensitivity distribution.
4. In responses to Regional Board staff comments, the authors state... *“The USEPA method works reasonably well despite violations of distributional assumptions because the method ultimately focuses on just the four values nearest the 5th percentile, thus often disregarding a large body of available data.”* This is not a correct characterization. The USEPA method uses all of the data in the distribution to establish the probabilities of the distribution. It also recognizes that results for insensitive species have little relevance and should have little influence on estimating criteria to protect sensitive species. USEPA’s method has the advantages of making few assumptions about the underlying distribution and thus avoids potential problems of multimodality and outliers in the data set. In many ways, it is a more flexible and robust method using the Burr III distribution, and should be reconsidered.

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5. Would result in unnecessary reduction in data set, and increased extrapolation and uncertainty, and consequently overly stringent criteria; this potential problem can and should be addressed by the USEPA method of estimating the 5th percentile value using only the sensitive end of the toxicity distribution.
 6. The proposed method treats potential outliers and bimodal distributions inappropriately by excluding data from the dataset without accounting for them in the probability distribution. This results in unnecessary reduction of the size of the data set, and consequently increases extrapolation and uncertainty in estimating the desired level of protection. This will result in unnecessarily stringent criteria. This deficiency in the proposed method can be addressed by the USEPA method of estimating the 5th percentile value using only the sensitive end of the toxicity distribution. This method can be combined with the Burr III distribution fitting method.
 7. The SSD procedure should also be refined to allow inclusion or consideration of results that may not meet all of the current data evaluation quality criteria. These data often provide enough information to include the result in the overall distribution of toxicity results. The current evaluation process is too quick to exclude results that can contribute to the overall distribution. Exclusion of useful results without adjusting the probability distribution will lower the criterion unnecessarily. This deficiency in the method should be addressed by modifying the SSD procedure to accommodate censored data (e.g., an indeterminate SMAV that is greater than a specific concentration) that doesn't overly influence the lower (sensitive) end of the distribution. This can be accomplished through use of well-established "Regression on Order Statistics" (ROS) statistical estimation methods.
 8. The use and basis of a default ACR of 12.4 when there are insufficient pesticide-specific ACR data is not valid. The basis for using an 80th percentile default ACR value is not adequately supported, and in the Phase I report TenBrook & Tjeerdema (2006) even concluded that there is no evidence that any default ACR value is appropriate for pesticides. They subsequently offer the rationale that an ACR is needed to calculate a chronic criterion and that "...*The 80th percentile of values is used in the Great Lakes methodology (USEPA 2003) and that is why it was selected for the new methodology.*" What is the underlying reason for using an 80th percentile value? If there are insufficient data to generate a valid pesticide-specific ACR, sufficient data should be generated instead of using a simplistic and scientifically invalid default value.