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VIA ELECTRONIC MAIL ONLY

Mr. Adam Laputz
Assistant Executive Officer
California Regional Water Quality Control Board
Central Valley Region
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SUBJECT: Comments on Pyrethroids TMDL and Basin Plan Amendment

Dear Mr. Laputz:

Our firm represents the Pyrethroid Working Group (PWG), which is a coalition of registrants of pyrethroid pesticides. The PWG has been an active stakeholder in the Central Valley Regional Water Quality Control Board's (Central Valley Water Board) process with respect to the development of total maximum daily loads (TMDLs), and an amendment to the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins for the control of Pyrethroid Pesticides Discharges (Basin Plan Amendment). On December 1, 2014, we submitted comments to the Central Valley Water Board staff on a Preliminary Draft Basin Plan Amendment. Many of our comments in that correspondence are applicable here, and rather than repeating such comments, we have attached our previous letter for your convenience. (Attachment 1.) We are also providing editorial corrections with respect to cited data under separate cover and will provide that information directly to Mr. Daniel McClure.

At this time, we are providing comments in response to discussion that occurred at the November 30, 2015 Stakeholder Meeting. During the course of that meeting, several substantive issues were discussed, and a summary of that discussion has been provided in DRAFT Meeting Notes. Stakeholders have been invited to provide comments on the DRAFT Meeting Notes, as well as proposed Basin Plan Amendments in general. Accordingly, we provide our comments here.

As a preliminary matter, the PWG wants to first express its commitment to ensuring proper use and stewardship of these valuable products. The PWG has worked closely with the California Department of Pesticide Regulation and others to develop the Surface Water Protection regulations for non-agricultural uses. These regulations are designed to protect surface water by requiring structural pest control operators to conduct urban applications in a

certain manner. The regulations were developed after extensive studies were conducted to determine what practices best reduce off-site movement of pesticide residues that may enter surface waters. The PWG is actively working to educate and inform the structural pest control community with respect to the regulations, and implementation of the regulations.

Further, the PWG has an active consumer awareness program for the use of pyrethroids, and strives to educate consumers with respect to proper use, handling, and application of the pyrethroid products. Similarly, the PWG works with the Coalition for Urban and Rural Environmental Stewardship (CURES) to educate growers with respect to the proper use, handling, and application of pyrethroid pesticides for agricultural uses. With proper use and handling of pyrethroids, the PWG believes that surface water will be protected and that the pyrethroid pesticides do not pose an unreasonable risk to aquatic life.

I. Potential Alternatives for Moving Forward

Before addressing issues specifically related to the draft proposed water quality criteria/objectives/triggers, the PWG would like to first comment on the need for the Basin Plan Amendment in general. It is our understanding that the Central Valley Water Board determined it necessary and appropriate to prepare TMDLs and a Basin Plan Amendment for pyrethroid pesticides because of impaired water body listings. In the course of preparing TMDLs for the specific water bodies in which impairment has been actually listed, the Central Valley Water Board decided to work with the University of California, Davis (UCD) to establish a new methodology for establishing water quality criteria rather than relying solely on United States Environmental Protection Agency's (U.S. EPA) 1985 Stephen et al. methodology. Once the methodology was established, Central Valley Water Board staff decided to use the methodology to first calculate water quality objectives for chlorpyrifos and diazinon. Subsequent to those actions, the Central Valley Water Board decided to pursue adoption of water quality objectives for certain pyrethroid pesticides—again based on the UCD criteria calculation methodology.

However, to our knowledge, nowhere in this process, has the Central Valley Water Board (i.e., the Board—not staff) determined that it is necessary and proper to adopt Basin-wide water quality objectives for pyrethroid pesticides. Further, there has been little discussion in the recent past with respect to the actual impaired water body listings, and if the adoption of water-column based water quality objectives is necessary to address the impaired water body listings.

Notably, Central Valley water bodies that have been identified on the 303(d) list as impaired for pyrethroids have all been placed on the list based on sediment measurements—not water column measurements. And, sediment impairment was based on sediment toxicity test results using a laboratory strain of single species (*Hyalella azteca*), which is highly sensitive to pyrethroids. The occurrence of toxicity in collected sediment samples is not surprising as it is common knowledge that pyrethroids are extremely hydrophobic chemicals, thereby adsorbing to sediment quickly rather than remaining dissolved (and bioactive) in the

water column.[1] Moreover, the number of pyrethroid listed water bodies (on the most recent 2012 list) is not expansive considering the total size of the Sacramento-San Joaquin River Basins. According to the Preliminary Draft Basin Plan Amendment (May 2015), out of 730 water body-pollutant combination listings for the Central Valley, eight water bodies that receive urban runoff have been listed for pyrethroids, and four water bodies that receive agricultural discharges have been listed for pyrethroids. This low percentage of listed water bodies does not appear to support the need for adoption of a broad Basin Plan Amendment that would apply throughout the Sacramento and San Joaquin River Basins.

Moreover, considerable, multi-year bioassessment work has been done on several, representative types of water bodies in the Central Valley. This includes two wadeable urban water bodies that are listed for pyrethroids (Arcade and Pleasant Grove Creeks) and a non-wadeable agricultural water body (Cache Slough). A bioassessment is a field study that can provide valuable information because it integrates the effects from physical, chemical, and biological stressors on aquatic organisms. Based on the Arcade Creek and Pleasant Grove Creek multiple stressor bioassessments, pyrethroids were a less important factor influencing benthic communities than habitat factors and metal. (See, e.g., *A Summary of Case Studies Designed to Determine the Influence of Multiple Stressors on Benthic Communities in Urban California Streams*, Hall, L.W. Jr., et al. (2014).) With respect to Cache Slough, pyrethroid concentrations in sediments are generally low relative to the toxicity threshold of sensitive laboratory strains of *Hyalella*. Based on study results, it appears that the benthic community characteristics in Cache Slough are much more strongly influenced by sediment characteristics and metals than by pyrethroids. (*The Relationship of Benthic Community Metrics to pyrethroids, metals, and sediment characteristics in Cache Slough, California*, Hall, L.W., Jr. et al. (2015).)

Another factor for consideration is U.S. EPA's current, ongoing registration review of pyrethroid pesticides. Significant studies have been conducted and are being reviewed by U.S. EPA that address potential environmental risks that may or may not occur due to the use of pyrethroid pesticides for urban and agricultural uses. The U.S. EPA's release of Preliminary Risk Assessments for public comment is scheduled for September 2016, and a registration decision will be made in 2017. Thus, this U.S. EPA registration review is concurrent with the California process, which should have some bearing on the Central Valley Water Board's decision.

Considering the lack of data and information available to support the need for a Basin-wide water-column based water quality objective for pyrethroid pesticides and the U.S. EPA registration review process, the PWG asks that the Central Valley Water Board reconsider the need for the Basin Plan Amendment at this time. Rather than adopting water quality

[1] It has also been shown in studies that monitoring programs are often designed to collect sediment samples from depositional areas of streams, which typically do not represent the water body as a whole or the habitats of most ecological significance. Thus, the occurrence of a reportedly toxic sediment sample does not indicate or represent the condition of the stream reach in its entirety.

objectives (or triggers to interpret the narrative toxicity objective) now, it may be more appropriate to wait until the U.S. EPA completes its registration review. In the meantime, the stakeholders can work with the Central Valley Water Board to identify Central Valley specific data gaps that are necessary for determining the potential impact that pyrethroid pesticides may have on aquatic life beneficial uses. The PWG is more than willing to work in cooperation and partnership with the Central Valley Water Board in identifying the data gaps, and in identifying pathways for filling the data gaps.

II. Trigger v. Water Quality Objective

The Central Valley Water Board has suggested the use of a trigger value rather than adoption of a water quality objective. The PWG believes this suggestion has merit, unless the trigger is simply used to interpret a narrative objective, and in essence becomes a de facto water quality objective. A trigger used in this manner would be problematic in that the Central Valley Water Board avoids considering the mandatory factors set forth in Water Code section 13241. Consideration of such factors is essential because it requires a regional board to evaluate economics and conditions that can reasonably be achieved through the coordinated control of all factors when it establishes a water quality objective.

Moreover, a trigger should not be used to divert the Central Valley Water Board away from determining levels that are necessary to ensure "the reasonable protection of beneficial uses." As we have stated verbally and in writing, the Central Valley Water Board's role is to protect the most sensitive beneficial use (i.e., WARM and COLD aquatic life beneficial uses)—not the most sensitive species. Accordingly, when calculating or identifying an appropriate trigger, the Central Valley Water Board must apply these legal principles. Use of a trigger should not be a substitute pathway for using extremely conservative values that as water quality objectives would unlikely past muster as being necessary to reasonably protect the beneficial uses. Use of a water based trigger is also called into question since, as discussed above, the link between a water based concentration at a point in time and the presence of sediment that may be toxic has not been clearly established.

Alternatively, the PWG believes that it may be possible to develop an approach whereby a reasonable and meaningful trigger is used to indicate that there may be a need for more focused monitoring, or that some additional implementation of best management practices should be evaluated. However, under such an approach, receiving waters that fail to meet the trigger would need to not be considered impaired under section 303(d) of the Clean Water Act, and discharges that fail to meet the trigger would need to not be considered out of compliance with the Clean Water Act or the Porter Cologne Water Quality Control Act.

III. 1st v. 5th Percentile

The PWG agrees with several of the Peer Reviewers that use of the 1st percentile is overly conservative and inappropriate. Use of the 5th percentile is consistent with the U.S. EPA's criteria setting process, and represents a more robust statistical approach for

setting criteria, objectives, or triggers. Moreover, and as noted above, the 1st percentile approach looks to protect the most sensitive laboratory species rather than the most sensitive beneficial use. As indicated, the Central Valley Water Board's charge is to reasonably protect the most sensitive beneficial use—not the most sensitive species. Also, other evidence that use of the 1st percentile is overly conservative is the fact that it is based on toxicity tests using sensitive laboratory *Hyalella azteca*, which do not necessarily reflect the native populations in Central Valley water bodies. Recent studies show that native populations of *Hyalella azteca* can be abundant in Central Valley water bodies even when pyrethroids are present in concentrations that exceed the values calculated using the UCD methodologies. (See, e.g., *Comparative sensitivity of field and laboratory populations of Hyalella azteca to the pyrethroid insecticides bifenthrin and cypermethrin*, Clark, Stephen L., et al. (2015).)

IV. Bioavailability

The PWG appreciates Central Valley Water Board staff's ongoing consideration with respect to bioavailability, and agrees that regardless of values ultimately selected (as either objectives or triggers), all such values must be considered and compared to the bioavailable portion of pyrethroids in the water column. This approach is scientifically sound and supported by the literature with respect to pyrethroid pesticides. As already noted, pyrethroids are highly hydrophobic and it is well-established that only the bioavailable portion is able to cause toxicity if it reaches high enough concentrations—not the total measured pyrethroid concentration in a water sample.

In summary, the PWG greatly appreciates the open and transparent process that the Central Valley Water Board has conducted with respect to the development of this draft Basin Plan Amendment. Staff has been willing to meet with PWG representatives (and others) to discuss the science, studies, and policy issues related to this Basin Plan Amendment on an ongoing basis. However, at this time, the PWG questions the need for a broad Basin Plan Amendment to address less than 2 percent of the water body pollutant combination listings in the Central Valley. Further, the PWG questions the need for water-column based objectives or criteria, considering the fact that impairments were generally determined from sediment toxicity—not water column toxicity. Rather than adopting a new, broad regulatory program, the PWG believes it appropriate to take a "step back" and identify as well as address gaps in data. The PWG is committed to working with the Central Valley Water Board and the other stakeholders to accomplish such a task.

Please contact me at (916) 446-7979 if you have questions with respect to the comments provided here.

Sincerely,

Theresa A. Dunham

cc: Jeanne Chilcott, Central Valley Water Board
Daniel McClure, Central Valley Water Board

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ATTACHMENT 1

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December 1, 2014

VIA ELECTRONIC MAIL ONLY

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SUBJECT: Comments on October 2014 Preliminary Draft Pyrethroid Basin Plan Amendment

Dear Ms. Fojut:

Our firm represents the Pyrethroid Working Group (PWG), which is a coalition of registrants of pyrethroid pesticides. We appreciate the opportunity to submit these early comments on the October 2014 Preliminary Draft Pyrethroid Basin Plan Amendment (Preliminary Draft Amendments). Further, we appreciate the efforts of you and other Central Valley Regional Water Quality Control Board (Central Valley Water Board) staff to communicate with stakeholders interested in this process. We recognize that this takes tremendous time and effort, and we fully appreciate having the opportunity to submit early comments on the Preliminary Draft Amendments, as well as the opportunity to submit suggested issues/questions for consideration in the peer review process that will begin early next year. To that end, the PWG submits the following comments on the Preliminary Draft Amendments, including the specific proposed objectives, implementation language, and issues for peer review.

I. Beneficial Uses Being Protected

As a preliminary matter, we believe it important to provide perspective on the purpose of water quality objectives in general, as well as the specific pesticide objectives proposed here. Water quality objectives, as defined in the Porter-Cologne Water Quality Control Act (Porter-Cologne), "means the limits or levels of water quality constituents or characteristics which are established for the reasonable protection of beneficial uses of water or the prevention of nuisance within a specific area." (Wat. Code, § 13050(h).) Regional water quality control boards (regional boards) are required to establish water quality objectives in water quality control plans, which in the regional board's judgment "will ensure the reasonable protection of beneficial uses and the prevention of nuisance; . . . ." The Water

Code further states, however, that, "it is recognized that it may be possible for the quality of the water to be changed by some degree without unreasonably affecting beneficial uses." (Wat. Code, § 13241.) Next, when establishing such objectives, regional boards are required to consider certain specified factors, including, but not limited to environmental characteristics of the hydrographic unit under consideration, water quality conditions that could reasonably be achieved, and economic considerations. (Wat. Code, § 13241.)

In this case, the beneficial uses proposed for protection are the WARM and COLD beneficial uses.[1] These are uses of water that support warm and cold water ecosystems (respectively), including but not limited to preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates. Thus, the beneficial uses are the cold and warm ecosystems as a whole—not individual species within the ecosystem. We believe this point to be important and relevant because it provides context with respect to establishing water quality objectives that provide for the reasonable protection of these two beneficial uses.

Here, the Preliminary Draft Amendments propose water quality objectives for six pyrethroid pesticides. The proposed water quality objectives come from Water Quality Criteria Reports prepared by the University of California Davis (UCD) (collectively referred to as "UCD criteria reports"), and the criteria in the reports were derived using a new criteria methodology, also prepared by UCD.[2] Overall, the criteria values established in the UCD criteria reports are at levels that would be protective of the most sensitive known species. In this case, it is *Hyalella Azteca*, which is a laboratory-reared species. Further, the studies that suggest pyrethroids are toxic to such species at such levels were conducted in clean water, and thus do not reflect environmentally relevant conditions. While such an approach may be appropriate for deriving criteria from an academic perspective, simply proposing to adopt the criteria as developed by UCD as water quality objectives fails to actually consider what levels

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[1] Warm Freshwater Habitat (WARM) is defined to mean, "Uses of water that support warm water ecosystems including but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates." (Water Quality Control Plan for the Sacramento River and San Joaquin River Basins (Fourth Edition-1998) (Basin Plan) at p. II-2.00.) Cold Freshwater Habitat (COLD) is defined to mean, "Uses of water that support cold water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates." (Basin Plan at p. II-2.00.

[2] Since the criteria reports were published, there has been an ongoing registration review process being conducted by the United State Environmental Protection Agency (US EPA), which includes new data and information that has been gathered and developed by the PWG and its member companies. Considering the new data and information, the PWG believes it appropriate and timely to review this new information with Central Valley Water Board staff in the near future. To that end, the PWG will seek to set up a meeting with Central Valley Water Board staff in early 2015 for such a discussion. However, until that discussion can occur, the PWG believes it appropriate to focus its comments and concerns on the proposed water quality objectives as they appear in the Preliminary Draft Amendments.

of pyrethroids may be present in California's waterways and still ensure reasonable protection of the WARM and COLD beneficial uses.[3]

To establish the appropriate level of pyrethroids that may be present in water while reasonably assuring protection of the WARM and COLD beneficial uses, we believe it necessary for the Central Valley Water Board to consider environmentally relevant conditions, rather than relying solely on laboratory toxicity tests with clean water and laboratory reared species. Thus, to properly calculate water quality objectives, field data where resident taxa are exposed to real world concentrations of pyrethroids would provide the best information for determining if the presence of pyrethroids at certain levels are, in fact, unreasonably impacting resident benthic macroinvertebrates, which would then be considered impairment of the WARM or COLD beneficial use.[4] While laboratory toxicity tests in clean water with laboratory reared *Hyalella* may indicate high intrinsic toxicity of pyrethroids (i.e., high hazard), pyrethroid toxicity has not been observed in the field where actual exposure may be reduced as a result of various factors such as binding to organic matter and low bioavailability. Moreover, field populations of *Hyalella* have been reported to be the most dominant taxa in California water bodies such as Pleasant Grove Creek (a 303(d) listed water body based on pyrethroids) (Hall et al. 2014b), and native *Hyalella* have been reported to be much more tolerant of pyrethroids such as bifenthrin and cypermethrin than laboratory reared *Hyalella* (Clark et al. in press). Results from the field studies described above would certainly question the adoption of water quality objectives that are based solely on impacts to laboratory reared species for assessing the possible impacts of pyrethroids on resident aquatic taxa found in the environment. Moreover, for species such as *Hyalella*, which have short generation times, loss of some individual organisms that are sensitive to pyrethroids is quickly compensated by resistant (less sensitive) individuals with a high reproductive rate. Thus, the population in the environment remains viable, which means that the aquatic ecosystem as a whole remains viable.

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[3] The Central Valley Water Board's approach here is a hazard assessment-based approach that simply compares environmental concentrations of a pesticide against some estimated threshold effects to determine if there is impairment to the beneficial use. Typically, the estimated threshold values used in such a comparison fail to consider environmentally relevant data. Rather than determining impairment in this manner, the PWG contends that a risk-based approach is more appropriate and scientifically superior as compared to a hazard-based approach. The risk-based approach is a process whereby one estimates the probability of some adverse effect from a present or anticipated exposure to stressors such as pesticides. Accordingly, a risk-based approach uses environmentally relevant data to determine the probability of exposure. Considering its use of environmentally relevant data, the risk-based approach is a better measurement for determining what constitutes reasonable protection of beneficial uses.

[4] For example, bioassessment multiple stressor studies using resident benthic taxa in four urban streams in California have demonstrated that pyrethroids were the least important stressor in these streams when evaluated along with other stressors such as physical habitat and metals (Hall et al. 2014a). Furthermore, for two of these four streams, pyrethroids were not found to be a significant stressor when considered in a multiple stressor analysis.

In summary, the Central Valley Water Board must consider a number of factors when establishing water quality objectives at levels necessary to protect the beneficial uses. While adopting the most conservative number developed by academia may appear appropriate, it fails to incorporate the balancing principles that are a fundamental part of Porter-Cologne. Specifically, the Legislature declared that, "activities and factors which may affect the quality of the waters of the state shall be regulated to attain the highest water quality which is reasonable, considering all demands being made and to be made on those waters and the total values involved, beneficial and detrimental, economic and social, tangible and intangible." (Wat. Code, § 13000.)

II. Proposed Individual Pyrethroid Objectives Are Overly Conservative

Keeping in mind the need to provide reasonable protection for the WARM and COLD beneficial uses, the PWG contends that the proposed objectives for the pyrethroid pesticides are overly conservative in many ways. As indicated above, they are set at levels to protect sensitive laboratory species and fail to consider environmentally relevant data. Further, the chronic values are calculated with limited if any data, and, if not further clarified, fail to take into account the highly hydrophobic nature of these pesticides. Moreover, the proposed water quality objective for additivity perpetuates the overly conservative nature of the objectives, and further compounds the conservatism by using the proposed objectives, that include significant safety factors, as the denominator. Each of these concerns is discussed further here.

A. Compliance With Pyrethroid Water Quality Criteria Should Be Based on the Bioavailable Fraction of Pyrethroids

First, pyrethroids are highly hydrophobic insecticides with K_{ow} values in the 6-7 range. Their sorptive behavior means that the parent molecules will largely bind reversibly to sediment particles, organic matter, or even inert surfaces in aquatic systems. Water column measurements of pyrethroids in the environment are generally measures of whole water concentrations (without filtration). In comparison, however, laboratory toxicity tests used to generate pyrethroid criteria have been conducted in laboratories where the water source is generally filtered and free of organic material and suspended sediment found in the environment. Toxicity data from these tests are generally considered to represent the dissolved fraction that is bioavailable to aquatic life. In order to compare the pyrethroid concentrations from field-collected samples with dissolved based criteria, the bioavailable fraction can be calculated by using K_{oc} and K_{doc} values. Other reasonable options for assessing the bioavailable fraction include direct measures of freely dissolved concentrations (e.g., Solid-Phase Micro-Extraction (SPME)) or sample filtration. This issue of bioavailability was clearly recognized and discussed in the UCD criteria methods development report by TenBrook and Tjeerdema (2006), and in the UCD criteria reports for the individual pyrethroids. (See, e.g., Water Quality Criteria Report for Bifenthrin (March 2010) at p. 10 ["The studies above suggest that the freely dissolved fraction of

bifenthrin is the primary bioavailable portion, and that this concentration is the best indicator of toxicity, thus, it is recommended that the freely dissolved fraction of bifenthrin be directly measured or calculated based on site-specific information for compliance assessment."].)

Considering that the criteria in which the proposed water quality objectives are derived from are considered to be "dissolved" based criteria, it is therefore appropriate for the proposed water quality objectives to also be recognized as "dissolved" objectives. There is clear legal precedent for adopting water quality criteria/objectives that are considered to be "dissolved" objectives. For example, in its adoption of the California Toxics Rule, US EPA specifically notes that the metals criteria are dissolved objectives. (See 40 C.F.R. § 131.38(b)(1), fn. m.) In another example, the Basin Plan includes water quality objectives for certain water bodies in Table III-1. (Basin Plan at pp. III-3.00 – III-4.00.) The footnote to this table clearly specifies that the metal objectives in the table are "dissolved" concentrations. Thus, when appropriate, US EPA and the Central Valley Water Board have both adopted water quality criteria/objectives that recognize bioavailable fractions. We believe it appropriate here as well.

US EPA (1994) uses a water effects ratio (WER) for metals in order to account for a difference between the toxicity of a metal in laboratory dilution water and its toxicity in ambient water at a site. In the US EPA (1994) document, it is recommended that: (1) measuring the dissolved metal is the most appropriate approach; and (2) dissolved metals criteria are not numerically equal to total recoverable criteria. The bioavailability issue with pyrethroids is similar to the metals issue. US EPA has clearly set a precedent and correctly addressed the bioavailability issue by recommending that field constituent concentration measurements must be comparable with criteria derived from laboratory toxicity data. As stated above, this is the same approach that should be used for pyrethroids by converting the whole water field measured pyrethroid concentrations to filtered or bioavailable concentrations using K_{oc} and K_{doc} values, or using other approaches such as direct measures of the bioavailable fraction or sample filtration.

B. Criteria Development Should Include Use of Toxicity Data From Field-Collected Native Taxa

Second, toxicity data with field-collected native taxa should be included in criteria development. Whether certain taxa adapt to a particular stressor, or are simply adapting to the multiple stressors present in a natural environment, the point is that adaptation occurs and as long as the taxa are successful, the beneficial uses (i.e., WARM and COLD ecosystems) are not impaired. Moreover, a document on the US EPA website that is an appendix to the Aquatic Life Guidelines developed by Stephen et al. 1985 lists a total of 13 reasons when toxicity data would not be appropriate for use in criteria development.[5] For example, a few reasons for rejecting toxicity data for criteria development include: the test species is not

[5] See http://water.epagov/scitech/swguidance/standards/criteria/aqlife/upload/review_toxicity.pdf.

aquatic; test species lives naturally in only a unique habitat; and, the test species is not a resident of North America. Notably, the use of toxicity data with field-collected native taxa is not listed as a reason for rejection of toxicity data for criteria development. Further, US EPA (2003) has previously used toxicity data from field-collected Atlantic menhaden (*Brevoortia tyrannus*), Sheepshead minnow (*Cyprinodon variegatus*), Mummichog (*Fundulus heteroclitus*), grass shrimp (*Palaemonetes sp.*), and amphipod (*Gammarus sp.*) as reported by Bushong et al. 1988 and Bushong et al. 1987 in the development of saltwater acute water quality criteria for tributyltin.

C. Additivity Formula Should Use a Definitive Toxicity Endpoint

Third, additivity occurs when the cumulative toxicity of a mixture of chemicals can be estimated from the sum of the individual potencies of each component. Additivity results when there are no interactions between chemicals in a mixture. The additivity equation in the Preliminary Draft Amendments is incorrect. The denominator for all the pyrethroids used in the sum equation should be a definitive toxicity endpoint such as an LC50/EC50 value for similar taxa—not the water quality criteria (objective) for each pyrethroid. Use of the objective in the denominator in the sum equation is incorrect because each individual objective includes significant safety factors in its calculation. Thus, by using the proposed objective in the additivity equation, the conservatism is further compounded. It is also incorrect to assume that additive toxicity exists if reported pyrethroid concentrations are well below established effects thresholds.

D. The UCD Methodology to Develop Chronic Criteria for Pyrethroids is Not Appropriate Considering the Lack of Chronic Data

Fourth, the Preliminary Draft Amendments propose water quality objectives for both acute and chronic criteria calculated with the UCD methodology. The primary issue with the proposed chronic criteria is the default Acute to Chronic Ratio (ACR) used in the UCD criteria reports. In general, the PWG does not contest the use of an ACR to calculate chronic criteria, but rather questions the overly conservative nature of the default ratio generally used in the UCD criteria reports. Based on new data and information recently developed, the PWG believes that new information supports development of more accurate ACRs for calculating chronic criteria. As we indicated in footnote 2 above, the PWG would like to meet with Central Valley Water Board staff in the near future to review this new data and information.

III. Direction to Peer Reviewers

At the November 7, 2014 Stakeholder Meeting, Central Valley Water Board staff indicated a willingness to consider comments from stakeholders with respect to the direction that should be issued to those individuals that will ultimately be selected for conducting peer review of certain portions of the Preliminary Draft Amendments. We appreciate staff's willingness to provide us this opportunity. In particular, the PWG believes that rigorous, independent peer review of the six UCD water quality criteria reports is necessary considering

that the Central Valley Water Board's proposed water quality objectives are in fact the "criteria" as calculated in the UCD criteria reports. To date, this level of peer review of these reports has not occurred. Rather, to our knowledge, peer review so far has been limited to review by other state agencies and Lawrence Livermore Laboratories.

The PWG also believes it imperative that the questions/issues directed to peer review be scientific/technical in nature, and not include (directly or indirectly) questions/issues that are policy questions reserved for the Central Valley Water Board. For example, it would be inappropriate to ask the peer reviewers their opinion as to whether the proposed water quality objectives "reasonably" protect the beneficial uses. Under the California Water Code, the Central Valley Water Board is required to answer this question considering a number of factors. The peer reviewers are not in a position to answer this question, which is policy oriented.

Accordingly, we recommend the following questions be directed to those that will conduct peer review of the UCD criteria reports and the Preliminary Draft Staff Report.

1. How can bioavailability be considered when determining compliance with pyrethroid water quality criteria that will be used as a regulatory endpoint?

2. Should toxicity data from native field-collected taxa be used in pyrethroid criteria development?

3. Is the additivity equation proposed by the Central Valley Water Board using a pyrethroid criterion (objective) in the denominator correct given that the criterion includes safety factors? How do differences in data sets and methods for each criterion impact adding them altogether in the manner proposed?

IV. Proposed Implementation Language Needs Further Review and Revision

The Preliminary Draft Amendments propose some limited changes to existing Basin Plan language, and wholesale additions specific to pyrethroid pesticides. With respect to the proposed changes to existing language, the PWG is concerned that these changes are surgical in nature and fail to address the outdated nature of this section of the Basin Plan. This section of the Basin Plan, "Pesticide Discharges from Nonpoint Sources," was adopted many years ago and does not reflect current regulatory practices or current permitting approaches. As such, the proposed limited surgical changes do not correct the outdated nature of these provisions and do little in making this section of the Basin Plan relevant. Accordingly, we recommend that Central Valley Water Board staff make no changes, delete the whole section, or undertake the appropriate level of effort to revise the section in its entirety.

Next, the Preliminary Draft Amendments apparently borrow extensive language from a Bay Area pesticide total maximum daily load (TMDL). The Central Valley is very different from the Bay Area and thus the language in that broad TMDL is not necessarily applicable

here. Further, the proposed language with respect to TMDLs in the Preliminary Draft Amendments needs extensive revision to avoid the imposition of numeric effluent limits on National Pollutant Discharge Elimination System permittees. The PWG encourages Central Valley Water Board staff to work directly with different stakeholders to develop appropriate implementation language for the various types of dischargers.

In closing, the PWG looks forward to working with staff to resolve our issues of concern. Please contact me at (916) 446-7979 or tdunham@somachlaw.com.

Sincerely,

Theresa A. Dunham

cc: Ann B. Orth, Ph.D., Pyrethroid Working Group
James Wells, Environmental Solutions Group, LLC
TAD:cr

References

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