REGIONALSAN
TAKING THE WASTE OUT OF WATER
Sacramento Regional County Sanitation District

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March 24, 2017

Tessa Fojut
California Regional Water Quality Control Board
Central Valley Region
11020 Sun Center Drive, Suite 200
Rancho Cordova, CA 95624

Sent via e-mail: tessa.fojut@waterboards.ca.gov

Subject: Comments on the January 2017 Draft Staff Report for the Proposed Basin Plan Amendment for the Control of Pyrethroid Pesticides Discharges

Dear Ms. Fojut,

The Sacramento Regional County Sanitation District (Regional San) appreciates the opportunity to provide comments on the January 2017 Proposed Amendments to the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins for the Control of Pyrethroid Pesticides Discharges, Draft Staff Report (Draft Staff Report). We strongly support the Water Board's use of stakeholder processes in developing Basin Plan Amendments. We believe this type of process allows the various stakeholders to work collaboratively with regulatory agencies in achieving technically and scientifically sound standards and policies. The ability to express concerns early in the basin planning process and work through issues, results in an effective Basin Plan Amendment (BPA) that not only meets the requirements of water code, but that also can be practically and feasibly implemented to protect beneficial uses.

Regional San generally supports the language that specifies that the numeric trigger concentrations will not be used as water quality based effluent limitations, or in a reasonable potential analysis. We also agree with Staff that the use of the fifth percentile for establishing the criteria is conservative in protecting beneficial uses. However, Regional San still has several concerns with the proposed BPA, its implementation and potential adverse consequences for wastewater agencies. Listed below are our general recommendations, which are followed with more details to substantiate these changes:

- The Regional Board is the responsible entity to establish and approve non-EPA analytical and toxicological methodologies that commercial laboratories can use to ensure comparable data can be produced; wastewater agencies should not be required to develop methods.

- The calculation to determine whether numeric triggers are exceeded should be based on ambient water quality data, not effluent data;
- It is not appropriate to assume wastewater discharges can control pesticide use or that they can be held accountable for determining future impacts from unknown future pesticides; and
- There needs to be flexibility included in the BPA to allow dischargers the ability to work jointly with other agencies in submitting one management plan, thereby avoiding costly duplication.

Many of the individual pyrethroid concentrations are measured at, or are below, the available analytical method detection levels. We appreciate the incorporation into the BPA that bioavailable pyrethroid concentrations below the reporting limit of a reliable commercial laboratory will not be used in calculating the numeric trigger. However, with respect to what constitutes reliable commercial methods, this should be defined as methods that are generally available at multiple laboratories, with results being reproducible and comparable amongst laboratories. With respect to what constitutes reliable commercial methods for the future, multiple labs need to be able to provide reproducible data before the Executive Officer would approve a method. This also applies to the Hyalella toxicity monitoring required in Chapter V. Surveillance and Monitoring program. Before a method is approved by the Executive Officer and used for compliance with this BPA, further method validation needs to be done, including evaluating inter-laboratory and species variability among laboratories performing Hyalella toxicity testing. We recommend that monitoring not start until reliable methods are established.

The proposed BPA language requires effluent monitoring, which we believe is inappropriate. The numeric triggers are related to potential impacts to beneficial uses in receiving waters, not at end of pipe. Therefore, the calculation of whether numeric triggers are exceeded should be based on ambient water quality data, not effluent. This is especially important for wastewater treatment plants that have mixing zones and/or dilution, such as Regional San. We request that the BPA language be changed to reflect ambient conditions, similar to the approach that is being proposed for irrigated agriculture and stormwater discharges.

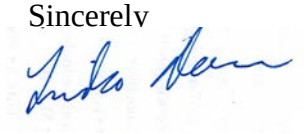
The Draft Staff Report in some places, and the BPA language, indicates that the Regional Water Board will work with dischargers, California Department of Pesticide Regulation (DPR), and USEPA Office of Pesticide Programs (OPP) for determining if replacement products require monitoring and mitigation. The Draft Staff report indicates in the CEQA analysis that management plans must identify a set of management practices that taken as a whole, are reasonably expected to mitigate the potential for replacement insecticide products to cause additional water quality impairments. The CEQA analysis also states that potential impacts to hydrology and water quality are expected to be less than significant because the amendment requires **dischargers** to determine whether alternatives to pyrethroid pesticides are being discharged at concentrations that have the potential to cause or contribute to exceedances of applicable water quality objectives.

Language in the Draft Staff Report should be consistently clear that the Regional Board, DPR, OPP, and dischargers are working together for understanding potential impacts from replacement products, as dischargers have no control over the use of pesticides.

Flexibility is also needed to allow wastewater dischargers to work jointly with other agencies in developing a joint management plan and implementing the identified management practices. For example, if a County's stormwater program is conducting education and outreach to the public, the wastewater agency for that County should be able to work collectively, thus, avoiding duplicative programs. The language allows for implementation of management practices in such a fashion, but there should be sufficient flexibility for agencies to submit one management plan.

Regional San appreciates this opportunity to provide comments on the proposed Pyrethroid BPA and Draft Staff Report. We have attached a Technical Memo prepared by CH2M for Regional San that provides additional detailed comments. Regional San also supports the comment letters submitted by CVCWA and CASA. We look forward to working with you in the implementation of the BPA. If you have any questions, please contact Linda Dorn, at (916) 876-6030.

Sincerely



Linda Dorn
Environmental Program Manager

Cc: Christoph Dobson, Director of Policy and Planning
Terrie Mitchell, Manager Legislative and Regulatory Affairs
Lisa Thompson, Chief Scientist

Attachment: CH2M Technical Memorandum: Technical Comments on the Central Valley Regional Board draft Pyrethroid Basin Plan Amendment (2017)

TECHNICAL MEMORANDUM

Technical Comments on the Central Valley Regional Water Quality Control Board draft Pyrethroid Basin Plan Amendment (2017)

PREPARED FOR:	Linda Dorn/Regional San Vyomini Upadhyay/Regional San
PREPARED BY:	Cameron Irvine/CH2M Christine Arenal/CH2M
DATE:	March 21, 2017
PROJECT NUMBER:	386701

Introduction

A draft basin plan amendment for the Sacramento and San Joaquin River Basins for control of pyrethroid pesticide discharges (Draft BPA) was developed by the Central Valley Regional Water Quality Control Board (Regional Water Board) for public review on 11 January, 2017. This draft BPA is described in the Draft Staff Report, Proposed Amendments to the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins for the Control of Pyrethroid Dischargers Draft Staff Report. The stated goal of the Draft BPA is "…*to establish clear requirements for the control of pyrethroid pesticide discharges that provide reasonable protection of beneficial uses in the Sacramento and San Joaquin River Watersheds*." The Draft BPA proposes water concentration 'goals' for each of six pyrethroid (sometimes referred to as 'targets') rather than water quality 'criteria' (WQC), with the recognition that there are uncertainties in developing and adopting pyrethroid WQC that would pose challenges for implementing a discharge control plan. Uncertainties recognized in the Draft BPA and draft Staff Report include: current reporting limits are generally above the proposed 'goals', necessary toxicity studies are limited, municipal stormwater systems and municipal wastewater treatment plants have little control of pyrethroids input into their discharges, and potential treatments effectiveness at meeting these goals are not known. Due to these uncertainties, the Draft BPA proposes a phased implementation approach that provides time for monitoring to determine if municipal discharges contain pyrethroid concentrations above the goals and to develop a management plan if there are exceedances. Numeric sediment quality criteria were not recommended in the Draft BPA Staff Report but sediment toxicity testing with the epibenthic invertebrate *Hyalella azteca* is described for some dischargers to meet the narrative basin plan language for toxicity (i.e., "no toxics in toxic amounts"). It seems that municipal dischargers would be required to monitor pyrethroids in effluent and receiving waters, evaluate sediment toxicity to *H. azteca*, and to develop a management plan if concentrations exceed the 'goals'.

Comments were prepared based on a technical review of the Draft BPA and supporting documentation on behalf of the Sacramento Regional County Sanitation District.

Documents:

http://www.swrcb.ca.gov/rwqcb5/water_issues/tmdl/central_valley_projects/central_valley_pesticides/pyrethroid_tmdl_bpa/index.shtml

General Comments

1. Pyrethroid Pesticide Discharges (pages xli and xliii) – "*With the assistance of the Regional Water Board and DPR, determine if monitoring and reporting for alternatives to pyrethroid pesticides is necessary and identify alternatives for which monitoring might be appropriate with consideration of the commercial availability of acceptable analytical methods. If an alternative pesticide is identified as appropriate for monitoring, monitoring shall be performed by the discharger to determine whether alternatives to pyrethroid pesticides are being discharged at concentrations with the potential to cause or contribute to exceedances of applicable water quality objective.*"

   Determining if any pesticide poses a potential to cause beneficial use impairment is a current duty performed by the Regional Water Board and other agencies. It is inconsistent with text in the draft Staff Report (e.g., Section 8; pages 138 and 142) to state, as it seems to state in the Draft BPA, that dischargers would determine the need for monitoring and reporting alternative pesticides, with assistance from the Regional Water Board and DPR. It is not clear why the Regional Water Board would decentralize this duty to individual dischargers without the required expertise. Please clarify this text, since it wouldn't be appropriate for dischargers to have this responsibility. If the intended meaning was to say that the Regional Water Board and DPR would work *with* dischargers to make these determinations, which would be consistent with the draft Staff Report text (e.g., Section 8; pages 138 and 142), then it would be helpful to clarify why this BPA language is needed for Regional Water Board authority to require additional monitoring, and what process would be followed, if different from existing regulatory processes, to determine if an action is needed. It otherwise doesn't seem necessary to state the authority already held by the Regional Water Board to require additional monitoring by discharges, when justified. These monitoring requirements can be imposed through NPDES permit revisions, monitoring requests, or in accordance with Water Code Section 13267. Please also clarify what involvement dischargers would have in the development or review of data and decisions, if different from the current regulatory process. The draft Staff Report should be further revised to include USPEA as a partner in these efforts (also see Sections 8.1, 8.2, 8.3).

2. Conditional Prohibition Implementation Components (page xxxiv) – It is helpful that the draft Staff Report recognizes "…*POTWs have little control over pyrethroid levels in their influent*…" (e.g., Section 7.3; page 128), "…*do not have control over the use of pesticides by individuals in their service area…"*(page 37), and that there is no practical technology for removing pyrethroids. It should also be noted that more than 90% of pyrethroid loads are currently removed by wastewater treatment prior to discharge (Markle et al., 2014; Weston 2013a). However, it is not clear, given these limitations, how a discharger can comply with the Draft BPA language to develop a Pesticide Plan to identify "…*a set of management practices that, taken as a whole, may be reasonably expected to effectively reduce pyrethroid levels in their discharges, and to mitigate the potential for replacement insecticide products to cause additional water quality impairments*." when also stating that it is *"…unclear if implementing the identified management practices will lead to attainment of the potential pyrethroid concentration goals…" (*Section 5.6; page 105). Please revise the Draft BPA to indicate that dischargers will take *reasonable* steps to implement a management plan, as described in the draft Staff Report, but they may not be able to reasonably expect to effectively reduce pyrethroid levels in discharges or have any impact on replacement insecticides (or pesticides) for which it is not known if they pose a potential for beneficial use impairment. In fact, it is not clear what additional steps municipal dischargers need to do when current activities may already be addressing the issues as best as possible given that "*Considerable pro-active engagement by the Board and discharger community with DPR and USEPA OPP has occurred and is ongoing to address pyrethroid water quality concerns.*" (page 37).

3. Pyrethroid Pesticide Discharges (page xxxix) – "*If reliable commercial analytical methods are available with reporting limits at or below the pyrethroid pesticides numeric trigger concentrations in the matrix being monitored, those methods shall be considered by dischargers for monitoring of pyrethroid pesticides*." The draft Staff Report recognizes that analytical methods that are 40 CFR part 136-approved are not currently sufficient to detect pyrethroids at concentrations below the proposed goals or 2015 criteria. Therefore, the Regional Water Board will need to approve discharger-specific sampling and analysis plans, each with its own rationale and supporting documentation justifying the analytical lab/method selection and validation. Resulting data may not be helpful in understanding regional trends or the potential for exceedances of the draft goals if most reported concentrations are below detection or qualified. Also note that treated wastewater can have matrix interferences that increase MDLs/RLs higher than in ambient surface water so effluent data may differ in detection limits from surface waters. It would be helpful if the Regional Water Board would provide further guidance on the supporting data, decision criteria, and method validation criteria they would find acceptable for a pyrethroid monitoring program to provide reproducible and reliable data that can be used for compliance with the BPA and be comparable among dischargers using different labs and using different analytical methods.

4. It is concerning that some of the most important data referenced in this Draft BPA (i.e., those with the lowest LC50 results for *H. azteca by an order of magnitude*) was based on a single study that is not publically available. Bradley et al. (2013 a,b,c,d,e,f) toxicity reports are not available to the public and it is not clear what methods were used. These acute toxicity studies reported that *H. azteca* were an order of magnitude more sensitive than other chronic studies and the type of water was used, control performance, reference toxicity test results or other test validation data, and detailed results are not available. It hinders transparency for the Regional Water Board to rely on data that are not freely available to the public and, when used in the UC Davis Criteria derivation method, these outliers have a heavy weight on pyrethroid WQC and goals.

5. It is helpful that the draft Staff Report describes factors considered when developing pyrethroid concentration goals (Section 5.2). Some of the factors increase the environmental relevance of the criteria (e.g., additive toxicity and bioavailability), others are unknowns or less conservative (e.g., potential interactions with other toxicants or temperature), but many are conservative (e.g., dilution, averaging period, application of Assessment Factors/Uncertainty Factors in criteria derivation when data are unavailable). Additionally, unrealistically low values often cannot be met and hinder regulation. We reiterate these conservative, realistic, and less conservative factors to demonstrate that the water quality goals are not only protective, but may be overprotective, due to the multiple conservative factors that are compounded in the WQC derivation and use of goals.
    - Conservative
        - Assessment Factors (AFs) – AFs were used when data were insufficient for development of the water quality goals in the individual water quality criteria derivation reports for the six pyrethroids.
        - Exposure Duration/Timing – Data considered in this draft BPA include test organisms exposed to storm water samples for longer than occurs in the environment (i.e., four days). This overestimates toxicity because longer exposures typically result in greater toxicity and organisms in ambient waters are not exposed to first-flush conditions for such long periods.
        - Dilution – The Draft BPA proposes that the water quality goals be compared to pyrethroid concentrations in effluent from POTWs (i.e., the point of discharge). This fails to account for dilution of discharges in receiving waters; and is considered an "*additional margin of safety*" in the Draft BPA (page xviii; Section 5.6.7.2, pages 107-108).

- Realistic
    - Bioavailability adjustment – The freely dissolved pyrethroid concentrations would be measured or estimated to reflect the bioavailable fraction (Section 5.2.2, pages 57-64). This is realistic and reduces uncertainty.
    - Additive toxicity – Because pyrethroids have a similar mode of action, the Draft BPA recommends summing the water quality goal-normalized quotients (Section 5.2.1, pages 54-57). This is generally appropriate, but using water quality criteria or goals that are themselves conservative to normalize concentrations, results in a conservative assessment where exceeding the trigger (summed pyrethroid quotients > 1) does not indicate a potential for adverse effects.
- Not Conservative
    - Interactions with other chemicals/pesticides – Additive or synergistic effects with other chemicals or pesticides with pyrethroids may occur, but are not included in the water quality goal derivation due to a lack of data (page xv; Section 5.2.1, page 57). This may underestimate toxicity.
    - Temperature affects pyrethroid toxicity where greater toxicity are observed at lower temperatures (Section 5.2.3, pages 64-65). The use of toxicity data at warmer temperatures than are often observed in the Delta may underestimate toxicity.

6. Throughout the Draft BPA, there are inconsistent references to the water quality 'goals'. These 'are referred to as water quality "goals" (page 40, 98, 156) or pyrethroid concentration goals (page xii), "targets" (page 38, 40), "criteria" (page xii, page 71 – UCD WQC), "triggers" (page xii), and "objectives" (page xii, xxi), with some of these terms seemingly used interchangeably (e.g., pages xi-xii). This causes confusion and ambiguity, particularly related to how these terms fit into the regulatory context. Please define these terms, identify how each fits into a regulatory context, and confirm that they are being used consistently throughout the document. A glossary may be helpful to provide this clarity.

7. The draft BPA language and draft Staff Report are not clear in the requirements and evaluation of toxicity testing with *H. azteca* by Municipal and Domestic Wastewater Dischargers or these monitoring requirements are inconsistent with those of Municipal Storm Water and Agriculture (Executive Summary; pages xl and xli; Section 8.3; page 142; Section 9.3; page 152).

    a. The draft BPA text states that *Hyalella azteca* (10-day) survival will be used to evaluate the Sediment Toxicity Numeric Target (page xxxi). This is the only indication of a method for *Hyalella* toxicity testing in the draft BPA text or draft Staff Report.

    b. The draft BPA changes to Chapter V, Surveillance and Monitoring seems initially consistent with this sediment toxicity testing approach by indicating that Municipal Storm Water will "*Provide chemical analysis and Hyalella azteca toxicity test data to determine whether pyrethroid pesticides are causing or contributing to exceedances of the narrative water quality objective for toxicity in surface waters or bed sediments*." (page xl; restated in the draft Staff Report Section 8.1; page 137).

    c. Draft BPA changes to Chapter V, Surveillance and Monitoring also describes the need for Agricultural dischargers to monitor "*…whether receiving waters and bed sediments are attaining the narrative water quality objective for toxicity*;" (page xli; restated in the draft Staff Report Section 8.2; page 139). This seems to indicate that the water quality objective can be broadly evaluated using a sediment toxicity assessment method.

d. The use of sediment toxicity testing to evaluate the narrative water quality objective for toxicity seems to be confirmed by only considering sediment toxicity testing in the cost analysis for MS4 dischargers (Table 9-1) and for agricultural dischargers (Table 9-2); although, toxicity testing is not considered at all in the cost analysis for Municipal and Domestic Wastewater discharges (Table 9-3).

e. The draft BPA changes to Chapter V, Surveillance and Monitoring for Municipal and Domestic Wastewater is also inconsistent in its monitoring requirement for "…*chemical analysis and Hyalella azteca toxicity test data to determine whether municipal or domestic wastewater discharges of pyrethroids are causing or contributing to exceedances of the narrative water quality objective for toxicity in receiving waters*;" (page xlii; restated in the draft Staff Report Section 8.3; page 142). Unlike MS4 and agricultural discharge monitoring, "sediment" is not stated in this description of Municipal and Domestic Wastewater monitoring so it is not clear if the same approach is intended.

For clarify and consistency, please state that the *Hyalella azteca* (10-day) survival sediment toxicity test will be used for monitoring by Municipal and Domestic Wastewater dischargers and consistently state that this approach will be for all discharges to "…*determine whether pyrethroid pesticides are causing or contributing to exceedances of the narrative water quality objective for toxicity in surface waters or bed sediments*." Please also update the cost analysis for Municipal and Domestic Wastewater dischargers to clarify this inconsistency.

Please clearly indicate the USEPA (2000) method (or most recent version thereof) will be used for sediment toxicity testing with *H. azteca* (Executive Summary, page xxxi). If any other toxicity testing method is required then it would need to be described. There are concerns that *H. azteca* water-only toxicity testing methods are not standardized and are not 40 CFR part 136-approved. Therefore, additional public review is requested if this is intended by the draft BPA language.

Specific comments

8. Executive Summary - It would be helpful to present the recommended 'goals' in a table format (as was done in Table 5-11, page 90) in the Executive Summary and in the proposed changes to the BPA. Although the goals are included in the equation definitions (page xxvi) of the changes to the Proposed Basin Plan Amendment for Pyrethroid Pesticides (pages xxii through xliii), these values are not very obvious and the current presentation diminishes the importance of these concentration goals.

9. Executive Summary (pages xii-xiii) – The Draft BPA consistently identifies the pyrethroid toxicity data used in development of the water quality goals as median lethal concentrations (LC50s). However, median effect concentrations (EC50) based on an immobilization endpoint make up a portion of the dataset (e.g., Weston and Lydy 2010). It is concerning that at least some of these EC50 data were misrepresented as LC50s in the text as well as at the Board hearing on February 28, 2017. Moreover, validation of the immobilization endpoint is lacking and interlaboratory comparisons with split samples, albeit a limited dataset, has shown a high degree of variability among labs (RPDs up to 200%), even when test organisms (*H. azteca*) come from the same source (Exhibit 1). RPDs for the survival endpoint were less than 100 in all 6 tests. Because this is a sublethal effect that is difficult to reliably measure, use of these data to derive the water concentration goals adds uncertainty. The use of these EC50 data are cautioned and should at least be correctly referenced in the text if not rejected.

Exhibit 1. Spit samples of POTW effluent collected January 2008 - February 2009 with 96-hour *H. azteca* survival and immobilization endpoints evaluated (no dilution) at 2 labs

Sample Date	Survival %			Paralyzed		
	Lab 1	Lab 2	RPD	Lab 1	Lab 2	RPD
1/27/08	82	98	18%	13	85	149%
5/27/08	100	36	94%	n/a	8	-
7/15/08	40	88	75%	100	0	200%
9/22/08	66	56	16%	n/a	30	-
11/2/08	46	60	26%	87	50	54%
2/18/09	62	96	43%	90	86	5%

Notes
n/a = not available
RPD = Relative percent difference
Source: Weston and Lydy, 2010; Pacific EcoRisk, unpublished data

10. Section 5.2 (page 62) – It would be very helpful for the draft Staff Report to include references when discussing data or sources of information. Text indicating that one study met all the listed criteria for partition coefficients does not include a citation; nor do Tables 5-1 and 5-2 when describing these data.

11. Section 5.2 (page 66) – The following text should be reviewed and may need to be edited as shown. "*However, the F3 generations from these populations were still ~~more~~ less sensitive than populations from undeveloped areas or laboratory cultures by approximately a factor of 5-10*."

12. Section 5.2 (page 67) – It is curious that changes in a gene are stated to be "population-level effects" from contaminants as if this is an adverse change. It would be helpful to also indicate that there is no evidence in the referenced documents (Weston et al. 2013b and Clark et al. 2015) indicating that wild populations are currently experiencing adverse effects (i.e., reduced number of organisms, growth, or fecundity) due to the development of pyrethroid resistance. The population may have been impacted at one time if pyrethroids or other contaminants caused organism mortality that reduced the population. However, a change in the genetic makeup of a population should not be considered an ongoing beneficial use impairment if the population is now healthy. This is no more of an impairment than is prey selection causing genetic change that favors faster moving organisms to avoid being eaten. It would further be helpful for the Regional Board to reiterate that they are not advocating protection of genes by referencing these statements and that only survival, growth, and reproduction toxicity endpoints, or effects directly linked to these (as indicated in Section 5.2.5, pages 67-68 and page xvi), are considered in criteria derivation and beneficial use impairment determinations.

13. Section 5.2 (page 67) Aquatic Species Sensitivity – *We suggest the following text edit: "Cole et al. (2016) reported reproductive effects on longfin smelt, which reside in the Delta, at 0.5 ng/L bifenthrin, which is equal to the lowest H. azteca LC50 for bifenthrin*."

14. Section 5.3 (page 70) - Please include the lowest Species Mean Acute Values (SMAVs) used to develop acute criteria in Table 5-4 and/or elsewhere when available criteria are compared to effect concentrations. These data represent the average effect concentrations for the most sensitive species with toxicity data and are more relevant than the lowest LC50/EC50 data which exists, and may represent outliers. The current lowest LC50 data from Bradley et (2013) are an order of magnitude below the EC50s for *H. azteca* developed by others (e.g., Weston and Lydy 2010) and so

the SMAVs are a statistically relevant basis for comparing how appropriateness of available criteria and guidelines for use as proposed 'goals'.

15. Section 5.3.1 (page 72) – We suggest the following text edit: "*The UC Davis methodology has the ability to handle data sets that do not meet the eight taxa requirements of the USEPA method (USEPA 1985) and can use as few as one datum.*"

16. Section 5.3 (page 81) – The concentration units indicated in Table 5-6 are inconsistent with other tables presenting these data. We suggest changing the units from µg/L to ng/L to be consistent with the source documents.

17. Section 6 Addressing Impaired Waters (page 115) – The page header in this section indicates that this is *Appendix A Evaluation of Potential Pyrethroid Concentration Goals*. Please correct this to reflect the correct section.

18. Section 8.1 (page 137) – Please clarify how toxicity testing with *H. azteca* in sediment (Section 6.1.1.2, page 117; and Section 9.2, page 151) will evaluate if "… *pyrethroid pesticides are causing or contributing to exceedances of the narrative water quality objective for toxicity in surface water or bed sediments*." when sediment toxicity tests only evaluate sediment toxicty and not toxicity from the water column. If water column toxicity testing is not required, then this should be stated clearly in the text whenever surface water and sediment toxicity evaluation is discussed. Also, note that toxicity in a sediment test does not implicate pyrethroids as the cause without sediment concentrations exceeding known effect levels (i.e., LC50s and not benchmarks or criteria) or the use of toxicity identification evaluation methods.

19. Section 8.4 (page 143) – The draft Staff Report discussion of reporting limits indicates that the method detection limit (MDL) for cypermethrin is 0.066 ng/L using EPA1699 and that this is above the "*proposed acute criterion*". While the acute criterion (0.04 ng/L) in Fojut et al. (2015) is lower than this MDL, the method would adequately measure concentrations below the proposed acute and chronic cypermethrin 'goals' of 1 and 0.3 ng/L. Please clarify in this discussion if the purpose of monitoring would be to meet the acute 'criteria' or the 'goals' / 'numeric triggers' or LC50s that represent effect levels.

References

Bradley MJ. 2013a. Bifenthrin – Acute toxicity to freshwater amphipods (*Hyalella azteca*) under flow-through conditions. Submitted to: Pyrethroid Working Group, FMC Corporation, Ewing, NJ, 08628. Performing laboratory: Smithers Viscient, 790 Main St, Wareham, MA, 02571-1037; lab project ID: Smithers Viscient Study No. 13656.6164.

Bradley MJ. 2013b. Cyfluthrin – Acute toxicity to freshwater amphipods (*Hyalella azteca*) under flow-through conditions. Submitted to: Pyrethroid Working Group, FMC Corporation, Ewing, NJ, 08628. Performing laboratory: Smithers Viscient, 790 Main St, Wareham, MA, 02571-1037; lab project ID: Smithers Viscient Study No. 13656.6168. USEPA MRID: 49171201.

Bradley MJ. 2013c. Cypermethrin – Acute toxicity to freshwater amphipods (*Hyalella azteca*) under flow-through conditions. Submitted to: Pyrethroid Working Group, FMC Corporation, Ewing, NJ, 08628. Performing laboratory: Smithers Viscient, 790 Main St, Wareham, MA, 02571-1037; lab project ID: Smithers Viscient Study No. 13656.6171. USEPA MRID: 49274301.

Bradley MJ. 2013d. Esfenvalerate – Acute toxicity to freshwater amphipods (*Hyalella azteca*) under flow-through conditions. Submitted to: Pyrethroid Working Group, FMC Corporation, Ewing, NJ, 08628. Performing laboratory: Smithers Viscient, 790 Main St, Wareham, MA, 02571-1037; lab project ID: Smithers Viscient Study No. 13656.6169. USEPA MRID: 49209501.

Bradley MJ. 2013e. Lambda-cyhalothrin – Acute toxicity to freshwater amphipods (*Hyalella azteca*) under flow-through conditions. Submitted to: Pyrethroid Working Group, FMC Corporation, Ewing, NJ, 08628. Performing laboratory: Smithers Viscient, 790 Main St, Wareham, MA, 02571-1037; lab project ID: Smithers Viscient Study No. 13656.6166. USEPA MRID: 49234301.

Bradley MJ. 2013f. Permethrin – Acute toxicity to freshwater amphipods (*Hyalella azteca*) under flow-through conditions. Submitted to: Pyrethroid Working Group, FMC Corporation, Ewing, NJ, 08628. Performing laboratory: Smithers Viscient, 790 Main St, Wareham, MA, 02571-1037; lab project ID: Smithers Viscient Study No. 13656.6167. USEPA MRID: 49234302.

Parry, E. and Young, T.M. 2013. Distribution of Pyrethroid Insecticides in Secondary Wastewater Effluent. Environ. Toxicol. Chem. 32:2686–2694.

TenBrook and Tjeerdema. 2009. Responses to Public Comments. Phase I: Review of Existing Methodologies. Phase II: Methodology Development and Derivation of Chlorpyrifos Criteria of the Methodology for Derivation of Pesticide Water Quality Criteria for the Protection of Aquatic Life in the Sacramento and San Joaquin River Basins.

TenBrook, P.L., A.J. Palumbo, and R.S. Tjeerdema. 2009. Methodology for Derivation of Pesticide Water Quality Criteria for the Protection of Aquatic Life - Phase II, Methodology Development and Derivation of Chlorpyrifos Criteria.

Markle, J.C., van Buuren, B.H., Moran, K.D., Barefoot, A.C. 2014. Pyrethroid pesticides in municipal wastewater: A baseline survey of publicly owned treatment works facilities in California in 2013. Technical Report sponsored by the Pyrethroid Working Group. 22 January.

Weston DP, Lydy MJ. 2010. Urban and Agricultural Sources of Pyrethroid Insecticides to the Sacramento-San Joaquin Delta of California. Environmental Science & Technology 44:1833-1840.

Weston, D.P., Ramil, H.L., Lydy, M.J. 2013a. Pyrethroid Insecticides in Municipal Wastewater. Environ. Toxicol. Chem. 2013, 32, 2460–2468.

Weston DP, Poynton HC, Wellborn GA, Lydy MJ, Blalock BJ, Sepulveda MS, Colbourne JK. 2013b. Multiple origins of pyrethroid insecticide resistance across the species complex of a nontarget aquatic crustacean, *Hyalella azteca*. Proceedings of the National Academy of Science of the United States of America 110(41):16532-16537.

U.S. Environmental Protection Agency (USEPA). 2000. Methods for Measuring the Toxicity and Bioaccumulation of Sediment-Associated Contaminants with Freshwater Invertebrates. Second Edition. Office of Water. Washington, DC. EPA-600-R-99-064. March.