



State & Federal Contractors Water Agency

1121 L Street, Suite 806, Sacramento, CA 95814

February 17, 2016

Ms. Pamela Creedon

Delivered via email to Pamela.Creedon@waterboards.ca.gov

Executive Officer, Central Valley Regional Water Quality Control Board

11020 Sun Center Drive, Suite 200

Sacramento, CA 95670

SUBJECT: Comments on the development of a pyrethroid Basin Plan Amendment and TMDL

Dear Ms. Creedon:

This letter is in response to the Central Valley Water Board's (Water Board) development of a pyrethroid Basin Plan Amendment and Total Maximum Daily Load (TMDL) for the Sacramento-San Joaquin River Basin. The State and Federal Contractors Water Agency (SFCWA) was formed in August 2009 as a Joint Powers Authority under California law by various water agencies that receive water transported across the Sacramento-San Joaquin River Delta by the State Water Project and Central Valley Project. The organization's mission is to assist its member agencies in assuring a sufficient and reliable high-quality water supply for their customers from the State Water Project and federal Central Valley Project. The core focus of activities in pursuing this mission is centered on facilitating habitat conservation measures and research related to the restoration of the Delta ecosystem while assuring sufficient and reliable export water supplies.

We are pleased to see this timely development of a Basin Plan Amendment and TMDL. We have actively participated in this process and would like to commend your staff for initiating an external scientific peer review. We support the use of the UC Davis methodology for deriving the proposed pyrethroid Water Quality Objectives and that pyrethroids should be considered additively, yet there are two topics noted in the staff report that I would like to highlight for your consideration.

1. Ecological Relevance of Water Quality Criteria

Some stakeholders question the use of laboratory cultures of *Hyalella azteca* for testing because studies have shown varying toxicity sensitivities of these *H. azteca* compared to field-collected animals (Weston et al. 2013, Clark et al. 2015, Weston et al. 2016). In a current study, Don Weston (pers. com.) has collected *H. azteca* from the field that exhibit sensitivities comparable to laboratory cultures, proving that effect concentrations derived with laboratory cultures are representative of resident organisms. Furthermore, *H. azteca* is the most sensitive to pyrethroids of the standard testing species, but this does not mean it's the most sensitive resident species. There very well could be other resident species that are even more sensitive to pyrethroids than *H. azteca* that should be considered.

H. azteca are not only ecologically relevant because they are resident to California, but also because they are an important food source for fish. They have been found to make up 20% of the delta smelt diet (Hilton et al), and Peter Moyle (2015) has attributed an altered food supply as one of the factors driving delta smelt to extinction.

2. Bioavailability

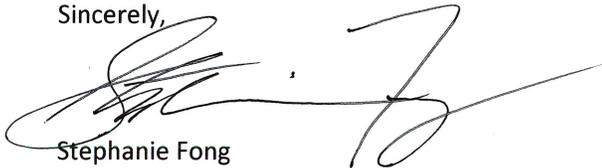
Pyrethroids are hydrophobic compounds that bind to particulates and organic matter, yet studies (Weston et al. 2015, Jorgenson et al. 2013, Domagalski et al. 2010) have shown that pyrethroids cause mortality to

organisms exposed only to whole water samples collected from the field. Relying on the binding affinity to determine bioavailability of pyrethroids can be problematic. Increased flow or agitation can resuspend pyrethroids previously bound to particulate matter, and assuming that only the freely dissolved fraction will be bioavailable doesn't account for the many organisms that ingest particulate matter.

Concluding Comments

We think pyrethroid insecticides are a concern, as has been supported by our studies and many others, and we fully support this process to develop a pyrethroid Basin Plan Amendment and TMDL. We appreciate the progress made, and encourage staff to continue to work closely with the Department of Pesticide Regulation, US Environmental Protection Agency, pesticide manufacturers, and other stakeholders to complete this Basin Plan Amendment in a timely manner. SFCWA greatly appreciates your leadership in the efforts to protect Central Valley resources and we look forward to continued collaboration with you and your staff in the development of a pyrethroid Basin Plan Amendment and TMDL.

Sincerely,



Stephanie Fong
Acting Science Program Manager

cc: SFCWA member agencies
Adam Laputz
Jeanne Chilcott
Danny McClure

REFERENCES

Clark SL, Ogle RS, Gantner A, Hall LW, Mitchell G, Giddings J, McCool M, Dobbs M, Henry K, Valenti T. 2015. Comparative sensitivity of field and laboratory populations of *Hyaella azteca* to the pyrethroid insecticides bifenthrin and cypermethrin. *Environ. Toxicol. Chem. USA* 9999:1-13.

Domagalski JL, Weston DP, Zhang MH, Hladik M. 2010. Pyrethroid insecticide concentrations, toxicity, and loads in surface waters of the San Joaquin Valley, California. *Environ. Toxicol. Chem.* 29:813-823.

Jorgenson B, Brown L, Fleishman E, Macneale K, Schlenk D, Scholz N, Spromberg J, Werner I, Weston D, Young T, Zhang M, Zhao Q. 2013. Predicted transport of pyrethroid insecticides from an urban landscape to surface water. *Environ. Toxicol. Chem.* 32:2469-2477.

Moyle P. 18 March 2015. Prepare for the extinction of delta smelt. California WaterBlog <https://californiawaterblog.com/2015/03/18/prepare-for-extinction-of-delta-smelt/>

Weston DP, Poynton HC, Wellborn GA, Lydy MJ, Blalock BJ, Sepulveda MS, Colbourne, JK. 2013. Multiple origins of pyrethroid insecticide resistance across the species complex of a nontarget aquatic crustacean, *Hyaella azteca*. *Proc. Nat. Acad. Sci. USA* 110:16532-16537.

Weston DP, Schlenk D, Riar N, Lydy MJ, Brooks ML. 2015. Effects of pyrethroid insecticides in urban runoff on Chinook salmon, steelhead trout, and their invertebrate prey. *Environ. Toxicol. Chem.* 34:649-657.

Weston DP, Poynton HC, Lydy MJ, Wellborn GA. 2016. Adaptation, not acclimation, is likely mechanism for reduced sensitivity for some wild *Hyaella* populations to pyrethroid insecticides. Letter to the Editor. *Environ. Toxicol. Chem.* (in press).