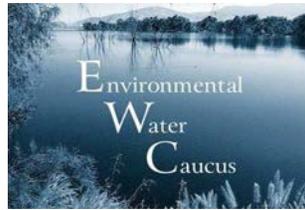




CRAB BOAT OWNERS ASSOCIATION, Inc.
2907 Jones Street
San Francisco, California 94133-1115
415-885-1180



CA Save Our Streams Council



March 28, 2019

Ms. Julianne McLaughlin
Office of Water, Standards and Health
Protection Division
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue NW
Washington, DC 20460
mclaughlin.julianne@epa.gov

Ms. Diane E. Fleck, P.E., Esq.
Water Division (WTR-2-1)
U.S. Environmental Protection Agency
Region 9
75 Hawthorne Street
San Francisco, CA 94105
Fleck.Diane@EPA.gov

Via Email: OW-Docket@epa.gov

RE: Attention Docket No. EPA-HQ-OW-2018-0056-0421

EPA-HQ-OW-2018-0056 Docket Name: Federal Selenium Criteria for Aquatic Life and Aquatic-Dependent Wildlife Applicable to California, **Docket RIN,** 2040-AF79 EPA-HQ-OW-2018-0056 FRL-9989-46-OW.

Thank you for the opportunity to comment on the Federal Selenium Criteria for Aquatic Life and Aquatic-Dependent Wildlife Applicable to California. The undersigned groups, representing fishing, tribes, low-income communities and communities of color, business and conservation organizations agree with the scientific view supported by federal government scientists that *“Few environmental contaminants have the potential to impact aquatic resources on such a broad scale, and even fewer*

exhibit the complex aquatic cycling pathways and range of toxic effects that are characteristic of selenium (Lemly and Smith 1987; Lemly 2004)." Thus, adopting protective water quality criteria for selenium is essential not only for various aquatic species, through various lifecycles, during various seasons, but also for the protection of terrestrial wildlife that feed on these aquatic resources. Unfortunately the proposed criteria for selenium are not protective of aquatic resources or the food chain that depends upon this habitat.

EPA is proposing water quality criteria applicable to fresh waters under the state of California's jurisdiction to protect aquatic life and aquatic-dependent wildlife from exposure to selenium. We have comments on three main aspects of the proposed criteria:

1. **Arbitrary Geographic Restrictions & Procedural Confusion over 303(d) Water Bodies:** EPA's proposed rule does not include waters within known selenium-contaminated geographical areas, including tributary flows into the San Francisco Bay Delta system such as, the San Joaquin River from Sack Dam to Vernalis, Mud Slough, Salt Slough, along with the water supply channels in the Grassland watershed, and the Grasslands Ecological Area in Fresno and Merced Counties. Also excluded are the surface waters that are tributaries to the Salton Sea in Imperial County. EPA is exercising its authority under section 303 (c)(4) of the Clean Water Act to apply the proposed standards across the entire state. Excluding these geographical areas and allowing State criteria that exceed protective levels is arbitrary and fails to meet the legal protection requirements under the Clean Water Act. Further there are a number of procedural questions associated with the application of proposed criteria to the existing and proposed 303 (d) list of selenium impaired water bodies.
2. **Application to Canals and Sloughs:** It is unclear how the proposed criteria will apply to freshwater canals and sloughs, which raises significant procedural compliance questions with regard to protecting aquatic species, endangered species, fish and wildlife.
3. **Derivation and Implementation:** There are a number of specific technical issues and questions with how the criteria were derived and the procedures for their implementation.

More detailed discussions of each of these aspects are provided below.

1. Broad geographical areas of California are impacted by selenium contamination, but the proposed Criteria will not be applied to those areas.

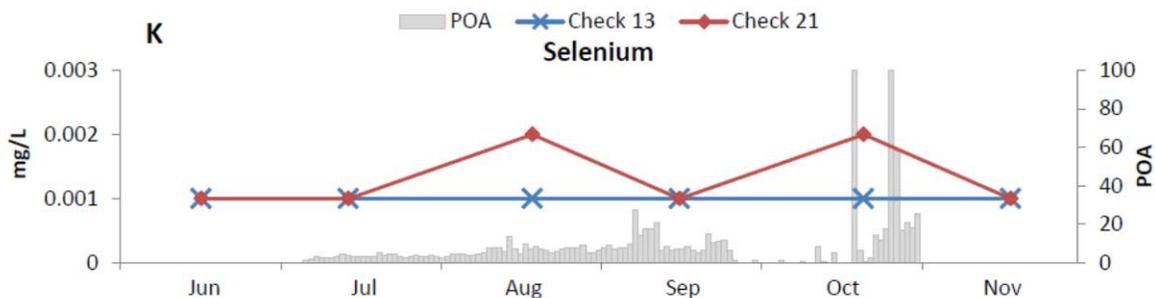
Under the Clean Water Act, 303 (d), a TMDL is a plan to restore and protect water quality based on applicable standards and criteria. They are not self-implementing. California is geographically diverse and there are many regions in California where fresh water streams are impaired by selenium. Selenium is a mineral essential for reproductive health and immune system function in humans, fish and wildlife. The safety margin, however, between nutritionally optimal and detrimental amounts is very narrow. Further complicating adherence to the CWA requirements to restore and protect water quality in aquatic ecosystems, selenium bio-accumulates in food webs at concentrations that can impair reproduction in sensitive fish and birds. Typically water quality criteria require protection of beneficial uses and prohibit the discharge of toxic substances at levels that will bio-accumulate in aquatic resources to levels which are harmful to human health or where concentrations in the water column, sediments or biota adversely affect beneficial uses. Like the San Francisco Bay Delta Estuary, the Newport Bay contamination by selenium is fed by the discharges of selenium from freshwater tributaries, including San Diego Creek, Santa Ana Delhi Channel and Big Canyon Wash. The insufficiently protective criteria proposed will not protect the beneficial uses of these watersheds where the bioaccumulation will compound exposure and reproductive impacts. Similarly the avian populations relying on the Salton Sea also will not be protected.

2. How the new standards will apply to freshwater canals and sloughs is unclear and raises significant procedural compliance questions with regard to protecting aquatic species, endangered species, fish and wildlife.

More than three decades ago, federal scientists discovered the cause of a massive die-off of fish and birds at the Kesterson National Wildlife Refuge in Merced County, 10 miles north of Los Banos. Selenium, a trace element abundant in the soils of the western San Joaquin Valley, had been dissolved by irrigation in the Westlands Water District and then funneled in drainage water from the fields to evaporation ponds at Kesterson through a cement-lined drainage ditch called the San Luis Drain. As the selenium moved up the Kesterson food chain, it became more lethal until it caused the deaths of thousands of migratory birds and near total reproductive failure in some avian species. The current criteria propose to exempt this area and how canals that receive selenium contaminated discharges will be regulated to protect aquatic resources, endangered species, fish and wildlife are not clear.

For example, Westland Water District currently under state rules is allowed to discharged selenium contaminated water into the California Aqueduct. Downstream uses of the water include the Kern National Wildlife refuge and critical habitat for the federally listed Buena Vista Lake Ornate Shrew. The MCL of 50 µg/l is not sufficient to protect the BVLO Shrew. How the new criteria will or will not apply to this freshwater canal and other canals receiving selenium contaminated discharges, such as the Agatha Canal in South Grasslands is not clear. These canals also serve as critical habitat for endangered species such as the Giant Garter Snake and breeding for the least Bell's vireo. Data from the California Department of Water Resources¹ indicates discharges of selenium contaminated water into the California Aqueduct exceed even the proposed lack standards and yet monitoring and enforcement under the proposed criteria is not clear. Here is DWR's monitoring chart of Westlands' selenium discharges:

Water Quality Assessment of Non-Project Turn-ins to the California Aqueduct, 2015



Notes:

mg/L = milligrams per liter, POA = percentage-of-Aqueduct, µg/L = micrograms per liter, µS/cm = microSiemens per centimeter
POAs of 100 percent during October represent days when Dos Amigos Pumping Plant (DPP) was inactive.

Procedural issues and the implementation process with regard to 303 (d) lists of selenium impaired water bodies.

Congress adopted the Clean Water Act (“CWA”) “to restore and maintain the chemical,

¹ <https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/State-Water-Project/Water-Quality/Documents/Water-Quality-Assessment-of-NonProject-Turnins-to-the-California-Aqueduct-2015.pdf?la=en&hash=7031838ED764C76616255C5FA38150659FEC5C94>

physical and biological integrity of the Nation’s waters.” 33 U.S.C. § 1251(a). Under CWA section 303(d) (33 U.S.C. § 1313(d)), California is required to report to the U.S. Environmental Protection Agency (“EPA”) on the quality of the waters of the United States within California’s boundaries every two years. Known as the “section 303(d) list,” this report identifies water bodies not meeting federal water quality standards and the specific water quality parameters that are not being met. 40 C.F.R. § 130.7(d).

Of particular concern is how and whether water quality criteria for selenium will be enforced with regard to specific 303(d) geographical areas where selenium criteria have been relaxed, resulting in incorrect TMDLs, or where selenium is contaminating freshwater and yet no 303(d) TMDL has been adopted. For example, insufficiently protective selenium criteria for the San Joaquin River and western valley agricultural drainage, which apparently would not be covered by the proposed criteria, has led to elevated selenium loads to the Bay-Delta estuary. The excessive selenium loads threaten to drive another nail in the coffin of California’s sport and commercial fisheries, the ecosystems that support them, and the public trust resources these communities rely upon for swimming, recreation, and other beneficial uses.

Threats from selenium in the San Joaquin River to the Delta’s health have grown over the past five decades. The environmental devastation caused by water exports and contaminants has pushed the Delta’s imperiled fisheries to the brink of extinction. Several species of fish endemic to the Delta have already gone extinct; just twelve indigenous species remain. Critical habitat for the endangered Sacramento River winter run chinook salmon, Central Valley steelhead and spring run chinook, the Delta smelt, and the Southern Distinct Population Segment (“DPS”) of the Northern American green sturgeon suffers progressively accelerating degradation. Excluding these receiving waters, such as the San Joaquin River and the Delta, from the proposed Selenium Criteria will compound impacts to these threatened and endangered species.

Furthermore, the federal CVPIA and 2006 bay-delta plan’s salmon-doubling objective is ignored. The proposed Criteria do not explain how exempting this geographical area and freshwater canals, streams, and rivers that feed the estuary that are also exempted and contain elevated levels of selenium will be protective of these endangered species, habitat and aquatic resources. EPA merely exempts and does not consider the proposed “freshwater” criteria to large selenium impaired tributaries to the San Francisco Bay-Sacramento-San Joaquin Delta Estuary. And yet, the selenium discharges to the freshwaters of the San Joaquin River and other sources do impact fish, wildlife and aquatic life that feed and migrate through the estuary to the rivers and streams or feed on these freshwater sources and the estuary. The cumulative or compounded impact of a relaxed freshwater standard will be felt throughout the watershed.

Specific Comments on Derivation and Application of the proposed Criteria:

Our comments are inserted in bold red italics within the following excerpts from the draft criteria document (page 101):

Part 6 AQUATIC AND AQUATIC-DEPENDENT WILDLIFE CRITERIA FOR SELENIUM IN CALIFORNIA’S FRESH WATERS

The available data indicate that aquatic life and aquatic-dependent wildlife would **not** be protected from the toxic effects of selenium by applying the following criteria, recognizing that fish tissue elements and bird egg elements supersede the translated site-specific water elements (except in special situations, see footnote 4 in Table 6-1) and that the fish egg-ovary elements supersede all other fish tissue elements:

Comments on application of Criteria (1-5 below):

- a) Considering the following criteria, 1-5 in the draft document, EPA has not adequately specified how the criteria would be applied in different site and data availability situations. For***

example, would it be acceptable for approach 4 (translation method to yield site-specific water criteria) to be the final determinant of the criterion for a site without ever confirming actual tissue values for critical species at a site?

- b) As the selenium criteria-setting process adds scientifically needed improvements it gets more complex. EPA should provide a more explicit decision analysis process, including requirements for data collection, for implementing the new criteria.*

1. The concentration of selenium in bird eggs does not exceed 11.2 mg/kg, dry weight;
2. The concentration of selenium in the eggs or ovaries of fish does not exceed 15.1 mg/kg, dry weight;
3. The concentration of selenium (a) in whole body of fish does not exceed 8.5 mg/kg dry weight, or (b) in muscle tissue of fish (skinless, boneless fillet) does not exceed 11.3 mg/kg dry weight;

Comments on 1-3: The above tissue criteria, the foundation of the proposed approach, are not adequately protective:

- a) They are based on a limited number of EC10 values screened from the literature for various species and locations, and then these values are averaged. This averaging generally tends to bias the estimated value to the high side. Given the unknown significance for different species and conditions at sites not yet studied, and to which the criteria will be applied, there should be a more conservative approach. We suggest using the 10th percentile of the available EC10 values for each of the three tissue types. A less conservative option, but one in line with that used in similar situations in “Translation of Selenium Tissue Criterion Elements to Site-Specific Water Column Criterion Elements for California”, would be the 20th percentile.*
- b) Previous reviews of similar tissue-based criteria (2016 National Selenium Criteria) by FWS disagreed with EPA’s selection and screening of appropriate EC10 values from the literature and argued that the tissue criteria values were, as a result, too high. In addition, review by USGS was critical of the methodology. We suggest that, before finalizing the subject criteria, that a consensus be achieved and documented among the relevant scientists from EPA, FWS, and USGS. This is critically important because these tissue values and how they are applied will be the foundation of most regulatory decisions.*
- c) EPA’s proposed tissue-based selenium criteria for aquatic life and aquatic-dependent wildlife are internally inconsistent and therefore scientifically indefensible. For example, the proposed fish whole-body criterion is 8.5 ppm Se (dry weight basis) and the proposed avian egg criterion is 11.2 ppm Se (dry weight basis) (USEPA 2018). Both values are intended to control toxicity among fish and birds to an EC-10 level or lower. However, based on the invertebrate food web to fish trophic transfer factors (TTFs) presented in Table 5-2 (USEPA 2018), allowing fish whole-body tissue to rise as high as 8.5 ppm would be the same as allowing the invertebrate food web to rise as high as 3.2 to 12.5 ppm Se (corresponding to the highest TTF of 2.67 and lowest TTF of 0.68 in Table 5-2). The median TTF of 1.205 would correspond to allowing food web contamination up to 6.7 ppm. Based on Ohlendorf’s (2003) dietary toxicity response curve for mallards (breeding female mallards feed nearly exclusively on the aquatic invertebrate food web due to the high protein requirements necessary for ovulation), a dietary exposure of 6.7 ppm is approximately the EC-30 for mallard egg viability (or an egg selenium concentration of about 19 ppm, based on Ohlendorf’s (2003) egg toxicity response curve), which, of course, is almost twice the intended upper allowable limit of 11.2 ppm. Apparently, a whole-body fish tissue criterion consistent with keeping avian eggs below 11.2 ppm selenium would have to be 5.9 ppm or lower (the value that would keep the invertebrate food web at or below the dietary EC-10 for mallards of 4.9 ppm, at the median TTF of 1.205).*
- d) The proposed avian egg criterion of 11.2 ppm selenium is inherently under-protective because it is derived from only one short segment of the avian reproductive cycle (egg incubation). Once an avian egg hatches in selenium contaminated environments, which is the only way one*

could describe an environment that produces avian eggs exceeding 5 ppm (Janz et al. 2010), the hatchling continues to be exposed to elevated Se in its diet. Studies at Kesterson Reservoir demonstrated that by far the largest source of selenium-induced avian reproductive toxicity occurred post-hatch, as opposed to during egg incubation (Ohlendorf et al. 1986; Williams et al. 1989). Marn (2003) found increasing post-hatch mortality rates matching increasing selenium exposures among avocets, even in environments that didn't reach the egg selenium threshold for depressed egg hatchability in avocets (i.e., at the EC-0 for eggs).

- e) For precocial shorebirds, it is well established that growth rates in the first few days after hatch correlate strongly with a hatchling's ability to avoid predation, and other sources of mortality. It is also known that in-ovo selenium exposure reduces initial post-hatch growth rates in avocets, so there is a clear mechanism to explain Marn's results and those of Williams et al. An EC-10 for toxicity to avian eggs is much more than an EC-10 for the entire avian reproductive cycle, and EPA's proposed criterion to protect aquatic-dependent wildlife does not account for that.*

4. The 30-day average concentration of selenium in water does not exceed more than once in three years on average the value derived on a site-specific basis using the methodology described in *Translation of Selenium Tissue Criterion Elements to Site-Specific Water Column Criterion Elements for California*.

- a) Valid translation of tissue concentrations to water column criteria via the Translation Model requires accurate and representative TTF values. For example, using the median TTF from Table 5-2 in the proposed document is equivalent to settling for criteria that are approximately 50% protective. At a more appropriate 90% protection level (using the 10th percentile TTF from Table 5-2, or 0.85) the whole-body fish tissue criterion would have to be set at 4.2 ppm to be consistent with keeping avian eggs at or below 11.2 ppm.*
- b) Water column criterion values determined by the proposed site specific method will unavoidably have a very high range of uncertainty among different sites, depending on such factors as which species are present at each site, data on site characteristics, and so forth. Because of this and the newness of this approach for producing regulatory criteria with few or no direct measurements, we suggest that the first phase of implementation of the proposed criteria require direct measurements according to the sampling plan described in *Translation of Selenium Tissue Criterion Elements to Site-Specific Water Column Criterion Elements for California*. This approach will develop a database that can be analyzed for method validation and improvement. The present draft is not clear on such requirements. Though the sampling plan is described in the "Translation Document", there appears to be no requirement that it be followed or when it should be implemented. Following the recommended sampling plan should be required.*
- c) We note that both the 30-day average and the once-in-three-year exceedance are, for the most part, arbitrary metrics for decision making. Given the uncertainties inherent in these values and their importance in determining compliance, we recommend a more conservative and protective approach of a 14-day average in any particular year. As part of implementing the final criteria, whatever metrics are selected should be explicitly monitored and validated as site-specific applications of the criteria accumulate. This approach would allow the metrics to be defensibly updated as data dictate.*

5. The intermittent concentration of selenium in either a lentic or lotic water, as appropriate, does not exceed $WQC_{int} = WQC_{30-day} - C_{bkgrnd}(1-f_{int})f_{int}$ more than once in three years on average.

- a) As noted above for the 30-day average water concentration, the intermittent criterion is, for the most part, an arbitrary metric for decision making. Given the uncertainties inherent in these*

values and their importance in determining compliance, we recommend a more conservative and protective approach of a 4-day average in any particular year. This would be consistent with EPA's practice for determining Chronic Continuous Criteria.

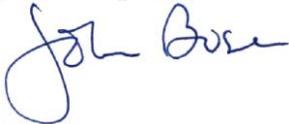
- b) As part of implementing the final criteria, whatever metrics are selected should be explicitly monitored and validated as site-specific applications of the criteria accumulate. This approach would allow the metrics to be defensibly updated as data dictate.*

In closing, we urge USEPA to work directly with the scientific experts from their sister Federal agencies in order to develop selenium criteria that will protect our public resources. Our plea is that the scientists from USFWS, NMFS, USFS, and USGS be brought directly into the Criteria setting process with EPA scientists to ensure a consensus-based criteria that all federal resource agencies will support. USEPA needs to ensure that the selenium criteria adopted will in fact comply with the Clean Water Act, Endangered Species Act, Migratory Bird Treaty Act, Fish and Wildlife Coordination Act and Tribal fishing rights.

Sincerely,



Jonas Minton
Senior Water Policy Advisor
[Planning and Conservation League](#)
jminton@pcl.org



John Buse
Senior Counsel, Legal Director
Center for Biological Diversity
jbuse@biologicaldiversity.org



Carolee Krieger
Executive Director
California Water Impact Network
caroleekrieger7@gmail.com



Conner Everts
Executive Director
Environmental Water Caucus
Southern California Watershed Alliance
[Environmental Water Caucus](#)
connere@gmail.com



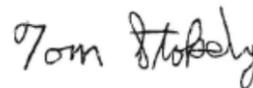
Noah Oppenheim
Executive Director
[Pacific Coast Federation of Fishermen's Asso.](#)
noah@ifrfish.org



Barbara Barrigan-Parrilla
Director
Restore the Delta
Barbara@restorethedelta.org



Colin Bailey
Executive Director
Environmental Justice Coalition for Water
colin@ejcw.org



Tom Stokely
Director
Save California Salmon
tgstoked@gmail.com



Bill Jennings
Chairman Executive Director
California Sportfishing Protection Alliance
deltakeep@me.com



Barbara Vlamis,
Executive Director
AquAlliance
barbarav@aqualliance.net



Stephen Green
President
Save the American River Association
gsg444@sbcglobal.net



Lloyd G. Carter
President, Board of Directors
California Save Our Streams Council
lcarter0i@comcast.net



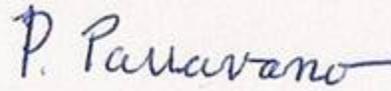
Eric Wesselman
Executive Director
Friends of the River
Eric@friendsoftheriver.org



Larry Collins
President
Crab Boat Owners Association
papaduck8@gmail.com



Kathryn Phillips
Director
Sierra Club California
kathryn.phillips@sierraclub.org



Pietro Parravano
President
Institute for Fisheries Resources
pietro15@comcast.net



Caleen Sisk
Chief and Spiritual Leader of the
Winnemem Wintu Tribe
caleenwintu@gmail.com

References:

1. Janz, D.M., D.K. DeForest, M.L. Brooks, P.M. Chapman, G. Gilron, D. Hoff, W.A. Hopkins, D.O. McIntyre, C.A. Mebane, V.P. Palace, J.P. Skorupa, and M. Wayland. 2010. Selenium toxicity in aquatic organisms. Chapter 6 in: P.M. Chapman et al. (eds.), Ecological Assessment of Selenium in the Aquatic Environment. SETAC Press, Pensacola, FL.

2. Marn, C.M. 2003. Post-hatching survival and productivity of American avocets at drainwater evaporation ponds in the Tulare Basin, California. PhD Dissertation, Oregon State University, Corvallis, OR. 115 pp.
3. Ohlendorf, H.M. 2003. Ecotoxicology of selenium. Pp. 465-500 in: D.J. Hoffman et al. (eds.), Handbook of Ecotoxicology. Lewis Publishers, Boca Raton, FL.
4. Ohlendorf, H.M., D.J. Hoffman, M.K. Saiki, and T.W. Aldrich. 1986. Embryonic mortality and abnormalities of aquatic birds: Apparent impacts of selenium from irrigation drainwater. Science of the Total Environment, 52:49-63.
5. USEPA. 2018. Draft Aquatic Life and Aquatic-Dependent Wildlife Selenium Water Quality Criterion for Freshwaters of California. United States Environmental Protection Agency, Region 9 and Office of Water, San Francisco, CA, and Washington, DC. 215 p
6. Williams, M.L., R.L. Hothem, and H.M. Ohlendorf. 1989. Recruitment failure in American avocets and black-necked stilts nesting at Kesterson Reservoir, California, 1984-1985. Condor, 91:797-802.