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DEPARTMENT OF FISH AND WILDLIFE  
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GAVIN NEWSOM, Governor  
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April 26, 2019

Via Electronic Mail Only

Jay Simi  
California Regional Water Quality Control Board,  
Central Valley Region  
11020 Sun Center Drive, Suite 200  
Rancho Cordova, CA 95670

PROPOSED CENTRAL VALLEY REGION "OFF-CYCLE" LISTING  
RECOMMENDATIONS FOR THE 2018 CLEAN WATER ACT SECTION 303(d) LIST  
OF IMPAIRED WATER BODIES

Dear Mr. Simi:

The California Department of Fish and Wildlife (Department) appreciates the opportunity to review and comment on the Central Valley Regional Water Quality Control Board's (Regional Board) proposed Clean Water Act Section 303(d) 2018 Impaired Waters List Updates for the Central Valley Region Draft Staff Report (Staff Report). The proposed off-cycle updates to the 303(d) list are limited to impaired waterbodies addressed by existing regulatory programs. Even though pollutant control programs have resulted in benefits to water quality, the Department is concerned that some of the decisions to change the status of some waterbody segments may be inappropriate considering the availability and applicability of data.

The Department is California's Trustee Agency for fish and wildlife resources and holds those resources in trust by statute for all the people of the state. (Fish & G. Code, §§ 711.7, subd. (a) & 1802; Pub. Resources Code, § 21070; CEQA Guidelines § 15386, subd. (a).) The Department, in its trustee capacity, has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and habitat necessary for biologically sustainable populations of those species. (Id., § 1802.) Similarly for purposes of CEQA, the Department, as a Responsible Agency, is charged with providing, as available, biological expertise during public agency environmental review efforts, focusing specifically on projects and related activities that have the potential to adversely affect fish and wildlife resources. (Pub. Resources Code, § 21069; CEQA Guidelines, § 15381.)

This off-cycle update to the 303(d) list is primarily limited to impairments identified to be caused by pesticides and toxicity. Pesticide discharges and toxicity in surface waterbodies are topics of great concern for the Department for the protection of the aquatic ecosystem and the recovery of threatened and endangered species. For example, the National Marine Fisheries Service's recent Endangered Species Act Section 7 Biological Opinion on the United States Environmental Protection Agency's

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(USEPA) registrations of pesticides containing chlorpyrifos, diazinon, and malathion concluded that the use and discharge of these pesticides would likely jeopardize the continued existence of federally-listed threatened Central Valley spring-run Chinook salmon (*Oncorhynchus tshawytscha*), endangered Sacramento River winter-run (*O. tshawytscha*), threatened California Central Valley steelhead (*O. mykiss*), and Southern distinct population segment North American green sturgeon (*Ancipenser medirostris*) (NMFS 2017). In addition, the USEPA determined that bifenthrin and cyfluthrin were “Likely to Adversely Affect” endangered Delta smelt (*Hypomesus transpacificus*) and its habitat (Melendez et al. 2012; Pranger and Hetrick 2013).

After review of the proposed listing decisions and available data, the Department requests that the Regional Board staff further investigate to ensure the proper categorization of waterbodies. The key issues identified by the Department include:

- Improper use of individual waterbody data to represent the large, diverse subregions of the Sacramento-San Joaquin Delta;
- Failure to use all readily available data from each waterbody in the assessments for listing/delisting decisions;
- The use of acute toxicity data as a measure for the protection of aquatic-life beneficial uses will underestimate the impacts from chronic effects; and
- The delisting of Mormon Slough, when the frequency of toxicity exceedances is greater than maximum the Listing Policy allows.

### **Delta Waterways (northwestern portion) and Ulatis Creek**

The assessment for Delta Waterways (northwestern portion) for toxicity impairments failed to use all the available data for that waterbody by only using data from Ulatis Creek at Brown Road. The data that was assessed included sediment and water toxicity monitoring that occurred from January 2011 to September 2015. However, the Regional Board’s Delta Regional Monitoring Program’s (DRMP) pesticide monitoring program has observed frequent toxicity at this same location since 2015, and toxic observations have persisted to the present. The intensity and frequency of toxicity observed at that location labeled Ulatis Creek as one of the two toxic hotspots identified by the DRMP as needing further investigation. Toxicity data collected by the DRMP is submitted into the California Environmental Data Exchange Network (CEDEN) within 90 days, so at a minimum, data collected up to January 2017 should have been available in CEDEN to be used for this off-cycle assessment.

In addition, the DRMP has determined that monitoring a single location in the Delta is not representative of the entire Delta or subregion of the Delta. Data from a single location is not adequate to infer conditions throughout a waterbody as diverse as a Delta subregion. Due to the limitations of single location monitoring, the DRMP has modified its monitoring design to a stratified design that will be better able to infer water quality conditions across a Delta subregion.

Furthermore, additional toxicity data are available for waterbodies located in the northwestern portion of the Delta, which needs to be included in the assessment. Ulatis Creek at Brown Road was last assessed for the 2014 and 2016 Clean Water Act Section 303(d) List and 305(b) Integrated Report for the Central Valley Region (2014/2016 Integrated Report) with data up to April 2009, and the decision was to list the waterbody on the 303(d) list (TMDL required list). For the time period from 2010 to January 2017, new sediment and water toxicity data are available for sites labeled: Cache Lindsey, Cache Slough at Mouth, Cache Slough Upper, Deep Water Ship Channel Lower, Liberty Island, Lindsey Slough, Lindsey Slough Lower, Ulatis Creek at Brown Road, and Ulatis Creek at Mouth. Overall, there were 136 individual site/date toxicity monitoring events, and statistically significant toxicity occurred on 17 events. The maximum number of exceedances allowed by the Listing Policy to remove a water segment from the 303(d) list for toxicants for a sample size of 136 is 10.

The Department's assessment of all available data from Ulatis Creek suggests that Ulatis Creek evaluated as a single waterbody is still impaired for toxicity. Available data in CEDEN from Ulatis Creek at Mouth and Ulatis Creek at Brown Road from 2010 to January 2017 has 74 individual site/date sediment and water toxicity monitoring events with 10 of those events exhibiting statistically significant toxicity. The maximum allowable exceedances to remove the water segment from the 303(d) list for a sample size of 74 is 5. These data and the data representing the broader Delta portion above suggest that Ulatis Creek and the Delta Waterways (northwestern portion), respectively, may not be supporting aquatic-life beneficial uses and should remain on the list of impaired waterbodies for toxicity.

### **Colusa Basin Drain**

The Staff Report proposes to remove the Colusa Basin Drain from the 303(d) list (TMDL required list) using monitoring data collected from May 2005 to May 2016 at monitoring sites Colusa Basin Drain above Knights Landing, Colusa Drain near Maxwell Road, and Colusa Basin Drain @ Knights Landing Downstream. However, three of the lines of evidence were previously assessed for the 2014/2016 Integrated Report (LOE ID: 59170, 59122, and 61446). In addition, CEDEN has available toxicity data from 2002 to 2016, which appear not to have not been assessed for any updates to the 303(d) list thus far, from monitoring sites labeled Colusa Basin Drain #5, Colusa Basin Drain above KL, Colusa Basin Drain at Rd 99, Colusa Basin Drain @ Knights Landing Upstream, and additional sampling dates for the monitoring sites already assessed in the Staff Report for this update. Including the three lines of evidence assessed in the Staff Report, there appears to be 225 individual site/date sediment and water toxicity monitoring events with 39 of those events exhibiting statistically significant toxicity. The maximum number of exceedances allowed by the Listing Policy to remove a water segment from the 303(d) list for toxicants for a sample size of 225 is 22. Colusa Basin Drain should remain on the list of impaired waterbodies for toxicity.

## Acute versus Chronic Toxicity Testing

Acute toxicity tests using mortality as an endpoint will underestimate adverse impacts to necessary biological functions. Acute toxicity tests are used for “identifying effluents and receiving waters containing toxic materials in acutely toxic concentrations.” (USEPA 2002a). Acute toxicity tests are short duration (96 hours or less) and assess mortality (or inversely survival) as an endpoint only (USEPA 2002a). Acute toxicity tests lack the sensitivity to measure endpoints necessary to represent the conditions that will permit normal propagation and protection of fish and other aquatic life in receiving waters. The use of mortality endpoints only as a measure for the protection of aquatic-life beneficial uses suggests that reproduction, growth, behavior, locomotor activity, etc. are unnecessary for aquatic-life population success. The Department has emphasized the lack of acute toxicity endpoints’ ability to measure important chronic and sub-lethal effects in the past (Louie et al. 2016; CDFW 2017).

The data for Colusa Basin Drain and Delta Waterways support the lack of sensitivity of acute mortality endpoints. Table 1 shows the occurrences of statistically significant toxicity in the waterbodies, including to which species and at which endpoints. Out of the 30 occurrences of toxicity, only 5 of the examples included statistically significant mortality in the ambient samples. Therefore, sub-lethal endpoints (e.g., reproduction and growth) are likely 6-fold more sensitive at observing toxicity than mortality endpoints. Furthermore, the chronic tests for *Ceriodaphnia* and *Pimephales* are 7-day tests, which are likely more sensitive for mortality endpoints than the shorter 4-day acute tests that were primarily assessed in the Staff Report. The *Hyalella* toxicity tests had a variety of test durations, but the tests that included the sub-lethal endpoint were 4-day tests. The algal species *Selenastrum* exhibited some toxicity using the chronic tests for these waterbodies; however, there is no analogous acute testing method for comparison (USEPA 2002a), so algal tests are not included in this comparison.

This ratio of chronic to acute effects is consistent with acute-to-chronic ratios (ACR) for pesticides (e.g., chlorpyrifos and diazinon approximately ACR 3 (CVRWQCB 2013) and pyrethroids ACR 4.7-12 (CVRWQCB 2017)). However, chronic to acute effects ratios have been found to be much larger in fish species using longer term studies (e.g., 4,200 for a 30-day test, Brander et al. 2016 as cited in CDFW 2017). Even the short-term 7-day tests may underestimate long-term chronic toxicity in fish species.

Short-term methods for estimating chronic toxicity for endpoints such as reproduction and growth are readily available (USEPA 2002b). Even though these endpoints are not always the most sensitive (e.g., fish olfaction, Moore and Waring 2001 as cited in CDFW 2017), the tests are relatively short (7 days), cost effective, and usually adequately sensitive for measuring adverse impacts to aquatic life. In addition, additional species tests can be developed or used, if regional species or endpoint specific assessments are desired.

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Acute toxicity testing is useful in some situations, for example in a highly polluted waterbody or when monitoring is designed to answer if a discharge or pollutant spill is acutely toxic to aquatic life or if mortality frequently occurs in a waterbody. In these situations, acute toxicity tests can be much more cost effective. However, if the monitoring is designed to provide information on the support or attainment of aquatic-life beneficial uses, then the use of mortality only endpoints will likely underestimate toxicity and adverse impacts to aquatic life. Reproduction, growth, etc. are essential for the proliferation and persistence of aquatic populations and, therefore, the Department recommends the Water Board must consider chronic toxicity endpoints in making toxicity evaluations.

### **Mormon Slough**

The Staff Report contains five lines of evidence for Mormon Slough (from the Stockton Diverting Canal to Bellota Weir – Calaveras River) containing various water and sediment toxicity testing data. There appears to be 57 samples of toxicity test events, and statistically significant toxicity occurred on 11 events. The maximum number of exceedances allowed by the Listing Policy to remove a water segment from the 303(d) list for toxicants for a sample size of 57 is 5. This suggests the waterbody should be on the Do Not Delist from 303(d) list (TMDL required list).

### **Additional Data Not Assessed**

Table 2 displays examples of data that should have been available from CEDEN during the solicitation period and were not evaluated during this off-cycle's assessment. Nearly all the lines of evidence used in the assessment appear to have not incorporated all the available data. Like the Colusa Basin Drain, Ultatis Creek, and the Delta Waterways (northwestern portion) discussed above, there are additional monitoring location data that should be assessed to provide the best information from available data.

The Department appreciates the opportunity to provide comments on the proposed Clean Water Act Section 303(d) 2018 Impaired Waters List Updates for the Central Valley Region. If you have any questions, please feel free to contact me at (916) 327-8758 or [Stephen.Louie@wildlife.ca.gov](mailto:Stephen.Louie@wildlife.ca.gov).

Sincerely,



Stephen Louie

Senior Environmental Scientist, Water Branch

**Table 1. Summary of Toxicity Tests Measuring Lethal and Sub-Lethal Endpoints that Exhibited Toxicity**

Water Body	Sample Data	Test Organism	Toxic Endpoint <sup>1</sup>
Ulatis Creek at Mouth	2/19/11	<i>Hyalella</i>	Mean Percent Normal Alive and Mortality
Ulatis Creek at Mouth	3/19/11	<i>Hyalella</i>	Mean Percent Normal Alive
Cache/Lindsey	6/3/10	<i>Ceriodaphnia</i>	Reproduction
Cache Slough Upper	2/19/11	<i>Hyalella</i>	Mean Percent Normal Alive
Cache Slough Upper	3/19/11	<i>Hyalella</i>	Mean Percent Normal Alive
Cache Slough Upper	3/25/11	<i>Hyalella</i>	Mean Percent Normal Alive
Lindsey Slough lower	3/19/11	<i>Hyalella</i>	Mean Percent Normal Alive
Lindsey Slough lower	6/5/11	<i>Hyalella</i>	Mean Percent Normal Alive and Mortality
Lindsey Slough	6/3/10	<i>Ceriodaphnia</i>	Reproduction
Ulatis Creek at Brown Road	10/21/15	<i>Ceriodaphnia</i>	Reproduction
Ulatis Creek at Brown Road	1/19/16	<i>Ceriodaphnia</i>	Reproduction
Ulatis Creek at Brown Road	2/27/16	<i>Ceriodaphnia</i>	Reproduction
Ulatis Creek at Brown Road	8/17/16	<i>Ceriodaphnia</i>	Reproduction
Colusa Basin Drain	7/21/98	<i>Ceriodaphnia</i>	Reproduction
Colusa Basin Drain	8/18/98	<i>Ceriodaphnia</i>	Reproduction
Colusa Basin Drain	4/21/99	<i>Pimephales</i>	Mortality <sup>2</sup>
Colusa Basin Drain	8/18/99	<i>Ceriodaphnia</i>	Reproduction
Colusa Basin Drain	2/16/00	<i>Ceriodaphnia</i>	Reproduction
Colusa Basin Drain	5/17/00	<i>Ceriodaphnia</i>	Reproduction
Colusa Basin Drain	7/21/00	<i>Ceriodaphnia</i>	Reproduction
Colusa Basin Drain	9/20/00	<i>Ceriodaphnia</i>	Reproduction
Colusa Basin Drain	1/27/01	<i>Ceriodaphnia</i>	Reproduction and Mortality
Colusa Basin Drain	2/7/01	<i>Ceriodaphnia</i>	Reproduction
Colusa Basin Drain	5/15/02	<i>Ceriodaphnia</i>	Reproduction
Colusa Basin Drain	1/23/03	<i>Ceriodaphnia</i>	Reproduction
Colusa Basin Drain	6/9/03	<i>Ceriodaphnia</i>	Reproduction
Colusa Basin Drain	7/25/06	<i>Ceriodaphnia</i>	Reproduction
Colusa Basin Drain	10/25/06	<i>Pimephales</i>	Growth
Colusa Basin Drain	12/12/06	<i>Ceriodaphnia</i>	Reproduction and Mortality
Colusa Basin Drain	4/25/07	<i>Ceriodaphnia</i>	Reproduction

<sup>1</sup> "Mean Percent Normal Alive" is a sub-lethal endpoint indicating that an organism is alive but not functioning properly (e.g., impaired swimming, Weston et al. 2015).

<sup>2</sup> The growth endpoint is not evaluated, when the sample exhibits statistically significant mortality (USEPA 2002b). This sample exhibited 90% mortality.

**Table 2. Examples of Data Available in CEDEN not Assessed in the Staff Report or Wrong Location**

Listing Waterbody	Pollutant	Discrepancies
Delta Waterways (central portion)	Chlorpyrifos	CEDEN contains additional data e.g., Potato Slough, San Joaquin River @ West Neugerbauer Rd (Roberts Island off Windmill Cove), Light House Restaurant @ West Brannon Island Rd, and Empire Tract @ 8 Mile Rd in 2016-17
Delta Waterways (central portion)	Chlorpyrifos	Sacramento River at Rio Vista was used for the assessment, but Rio Vista is likely in the northern portion
Delta Waterways (export portion)	Chlorpyrifos and Diazinon	CEDEN contains additional data e.g., Old River @ the West End of Clifton Court Rd in 2016-17
Mokelumne River, Lower (in Delta Waterways, eastern portion)	Chlorpyrifos	CEDEN contains additional data e.g., Mokelumne River @ Bruella Rd and Mokelumne River at New Hope Road in 2016-17
San Joaquin River (Mendota Pool to Bear Creek)	Chlorpyrifos and Diazinon	CEDEN contains additional data e.g., SJR @ Sack Dam in 2016-17
San Joaquin River (Merced River to Tuolumne River)	Chlorpyrifos	CEDEN contains additional data e.g., San Joaquin River at Hills Ferry at Bridge, San Joaquin River at Laird Park (near J16 and Grayson Rd)- 535ADVLDP, and San Joaquin River at PID Pumps in 2016-17

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