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December 21, 2018

State Water Resources Control Board
Chair Marcus and Board Members
c/o Jeanine Townsend, Clerk to the Board
1001 I St.
Sacramento, CA 95814
VIA: E-mail to CommentLetters@waterboards.ca.gov

Subject: Comment Letter – Draft Toxicity Provisions Policy

Dear Chair Marcus and Members,

Central Coast Water Quality Preservation, Inc. ("Preservation, Inc.") manages the surface water Cooperative Monitoring Program (CMP) on behalf of Central Coast growers enrolled in the Irrigated Lands Regulatory Program (ILRP) for Region 3. We are concerned about rigid application of the TST approach to agricultural non-point source programs as proposed in the 2018 Draft Toxicity Provisions.

Since 2005, the CMP has performed the 7-day *Ceriodaphnia dubia* test for chronic toxicity to invertebrates (Method 1002.0 in EPA/821/R-02/013), four times annually at each of the program's 50+ monitoring sites. Samples are drawn from ambient waters and tested only at the in-stream concentration (no dilutions). The NOEC statistical analysis (CETIS® software by Tidepool Scientific, 2017) is used to declare results "significant" if the test organism performance is mathematically, significantly different than the control. The Percent Effect is then compared to a 20% threshold to further evaluate biological significance. Testing for both statistical and biological significance is applied separately to the survival and reproduction endpoints.

The above method has been widely applied by both the Region 3 CCAMP and the statewide SWAMP programs. It is highly standardized, relies on internationally promulgated statistical methods, and applies testing for both mathematically and biologically significant differences in performance between test and control organisms. It is also adaptable in that it can be applied to any test organism, endpoint and effect level of interest, whereas the TST is limited to a subset of organisms and endpoints, and only the 10%/25% effect levels.

The use of the NOEC statistical method and its ability to adapt to new test organisms are both important features of the Region 3 ILRP's current approach to managing aquatic toxicity. As agricultural toxicity impairments are often related to pesticides, invertebrate test species are important. As new chemistries emerge and use patterns change, it may become important to incorporate new test organisms into the program, as has been done since 2016 by adding *Chironomus* to address potential toxicity from neonicotinoid pesticides. While the NOEC approach can be immediately and universally applied to new test organisms, the TST cannot, which will lead to non-uniform analysis of results. If the TST approach is rigidly adopted, the CMP results will be evaluated with the TST for the *Ceriodaphnia* reproduction endpoint, by NOEC for *Chironomus* (survival endpoint only), and also by NOEC for the *Ceriodaphnia* survival endpoint (the TST does not apply to *Ceriodaphnia* survival except as incorporated in the reproduction counts). The NOEC would likely then also be applied to the *Ceriodaphnia* reproduction endpoint (in addition to the TST), to interpret sublethal effects from pesticides because pesticide effect concentrations (for example, EC50s/LC50s) are derived with the NOEC.

In addition to being applied as described above for Toxic Unit Analysis, the NOEC is also used in TIE (Toxicant Identification Evaluation) tests that are either required or included by Executive Officer discretion in ILRP monitoring requirements for multiple regions. Bioassay test results ***must*** be analyzed using the NOEC approach in order for valid comparison to be made to literature EC50s/LC50s; the TST is not valid for this purpose.

Finally, Table 1 in the Draft Toxicity Provisions suggests that the survival endpoint (separately from reproduction) should be tested with the TST, which is not appropriate. The table content should be re-worded and clarifying language added to the document. The CMP recently performed a "test drive" of the TST against historic CMP bioassay results for *Ceriodaphnia*. For effects less than 25%, there was generally good agreement between the TST and NOEC results. There was also good agreement between the TST and NOEC for the reproduction endpoint when effect levels were slightly greater than 25% (i.e. both tests generally agree/show toxicity for effects of 25-30%). However for the survival endpoint, there was almost no agreement between the TST "25% effect threshold" and samples with effects just over that threshold (i.e. 25-30%) that were found to be "not toxic" by the NOEC. I have high confidence in our toxicity laboratory's ability to perform the *Ceriodaphnia* test with precision, and there is a large historic dataset for review. In these cases, the 25% TST threshold incorrectly suggests a biologically significant effect where there is no true difference between the test and control. Bioassays are performed with living organisms, which over the course of a long-standing program like the CMP will inevitably exhibit some fluctuations in vigor. In its intent to discourage poor laboratory precision, the TST's 25% threshold, if applied to the survival endpoint, incorrectly designates as "toxic" a clear subset of CMP samples where there is no significant (mathematical) effect and variability is not likely due to laboratory error.

At a minimum, I would discourage rigid application of the TST as the primary approach to interpreting bioassay results for non-point source programs that rely on ambient water quality monitoring and an investigative and/or trends-based approach to toxicity, such as the Ag programs. If standardization is desired, I recommend continuing the "NOEC + Threshold" approach that is already widely in use by ambient monitoring programs statewide, and if necessary incorporating the TST concept of 10%/25% biological relevance levels in lieu of the 20% threshold currently in use.

Sincerely,

Sarah Lopez
Executive Director
Central Coast Water Quality Preservation, Inc.