Central Valley Clean Water Association

Representing Over Fifty Wastewater Agencies

August 16, 2017

Letter 7

Via Electronic Mail

Jeanine Townsend, Clerk to the Board
State Water Resources Control Board
P.O. Box 100
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Subject: Comment Letter – Proposed SWRCB Bacteria Provisions

Dear Ms. Townsend:

The Central Valley Clean Water Association (CVCWA) appreciates the opportunity to provide written comments on the State Water Resources Control Board's (State Water Board's) proposed Part 3 of the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California (ISWEBE)—Bacteria Provisions and a Water Quality Standards Variance Policy (*Bacteria Provisions*). CVCWA is a non-profit association of public agencies located within the Central Valley region that provide wastewater collection, treatment, and water recycling services to millions of Central Valley residents and businesses. We approach these matters with the perspective of balancing environmental and economic interests consistent with state and federal law.

7.01

CVCWA commends the efforts by the State Water Board in developing the Bacteria Provisions and believes these documents will help to standardize a state approach and further protect California waters and human health. As stated in the Draft Staff Report[1], the Bacteria Provisions seek to establish consistent statewide water quality objectives for California waters using the 2012 USEPA Recreational Water

1 Draft Staff Report, including the Draft Substitute Environmental Documentation, for the Bacteria Provisions. June 30, 2017.

Quality Criteria (EPA 2012 Criteria) as a framework. CVCWA is overall supportive of the Bacteria Provisions, but would like to highlight the following three concerns about implementation of the Bacteria Provisions, and offer our suggested modifications.

7.02

1. **The Draft Staff Report and associated Economic Analysis are incorrect in assuming no additional cost for WWTP dischargers to monitor for *E. coli.* WWTP dischargers that meet effluent limitations based on Title 22 disinfection requirements should not be required to monitor for *E. coli.***

The Draft Staff Report and associated Economic Analysis[2] anticipate a cost savings for municipal wastewater treatment plants (WWTA) for bacteria monitoring, assuming that WWTPs would substitute *E. coli* monitoring for fecal coliform monitoring. In fact, WWTPs in the Central Valley are required to monitor for total rather than fecal coliform. The assumption that WWTPs would substitute *E. coli* for total coliform monitoring is incorrect, as discussed below.

Most WWTPs in the Central Valley have effluent limitations for total coliform derived from the Division of Drinking Water's reclamation criteria, California Code of Regulations, Division 4, Chapter 3 (Title 22), for the reuse of wastewater, which are more stringent than the EPA recreational criteria.

Title 22 requires that for spray irrigation of food crops, parks, playgrounds, schoolyards, and other areas of similar public access, wastewater must be adequately disinfected, oxidized, coagulated, clarified, and filtered, and that the effluent total coliform levels shall not exceed 2.2 MPN/100 mL as a 7-day median; 23 MPN/100 mL, not to be exceeded more than once in a 30-day period; and 240 MPN/100 mL, at any time. The Central Valley Regional Water Quality Control Board (Central Valley Water Board) has stated that: "Title 22 is not directly applicable to surface waters; however, the stringent disinfection criteria of Title 22 may be appropriate in the site-specific circumstances of a discharge where the irrigation of food crops and/or for body-contact water recreation are beneficial uses. Coliform organisms are intended as an indicator of the effectiveness of the entire treatment train and the effectiveness of removing other pathogens."[3]

Total coliform bacteria are a broad group of indicator bacteria, including a variety of bacteria, mostly of intestinal origin. *E. coli* is a small subset of the group of coliform bacteria. Thus, if a WWTP is able to achieve *E. coli* limits with total coliform

[2] Abt Associates Inc. 2017. Economic Analysis of Proposed Water Quality Objectives for Pathogens in the State of California. June 2017.
[3] See, e.g., Central Valley Regional Water Quality Control Board. 2016. Order R5-2016-0020. Attachment F – Fact Sheet.

measurements, it is achieving *E. coli* levels that are conservatively two orders of magnitude lower than those included in the Bacteria Provisions.

It is not likely that the Central Valley Water Board would replace total coliform limitations with limitations based solely on the *E. coli* criteria. To ensure that disinfection standards are met, the Central Valley Water Board will likely continue to require monitoring of total coliform. Therefore, because WWTPs are regulated to the more stringent Title 22 disinfection standards for total coliform, it does not make practical sense to require them to monitor *E. coli* in addition to total coliform.

Further, the Staff Report Economic Considerations section focuses solely on ocean WWTP discharges, and does not consider the economic impact to inland surface water dischargers.

Recommendation: Modify the Draft Staff Report to specify that dischargers meeting the more stringent Title 22 disinfection requirements that exist as effluent limitations in NPDES permits shall not be required to monitor for *E. coli* also.

Modify the Draft Staff Report and associated Economic Analysis to acknowledge that WWTP dischargers in the Central Valley will need to monitor total coliform to meet Title 22 disinfection requirements, and that a requirement to monitor for *E. coli* would represent an additional cost.

7.03

2. The 13241 Analysis does not include a description of the water quality conditions that are achievable through coordinated control of all factors which affect water quality in the area.

Under California Water Code Section 13241, the State Water Board and Regional Water Boards are required to establish water quality objectives that ensure the reasonable protection of beneficial uses. In establishing such objectives, the Water Boards are required to consider a number of factors, including in part:

- Past, present and probable future beneficial uses of water;
- Water quality conditions that could reasonably be achieved through the coordinated control of all factors which affect water quality in the area; and
- Economic considerations.

The Draft Staff Report should include appropriate information to satisfy the 13241 requirements. The current language of the Bacteria Provisions included in the Draft Staff Report does not identify – and therefore cannot properly consider – the water quality conditions that could reasonably be attained through coordinated control of all factors affecting water quality. The Draft Staff Report simply states that: "The

proposed water quality objectives for bacteria and implementation provisions can be implemented through NPDES permits issued pursuant to section 402(p) of the Federal Clean Water Act, water quality certifications issued pursuant to section 401 of the Clean Water Act, WDRs, waivers of WDRs, and TMDLs." However, this statement describing the regulatory mechanisms available to enforce water quality objectives does not fulfill the 13241 requirements.

Indicator bacteria have many natural, background sources in addition to those sources regulated by the Water Boards. Without considering such sources, the State Water Board will be unable to properly understand whether proposed objectives are less than, equal to, or exceed the water quality conditions that could reasonably be achieved through the coordinated control of all factors.

In addition, an understanding of the resource commitment necessary to implement control measures is needed to determine the water quality conditions that could reasonably be achieved. While the Draft Staff Report includes an economic analysis, it does not consider whether control measures and associated costs are reasonable, or whether they will lead to achieving the desired water quality conditions (i.e. compliance with the proposed water quality objectives).

Section 13242 of the Water Code requires that a program of implementation be developed and documented, wherein the nature of actions necessary to achieve proposed objectives must be identified and a time schedule for the actions to be taken must be provided. The Draft Staff Report does not include this information.

Recommendation: Modify the Draft Staff Report to clearly describe the information required under Sections 13241 and 13242 of the Water Code, and to document the information that is currently available and not available. Modify the proposed Provisions, as necessary.

7.04

3. Appendix C of the Draft Staff Report uses an inappropriate conversion factor to convert fecal coliform objectives to *E. coli* objectives.

Appendix C of the Draft Staff Report uses a conversion factor to convert fecal coliform objectives used in Regions 1, 5 and 6 to *E. coli* objectives, and to back calculate the associated risk levels. The conversion factor used is "*E. coli* is ~ 90% of Fecal Coliform (based on number used by Ocean Plan staff – M. Gjerde)." This conversion factor does not include a citation to scientific literature. At the Stakeholder Meeting on July 10, 2017, State Water Board staff suggested that the conversion factor came from a study conducted by the Southern California Coastal Water Research Program (SCCWRP), but staff did not remember specifics of the study.

Communication with SCCWRP indicated that the Southern California Bight 1998 Regional Monitoring report[4] was the source of the 0.9 ratio. This study included an inter-laboratory comparison of indicator bacteria results among multiple laboratories that used samples spiked with wastewater influent. However, the study neither included nor made a recommendation for a conversion factor from *E. coli* to fecal coliform.

In a later SCWRRP 2007 study of natural open-space sites spread across southern California's coastal watersheds, the researchers stated an assumption that "*E. coli* levels typically equal 80% of fecal coliforms;"[5] however, no basis was provided in the study report to support that assumption.

It is inappropriate to assume that a Southern California-specific relationship would be applicable statewide. Fecal coliform bacteria are a large group of bacteria, including those that originate in feces (e.g., *E. coli*) as well as genera that are not of fecal origin (e.g., *Enterobacter, Klebsiella, Citrobacter*). The EPA's 2012 Criteria noted that "Scientific advancements in microbiological, statistical, and epidemiological methods have demonstrated that culturable enterococci and *E. coli* are better indicators of fecal contamination than the previously used general indicators, total coliforms and fecal coliforms." Fecal coliform can be naturally present in the environment due to regrowth and wildlife, in addition to human sources. The composition of fecal coliform bacteria present can vary due to the sources of bacteria. Any conversion factors used to estimate *E. coli* from fecal coliform would be site-specific. It is inappropriate to apply one conversion factor statewide.

In other locations in the United States, state environmental agencies have developed region-specific ratios to convert fecal coliform data to *E. coli* to align with the EPA-recommended criteria. A summary of a few conversion factors is shown in **Table 1**. A report by the United States Geological Survey (USGS) noted that: "[*E. coli* to fecal coliform] ratios and regression models are site specific and make it possible to convert historic fecal coliform bacteria data to estimated *E. coli* densities for the selected sites," and further noted that variation between locations is probably due to site-specific factors such as sources of bacteria and water quality conditions.[6]

[4] Noble, R., J. Dorsey,. M. Leecaster, M. Mazur, C. McGee, D. Moore, B. Orozco-Borbón, D. Reid, K, Schiff, P. Vainik, and S. Weisberg. 1999. Southern California Bight 1998 Regional Monitoring Program: I. Summer Shoreline Microbiology.

[5] Stein, E. and V. Yoon. 2007. Assessment of Water Quality Concentrations and Loads from Natural Landscapes. Southern California Coastal Water Research Project Technical Report 500. February.

[6] Rasmussen, P. and A. Ziegler. Comparison and Continuous Estimates of Fecal Coliform and *Escherichia Coli* Bacteria in Selected Kansas Streams, May 1999 Through April 2002. U.S. Geological Survey. Water-Resources Investigations Report 03-4056.

Moreover, an examination of Northern California-specific data from the Sacramento River at Freeport (30 samples over the past ten years), showed an average ratio of *E. coli* to fecal coliform of 0.74.

Table 1. Conversions used to estimate *E. coli* based on Fecal Coliform

Location	***E. coli* to fecal coliform conversion**	**Reference**
Kansas	*E. coli* = 0.77 x fecal coliform	Rasmussen, P. and A. Ziegler. Comparison and Continuous Estimates of Fecal Coliform and *Escherichia Coli* Bacteria in Selected Kansas Streams, May 1999 Through April 2002. U.S. Geological Survey. Water-Resources Investigations Report 03-4056.
Oregon	*E. coli* = 0.531 x fecal coliform$^{1.06}$	Cude, Curtis G. 2005. Accommodating Change of Bacterial Indicators in Long Term Water Quality Datasets. Journal of the American Water Resources Association, Paper No. 02144, February.
Virginia	*E. coli* = 0.998 x fecal coliform$^{0.919}$	Commonwealth of Virginia, Department of Environmental Quality. 2003. HSPF Model Calibration and Verification for Bacteria TMDLs, Guidance Memo No. 03-2012. Water Division, September.
Ohio (Northeast District)	*E. coli* = 0.667 x fecal coliform$^{1.034}$	Ohio Environmental Protection Agency. 2006. Ohio EPA Bacterial TMDL Correlation Equations for Converting Between Fecal Coliform and *E. Coli*. December.
Ohio (rest of the state)	*E. coli* = 0.403 x fecal coliform$^{1.028}$	

Recommendation: Derive site-specific *E. coli* objectives where applicable. The Draft Staff Report should not include a single statewide conversion factor to estimate *E. coli* levels based on fecal coliform data, or at the very least, should qualify the use of this value with a statement that locally-derived values are preferred. In addition, the Draft Staff Report should provide a citation for any conversion factor that is used, along with an explanation of the conditions under which it was developed, and justification of why it is appropriate.

Again, we thank you for the opportunity to provide these comments. We look forward to working with you and your staff to refine the current proposed policy language and to craft effective solutions applicable to implementation of the Bacteria Provisions.

Sincerely,

Debbie Webster

Debbie Webster, Executive Officer

cc: Pamela Creedon