THE CITY OF SAN DIEGO

August 16, 2017

VIA EMAIL TO: commentletters@waterboards.ca.gov

Letter 12

Ms. Jeanine Townsend
Clerk to the Board
State Water Resources Control Board
1001 I Street, 24th Floor
Sacramento, CA 95814

Subject: City of San Diego Comments on the Proposed State Bacteria Provisions

Dear Ms. Townsend:

The City of San Diego (City) appreciates the opportunity to comment on the *Draft Part 3 of the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California—Bacteria Provisions and a Water Quality Standards Variance Policy* and the *Draft Amendment to the Water Quality Control Plan for Ocean Waters of California—Bacteria Provisions and a Water Quality Standards Variance Policy* (hereafter referred to as the ISWEBE and Ocean Plan Provisions). For the City, and many other municipalities in California, our culture and economy depend on clean beaches and waterways. The City has been working closely with the San Diego Regional Water Quality Control Board (San Diego Water Board) and other stakeholders in the region to improve water quality and protect public health. For example, the City has been proactively addressing complex sources of bacteria and developed a Tiger Team approach to enhance bacterial source identification and source abatement efforts. The City also jointly funded the Surfer Health Study, which is the first of its kind effort to quantify health risks associated with coastal water exposures following storm events, and includes a comprehensive epidemiological study, extensive microbiological water quality monitoring, and an innovative Quantitative Microbiological Risk Assessment (QMRA).

12.01 The City appreciates the State Water Resources Control Board's (State Water Board) efforts to develop the proposed ISWEBE and Ocean Plan Provisions. Although the City supports the development of these statewide bacteria water quality policies, we have several comments that we respectfully request the State Water Board consider before finalizing these provisions:

- 12.02 **Risk-Based Foundation**: Both the ISWEBE and Ocean Plan Provisions should provide more discussion on the risk protection level (i.e., 32 excess illnesses/1,000 recreators) associated with the proposed bacteria water quality objectives, and that the *Escherichia coli* (*E. coli*) and Enterococcus objectives are the indicators being used to interpret the risk level at this time. Following a risk-based approach, the provisions should also include language which allows incorporation of more accurate indicators of human sources of bacteria (or direct measures of pathogen risk), and the associated risk level, based on new scientific findings in the future.

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12.03

- **Replace Dated Bacteria Water Quality Indicators with the Proposed Water Quality Objectives**: Both the ISWEBE and Ocean Plan Provisions should include language which requires State agencies and Regional Water Boards to update existing bacteria water quality objectives and values, including but not limited to AB411/California Department of Public Health (CDPH) standards, based on fecal and total coliforms. These indicators are deemed to be unreliable by the United States Environmental Protection Agency (USEPA) and are not based on best available science. Fecal and total coliform indicators should be replaced by the proposed *E. coli* and enterococci objectives, as well as any other alternative indicators of the protective risk level based on best available science in the future.

12.04

- **Clarify Site-Specific Objectives**: Both the ISWEBE and Ocean Plan Provisions should include a provision allowing for site specific objectives, and should specifically include the option to develop site-specific objectives using procedures outlined in USEPA's 2012 Recreational Water Quality Criteria (RWQC).

12.05

- **Distinguish Dry Weather and Wet Weather Objectives**: Both the ISWEBE and Ocean Plan Provisions make no distinction as to which objectives should apply during dry and wet weather. For southern California beaches in particular, the geometric mean should not apply to the wet weather season when storm events frequently occur. Only the statistical threshold value should apply during wet weather months at southern California beaches.

12.06

- **Include Guidance on Use Attainability Analysis (UAA)**: The ISWEBE Provisions require development of a UAA in order to designate a waterbody under the Limited Water Contract Recreation (LREC-1) beneficial use or allow for high flow or seasonal suspensions. Although the City supports the Provisions' requirement that UAAs be completed prior to designation with the LREC-1 beneficial use, as required under existing law, the Provisions do not provide guidance as to how an approvable UAA should be conducted or alternative methods that could be used to determine appropriate beneficial uses. The State Water Board should develop guidelines for conducting such UAAs to reduce the burden on Regional Water Boards and permittees and maintain a level of consistency in UAA requirements across the state.

12.07

- **Strike Use Attainability Analysis Requirement for Suspensions:** In the past, Regional Water Boards can and have incorporated suspensions within Basin Plans as part of the objectives for individual waterbodies without requiring a UAA. This type of strategy has been approved by USEPA for other states. UAAs require extensive and time-consuming analysis that could impede the accessibility and utility of the suspensions contained in the Provisions. In addition, attainability of REC-2 uses should also be evaluated in the implementation of suspensions.

12.08

- **Consider Dilution for Storm Water**: Both the ISWEBE and Ocean Plan Provisions do not consider dilution or a mixing zone for storm water. The provisions should account for dilution/mixing zone for storm water if recreational activity does not occur in the immediate vicinity of a storm water discharge and dilution of storm water is likely.

Please see the enclosed table that accompanies this letter for additional comments and further details. We appreciate this opportunity to share our comments. If you have any questions, please contact Ruth Kolb at (858) 541-4328 or at rkolb@sandiego.gov.

Sincerely,

Drew Kleis
Deputy Director

DK\rk

Enclosure: City of San Diego Comment Table for Bacteria Provisions

cc: Paz Gomez, Deputy Chief Operating Officer, Infrastructure/Public Works
Alejandra Gavaldon, Director of Infrastructure and Water Policy, Office of the Mayor
Kris McFadden, Director, Transportation & Storm Water Department
Davin Widgerow, Deputy City Attorney, City Attorney's Office
Agnes Generoso, Deputy Director, Public Utilities Department
Ruth Kolb, Program Manager, Transportation & Storm Water Department
Cathy Pieroni, Program Manager, Public Utilities Department

Comment Number	Applicable Sections	Comment
Comment Applicable to Both the ISWEBE and Ocean Plan Provisions		
Clearly reference the proposed WQOs are based on a protective risk level.		
1.	ISWEBE and Ocean Plan Provisions - Overall 12.02 cont.	The City of San Diego supports the proposed water quality objectives (WQOs) to protect public health for waterbodies that support recreational uses. However, the City is concerned that the provisions do not include detailed discussion of the associated protective risk level (except for listing the associated illness rate in the Bacteria WQOs tables). The Staff Report includes some additional context, but does not adequately describe the relationship between the proposed risk level and WQOs. Incorporating a discussion of risk will clarify that the ultimate goal of recreational water quality improvement programs is to reduce risk of illness to recreators, as opposed to being solely focused on reducing densities of fecal indicator bacteria. The Regional Boards should have the flexibility to incorporate alternative and better indicators of human sources of bacteria and possibly direct measures of pathogens in the future so long as they are protective of an acceptable level of risk. USEPA and others are actively researching more reliable and specific indicators of human sources and it is expected that more reliable indicators will become available in the near future. Additionally, science regarding alternative indicators is evolving more rapidly than the regulatory process can keep up. The provisions should streamline the process using alternative indicators in the future as long as they provide equivalent protection of recreational beneficial uses. **Recommendation**: The provisions should clearly indicate that the objectives correspond to a protective risk level and that the *Escherichia coli* (*E. coli)* and *Enterococcus* objectives are the indicators being selected to interpret that risk level based on current science. The City also recommends that the provisions include language which allows incorporation of alternative indicators based on new scientific findings in the future under this risk-based approach. Modify language to: "Regional Water Boards may consider alternative indicators or direct measures of pathogens if they are scientifically defensible and can be used to effectively assess the protective level of risk of 32 illnesses per 1,000 recreators".
Dated bacteria water quality indicators should be replaced with *E. coli and Enterococcus,* or other alternative indicators based on sound science.		
2.	ISWEBE Provisions III.E.1 & 2 & Ocean Plan Provisions II.B.1 and III.D.1.c 12.03 cont.	The City supports the use of *E. coli* and *Enterococcus* as bacteria water quality indicators, which USEPA recommended as superior to fecal and total coliform indicators: "*Microorganisms that are potential indicators of fecal contamination are normally present in fecal material. Not all of these indicators, however, have a clear relationship to illness rates observed in epidemiological studies…two microorganisms that have consistently performed well as indicators of illness in sewage-contaminated waters during epidemiological studies are Enterococci in both marine and fresh water and E. coli in fresh water measured by culture (Prüss, 1998; Wade et al., 2003; Zmirou et al., 2003). Additionally, two epidemiological studies also demonstrate the utility of E. coli as an indicator as recommended in the 1986 criteria (Marion et al., 2010; Wiedenmann, 2006). Together the available body of information supports USEPA's 2012 Recreational Water Quality Criteria (RWQC) recommendations to use Enterococci and E. coli as indicators of fecal contamination*" (pp. 9-10 of USEPA 2021 RWQC). However, the City is concerned that, although both

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	12.03 cont.	provisions establish new objectives based on *E. coli* and *Enterococci*, the provisions do not prevent Regional Water Boards from continuing to use fecal and total coliforms. Latest USEPA studies demonstrated that these two indicators are not as reliable as *E. coli* and *Enterococci* and the numeric values associated with fecal and total coliforms are not based on sound science. **Recommendation**: Add language that requires Regional Water Boards to update all existing bacteria WQOs to *Enterococci* and *E. coli*, or other alternative indicators of the protective risk level based on sound science.
Recommended analytical methods should include methods for alternative indicators.		
3.	ISWEBE Provisions III. E.2. & Ocean Plan Provisions II.B.1.a.(1) 12.17	The City supports the use of either USEPA standard methods or other equivalent methods as recommended in the provisions. The City, however, is concerned that this recommendation is limited to methods that measure cultural *Enterococci* or *E. coli*. Limitations on *Enterococci* and *E. coli* culture-based methods could create issues for using alternative indicators in the future, for which analytical methods will differ from the culture-based methods. For example, quantitative polymerase chain reaction (qPCR) is a non-culture based analytical method recommended in USEPA's 2012 RWQC. In addition, the science of recreational water quality is rapidly developing and research in Southern California has been at the forefront of new scientific advancements. These advancements have increased the number of pathogens and indicators that can be measured in recreational waters, lowered the cost of those measurements, and increased the reliability of health risk estimates at local sites based on site-specific data. The USEPA and Southern California Coastal Water Research Project (SCCWRP) have investigated the use of coliphages, which are viruses that target *E. coli*, as a possible alternative indicator (refer to: USEPA. 2015. Review of Coliphages as Possible Indicators of Fecal Contamination for Ambient Water Quality. Office Water and Science and Technology Health and Ecological Criteria Division. EPA-820-R-15-098). As a virus, coliphage monitoring holds the potential to offer results in a matter of hours versus days, thus giving more timely results of any potential waterbody exceedances. In their current form, the provisions would not allow coliphage to be used as an indicator of the risk to human health. The Bacteria Provisions and Staff Report should be amended to include the option for the use of alternative indicators such as coliphage or other, yet to be developed indicators. **Recommendation**: Analytical methods language should be revised to "or other equivalent methods to measure *Enterococci*, *E. coli*, or alternative indicators".
Include provision for development of site-specific objectives using procedures outlined in USEPA's 2012 RWQC.		
4.	Overall	The City supports the proposed language that bacteria WQOs do not supersede a site-specific numeric water quality objective for bacteria established for the REC-1 beneficial use (ISWEBE Provisions III. E.3). However,

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	12.04	the Ocean Plan Provisions make no mention of site-specific objectives. Further, both provisions make no mention of developing site-specific objectives using procedures outlined in USEPA's 2012 RWQC (e.g. Quantitative Microbial Risk Assessment [QMRA]). USEPA encourages the development of site-specific bacteria objectives: "*States could adopt site-specific alternative criteria to reflect local environmental conditions and human exposure patterns*" and include examples of tools to develop the site-specific numeric values: "*(1) an alternative health relationship derived using epidemiology with or without QMRA; (2) QMRA results to determine water quality values associated with a specific illness rate; or (3) a different indicator/method combination*" (p. 48 of USEPA 2012 RWQC). **Recommendation**: Add a provision for allowing site-specific objectives, including an option to develop site-specific objectives using procedures outlined in USEPA's 2012 RWQC. Furthermore, the following language in ISWEBE Provisions III. E.3 should be added to the Ocean Plan Provisions: "The BACTERIA WATER QUALITY OBJECTIVES do not supersede any site-specific numeric water quality objective for bacteria established for the REC-1 beneficial use".
Dry weather and wet weather objectives should be distinguished.		
5.	ISWEBE Provisions III. E.2. & Ocean Plan Provisions II.B.1.a.(1) 12.05	The City is concerned that the provisions do not make a distinction as to which objectives should apply during dry and wet weather. Weekly samples are typically collected during the dry season as part of the AB411 beach monitoring program, which allows for calculation of a geometric mean (GM), assuming a sufficient number of samples are collected during the averaging period, in addition to comparison to the statistical threshold value (STV). Storm events are infrequent in southern California; therefore, a sufficient number of samples would typically not be available for calculation of a GM to represent wet weather conditions. As a result, only the STV should apply for wet weather in this region. **Recommendation**: Apply the GM and STV to dry-weather samples (only apply the STV when the sample size is insufficient for calculation of the GM). Only apply STV to wet weather samples.
Provide flexibility in the GM calculation as allowed by USEPA.		
6.	ISWEBE Provisions III. E.2. & Ocean Plan Provisions II.B.1.a.(1) 12.09	The City supports the proposed six week interval for the GM calculation. As USEPA acknowledged, "a longer duration would typically allow for more samples to be collected and that including more samples in calculation of the GM and STV improves the accuracy of the characterization of water quality" (p. 40 of USEPA's 2012 RWQC). The City is concerned that a GM is to be calculated as a rolling 6-week GM and evaluated on a weekly basis. The use of the rolling GM can erroneously imply the persistence of bacterial water quality problems even when the risk is no longer present. USEPA's 2012 RWQC recommend either a static or rolling average for the GM calculation (p. 40 of USEPA's 2012 RWQC). **Recommendation**: The GM calculation should be replaced with "either a rolling or static 6-week GM". Allow for flexibility to use either a rolling a static 6-week GM calculation to encourage larger sample sizes

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		which provide more accurate assessments.
Averaging period for use in assessing wet and dry weather conditions		
7. 12.10	ISWEBE Provisions III. E.2. & Ocean Plan Provisions II.B.1.a.(1)	The City supports the application of the STV with a 10% allowable exceedance frequency, which is recommended by USEPA. A monthly calculation is specified using the STV and a 6-week rolling period (assessed weekly) is specified for use with the GM. The City supports using a longer time period for the STV, consistent with the rationale presented in the provisions. **Recommendation**: Assess the STV using a longer averaging period.
Allowable exceedance frequencies should apply to both the STV and the GM.		
8. 12.11	ISWEBE Provisions IV.E.2.b & Ocean Plan Provisions III.D.1.b & III.D.2.b	The City supports the reference system and natural sources exclusion approaches based on observed exceedances in an applicable reference system or due to a natural source. The proposed approaches, however, allow a certain frequency of exceedance of the STV and not the GM. The City believes that if GM exceedances are observed in a reference system or due to a natural source, this should be considered as allowable exceedances. **Recommendation**: Allowable exceedance frequencies should apply to both the STV and the GM.
The reference system and natural source exclusion approaches should be allowed in non-TMDL waterbodies.		
9. 12.12	ISWEBE Provisions IV.E.2 & Ocean Plan Provisions III.D.1.b & III.D.2.b.(1)	Both provisions allow the reference system and natural source exclusion approaches to be used in the context of a TMDL and do not allow the approaches to apply to non-TMDL waterbodies. The City believes the use of these approaches should not be limited to only TMDL waterbodies. **Recommendation**: Both approaches should be allowed in non-TMDL waterbodies.
Guidance is needed for application of the natural source exclusion approach.		
10. 12.13	ISWEBE Provisions IV.E.2.b & Ocean Plan Provisions III.D.2.b.(1)	Both provisions require that all anthropogenic sources of bacteria be identified, quantified, and controlled prior to the implementation of the natural source exclusion approach. The City has a concern that the provisions provide no further details on the definition of anthropogenic bacteria sources and the demonstration of anthropogenic source control. **Recommendation**: The State Water Board should define "anthropogenic bacterial sources", provide guidelines for documenting control of these sources, and methods/tools for demonstrating that prerequisite requirements for the natural source exclusion approach have been met.
Dilution should be considered for stormwater.		

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11. 12.08 cont	Overall	Both the ISWEBE and Ocean Plan Provisions do not consider dilution and a mixing zone for stormwater. **Recommendation**: The City recommends adding language to account for dilution/a mixing zone for stormwater.
Economic Considerations analysis is incomplete and does not fully consider the costs of wet weather implementation		
12. 12.14	Staff Report Section 10.4	The analysis of economic considerations does not fully evaluate the additional increase in cost from the lower illness rate proposed in the provisions for stormwater dischargers, particularly during wet weather. The analysis presumes that the difference in the objectives is small and will therefore not result in additional costs to wastewater agencies, but does not assess stormwater agencies. **Recommendation**: Conduct an economic analysis for wet weather discharges to meet the lower illness rate.
Comments Applicable to the ISWEBE Provisions Specific Issues		
The State Water Board should provide UAA guidance for use in designating LREC-1. Also, UAAs should not be required for high flow and seasonal suspensions.		
13. 12.06 cont	ISWEBE Provisions IV.E.3 4, & 5	The City supports that the provisions allow for the Regional Water Boards to designate waterbodies under the Limited Water Contact Recreation (LREC-1) beneficial use, and allow for high flow or seasonal suspensions. However, the City is concerned that the provisions require development of a Use Attainability Analysis (UAA) to implement these designations but provide no further details on the UAA methods, and requirements, or alternatives that could streamline the process. The UAA requirement would create a large burden on permittees and the Regional Water Boards. High flow suspensions have been developed in the Santa Ana Region without the use of a UAA. The State Water Board should not require UAAs for high flow and seasonal suspensions in all situations (?), and should develop guidelines to streamline development of the suspensions and UAAs for LREC-1 to reduce the burden on Regional Water Boards and permittees and to maintain a level of consistency in developing these suspensions across the state. **Recommendation**: The City supports the requirement to complete a UAA before designating LREC-1 for a specific waterbody. The State Water Board should provide streamlined UAA guidance and the requirements should clearly state that if approved, LREC-1 would replace an existing REC-1 beneficial use designation. Guidelines should also be developed to support incorporation of high flow and seasonal suspensions, such as identifying flow conditions that pose hazardous conditions, in lieu of requiring development of a UAA. These steps will protect recreational uses while reducing the burden on Regional Water Boards and permittees, and will also help maintain a level of consistency in applying these provisions across the state. It is important to note that Regional Water Boards can and have incorporated suspensions within Basin Plans as part of the objectives for individual waterbodies without needing a UAA. This type of strategy has also been approved by USEPA for other states such as Georgia, Oklahoma, Arkansas, and Missouri.
High flow and seasonal suspensions should apply to both REC-1 and REC-2 beneficial uses.		
14.	ISWEBE Provisions	The City is concerned that when a suspension is implemented, the provisions make clear that the REC-2 objectives still apply and no changes to the REC-2 objectives are included. Especially during a high flow

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12.15	IV.E.3 & 4	condition, both REC-1 and REC-2 may not be supported due to safety concerns. Attainability of both REC-1 and REC-2 uses should be determined in the implementation of the suspensions. The Staff Report notes several times in Section 5.3.2 that REC-1 and REC-2 beneficial uses are not fully attainable during high flow events that justify the suspension of REC-1 objectives. This language is inconsistent with the exclusion of REC-2 from the suspensions in the Bacteria Provisions. **Recommendation**: Application of the suspensions to REC-2 beneficial uses should also be considered.
Comments applicable to Ocean Plan Provisions Specific Issues		
AB411/the California Department of Public Health (CDPH) standards should be replaced with the proposed bacteria WQOs.		
15. 12.16	Ocean Plan Provisions II.B.1 and III.D.1.c	The City is concerned that the provisions maintain the AB411/CDPH standards but do not provide a clear distinction of the differences between the new bacteria WQOs and the AB411/CDPH standards and how the latter should be used. The language appears to state that all of the objectives would be used for permitting, but only the new objectives should be used for 303(d) listing decisions. Further, the continuing use of fecal and total coliform-based numeric values are not recommended as discussed in Comment 2. **Recommendation**: Replace the AB411/CDPH standards with State approved bacteria WQOs.