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August 16, 2017

Letter 4

Jeanine Townsend, Clerk to the Board
State Water Resources Control Board
P.O. Box 100
Sacramento, CA 95812-2000

Subject: Comment Letter – Bacteria Provisions

Dear Ms. Townsend:

Intro text

The California Stormwater Quality Association (CASQA) is writing to comment on the 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 and the Proposed Amendment to the Water Quality Control Plan for Ocean Waters of California (Ocean Plan)—Bacteria Provisions and a Water Quality Standards Variance Policy (hereafter Bacteria Provisions).

CASQA understands that, if adopted, the Bacteria Provisions would revise the indicator organisms to *Escherichia coli (E. coli)* in freshwater and Enterococci in saltwater, establish a risk protection level, and include new bacteria water quality objectives (WQOs) for the protection of the Water Contact Recreation (REC-1) beneficial use. These Bacteria Provisions describe reference reach/antidegradation and natural source exclusion approaches as well as high flow and seasonal suspensions as possible implementation measures. The Bacteria Provisions also include the designation of a new beneficial use, the Limited Water Contact Recreation (LREC-1). Finally, the Bacteria Provisions identify mechanisms for adopting water quality standards variances (WQS Variance) for pollutants and waterbodies.

CASQA commends the efforts by the State Water Resources Control Board (State Water Board) in developing the Bacteria Provisions and believes these documents will help to standardize the state approach and further protect California waters and human health. As stated in the Staff Report[1], the Bacteria Provisions seek to establish consistent statewide water quality objectives for California waters using the 2012 USEPA Recreational Water Quality Criteria (hereinafter USEPA 2012 Criteria)[2] as a framework. The Bacteria Provisions are also meant to provide the Regional Water Quality Control Boards (Regional Water Boards) "with tools and direction in addressing specific issues related to applying the Bacteria Objectives." CASQA supports the intent of the Bacteria Provisions to reconcile the current inconsistent application of bacteria objectives across the regions.

1 Draft Staff Report, including the Draft Substitute Environmental Documentation, for the Bacteria Provisions. June 30, 2017.
2 US EPA. 2012. Recreational Water Quality Criteria. Office of Water 820-F-12-058. www.epa.gov/wqc/2012-recreational-water-quality-criteria-documents

CASQA has identified a number of changes that would improve the effectiveness of the Bacteria Provisions and avoid implementation issues that CASQA anticipates the Stakeholders would encounter. The following comments are intended to improve the Bacteria Provisions, which will provide the Regional Water Boards with guidance and flexibility to best protect recreational beneficial uses within their respective regions.

I. Comments relevant to both the ISWEBE and Ocean Plan Provisions

4.01

Comment 1: Clarify that the proposed WQOs are based on a protective level of risk.

USEPA's 2012 Criteria were developed based on epidemiological studies that linked the health risk associated with recreational water use to concentrations of indicator bacteria. USEPA identified acceptable estimated gastrointestinal illness rates protective of REC-1 uses, which were then associated with specific indicator bacteria concentrations. Although the risk levels were the driver for selecting appropriate indicator levels, the only mention of risk level in both the ISWEBE and Ocean Plan Provisions occurs in the header of the WQOs table. The Staff Report includes some minor discussion of risk but nowhere is the relationship between the proposed risk level and WQOs adequately described. Since the risk level is the driving mechanism to protect human health, it should be clearly described in the Bacteria Provisions and Staff Report.

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. Incorporating a risk discussion into the Bacteria Provisions and Staff Report will allow the amendments to be adaptable to the evolving science in the event that a better indicator becomes available.

Thus, CASQA requests that the State Water Board include a discussion within the Bacteria Provisions of the risk-level basis of the *E. coli* and Enterococci numeric criteria, and acknowledge that the fecal indicator-based criteria are established to support the accepted risk level. CASQA recommends consideration of language similar to that adopted by the Santa Ana Regional Water Board as their Pathogen Indicator Bacteria objectives, updated to reflect the USEPA 2012 criteria.[3] The Santa Ana Basin Plan includes a discussion of the basis for the indicator bacteria objectives, a narrative objective that allows for development of alternative indicators and site-specific objectives, and indicator bacteria concentrations established as surrogate numeric indicators of the narrative objective. For example, possible language that could be inserted into the ISWEBE and Ocean Plan under the "Bacteria Water Quality Objectives" section includes the following:

"*Indicator bacteria originate from the intestinal biota of warm-blooded animals, and their presence in surface water is used as an indicator of fecal contamination and the potential presence of pathogens capable of causing gastrointestinal (GI) illnesses. However, most strains of indicator bacteria are harmless and the actual risk to human health is caused by pathogens, microorganisms that are known to cause disease. Pathogens can cause illness in recreational*

[3] Water Quality Control Plan for the Santa Ana River Basin, updated February 2016.

water users and threaten or impair recreational beneficial uses. Measuring pathogens directly has been impractical due to the lack of standard methods so surrogate indicator bacteria have typically been used to indicate the presence of pathogens. However, the surrogate indicator bacteria have changed over time and future scientific advancements are anticipated that will allow better assessment of pathogens that cause illness.

The USEPA criteria identified acceptable estimated gastrointestinal illness rates due to pathogens that are protective of REC-1 uses. The risk of illness was then translated to E. coli and enterococci densities determined to be protective of this risk level. To allow for incorporation of better pathogen indicators or new USEPA criteria, these WQOs are set equal to the USEPA established risk level and interpreted as E. coli and enterococci concentrations."

As part of the discussion of risk, CASQA requests that the amendments allow for the use of human markers as part of the compliance pathways for the objectives. Numerous studies have established that human sources of bacteria pose the most risk to human health. The recent Surfer Health Study conducted in the San Diego region incorporated an epidemiological component and a Quantitative Microbial Risk Assessment (QMRA) component, which found a different relationship between indicator bacteria levels and human health risk than the epidemiological studies that supported the USEPA criteria – and pointed out that human sources of indicator bacteria posed the greatest health risk, and that elimination of human sources is most effective at reducing the risk of illness.[4] Methods for reducing human sources of bacteria are not always aligned with the methods necessary to reduce fecal indicator bacteria. The implementation procedures for the objectives should allow for a demonstration that human markers are absent or below thresholds that would increase the risk to human health to be above the established risk level. Such an approach would limit burdensome efforts to remove bacteria sourced from wildlife such as that described under section 6.2.2.4 of the Staff Report, especially in light of the lower risk of human illness posed by bacteria sourced from wildlife.

CASQA Recommendation:

- *Include a statement in the ISWEBE and Ocean Plan Amendments stating that the WQOs are set equal to a risk level that has been interpreted as the indicator bacteria concentrations shown in the amendment.*
- *Include an expanded discussion of the risk level as described in the 2012 USEPA Criteria in the Staff Report.*
- *Include an implementation provision for the objectives that allows the use of human markers to demonstrate compliance with objectives*

4.02

Comment 2: Amendments should include the possibility of using alternative indicators as supported by the most current scientific research.

The Amendments endorse the use of *E. Coli* and Enterococci as indicators for fresh and salt waters, respectively. CASQA supports the use of these indicators as they represent the best indicators of human health risk known to date, however the field is rapidly evolving and the

[4] Southern California Coastal Water Research Project (SCCWRP). 2016. The Surfer Health Study: A Three-year Study Examining Illness Rates Associated with Surfing During Wet Weather. Technical Report 943.

Bacteria Provisions should be written to be adaptable to future scientific advances. In addition, the Staff Report should also be amended to include a discussion of alternative indicators of risk.

For instance, USEPA, Southern California Coastal Water Research Project (SCCWRP), and many other national and international researchers have investigated the use of coliphages, viruses that target *E. coli*, as a possible alternative indicator.[5] Coliphage monitoring holds the potential to offer results in a matter of hours versus days, thus giving more timely results of 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 USEPA 2012 Criteria includes a section discussing alternative indicators or methods to assess risk (Section 6.2.3 p. 51) which could be cited in both the Bacteria Provisions and Staff Report:

"*EPA anticipates that scientific advancements will provide new technologies for enumerating fecal pathogens or [fecal indicator bacteria]. New technologies may provide alternative ways to address methodological considerations, such as rapidity, sensitivity, specificity, and method performance. As new or alternative indicator and/or enumeration method combinations are developed, states may want to consider using them to develop alternative criteria for adoption in WQS.*"

CASQA proposes that the following language be included the Bacteria Provisions:
"*Regional Water Boards may use alternate indicators of risk that are equivalent or better than E. coli and Enterococcus in assessing risk associated with human illness within a waterbody as long as they meet standard USEPA guidance, have been approved by the Regional Water Board, and are supported by the most current scientific understanding."*

In addition, CASQA requests that the Staff Report be amended to provide guidance to the Regional Boards on using alternative indicators. The 2014 USEPA report[6] for developing alternative indicators would serve as a good reference for this updated section.

CASQA Recommendation:

- *Include a statement in the ISWEBE and Ocean Plan Amendments endorsing the use of alternative indicators of risk as supported by the most current science.*
- *Include authorization for thresholds for alternative indicators to be used as objectives if they are established at an equivalent risk level to the E. coli and enterococcus objectives.*
- *Update language in the Staff Report to provide guidance and allow the use of alternative indicators of risk.*

[5] 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.
[6] USEPA. 2014. Site-Specific Alternative Recreational Criteria Technical Support Materials for Alternative Indicators and Methods. Office of Water and Science and Technology Health and Ecological Criteria Division. EPA-820-R-14-011

4.03

Comment 3: The recommended analytical methods should not be limited to measurements of *E. coli* and Enterococci.

The Bacteria Provisions recommend USEPA Methods 1603 and 1600 or other equivalent method to measure culturable *E. coli* and Enterococci, respectively. This language may be interpreted as precluding the use of new methods to measure *E. coli* and Enterococci that are not culture based. Rapid methods to measure the presence of pathogens outside of a lab culture continue to be an active area of research. For example, the USEPA 2012 Criteria provides guidance for the detection of Enterococcus as measured by qPCR through EPA Method 1611. This methodology is expected to increase public health protection due to a shorter turnaround time and stronger relationship to GI illness.[7] It is unclear if the current language in the Bacteria Provisions would preclude the use of such available and future methods that offer advantages in public health protection. CASQA encourages the State Water Board to adopt language similar to Section 115880 of the Health and Safety Code, which states:

> "*if a local health officer demonstrates or has demonstrated through side-by-side testing over a beach season that the use of United States Environmental Protection Agency method 1609 or 1611, or any equivalent or improved rapid detection method published by the United States Environmental Protection Agency for use in beach water quality assessment or approved as an alternative test procedure pursuant to Part 136 of Title 40 of the Code of Federal Regulations, to determine the level of enterococci bacteria as a single indicator provides a reliable indication of overall microbiological contamination conditions at one or more beach locations within that health officer's jurisdiction, the department may authorize the use of that testing method at those beach locations instead of other testing methods. In making that determination, the department shall take into account whether an alternative indicator or subset of indicators, with the associated test method, can provide results more quickly, thereby reducing the period of time the public is at risk while waiting for contamination to be confirmed.*

In addition, if an alternative indicator (e.g., coliphage) is developed and approved, the current Bacteria Provision language could be problematic assuming that the use of those methods is interpreted as a requirement. CASQA recommends that the text in the Bacteria Provisions regarding preferred methods be rewritten to be adaptable to future scientific developments such as improved measurements of *E. coli* and Enterococci as well as alternative indicators.

CASQA Recommendation:

- *Remove the word "culturable" from the sentences describing E. coli and Enterococci methods in the ISWEBE and Ocean Plan Provisions.*
- *Include language in the ISWEBE and Ocean Plan Provisions to allow use of a scientifically defensible method to measure alternative indicators.*
- *Update the Staff Report to reflect the changes in recommended methodologies.*

[7] Wade, T.J., Calderon, R.L., Brenner, K.P., Sams, E., Beach, M., Haugland, R., Wymer, L., Dufour, A.P. 2008. High Sensitivity of Children to Swimming-Associated Gastrointestinal Illness – Results Using a Rapid Assay of Recreational Water Quality. Epidemiology 19(3): 375-383; U.S. EPA 2010a. Report on 2009 National Epidemiologic and Environmental Assessment of Recreational Water Epidemiology Studies (NEEAR 2010 - Surfside & Boquerón). EPA-600-R-10-168; U.S. EPA 2010b. Comparison and Evaluation of Epidemiological Study Designs of Health Effects Associated with Recreational Water Use.

4.04

Comment 4: Reassess all existing waterbodies included on the 303(d) List for REC-1 bacteria exceedances with the new WQOs.

Over 500 waterways were included on the 2010 303(d) list as impaired due to indicator bacteria, pathogens, fecal coliform, total coliform, Enterococci, *E. coli*, or enteric viruses. Currently, it is unclear how these new WQOs will affect legacy waterbody listings. CASQA requests that these listings all be reassessed using the new, scientifically defensible WQOs and any waterbodies that no longer exhibit exceedance be delisted. The reassessment should be conducted as a listing evaluation, and waterbodies that do not meet the listing thresholds should be removed, regardless of whether or not they meet the delisting requirements.

At a minimum, any waterbody undergoing TMDL development should be reassessed for exceedances with the new WQOs. This requirement should be clearly stated in the Bacteria Provisions and discussed in the Staff Report in order to standardize the regional approach and avoid unnecessary TMDLs for waterbodies that are not in exceedance under the new objectives.

CASQA Recommendation:

- *Include language in the Bacteria Provisions requiring legacy 303(d) bacteria listings to be reassessed with the new WQOs under the next 303(d) Listing cycle using the criteria for listing waterbodies.*
- *Include language in the Staff Report requiring that any new bacteria TMDL include an analysis of bacteria exceedances with the new WQOs prior to TMDL development and implementation.*

4.05

Comment 5: Amendments should include the option to develop site-specific objectives using procedures outlined in the 2012 USEPA Recreational Criteria.

The ISWEBE Plan includes language that bacteria WQOs do not supersede any site-specific numeric water quality objective for bacteria established for the REC-1 beneficial use (ISWEBE Provisions III. E.3). However, the Ocean Plan Provisions do not include similar language. Furthermore, neither Provision includes a discussion for developing site-specific objectives (SSOs). Such an approach was encouraged in the 2012 USEPA Criteria (e.g., QMRA), which includes the following language:

"*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*." (USEPA 2012 Criteria, p. 48)

CASQA strongly encourages the State Water Board to include implementation language supporting (or at least acknowledge an option for) the development of SSOs within the Bacteria Provisions. CASQA also requests that the SSO option be streamlined to allow ease of use for municipalities by providing a procedure or detailed guidance to follow in the Staff Report.

CASQA Recommendation:

- *Include an option to develop site-specific objectives via QMRA or an equivalent approach in both the ISWEBE and Ocean Plan Provisions.*
- *Update the Staff Report to provide procedures or detailed examples of how to develop site-specific objectives.*

4.06

Comment 6: Bacteria Provisions should distinguish between wet and dry conditions.

CASQA is concerned that there is no distinction between wet and dry weather conditions in the Bacteria Provisions. There are many areas throughout the state that experience sporadic and limited rainfall. When these infrequent wet weather conditions do occur, they result in high concentrations of pollutants, including bacteria, such that meeting WQOs (which are derived from dry-weather bacteria distributions) is potentially not feasible. Evaluation of wet and dry weather often occurs separately when the objectives are applied and the methods for appropriately applying the objectives should be established as part of the objectives. For example, the Los Angeles Water Board has adopted many bacteria TMDLs[8] that include separate allocations for summer dry, winter dry, and wet weather conditions based on the large changes in bacteria loading under each of these weather and seasonal conditions as well as the variations in recreational use (and therefore exposure risk) under these different weather and seasonal conditions.

Under the California Water Code (CWC Section 13241), the State Water Board and regional boards are required to consider a number of factors when adopting water quality objectives, including in relevant part here: consideration of past, present and probable future beneficial uses of water; and consideration of the water quality condition that could reasonably be achieved through coordinated control of all factors which affect water quality in the area. The Staff Report should include appropriate information separately for wet and dry weather events to ensure that the State Water Board has all of the necessary information to consider the required 13241 factors. Dry and wet weather have different foreseeable methods of compliance that could impact the analysis of the water quality that could be reasonably achieved. The current language of the Bacteria Provisions does not indicate if the differences between wet and dry conditions were evaluated in the Section 13241 analysis. Without such information, the State Water Board will be unable to properly consider compliance with section 13241. In short, such considerations might result in different requirements for wet weather as achieving the proposed objectives during wet weather may not be reasonable to achieve.

Further, implementation provisions for WQOs should clearly define implementation requirements for both wet and dry weather. The implementation procedures should be developed based on the 13241 analysis results, consideration of the underlying science used to develop the objectives, consideration of the short duration of storm events, and the associated potential impacts to beneficial uses, all consistent with the CWC 13241 requirement of the "reasonable protection" of beneficial uses. Establishing water quality objectives should assess the ecological impact of wet weather exceedances and establish associated implementation procedures that

[8] Reconsideration of Certain Technical Matters of the Santa Monica Bay Beaches Bacteria TMDLs; the Marina del Rey Harbor Mothers' Beach and Back Basins Bacteria TMDL; and the Los Angeles Harbor Inner Cabrillo Beach and Main Shop Channel Bacteria TMDL: - Staff Report – Los Angeles Water Board.

account for allowable exceedances and impacts that occur as a result of the exceedance during wet weather as distinct from dry weather.[9] As currently drafted the implementation provisions do not meet the requirements for a Program of Implementation as required by section 13242.

In order to correct this problem, CASQA recommends the Bacteria Provisions be amended to exclude wet weather events from GM calculations and only apply the acute STV endpoint to wet weather events. The epidemiological studies that were the basis for the 2012 USEPA criteria were used to establish relationships with indicator bacteria collected during dry weather. Wet weather events are sporadic, short-term events that do not have lasting impacts on bacteria water quality in receiving waters. As a result, wet weather data are not appropriate to be considered in the longer term conditions represented by the GM and will unnecessarily indicate that an area has a higher long-term bacteria distribution than it actually does. Furthermore, the State Water Board should recognize that the risk levels during wet weather are significantly different than the risk levels during dry weather as a result of lower exposure levels during wet weather (less recreators) than during dry weather. Because the GM and STV both offer the same level of risk protection, using only the STV for wet weather conditions will not result in higher risk to human health and will be more representative of the short term impact from wet weather events.

CASQA Recommendation:

- *Conduct a 13241 analysis specific to wet weather and modify the objectives for wet weather if necessary after the analysis.*
- *Exclude wet weather events from GM calculations and state that only the STV should apply for wet weather events.*

Comment 7: Provide flexibility in the calculation of the geometric mean.

4.07

CASQA supports the use of a six-week geometric mean (GM), which allows flexibility in monitoring programs especially when sampling events are affected by uncontrollable weather or laboratory issues. However, some of the language in the Bacteria Provisions appears to limit the flexibility of monitoring programs. For example, in the ISWEBE Provisions there is language stating: "*…the geometric mean values shall be applied based on a statistically sufficient number of samples, which is generally not less than five samples* ***equally spaced*** *over a six-week period.*" [Emphasis added]

The requirement for equal spacing of the samples places a burden on sampling programs especially if weather or other uncontrollable circumstances result in loss of a sample. Furthermore, the Staff Report states that the Bacteria Provisions are not intended to act as a disincentive for permittees to sample more frequently. Requiring equal spacing of samples would make more frequent sampling following an exceedance difficult.

In addition, the use of the rolling GM may result in the persistent identification of a violation even when the actual violation no longer exists. This same reasoning was cited in the Staff Report to justify performing a static statistical threshold value (STV):

[9] Recognition of wet weather limitations on uses was identified in the 1968 Report of the Committee on Water Quality Criteria, FWPCA and in part notes that "There are, depending on local conditions, waters --- typically below points of discharge and before mixing --- where recreational uses should be discouraged."

"*Using a rolling average to calculate the STV could result in the [sic] reporting violations over a 6-week period where the actual violation no longer exists.*" (p. 72 Staff Report)

There should be consistency between how the GM and STV are calculated and the GM should be allowed to be calculated as either a static or rolling mean.

CASQA Recommendation:

- *Remove the language in the Bacteria Provisions requiring "equally spaced" sampling for the GM and STV.*
- *Allow the GM to be calculated as a static or rolling geomean.*

4.08

Comment 8: Allow the reference reach/antidegradation approach and natural sources exclusion approach to be applied to all waterbodies.

CASQA supports the use of the reference reach/antidegradation approach or natural sources exclusion approach that will provide Regional Water Boards with flexibility to adapt the WQOs to their specific regions. However, the extent of these implementation approaches appears to be limited to only waterbodies with a TMDL as noted in Staff Report:

"The reference system/antidegradation approach and the natural sources exclusion approach are appropriate within the context of a TMDL. The TMDL process includes the robust analysis necessary to characterize bacteria sources and it provides an appropriate venue for determining the appropriateness of applying either approach."

CASQA strongly disagrees with this limitation and recommends that these implementation tools be expanded to ALL waterbodies. There are many instances in which CASQA members have made proactive steps to protect a waterbody in advance of a bacteria TMDL being developed or are implementing actions that address multiple pollutants in response to another TMDL. In particular, one of the reasons for requiring development of watershed management plans in many stormwater permits is to address all 303(d) listed pollutants and preclude the need to develop TMDL(s). It is inappropriate for dischargers to these waterbodies to not have the same tools available to them when they are actively working to remove impairments ahead of TMDL development. Additionally, in Southern California, the available reference reach studies have been used in all regions in relatively consistent ways. Therefore, it would be straightforward to utilize the existing studies in a consistent manner in watersheds that do not have a bacteria TMDL. The requirement for this tool to only be used in the context of a TMDL may force Regional Water Boards and their constituents to develop TMDLs in places that could be more quickly and effectively addressed without a TMDL.

While CASQA agrees that the TMDL represents a robust analysis process to determine the alternative implementation approaches, it is not the only scenario that allows for such an analysis. Regional Water Boards should be allowed to oversee and approve robust reference system/antidegradation and natural sources exclusion approaches as they deem appropriate. Expanding the implementation tools to all waterbodies will allow for more flexible and cost

effective implementation options, faster and more complete protection of human health, and availability of all regulatory tools to address bacteria to all waterbodies.

Furthermore, Regional Water Boards should be given guidance as to how best to perform either the reference reach/antidegradation or natural source exclusion approaches. For example, the Areas of Special Biological Significance (ASBS) defined in the Ocean Plan are protected from waste discharge by maintaining "natural water quality". "Natural water quality" was defined using a robust reference approach approved by a panel of expert scientists.[10] The approach could serve as a useful model for reference reach assessments and should be cited in the Staff Report.

CASQA Recommendation:

- *Update the ISWEBE and Ocean Plan Provision Implementation language to allow the reference reach/antidegradation and natural source exclusion approaches to apply to all waterbodies.*
- *Include guidance for Regional Water Boards implementing reference reach/antidegradation and natural source exclusion approaches in the Staff Report. As part of this guidance consider citing the ASBS natural water quality reference approach as an example.*

4.09

Comment 9: Allow the reference reach/antidegradation approach and natural sources exclusion approach to be applied to both the STV and GM.

As stated in the previous comment, CASQA supports the use of these alternative implementation measures, however the limitation that they only apply to the STV is unnecessary and not based in sound science. During the staff workshop, it was mentioned by Water Board staff that the STV was the only endpoint that was likely to see exceedances in reference reaches. CASQA disagrees with this perspective and notes that there are a number of areas that experience high natural sources of indicator bacteria such that GM calculations are also elevated. For instance, in the Los Angeles Region Bacteria TMDLs, the winter dry weather exceedance GM rate for the reference reach was 10%.[11] The justification in the Staff Report for the application of alternate implementation measures for the STV only includes the following:

"By allowing an exceedance of the STV, but not the geometric mean, the data distribution of the water quality associated with the geometric mean is not changed and thus the level of protection is not changed. The STV is a percentile of the expected water quality sampling distribution of the GM objective value that is set at a 90 percentile, so that 90 percent of the distributed data is below the STV and 10 percent is above the STV. In the reference system/antidegradation and natural source exclusion approaches, the STV can change to a different percentile of the distributed data, but the geometric mean remains, ensuring the same level of protection of water quality."

[10] SCCWRP, 2011. Southern California Bight 2008 Regional Monitoring Program: Vol. II. Areas of Special Biological Significance. February 2011. www.sccwrp.org/pub/download/DOCUMENTS/TechnicalReports/641_B08ASBS.pdf

[11] Reconsideration of Certain Technical Matters of the Santa Monica Bay Beaches Bacteria TMDLs; the Marina del Rey Harbor Mothers' Beach and Back Basins Bacteria TMDL; and the Los Angeles Harbor Inner Cabrillo Beach and Main Shop Channel Bacteria TMDL: - Staff Report – Los Angeles Water Board.

CASQA finds this language inadequate. The data distribution will remain unchanged regardless of whether the STV and/or the GM are exceeded. As mentioned in previous comments the basis for the Bacteria Provisions is to provide a protective level of risk for human health. Reference reach/antidegradation and natural source exclusion approaches are intended to provide Regional Water Boards flexibility in meeting the protective level of risk. If an area experiences high levels of natural indicator bacteria, which in many cases have been shown to cause lower rates of illness rates than anthropogenic sources of indicator bacteria[12], then an exceedance of the GM and/or STV may still be protective of the USEPA derived risk-based illness rate and the water quality objectives may not be able to be attained due to uncontrollable sources. Such determinations must be made only after analysis of the reference reach or natural source exclusion study data. Thus, Regional Water Boards should be given the discretion to determine if the reference reach/antidegradation approach and natural source exclusion can apply to both the GM and STV. The above approach is consistent with CWC 13421 regarding the "reasonable protection" of beneficial uses. As mentioned under Comment #6, CWC 13241 requires State Water Board and Regional Water Boards to consider a number of factors when adopting water quality objectives, including "water quality conditions that could reasonably be achieved through the coordinated control of all factors which affect water quality in the area." Conducting the required 13241 analysis could help define/identify reasonably controllable factors as well as those that are not controllable.

CASQA encourages the State Water Board to provide guidance in the Staff Report about how to execute reference reach/antidegradation and natural source exclusion approaches and not limit their applicability to only the STV.

CASQA Recommendation:

- *Update the ISWEBE and Ocean Plan Provision Implementation language to allow the reference reach/antidegradation and natural source exclusion approaches to be applied to both the GM and the STV.*
- *Provide guidance in the Staff Report about approaches to implement the reference reach/antidegradation and natural source exclusion approaches at the regional level.*

Comment 10: Support Inclusion of Water Quality Standards Variance Language

4.10

In general, CASQA supports the reference to variance provisions established in federal regulations. It is important for regional boards to recognize that variances are an appropriate and legal mechanism for addressing compliance with water quality standards. In addition to regional variances, CASQA also supports the statewide application of variances and encourages the State Water Board to promote their use and application. For instance, the State Water Board should consider developing a statewide variance for wet weather. As mentioned in a previous comment, recreation and therefore exposure risk varies significantly between wet and dry weather conditions. The State could standardize the approach to wet weather by developing a statewide variance for certain weather conditions when recreators are unlikely to be exposed.

[12] USEPA 2012 Criteria Sources: Roser et al., 2006; Schoen and Ashbolt, 2010; Soller et al., 2010b; Till and McBride, 2004; WERF, 2011.

CASQA Recommendation:

- *Promote the application of regional **and** statewide WQO variance provisions.*
- *Consider developing a statewide variance for wet weather conditions.*

4.11

Comment 11: Perform a 13241 analysis to justify the selection of risk level.

The USEPA 2012 Criteria was based on an extensive review of available scientific literature and public review to arrive at two NGI[13] risk levels that would be protective of contact recreation. As stated in the Criteria document: "*EPA recommends that states make a risk management decision regarding illness rate which will determine which set (based on illness rate selected) of criteria values are most appropriate for their waters. The designated use of primary contact recreation **would be protected if either set of criteria** … **is adopted** into state WQS and approved by EPA."* [Emphasis added]

The State Water Board endorsed the NGI risk level of 32 illnesses per 1,000 water contact recreators in the proposed Bacteria Provisions stating that "*while both recommended illness rates are considered protective of public health, the 32 NGI per 1,000 would require a more stringent threshold for Fecal Indicator Bacteria,"* (Staff Report, p. 69).

In choosing between the two risk levels, the State Water Board is required to include economic considerations of water quality conditions that could reasonably be attained through coordinated control of all factors affecting water quality under CWC Section 13241. In this analysis, the State Water Board should distinguish between the selection of either the 32 or 36 illnesses per 1,000 water contact recreators. Such an analysis does not appear to have been completed. Chapter 10 of the Staff Report includes economic considerations for the chosen risk level but not a comparison between the two.

From a risk standpoint, the two numbers are close enough as to not be discernable when assessing different illness rates, which in part supports EPA's conclusion that both risk levels are protective of human health. However, from the compliance standpoint, the two risk levels will result in different numbers of exceedances of the GM and STV triggering additional costs to the regulated community if the lower risk level is carried forward. Since both risk levels are protective of public health, as stated by USEPA, an economic analysis should be performed to ensure that the costs of complying with the chosen risk level are justified through protection of the beneficial use. Endorsing the lower risk level simply because it is more conservative without consideration of impacts to the regulated community is not defensible without a supporting analysis.

In addition, applying an overly conservative risk level can, in and of itself, lead to a significant impact on REC-1 beneficial uses. The State and Regional Water Boards should consider in their analysis the impacts of selecting the lower risk level especially if they may lead to more beach closings (thus removing the beneficial use) while not providing any additional protection to human health.

[13] NGI = National Epidemiological and Environmental Assessment of Recreational Water gastrointestinal illness rate

CASQA Recommendation:

- *Conduct a 13241 analysis specific to the two NGI risk levels proposed in the USEPA 2012 Criteria and detail the findings in the Staff Report.*

4.12

Comment 12: Provide a discussion of mixing zones in the ISWEBE and Ocean Plan Provisions.

CASQA encourages the State Water Board to consider the allowance of mixing zones for stormwater discharges for bacteria. The Ocean Plan currently contains implementation provisions for permitted stormwater discharges that include the following definition:

> *"RECEIVING WATER, for permitted storm water discharges and nonpoint sources, should be measured at the point of discharge(s), in the surf zone immediately where runoff from an outfall meets the ocean water (a.k.a., at point zero)."*

CASQA requests that the State Water Board consider modifications of this definition or inclusion of a mixing zone provision for permitted storm water discharges. Permittees should be allowed to conduct studies to determine applicable mixing zones for bacteria and not be precluded from establishing them by the implementation provisions of the ISWEBE and Ocean Plan. As stated in the Staff Report, the Ocean Plan already has a statewide policy regarding mixing zones for toxic pollutants that are implemented through wastewater NPDES Permits, but has not established something similar for stormwater. It is logical to extend a similar policy to the Bacteria Provisions in order to establish a statewide standard for developing mixing zones for stormwater discharges.

Such mixing zones should consist of a designated exclusion zone adjacent to the storm drain and approved by the County Health Department and by the Regional Water Board. The beach or shoreline access to the exclusion zone should be closed during periods of discharge from the storm drains. The exclusion zone should also be posted with warnings and maps alerting the public to the potential health hazards when the storm drains are flowing.

Compliance monitoring sites should be located at the edge of the mixing zone and at other locations outside the mixing zone as appropriate.

Dilution credits used to establish water quality-based effluent limits, when necessary, should be based on the minimum initial dilution occurring at the edge of the mixing zone. The dilution factor shall be determined based on a dilution study or application of an appropriate dilution model developed or approved by USEPA (i.e., one of the EPA Visual Plumes models, 4th or later editions).

In addition, CASQA recommends that mixing zone provisions promulgated as part of the Bacteria Provisions supersede basin plan mixing zone provisions to the extent that they apply to implementation of water quality standards for pathogens and pathogen indicators of risk to human health. In addition, the mixing zone provisions should establish the methodology for the use of mixing zones in Regions that have not established mixing zone provisions in their basin plans.

CASQA Recommendation:

- *Add a provision for establishing mixing zones for permitted stormwater discharges in the ISWEBE and Ocean Plan Provisions and Staff Report.*
- *Include language in both the ISWEBE and Ocean Plan Provisions that these mixing zone provisions will supersede all region basin plan mixing zone provisions for pathogens and pathogen indicators of risk.*

4.13 Comment 13: Provide direction to Regional Water Boards regarding the implementation of the Bacteria Provisions

While the Bacteria Provisions include a number of useful implementation tools, they all can only be used for a waterbody after approval by a Regional Water Board. In the spirit of streamlining the application of Bacteria Provisions, CASQA requests that the State Water Board direct the Regional Water Boards to actively and expediently take for consideration any modifications to the objectives, TMDLs, or permit requirements that result from studies initiated by stakeholders in accordance with the Bacteria Provisions. While Regional Water Boards may establish requirements for the scientific validity of the study and will need to review and evaluate the results, it is important for actions associated with valid studies to be taken for Regional Water Board and State Water Board consideration in an efficient manner and not be delayed due to concerns about modifying objectives or beneficial uses.

CASQA Recommendation:

- *Add a finding to the adopting resolution requiring Regional Water Boards to actively and expediently take action on studies conducted to apply an implementation option of the Bacteria Provisions.*

II. Comments relevant to the ISWEBE Provisions

4.14 Comment 14: Remove the requirement for the Use Attainability Analysis in the implementation of high flow and seasonal suspensions of REC-1 objectives.

CASQA appreciates and supports the inclusion of high flow and seasonal suspension of REC-1 beneficial use as an implementation option in the Bacteria Provisions. However, the Bacteria Provisions do not provide sufficient guidance to the Regional Boards on the implementation of these suspensions apart from requiring a use attainability analysis (UAA). CASQA believes that requiring a UAA would create a large burden leading to infrequent use of this implementation option. The Staff Report incorrectly states that the Los Angeles Regional Board is the only Regional Water Board that has adopted a high flow suspension to their Basin Plan. The Santa Ana Region Basin Plan also incorporated a high flow suspension as an implementation action that was developed with extensive stakeholder input and approved by both the USEPA and State Water Board.[14] Importantly, the Santa Ana Regional Board implementation action does not require a UAA. Thus, it appears that UAAs are not legally required for a suspension to be implemented if the suspension is incorporated as an implementation provision of the objectives.

[14] State Water Resources Control Board Resolution No. 2014-0005.

CASQA requests that the State Water Board remove the requirement for a UAA and allow Regional Water Boards the option to adopt high flow and seasonal suspensions in the same manner as the Santa Ana Regional Board via an implementation action. CASQA also requests that the Staff Report be updated to include mention of the high flow suspension implementation option in the Santa Ana Region Basin Plan.

Additionally, CASQA requests that the State Water Board establish the high flow and seasonal suspensions as implementation provisions of the objectives, consistent with the Santa Ana Regional Board approach, with thresholds (e.g., velocity or depth) that would meet the criteria for the suspension. Then, Regional Water Boards could develop information on when and where the suspensions apply in waterbodies within their region that is specific to the local hydrologic and climate conditions. Resources such as *Methods for Assessing Instream Flows for Recreation*[15] and others have provided information on thresholds for velocity and depth for various beneficial uses that can be used to develop thresholds for the suspensions that could apply statewide. This approach would facilitate the consistent use of the suspensions statewide in a manner that is more feasible than conducting UAAs. However, if a UAA is required for suspensions, CASQA encourages the State Water Board to develop a statewide Categorical UAA for recreation. A similar approach was recently completed in Wyoming that distinguished between primary and secondary contact recreation (i.e., full immersion recreation or non-full immersion recreation) based on season and flow.[16] Conducting a UAA is an expensive lengthy process that, under the proposed Bacteria Provisions, would need to be implemented numerous times throughout California to address similar waterbodies. A statewide, Categorical UAA approach would alleviate the burden from the regulatory community while providing uniformity across the state.

CASQA Recommendation:

- *Remove the requirement for a UAA for high flow and seasonal suspensions.*
- *Update the Staff Report to include the high flow suspension implementation option from the Santa Ana Region Basin Plan.*
- *Establish the suspensions as implementation provisions of the objectives with thresholds for application of the suspensions.*
- *If the requirement to conduct a UAA is maintained for suspensions, conduct a statewide, Categorical UAA for recreation.*

4.15

Comment 15: Suspend REC-2 objectives when high flow or seasonal suspensions apply and consider modifying REC-2 objectives.

The Amendments state that REC-2 water quality objectives shall remain in effect during high flow suspension. However, 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 is recognized in the Santa Ana Region Basin Plan, which temporarily suspends REC-1 and REC-2 objectives when high flows prevent safe recreation. CASQA

[15] Cooperative Instream Flow Services Group, Instream Flow Information Paper No. 6, June 1978.
[16] WDEQ/WQD. 2016. Categorical Use Attainability Analysis for Recreation. September 2016. Wyoming Department of Environmental Quality, Water Quality Division, Cheyenne, Wyoming.

recommends that REC-2 water quality objectives also be suspended during events where REC-1 objectives are suspended.

CASQA also requests that the State Water Board consider modifying the REC-2 objectives, consistent with the approach taken by the Santa Ana Regional Water Board. As noted in the Santa Ana Basin Plan:

> *"REC2 activities involve proximity to water but not normally body contact such that the ingestion of water is reasonably possible. Water contact is incidental or accidental, relatively brief and limited primarily to body extremities. There is no scientific basis to establish pathogen indicator objectives intended to protect human health as the result of such contact."*

CASQA agrees with this statement and requests that the State Water Board consider modifying the REC-2 objectives as part of this action to make both sets of recreational objectives consistent with the latest science and information.

CASQA Recommendation:

- *Suspend REC-2 objectives when high flow or seasonal suspensions apply.*
- *Remove existing REC-2 objectives and replace with anti-degradation objectives, consistent with the Santa Ana Region approach*

4.16 Comment 16: The salinity threshold should be written to clearly demonstrate that a waterbody will not be subject to changing *E. coli* and Enterococci WQOs.

CASQA supports the application of separate indicators for fresh and saline waters and particularly supports the decision by the State Water Board to only apply the Enterococci indicator to saltwater, as it is known to result in erroneous exceedances when applied to freshwater due to natural sources. However, CASQA is concerned that the distinction between saline and freshwater does not cover all waterbodies and may inadvertently expose estuaries and river mouths to varying WQO indicators due to seasonal and tidal changes to salinity. The ISWEBE Provision includes the following language in Table 1 to distinguish between the salinity of the waterbodies:

Freshwater (*E. coli*): "*All waters, except Lake Tahoe, where the salinity is less than 10 ppth 95 percent or more of the time*"
Saltwater (Enterococcus): "*All waters, where the salinity is equal to or greater than 10 ppth 95 percent or more of the time*"

However, no guidance is provided for waterbodies that may fall between the two cutoffs, for instance an estuary that is seasonally separated from the ocean such that it is saline (>10 ppth salt) only 70 percent of the time in a calendar year.

CASQA recommends that the State Water Board correct the wording of the salinity threshold to be discrete and cover all waterbodies (including those that might fall between the two salinity cutoffs) or provide recommendations of how to monitor waterbodies that do not fall into either

freshwater/salinity classification. CASQA recommends making the following change to the freshwater language:

Freshwater (*E. coli*): "*All waters, except Lake Tahoe, where the salinity* ***is not equal to or greater*** *than 10 ppth 95 percent or more of the time*"

CASQA requests that in no situation should a waterbody need to be monitored with varying WQO indicators based on the ambient salt concentrations. Such a requirement would result in unnecessarily complicated monitoring efforts.

CASQA Recommendation:

- *Update the language in the ISWEBE regarding salinity such that the threshold represents discrete classifications for E. coli and Enterococci.*
- *If a text change is not completed, provide guidance on how to handle waterbodies that do not distinctly fall into either the freshwater or saline category.*

III. Comments relevant to the Ocean Plan Provisions

4.17

Comment 17: Clarify the distinction between the Ocean Plan Bacteria Provisions and AB411 standards and do not allow outdated indicators to apply to permitting actions.

Alignment of the AB411 and Bacteria Provisions should be a priority; however, the Staff Report states that changes to AB411 standards are outside of the scope of these Bacteria Provisions. CASQA encourages the State Water Board to work with the California Department of Public Health (CDPH) to align the two sets of standards to utilize the most current indicators protective of human health. In addition, the Provisions do not provide a clear distinction between the new objectives and the AB411 objectives and how and when they should apply. The Provision language appears to state that all of the objectives (new bacteria and AB411 objectives) would be used for permitting, and that only the new WQOs would be used for 303(d) listing decisions; however, the distinction is unclear. For instance, in section III.D.1.a of the Ocean Plan Provisions, the text states:

"***Any of the bacteria water quality objectives*** *shall be implemented, where applicable, through National Pollutant Discharge Elimination System (NPDES) permits…*" [Emphasis added]

The State Water Board should clarify that the bolded text refers only to the new State Water Board Water-Contact Objectives (II.B.1.a) and that the AB411 objectives should only be used for the purposes of posting beaches, not for 303(d) listing, permitting or TMDL development. The Provisions need to be clear as to the purpose of each of the objectives as they use different indicators and were established using different methodologies for different purposes.

The Bacteria Provisions are based on the most protective indicators, according to the USEPA 2012 Criteria: "*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.*"

Requiring additional measurements of lesser fecal indicator bacteria indicators should not be equated to taking a more protective approach to human health. The AB411 standards include the measurement of total and fecal coliforms, which are not the most protective indicators for human health and therefore should not be applied to 303(d) listings, permitting, or TMDL development.

In addition to the GM and STV values, the USEPA 2012 Criteria also included Beach Action Values (BAVs) that can be used for beach alerts and represent the 75th percentile value of a water quality distribution. The State Water Board should include text in the Staff Report noting that the BAVs are available for counties and municipalities to use in beach postings, especially for beaches which fall below the threshold for AB411 monitoring (i.e., 50,000 annual visitors).

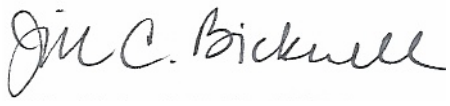
CASQA Recommendation:

- *Work with the CDPH to align the AB411 objectives with the Bacteria Provision objectives.*
- *Update the language in Ocean Plan Provision so that the WQOs that apply to the NDPES permits are clearly listed as the new State Water Board Water-Contact Objectives by inserting "(II.B.1.a)" after the word "objectives" in section III.D.1.a.*
- *Clarify that the CDPH AB411 objectives should only be utilized for beach posting purposes.*
- *Do not allow the use of outdated AB411 indicators (total coliform and fecal coliform) to be used for permitting actions.*
- *Add language in the Staff Report highlighting the availability of EPA-developed BAV values for use in beach postings.*

closing text

We recognize the large amount of work that went into developing the Bacteria Provisions, and we appreciate the opportunity to participate in the stakeholder working groups. CASQA supports the efforts already made by the State Water Board and we look forward to working with State Water Board staff to finalize the Provisions. The intent of our comments is to further improve the Provisions so that they can be best utilized by the Regional Water Boards to protect human health. If you have any questions, please contact CASQA Executive Director Geoff Brosseau at (650) 365-8620.

Sincerely,



Jill Bicknell, Chair
California Stormwater Quality Association

cc: Nick Martorano, State Water Board
Stephanie Rose, State Water Board
Michael Gjerde, State Water Board
CASQA Board of Directors
CASQA Executive Program Committee