



County of San Diego



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December 21, 2018

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

Dear Ms. Townsend:

Subject: Comment Letter – Draft Toxicity Provisions

Thank you for the opportunity to comment on the State Water Resources Control Board's (State Board) Proposed Establishment of the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California: and Toxicity Provisions (Toxicity Provisions)

On behalf of San Diego County's 21 National Pollutant Discharge Elimination System (NPDES) Permit Municipal Separate Storm Sewer Systems (MS4) Copermittees that include the cities of Carlsbad, Chula Vista, Coronado, Del Mar, El Cajon, Encinitas, Escondido, Imperial beach, La Mesa, Lemon Grove, National City, Oceanside, Poway, San Diego, San Marcos, Santee, Solana Beach and Vista, San Diego County Regional Airport Authority, and San Diego Unified Port District, the County of San Diego (County) is providing the following comments regarding the Toxicity Provisions.

The Copermittees appreciate the substantial number of changes State Board staff have made in the Toxicity Provisions since the previous 2012 draft of the Toxicity Policy. In particular, the Copermittees support the changes that were made to clarify the application of the Toxicity Provisions to stormwater permittees in *Section III.B.4. Interaction of Toxicity Provisions with Narrative and Numeric Toxicity Water Quality Objectives*. The language in this section clarifying the use of the new objectives in permitting stormwater dischargers, as distinct from Non-Stormwater NPDES Dischargers, provides clarity and removes concerns about how the Toxicity Provisions will be applied to stormwater permits. For the reasons outlined in Comment #1 (below), the Copermittees support maintaining the language that clarifies that numeric effluent limitations for toxicity will not be included in permits for

Stormwater NPDES Dischargers. As noted in the Draft Staff Report “There are significant difficulties associated with numeric effluent limitations calculations and compliance monitoring. While a compliance schedule would aid implementation efforts, the highly variable nature of stormwater, coupled with the multitude of point sources within a municipality, continues to caution against a blanket policy of imposing numeric effluent limitations.”¹ Additionally, the language in this section is sufficient for clarifying the application of the Toxicity Provisions to the various types of dischargers and additional implementation provisions for Stormwater NPDES Dischargers are not necessary. Finally, the Copermittees support the modifications to the monitoring requirements for Stormwater NPDES Dischargers.

Although the Copermittees appreciate the substantial number of changes State Board staff have made in response to previous stakeholder comments, the Copermittees are concerned about the implications of some aspects of the Toxicity Provisions, specifically the incorporation of numeric objectives, for Clean Water Act 303(d) listings and receiving water limitation compliance for MS4 permittees.

To address the concerns, the Copermittees have two requested modifications to the Toxicity Provisions:

1. Include narrative toxicity objectives with numeric implementation guidance rather than a numeric toxicity objective to address concerns with the application of numeric objectives to stormwater discharges.
2. Include toxicity specific 303(d) listing procedures to address concerns with the application of the TST test method and the potential for false positives.

More details on the concerns and the requested modifications are provided below.

Comment #1. Replace the Numeric Toxicity Objectives with Narrative Objectives and Numeric Implementation Guidance

Toxicity testing is a useful tool for evaluating and assessing the potential adverse effects of pollution. However, toxicity testing becomes problematic when applied as a numeric objective, particularly during wet weather events. Toxicity is not a pollutant, but rather an indicator of pollution being present. Addressing persistent toxicity requires the identification of a toxicant (i.e., pollutant) so that mechanisms to reduce the discharge of the toxicant can be identified. With a numeric objective, MS4 dischargers that exhibit an exceedance of that objective would be in violation of receiving water limitations in their permit prior to being able to identify and address the toxicant²

Application of the proposed numeric objectives for toxicity are particularly problematic for stormwater dischargers because they were developed without consideration of the

¹ Draft Staff Report page 111.

² The Draft Staff Report acknowledges that there are “significant difficulties associated with numeric effluent limitations calculations and compliance monitoring” for stormwater, however a numeric objective would essentially result in numeric receiving water limitations for stormwater permittees.

appropriate application of the objectives during wet weather events. The numeric objectives proposed in the Toxicity Provisions were developed based on methods and science for continuous dischargers and were not evaluated for applicability to wet weather flows or varying conditions in receiving waters. Additionally, many of the proposed toxicity tests are not representative of the length of exposure typically experienced by organisms during a storm event, yet the objectives apply to the receiving waters equally in dry and wet weather. As per the USEPA's *Short-term methods for estimating the chronic toxicity of effluents and receiving waters to freshwater organisms* (1994) and *Short-term methods for estimating the chronic toxicity of effluents and receiving waters to west coast marine and estuarine organisms* (1995), chronic tests require an exposure of test organisms to water samples for a period of up to seven days (e.g. *Ceriodaphnia dubia* chronic survival and reproduction test), typically with daily renewals. Conversely, storm events have a typical duration of less than 12 hours in Southern California and the episodic pulse of stormwater flow is not comparable or representative of the exposure duration specified for chronic testing.

Further, the statistical hypothesis test used in the proposed objectives is being applied incorrectly. Because the TST approach reverses the null and alternative hypotheses, rejection of the null hypothesis means that the sample is not toxic. Conversely, if the null hypothesis is not rejected, the Draft Toxicity Provisions state that the null hypothesis should be accepted (meaning that the sample is considered toxic, or "equivalent to the exceedance of the acute/chronic toxicity water quality objective"). This is an incorrect application of the test for hypothesis. Failure to reject the null hypothesis does not mean that the hypothesis is true, and therefore should not result in the failure of the sample without additional testing or analysis.

Finally, we are concerned that the lack of internal safeguards in the two-concentration approach is contrary to the EPA's promulgated methods in 40 C.F.R. Part 136. The methods promulgated in 2002 were the subject of a legal challenge on multiple grounds, one of which is the tendency of whole effluent toxicity testing to result in an unacceptable number of false indications of toxicity and nontoxicity. (*Edison Elec. Inst. v. EPA* (D.C. Cir. 2004) 391 F.3d 1267, 1271.) The court in *Edison* recognized that "WET tests are not without their flaws[.]" (*id.* at 1274), particularly because the methods do not rely on comparisons with an independent, objective, true value, which means that "their scientific validity must be assessed through other means." (*Id.* at 1270.) Despite the recognized flaws in WET tests, the court upheld the promulgated tests, because the multiple-concentration test design, developed over "years of scientific studies, negotiation, and public notice-and-comment" provided safeguards to protect against an unacceptably high number of false results. The Court described the safeguards as follows:

A single WET test involves exposing multiple batches of organisms to the effluent at various concentrations, as well as to a "control" sample of pure water, and then aggregating the effects on each batch. Statistical analysis then is used to ensure that any observed differences between the organisms exposed to a given effluent concentration and those exposed to the control blanks most likely are not attributable to randomness - - that they are statistically significant. See Final Rule, 67 Fed. Reg. at 69,957-58. This safeguard addresses

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the petitioners' concerns [regarding false positives]. EPA, in short, has offered a reasoned and thorough explanation of its decision on this subject.

(*Id.* at 1272-1273.) Until the TST analytical approach has been formally promulgated, it should not be required in NPDES permits or be used to determine compliance. (40 C.F.R. § 122.44(i)(1)(iv).)

To address these concerns, the Copermittees request that the Toxicity Provisions for all inland surface waters, enclosed bays, and estuaries of the state establish a consistent narrative objective. Numeric guidance would be provided to guide interpretation of the narrative objective for the purpose of 303(d) listing decisions. The numeric implementation guidance should be designed to identify and trigger actions only for persistent toxicity and help control the inherent issues with toxicity test procedures, such as false positives and false negatives by only requiring actions after multiple exceedances of the numeric values. A narrative objective with numeric implementation guidance would be fully protective of beneficial uses and allow the Water Boards flexibility in regulating different categories of permittees.

The Copermittees also request that the Toxicity Provisions clarify that chronic toxicity tests and water quality objectives should not apply during wet weather events. If the Toxicity Provisions were to apply during wet weather, the Copermittees recommend conducting toxicity tests with short-exposure duration (e.g., 24 to 48-hours), which would be more representative of site conditions and limit the difficulties of chronic toxicity test logistics (i.e., renewals).

Specific recommended changes to the Toxicity Provisions are included in the Attachment.

Comment #2. Include Specific 303(d) Listing Guidance for Toxicity

Laboratory intercalibration tests have shown that certain toxicity test endpoints (particularly non proportional ones) are inherently subject to higher variability and there is a risk of false positives when applying the TST tool. The TST may result in a "fail" when the variability of the replicates is high, but no toxicity is present. While the need for additional replicates is suggested in the Whole Effluent Toxicity Test Drive Analysis of the TST (EPA 2011), there has been no formal guidance or updates to test methods which were originally designed to suit the current statistical model of chronic and acute toxicity units (TU). In the following example (Figure 1), the mean reproduction for each test is identical in both the control and the IWC, but the TST result is different due to the lower variability with the higher number of replicates:

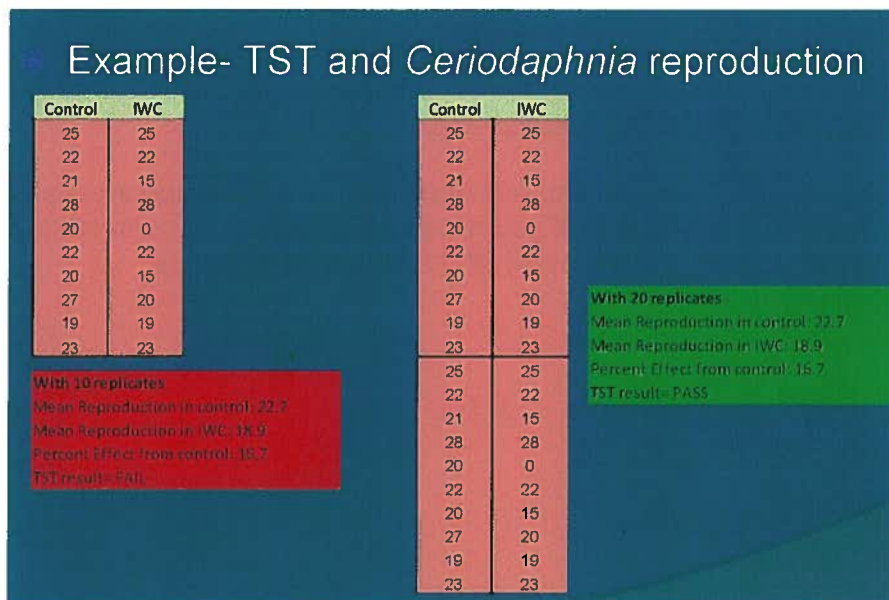


Figure 1. Example of TST Implementation with Differing Replicate Numbers (Nautilus Environmental)

While increasing the number of replicates may help reduce the variability, the replicate information is not used to determine whether or not the objective has been exceeded. Additionally, the objectives have an acknowledged best-case 5% "false positive" rate. The toxicity test variability, false positives, numeric objectives and existing 303(d) listing criteria will lead to inappropriate impairment listings. Table 3.1 of California's 303(d) listing policy specifies that if two or more of 24 measurements in a waterbody exceed the water quality objective, the waterbody will be listed as impaired. At a false positive of 5%, 34% of California's non-toxic water bodies would be expected to be incorrectly listed as impaired based on an assessment of 24 samples. Ultimately, inappropriate impairment listings would lead to unnecessary focus and use of resources for regulating agencies and the regulated community.

These concerns can be mitigated by modifying the numeric objective to a narrative objective with numeric implementation guidance (as requested in Comment #1). In addition, the Copermittees request that specific 303(d) listing procedures be included in the Toxicity Provisions, similar to what was done for the Sediment Quality Objectives. Including toxicity specific 303(d) listing procedures will help address identified concerns with the toxicity testing methods and statistical analysis procedures to avoid expending resources on transient toxicity and false positives. Specifically, the Copermittees recommend adding a new Chapter IV.B.6 as follows:

IV.B.6 Evaluating Waters for Placement on the Section 303(d) List

The numeric interpretations of the aquatic toxicity water quality objective described in Chapter IV.B.1 shall be used to assess waters for placement on the section 303(d) list for toxicity alone. Water segments shall be placed on the section 303(d) list for exceedance

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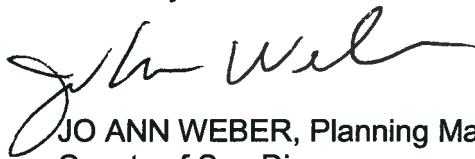
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of the narrative aquatic toxicity objective when persistent toxicity is observed in a waterbody segment. Persistent toxicity is defined as at least three consecutive sampling events failing to reject the NULL HYPOTHESIS for chronic or acute toxicity or at least three sampling events in one year failing to reject the NULL HYPOTHESIS with each sample having a percent effect greater than 50%.

The County of San Diego's Municipal Copermittees appreciate the opportunity to comment on this important document. If you have any questions or comments, please do not hesitate to contact Jo Ann Weber at 858-495-5317 or via e-mail at joann.weber@sdcounty.ca.gov.

Sincerely,



JO ANN WEBER, Planning Manager
County of San Diego

Attachment

Attachment: Specific Proposed Changes to the Draft Toxicity Provisions to Incorporate a Narrative Objective

The Copermittees recommend the following changes be made to the Draft Toxicity Provisions to include a narrative objective with numeric implementation guidance in lieu of the existing numeric objective:

Delete Chapter III.B.2 and replace with the following language:

III.B.2. Aquatic Toxicity Water Quality Objectives

Pollutants in water shall not be present in quantities that, alone or in combination, produce detrimental physiological responses in human, plant, animal, or aquatic life. This narrative objective shall be implemented as described in Chapter IV.B.

Modify Chapter III.B.4 as follows:

III.B.4. Interaction of Toxicity Provisions with Narrative and Numeric Toxicity Water Quality Objectives

Compliance with narrative toxicity water quality objectives is determined by use of indicator species, analysis of species diversity, pollution density, toxicity tests or other appropriate method as specified by the PERMITTING AUTHORITY. The PERMITTING AUTHORITY may also consider all material and relevant information submitted by the discharger and other interested parties and numerical criteria and guidelines for toxic substances developed by the State Water Board, the California Office of Environmental Health Hazard Assessment, the California Department of Health Services, the U.S. Food and Drug Administration, the National Academy of Sciences, the U.S. EPA, and other appropriate organizations, to evaluate compliance with actions necessary to address pollutants potentially causing toxicity in receiving waters. ~~narrative toxicity water quality objectives.~~

The PERMITTING AUTHORITY shall have discretion regarding the application of narrative ~~or numeric~~ toxicity water quality objectives to derive narrative effluent or narrative receiving water limitations.

The PERMITTING AUTHORITY shall not include numeric effluent limitations for aquatic toxicity endpoints addressed by any of the acute and chronic toxicity test methods identified in Table 1 of Section IV.B.1.b to implement either the toxicity narrative or numeric water quality objectives except as indicated in section IV.B.2.e and only for Non-Storm Water NPDES Dischargers.

Add a new Chapter IV.B.1 as follows:

IV.B.1 Implementation of Water Quality Objectives

The PERMITTING AUTHORITY shall use the following numeric interpretations of the aquatic toxicity water quality objective for implementing procedures in Chapters IV.B.3

(Implementation for Non-Storm Water NPDES Dischargers) and IV.B.6 (Evaluating Waters for Placement on the Section 303(d) List)

a. Numeric Interpretation for Chronic Aquatic Toxicity Objective

The chronic aquatic toxicity water quality objective is expressed as a NULL HYPOTHESIS and an ALTERNATIVE HYPOTHESIS with a REGULATORY MANAGEMENT DECISION (RMD) of 0.75, where the following NULL HYPOTHESIS shall be used:

H_0 : Mean RESPONSE (ambient receiving water) $\leq 0.75 \cdot$ mean RESPONSE (control)

In general terms, the NULL HYPOTHESIS is the following statement: the ambient receiving water is toxic because the test organism RESPONSE (e.g., survival, reproduction, growth) in the ambient receiving water sample is less than or equal to 75 percent of the test organism RESPONSE in the control water sample.

And where the following ALTERNATIVE HYPOTHESIS shall be used:

H_a : Mean RESPONSE (ambient receiving water) $> 0.75 \cdot$ mean RESPONSE (control)

In general terms, the ALTERNATIVE HYPOTHESIS is the following statement: the ambient receiving water is not toxic because the test organism RESPONSE (e.g., survival, reproduction, growth) in the ambient receiving water sample is greater than 75 percent of the test organism RESPONSE in the control water sample.

~~Attainment~~ Evaluation of the narrative water quality objective is demonstrated by conducting CHRONIC TOXICITY TESTING as described in Section IV.B.1.b and rejecting this NULL HYPOTHESIS in accordance with the TEST OF SIGNIFICANT TOXICITY (TST) statistical approach described in Section IV.B.1.c. ~~When the NULL HYPOTHESIS is rejected, the ALTERNATIVE HYPOTHESIS is accepted in its place, and there is no exceedance of the chronic toxicity water quality objective. Failing to reject the NULL HYPOTHESIS (referred to as a "fail") is equivalent to an exceedance of the chronic toxicity water quality objective.~~

b. Numeric Interpretation for Acute Aquatic Toxicity Objective

The acute aquatic toxicity water quality objective is expressed as a NULL HYPOTHESIS and ALTERNATIVE HYPOTHESIS with an RMD of 0.80, where the following NULL HYPOTHESIS shall be used:

H_0 : Mean RESPONSE (ambient receiving water) $\leq 0.80 \cdot$ mean RESPONSE (control)

In general terms, the NULL HYPOTHESIS is the following statement: the ambient receiving water is toxic because the test organism RESPONSE (e.g., survival) in the ambient receiving water sample is less than or equal to 80 percent of the test organism RESPONSE in the control water sample.

And where the following ALTERNATIVE HYPOTHESIS shall be used:

H_a : Mean RESPONSE (ambient receiving water) > 0.80 • mean RESPONSE (control)

In general terms, the ALTERNATIVE HYPOTHESIS is the following statement: the ambient receiving water is not toxic because the test organism RESPONSE (e.g., survival) in the ambient receiving water sample is greater than 80 percent of the test organism RESPONSE in the control water sample.

Evaluation of the narrative water quality objective is demonstrated by conducting ACUTE TOXICITY TESTING as described in Section IV.B.1.b and rejecting this NULL HYPOTHESIS in accordance with the TST statistical approach described in Section IV.B.1.c. ~~When the NULL HYPOTHESIS is rejected, the ALTERNATIVE HYPOTHESIS is accepted in its place, and there is no exceedance of the acute toxicity water quality objective. Failing to reject the NULL HYPOTHESIS (referred to as a "fail") is equivalent to an exceedance of the acute toxicity water quality objective.~~

