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# State Water Resources Control Board

## Division of Water Quality

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Arnold Schwarzenegger  
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ME #53  
rec'd  
2/18/04

**TO:** Craig J. Wilson  
Division of Water Quality  
State Water Resources Control Board

**FROM:** Val Connor, Coordinator  
CA Surface Water Ambient Monitoring Program (SWAMP)  
Representing Regional Board SWAMP staff

**DATE:** February 18, 2004

**SUBJECT:** **SWAMP Roundtable Comments on Draft Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List – December 2003**

The SWAMP Roundtable appreciates the opportunity to review the proposed Listing Policy of December 2003 and has the following comments.

## I. Agreement with TMDL Roundtable

The SWAMP Roundtable has reviewed the four issues and recommendations of the TMDL Roundtable in their letter of February 13, 2004 to the SWRCB on the Listing Policy, and supports those issues and recommendations:

- Need for a standard statistical method and a weight of evidence approach.
- Need to correct confusing, redundant or unnecessary language.
- Proposed policy goes beyond assessing attainment of standards.
- Need to decouple the priority of a TMDL from TMDL time schedule.

In addition to concurring with the TMDL Roundtable, we have the following concerns/suggestions that we would like the SWRCB to fully consider and incorporate.

## II. Assessing the Quality of State Waters

**Issue** - The SWAMP program is not funded at a level that would allow investigation of many known or suspected problem sites at the intensity required by the draft Listing Policy to justify a listing. In addition, SWAMP is mandated as an ambient monitoring program, and the Report to the Legislature that laid the foundation for SWAMP specifically directs that RWQCBs shall **not** focus SWAMP resources exclusively on sites with known or suspected problems.

**Recommendation** – The introduction to the Listing Policy should state that the SWAMP program is intended for general assessment of statewide water quality. Listing under the

proposed Listing Policy guidelines will require additional monitoring resources that are not currently available through SWAMP.

**Discussion** - The Clean Water Act section 305(b) requires that all States regularly assess the quality of their waters, and the SWAMP program is the primary mechanism Regions have to conduct this assessment. Given these mandates and our current budget, it will be difficult to impossible for our program to generate the quantity of data required to list for most pollutants, using the protocols described in the proposed listing policy. Most Regions sample conventional pollutants either monthly or quarterly, and sample organic chemicals and metals less frequently (one to four times per year, if at all). Most Regions are applying an annual watershed rotational strategy for monitoring, meaning multiple years of data will not typically be available from a given waterbody to increase sample counts. This means that at the current levels of funding of the SWAMP program, it will be difficult to generate new 303(d) listings from SWAMP data alone, unless study designs are radically changed to specifically support listing requirements. Given 305(b) mandates for regular assessment of waterbodies and the SWAMP mandate to focus on ambient monitoring, any such fundamental redirecting of funds for this purpose would not be appropriate. While we do not suggest any specific changes to the draft listing policy to address these concerns, the SWAMP Roundtable wants to make sure that all interested parties are aware of these constraints. This situation may become even more severe because the stakeholder group that provides input on the discharger fees that fund SWAMP is seeking to reduce the overall amount of the monitoring surcharge.

### III. Alternate Data Evaluation

**Issue** – We believe that the list of required components of this Alternate Data Evaluation are excessive and do not provide sufficient latitude to staff.

**Recommendation** – We recommend that the Alternate Data Evaluation be modified to provide more flexibility to staff to apply a weight of evidence approach, rather than relying on an “equivalent level of [statistical] confidence” as that required by the binomial approach described in Section 3.1.

**Discussion** - The alternate data evaluation described in Section 3.1.11 will in many cases be the only route for SWAMP data to be utilized for 303(d) listing (given the generally high sample count requirements of the proposed listing policy). Weight of evidence may include corroborating data of multiple types or from multiple sources, and may consider magnitude of exceedance or other lines of evidence which support the listing without necessarily considering statistical confidence. The policy currently states that “at a minimum the justification must demonstrate:” all of the six conditions listed. We believe that there are a number of instances when listing may be justified without all of these conditions being met. For example, chemicals known to be toxic may be present in elevated concentrations and yet no guideline values (as

defined by Section 6.2.3) are available for comparison. Section 3.1.11 implies that the "alternate data evaluation" is applicable only to the limited chemical list for which numeric objectives or guidelines are available.

The reference in this section to Section 4.2 is not clear. Why does this section refer to delisting requirements?

#### IV. Data Quality Assessment

**Issue** – There seems to be an inherent assumption that Quality Assurance Project Plans (QAPPs) always lead to collection of data of known quality, but this may not always be the case. Conversely, there are many sources of reliable, well-documented, scientifically defensible data of known quality that do not use a QAPP or something equivalent.

**Recommendation** – Allow for the use of reliable, well-documented, scientifically defensible data of known quality that do not use a QAPP. It is recommended to add the following to the policy: (a) qualify the use of the QAPP to those containing a requirement for proof and/or outcome of completed validation; and (b) confirm that any data of known quality is acceptable.

**Discussion** - Beyond the data contributed by the major monitoring programs described in Section 6.2.4, this section of the policy allows for acceptance of data that were collected with a Quality Assurance Project Plan (QAPP) or 'equivalent' in place. Many approved QAPPs lack specificity about data verification and validation procedures, with few detailed and instrument-specific Standard Operating Procedures (SOPs) written for these procedures. Even the new USEPA Quality System guidance for verification and validation procedures does not add the required specificity. On page 19 (second set of bullets) the policy lists the required contents of a sampling and analysis plan for the collection of any numeric data, but that list does not resolve this issue.

#### V. Standards for Bacteria

**Issue** – The applicable bacteria standards are not specified.

**Recommendation** – Section 3.1.3 needs to specify which standards are applicable and consistently define a site-specific exceedance frequency as a "percent of water quality exceedances in a relatively unimpacted watershed.

**Discussion** - Section 3.1.3 provides detail as to how to determine percent exceedance of bacterial standards but does not specify which standards are applicable. For example, in the case of fecal coliform, would the binomial distribution be applicable to 200 MPN or 400 MPN? It would seem that in this example the standard most applicable would be 400 MPN, as it is applied as a percent exceedance rather than a geomean. Since this is not specified, the guidance is

ambiguous. The site-specific exceedance frequency is defined as the “number of water quality standard exceedances in a relatively unimpacted watershed”. This is also ambiguous as it doesn’t state the overall sample size. Is this number of exceedances out of 50? Out of 100? It should be defined as a “percent of water quality exceedances in a relatively unimpacted watershed”.

## VI. Re-Evaluation of Listed Water Bodies

**Issue** – In many cases, the new listing process methodology differs substantially from the criteria that have been used in the past to identify impaired waters. It is very likely that some of the waters in the state will no longer meet the new criteria for 303(d) listing and thus may be considered for removal from the list.

**Recommendation** – Add the following to Section 4 (California Delisting Factors): “If sample size requirements have been revised and the site or water no longer meets the listing criteria, the water segment may be removed from the Section 303(d) list, if no other factors warrant retention of the listing.

**Discussion** - Section 4 of the new policy addresses California delisting factors. This Section provides methodology for removing waters from the 303(d) list. It indicates that listings of water segments shall be re-evaluated if the listing was based on faulty data. It also indicates that water segments shall be removed from the list if objectives or standards have been revised and the waters now meet water quality standards.

However, the new policy does not explicitly address the situation where the objectives or standards have not changed, but the required number of samples or exceedances has changed. If there is insufficient data to warrant listing under the new guidance policy, previous listings should be reconsidered and the water body should be delisted if no other factors warrant retention of the listing.

Example: A water body was listed in 2002 as impaired based on two bioaccumulation samples that exceeded tissue standards for human health protection. However, the new policy would require a minimum of three samples exceeding the standard to warrant a listing as impaired. Without any supporting evidence, this water body does not meet the new listing criteria and should be considered for removal from the list.

## VII. Use of Bioassessment in Listing & De-listing Decisions

As discussed above, the SWAMP Roundtable concurs with the issues and recommendations submitted by the TMDL Roundtable, which would allow for a Weight of Evidence approach to listing and de-listing, without the need to specify detailed methods for incorporating bioassessment data. However, if the State Water Resources Control Board chooses for any reason not to adopt the TMDL Roundtable's recommendation, then the SWAMP Roundtable requests consideration of the following issues and recommendations regarding bioassessment.

**Issue:** The SWAMP Roundtable is concerned that the draft policy does not appear to articulate how bioassessment data can be most efficiently utilized in listing and de-listing decisions.

**Recommendations:** Amend sections 3.1.9 and 6.1.B of the draft policy to split paragraphs, add underlined text, and delete strikeout text, as indicated below:

Water segments shall be placed on the section 303(d) list if any of the following conditions are met...

### **3.1.9 Degradation of Biological Populations and Communities**

A water segment exhibits significant degradation in biological populations and/or communities as compared to reference site(s) and associated water or sediment concentrations of pollutants are documented as described in section 3.1.6.

Associations may also be made with other stressors, such as temperature, nutrients, dissolved oxygen, trash, etc. For impairments not associated with toxicity (i.e., where section 3.1.6 does not apply), a "weight of evidence" approach may be used to document the associated pollutant(s). This condition requires diminished numbers of species or individuals of a single species or other metrics when compared to reference site(s). ~~The Toxicity analyses analysis~~ should rely on measurements from at least two stations.

For population or community degradation related to sedimentation, the water segment shall be placed on the section 303(d) list if degraded populations or communities are identified and effects are associated with clean sediment loads in water or those stored in the channel.

Bioassessments used for listing decisions shall be consistent with section 6.2.3.4 and section 6.2.5.11. For bioassessments, measurements at one stream reach may be sufficient to warrant listing provided that impairment is associated with a pollutant(s), as detailed above.

Waters shall be placed on the section 303(d) list if evaluation guidelines (satisfying the conditions of section 6.2.3) are exceeded in 10 percent of the samples with a confidence level of 90 percent using a binomial distribution (Table 3.1). For sample populations less than 20, when 5 or more samples exceed the water quality objective, the segment shall be listed.

#### **Section 6.1 Evaluating Existing Listings**

Water segment and pollutants on the section 303(d) list shall be reevaluated if new data and information become available. The steps to complete a reevaluation are:

**A.** All readily available data and information shall be used...

**B.** In performing the reassessment the RWQCBs shall either: (1) use the California Listing Factors (i.e., waters shall be assessed as if they had never been listed before) to assess each water segment-pollutant combination, or (2) where bioassessment would be an appropriate indicator, follow the process specified at section 6.2.3.4.

**Discussion:** Bioassessment can be a powerful and cost-effective tool for assessing the status of aquatic life beneficial uses. The SWAMP program is working to develop and refine indices of biological integrity (IBIs) for rivers and streams in several regions throughout California. Most bioassessment efforts currently underway rely on benthic macroinvertebrate assemblages. A pilot study is also underway in the Lahontan Region to evaluate the utility of using periphyton assemblages (i.e., diatoms and other attached algae) as a cost-effective indicator of pollution.

Use of Bioassessments in Listing Decisions: The draft policy (Section 3.1.9) states that water segments shall be placed on the section 303(d) list if the following conditions are met:

“A water segment exhibits significant degradation in biological populations and/or communities as compared to reference site(s) and associated water or sediment concentrations of pollutants as described in Section 3.1.6. This condition requires diminished numbers of species or individuals of a single species or other metrics when compared to reference site(s). The analysis should rely on measurements from at least two stations.”

Because bioassessments can be used to indicate where or when an impact exists, but do not often reveal the specific cause(s) of the impact, it is reasonable to require that an association with a pollutant be demonstrated prior to listing. However, the above paragraph, as written, raises three key issues:

First, Section 3.1.6 (Water/Sediment Toxicity) provides only a partial list of the possible pollutants that could impair biological integrity. For example, altered levels of temperature, nutrients, dissolved oxygen, trash inputs, or transient chemical pollutants that act alone or in

combination can also impair biological integrity without exhibiting toxicity in standard toxicity tests. The draft policy should be supplemented to allow for listing whenever bioassessment data indicates impairment and a scientifically valid association with a pollutant of any type can be demonstrated.

Second, because bioassessments normally evaluate stream reaches, not discrete “stations,” it is not clear what methods are covered by the sentence: “The analysis should rely on measurements from at least two stations.” (We assume that this was meant to apply to toxicity tests, not bioassessment.) The integrative evaluation of a single representative stream reach—as is routinely performed by the bioassessment methods utilized by the SWAMP program—should be recognized by the policy as sufficient to demonstrate impairment.

Third, the SWAMP roundtable would like to make clear that current funding levels for ambient monitoring are insufficient in many cases to document the cause(s) of impairment detected by bioassessments. It is important for all parties to understand that, given the current level of funding for SWAMP, bioassessments may indicate impairment at sites in California, but in many (or even most) cases the causes of impairment may remain unknown for long periods of time. Follow-up studies, using the USEPA’s Stressor Identification Guidance (2000), or equivalent, would be needed to determine the causes of impairment, but are generally not possible with the current funding levels.

These three key issues would all be adequately addressed by the incorporation of the TMDL Roundtable’s recommended changes, or the SWAMP roundtable’s recommended changes (above).

The draft policy at section 3.1.9 (second paragraph) goes on to specifically address impairments due to clean sediment and a host of other potential stressors:

“For population or community degradation related to sedimentation, the water segment shall be placed on the section 303(d) list if degraded populations or communities are identified and effects are associated with clean sediment loads in water or those stored in the channel. Waters shall be placed on the section 303(d) list if evaluation guidelines (satisfying the conditions of section 6.2.3) are exceeded in 10 percent of the samples with a confidence level of 90 percent using a binomial distribution (Table 3.1). For sample populations less than 20, when 5 or more samples exceed the water quality objective, the segment shall be listed.”

This paragraph is problematic because multiple issues are lumped into the same paragraph, which creates confusion and leaves the listing requirements open to wide interpretation. Specifically, it is unclear whether and how the second and third sentences modify the first sentence. The first sentence makes perfect sense if it is meant to stand alone, and we recommend

that, for clarity, it be separated from the remainder of the paragraph. The last two sentences of this paragraph (i.e., requiring a minimum number of "samples" with a confidence level of 90 percent using a binomial distribution) apply to guidelines for sediment quality, fish/shellfish consumption, or bioaccumulation. They are not applicable to bioassessments (which rely on integrative composited samples and multimetric or multivariate-derived indices). To avoid confusion, the policy should clearly acknowledge that bioassessments do not (and cannot) properly rely on the same statistical tests as guidelines for sediment quality, fish/shellfish consumption, or bioaccumulation. This can be accomplished by adopting the suggestions of the TMDL roundtable, or by splitting the second paragraph of section 3.1.9 and adding other language as recommended above.

The SWAMP roundtable acknowledges that Section 3.1.11 (Alternate Data Evaluation) may provide for 303(d) listings based on bioassessment data if "corroborating evidence from independent lines of evidence show narrative standards are not attained." However, given the wide acceptance and discriminatory power of modern bioassessments, the draft policy should be supplemented to articulate when bioassessments may be used without the need for "independent lines of evidence." This concern can also be resolved by adopting the suggestions of the TMDL roundtable, or by adding language to section 3.1.9 as recommended above.

Use of Bioassessments in De-Listing Decisions: The SWAMP roundtable is equally concerned about the use of bioassessments in de-listing decisions. The roundtable notes that a significant number of water bodies in California have been listed as impaired based on little (or no) actual data to document violation of objectives or impacts to beneficial uses. In many such cases, bioassessment could be a cost-effective tool to demonstrate attainment of aquatic life uses, thereby justifying de-listing and saving substantial resources for addressing real problems. For example, where water bodies have been listed for sediment based on anecdotal evidence, bioassessment could document non-attainment of aquatic life uses (thereby confirming impairment). Alternatively, bioassessment could document the attainment of aquatic life beneficial uses, thereby justifying de-listing. But the draft de-listing criteria could be interpreted to impede or even preclude reliance on bioassessment for such de-listing decisions.

For de-listing to occur under Section 4.9 (Degradation of Biological Populations and Communities), the draft policy specifies a minimum sample size of 22, and statistical tests not appropriate for bioassessment data. These provisions would make it infeasible to de-list under this Section using bioassessments, because 22 bioassessment "samples" would be prohibitively expensive, and bioassessment data cannot be meaningfully analyzed using the binomial distribution method.

For de-listing to occur under Section 4.10 (Alternate Data Evaluation), there must exist "corroborating evidence from independent lines of evidence," and an alternative approach as defined by Section 3.1.11 must have been used originally to place the water segment on the list.



These provisions could make it infeasible to de-list under this section using bioassessments, because: (1) even though bioassessment may document healthy instream communities, independent lines of evidence may be unavailable or cost-prohibitive; and (2) few (if any) of the currently-listed waters that may be cost-effectively shown to be "healthy" using bioassessments were listed following the criteria at Section 3.1.11.

Section 6 specifies a process for evaluating existing listings, and it appears that Subsection 6.2.3.4 (Evaluation Guidelines for "Other" Parameters) might be useful for de-listing water bodies shown by bioassessments to be in healthy condition. However, relying on Subsection 6.2.3.4 to de-list based on bioassessment data appears to be precluded by Section 6.1.B, which requires (for all currently existing listings) that:

"In performing the reassessment the RWQCBs shall use the California Listing Factors (i.e., waters shall be assessed as if they had never been listed before) to assess each water segment-pollutant combination."

The language at Section 6.1.B thus makes it infeasible to remove existing listings based on bioassessment data because: (1) it would require substantial and often cost-prohibitive additional data collection (even in cases where the bioassessment has shown aquatic life uses to be fully supported); and (2) as discussed above, the California Listing Factors (i.e., Section 3) are not well-suited to the use of bioassessment.

The SWAMP roundtable's concerns about the draft de-listing criteria could be resolved by adopting the suggestions of the TMDL roundtable (which allows for a weight-of-evidence approach to de-listing), or by adding language to section 6.1.B, as recommended above.

## References

U.S. Environmental Protection Agency. 2000. Stressor Identification Guidance Document. EPA/822/B-00/025, USEPA Office of Water, Washington, D.C. (Available free by calling 1-800-490-9198.)

END OF COMMENTS

The above are consensus comments of the SWAMP Coordinators at each Regional Board, as listed below. We appreciate your consideration of these comments.

Region 1 – Peter Otis  
Region 2 – Karen Taberski,  
Region 3 – Karen Worcester, Mary Adams  
Region 4 – Michael Lyons, Shirley Birosik

Region 5 – Jeannie Chilcott, Dennis Heiman, Pam Buford, Chad Dibble, Robert Holmes

Region 6 – Thomas Suk

Region 7 – Maria de la Paz – Carpio Obeso

Region 8 – Pavlova Vitale

Region 9 – James Smith