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TO: Dr. Gerald Bowes
Division of Water Quality

FROM: Craig J. Wilson, Chief
TMDL Listing Unit
DIVISION OF WATER QUALITY

DATE: OCT 27 2003

SUBJECT: REQUEST TO INITIATE SCIENTIFIC PEER REVIEW PROCESS FOR ADOPTION OF WATER QUALITY CONTROL POLICY FOR GUIDANCE ON DEVELOPING CALIFORNIA'S CLEAN WATER ACT SECTION 303(d) LIST

The purpose of this memorandum is to request selection of scientific peer reviewers for the adoption of a Water Quality Control Policy for Guidance on Developing California's Clean Water Act section 303(d) list (Policy) (Attachment 1). Every two years, states are required to list surface waters within the state that do not meet water quality standards even after source waste discharge limitations have been implemented. Such water quality limited segments are required to be listed and prioritized for Total Maximum Daily Load (TMDL) development. Section 303(d) requirements apply nationwide. This has prompted many states to adopt their own consistent statewide assessment methodologies.

In response to this federal mandate, the California Water Code was amended to include section 13191.3 requiring SWRCB to prepare guidelines for listing and delisting waters. In the listing and delisting process, the 2001 Budget Act Supplemental Report also required that SWRCB and the RWQCBs develop and use a weight of evidence approach. This weight of evidence approach should establish specific criteria to be followed that will ensure that the data and information used for listing and delisting waters under section 303(d) are accurate and verifiable. SWRCB has used the provisions of many states' methodologies as the basis for the proposed Policy.

In the process of adopting the Policy, SWRCB has developed a draft Functional Equivalent Document (FED) to satisfy requirements of the California Environmental Quality Act. The FED addresses a wide variety of issues spanning many subject areas (Attachment 2), some of which overlap areas of expertise. Some of the issues discussed were developed with the technical input of various experts (Attachment 3). Peer reviewers selected to provide comments on the draft

proposed Policy and FED should not only have a broad understanding of water quality assessment issues, but should also be able to address issues that cover interdisciplinary topics (e.g., chemistry and toxicology) and/or disciplines that affect different media. In each issue discussed, various alternatives are considered, one recommendation is proposed, and the rationale for the proposed recommendation is provided. All recommendations are reflected in the proposed Policy. The draft FED and proposed Policy will be ready for review on November 23, 2003. For peer reviewers, there will be a 30-day review and comment period.

If you have any questions or comments, please do not hesitate to call me at 341-5560.

Attachments (3)

cc: Ken Harris, DWQ

Description of the Proposed Policy

The State Water Resources Control Board is developing a statewide Policy for the consistent identification of waters that do not meet water quality standards. The goal of the Policy is to establish a standardized approach for making these determinations. Total Maximum Daily Loads will be developed for the waters identified under the provisions of the Policy. The Policy outlines the decision rules for different kinds of data; an approach for analyzing data statistically; and requirements for data quality, data quantity, and administration of the listing process. Decision rules are provided for: chemical-specific water quality standards; bacterial water quality standards; health advisories; bioaccumulation of chemicals in aquatic life tissues; nuisance such as trash, odor, and foam; nutrients; water and sediment toxicity; adverse biological response; and degradation of aquatic life populations and communities. An approach for interpreting narrative water quality objectives using numeric data is also proposed.

Federal law (section 303[d] of the Clean Water Act) requires listing of waters that do not meet water quality standards, and State law requires the development of the Policy.
U.S. Environmental Protection Agency (USEPA) has developed many guidance documents to help states complete this process, and many states have developed specific methodologies to guide the section 303(d) listing and delisting process. California's proposed Policy is based, in large part, on the approaches recommended by USEPA and approaches used by other states.

Summary of Technical and Scientific Issues taken into Consideration

Peer reviewers are needed in following disciplines: Chemistry, Toxicology, Life Sciences, Hydrology, Statistics, and Human Health.

The overall goal of the Policy is to provide guidelines to the RWQCBs on how to appropriately identify water quality limited segments using accurate and verifiable data and information. Review of such general guidance not only requires expertise in the disciplines mentioned above but also requires the reviewer to apply their experience and knowledge in issues pertaining to the evaluation of data, quality assurance, interpretation of water quality standards, biological effects due to pollutant exposure, tissue burdens, evaluation of effects due to nutrients, trash and other nuisance (e.g., foam, scum, oil, etc.).

The technical issues addressed in the FED are listed below. These are grouped according to general subject matter. There are many issues that overlap into more than one discipline.

1. Statistics

Evaluation of numeric water quality data and information used in making recommendations for the section 303(d) list.

A. Appropriate null hypotheses.
B. Appropriate statistical tests for the evaluating of water quality data.
C. Level of statistical confidence for listing.
D. Appropriate exceedance rate to assess water quality data.
E. Minimum number if samples needed for assessment of water quality standard attainment.

2. Toxicology, Life Sciences and Human Health

Evaluating biological related data and information to determine impacts to human health and aquatic life.

A. Interpreting numeric marine and freshwater bacterial water quality standards.
B. Interpreting health advisories.
C. Interpreting aquatic life tissue data.
D. Interpreting toxicity data.
E. Interpreting data related to nuisance.
F. Interpreting data on trash impacts to water bodies.
G. Interpreting data related to adverse biological response.
H. Interpreting degradation of biological populations or communities.
I. Interpreting narrative water quality objectives.

3. Chemical and Physical Sciences

How to evaluate different chemical and physical related data to determine impacts to aquatic life.

A. Evaluation of numeric data.
B. Interpretation of nutrient data.
C. Interpretation of sedimentation data.
D. Interpretation of temperature water quality objectives.
E. Considerations related to natural sources of pollutants.
F. Consideration of observed measurements that are below or less than the quantitation limit of the analytical instruments.

4. Multidisciplinary

Other issues to consider when interpreting data and information in order to determine impacts to water bodies.

A. Quality assurance considerations.
B. Considerations of spatial and temporal representation.
C. Data quality requirements.
D. Consideration of water body specific information.
E. Data age requirements.
F. Determining water body segmentation.

Peer review should focus on the adequacy and validity of the recommendation proposed in the draft Policy.

Attachment 3

Contact List

Statistical Issues

1. Michael Riggs
   Department Statistical Research, Research Triangle Institute
   Research Triangle Park
   North Carolina

2. Eric P. Smith
   Department of Statistics
   Virginia Tech
   Blacksburg, Virginia

3. Robert D. Gibbons
   Center for Health Statistics
   University of Illinois, Chicago

4. Pi-Erh Lin
   Department of Statistics
   Florida State University
   Tallahassee, Florida

Toxicity and Adverse Biological Response Issues

1. Chris Ingersoll
   Columbia Environmental Research Center,
   USGS, Missouri

2. Brian Anderson
   University of California, Davis
   Granite Canyon Laboratory

3. Bryn Phillips
   University of California, Davis
   Granite Canyon Laboratory

4. Debra Denton
   USEPA, Region 9

5. Steve Bay
   Southern California Coastal
   Water Research Project (SCCWRP)

6. Doris Vidal
   SCCWRP

7. Judy Crane
   Minnesota Pollution Control Agency

8. Swee Teh
   Veterinary Medicine: Anatomy,
   Physiology and Cell Biology
   University of California, Davis