May 11, 2001

Via electronic mail
Robert Cantilli (MC- 4304)
U.S. Environmental Protection Agency
Ariel Rios Building
1200 Pennsylvania Avenue, N.W.
Washington, D.C. 20460

Dear Mr. Cantilli:

Comments on the Ecoregion 2 (Western Forested Mountains) and Ecoregion 3 (Xeric West) Nutrient Criteria Documents

We are writing on behalf of Tri-TAC, the California Association of Sanitation Agencies (CASA), and the Southern California Alliance of POTWs (SCAP) to express our concerns regarding the following ecoregion criteria documents: the ecoregion 2 (western forested mountains) document for rivers and streams, the ecoregion 3 (xeric west) document for rivers and streams, and the ecoregion 2 (western forested mountains) document for lakes and reservoirs.

CASA, SCAP, and Tri-TAC are statewide organizations of local public agencies responsible for wastewater collection, treatment, disposal, and reclamation. Tri-TAC is an advisory group including representatives from CASA, the California Water Environment Association, and the League of California Cities. CASA's membership includes 92 agencies responsible for the operation of publicly owned treatment works (POTWs). SCAP's membership includes over 50 water and wastewater agencies serving more than 16 million people in southern California. Together, the constituent agencies of CASA, SCAP, and Tri-TAC serve most of the sewered population of California.

While we understand that nutrient enrichment in U.S. waterbodies is a concern that EPA should address, we do not believe developing hypothetical numeric criteria at the ecoregional level is the answer. Our main concerns with the ecoregion criteria are as follows:

- EPA has not linked the criteria to beneficial uses nor has it clearly defined what alternate goal it is trying to accomplish by issuing these criteria.

- The criteria are scientifically unsound because they were developed using statistical methods that ignore the benefits of nutrients to ecosystem health and assume there is a clear nutrient threshold beyond which eutrophic problems occur.

- Numeric nutrient criteria, if they are to be developed at all, should be developed at a more site-specific level. Because enrichment and eutrophication are controlled by many more factors than nitrogen and phosphorus alone, developing ecoregional numbers to accurately address nutrient impairment is impossible.

Because the criteria are not scientifically sound, are not linked to protection of beneficial uses, and are likely to result in extremely costly and unnecessary retrofits to municipal wastewater treatment plants, we recommend that the criteria be rescinded pending further study. We explain our concerns in more detail in the following sections of our comment letter.

The nutrient criteria are not scientifically sound.

We question the scientific validity of the nutrient criteria because they are based on the false premise that the degree of nutrient impairment is in direct proportion to nutrient levels. Nutrient impairment does not operate on a continuum like the toxicity of priority pollutants, and because either nitrogen or phosphorus can be limiting, regulating these two constituents separately does not make sense. In addition, nutrient inputs are necessary to the healthy functioning of ecosystems. Therefore, EPA should not continue to assume that very low nutrient levels are necessarily better and should develop a new regulatory approach that ties together all the factors that can contribute to nutrient impairment. While we understand that a different approach for nutrients would create more work and require more resources in order to determine whether nutrient discharges should be regulated and how they should be regulated, we are troubled that "too much work" is used by EPA as excuse for not "doing the right thing"; namely, developing a regulatory framework appropriate for nutrients. EPA's mandate is to protect the environment, and applying an unscientifically sound regulatory approach to address nutrient concerns will not meet this mandate.

We also question the validity of the criteria based on EPA's new approach of using the 75^{th} percentile of reference waterbodies or the 25^{th} percentile of all waterbodies within an ecoregion to derive criteria that will be used to determine if water quality standards can be achieved and if waterbodies should be listed as impaired. We question these methods because 1) they do not consider the site-specific conditions or beneficial uses of the streams or lakes where the criteria will be applied, 2) they involve the manipulation of data that likely has no relationship or connection to these waterbodies, and 3) they do not differentiate between conditions leading to impairment or attainment of standards. Consequently, the foundation for establishing permit limits, evaluating attainment of water quality standards, and setting targets for TMDLs is inherently flawed and will create significant problems in all aspects of the water quality standards program. This alarms us because the likely outcome of this approach will be that very low permit limits and waste load allocations (WLAs) will be imposed on POTWs leading to the application of expensive advanced treatment as a direct result of EPA's lack of data and understanding of nutrient ecology. EPA must come to terms with the fact that statistical percentiles only represent the properties of a specific data distribution and percentiles cannot take into account beneficial uses and impairment with which they are not associated.

Finally, we question the scientific basis of the criteria because we do not agree with EPA's approach of promulgating criteria without first having a solid understanding of nutrient ecology. EPA's *Nutrient Criteria Technical Guidance Manual: Rivers and Streams* states the following (p.14-15):

> Although this document is meant to provide the best available scientific procedures and approaches for collecting and analyzing nutrient-related data, including examination of nutrient and algal relationships, a comprehensive understanding of nutrient and algal dynamics within all types of stream systems is beyond the current state of scientific knowledge . . . A more comprehensive knowledge base pertaining to nutrient and algal relationships will be expanded as new information is gained and obstacles overcome, justifying potential refinements to the criteria development process described here.

We do not believe EPA can promulgate legally defensible criteria according to this plan. Section 304 of the Clean Water Act requires EPA, after consultation with appropriate Federal and State agencies and other interested persons, to develop and publish water quality criteria that accurately reflect the latest scientific knowledge on 1) the kind and extent of all identifiable effects on health and welfare, 2) the concentration and dispersal of pollutants, or their byproducts, through biological, physical, and chemical processes, and 3) the effects of pollutants on biological community diversity, productivity, and stability. In this case, EPA has not met the conditions specified above. Defensible criteria require a sound scientific rationale. It is clear that developing criteria before obtaining the data to support them does not make sense.

The 304(a) criteria are not linked to beneficial uses, and, as a result, EPA's desired endpoint(s) with respect to nutrient enrichment is unclear.

One of the most perplexing aspects of the criteria documents is determining what EPA is trying to accomplish by issuing nutrient criteria. EPA has made no attempt to show any relationship between the nutrient criteria levels and the associated eutrophic conditions they are trying to protect against, such as dissolved oxygen levels, fish kills, and nuisance algal blooms. EPA has stated in presentations to Regional Technical Advisory Groups (RTAGs) that by protecting the "inherent beneficial uses" of waterbodies with nutrient criteria, all beneficial uses will be protected. We do not understand, however, what an inherent use is or how protecting inherent uses can assure protection of all beneficial uses. Each beneficial use may be protected by different levels of nutrients, e.g. fisheries might be protected by higher nutrient levels while swimming might be protected by lower nutrient levels, and in many cases, changing the nutrient levels will not affect the endpoint of concern, e.g. algae levels. In addition, high nutrient concentrations can be the natural state of a healthy ecosystem. Therefore, we believe EPA is misguided in believing that there is a clear nutrient threshold beyond which eutrophication occurs and that lowering nutrient concentrations to extremely low levels will result in protection of all the beneficial uses.

Instead, EPA should spend more time focusing on the desired endpoints and a procedure for achieving them. We believe the desired endpoint should be protection of the beneficial uses of each waterbody decided upon by stakeholders on a local level. Once the desired beneficial uses have been agreed upon, studies should be conducted to determine what factor or causative agent is preventing the attainment of these uses. Studying the source of the problem on a local level is crucial because the causes of eutrophication vary considerably from site to site, and focusing solely on nutrient concentrations may not solve the problem yet result in unnecessary, expensive nutrient control measures. Therefore, to truly address the problem of eutrophication, EPA must go beyond a simple statistical analysis of nutrient levels unreflective of local conditions or desired ecological endpoints, and focus instead on eutrophic conditions and the levels at which they are affecting beneficial uses.

Because the 304(a) nutrient criteria are not scientifically valid, using them as a starting point to develop "refined" scientifically defensible 303 (c) criteria at the state level is impossible.

If states do not agree with the criteria that EPA has developed, they have until 2004 to develop an approach to address eutrophication that is scientifically defensible. We do not believe, however, the states can "refine" the criteria in a scientifically defensible manner because the nutrient criteria have no scientifically defensible starting point from which to make such changes since they were developed through a statistical method that ignored the complex nature of nutrient ecology. To develop a scientifically defensible approach for nutrients, the states would have to invest substantial amounts of money, time, and resources because they cannot build upon EPA's work. In fact, the states would be faced with developing a completely new approach. Unfortunately, states do not have the money, time, and resources to do so and will be forced into accepting EPA's 304(a) criteria even if they do not find them to be reasonable. Therefore, it is unfair (and disingenuous) for EPA to expect the states to be able to do anything other than accept the EPA recommended criteria given the three year compliance deadline to come up with adjusted criteria or some other "scientifically defensible" approach. In addition, we do not know "how acceptable" any newly developed scientifically defensible methods would be since EPA states in the foreword of its ecoregion criteria documents that adopting the 304 (a) ecoregion criteria is preferable to developing nutrient criteria using "other scientifically defensible methods." Not only is this statement erroneous in referring to the criteria as scientifically defensible, but it also discourages states from implementing other methods that are scientifically defensible.

We realize the EPA RTAGs are making efforts to refine the nutrient criteria and are attempting to assist states in their efforts to refine the criteria. Unfortunately, we find that the RTAGs ability to develop a scientifically defensible approach for nutrients is highly limited. For example, the Region 9 RTAG in which we are participating has made little progress in finding a connection between nutrient levels and impairment. Tetra Tech, the consulting firm working for the Region 9 RTAG, has conducted two pilot studies of waterbodies located in Region 9, and after completing these studies has found that there is insufficient information to develop nutrient criteria at this time and has recommended that the RTAG take a more long term approach. The first pilot study looking at western forested mountain waterbodies found that reference sites had higher nutrient levels than human-impacted sites. The second study found that bioassessment is not a useful tool for determining nutrient impairment given the current lack of data.

The results of the first pilot study looking at western forested mountain waterbodies are of particular concern to us because they confirm our doubts about the statistical method employed in the criteria documents and our belief that the 304(a) criteria are not a scientifically valid starting point for "refining" criteria. If the RTAG were to develop criteria that we believe are appropriate, they would have to be focused much more at the site-specific and watershed levels. Because we are not confident that the RTAG or any other group will be able to complete the more localized studies by the 2004 deadline, we are very concerned that the 304(a) criteria or other numbers based on the same statistical method will be imposed upon the states and the regulated community. Despite our concerns, we will continue to work with the RTAG with the goal of helping to develop an appropriate approach for addressing nutrients, but EPA must do its part in aiding the RTAGs by:

Rescinding the 304(a) ecoregion criteria documents.

Removing the 2004 deadline for state adoption of nutrient criteria.

Redirecting the national nutrient program from numeric criteria development to developing an approach which focuses on beneficial uses at a localized level.

If these criteria are promulgated and implemented, the adverse consequences will be far reaching with little or no environmental benefit.

These nutrient criteria will be used to establish water quality based effluent limits and determine waterbodies slated for TMDLs. In both cases, imposing the nutrient criteria on the regulated community would have significant impacts on the costs of controlling point and non-point source loadings and require POTWs to make expensive capital improvements based on unsound criteria. In terms of the technical feasibility of achieving a 0.38 mg/L total nitrogen standard, we are not aware of a treatment system that is capable of meeting this level. Membrane systems coupled with tertiary treatment and/or microfiltration cannot reduce total nitrogen concentrations to less than 1 mg/L.[1] These treatment technologies are very costly ($2.7 x 10^3 per million gallons of wastewater treated) and generate treatment residuals (brine streams) requiring waste disposal.[2]

The high cost of the wastewater treatment necessary to approach the very low levels of the nutrient criteria is of great concern to us because we are not convinced there will be an environmental benefit if nutrients are reduced to these levels. Reducing nutrient levels in waterbodies to the 304(a) nutrient criteria levels will not ensure that ecosystems will receive appropriate nutrient loadings, and there is a likely chance that such a reduction in nutrients will harm ecosystems. We would be happy to provide EPA with examples where nutrient loadings improved fishery production and diversity and actually protected fish from pollutant toxicity. In addition, EPA should consider that employing the treatment methods we have discussed above could harm aquatic life by reducing the buffering capacity of treated wastewater effluent.

We realize that EPA is not required to consider economics in developing 304(a) criteria, but because states will be required to develop standards by 2004 and these criteria will probably be de facto standards, EPA should consider the economic burden it will be placing on dischargers and their ratepayers by issuing the 304(a) ecoregion criteria. Requiring ratepayers to pay substantial, capital costs, which may prove unnecessary, even harmful, a few years later because EPA is in a rush to develop criteria, is simply unwarranted and poor public policy.

With respect to the xeric west criteria document, the ecoregion approach is especially inappropriate for the arid west where the structure and function of rivers and streams can fluctuate dramatically and where many waterbodies are effluent dominated.

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[1] AClean Water Revival Groundwater Replenishment System Performance and Reliability Summary Report,≅ Dublin San Ramon Services District, October 1999; and AHealth Effects Study Final Report, Sanitation Districts of Los Angeles County, March 1984.

[2] *Managing Wastewater in Coastal Urban Areas*, National Research Council, National Academy Press, 1993. Note: the 1991 dollar values were adjusted to year 2000 dollars; and Bureau of Reclamation, Technical Service Center, Denver, CO, September 1999.

While we doubt the ecoregion process will adequately address the question of nutrient impairment in homogeneous regions, the ecoregion process unequivocally fails to address this question in the arid west where heterogeneity is high. EPA's *Nutrient Criteria Technical Guidance Manual: Rivers and Streams* explains in detail the complexity of river and stream systems in the arid west. Conditions are constantly changing, and one severe flood event can change the entire structure and functioning of a stream. In addition, the watercourses are heavily managed through water diversion and storage structures in order to meet consumptive use and flood control needs at the time and place of demand. Appendix A states on page 54 that the "hydrologic variability and the unique chemical and biological characteristics of arid land aquatic ecosystems may make the use of broad generalizations to explain nutrient regimes impossible." Appendix A also states on page 55 that "the aquatic ecosystems structured by these often catastrophic and always chaotic flow regimes exhibit spatially and temporally heterogeneous structure and function which may not allow the application of nutrient criteria derivation techniques applicable to more homogeneous environments." Both of these statements are in conflict with the application of the ecoregion approach to the arid west. Considering that EPA is aware of the variability and uncertainty associated with arid rivers and streams, we are perplexed by EPA's decision to issue 304(a) nutrient criteria for these waterbodies.

We are also adamantly opposed to the application of the xeric west nutrient criteria to effluent dominated waters (EDWs) because the data used to calculate the criteria are not representative of such waters. EDWs consist almost entirely of wastewater effluent and are often concrete channels. Not only do the sites chosen to calculate the xeric west 304(a) criteria not include this type of waterbody, but the ecoregion approach is also based on the assumption that waterbodies can achieve a healthy, natural, or "reference reach" state. EDWs cannot achieve such a condition due to the source of their water and their structural modification, usually for drainage and flood control purposes. We do not believe asking the question of whether or not an EDW is impaired based on a comparison to "natural" waterways is an appropriate question to ask. EDWs receive treated effluent and act as conduits to prevent flooding. There is no natural ecosystem to impact, and therefore, these criteria are not a proper benchmark for determining effluent limits or achievement of water quality standards.

Conclusion

In conclusion, we are not asking EPA to ignore or discount waterbody impairment caused by eutrophication. We are asking that EPA take more time to research the causes and effects of nutrient enrichment and investigate other avenues for addressing this problem instead of developing improper and unsound criteria which could possibly harm the environment and require regulated entities -- and the public -- to absorb unnecessary financial costs. As stated previously, we believe EPA must do the following in order to effectively address eutrophication:

- Rescind the 304(a) ecoregion criteria documents.

- Remove the 2004 deadline for states to develop 303(c) nutrient criteria.

- Redirect the national nutrient program from numeric criteria development to developing an approach which focuses on beneficial uses at a localized level.

We appreciate this opportunity to comment. If you have any questions or comments, please contact Sharon Landau at (562) 699-7411, extension 2820, or Michelle Buzbee at (925) 962-9700.

Yours very truly,

Phil Bobel
Chair, Tri-TAC

cc: Suesan Saucerman, EPA Region IX Nutrient Coordinator
Chris Bailey, California State Water Resources Control Board