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May 26, 2000

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Ariel Rios Building  
1200 Pennsylvania Ave., NW  
Washington, DC 20460

RE: FLOWCHART TO PRIORITIZING NUTRIENT CRITERIA DEVELOPMENT

*Executive Director*  
Ken Kirk

Dear Geoff:

As I have discussed with you recently, AMSA's Nutrients Workgroup has been crafting a methodology for prioritizing the development of site-specific nutrient criteria. This alternate approach was developed to address AMSA concerns with EPA's draft nutrient guidance, which proposes ranges for criteria which in our view, are not adequately linked to aquatic life or other beneficial uses, and may ultimately result in inappropriate state-adopted water quality criteria.

We recognize that you have put significant effort into developing these nutrient criteria guidance and methodologies and also recognize the difficult work your staff and contractors have faced in compiling national data on nutrients and attempting to resolve the complexities of the nutrient loading cycle on a gross eco-regional and waterbody-type scale. Despite these efforts, we still feel that the resulting criteria will not adequately predict nutrient impacts on individual water segments or downstream receiving water impacts. Such smaller-scale work would need to be done through additional research and/or modeling work.

You have previously stated your interest in suggestions on alternative or flexible implementation approaches which could be used in adopting nutrient criteria into state water quality standards. You also have indicated that EPA remains committed to its strategy whereby states would develop numeric criteria to protect against nutrient

May 26, 2000

Page 2

impairment. We believe that we have developed an approach that would accomplish this goal, but would allow states to target its resources on the areas in most need of protection. The approach would also use the significant work that EPA has done to develop its criteria guidance documents by using the resulting criteria ranges as flag values for states to determine the priority for nutrient criteria development and the need for further assessment target uses. High priority for nutrient criteria development would be placed on those waterbodies that are impaired or are causing impairment downstream due to nutrient enrichment.

Attached is a draft flow chart which outlines the above approach, and describes each of the decision points of the process. We hope that this flowchart could be used by states as an alternative approach to blanket adoption of criteria on a broad geographic scale.

We look forward to meeting with you in the near future to discuss this proposal, and our continued concerns with the draft criteria guidance documents. If you have any questions, please call me at 757-460-4243 or Mark Hoeke at 202/833-9106.

Sincerely,

A handwritten signature in cursive script that reads "Norm LeBlanc".

Norm LeBlanc  
Chair, AMSA Water Quality Committee

cc: AMSA Nutrients Workgroup

## Prioritizing Nutrient Criteria Development - Draft

A draft flow chart has been developed to illustrate an alternate approach to address AMSA's concerns with the existing nutrient guidance for Lakes / Reservoirs and Rivers / Streams. In the following section the elements of the framework are described (see Figure 1):

Classify water body- Consistent with methods of the present guidance, various sections of the nation's waters are classified into regions of similar water quality.

Establish target use- Beneficial uses are the foundation of the water quality criteria program. The target use represents the specific "end point" or objective that is intended for protection and/or restoration by the criteria. Examples include living resources, biological condition indexes, established nuisance levels of algae, or other established water quality standards such as dissolved oxygen or pH that directly relate to effects on living resources. *Note: Nitrogen, phosphorus, chlorophyll a, turbidity, etc, do not represent target uses. They represent intermediate response variables to nutrients that may or may not be related to beneficial uses.* In cases of competing uses (e.g. fisheries vs drinking water), decisions need to be made regarding which use is "target". The public and stakeholders should be involved in the process of the establishment of target uses and the associated objectives that the nutrient criteria are intended to address.

Establish flag value- Statistical evaluations and statistical demarcations of data distribution (i.e. percentiles) are established relative to reference conditions. Flag values may be developed for nitrogen, phosphorus, chlorophyll a, periphyton, turbidity, or other intermediate response variables to nutrients. *Note: Flag values are used in the first level of site screening. Flag values are not to be converted directly into criteria because their relationship to impairment of the use is uncertain.*

Does site exceed flag value?- Site data are evaluated relative to flag values and a determination is made regarding whether they exceed them.

Is target use impaired by N or P?- Employing cause and effect assessments a determination is made regarding whether the established target use (i.e. living resources, biological condition indexes, established nuisance levels of algae, or other established water quality standards such as dissolved oxygen or pH that directly affect living resources) has been impaired by nitrogen and/or phosphorus.

Next, dependent upon the outcomes of the above screening steps, there are three potential outcomes for which a given site can be categorized. For simplicity and ease of discussion they are color coded.

Green- The site is not considered enriched because the flag values were not exceeded. Because nutrient values or intermediate response variables are low it is logically assumed there is also lack of nutrient impairment. This condition represents a low priority for

criteria development. Site monitoring continues to periodically re-assess its priority for criteria development. Existing anti-degradation tools may be used to prevent enrichment. The development of criteria values to prevent impairments to beneficial uses are re-visited as a third priority after the completion of high and medium priority waters. *Note: Eventual criteria may be greater than flag values given that these sites were not defined as impaired. When appropriate, mechanistic methods similar to the red condition should be used to establish those criteria.*

Yellow- The site may be enriched because the flag value was exceeded. Because the flag value was exceeded an analysis of impairment was required, but showed no apparent impairment. This condition represents a medium priority for criteria development. Site monitoring continues to periodically re-assess its priority for criteria development. Existing anti-degradation tools may be used to prevent further enrichment. The development of criteria values to prevent impairments to beneficial uses are re-visited as a second priority after the completion of high priority. *Note: Eventual criteria may be greater than flag values given that these sites were not defined as impaired. When appropriate, mechanistic methods similar to the red condition should be used to establish those criteria.*

Red- Because the flag was exceeded an analysis of impairment was required, which indicated impairment. Due to the presence of nutrient related impairments the site is also considered enriched. This represents a high priority for criteria development. Given a combination of flag values being exceeded and a finding of nutrient impairment, additional analyses (mechanistic models) are developed and employed. The mechanistic models are used to determine the level of nutrient reductions needed to remove the impairment to the use on a site specific basis. The feasibility / use attainability and socio-economic impacts associated with this criteria value are evaluated. Subsequently, criteria are established (and modified as needed by the use attainability and socio-economic analyses) and considered for adoption into water quality standards.

*Note: The major elements of the flow chart should apply in all circumstances. However, it was designed to propose a process to be used in the absence of additional information. In some cases many of the elements (target use, demonstrations of impairment, loading reductions needed to attain use) may be already known. In such cases a duplication of existing efforts should be avoided.*

#### Additional remarks

AMSA believes that the approach described above represents a workable framework and compromise to address the issues that AMSA (and others) have identified as weaknesses in the present criteria guidance. The major benefits of the proposed approach are as follows:

- The basis of the criteria on beneficial uses is consistent with the intent of the water quality standards program. It improves the defensibility of the criteria because

without a firm basis in beneficial uses the criteria are subject to challenge at their most fundamental level.

- The use of flag values benefits the program by providing a utilization outlet for the work that EPA and others have placed in developing a reference and statistical based approach. A screening role is viewed as a good application for these methods considering the severe limitation of these tools.
- The prioritization of nutrient criteria development on the basis of flag values and use impairment decision points serve to ensure that (1) the 303 (d) listings are not needlessly increased, (2) the resources available to nutrient criteria development are properly focused and commensurate to the level of problem, or a lack of one, and (3) those sites truly in need of attention are identified and corrected sooner because the resources are directed properly towards them. The prioritization of the criteria also helps address the comments that many States have expressed regarding the apparently inordinate and excessive amount of resources needed to develop criteria.

**Figure 1. Prioritizing Nutrient Criteria Development**

