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August 31, 2009

Dr. Thomas Armitage
Science Advisory Board
US Environmental Protection Agency
(Mailcode 1400F)
1200 Pennsylvania Avenue, NW
Washington, DC 20460

Re: SAB Review of Nutrient Criteria Guidance
[Sent electronically to Armitage.Thomas@epa.gov]

Dear Dr. Armitage,

The Pennsylvania Municipal Authorities Association (PMAA) represents 715 municipal authorities across Pennsylvania, serving over 6 million citizens, half the state's population. Nearly 400 of the authorities we represent are sewer authorities that will be impacted by forthcoming guidance and interpretations by EPA for TMDLs tied to in-stream nutrient levels. We are very concerned with the impact that adoption of this approach will have on our wastewater systems. We have listed several of our concerns for review and discussion by the Science Advisory Board's Ecological Processes and Effects Committee.

General Comments

The original request for SAB peer review was prompted by continuing concerns of PMAA and some of our members over the "science" employed by EPA Region III and its contractors in developing TMDLs to address presumed nutrient-related impacts in several streams in Pennsylvania. Attachment 1 illustrates the basic nature of our concerns.

We understand that the original peer review request[1] was submitted to EPA to *"initiate a formal independent peer review of the unprecedented scientific approach EPA Region III utilized to develop stringent phosphorus stream standards for three major Pennsylvania ecoregions"*.

It is our further understanding that EPA Region III's approach was significantly at odds with EPA's established guidance for evaluating nutrient impacts on rivers and streams [2].

We do not understand how the current peer review process has evolved into an evaluation of an entirely new draft guidance document[3] (which repeatedly refers to EPA's 2000 guidance document), published 12 months after the initial peer review request. This new draft guidance basically summarizes a variety of statistical data evaluation techniques that can be used to implement or supplement the procedures discussed in EPA's 2000 guidance.

As such, we question the direction of this particular peer review effort in response to the original request.

Comments in Response to Charges to the SAB

The SAB has been charged with commenting on the utility, appropriateness and adequacy of various portions of the draft guidance document. We have a basic grasp of statistical analysis methodologies and we understand the mechanisms by which nutrients can have an impact on aquatic ecosystems, and we therefore offer the following for SAB consideration.

1. We do not dispute the fact that nutrients can have a very detrimental impact on some aquatic systems, nor do we dispute the fact that a proper assessment of such systems is needed to determine the degree to which nutrients are contributing to such impacts. However, such assessments must rely upon a carefully designed site-specific data collection and analysis effort in order to evaluate cause and effect and to determine the appropriateness of various point-source or non-point-source control measures.

2. Anyone with a basic understanding of aquatic ecosystems knows that nutrients are but one of several factors contributing to the presence or absence of impairment in a flowing stream. Impairment can occur, or not occur, at various points along the entire length of a stream depending on the presence or absence of one or more of these factors. This was made particularly clear in the case of EPA's abovementioned draft TMDLs where data showed higher levels of impairment upstream of some point source discharges than downstream from those discharges.

3. Virtually every graph or diagram we have seen (from EPA and others) that attempts to display a relationship between N (or P) and some aquatic life metric (such as chlorophyll a, or # of invertebrate taxa, or dissolved oxygen) looks like a shotgun array, or cloud, of data points. On this basis alone, it is clear that it is impossible to derive a single numeric instream criterion for N or P based on such analyses.

4. EPA's 2000 guidance and the draft August 2009 guidance are replete with explanations of how "this" or "that" statistical method can be employed to deciper such arrays of data points. The clear implication of such discussion is that "if that method doesn't work, then try this one". This is particularly evident by the inclusion of various "non-parametric" methods of analysis (which are usually employed when standard analysis fails to produce a definable result) for consideration by the data analyst.

5. Finally, as EPA's charge to the SAB notes, adoption of numeric criteria allows for easier and faster development of TMDLs and NPDES permits. This is precisely why we are so concerned with this issue. Once a numeric criterion is established, the regulatory entity may neglect to fully assess what is really happening in the aquatic ecosystem and will simply establish extremely stringent discharge limitations requiring the expenditure of huge sums of public funds with no assurances that such efforts are really necessary.

In conclusion, we request that the SAB take the opportunity to deliberate on the issues raised in the original request for peer review. We also ask that the SAB consider the above points and the data and findings presented by municipal interests.

Sincerely,

Peter T. Slack, P.E.
Government Relations Associate

References

1. Letter dated 8/21/08 from Hall & Associates to EPA Administrator Johnson

2. Nutrient Criteria Technical Guidance Manual – Rivers and Streams, EPA-822-B-00-002, July 2000

3. Empirical Approaches for Nutrient Criteria Derivation (Science Advisory Board Review Draft), EPA, 8/17/2009

ATTACHMENT 1

PMAA General Observations and Comments on Five Nutrient TMDLS Developed by EPA Region III

In April 2008, we provided detailed comments to EPA Region III regarding shortcomings associated with EPA's development of five draft TMDLs for streams in the southeastern, southcentral and southwestern ecoregions of PA.

It is significant to note that the watersheds for these streams have been increasingly impacted over the past 150 years through varying combinations of urban, suburban, commercial, industrial and agricultural land use, thus making it extremely difficult to identify specific cause-effect relationships for any ongoing impairment.

Listed below are several examples of comments and recommendations that we made on these proposed TMDLs:

The array of methodologies used by EPA to derive new in-stream nutrient criteria (characterized as a "weight of evidence" approach) seems to represent an attempt to make the means justify a predetermined end point that has little relevance to real world conditions.

The inclusion of Nitrogen as a parameter of interest for nutrient-related TMDLs essentially represents a "guilt by association" approach, which has little scientific merit. It will result in huge expenditures of public funds for no valid purpose and we believe it should be dropped entirely from any future TMDL efforts.

We are very concerned over the lack of supporting data and analysis presented in EPA TMDL reports pertaining to the actual impact of nutrients in the "impaired" segments. If nutrients are having major impacts on the aquatic ecosystem, why is there so little information presented about the actual impacts (e.g. nuisance algae, diminished species diversity, etc.) or the areal extent of those impacts, particularly upstream vs. downstream from point source discharges. It would appear that there is little meaningful scientific documentation available to support these new stringent guidelines.

Significant impairments are occurring within some watersheds due to hydrologic impacts from various land use activities. It seems quite likely that such impacts will continue to occur, even though not subject to a TMDL, and that any TMDL-related improvements, particularly from point sources, will be rendered meaningless.

This EPA-proposed TMDL report represents the results of a "desktop" analysis by persons who have never personally visited or observed the watershed or stream segment of concern, using out-dated land use information and water quality data that are incomplete and inconclusive.

There is no obvious data presented to support an actual nutrient-related impact, either in terms of stimulating nuisance algal growth or any other kind of indirect effect on aquatic life. There is a very limited amount of discussion by EPA (in proposed PA TMDLs) on aquatic life impacts and cause/effect relationships between nutrients and algal growth. In fact, there is no data presented on algal occurrence.

We are very skeptical as to the validity of the modeling effort and the resulting TMDL. Without having established the nature and extent of excessive algae and related aquatic impacts, the contractor carried out a modeling exercise using a combination of sophisticated stream water quality models (GWLF, WASP and WASP7) to simulate the response of the stream water quality to various point and non-point source inputs. The WASP7 module is specific to predicting algal response. This modeling relies upon numerous variables (and associated rate constants which are based on assumed "default" values and, depending on the values assigned, can have a tremendous impact on model results (for instance the nitrogen and phosphorus half-saturation constants, which supposedly relate to algal growth, can vary significantly). In plain English, the model can be structured to produce any desired result just by selecting rate constant values.

Irrespective of whether or not there is any documented evidence of excessive algal growth and related impacts, the contractor simply falls back on the weight-of-evidence approach that has been invented by EPA as a surrogate for how to determine the proper amount of nutrients to protect aquatic life. We believe that this approach is scientifically invalid and somewhat naive.

We suggest that EPA focus their efforts on a hierarchical watershed management approach to protect and preserve streams, focusing on:
reducing hydrologic impacts due to "urbanization" of the watershed;
reducing impacts from sediment-laden runoff from land development activities;
reducing impacts from MS4 stormwater and CSO discharges within the watershed (without imposing nutrient effluent limits);
achieving reductions from point source wastewater discharges.

We also suggested that EPA fully engage impacted stakeholders, particularly the point source community, and develop in-stream considerations weighing the body of evidence presented by experts studying these situations across the country and the inter-relationships between nutrients and stream impacts.