STATE OF CONNECTICUT
DEPARTMENT OF ENVIRONMENTAL PROTECTION

30 November 2009

Dr. Thomas Armitage
EPA Science Advisory Board (1400F)
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., NW
Washington, DC 20460

Dear Dr. Armitage,

Attached is a statement regarding the SAB Ecological Processes and Effects Committee review of the EPA's draft guidance document titled "Empirical Approaches for Nutrient Criteria Derivation" for consideration by the Committee.

Thank you for this opportunity to comment.

Sincerely,

_____

Paul E. Stacey
Director of Planning and Standards
Bureau of Water Protection and Land Reuse

_____

Mary E. Becker
Environmental Analyst
Bureau of Water Protection and Land Reuse

Encl. Statement to the SAB EPEC

STATEMENT TO THE EPA SCIENCE ADVISORY BOARD
ECOLOGICAL PROCESSES AND EFFECTS COMMITTEE
Regarding
REVIEW OF EPA DRAFT GUIDANCE DOCUMENT
"EMPIRICAL APPROACHES FOR NUTRIENT CRITERIA DERIVATION"
For consideration during the 3 December 2009 Public Discussion of EPEC's Draft Report

Submitted by
Paul E. Stacey and Mary E. Becker
Planning and Standards Division
Bureau of Water Protection and Land Reuse
Connecticut Department of Environmental Protection

The Connecticut Department of Environmental Protection (CT DEP) appreciates the opportunity that the EPA Science Advisory Board (SAB) and Ecological Processes and Effect Committee (EPEC) has provided for public input on their review of EPA's draft guidance document titled *Empirical Approaches for Nutrient Criteria Derivation* ("Draft Guidance"). The Department commends the EPEC for their thorough review of the Draft Guidance and for their responsiveness to concerns raised by CT DEP and others through the public input process.

In general, CT DEP strongly agrees with the Committee's conclusions and recommendations stated in their Draft Review report. The revised framework summarized in Figure 1 of the Draft Review provides a stronger scientific approach for potential criteria development based on stressor-response relationships that was seriously lacking in the EPA Draft Guidance. However, coupled with the many technical flaws identified in the Draft Review and the much narrower, site-specific applicability, CT DEP questions whether the stressor-response approach is viable for the broader nutrient criteria development EPA seeks. In particular, key recommendation number 10 (line 36 on Page 40) asks some very troubling questions that have defied clear answers despite the best efforts of EPA to devise a criterion approach for nutrients.

Many of the objections raised by EPEC can only be addressed by defining site-specific complexities and indicators. That will be difficult to support with current levels of understanding, data and analytical tools, including models that are still too uncertain to set criteria, even on a site specific basis. To reasonably reduce or minimize variability as is necessary to develop single number criteria on a site by site basis would require enormous data collection and modeling efforts that are likely to be unsupportable. In particular, among the EPEC concerns were that non-nutrient stressors and habitat factors need to be considered when developing nutrient criteria and the integration of evaluating nutrient loads under site-specific habitat conditions is necessary to ensure that designated uses are met in each water body. Even

with that added attention, the analyses are likely to lead to a range of concentrations due to uncertainty, rather than useful, site-specific criteria.

This outcome is not surprising given the breadth of ecosystem structure exhibited in nature. CT DEP recommends that the committee seriously consider that EPA's goal for a single statewide, ecosystem or even waterbody type numeric criterion may not be realistic or the best way to manage nutrients. The EPA has not been advised to abandon their approach, which does not and cannot readily take into account the complex and dynamic nature of nutrient interactions with surrounding habitats in water bodies. Application of a single threshold concentration of nutrients for broad geographic areas suggests a commonality of response, assimilative capacity, human effect and biological status. This results in a misrepresentation of natural enrichment conditions creating inappropriate targets for nutrient reductions and allowing for significant increases in loadings to minimally enriched water resources before exceeding criteria and triggering management action. It also could diminish the diversity of ecosystems by creating a truncated distribution of conditions below an artificial and arbitrary criterion. In short, application of numeric criteria other than on a site-specific basis suggests a similarity in environmental design and condition among water bodies that simply defies logic, a sound scientific protocol and the reality of aquatic condition as we know it today. The path forward appears to be a dead end and EPA should be discouraged against further investments in their approach, at least for the short term.

There are some points that CT DEP also recommends that are clearly stated and emphasized in the EPEC's final draft review of the Guidance that could lead to a viable alternative to those proposed in the Draft Guidance. It should be clear that CT DEP recognizes that there are water quality problems caused by anthropogenically-derived nutrient loading that need to be addressed. The following concerns provide a critical path towards developing a scientifically credible nutrient management strategy that would result in achieving the goals of the Clean Water Act and ultimately protecting designated uses. EPA must first acknowledge that aquatic system responses to nutrients fall along a gradient of effects; one size does not fit all situations. Further, aquatic systems can only rarely return to a pre-existing state or equilibrium due to the dynamic nature of those systems. That is why nutrient criteria development must not only allow for the trophic tendencies of the water body that should prevail, but also needs to allow for human presence that has irretrievably altered most ecosystems from effects of watershed uses and climate change rather than setting a goal that may misdirect management efforts.

Practicable and viable guidance should include methods that strive to achieve a best attainable condition (BAC) rather than a reference condition or statistically defined change in the data. The BAC represents a scientifically defensible endpoint that fits within the tiered aquatic life and biological condition gradient concept supported by EPA in that it works toward setting a realistic management goal for a waterbody that achieves the best possible conditions given today's state of the landscape and resources available. This approach also helps preserve and protect those

waterbodies where there is minimal human disturbance. It is also an alternative approach that lends itself well to some of the concepts suggested by EPEC in the Draft Review. In particular, it uses a loading approach that can be directed towards an autotrophic response on a site-specific basis. Modeling productivity responses to nutrient loading is a much simpler endeavor, as pointed out in the Draft Review, and state managers can use reasonably well-developed GIS tools to assess today's loading conditions and compare them to water quality assimilative capacity and response using autotrophic endpoints.

CT DEP remains concerned that the EPEC review gives EPA the opportunity to "fix" an approach that may not be salvageable – and to do so on their own authority without follow up peer review from scientific experts. It leaves open many concerns from a management perspective, not the least of which how states could take such guidance and devise and apply "criteria" that may reflect a range of perfectly acceptable and healthy conditions. Of paramount concern is that EPA's revisions to the Draft Guidance would be at their discretion, and they would be the ultimate arbiter of criteria viability.

Given the breadth of EPEC stated concerns and the apparent uncertainty that is an unavoidable outcome of nutrient criteria development, the likely absence of follow-up review seems to jeopardize the value of the EPEC review in creating a workable final outcome. We urge EPEC to not only provide their good scientific advice and recommendations with respect to the Draft Guidance, but to request that any EPA revision undergo an additional peer review to ensure that sound science and applicability for the intended criteria use prevail. This is a legitimate concern given the unsatisfactory state and questionable utility of existing EPA ecoregional nutrient criteria guidance using a reference approach that did not have the benefit of an industrious and detailed peer review and is, for all intents and purposes, not usable for the development of meaningful criteria.

Thank you for the opportunity to comment on this very important matter. CT DEP hopes that EPA will seriously consider the comments provided in EPEC's review and that these comments will be reflected in both the guidance and EPA's overall nutrient management strategy.

_____ Date: _____

Paul E. Stacey

_____ Date: _____

Mary E. Becker