THE MOST ADVANCED NAME IN DRAINAGE SYSTEMS

May 15, 2013

Rule Coordinator
Ohio EPA
Division of Surface Water
P.O. Box 1049
Columbus, Ohio 43216-1049

OHIO EPA - DSW
2013 MAY 17 AM 8:58

Dear Rule Coordinator,

Advanced Drainage Systems, Inc. would like to thank the Ohio EPA for this opportunity to give our comments concerning water quality and agriculture. We are a concerned Stakeholder with our World Headquarters, 6 manufacturing plants and hundreds of employees based in Ohio.

ADS is the world's largest manufacturer of corrugated polyethylene pipe. We are involved in the agriculture, municipal and construction markets across the country. Our products are used daily in urban areas to help municipalities and private owners comply with water standards of EPA Phase II. ADS has been involved with agricultural water quality by active participation in the Agriculture Drainage Management Coalition.

We support the 4R's of nutrient management. We believe in minimizing the amount of nutrients that migrate to our streams and lakes. Research will prove what methods or BMP's are most useful and cost effective to implement without requiring arbitrary numeric nutrient criteria.

In the agricultural market, our products are used to drain farm fields, which helps farmers reduce fuel consumption, minimize compaction, maximize crop yields and minimize loss of nutrients and soil into surface waters. It is a fact that farm drainage helps increase crop yields an average of 30%. Subsurface drainage is a valuable tool in reducing sediment and nutrient load from surface and subsurface runoff. According to Ward, Witter, Brown, Shearer from the Ohio State University,

> "We estimate that if subsurface drainage was increased from 70-80% to 100% of the area currently under crop production in the Lake Erie Basin there would be a 10-20% reduction in SRP discharges associated with these crop production systems." [1]

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With systematically drained fields, there is more opportunity to reduce and treat nutrient loss with system design, drainage control structures and other hydraulic/ treatment buffers.

Controlling agricultural nutrients in Ohio's waterways will take a multi-pronged approach with a plethora of BMP's. We encourage the state to continue and expand its education and outreach to producers concerning agricultural drainage BMP's. As in the past, ADS looks forward to working with producers and state agencies to promote effective BMP's in the agricultural drainage industry.

Sincerely,

Kevin J. Rapp
Agriculture Market Manager

Mike Morrow
Senior Sales Representative

[1] Ward, Andy, John Witter, Larry Brown and Scott Shearer. Comments and recommendations on approaches to prevent problems associated with nutrient and sediment exports to the surface waters of Ohio. The Ohio State University. 2012

aomwa
association of ohio metropolitan wastewater agencies

Dax J. Blake, P.E.
President, AOMWA
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April 8, 2013

OHIO EPA - DSW
2013 APR 15 AM 8: 55

Director Scott J. Nally
Ohio EPA – Director's Office
Lazarus Government Center, P.O. Box 1049
Columbus, Ohio 43216-1049

Re: Ohio EPA's Nutrient Strategy

Dear Director Nally:

I am writing on behalf of the Association of Ohio Metropolitan Wastewater Agencies ("AOMWA") to express our appreciation for Ohio EPA's on-going efforts to develop a comprehensive nutrient reduction strategy in Ohio that considers the relative impacts of both point and non-point sources. Public wastewater agencies in Ohio have a keen interest in the development of a reduction plan that protects our State's watersheds from nutrient loading in a manner that considers contribution and balances reduction with cost-effectiveness. Accordingly, we are thankful for the cooperative efforts that Ohio EPA has undertaken with the Ohio Department of Agriculture (ODA) and the Ohio Department of Natural Resources (ODNR). We are also appreciative of Ohio EPA's demonstrated openness to a public dialogue on nutrient reduction issues with interested parties. We participated in the recent Nutrient Forum Visioning Workshop on November 14, 2012 which was jointly hosted by Ohio EPA, ODA and ODNR and were encouraged by the exchange and presentations that we heard. Our members were also integral members of Ohio EPA's Point Source & Urban Runoff Nutrient Workgroup and believe that the Workgroup forum provided an important opportunity for exchange and input of our concerns and perspectives. Again, we appreciate these opportunities and Ohio EPA's receptiveness to such dialogue.

We also want to encourage Ohio EPA, as it prepares to develop nutrient criteria, to incorporate the Point Source & Urban Runoff Nutrient Workgroup's final recommendations by:

- developing a state-wide mass balance sheet that accounts for point and non-point sources of nutrients;
- promoting operational experimentation at wastewater treatment facilities aimed at achieving low cost nutrient removal;
- allowing wastewater treatment plant owners to determine cost effective means to achieve lower effluent limits wherever such facilities are shown to be significant contributors to nutrient enrichment;

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- establishing a panel of economic, financial, and policy experts to consider options for funding the implementation of Ohio's nutrient reduction strategy;
- publishing an annual report on nutrient loadings and resulting water quality conditions in our lakes and rivers; and
- integrating watershed management and green infrastructure planning with Ohio's nutrient reduction approach.

AOMWA believes that these recommendations are vital for the development of a nutrient reduction strategy that properly considers both point and non-point contributors of nutrients and is protective of Ohio's water resources. Indeed, one of the most imperative recommendations, in our view, is the development of a State-wide mass balance which is critical to ultimately "determine appropriate reductions for all sources and to enable cost-benefit assessments to determine the most environmentally effective and economically feasible mechanism(s) for the State to reduce nutrient loading(s)" (page 4, Point Source & Urban Runoff Nutrient Workgroup: Final Report and Recommendations; 2012). Given its importance, we would offer our assistance in working with Ohio EPA on developing a strategy for advancing such an assessment. The integrated planning recommendation is also vital in our view and we are pleased to see that Ohio EPA is again open to such a concept.

Additionally, we were encouraged by the recommendations in the Directors' Agricultural Nutrients and Water Quality Working Group's Final Report which was issued on March 9, 2012. Particularly, we were pleased to see the recommendation of a soil testing program where there is a strong correlation between agricultural nutrients and water quality concerns. We believe soil testing would lead to design of better site-specific agricultural management techniques. We also applaud the proposed enhancement of fertilizer regulations and ODNR Soil and Water Resources Division's enforcement authority for violators. However, we would continue to encourage the Directors to consider mandatory, as opposed to voluntary, nutrient management measures for the agricultural sector particularly in areas that are to be designated Level 1 (Watershed in Distress) or Level 2 (Critical Natural Resource Areas) priorities. Agricultural practices are significant contributors to nutrient issues in many cases and should bear some of the costs of addressing these issues in critical areas.

Finally, AOMWA appreciates the opportunity to comment on Ohio EPA's planned development of nutrient criteria. We will submit our comments in response to Ohio EPA's March 2013 Early Stakeholder Outreach notice under separate cover, but do want to take this opportunity to again advise of our members' support for the proposed "weight-of-evidence" approach, which Ohio EPA has indicated it is considering. The weight-of-evidence approach recognizes that nutrient impacts are specific to a particular water body and not amendable to a "one-size-fits-all" approach to regulation. By allowing the flexibility for point sources to demonstrate that they are not causing biological impairments to a water body, we can maximize the limited financial resources of our public wastewater agencies and focus such resources on demonstrable water quality benefits. Such a nutrient reduction strategy is thus both protective of the State's watersheds and ensures that Clean Water improvements are necessary and remain affordable for our local communities.

Accordingly, please do not hesitate to contact me if there is anything AOMWA or its members can do to assist Ohio EPA in supporting its "weight-of-evidence" approach. We

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believe our members can provide valuable resources and insight relevant to Ohio EPA's advocacy of this approach as well as the implementation of the Point Source & Urban Runoff Nutrient Workgroup's recommendations.

Again, thank you for attention to these very important issues, and we look forward to continuing to work with you on these initiatives.

Sincerely,

Dax J. Blake, P.E.
President, AOMWA

cc: George Elmaraghy, Chief, Division of Surface Water
Dan Dudley, Division of Surface Water
Paul Novak, Division of Surface Water
Robert Ashton, AOMWA / City of Columbus
Jessica DeMonte, Squire Sanders (US) LLP

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May 22, 2013

Rule Coordinator
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Dsw_rulecomments@epa.ohio.gov

Re: Ohio EPA's Early Stakeholder Outreach/Developing Rules to Reduce the Impacts of Nutrients in Surface Water

Dear Rule Coordinator:

The Association of Ohio Metropolitan Wastewater Agencies ("AOMWA") appreciates the opportunity to comment on Ohio EPA's Early Stakeholder Outreach Notice regarding proposed development of nutrient criteria in Ohio (hereinafter "Nutrient ESO"). Our comments on the general approach of the Nutrient ESO as well as our technical, implementation and cost concerns are detailed below:

General Nutrient ESO Approach

AOMWA is supportive of the broad concepts outlined by Ohio EPA in the Nutrient ESO for the development of numeric nutrient criteria in Ohio. In particular, AOMWA agrees with Ohio EPA that focusing on biologically-based criteria is a preferable approach. Further, AOMWA is also supportive of the use of the multi-metric scoring system (the Trophic Index Criterion or "TIC") for determining the nutrient-impacted nonattainment of streams and rivers. Even though we do have questions about how the TIC will be implemented, we generally support continued development of a system that considers in-stream stressor and response variables in determining the applicability of a numeric limit. We are also encouraged by and support the use adaptive management concepts. This would allow communities to evaluate other stressors that are impacting aquatic life use attainment as well as nonpoint source reductions and cost effective reduction measures, prior to imposition of final nutrient targets for point sources.

AOMWA has also previously expressed its support to Ohio EPA for the proposed "weight-of-evidence" approach that Ohio EPA is considering in the Nutrient ESO. The weight-of-evidence approach recognizes that nutrient impacts cannot be identified solely by measurement of nutrient concentration (stressor variable), are specific to a particular water body and are not amenable to a "one-size-fits-all" approach to regulation. By allowing the flexibility for point sources to demonstrate that they are not causing biological impairments to a water body or that there may be other more limiting factors that are preventing attainment of the aquatic life uses in

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a waterbody, our members can maximize their limited financial resources and focus such resources on demonstrable water quality benefits. They can also work with other stakeholders to identify and implement solutions that will have more benefit than simply reducing nutrient loads. Such a nutrient reduction strategy is thus both protective of the State's watersheds and ensures that Clean Water improvements are actually necessary, which in turn protects the economic resources of our local communities in Ohio.

Proposed Nutrient Targets

While supportive of the concepts proposed in the Nutrient ESO, AOMWA members do have concerns about several key issues. In particular, the Nutrient ESO proposes draft stream nutrient targets of 3 mg/l nitrogen and 60, 160 or 300 ug/l phosphorus (depending on the habitat assigned by Ohio EPA). We are concerned that these proposed targets would result in numeric limits for point sources that are at the very limit of existing technology capabilities. Based upon information presented in supporting documents for the Nutrient ESO[1,2], we are concerned that the draft nutrient targets are overly conservative and would result in excessive reduction targets for point source dischargers. Accordingly, AOMWA would encourage Ohio EPA to reconsider these proposed target criteria.

Costs and Schedule of Nutrient Reduction Technologies

Further, where numeric limits would be imposed under this proposal, Ohio EPA must consider the costs point sources will incur in implementing nutrient reduction technologies and ensure that such costs will actually provide an environmental benefit. Indeed, at least one AOMWA member has estimated that implementation of nutrient reduction technologies to meet the expected nutrient limits of this proposed rulepackage will cost between $60 to $86 million. Other members face cost estimates in the range of $40 to $50 million. However, even with such expenditures, there is no guarantee that the draft stream nutrient targets will be achieved, in part, because there are significant nonpoint source contributors that are not subject to regulation under this rule. Accordingly, we remain concerned that public utilities will be forced to install extremely expensive reduction technologies which will do little to address the nutrient issue in impaired or threatened waterbodies. Instead, we would encourage Ohio EPA to consider (as detailed more fully below) the relative contributions of nutrient sources in determining the limits that will be applicable to public utilities. Such an analysis will preserve communities' limited financial resources and ensure that sources that are not significant contributors are not spending a disproportionate amount on measures that will do little to address the underlying nutrient conditions.

In fact, these concepts were directly included in the key recommendations of the August 8, 2012 Point Source & Urban Runoff Nutrient Workgroup's Final Report. The Workgroup was composed of a broad base of stakeholders, including representatives from both large and small wastewater utilities, engineering and environmental firms and environmental groups. It recommended that Ohio EPA, among other steps:

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[1] *Technical Support Document for Nutrient Water Quality Standards for Ohio Rivers and Streams* (Ohio EPA, 2011) ("Technical Support Document").

[2] A Method and Rationale for Deriving Nutrient Criteria For Small Rivers and Streams in Ohio (R.J. Miltner, *Environmental Management* 45:842-855, 2010).

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- develop a state-wide mass balance sheet that accounts for point and non-point sources of nutrients;
- allow wastewater treatment plant owners to determine cost effective means to achieve lower effluent limits wherever such facilities are shown to be significant contributors to nutrient enrichment; and
- integrate watershed management and green infrastructure planning with Ohio's nutrient reduction approach.

AOMWA believes that these recommendations are vital for the development of a nutrient reduction strategy that properly considers both point and non-point contributors of nutrients and is protective of Ohio's water resources. Indeed, in our view, the development of a State-wide mass balance is critical to ultimately "determine appropriate reductions for all sources and to enable cost-benefit assessments to determine the most environmentally effective and economically feasible mechanism(s) for the State to reduce nutrient loading(s)" (*Point Source & Urban Runoff Nutrient Workgroup: Final Report and Recommendations*, p.4, 2012).

We also believe that integrated planning as recommended by the Workgroup's Final Report should play an important role in the implementation of nutrient reduction improvements under this rule. If communities are incurring substantial costs implementing other Clean Water Act mandated improvements, the affordability of additional costs for nutrient reductions may be difficult for a community to absorb. Thus, the time that communities should be given to implement additional nutrient reduction measures should be lengthened and the affordability of such reduction technologies should be considered and weighed as part of the analysis. Such flexibility should be built into the rule.

We also believe that adaptive management is crucial to providing the necessary flexibility and are encouraged by its inclusion in the Nutrient ESO supporting materials. Thus, we would support Ohio EPA's utilization of integrated planning and adaptive management concepts to ensure that a community is spending its limited resources on measures that produce the "biggest water quality benefit for the buck." It may be that there are cases where nutrient reduction does that for a public utility; however, there are other cases where completion of wet weather improvements are of a more crucial nature. We would encourage Ohio EPA to allow flexibility in the implementation schedule of nutrient reductions so that the totality of such costs remains affordable and Ohio communities remain economically competitive in their utility rates. We further believe Ohio law supports such an approach. *See* R.C. 6111.03(J)(3) (which requires Ohio EPA in issuing permits to "give consideration to, and base the determination on, evidence relating to the technical feasibility and economic reasonableness of removing the polluting properties from those water and to evidence relating to conditions calculated to result from that action and their relation to benefits to the people of the state").

<u>*NonPoint Source Contributions*</u>

The Nutrient ESO indicates that where a stream or river is threatened or impaired, both effluent limitations for point sources and "nonpoint source load reduction goals" will be developed. The scope and enforceability of the nonpoint source "reduction goals" are not defined in the Nutrient ESO. However, it is well documented that agricultural and other nonpoint

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sources are significant contributors to nutrient impairment of water bodies in Ohio. Accordingly, we would encourage Ohio EPA in connection with the Ohio Department of Agriculture and the Ohio Department of Natural Resources to develop, in concert with these nutrient standards, nonpoint source control programs that will ensure that these sources are controlled as well, so that point sources (and their ratepayers) are not being unfairly burdened. Given their contributions to nutrient impairment, nonpoint sources should indeed bear costs of addressing these issues too.

Technical and Implementation Issues

While we remain supportive of the Nutrient ESO concepts, we do have various questions about how the rule will be implemented and raise these issues for Ohio EPA to address as it moves forward.

TIC Score Process and Implementation

With regard to the TIC scoring and implementation process, we ask and comment as follows:

1. How will credible data be used in the metric? We believe all available credible data should be used in deriving TIC scores.

2. Where in relation to a public utility's discharge will the TIC scores be determined (i.e., one mile downstream, three miles downstream, an average)?

3. What time period and what type of data will be used (i.e., the past year, the past five year, some average, worst-case, best-case)? We think it is appropriate to give more recent data higher weight in the TIC scoring process, including evaluations of trends in data.

4. How will multiple data values for each TIC component be used (i.e., average of all values, mean, specified percentile)? We would be concerned if a single unacceptable value overrides multiple acceptable values.

5. We are concerned about the currently proposed draft TIC scoring for biocriteria within the range of non-significant departure being given only one-half of the applicable biocriteria score. Given the precision of biocriteria measurement values, this appears to be an overly restrictive TIC scoring rule. We would like to understand the rationale for this planned TIC scoring procedure, since we think halving the score is overly conservative.

6. What happens if there is no data for one of the metric factors? Or, what if there is insufficient data to develop a TIC score? We strongly believe that in either such case nutrient limits should not be implemented until such data is developed and time should be permitted to develop such data before nutrient limits are imposed.

7. How will partial biological attainment areas be addressed?

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8. Revisions have been made to the TIC scoring process since the 2010 Working Draft. We are interested in understanding the basis for these revisions.

TMDL/WQBEL Calculations

With respect to how the TIC score will be used to develop nutrient standards, we comment and ask:

1. There is little detail provided in the Nutrient ESO on the process for utilizing the TIC score in the development of Total Maximum Daily Load (TMDL) and Water Quality Based Effluent Limit (WQBEL) calculations. Further information is necessary to evaluate this component and provide comment. Accordingly, we look forward to Ohio EPA's explanation.

2. In any event, we strongly believe that relative source contribution must be considered as part of the TMDL process and are interested in how Ohio EPA will evaluate source contributions as part of this process? In other words, how will Ohio EPA determine that a point source's contribution to the nutrient impairment is significant enough that controls will actually make a difference in water quality or should be imposed?

3. Will the proposed reasonable potential process outlined in the Nutrient ESO and supporting documents be the same as the process used for toxics? If not, how will it differ?

4. Because overall loading over time is the concern, it does not make sense to have weekly or monthly nutrient limits. We suggest seasonal or annual loading limits instead of concentration based limits. This would be consistent, for instance, with NPDES permit nutrient WQBELs implemented by a number of states in the Chesapeake Bay watershed.

Implementation of Nutrient Limits

With respect to how nutrient limits will be developed and implemented in point source permits, we comment and ask:

1. As stated above, we are supportive of the adaptive management approach suggested in the Trophic Index Criterion-Rationale and Scoring document for implementation in NPDES permits. However, we believe further discussion is necessary as to whether the proposed interim ("default") limits of 1.0 mg/l total phosphorus ("P") and 10 mg/l dissolved inorganic nitrogen ("DIN") identified in the Nutrient ESO are appropriate limits.

2. If default limits are developed and imposed as part of this process, we also encourage Ohio EPA to consider more flexibility in the length of time such default limits can be in place. There may be instances where such limits should be in place for longer than two permit cycles, as Ohio EPA has proposed, to give sufficient time to evaluate implemented reduction measures and before requiring substantial investment in treatment to achieve very stringent final discharge limits.

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3. We also believe that the term "adaptive management" should be broadly defined in this program. We are concerned with a reference in the Technical Support Document, p. 52, which may be read to suggest that adaptive management equates solely to enrollment in a water quality trading program. Although water quality trading can be an important tool, we believe "adaptive management" is broader and point sources should be able to consider other nonpoint source reductions as part of this process.

4. Additionally, prior to implementation of nutrient limits for a point source, there also needs to be confirmation that nutrients are the actual cause of the impairment as opposed to other non-nutrient stressors. Such a step should be built into the rule.

5. We also believe that the rule should include flexibility for compliance with nutrient limits when there are other stressors preventing the attainment of aquatic life, such as dams, lack of habitat or toxic sediments, or when other constraints are present.

6. If reasonable potential indicates no rationale for nitrogen limits, we assume there should be no interim DIN limits implemented in NDPES permits and no interim DIN waste load allocations included in TMDLs. Please confirm or advise if we are mistaken on this point.

7. Upon incorporation of final nutrient limits in a permit, will time be permitted for evaluation and data collection following implementation of nutrient reduction measures? We are concerned that reduction measures will be taken and time will be necessary to see results. Instead, we would strongly encourage that elements of adaptive management be incorporated into implementation of nutrient WQBELs and TMDLs.

8. If nutrient limits already exist in an NPDES permit due to an existing TMDL, how will those limits be handled? We believe if there is no rationale for such limits based upon the TIC process, such limits should be eliminated.

9. Nutrients require tracking of water quality improvements, in addition to pounds of reduction. This is because the benefits of load reductions, particularly from best management practices for agricultural and urban land, may take years before instream responses are observed due to continued inputs of nutrient loads from soil and groundwater.

10. As part of this process, we would also encourage Ohio EPA to give consideration and credit to actions already taken by wastewater utilities that have resulted in nutrient reductions. Facilities that have invested in such reduction technologies should receive credit for such investments as part of the process.

Advisory Working Group

Finally, because of the significance of the implementation questions that remain (some of which we have raised herein), AOMWA would encourage Ohio EPA to convene an advisory group that includes interested party representatives, such as AOMWA members, to work with Ohio EPA as it develops the language of the nutrient criteria rules. These technical and

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implementation issues will be crucial and an advisory/working group will allow for an open dialogue in identifying and addressing such issues prior to the rule's circulation for interested party review. We also believe AOMWA can be a resource as part of this process on these technical points as well as the costs that the regulated community will face in response to the concepts in this rule.

Again, we thank the agency for considering our comments on these very important issues. We remain a supporter of the general approach outlined in the Nutrient ESO and hope Ohio EPA will consider us a partner in developing the rules necessary to implement its nutrient reduction strategy.

Sincerely,

Dax J. Blake, P.E.
President, AOMWA

cc: Robert Ashton, AOMWA / City of Columbus
Elizabeth Toot-Levy, AOMWA/ Northeast Ohio Regional Sewer District
Jessica DeMonte, Squire Sanders (US) LLP

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May 21, 2013

Ohio Environmental Protection Agency
Division of Surface Water
P.O. Box 1049
Columbus, Ohio 43216-1049
Attn: Rule Coordinator

Via email: *dsw_rulecomments@epa.state.oh.us*

Re: Comments on Early Stakeholder Outreach: Developing Rules to Reduce the Impacts of Nutrients in Surface Waters (OAC 3745-1)

Dear Rule Coordinator,

The Butler County Water and Sewer Department (BCWS) appreciates the opportunity to comment on the Early Stakeholder Outreach regarding proposed development of nutrient criteria in Ohio. In general, BCWS supports Ohio EPA's "weight of evidence" approach to nutrient regulation, as well as Ohio EPA's plan to develop numeric nutrient criteria versus narrative criteria. BCWS is also supportive of Ohio EPA's multi-metric scoring system (Trophic Index Criterion) as a structured method of aggregating environmental data to evaluate the condition of a water body relative to nutrient enrichment. BCWS appreciates Ohio EPA's recognition that impairment of a receiving water should not automatically result in point source effluent nutrient limits, as non-nutrient causes and sources of impairment in Ohio are common. BCWS also appreciates Ohio EPA's recognition of the contribution of nonpoint source nutrient loads to State waters, and urges the Agency to continue to evaluate mechanisms to reduce said loads in a manner equitable to the load reduction efforts required by point source dischargers; BCWS is supportive of *mandatory* nonpoint source nutrient reduction goals, as opposed to voluntary.

In general, BCWS seconds the comments and questions submitted by the Association of Ohio Metropolitan Wastewater Agencies (AOMWA), of which BCWS is an active member. While BCWS' comments and concerns have been incorporated into the AOMWA letter, please consider the following as supplemental information relative to the potential cost associated with complying with nutrient limits in the same range as Ohio EPA's draft stream nutrient targets:

> BCWS recently had an engineering firm evaluate nutrient removal technologies for its 16 MGD Upper Mill Creek Regional Water Reclamation Facility in West Chester, OH, to enable the facility to comply with a potential future total phosphorus limit of 0.25 mg/l and a potential future nitrate plus nitrite limit of 3.35 mg/l. The facility discharges into an effluent-dominated stream and currently utilizes BNR technology and chemical addition to meet a phosphorus limit of 1.0 mg/l and a nitrate plus nitrite limit of 5.0 mg/l. The required upgrades and infrastructure additions, and associated conceptual costs, are provided in the table below.

ITEM	ESTIMATED COST (Million US dollars)
4.3 million gallons of additional tank volume	$8.5M – 10.0M
8.6 million gallons existing tank volume reconfiguration	$13.0M – 17.4M
Additional final clarifier	$2.5M
New tertiary filter system	$14.0M
Tertiary filter pumping station	$5.0M – 12.5M
Internal recycle pumping expansion, upgrade, and reconfiguration	$6.4M – 16.0M
Site piping	$5.0-7.0M
TOTAL	**$54.4 - $79.4M**

As the table indicates, the costs associated with removing nutrients from wastewater to a very low level are significant, and it should be noted that no additional plant capacity would be gained as a result of this extensive capital outlay. Roughly, a $79M sewer project would translate into a rate increase of approximately 32% for each of BCWS' 45,000 customers. But this would not be the extent of the rate increase as BCWS operates a total of six wastewater treatment facilities, all of which would require similar major upgrades in order to comply with effluent limits driven by draft stream nutrient targets. The resulting sewer rates for the customers of the BCWS system would be cost prohibitive.

BCWS is obviously concerned about the financial impact of the draft stream nutrient targets as related to wastewater treatment facility operation. BCWS is also concerned that the proposed targets would result in numeric limits at the very edge of current technology. BCWS is willing to do its part to mitigate nutrient enrichment in Ohio water bodies when the costs and benefits are justified, but remains skeptical of the State's current regulatory framework and its ability to deal with nutrient pollution in a comprehensive manner – especially nonpoint source pollution. BCWS is troubled by the possibility that it will have to invest multiple millions of dollars in additional capital infrastructure at its wastewater treatment facilities to further reduce nutrient loads to water bodies that will not likely, in the end, achieve TMDL-prescribed nutrient allocations and/or consistent attainment of designated uses due to other unregulated causes and sources of impairment. This unbalanced regulatory burden, and its potential economic ramifications to BCWS and its industrial, commercial and residential customers, seems inconsistent with the State's Common Sense Initiative (Executive Order 2011-01K) and Ohio Senate Bill 22 ("Affordability Act", 9/30/2011).

BCWS appreciates your consideration of these comments. Should you have any questions regarding these comments, please contact me at 513-887-5563 or by email at sackenheima@butlercountyohio.org.

Sincerely,
BUTLER COUNTY WATER AND SEWER DEPARTMENT

Adam M. Sackenheim
Regulatory Compliance Manager

C: BCWS Regulatory Team

GREG J. DAVIES
Director

THE CITY OF
COLUMBUS
MICHAEL B. COLEMAN, MAYOR

DEPARTMENT OF
PUBLIC UTILITIES

May 22, 2013

Rule Coordinator
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Re: Early Stakeholder Outreach – OAC 3745-1
Developing Rules to Reduce the Impacts of Nutrients in Surface Waters

Dear Rule Coordinator:

I am writing to submit the comments of the City of Columbus Department of Public Utilities on Ohio EPA's Early Stakeholder Outreach (ESO) for the development of rules to reduce the impact of nutrients in the surface waters of the state. Columbus is the regional wastewater utility in Central Ohio, providing wastewater collection and treatment for over one million people. In recent years, Columbus has made very substantial capital investments in wastewater collection and treatment upgrades in order to improve water quality in Central Ohio. As a result, Columbus has a significant interest in the development of rules to reduce the impact of nutrients in surface waters of the state.

To begin with, Columbus greatly appreciates the substantial effort undertaken by Director Nally and Ohio EPA staff to develop numeric criteria for nutrients that are based on sound science and reasoned policy choices. Columbus also appreciates Ohio EPA's outreach to stakeholder groups throughout the development of Ohio's Nutrient Reduction Strategy, outreach that has included the sharing of data and technical approaches, the willingness of Ohio EPA staff to meet with stakeholders, and the stakeholder work group process initiated by Director Nally to review and comment on the Draft Nutrient Reduction Strategy. Columbus is committed to working with Ohio EPA to address the problem of cultural eutrophication in Central Ohio's lakes, rivers, and streams in the context of a balanced framework for nutrient reduction that recognizes the relative contributions of point and non-point sources and that takes into account the environmental, economic, and social costs associated with nutrient removal by publicly owned wastewater utilities (POTWs).

Columbus is a member of the Association of Ohio Metropolitan Wastewater Agencies (AOMWA) and the National Association of Clean Water Agencies (NACWA), both of which have submitted comments in response to this ESO. Columbus incorporates by reference, as if fully restated herein, the comments submitted by AOMWA and NACWA. In addition, Columbus offers the following comments on several issues of concern in this matter.

Weight of the Evidence Approach

Columbus believes that an overriding public policy goal in the development of the nutrient criteria rules should be avoiding an outcome in which POTWs will be forced to install very expensive nutrient removal treatment processes to meet nutrient limits where the utilities are not a substantial contributing cause of the cultural eutrophication observed in the waters to which they are discharging, and/or where such treatment processes will have little or no effect in alleviating such eutrophication. Columbus appreciates both the "weight of the evidence" approach that Ohio EPA has adopted in the developing its nutrient reduction strategy and Ohio EPA's robust advocacy for that approach in its discussions with US EPA. Columbus assumes that under weight of the evidence approach and the Trophic Index Criteria (TIC) scoring scheme developed by Ohio EPA, a stream segment that is in non-attainment due to non-nutrient stressors will not be subject to numeric water quality criteria for nutrients and dischargers to that stream segment will not receive nutrient limits in their NPDES permits. In other words, under Ohio EPA's TIC scheme a stream segment can be in non-attainment but receive a TIC score high enough such that POTWs discharging to the stream may avoid nutrient effluent limits.

What is not clear under Ohio EPA's weight of the evidence approach is how Ohio EPA will meet the public policy goal identified above. When a stream segment is in non-attainment and receives a low TIC score, a wastewater utility discharging to that stream should not receive stringent NPDES permit limits for nutrients that will be very expensive to meet where the primary cause of the observed cultural eutrophication is, for example, upstream non-point sources or other stressors unrelated to the POTWs discharge. POTWs in Ohio have been burdened with capital costs related to the statewide effort to reduce and/or eliminate combined and sanitary sewer overflows, which costs have approached the limits of affordability for these communities. The rules under development in this matter should accommodate these concerns and not impose substantial additional costs on POTWs that will not result in the achievement of Ohio EPA's nutrient targets.

Adaptive Management

Columbus supports Ohio EPA's adoption of adaptive management principles in its nutrient reduction strategy. Columbus believes that the rules under development should have the flexibility to accommodate a full range of potential solutions to the problem of cultural eutrophication. We endorse the plan to allow a two permit cycle regime of default "intermediate" nutrient limits (prior to imposition of even more stringent nutrient limits) in order to allow monitoring of alternative solutions and to determine their effect on water quality improvement. However, Columbus believes that the rules should not rigidly restrict this period to two permit cycle in every case, particularly where a wastewater utility is pursuing alternative solutions that show a downward trend in nutrient-caused water quality impairment. For example, Columbus is undertaking a comprehensive Integrated Planning process to address sanitary sewer overflows. Columbus' Integrated Plan provides for very substantial investments in green infrastructure that may result in significant water quality improvements, including a reduction in nutrient loadings to Central Ohio's rivers and streams. Green infrastructure improvements may require additional time for community acceptance, installation, and assessment of their effectiveness. In addition, solutions such as dam removal and habitat restoration, improvements that Columbus has also

undertaken, may have significant water quality benefits that may alleviate the problem of cultural eutrophication. While the imposition of default nutrient limits followed by water quality based nutrient limits may be appropriate in some circumstances, the rules under development here should have the flexibility to accommodate the implementation effective alternatives where appropriate.

Advisory Working Group

Columbus fully supports AOMWA's request that Ohio EPA create a stakeholder Advisory Working Group to address the development and implementation of the rules at issue here. The establishment of such a group is consistent with Ohio EPA's outreach efforts throughout the development of its Nutrient Reduction Strategy and will provide Ohio EPA with additional resources in its effort to develop balanced and effective rules to reduce the impact of nutrients in the waters of the state.

Your attention and consideration in this matter are appreciated. If you have any comments or questions, or if I can be of any further assistance in this matter, please contact me.

Sincerely,

Greg J. Davies
Director

614-645-6141
gjdavies@columbus.gov
GJD/REA:sls

ALLIANCE FOR THE GREAT LAKES

ENSURING A LIVING RESOURCE FOR ALL GENERATIONS

June 14, 2013

To: dsw_rulecomments@epa.ohio.gov

RE: Ohio Early Stakeholder Outreach – OAC 3745-1 -- Developing Rules to Reduce the Impacts of Nutrients in Surface Waters

The Alliance for the Great Lakes is the oldest non-profit organization committed to protecting and restoring the Great Lakes. We do so through policy, education, and local outreach efforts. We appreciate you accepting input on this critical issue for Ohio and Lake Erie.

Lake Erie is home to one of the world's largest freshwater commercial fisheries and provides recreation and drinking water to 11 million people. Lake Erie is being impacted by excessive algal production — resulting in oxygen depletion in the water and dead zones for fish, nuisance algae that result in beach fouling detrimental to recreation, as well as harmful algal blooms that produce potent toxins and pose threats to wildlife and human health. Such algae growth is driven by excessive nutrient loading into Lake Erie.

Since being practically eliminated in the 1980s, dead zones caused by excessive nutrients are expanding—both in size and duration and are hurting the fishing industry. Walleye and yellow perch populations have been declining since the 1990s, and there has not been a good hatch of walleye since 2003. Nuisance algae are also responsible for the growing amount of smelly and bacteria-riddled algae blobs washing up on the central basin's shoreline. Volunteers in the Alliance's Adopt-a-Beach™ program often documented such algae at Edgewater beach in Cleveland on many of their clean-up visits.

But now we must worry about more than just nuisance algae—harmful algal blooms are appearing in the western and central basins. These blooms produce toxins harmful to wildlife and humans alike. Both toxic and nuisance blooms not only threaten the health of the lake, but also the regional economy and even human health. Lake Erie's algae problems are fueled by excess nutrients, primarily from sewage plants and agricultural runoff, resulting in exceedances of water quality standards in Lake Erie and its major tributaries.

Our comments today focus on urging adoption of numeric standards for nutrients and pursuit of innovative water quality trading approaches for nutrients in the Lake Erie watershed.

1. Ohio should adopt numeric standards for nutrients.

Since 1985, US EPA has issued a number of guidelines, reports and memos strongly urging states to implement numeric water quality standards for nutrients. Although Wisconsin has responded to US

EPA's recommendations by adopting numeric standards for phosphorus, Ohio has not. Without ambient numeric water quality standards, when it sets discharge permit limits or takes enforcement action, Ohio EPA typically will only apply the technology-based standard used in Great Lakes NPDES permits which is 1.0 mg/L for phosphorus. This standard is 3 times higher than US EPA recommended ambient water quality standard (EPA's recommended standard ranges from 8 to 37.5 ug/L depending on the ecoregion). A 1.0 mg/L discharge limit will not adequately address the problem of eutrophication in Lake Erie. If numeric ambient standards were adopted, Ohio EPA could calculate appropriate discharge limits and better protect water quality.

Although significant work was done in the 1980's to reduce phosphorus loadings from wastewater treatment plants (WWTP) through investment in infrastructure upgrades, many municipalities' infrastructure is still outdated or in disrepair and they continue to discharge significant loads of phosphorus. According to the USGS's SPARROW data, the accumulated load from point sources within the Lake Erie Watershed is 7 million kg.[1] Although it is less than the load from agricultural runoff (9.2 million kg), it accounts for 25% of the accumulated load.[2] In the United States, National Pollution Discharge Elimination System (NPDES) permits can be an effective tool for limiting point source discharges of phosphorus. However, these permits often do not adequately address phosphorus because of the lack of enforceable state water quality standards. For NPDES permits to be effective at reducing phosphorus loads, numeric standards are needed.

In addition, the lack of numeric standards contributes to government mandated evaluations of waterbodies that are incomplete and/or inaccurate. The 303(d) Impaired Water list is the primary tool states use to identify waters that do not meet water quality standards for their intended uses. This list is then used to prioritize the allocation of state resources. Ohio's 2012 impaired waters list, and the accompanying Integrated Report which outlines the methodologies used to develop the list, does not adequately address the serious algae problem that the state is experiencing in Lake Erie.

While Ohio does not have numeric standards for phosphorus, Ohio does have a narrative standard that addresses algae. The standard reads:

> To every extent practical and possible as determined by the director, these waters shall be […] free from nutrients entering the waters as a result of human activity in concentrations that create nuisance growths of aquatic weeds and algae.[3]

However, Ohio did not list any of the Lake Erie units of assessment as impaired for recreational use due to algae. The summary pages for the Western Basin and Central Basin do list aquatic life use impairment due to nutrients, but the recreational use listing for these basins does not state a cause of impairment. If this list is used to determine resources and to what issues these resources should be applied, then this omission has the potential to divert resources that could be used to remediate the algae issue to other

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[1] Dale M. Robertson and David A. Saad, USGS Sparrow MRB3 2002 Nutrient Model [online], http://wim.usgs.gov/Sparrow/SparrowMapper.html#, last accessed on 08/29/2012
[2] *Id*.
[3] Ohio Admin. Code 3745-1-04(E)

perceived causes of recreational use impairment. Adoption of numeric standards will help set meaningful reduction targets to remove these aquatic life use impairments.

US EPA also recently requested Ohio EPA list the open waters of Lake Erie as impaired due to nutrients. With their request, US EPA submitted data to substantiate the need for the listing. Ohio EPA's response to US EPA stated that they did not have a methodology to analyze the data and did not have enough time to develop a methodology and perform the analysis before the deadline to submit the report. Ohio EPA goes on to say that they will consider listing Lake Erie in 2014. Ohio must adopt a numeric standard for phosphorus to give Lake Erie the priority and resources it needs to solve its nutrient and algae problems.

2. Ohio should adopt ambient numeric standards from the targets in the Lake Erie Binational Nutrient Management Strategy, ambient numeric standards for dissolved reactive phosphorus, and nitrate-N discharge standards for the Lake Erie basin.

We urge Ohio to adopt the offshore, nearshore and Lake Erie tributary river mouth total phosphorus targets set out in Lake Erie Binational Nutrient Management Strategy (Lake Erie LaMP. 2011) in Ohio's proposed phosphorus standards. We note that Wisconsin has already adopted lower phosphorus standards for the nearshore and open waters of the Great Lakes. These LaMP targets are consistent with the Great Lakes Water Quality Protocol of 2012 and were developed based on sound science to protect Lake Erie.

In addition, we urge Ohio to propose a dissolved reactive phosphorus ambient standard for the Lake Erie basin. The Ohio Phosphorus Task Force has noted that HABs have been observed in Lake Erie when the DRP concentration was 6 ug/L. In their final April 2010 report, the Ohio Lake Erie Phosphorus Task Force stated "while there are multiple contributors to phosphorus loading, currently the most significant is the result of runoff from agricultural nutrient applications."[4] The Task Force concluded that the evidence of increased DRP loads in primarily agricultural areas that extensively utilize DRP containing commercial fertilizer demands that efforts be focused on controlling application of these fertilizers.

Current research has shown that although the total phosphorus loading has remained relatively stable, loadings of DRP have increased. In the dissolved reactive form, phosphorus is more available for uptake by plants which would explain why the algal blooms have reappeared after measures were enacted to control total loadings. Studies of the rivers in Northern Ohio that feed western basin of Lake Erie, where the majority of the algal blooms appear, show an increased trend in DRP. Among the five major tributaries, the Maumee River and the Sandusky River show the greatest concentrations of DRP.

Based on this scientific evidence showing the impact of DRP on algae in Lake Erie, we urge Ohio to propose DRP standards in addition to total phosphorus standards.

Finally, we urge Ohio to consider applying its nitrate-N standard of 10 mg/l throughout the Lake Erie basin, instead of just near drinking water intake areas. Currently this standard is listed as a human

[4] Ohio Lake Erie Phosphorus Task Force Final Report, April 2010, available at: http://www.epa.ohio.gov/portals/35/lakeerie/ptaskforce/Task_Force_Final_Report_April_2010.pdf

health drinking water criteria but language in OAC 3745-1-33 restricts its application to areas near public water supply intake locations. Adopting this standard throughout the basin would allow for more consistent protection of Lake Erie from these nutrients.

3. Ohio should pursue innovative water quality approaches for nutrients in the Lake Erie watershed to achieve water quality standards.

Since nonpoint sources are the largest contributors of nutrient runoff, Ohio's policies must deal with these pollution sources to address the full threat. When Ohio EPA proposes nutrient standards, it will be critical to explain how it will ensure that its proposed solutions will lead to achievement of the water quality standards, and over what timeframe.

One innovative technique which may help to accomplish this can be found in Wisconsin's new phosphorus rule (NR 217) that allows adaptive management plans to address the combination effect of point and nonpoint effluent. This helps reduce the costs to farmers and municipalities in a watershed that decided to enter into an adaptive management plan. The adaptive management plan will allow point sources and nonpoint sources to enter into an enforceable agreement holding both sources to their discharge limit.

A different innovative approach used by Michigan was to apply its TMDL process to create more enforceable standards for some nonpoint sources. Using this TMDL technique, the point sources in a TMDL watershed were able to keep their existing permit limits provided that the point sources allocated funding in order to decrease the nutrient loading to the watershed by 23%. Thus, nonpoint sources, which often suffer shortfalls in funding to implement new programs, were able to get the resources necessary to reduce nutrient loading.

Thank you for the opportunity to offer comments in the Early Stakeholder Outreach process. Should you have any questions about these comments, please do not hesitate to contact Lyman Welch at 312-445-9739 or lwelch@greatlakes.org.

Sincerely,

Lyman Welch
Director, Water Quality Program

Harris, Melinda

From: Jamesson, Guy <Guy.Jamesson@arcadis-us.com>
Sent: Wednesday, May 22, 2013 11:58 PM
To: EPA dsw_rulecomments
Subject: Ohio EPA's Early Stakeholder Outreach: Nutrient Criteria Rulemaking
Attachments: KReckhow_Nutrient Criteria & Macroinvertebrates_5-21-2013.pdf

Rule Coordinator
Ohio EPA – Division of Surface Water
Lazarus Government Center, P.O. Box 1049
Columbus, Ohio 43216-1049
Dsw_rulecomments@epa.ohio.gov

Re: Ohio EPA's Early Stakeholder Outreach/Developing Rules to Reduce the Impacts of Nutrients in Surface Water

Dear Rule Coordinator:

I am submitting the following comments in response to Ohio EPA's Early Stakeholder Outreach (ESO) Notice regarding proposed rulemaking for nutrient criteria in Ohio surface waters. As an active consulting engineer providing water quality and wastewater engineering services to municipal and industrial clients throughout Ohio for the past thirty years, I have been closely observing Ohio EPA's efforts to develop sound, scientifically based water quality criteria over the past ten-plus years.

I support the overall approach that Ohio EPA is developing to establish criteria for the protection of beneficial uses in the state's surface waters from adverse impacts resulting from excessive nutrients. I support the use of stressor-response data relationships to develop numeric nutrient criteria. I very much agree with the weight of evidence approach to determine whether water quality impairment is the result of excessive nutrient enrichment or is the result of other non-nutrient related factors. The concept of the Trophic Index Criterion (TIC) – developed using extensive field data for relevant stressor and response variables – appears to be a good decision-making tool for this purpose. I support the proposed approach to determine the need for nutrient targets and controls based upon relevant and site-specific water quality monitoring data.

I strongly support the use of adaptive management elements in the implementation of nutrient criteria-based loading restrictions for point and nonpoint sources. While many details are not clear at this time, several of the proposed implementation elements for nutrient limits in NPDES permits (when needed) appear to be sensitive to the cost effective use of finite financial resources available to public and private owners and ratepayers.

I agree with and support comments in letters submitted by the Association of Ohio Metropolitan Wastewater Agencies (AOMWA) and by Ohio Water Environment Association (OWEA).

While I am in agreement with Ohio EPA's general approach to this nutrient criteria development as presented at this time, I do have questions or concerns with a number of the implementation details – some of which have not yet been published or developed. Please refer to the comprehensive list of questions and concerns in both the AOMWA and OWEA comment letters.

I share concerns expressed in these other comment letters – in particular regarding the following issues:

- Whether numeric criteria may be overly conservative and thereby impose excessive costs on point sources,
- How data will be used to evaluate the TIC for specific streams,

- How limits and loadings targets will be imposed and allocated among point and nonpoint sources – particularly how permit limits will be implemented if nonpoint source controls are necessary to achieve target nutrient reductions yet are not mandated,
- How reasonable potential analysis will be performed, and
- How effluent limits will be implemented in NPDES permits.

I'd also like to bring Ohio EPA's attention to a recent post to a blog addressing water quality assessment and policy analysis by Dr. Kenneth Reckhow, professor emeritus at Duke University, Nicholas School of the Environment. The posting was made May 21, 2013, and is titled "Should States Augment Numeric Nutrient Criteria for Rivers & Streams with Macroinvertebrate Assessments?". A copy of this commentary is attached as a PDF file. The link to the original is: http://kreckhow.blogspot.com/2013/05/should-states-augment-numeric-nutrient.html . In this commentary, Dr. Reckhow states that there is relatively little causal relationship between nutrients in streams or rivers and benthic macroinvertebrate indices. Please respond to the brief discussion presented in this blog posting, and comment on the appropriateness of using Ohio's ICI (Invertebrate Community Index) as one of the factors in the biocriteria metric of the proposed TIC to be used in Ohio's nutrient criteria rule in development.

I urge the Agency to continue soliciting opinions and ideas from water quality professionals in the regulated community.

In summary, I applaud Ohio EPA for its efforts in developing appropriate nutrient criteria to protect Ohio streams and rivers from adverse nutrient impacts, with implementation rules and procedures that incorporate flexibility and which should be cognizant of financial resources for control implementation. Thank you for this opportunity to comment.

Guy M. Jamesson
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Ken Reckhow's Water Quality Wire

Some thoughts and observations on the science, engineering, and policy analysis of water quality assessment and management.

Tuesday, May 21, 2013

Should States Augment Numeric Nutrient Criteria for Rivers & Streams with Macroinvertebrate Assessments?

The 2001 National Academy of Sciences review of the TMDL program recommended that water quality criteria be positioned as closely as possible to the biological (or human health) response in the stressor-response causal chain. For nutrient criteria, this means that a measure of algal density (e.g., chlorophyll a), submerged aquatic vegetation, and/or macroinvertebrate indices might serve to augment or replace phosphorus and nitrogen criteria. A number of recent high-profile US EPA and other regulatory agency efforts to develop water quality criteria using possible stressor-response relationships observed in field data highlight the importance of this as part of the nutrient criteria development process; the recent assessment of Florida nutrient criteria provides a contentious example. As two recent EPA Science Advisory Board reviews have made clear, the presence of an underlying cause and effect in the stressor-response relationship is critical to the effectiveness of such water quality criteria. Unfortunately there is little EPA guidance on how to develop sufficient evidence to support cause-effect conclusions. This lack of guidance increases the likelihood that water quality criteria, lacking a firm basis for establishing cause and effect, will be proposed or established in regulations, resulting in ineffective and inefficient criteria.

We know that phosphorus and nitrogen are essential nutrients for plant and animal life. Likewise, we know that the range of levels of phosphorus and nitrogen found in surface water bodies do affect aquatic biota such as algae and aquatic vegetation. Indeed, there is a well-established scientific basis linking nutrient concentrations in lakes/estuaries to chlorophyll a; this relationship has been observed in both cross-sectional and time series analyses of data. However, while phosphorus and nitrogen are obviously essential for macroinvertebrate life, it has not been demonstrated that the range of phosphorus and nitrogen levels found in rivers and streams is a strong determinant of macroinvertebrate indicators of aquatic ecosystem health in these waterbodies. Observational data analyses suggest that other determinants of benthic macroinvertebrate indices (BMIs), such as variations in streamflow and temperature, sediments, and toxic substances may dominate cause-effect relationships. Thus one or more of these stressors may be the primary cause of observed changes in a river or stream benthic macroinvertebrate index that could falsely be attributed to nutrient levels.

When a state agency sets or modifies a water quality criterion, it is reasonable to expect that the state agency believes that its action will improve the probability of correct decisions on use impairment for a waterbody. In the specific situation of BMIs augmenting nutrient criteria, data analyses and rigorous causal analyses do not currently support that belief. Methods such as counterfactual analysis, Bayesian networks, and/or weight of evidence are needed to justify the causal relationship between nutrients and benthic macroinvertebrates in streams. Otherwise, we risk costly nutrient control measures that do not yield the expected benefits. This not only is a waste of critical resources, it undermines public confidence in legitimate efforts at environmental protection.

Posted by Ken Reckhow at 6:05 AM

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About Me

Ken Reckhow

Dr. Kenneth Reckhow is Professor Emeritus at Duke University in the Nicholas School of the Environment. During his 30 year tenure as a Professor at Duke, Dr. Reckhow taught courses in water quality management and modeling, environmental decision analysis, and environmental statistics; his research at Duke was also focused on those topics. Dr. Reckhow has served as Chair of the National Academy of Sciences Panel on the USEPA Total Maximum Daily Load Program (2001), as a member of the National Academy of Sciences Panel on the USGS National Water Quality Assessment

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(2000-01), as a member of the National Academy of Sciences Panel on Restoration of the Everglades Ecosystem (2003-05), and as Chair of the National Academy of Sciences Panel on Chesapeake Bay Restoration.Dr. Reckhow has a B.S. in Engineering Physics from Cornell University and a Ph.D. from Harvard University in Environmental Systems Analysis.

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May 20, 2013

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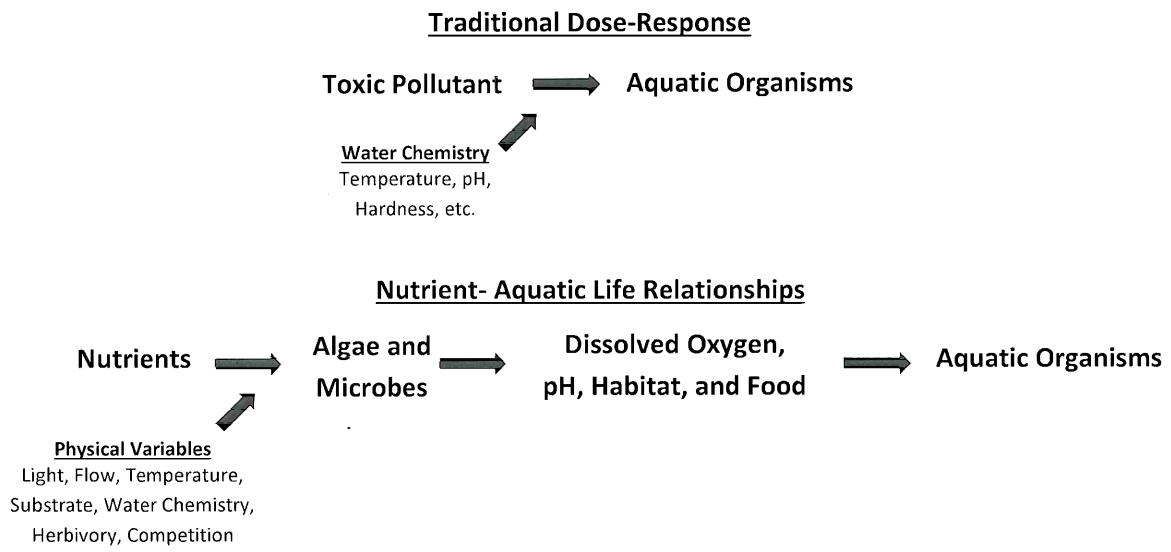
Re: OAC 3745-1 (Nutrients) – Early Stakeholder Outreach

The following comments regarding the early outreach nutrient rule concept are submitted on behalf of the City of Lima. In our view, the Trophic Index Criterion ("TIC") is a positive and welcome change to nutrient regulation, and we support Ohio EPA's efforts to develop quantitative, science-based nutrient targets that focus on achieving biological endpoints. However, as noted in our comments, the current TIC approach is incomplete and has shortcomings that must be addressed before it can be applied and implemented with any confidence. If these issues are not addressed, TIC results will be inconsistent and will result in significant wastewater treatment infrastructure expenditures that do not improve beneficial use attainment. After the TIC has been fully vetted by the scientific and legal community, and when accompanied by a thoughtful and holistic implementation strategy, we are hopeful that it can be the model for the future of water quality standards. To those ends, we offer the following comments and suggestions.

I. INTRODUCTION

Traditionally, numeric water quality criteria included in state water quality standards programs have been developed in a laboratory setting based on dose-response relationships between individual pollutants and aquatic organisms. Scientists have successfully been able to use this dose-response approach for developing criteria because aquatic organisms tend to exhibit predictable acute (mortality) or chronic (growth and reproduction) as a direct result of exposure to toxic compounds. Once the dose-response relationship is developed, calculating applicable acute and chronic water quality criteria from the data is fairly straightforward.

One of the biggest impediments for developing numeric nutrient (phosphorus and nitrogen) criteria with the traditional dose-response approach is that, with the exception of un-ionized ammonia-nitrogen, nutrients do not have direct, toxic effects on aquatic organisms. Instead, the relationship between nutrients and aquatic life is indirect and complicated by other, physical variables in the system.



The TIC approach described in the materials cited by Ohio EPA is not built on the assumption that a traditional, direct dose-response relationship exists between nutrients and aquatic organisms. Instead, the TIC is based on the concept that predictable and consistent dose-response thresholds exist at each step in the nutrient-aquatic life relationship (*i.e.*, nutrients to algae, algae to dissolved oxygen, dissolved oxygen to aquatic life). This underlying premise is generally supported by the literature. However, as discussed in the TIC support documents, the thresholds described in the literature exhibit considerable uncertainty. In addition, the data cited by Ohio EPA, and the analysis of them are, as described in the comments below, in some respects incomplete.

The TIC approach uses data collected over a four-year period from 109 Ohio stream sites to identify statistical change points for each of the steps. It describes a multi-metric scoring index that combines data from each of the steps into one, quantitative score that is used to evaluate and interpret TIC data. The multi-metric index is weighted such that data results more directly associated with the biological endpoint have a higher weight in the index than those elements that are indirectly related. For example, fish and macroinvertebrate scores are weighted more than dissolved oxygen and algae scores, which are weighted more than nutrient scores. Such a paradigm, where the evaluation of the health of the aquatic community and the stressors that impact it is used to develop a management strategy for pollution control decision-making, is vastly more logical and sensible than the rote application of numeric limits.

II. GENERAL COMMENTS

1- The structure of the eventual nutrient rule should ensure that it embraces and gives proper priority to the attainment of biological criteria. Nutrient limits should not be imposed if a water body is meeting biocriteria, unless there is compelling evidence that nutrient limits on point sources will, and are necessary to, ensure that the water body will continue to meet biological standards. Alternately stated, the rule should explicitly import the concept, if not the language of OAC 3745-1-07(A)(6)(a)("[D]emonstrated attainment of the applicable biological criteria in a water body will take precedence over the application of . . . chemical-specific . . . criteria associated with [applicable aquatic life] uses."

2- Phosphorus (and other nutrient) limits should not be applied independently of a holistic evaluation of a water body. An assessment of the other factors that may also impact aquatic organisms should be an explicit part of the final rule. There is no point—and considerable downside to financially strapped local governments—in imposing expensive nutrient limits when other factors (*e.g.*, non-point sources, habitat, hydrologic conditions) will prevent material progress in meeting applicable biocriteria.

3- The rule should not transfer the cost of nutrient reduction from non-point sources when they are a significant part of the problem on a water body (as is frequently the case) to point sources, merely because there is an available legal mechanism for regulating the latter but not the former. As stated earlier, most local governments are in difficult financial circumstances, and should not be required to pay for the "sins" of others.

4- If, despite the above objection, Ohio EPA determines to impose very stringent nutrient limits on point sources, based on the assumption that the costs of compliance can be reduced by engaging in effluent trading with non-point sources, the Agency needs to carefully examine and verify that this assumption is reasonable before moving forward. Effluent trading has met with very limited success around the country. While we believe that a workable, fair, and technically sound trading program would be very worthwhile, the Agency should not make regulatory decisions as to nutrient limits based on the uncertain possibility that trading will alleviate the tremendous cost burdens that could be placed on municipalities and other point sources.

5- The rule should explicitly incorporate off-ramps for permittees where the TIC-generated limits are economically unreasonable or technically infeasible. The current generation of technologies which can (in many, but not all, circumstances) achieve low levels of phosphorus in public treatment plant discharges are expensive. And the lower the limit, the higher is the cost per pound of nutrients removed. For example, for the City of Lima, the incremental operating costs per pound removed are (approximately) as follows:

Monthly Permit Limit	Operating Cost per pound
1.0 mg/L +	$0.21
1.0 to 0.5 mg/L	$6.11
0.5 to 0.08 mg/L	$126.00

The capital cost to achieve a monthly average phosphorous limit of 0.08 mg/L (which is the TMDL-proposed limit) at a peak wet weather flow rate of 70 mgd is estimated to be $59,000,000 or $843,000 per mgd. This phosphorus-only cost is 19% greater than the updated removal rate for both nitrogen and phosphorus mentioned in the TSD. (Obviously, the addition of nitrogen removal would further increase Lima's cost).

Lima, though, is merely an example. All WWTPs are different and costs to achieve nutrient removal vary significantly from one plant to the next. Factors that can impact the cost of nutrient removal include permit limits and permitting approach, availability of underutilized tankage, existing loading conditions (including wet weather flow variations), site conditions, and

method of sludge disposal. Also, cost data for different geographical regions will be different as temperature impacts tank sizing and achievable level of performance. The cost information presented in the TSD does not present a complete or accurate picture of the potential cost impact for Ohio WWTPs; and the data from Maryland and Connecticut cited is technology-specific and outdated.[1]

In addition, the ability of treatment technologies to consistently achieve very low limits remains somewhat problematic. Occasional permit violations are virtually inevitable even with a well-designed and well-run treatment plant.

Another matter that any new nutrient rule should consider is flow. The nutrient-related impacts of a WWTP's discharge on a receiving stream is usually substantially less during wet weather, but the cost of achieving low nutrient limits during high flow conditions is substantially higher.

III. TECHNICAL COMMENTS - GENERAL

6- The TSD scoring system, which weights the categories based on importance/relevance to the underlying beneficial use (Biological response > dissolved oxygen > algal biomass > nutrients), is a promising framework, but needs to be fully peer reviewed and tested.

7- There are several versions of the TIC presented in the various Ohio EPA support documents. Clarification is needed.

8- The level of peer-review given to the TIC and the underlying data analyses is unclear. Although the data analysis in the Miltner (2010) paper has been peer-reviewed, the TSD is in draft form, and includes information and scoring approaches not included in the published version.

9- The TSD and Nutrient Reduction Strategy documents need to be updated and discussed before the TIC is finalized.
   - Stakeholders would benefit from a clear graphic that illustrates how Ohio EPA derived the TIC. A number of analyses were conducted and it is not clear how, for example, the Structural Equation Model (SEM) was used, and more importantly how it would be used to calculate wasteload allocations.
   - How do the thresholds of total phosphorus (TP) and dissolved inorganic nitrogen (DIN) in the Rationale and Scoring document relate to the thresholds shown in Figure 16 in the draft TSD (page 37)?
   - As Ohio EPA acknowledges, there are a number of qualifiers in the TSD that stakeholders need to understand and discuss. For example, "Seasonal collections to estimate an average condition are a workaround, but not perfect" (p. 23).
   - The Nutrient Reduction Strategy document presents several different possible default limits (as low as 0.5 mg/L) that would be used once new water quality standards are in place. It is not clear how the default limits would be determined, so that should be

[1] The facilities cited in the TSD involved BNR upgrades, and the capital cost data for those, although identified as being vintage 2006, are actually older data that has been updated to 2006.

clarified by the Agency. But we are also concerned that supplying default limits will result in widespread use of these stringent values, and imposition of onerous control requirements, when application of biological metrics will eventually show that those requirements were not necessary to protect water quality. The Agency needs to carefully consider the circumstances under which default limits could be used, so that process does not obviate the biologically-based science supporting the new standards.

10- The TIC should be test applied to a number of different water bodies/dischargers before it is used to develop and promulgate standards. This would allow the state to verify (or not) that the TIC is scientifically sound by providing direct verification data.

11- Additional discussions regarding the TIC application in NPDES permits are needed.

a. Section 5.4 of the TSD includes boilerplate language regarding the calculation of water quality-based effluent limits in the context of total maximum daily loads (TMDLs) and wasteload allocations (WLAs). We request that Ohio EPA clearly explain how the TIC-based stream nutrient targets will be used to calculate point source WLAs, as well as how those WLAs will be translated to NPDES permit limits. Given the dynamic nature of stream systems and non-toxic effects of nutrients, we suggest that it is appropriate to interpret nutrient WLAs as long-term (*i.e.*, seasonal or annual average) effluent limits.

b. The TSD states that reasonable potential to exceed the TIC could be modeled using a point source's projected effluent quality (PEQ) and "available data or default values for the downstream segments" for the other metrics. However, modeling methods and default metric values are not provided. Because dissolved oxygen, benthic algae, and biological conditions can vary across streams due to site-specific conditions, we question the validity of using default metric values in the analysis. We request that Ohio EPA more clearly describe the approach for determining reasonable potential and present the basis for its approach for stakeholder review and comment before the TIC is finalized.

c. In addition to the previous comment, additional discussion is needed regarding the other data or modeling factors that Ohio EPA will propose for determining reasonable potential. Will these be the same as described in the draft TSD: 80% flow, monthly average permit limits? Will there be minimum data quantity and quality requirements? We suggest that temperature (which can significantly influence dissolved oxygen, and perhaps other variables) should be incorporated into the model. Further, we suggest that the approach include significant flexibility to allow for consideration of site-specific factors (*e.g.*, poor habitat limiting the biological community) when interpreting reasonable potential.

12- With respect to modeling that would be used to develop wasteload allocations, it appears that Ohio EPA could model just the "segment," however that term is ultimately defined, for the point source discharge, assign an upstream concentration based on observed data, and then calculate a very stringent permit limit because there is no assimilative capacity for the metrics included in the TIC calculation. This is not appropriate given that the TIC was (presumably) developed by integrating the effects of all sources (point and nonpoint) upstream of each sampling site. Likewise, it seems like any total maximum daily loads that are developed would need to

incorporate all of the water body segments upstream of a particular segment that was considered impaired. Further, is it appropriate to apply a steady-state model using these conditions to derive monthly average permit limits when the aquatic life data represent long-term antecedent conditions?

13- The implementation of the concepts and (lack of) definition of "threatened" water body and "reasonable potential" are of concern. For example, the draft TSD indicates that 23 (21.1%) of the 109 sites with historic data were rated as Enriched/Threatened by the TIC and 7 (4.6%) were rated as impaired, even though the same sites were rated as unimpaired based on fish and macroinvertebrate assessments (p. 39). It is possible that the presence of non-nutrient related stressors (such as low head dams or metals in sediment) is confounding decisions about impairment attributable to nutrients. Examples like this demonstrate the need for additional peer review and validation of the TIC.

14- How will Ohio EPA use the TIC for stormwater permits for municipal separate storm sewer systems (MS4s)?

IV. DATA SUFFICIENCY AND REPRESENTATIVENESS

15- The TSD states that 109 sites were selected for sampling between 2004 and 2007 to "establish a gradient of anthropogenic enrichment and habitat quality" (pp. 13-14). Figure 2b shows that the percent agricultural land use varied fairly linearly from 10 to 100%. However, more than 90% of the sites sampled had 10% or less urban land use. Studies have shown that the degree of urbanization has a profound impact on biological assemblages. Thus, further analysis is required to determine whether the TIC generates consistently valid output when applied to urbanized areas, given that many, if not most, wastewater treatment facilities ("WWTF") are located in urbanized or highly urbanized areas.

16- What were the ranges in flows of the data collected? What percentage of those samples were collected at or near the 80% stream flow?

17- The TSD states that macroinvertebrates were sampled qualitatively (presence/absence) at 102 sites, 56 of which were also sampled quantitatively (pp. 15-16). For the qualitatively sampled sites, staff biologists assigned an invertebrate community (IC) ranking. Did Ohio EPA evaluate how the IC rankings based on presence/absence compare with IC rankings based on the quantitative Invertebrate Community Index (ICI)? What do those data show?

18- Daily minimum dissolved oxygen concentrations were presumed to be linked to nutrient enrichment (TSD, p. 17). However, low dissolved oxygen can also be a function of hydromodification due to dams or sediment oxygen demand. Did Ohio EPA screen the 109 sites to evaluate how these factors might change the presumed correlation? What are the results of that analysis?

19- Has Ohio EPA conducted any sensitivity analyses to determine the level of confidence and conservativeness of the TIC, as well as the application procedures for using the TIC? What is the result of those analyses?

V. APPLICATION OF THE TIC

20- The TSD discusses measuring data "downstream" from WWTFs to determine reasonable potential to contribute to excursions of the water quality standards (p. 51), but doesn't define what downstream means.

21- The TSD doesn't discuss how to integrate or interpret data from multiple sampling stations.

22- The application and interpretation of biological data in the TIC is unclear. Specifically, Ohio EPA should discuss: (a) the process by which macroinvertebrate and fish are evaluated simultaneously together to develop a single, "biological assemblage" score, and (b) the definition of "within the range of non-significant departure," the basis for this definition, and how this threshold will be applied in practice.

23- The amount of data needed to apply the TIC is unclear. The TIC was developed from a limited (for example, geometric mean of 3 to 6 samples collected during the summer) set of data. The TSD doesn't discuss how many samples would be needed or when they should be collected. If this obligation is going to devolve on the regulated community, reliable information regarding the time and cost of acquiring and analyzing the data needs to be developed before the obligation is imposed. Also, the water quality data are point estimates of summer water quality conditions; the macroinvertebrates, fish, and periphyton reflect long-term antecedent conditions. This is acknowledged in the TIC (page 23) but raises implementation questions – should these be seasonal limits, appropriate timing of data collection, etc.

24- The documents present recommendations for implementing both nitrogen and phosphorus limits, with the exception of the Miltner paper which proposes a "soft target" of DIN of 1.1 mg/l. It is unclear under what circumstances Ohio EPA would impose limits for one or both parameters. Much of the TSD discusses the fact that phosphorus is limiting in the streams and state that phosphorus removal is <u>likely</u> the most cost-effective alternative for wastewater treatment facilities. (Emphasis supplied.) However, the documents also state that "an across-the-board 3.0 mg/L DIN criterion is proposed..." but that "DIN limits for point sources are not likely to be a matter of routine in cases where impairment is demonstrated" unless phosphorus controls do not work (page 49). Later on (page 52 in the TSD and page 3 of the Miltner paper), they introduce the idea of default DIN and TP limits of 10.0 and 1.0 mg/L, respectively. These statements are confusing at best and inconsistent at worst. Ohio EPA should clarify how effluent limits using the TIC will be developed.

25- The adaptive management (AM) approach presented in the TSD needs additional consideration of costs for WWTFs to achieve nutrient reductions. As presented, the AM approach appears to allow a facility to achieve 10/1 limits for DIN and phosphorus, presumably through upgrades, and then use water quality trading to meet TIC requirements. In theory, water quality trading provides WWTFs with a method to cost-effectively offset nutrient loads instead of installing traditional treatment upgrades. For some WWTFs, it may be much more cost-effective to engage in water quality trading to offset the entire load to meet any nutrient requirements, instead of having to expend substantial funds on the upgrade for compliance with the initial limits and then have to pay nonpoint sources to achieve the additional necessary load reductions. If Ohio EPA intends to allow water quality trading for offsetting nutrient loads, it should be allowed to be used for the entire offset required.

26- The TIC verification efforts should be more robust before it is used to set permit limits. In the TSD, TIC verification efforts were limited: the TIC was used to evaluate 1) water quality below three treatment facilities in the Great Miami River (page 39) and, 2) the potential interpretations/conclusions of the TIC approach when applied to historical, statewide data (pages 39-43). In both cases, the data needed to apply the TIC were incomplete and the results were generally used to show how TIC scores would be interpreted, not necessarily to verify that the approach works – i.e., that the TIC shows that impaired sites are indeed impaired and vice-versa. That may be what the discussion on the bottom of page 39 attempted, but data were lacking and the results are not convincing.

Further, the example for the Great Miami River tributaries (TSD, Table 12, page 40) calculates TIC values of 2-12 for each segment in the three tributaries. If a point source (WWTF or municipal separate storm system) were to discharge to these tributaries, what would the permit limits be?

The TIC needs verification using complete data from streams that are known to be impaired and not-impaired or, better yet, for streams that are impaired/not impaired for each component (nutrients, dissolved oxygen, etc.) of the TIC. This would help demonstrate whether and how well the TIC can differentiate among effects associated with each component. Verification should also include a "real-world" demonstration of how results will be used for NPDES-related decisions – *i.e.*, deriving wasteload allocations, total maximum daily loads, reasonable potential analyses. These issues are generally addressed only qualitatively in the existing documents.

27- The TIC approach introduces a new, intermediate category of "impairment." Instead of simply being impaired/non-impaired, a water body segment can be "threatened." The adoption of a "threatened" category without adequate definition, protocols, and limitations is of concern. As was stated in comment 1, limits should not be imposed if a water body is meeting biocriteria, unless there is compelling evidence that nutrient limits on point sources will, and are necessary to, ensure that the water body will continue to meet biological standards.

28- Ohio EPA should clarify how the TIC would be used to demonstrate reasonable potential. Currently, the TSD says that a "threatened" water body segment has reasonable potential to exceed standards, and would require limits. However, the data presented in the TSD indicate that a water body segment could be threatened because of poor habitat. Nutrient limits would not alleviate these situations.

29- Ohio EPA should provide more documentation about how it derived the 80th percentile flow value, as well as how that relates to applying appropriate permit averaging periods (monthly v. annual). For example, how does the proposed 80th percentile compare with the 7Q10 flow commonly used to calculate wasteload allocations and permit limits? In general, we would expect the 7Q10 to be smaller but the relationship will likely be stream or basin-specific. OPEA should present the flow derivation process and permitting implications in more detail so that stakeholders can better evaluate the impact of these decisions.

30- The 2011 draft nutrient strategy document references incorporating the TIC approach in the overall NPDES program. Information about the TIC presented in this document appears to reflect an early version of the TIC process and associated scoring procedure. According to page 3 of Miltner's "Development of Nutrient Water Quality Standards for Ohio: Reconciling

Environmental, Regulatory, and Administrative Realities" document, the Ohio Nutrient Reduction Strategy is scheduled for completion in 2013. It is essential that a final TIC development document be prepared and subject to comment before the strategy document is completed. Also, the 2013 strategy document may help clarify Ohio EPA's position on many of the big picture policy decisions/implications identified in the existing documents.

31- The TIC does not appear to distinguish between point and nonpoint sources. As point sources apply more stringent treatment levels, it becomes more difficult to reduce the dissolved nutrients that are readily available for uptake by algae and other plant growth. This means that the particulate fraction of total phosphorus in effluent increases relative to other sources (such as agriculture). Did Ohio EPA do any analyses of the data using ortho-phosphate as opposed to total phosphorus?

VI. CLARIFICATION QUESTION

32- On page 16 of the TSD, it states "DIN was used in lieu of NOx as the two are statistically equivalent (see Table 1), and DIN would likely be used in management. DIN was forced in favor of TP because it showed a stronger association with benthic chlorophyll (Table 1)." However, Table 1 was not included in the Ohio EPA-provided materials.

The City appreciates the opportunity to comment, and would be pleased to be invited to participate in an Advisory Panel to help in the further evaluation, development, and implementation of the TIC.

Very truly yours,

Stephen P. Samuels

NACWA
A Clear Commitment to America's Waters

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May 22, 2013

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RE: Ohio EPA's Early Stakeholder Outreach/Developing Rules to Reduce the Impacts of Nutrients in Surface Water

Dear Rule Coordinator,

The National Association of Clean Water Agencies (NACWA) appreciates the opportunity to comment on the Ohio Environmental Protection Agency's (Ohio EPA) Early Stakeholder Outreach (ESO) notice regarding the proposed development of nutrient criteria for Ohio. NACWA represents more than 280 public wastewater treatment utilities across the country, including 11 wastewater utilities in Ohio that will likely be directly engaged with Ohio EPA as its rulemaking proceeds.

Nutrient-related impacts are arguably the top water quality challenge currently facing our nation's waters and NACWA is committed to working toward science-based and rational approaches to address *all* sources of nutrient pollution. Reliance on nutrient control strategies that do not account for the varying ecological effects of nutrient pollution will result in major expenditures for point sources with minimal or no improvement to water quality for many waters. Since it began work in 2002 to establish a nutrient control program, Ohio has been a national leader on efforts to develop criteria that are scientifically sound and that effectively link nutrient concentrations to actual water quality impacts.

States need room to innovate and try new approaches that do not necessarily fit a national mold. While the U.S. Environmental Protection Agency (EPA) has continued to press states to develop numeric nitrogen and phosphorous criteria for all waters, it has begun to better recognize that it must be flexible in its expectations to enable innovation. Beginning with its March 2011 memorandum, *Working in Partnership with States to Address Phosphorus and Nitrogen Pollution through Use of a Framework for State Nutrient Reductions*, EPA acknowledged that while it would like to

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"maximize progress" toward reducing nutrient discharges in all states, "states need room to innovate and respond to local water quality needs". Ohio's proposed approach to addressing nutrient-related impacts as outlined in the ESO – numeric criteria directly linking nutrients with impacts on designated uses based on measures of stressor variables – is entirely consistent with and advances the goals of EPA's 2011 memorandum.

General Nutrient ESO Approach

Ohio EPA has laid out a strong proposal that utilizes the wealth of water quality information it has collected over the last decade and that seeks to strike the right balance in controlling nutrient discharges relative to impacts on designated uses. The multi-metric scoring system (the Trophic Index Criterion or "TIC") for determining impairment of streams and rivers outlined in the Nutrient ESO is a strong, weight-of-evidence approach that will better account for the varying impacts nutrients can have on different waterbodies. In its April 2010 report, *SAB Review of Empirical Approaches for Nutrient Criteria Derivation*, EPA's Science Advisory Board (SAB) stressed the importance of "establishing linkages among designated uses and measured responses, stressors and measures of stressors"... and " relating measures of stressors directly to deleterious effects on designated uses" when developing nutrient criteria. Unlike other approaches such as EPA's eco-regional criteria, Ohio's TIC will better accomplish these objectives.

Though important questions remain regarding the implementation of the TIC, NACWA supports the state's efforts to use a system that will better consider in-stream stressor and response variables in an integrated fashion to determine the need for control measures. U.S. EPA has previously insisted that numeric values for the key stressor variables be independently applied when determining impairment or the need for an effluent limit. Only very recently however, with statements regarding criteria efforts in Florida and Maine, has EPA begun to recognize the validity of a weight of evidence approach like the TIC proposed by Ohio.

Though Ohio may be uniquely positioned to develop and use the TIC given the extensive water quality information it has available, the success of Ohio's weight of evidence approach will have national significance in terms of providing a potential model for other states that are struggling to address impacts related to nutrients.

Implementation Challenges

NACWA understands that concerns will be raised with the proposed nutrient targets Ohio EPA is considering. This is an issue that many states are struggling with – establishment of nutrient criteria that push wastewater utilities to the limits of technology and beyond – and U.S. EPA is working to provide more guidance to the states in this area. NACWA urges Ohio EPA to maintain an active and open dialogue with the public wastewater community on this issue throughout the rulemaking process. Ohio's proposed inclusion of adaptive management concepts that would allow for evaluation of nonpoint source reductions and more cost-effective control measures prior to imposition of final nutrient targets for point sources, is an important element that can help ensure that Ohio is investing in those management actions that will provide the biggest water quality benefit.

Along the lines of adaptive management, integrated planning, as contemplated by U.S. EPA in its June 2012 Framework, should play an important role in Ohio and across the country as more states look to develop nutrient control strategies. Affordability considerations and flexible implementation timeframes should factor

heavily in the implementation of the nutrient reductions contemplated by the Nutrient ESO given the Clean Water Act obligations many Ohio communities are already working hard to complete.

Nonpoint Source Contributions

The Nutrient ESO indicates that where a stream or river is threatened or impaired both effluent limitations for point sources and "nonpoint source load reduction goals" will be developed. The scope and enforceability of the nonpoint source "reduction goals", however, are poorly defined and largely listed as "voluntary". It is well-documented that agricultural and other nonpoint sources are significant contributors to nutrient impairment of waterbodies across the country and in Ohio. Any effective nutrient control program must contain meaningful reduction requirements for nonpoint sources. The establishment of accountability frameworks for nonpoint sources at the state level must be a top priority if progress on controlling the negative impacts of nutrients is going to be made. These frameworks would include a quantitative allocation process for all sources, performance standards (to enable progress monitoring), and implementation drivers (e.g., loss or redirection of funding for nonpoint source management to the extent possible under current law). Ohio should consider using state authority to include these elements in its final nutrient control strategy.

* * *

Again, NACWA appreciates the opportunity to comment on Ohio EPA's ESO notice regarding the proposed development of nutrient criteria in Ohio. The proposed approach Ohio EPA has presented for stakeholder comment is an important step in the right direction.

If you have any questions, please contact me at chornback@nacwa.org or 202/833-9106.

Sincerely,

Chris Hornback
Senior Director, Regulatory Affairs

NAVISTAR
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To: Ohio EPA – DSW

From: Lisa P. Silva
Environmental Engineering Supervisor

Date: May 22, 2013

Subject: Early Stakeholder Outreach
Developing Rules to Reduce the Impacts of Nutrients in Surface Waters

Navistar, a manufacturer of medium and heavy duty trucks, would like to submit the following comments for consideration in the Nutrient Rulemaking Process:

Navistar is currently in an NPDES Renewal process which includes the issue of Phosphorus regulation. The following is an excerpt of comments submitted within the permit renewal process. Multiple concerns are addressed throughout these comments.

Phosphorus Limit

We are concerned with the proposed limit of 2.501 mg/L is too restrictive and was not adequately supported by the accompanying Fact Sheet.

OEPA determined the limit by "averaging the PEQs for four different wastewater treatment plants in the area, Bellefontaine WWTP, Indian Lake WPCF, Quincy WWTP and Jackson Center." Fact Sheet at 13. Navistar does not believe that simply averaging the PEQs from four publicly owned wastewater treatment facilities is an appropriate method of determining a limit. This appears to us to be an arbitrary method of determining a limit. No rationale was given for the choice of these facilities. No analysis was provided as to the nature of the incoming wastewaters or capabilities of the treatment facilities. Based on the limited information provided, it appears that each of these facilities is a low flow public wastewater treatment plants with primarily sanitary sewage influent. At least three of the four facilities have recent permits beginning in 2011. In addition, in our review of the permits for those facilities, we could find no effluent discharge limits at all for phosphorus. We request clarification on this point for the basis of the limit proposed for our facility.

Furthermore, no analysis was provided that a limit this restrictive is needed or will address conditions in the Moore Run. This is particularly of concern as OEPA noted that a previous study by Navistar had found that further phosphorus controls were not possible under current processes. Therefore, OEPA essentially proposes a limit that forces process or wastewater treatment plant changes, with accompanying expenses, while not determining that this effluent level would actually address issues in the stream. Indeed, it appears arbitrary and capricious to establish an effluent limit without establishing a water quality standard. Without the water quality standard, there is no way to measure the effectiveness of the effluent standard. This is particularly the case since, as discussed below, the TMDL established impairment causes other than phosphorus in the assessment unit.

Moreover, OEPA states that the effluent from Outfall 001 has been "high" and "extremely high" at various places in the Fact Sheet. OEPA also notes in the same paragraph that no water quality standard exists in the Ohio River basin for phosphorus. Very little analysis has been made as to what

level of phosphorus constitutes a high level. That is true both for the proposed effluent limit and the (currently nonexistent) water quality standard in the receiving stream.

The Fact Sheet asserts that the Total Maximum Daily Load for the Mad River Watershed, Final Report, December 18, 2009 (2009 TMDL) found that Navistar was

[A] source of high phosphorus levels in Moore Run. High levels of phosphorus in Moore Run have led to nutrient enrichment and impairment of the designated use.

However, a reading of the 2009 TMDL only characterized Navistar's discharge as "high" in connection with one discrete discharge event. 2009 TMDL at 27-28. Moreover, while the TMDL did discuss phosphorus in general terms, it actually addressed only the impairment causes of habitat alteration, flow alteration and bacteria for the relevant assessment unit. The 2009 TMDL summary of impairments and actions did not specifically establish nutrients, such as phosphorus or nitrates, as an impairment cause in need of an action. 2009 TMDL at Table 1. The 2009 TMDL also did not specifically state that an NPDES limit for phosphorus was an action necessary to address an impairment cause. As such, the actions set out in the 2009 TMDL may be sufficient to address any existing identified impairments in the relevant assessment unit. As the 2009 TMDL itself states: "Permits issued under the NPDES program must be consistent with the point source recommendations in a TMDL that has been approved by the U.S. EPA." 2009 TMDL at 43. The 2009 TMDL did not contain specific point source recommendations as to phosphorus effluent limits.

Moreover, Navistar is concerned that this requirement can lead to unintended consequences. The common treatment method for phosphorus involves the use of ferric chloride, which can in turn create salt management issues.

Section 3745-33-05(A) of the Ohio Administrative Code sets out the authorization for setting effluent limits in NPDES permits:

(1) Except as provided by paragraph (G) of this rule, for each point source from which pollutants are discharged, the director shall determine and specify in the permit the maximum levels of pollutants that may be discharged to ensure compliance with:

(a) Applicable water quality standards; and

(b) Applicable effluent limitations, which shall be the national effluent limitations and guidelines adopted by the administrator pursuant to sections 301 and 302 of the act, and national standards of performance for new sources pursuant to section 306 of the act, and national toxic and pretreatment effluent limitations pursuant to section 307 of the act; and

(c) Standards that prohibit significant degradation of the waters of the state, if the point source was installed or should have been installed pursuant to a permit to install under Chapter 3745-42 of the Administrative Code; and

(d) Any more stringent requirements necessary to comply with a plan for area-wide waste treatment management, approved pursuant to section 208(b) of the act; and

(e) Any more stringent limitations required to comply with any other state or federal law or regulation.

Navistar does not believe that these standards were met in the proposed permit. First, since there is no applicable water quality standard, the first provision, 3745-33-05(A)(1)(a), cannot apply. As discussed above, it does not appear to Navistar that OEPA went through requisite determination for any of the remaining requirements. In fact, if OEPA is relying upon the 2009 TMDL, it appears from that document that habitat impairment was the primary cause of adverse conditions. There is no analysis in that or other document that Navistar is aware of that clearly establish that phosphorus from the Navistar facility was the cause of adverse conditions or the determining the appropriate effluent level (considering impacts from other impairment causes) to address the impairments.

Therefore, we believe the proposed limit of 2.501 mg/L is too restrictive and should be developed based upon a more scientific approach.

In addition to the concerns expressed in the comments above, Navistar would also like to state a preference for numeric criteria should criteria be adopted. Applicable conditions in narrative could aide in the understanding of when or how criteria applies and provide direction to an appropriate numeric criteria.

Please contact me at (937) 390-4026 should you have any questions. Thank you for consideration of Navistar's comments and concerns.

Lisa P. Silva, P.E., CHMM, QEP
Environmental Engineering Supervisor

Northeast Ohio Regional
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May 22, 2013

Re: Early Stakeholder Outreach: Developing Rules to Reduce the Impacts of Nutrients in Surface Waters

Dear Rule Coordinator:

The Northeast Ohio Regional Sewer District (NEORSD) appreciates the opportunity to participate in Ohio EPA's effort to develop rules to reduce the impacts of nutrients in surface waters through the Early Stakeholder Outreach process. NEORSD is supportive of the effort being made by the Ohio EPA to involve stakeholders early in the rulemaking process. The excess eutrophication observed in Lake Erie and Ohio's inland lakes in recent years highlights the need for Ohio EPA to develop rules to address the impacts of nutrients in Ohio's waterways.

In most cases nutrients do not represent toxic inputs to a water body and should not be treated as such. Therefore nutrient water quality targets should not be developed on the assumption that less is better and that a threshold applicable to all waters will be adequately protective. The weight-of-evidence approach proposed by Ohio EPA recognizes the need to develop methodologies based on actual in-stream biological conditions. NEORSD supports this approach, including the use of a complete suite of adaptive management concepts (not limited specifically to nutrient trading) to provide flexibility in the implementation of nutrient reductions. This will allow for the use of more cost effective nutrient reduction strategies prior to imposition of final nutrient targets, if necessary, for point sources.

While NEORSD supports the Ohio EPA developed Trophic Index Criterion or TIC to determine the level of nutrient impairment in streams and believes that biologically-based criteria is a preferable approach, clarification regarding the actual calculation of the TIC score is necessary. TIC scoring questions include:

1. At what spatial relationship to a point source discharge will the downstream biological, nutrient concentration, dissolved oxygen, and benthic chlorophyll *a* TIC points be determined for calculation of the TIC score (immediately downstream, at the edge of the mixing zone, downstream receiving water, an average of scores from a stream segment or watershed, etc.)?

2. From what time period will the data be used (the past year, the past 5 years, averages or medians, worst-case scenario, best-case scenario, etc.) to calculate the TIC score?

3. How will values used to determine TIC scores be aggregated, will all data be treated equally, or will some periods or events be more highly weighted?

4. How frequently will TIC scores be calculated?

5. Will all available credible data be considered in determining TIC scores?

6. How will situations where partial biological attainment exists be addressed in calculating a TIC score?

7. According to the *Trophic Index Criterion – Rational and Scoring* document sites with marginal biological performance (i.e. non-significant departure) and one indication of over-enrichment will be listed as impaired even if the TIC score indicates a higher classification. Would this same downgrading of scores also apply to sites in non-attainment? It is possible for a site to fail the biological criteria, have a normal dissolved oxygen variation, and receive a one (1) in both the benthic algae and nutrients categories resulting in a score indicative of "Threatened" water body. Would such a site also be downgraded to "Impaired"? (See "A Note on TIC Categorical Levels").

In addition, NEORSD has concerns surrounding the use of the TIC score in the development of wasteload allocations (WLA) and water quality based effluent limits (WQBELS). WLA and WQBEL implementation questions include:

1. In some cases, the TIC score in a waterbody will show improvement while not yet reaching the "Acceptable" level. How will this be addressed?

2. How will the Ohio EPA evaluate a point source nutrient contribution to determine that controls on that point source will lead to improvements in environmental conditions?

3. NPDES permit limits based on weekly and monthly concentration averages were developed to control toxic pollutants and/or to address wastewater treatment plant (WWTP) variability. This does not make sense for nutrients as the impacts occur over much longer periods of time. Is Ohio EPA considering seasonal and/or annual loading limits?

4. The current reasonable potential process was developed for toxic pollutants and is not completely suited for nutrients. What will the reasonable potential process for nutrients look like?

5. What is the basis of using stream design flows at the 80th percentile exceedance level? These will be overly conservative as instantaneous loading does not play a significant role in nutrient eutrophication. Because of the theory behind them, harmonic mean flows would be more appropriate, especially if applied seasonally.

6. How will other sources of nutrients to the water body be evaluated to assure that the desired outcome is achieved without excess cost?

NEORSD generally supports the weight-of-evidence based approach Ohio EPA is considering. However, NEORSD is concerned with the values that Ohio EPA has presented to derive water quality based effluent limits if nutrient over-enrichment exists. The values presented in the Early Stakeholder Outreach of 0.13 mg/L total phosphorus (or 0.16 mg/L as presented in the conceptual design of the TIC flow chart) and 3.0 mg/L dissolved inorganic nitrogen could result in NPDES permit limits that have not been demonstrated to be achievable with current technologies. Therefore, NEORSD encourages Ohio

EPA to reconsidered the proposed values and consider target values that would result in more realistic NPDES permit limits. In addition, further discussion is necessary as to whether proposed interim limits of 1.0 mg/L total phosphorus and 10 mg/L dissolved inorganic nitrogen are appropriate.

Even with further reduction in nutrients at point sources like the NEORSD WWTPs, there is no evidence that stream nutrient targets will be met as there are significant non-point sources of nutrient loadings that are not addressed in this rule-making. It is well documented that agricultural and other nonpoint sources contribute significantly to Ohio's nutrient impairments. To that end, NEORSD encourages the Ohio EPA to continue working with the Ohio Department of Agriculture and the Ohio Department of Natural Resources to determine nutrient reductions for all sources and to include cost-benefit analyses to determine the most cost-effective, environmentally-beneficial mechanisms to reduce nutrient loadings. Without mandatory controls on nutrients from non-point sources, significant reductions from point sources in most cases will not lead to measurable environmental improvements. Ohio EPA must evaluate the relative nutrient contributions from point sources prior to determining applicable limits as NEORSD is concerned that point sources will be required to install treatment technologies that will do little to address nutrient issues in impaired or threatened waterbodies. NEORSD also continues to encourage Ohio EPA to implement the recommendations of the Point Source and Urban Runoff Nutrient Workgroup specifically including the development of a state-wide mass balance to account for point and non-point sources of nutrients and allow for the development of an effective and equitable nutrient reduction program.

The Ohio EPA nutrient rule has the potential for significant impacts at NEORSD's three WWTPs as further reductions in nutrient discharges will lead to increased wastewater treatment costs without commensurate environmental benefit. The District is already facing a high financial burden to comply with a USEPA Combined Sewer Overflow (CSO) Consent Decree. NEORSD would like Ohio EPA to consider integrated planning and the Ohio Law found at O.R.C. 6111.03(J)(3) to allow flexibility in the implementation of nutrient reductions at point sources to allow NEORSD and other communities to address the economic reality that nutrient reductions pose.

Lastly, along with the other members of AOMWA, the NEORSD invites the Ohio EPA to convene an advisory group of stakeholders to work with the agency in the development of rule language to implement nutrient criteria. The implementation issues associated with this rule-making will be crucial in developing a program in the state of Ohio that will lead to meaningful environmental improvements.

If you have any questions regarding the issues raised in this letter please contact Elizabeth Toot-Levy of my staff at toot-levye@neorsd.org or 216-641-6000.

Sincerely,

Julius Ciaccia
Executive Director

cc: Regulatory Compliance Advisory Team
Gregory Binder, Engineering Program Manager
Seth Hothem, Senior Investigator

Harris, Melinda

From: Bill Meinert <Bill.Meinert@obg.com>
Sent: Tuesday, May 21, 2013 11:14 AM
To: EPA dsw_rulecomments
Subject: OEPA Early Stakeholder Outreach - OAC 3745-1 - Comments by O'Brien & Gere

O'Brien & Gere has been active in nutrient reduction programs, including the Chesapeake Bay, for decades, and have several Midwest offices including Cincinnati OH. Personally, I participated in OEPA's 2012 Point Source & Urban Runoff Nutrient Workgroup. Our engineering teams currently represent five point-source owners with pending plant upgrades, where nutrient reduction may or may not be required.

Thank you for the opportunity to submit. Our comments, by 5/22/13 (5PM), are as follows:

1. Included as Key Recommendation #1 in the 2012 Point Source & Urban Runoff Nutrient Workgroup report, a state-wide nutrient mass balance sheet that accounts for significant point and non-point sources of nutrients (Nitrogen, Phosphorus) would be very helpful to establishing a baseline, evaluating important metrics such as annualized cost per pound removed, prioritizing nutrient reduction, and monitoring progress. This "mass balance" was critical to understanding and prioritizing reductions in the 30+ year-old Chesapeake Bay Program, for example.

2. The March 2013 Division of Surface Water Fact Sheet, Early Stakeholder Outreach – OAC 3745-1, Developing Rules to Reduce the Impacts of Nutrients in Surface Waters, states "Agriculture is currently exempt from most CWA regulations so water quality criteria cannot be translated into specific individual producer requirements. However, the criteria may be used to identify waters impaired by nutrients." How would nutrient reduction goals be assigned and achieved for watersheds that include both significant point and non-point source contributions? Are potential nutrient trading programs, such as the one under development by EPRI, not available to Ohio point-sources given the limitation in applicability of these regulations? USEPA has set a precedent with the Chesapeake Bay TMDL in working with the agricultural community to reduce non-point source pollution. Is OEPA following this lead? Also, additional regulations on stormwater discharges through expanded MS4 permits is being used to help attach other non-point sources. Is OEPA following this lead?

3. Included as Key Recommendation #2 in the 2012 Point Source & Urban Runoff Nutrient Workgroup report, OEPA should encourage and promote operational experimentation at wastewater treatment facilities aimed at achieving low cost nutrient removal solutions. With respect to the point source contribution, it is critical that NPDES Permitting provides adequate flexibility to POTW owners and operators to experiment with minor capital and operational adjustments to achieve nitrogen and/or phosphorus removal. If adopted, each plant will require a site-specific solution, experimentation is an effective way for Ohio stakeholders to learn what is possible in a "first phase" of implementation. "Early adopters" (volunteers) are critical to moving forward with such a proposed program, and will allow initial plans (scope, budgets, schedules) to be refined.

4. Such a proposed Ohio nutrient reduction program must address early and often the issue of "fairness" and "flexibility". If state-wide nutrient rulemaking is adopted, how will OEPA answer the public and key stakeholders with respect to equity issues, including: 1) Lake Erie vs. Ohio River on water quality issues and solutions; 2) funding for experimentation and implementation by early adopters (training, engineering, construction, and possibly O&M costs); and 3) Far-field effects and benefits of nutrient reduction vs. local-water quality TMDL requirements?

5. How does the proposed rulemaking consider the proposed Gulf of Mexico Initiative, announced in 2008 to include a watershed-wide (33 states, including approximately 2/3rds of Ohio (Ohio River valley)) TMDL? Is the proposed science of assigning narrative and numeric nutrient criteria in Ohio consistent with initial and current GOMI plans?

6. How does the proposed rulemaking consider the on-going Great Lakes Restoration Initiative, which includes approximately 1/3rd of Ohio (Lake Erie watershed)? Is the proposed science of assigning narrative and numeric nutrient criteria in Ohio consistent with past and recently-announced Lake Erie findings and recommendations for further action? (Reference – Fiscal Year Annual Reports to Congress and the President)

7. Has OEPA considered the analysis and recommendations in the recently-published WERF Final Report "Modeling Guidance for Developing Site-Specific Nutrient Goals"? As the announcement of the Nutrient Modeling Toolbox stated "Strong science is the hallmark of the Clean Water Act … directed to develop water quality criteria that is effects based; reliance on all aspects of water quality – chemical, biological and physical, process for assessing concentration and dispersal of pollutants; and on the effects of pollutants on response variables such as biological community diversity, productivity, and stability, including eutrophication and rates of organic and inorganic sedimentation for various water bodies." As the report suggests, not all models are equal in deriving site-specific limits. How would the proposed rulemaking consider both local near-field and far-field effects of nutrients? Will OEPA consider utilizing the screening criteria presented in the report to identify any alternative means to derive sub-watershed or watershed nutrient limits?

8. How might point-to-point or non-point-to-point source nutrient trading be incorporated into the proposed trophic index criterion (TIC) methodology, including recommended actions resulting from the proposed rationale and scoring system?

9. Consistent with Chesapeake Bay and GOMI program development, and associated USEPA memoranda, it is highly recommended that annual average goals or limits, not monthly average or weekly maximum limits, be assigned when nitrogen or phosphorus limits are driven by state-wide or watershed-wide nutrient reduction programs. Also, the proposed rulemaking mentions potential nutrient removal permit limits of 10 and 1. All references appear to state Total Phosphorus (TP) (1 mg/L). With respect to Nitrogen, one reference suggests Total Nitrogen (TN), another suggests that the 10 mg/L limit is Dissolved Inorganic Nitrogen (DIN) (nitrite + nitrate + ammonia, as N). A TN measure, at or around 10 mg/L goal or limit, is more consistent with other nutrient reduction programs' "initial phases".

10. If such a proposed nutrient reduction program is adopted, what would be the available sources of funding – loan and/or grant? To the issue of "fairness", how might costs be covered by all stakeholders benefitting from the nutrient reductions? Agriculture? Septic systems? Other?

Would much appreciate an email reply to confirm receipt. Again, thank you.

Bill

O'BRIEN & GERE
William J. Meinert, P.E.
VICE PRESIDENT

O'BRIEN & GERE

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_____

OhioCorn&Wheat
Growers Association

OCWGA 59 Greif Parkway, Suite 101 Delaware, OH 43015
740.201.8088 www.ohiocornandwheat.org

March 22, 2013

Rule Coordinator
Ohio EPA, Division of Surface Water
PO Box 1049
Columbus, OH 43216-1049

RE: Early Stakeholder Outreach – OAC 3745-1
Developing Rules to Reduce the Impacts of Nutrients in Surface Waters

To Whom It May Concern:

As representatives for Ohio's grain farmers, we appreciate the opportunity to comment on the early stakeholder outreach for OAC 3745-1.

While we understand that agriculture is exempt from most of the Clean Water Act regulations, we want to be engaged in this process as water quality standard (WQS) programs can impact nutrient usage, a vital input for any grain farmer, can affect federal farm conservation programming and be used as a baseline for many other regulatory entities and agencies.

Certainly water quality is everyone's business and we applaud the Agency's proactive approach to addressing Ohio's needs. Recognizing the uniqueness and complexity of developing standards for any watershed, it is appropriate to address those at the state level instead of having the U.S. EPA promulgate those rules for us. We also support taking a fact-based and scientific approach to the data collection and measurement and goal setting needed for any successful WQS program.

If we are to transition from a narrative to a numeric criterion, it is practical to have multiple factors when establishing the trophic index criteria (TIC). Looking at the biological community is an important factor to help measure the effectiveness of any numeric targets as those can be difficult to quantify in an ever changing watershed and complex ecological system.

However, with the rules and language in development, it is difficult to specifically comment on the impact of the potential changes under OAC 3745-1. We remain committed to working with your Agency to establish appropriate and effective standards for Ohio and ask for the opportunity to remain engaged throughout the rule-making process.

We appreciate the early outreach and look forward to continuing to work with you on this important issue.

Sincerely,

Tadd Nicholson
Executive Director
Ohio Corn & Wheat Growers Association

Ohio Environmental Council
[UNLEASHING THE POWER OF GREEN]
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Columbus, Ohio 43212
614 487-7506
www.theOEC.org

Rule Coordinator
Ohio EPA, Division of Surface Water
P.O. Box 1049
Columbus, Ohio 43216-1049

May 21, 2013

Dear Rule Coordinator,

Comments on Ohio Environmental Protection Agency's (OEPAs) Nutrient Standard Proposal

Submitted by The Ohio Environmental Council (the OEC)

We appreciate the opportunity to make early Stakeholder comments regarding the OEPA proposed nutrient standard for Ohio. The OEC strongly supports the prompt adoption of a nutrient standard for Ohio that is protective of water quality and of aquatic life. We also appreciate that the standard must be realistic and attainable.

As Ohio's oldest and largest statewide environmental advocacy group, we work with networks of conservation organizations, sporting enthusiasts and business groups who understand the crucial importance of clean water to their communities and businesses. The approval of a protective nutrient standard rule is regarded as essential by these groups. We have also worked closely with the agricultural community. They acknowledge the need to better control nutrient runoff from their farms, and have expressed support and acceptance of a rule that is fair and science-based.

We have reviewed a draft of the proposal released last year, as well as the material in the Agency's notice dated March 21,2013, and we are led to believe that the current proposal language remains similar to that earlier version.

We have listed several areas of concern below:

<u>Area of concern 1: Relative weighting of TIC indicators;</u>

Responding to USEPA's requirement that states must develop a method for quantifying the nutrient loadings for streams and lakes within their jurisdiction, Ohio EPA has proposed a "numeric standard" that integrates several factors. Ohio's proposed standard includes a complex matrix of factors, called a Trophic Index Criterion (TIC). The matrix includes measurements for four separate indicators of water quality, including:

- Biological Assemblages - an assessment of the health and diversity of aquatic biology in the water body. (Weighted at 0 - 12 points)

(over, please)

- Dissolved Oxygen - an assessment of the ranges of variation in dissolved oxygen between daytime levels and night time levels. (weighted at 0-12 Points)

- Benthic Algae - a measurement of the amount of algal growth in the water body. (Weighted 0 - 8 points)

- Nutrients - a numeric measurement of the nutrient concentration in the water body. (Weighted at 0 - 6 Points)

We appreciate the usefulness and importance of each of these measurements and support their inclusion in the index, however, we are concerned that the various indicators are weighted differently, with Biological Criteria and Dissolved Oxygen indicators weighted on a scale of 0-12 points, Benthic algae weighted on a 0-8 scale and Nutrients weighted on a 0-6 scale. Within the TIC, each criterion is assessed individually and given a score. The scores for the various indices are then added together to achieve a final TIC score.

We are concerned that the weighting differential between the various indicators can effectively reduce the importance of some indicators (Nutrients) relative to others (Biological Assemblages or Dissolved Oxygen swings). The net result could be that high nutrient concentrations, which can drive excessive swings in dissolved oxygen and promote excessive algal growth, may be considered as much less important than the other factors, even though those other factors may be driven by nutrient loads.

We appreciate that each of these indicators is related to the others and that with all other factors being equal, they will move together, however, we urge the rebalancing of the weighting of the respective indicators to avoid the possibility of waters with a high nutrient load actually meeting the nutrient standard in a flowing stream but causing extreme harmful algal growth once they reach an area of calm receiving waters.

<u>Area of concern 2 - Inclusiveness of the nutrient rule</u>:

Our second area of concern with the proposal deals with the inclusiveness of the standard. We understand that differences exist between small, medium and large streams, but we believe that they all deserve to be protected by a standard. The OEC believes that Ohio's larger streams (over 500 square miles) need a protective standard and we also believe that headwaters streams, including Modified Warmwater Habitat need protection. We acknowledge that the resources of Ohio EPA are limited and that the protecting the numerous headwaters streams and ditches would overly tax Ohio EPA staff. We would suggest that headwaters streams and Modified Warmwater habitat be prioritized with those connecting to impaired streams being given priority, but with no streams exempted.

(over, please)

Areas of Concern 3 - mechanism for considering impact on receiving waters:

The OEC has expressed our concerns about the possibility that using the proposed TIC formula might allow receiving waters to become impaired despite tributary streams meeting standards. We have received verbal assurances that the condition of receiving waters would be factored into the management of upstream tributaries. We believe that any proposed rule should include specific language about how this would occur:- (What measurement indicators thresholds in receiving waters would trigger an adjustment in upstream management?)

Area of Concern 4 - Need for the inclusion of Mussel species in Biological Assemblages;

We also believe that the Indicator "Biological Assemblages" should be broadened to include mussel species, as they have proven to be a useful indicator species for ammonia and other nutrients.

We appreciate the opportunity to contribute these comments and look forward to working with OEPA staff to refine the rule language and achieve a protective rule for Ohio's surface waters.

Please do not hesitate to call or email for any needed clarification.
OEC office, Direct line - 614 487-5830
Cell 419 235-8061
Sincerely,

Joe Logan, Director of Agricultural Programs
The Ohio Environmental Council
Joe@theOEC.org

(over, please)

OHIO FARM BUREAU

FORGING *a* PARTNERSHIP *between* FARMERS *and* CONSUMERS

May 8, 2013

Rule Coordinator
Ohio EPA – Division of Surface Water
P.O. Box 1049
Columbus, OH 43216-1049

Re: Early Stakeholder Outreach – OAC 3745-1

To Whom It May Concern:

The Ohio Farm Bureau Federation (OFBF) would like to thank you for the opportunity to provide input via the early stakeholder outreach process to the proposed Ohio EPA rulemaking to develop rules to reduce the impacts of nutrients in surface waters.

OFBF is the largest general farm organization in the state of Ohio with members in all of Ohio's 88 counties. Our members produce virtually every kind of agricultural commodity and as a result, OFBF is strongly interested in Ohio's environmental policies and their potential impact to sustaining a viable agbioresource industry.

Each year at the county and state level, our members participate in a comprehensive grassroots policy development process where issues important to them are identified, researched and discussed leading to the development of policies to address these issues. Over 340 delegates from all 88 counties meet annually to vote on and adopt the policy proposals. The adopted policies guide the organization as we provide legislative and regulatory oversight. OFBF policies support the development of legislation, regulations and programs that are scientifically based, economically sound and whenever possible, delivered in a flexible and voluntary manner.

An abundant supply of high quality water has been long recognized as Ohio's greatest natural resource. Improving and protecting water quality is essential to Ohio's future. OFBF believes that farmers have the responsibility to proactively do our part to solve the nutrient management challenge facing Ohio today. In a letter signed by twenty agricultural organizations and widely distributed to every farmer in Ohio, Ohio agriculture in a single voice committed to the promotion and adoption of the principles of 4R Nutrient Stewardship and challenged all farmers to do the same.

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We have performed our review of the Early Stakeholder Outreach Fact Sheet and supporting documents and our responses to the general and specific questions raised in the March 2013 Fact Sheet are attached.

Once again, thank you for the opportunity to provide input via the early stakeholder outreach process. Feel free to give Dr. Larry Antosch of our staff a call, at 614-246-8264, if you have any questions regarding these responses.

Sincerely,

John C. Fisher
Executive Vice President

JCF/lma

Attachment

Cc: Steve Hirsch, President OFBF
OFBF Board of Trustees
OFBF Cabinet

Early Stakeholder Outreach – OAC 3745-1
Ohio Farm Bureau Federation

The Ohio Farm Bureau Federation wishes to provide the following feedback to the general and specific questions raised by Ohio EPA related to the development of rules to reduce the impacts of nutrients in surface waters.

GENERAL QUESTIONS

Does this rulemaking impact your business?

Agriculture is currently exempt from most Federal Clean Water Act regulations but the establishment of numerical nutrient water quality criteria could impact Ohio agriculture in the following ways:

- reduce current and future opportunities to engage in innovative water quality trading programs
- impact the amount and timing when crop nutrients will be allowed to be applied
- directly impact personal property rights by requiring the implementation of specific management practices to address nonpoint sources of pollution
- impact access to Federal Farm Bill Conservation Program dollars.

Narrative or numerical nutrient water quality criteria serve as the basis for listing (or changing the current listing) of each assessed 8-digit hydrologic unit (HUC 8) in the Integrated Water Quality Monitoring and Assessment Report (303d List) prepared by Ohio EPA. The 303d list is one of the factors used by Ohio USDA NRCS to identify geographical areas to target Federal Farm Bill Conservation funds. It is unclear as to how the new criteria will impact the current 303d list and indirectly impact the distribution of Farm Bill dollars. Any agricultural business regulated under the Federal Clean Water Act would be directly impacted by this rulemaking.

Does this rulemaking have an adverse impact on your business? If so, please identify the nature of the adverse impact (e.g., license fees, fines, employer time for compliance).

The extent to which this rulemaking and resulting implementation of the yet to be developed numerical nutrient water quality criteria will impact Ohio agriculture is unknown. While many potential scenarios could be imagined, they would only be speculative in nature at this point. Moving away from the flexibility inherent in the voluntary adoption of management measures to address nonpoint sources of nutrients would be unacceptable.

Is there a need to for the rule? Are the preliminary concepts regarding the rule clear?

The development of numerical nutrient water quality criteria is a critical component in reducing the impact on cultural eutrophication to Ohio's surface water resources. Moving from an unquantifiable narrative criterion to an ecoregion based quantifiable set of criteria would be a move in the positive direction.

Is there an alternative rulemaking (or specific provisions within the rule) that the Agency should consider?

Recommend that the Ohio EPA develop numerical nutrient water quality criteria specific to each of the 5 recognized ecoregions (eastern corn belt plains, Huron/Erie lake plain, Erie/Ontario lake plain, western Allegheny plateau and interior plateau), 4 sizes of streams (headwaters, wadeable streams, small rivers and large rivers) and designated use (aquatic life habitat, water supply, recreation and state resource water) while taking stream assimilative capacity into consideration.

What are the benefits of the rulemaking?

The primary benefit for pursuing this rulemaking is that the State of Ohio will have the ability to develop numerical nutrient water quality criteria that are most appropriate for Ohio. A secondary benefit relates to the fact that the current unquantifiable narrative nutrient water quality criteria will be replaced by quantifiable numerical nutrient water quality criteria.

What are the costs of not adopting the criteria?

The cost to the State of Ohio for not developing and adopting numerical nutrient water quality criteria would be the loss of state control over the criteria development process when U.S. EPA takes actions to promulgate standards for the State. The most likely outcome would be less flexibility, increased regulatory requirements and increased implementation costs for all stakeholders.

SPECIFIC QUESTIONS

Should the Agency adopt narrative or adopt numeric nutrient criteria?

Water quality criteria are a key component of Ohio's Water Quality Standards. They serve as the benchmarks to determine whether or not each assigned designated use (aquatic life habitat, water supply, recreation and state resource water) is being attained. In addition, the specific water quality criteria are collectively used to assess the overall health of Ohio's surface water resources.

Water quality criteria are the expectations that assure that each designated use for a water body is protected. Narrative criteria are descriptions of a desired water quality endpoint. They are not quantifiable and most importantly are open to interpretation. Numeric water quality criteria are estimations of the concentrations of chemicals allowable in a water body without adversely impacting designated uses. Based on laboratory tests, field observations and the latest scientific information, numeric water quality criteria are quantifiable.

The Ohio Farm Bureau Federation supports the development of numeric nutrient criteria provided they have the following characteristics:

- empirically derived to reflect conditions minimally impacted by human activities and protect against the effects of nutrient enrichment due to cultural eutrophication
- ecoregion based to reflect the unique ecosystem components associated with each ecoregion (geology, soil, plants and precipitation)

- criteria established for each stream size (headwaters, wadeable streams, small rivers and large rivers)
- background concentrations are established that are appropriate for each ecoregion
- quantifiable endpoints are established based on defined ecological response signatures
- the appropriate forms of the nutrients (total, dissolved, particulate) are considered when developing the criteria
- all designated uses are protected
- the assimilative capacity of the various sized streams is considered.

Is there sufficient technical justification to adopt nutrient standards? For which type(s) of water bodies?

The Ohio EPA has a long history of developing multi-metric indices to evaluate the health (biological, chemical and habitat) of Ohio's surface water resources. Throughout this process, investigating the relationships between stressor variables and ecological response variables has lead to the development of enhanced tools for water resource protection. Over the years, Ohio EPA has collected biological, chemical and habitat information from numerous stream locations across the state. These data provide the technical information needed to begin the development of ecoregion based numerical nutrient water quality criteria. A report published by Miltner in 2010 suggest an adequate data set exists to pursue the development of numerical nutrient water quality criteria for small (less than 500 square miles) rivers and streams.

(Miltner, R. J. 2010. A method and rationale for deriving nutrient criteria for small rivers and streams in Ohio. Environmental Management 45:842-855)

Do you support the TIC criterion for streams and rivers? Is another approach preferable?

The Trophic Index Criterion (TIC) is a composite index that brings together measurements of biological communities, dissolved oxygen, benthic algae and nutrients. Each component of the index would be awarded points based upon ranges or benchmarks established by field measurements. The TIC provides a structured method to aggregate field data into a normalized index value to determine the condition of a water body relative to nutrient enrichment due to cultural eutrophication.

The development and use of a multi-metric index for nutrient enrichment due to cultural eutrophication is appropriate as long as each of the index components are ecoregion based. In its present form, the proposed TIC contains index components that are both ecoregion based and single state wide values. The mixing of index components is not appropriate.

For example within the proposed TIC, biological communities are evaluated using biocriteria based on ecoregional expectations established for each aquatic life habitat designated use and size of stream. The nutrient component of the index is based on a set of state wide values for total phosphorus and dissolved inorganic nitrogen. One would expect ecoregional differences in the nutrient background concentrations due to the unique ecosystem components. Like the biological criteria, each ecoregion should have a unique background nutrient concentration expectation. In

addition, the expectations for the in-stream nutrient concentration should change as the stream drainage area increases (headwaters, wadeable streams, small rivers and large rivers).

It is not clear how the proposed TIC accounts for changes in stream nutrient assimilative capacity. Establishing an ecoregion based relationship between acceptable in-stream nutrient concentrations based on stream drainage area and qualitative habitat evaluation index (QHEI) score would be an enhancement to the proposed TIC. It would link together stream size, stream structure and function and ecoregional nutrient concentration expectations.

Are the TMDL stream target values for DIN and TP used for calculating Waste Load Allocations (WLAs) and Water Quality Based Effluent Limits (WQBELs) reasonable?

The proposed TMDL stream target values for total phosphorus and dissolved inorganic nitrogen take into consideration aquatic life use designations and habitat quality but fail to reflect differences in ecoregional expectations. The proposed target values should be modified to reflect the uniqueness of Ohio's five ecoregions.

What other specific questions need to be addressed before proceeding with rule adoption?

- What process will be used to establish the ecoregional thresholds to determine when natural eutrophication transitions into cultural eutrophication?
- Current water quality data indicate that dissolved reactive phosphorus is responsible for the increase of occurrence of harmful algal blooms. Why has Ohio EPA chosen to develop numerical nutrient water quality criteria for total phosphorus rather than dissolved reactive phosphorus?
- Why has Ohio EPA abandoned the regional reference (ecoregion) approach to develop numerical nutrient water quality criteria for rivers and streams? This approach has been successfully used to establish biocriteria and numerical nutrient water quality criteria for inland lakes.

Via Electronic Mail

May 22, 2013

Ohio EPA Rule Coordinator
Division of Surface Water
P.O. Box 1049, Columbus, Ohio 43216

RE: Early Stakeholder Outreach – OAC 3745-1

Dear Sir/Madam,

The Ohio Home Builders Association ("OHBA") is providing these comments in response to Ohio EPA's request for Early Stakeholder Outreach in compliance with the Common Sense Initiative Process for its development of rules to reduce the Impacts of Nutrients in Surface Waters.

The OHBA is a 4,500 member trade association representing home builders, land developers and their associate vendors in a legislative and regulatory capacity on a statewide basis. OHBA serves its membership by taking a proactive approach to state issues to promote the residential construction and land development business. As Ohio's premier home building industry representative, OHBA represents an industry that creates significant economic growth in Ohio while also advocating for statewide policies that foster the public's ability to obtain affordable housing.

As the only statewide association representing the residential construction and land development industry, OHBA has unique insight into the practical reality of the home building/land development industry. Further, OHBA can offer valuable perspective on the level of impact promoting certainty and predictability in the building and development process can have on its membership and their ability to provide affordable housing opportunities in Ohio, as well as, the vital role the residential construction industry plays in the Ohio economy.

In general, OHBA does not believe the issues to be addressed by this rule to reduce the impacts of nutrients in surface waters should form any basis for additional regulation of discharge from construction sites. Land development and construction has not proven to be a significant source of the issues the agency is attempting to address. As stated in recent testimony and reports on the impact of nutrients in surface waters, the significant source of problems are being attributed to phosphorus from sewage treatment plants, lawn fertilizer runoff, water treatment plans, agriculture and septic tanks, as well as, an increased frequency in severe storms. To address problems, some focus has also turned to making significant changes regarding the management of agricultural practices and nutrient removal technology at wastewater treatment facilities.

Further, as the rule drafting goes forward, OHBA strongly discourages the OEPA from developing numeric standards for phosphorous and nitrogen when developing its nutrient water quality criteria. Narrative criteria remain the most appropriate means to protect beneficial uses of water from adverse impacts.

We appreciate the opportunity to provide feedback and encourage the Ohio EPA to work closely with the industry as it continues to make revisions to OAC 3745-1.

Feel free to contact me with any questions.

Sincerely,

Vincent Squillace, CAE
Executive Vice President

Ohio Water Environment Association
Preserving & Enhancing Ohio's Water Environment

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Amy Davis

May 22, 2013

Ohio EPA, Division of Surface Water
Attn: Rule Coordinator
P.O. Box 1049
Columbus, Ohio 43216-1049

Re: Ohio EPA's (OEPA) Early Stakeholder Outreach/Developing Rules to Reduce the Impacts of Nutrients in Surface Water

Dear Rule Coordinator:

The Ohio Water Environment Association (OWEA) is comprised of over 2,000 wastewater professionals from varying backgrounds, including operators, engineers, regulators, academia, and manufacturer representatives. Our mission is as follows:

- Educate our members through sharing information and networking
- Educate the public on preserving and enhancing our water quality
- Be proactive on water environment issues
- Build a positive professional image within and outside the Association

Based on our mission, we have a Technical Review Group, who bring forth their knowledge in their representative areas to review upcoming rules and regulations that impact our industry.

We would like to offer the following for consideration in the development of this rule.

General

Over the years the development of water quality standards has primarily focused on pollution generated by point source discharges and has resulted in outstanding improvements in Ohio's overall water quality. While this process typically results in more stringent discharge limits, it has been demonstrated as a scientifically sound approach that has been very beneficial to overall water quality.

OWEA supports the efforts of the OEPA for working toward a sound technologically based method of identifying thresholds and indicators of nutrient enrichment appropriate for this type of pollution as compared to the typical dose-response relationship used in dealing with toxic pollutants providing a "real world" approach. The multi-metric Trophic Index Criterion (TIC) appears to address the unique relationship between nutrient concentrations and Ohio's aquatic organisms.

Ohio Water Environment Association
Preserving & Enhancing Ohio's Water Environment

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We also support the concept of a weight-of-evidence based approach to addressing nutrient issues in the state of Ohio. OEPA's approach in not applying a "one size fits all" to nutrient goals is commendable as nutrients are not toxic and should not be treated as such. This approach allows flexibility for communities discharging into receiving water bodies currently in attainment and meeting water quality standards to focus their limited resources in meeting other regulations.

Technical / Implementation Considerations

Regulation of Nutrient Sources – OWEA is concerned that the planned rule falls short in identifying and having the ability to mandate regulations to all contributors to excessive nutrient levels in receiving waters. Point source users - primarily Publically Owned Treatment Works (POTWs) and their impacted communities (and rate payers) - are the only users affected by establishing numerical permit limits when a water body is considered impaired for nutrient causes by the TIC scoring. There does not appear to be a requirement to show a direct link from the POTW as to the relative contribution of the impairment or how nonpoint source contributors play a role. As shown in past sampling and testing, water bodies are impaired from a number of sources, including agricultural runoff, but agriculture is "currently exempt from most Clean Water Act regulations" (source: OEPA *Early Stakeholder Outreach fact Sheet*, March 2013). Regulation of point sources alone will not solve the problems caused by excessive nutrients in our water bodies.

OWEA would also like to have an explanation on how POTWs with existing nutrient limits and that have or are currently investing in implementation of improvements to their facilities will be addressed. Information currently provided does not address how these POTW's will be impacted by this new rule. Consideration should be made to either allow them to be "grandfathered in" or allow for "credits" for work already performed in meeting their nutrient limit as noted in their NPDES permit.

TIC Scoring - We have several questions regarding the determination of the TIC Score and request further information be provided.

1. Where in relationship to a discharge will the scores be determined: 1 mile downstream? 3 miles downstream, or the average of scores from a downstream segment, etc.?
2. What time period and what type of data will be used in determining the TIC score? (i.e. past year, the past 5 years, averages, medians, worst-case scenario, best-case scenario, etc?). If the water body has been improving over the years, we recommend the most recent data be given higher consideration in the development of the score.
3. What will be the determination of credible data and how will it be evaluated?
4. How will partial attainment areas be addressed?

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TMDL & WQBEL Development - The questions / comments below relate to the development of the Total Maximum Daily Load (TMDL) / Water Quality Based Effluent Limit (WQBEL) Calculations and request further information be provided.

1. How will the TIC scored be used in the determination of TMDL and WQBEL calculations?
2. How will the source of nutrients being contributed from a point source be determined vs. nonpoint sources? How will that factor into the determination of the calculations?
3. How will the reasonable potential process be used to determine nutrient limits in permits? Will it include elements presented in the November 2010 working draft rules 3745-1-44 and 3745-33-07? We support flexibility to establish appropriate time frames and compliance schedules to accommodate implementation of alternative water quality improvement actions, although not exclusively water quality trading programs.
4. We recommend consideration of seasonal or annual loading limits in lieu of weekly or monthly limits be established. Overall a nutrient loading over time is the cause of impairment as opposed to elevated loadings over a short period of time. "Long term loading limits" would therefore be consistent with NPDES permit Nutrient WQBELs implemented by other states in the Chesapeake Bay Watershed, and is recommended for Ohio.

Treatment Technology - OEPA's 2011 draft *Nutrient Reduction Strategy Framework for Ohio Waters* (*Nutrient Strategy Framework*) summarizes the basic treatment technology for nutrient removal (pages 47-50), but does not acknowledge the degree of difficulty existing wastewater treatment plants will face through major retrofit projects, resulting in significantly increased operations and maintenance, in addition to very great capital cost required to achieve these limits. In some cases, the reactor geometry is wrong, and in many other instances, there is a lack of physical space available to accommodate both the vertical (hydraulic grade line) and horizontal (foot print) modification requirements. The *Nutrient Strategy Framework* appropriately acknowledges that each level of control will cost more per pound of pollutant removed, although we believe that capital costs presented are out of date and will be considerably greater for Ohio POTWs by the time this rulemaking is finalized. OWEA strongly agrees with the statement in the Strategy Framework document that "without adequate financial support from the state and federal government . . . there will be significant public opposition to requirements to upgrade treatment technology."

It is also very important to understand that control strategies to reduce inorganic nitrogen to values cited in the *Nutrient Strategy Framework* (Table 14, p.47) or total phosphorus (Table 15, p.47) represent best case results for effluent limits. A more realistic expectation of performance would suggest that the presented treatment technology limits may not be achievable. For example, a POTW may achieve an effluent limit of 0.5 mg/l for ammonia-N normally, but may be challenged to meet this level on days where the flows and loads are variable and elevated, such as during wet weather periods when they POTWs need to comply with wet weather requirements.

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While OWEA supports the suggestion to provide two successive permit cycles (with 'interim' limits) prior to implementation of final nutrient criteria based permit limits, the burden of pursuing "other options including habitat restoration and water quality trading" falls on the shoulders of the POTW and the communities they serve. We strongly encourage that communities have the option to evaluate and collect data following the implementation of nutrient reduction measures to understand the impact these improvements have on the water quality of the receiving water body. The determination of allowable compliance time may need to be flexible depending on the specific factors involved. This should be evaluated and considered further during the development of the wording of the implementation aspects in the rule.

Integrated Planning - We believe an Integrated Planning Framework should be included in the implementation of the rule. These will provide an overall approach to mandated improvements, including the affordability of additional cost to address nutrient reductions. In order to meet the goals of the Clean Water Act (CWA) and provide full attainment with use designations under water quality standards, it is important that programs involving stormwater, wet weather sanitary sewer programs, drinking water, and agricultural nonpoint source runoff be considered as interconnected in a holistic approach to regulatory compliance. It is important to understand how different control strategies impact each other. For example, methods used to effectively control wet weather overflows – high rate treatment, storm flow treatment, and pushing a bioreactor system to its limits – in accordance with prescriptive operational control strategies, may work at cross purposes with those required to achieve a consistently high degree of biological nutrient control.

Adaptive Management – We applaud the inclusion of adaptive management into the rule. This, in addition to an Integrated Planning approach provides communities with the flexibility to spend their limited resources to achieve the "biggest return for their dollars invested". We would also encourage the OEPA to provide communities a means to balance and prioritize multiple mandated regulations based on their highest need for investment. This balance should be based on the cost effective improvement(s) which will have the most immediate impact on water quality standards first, and then consideration of other improvements as they become economically achievable and technically feasible.

<u>Nonpoint Source Contributors:</u>

We agree with the development of point and nonpoint source effluent limitations where streams or rivers are threatened or impaired. We understand the scope and enforceability of nonpoint source contributors is currently not defined and will be challenging. OWEA believes this to be a major problem. Clearly, to be serious about controlling excessive nutrient discharges we cannot continue mandating improvements only on point sources (the majority of which are local communities), but must include the nonpoint and private sources as well, which are outside of the ability of the Ohio EPA to control. We understand that without some change to the Ohio Revised Code (ORC), this challenge will continue. Therefore, we recommend the rule consider a more comprehensive and inclusive approach to watershed management. The traditional approach of compliance language only applying to POTWs should be altered in the final rules.

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It is well documented that agricultural and other nonpoint source contributors such as golf courses, retail plazas, and landscaping yards are significant contributors to the impairment of our water bodies. This point was also acknowledged at the Ohio Nutrient Forum Visioning Workshop in November 2012, where many speakers, including those from the OEPA, noted that nonpoint sources contribute significant amounts of nutrients with little incentive or regulatory requirements to curb the current practices that lead to nutrient loading problems. In lieu of a "…voluntary adoption of best management practices for nonpoint sources of phosphorus and nitrogen" (source: OEPA *Early Stakeholder Outreach Fact Sheet*, March 2013), we suggest finding a way to require compliance for all nonpoint source contributors equivalent to the point source contributors in critical areas, while assisting in the financial cost to address these issues. If only the POTW's and other point sources are mandated to meet the nutrient reduction goals there is a low likelihood that nutrient-impacted streams will achieve attainment. There should be some form of mandate that nonpoint sources implement appropriate Best Management Practices (BMPs) or other activities to reduce nutrient loadings.

Economic and Financial Burden

We encourage the OEPA to develop a means for communities to balance the benefits of implementing the rule vs. the financial impact required to comply with the rule. Many utilities are already faced with financial burdens to meet current regulatory requirements. This comes at the same time when grants and zero interest loans to pay for these unfunded mandates are limited. It is important that utilities prioritize their investments wisely to receive the most for their investment while meeting regulations. As noted in comments above, we are concerned about the financial burden utilities will face in order to reduce nutrients reaching our water bodies, while the possibility remains that these water bodies will not achieve attainment due to the lack of similar reductions by nonpoint source contributors.

As mentioned in the OEPA's 2011 draft *Nutrient Strategy Framework*, "The task ahead is to find COST EFFECTIVE means to reduce the delivery of nutrients present in point source effluents and in NPS runoff from urban and agricultural land use. And this must occur in a manner that does not interfere with Ohio's overall economic recovery."

We urge OEPA to be representative of everyone in making technically sound decisions on the development and implementation of nutrient limits that will help achieve meaningful pollutant reductions while at the same time will minimize the economic impact on rate payers.

Advisory Board

Various state and federal authorities and agencies have multiple existing plans and goals on how to achieve the reduction of nutrients. Based on the importance, sensitivity and impact of this rule upon so many utilities and communities, we encourage the OEPA to form an advisory board. We respectfully suggest the following organizations, at a minimum, be considered for participation: AOMWA, OWEA, small, medium and large

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municipalities, ODNR, Ohio Department of Agriculture, nonpoint source representatives and select industry experts. The purpose of this group would be to assist with the development of the rule through honest and open dialogue of impacted parties to resolve unanswered questions that remain in how the rule will be implemented.

In addition to our comments, OWEA supports the comments submitted by the Association of Ohio Metropolitan Wastewater Agencies.

We appreciate the opportunity that OEPA provides for input on upcoming rules. If you should have any questions, please contact Dianne Sumego at 330.607.5619 or sumegod@bv.com, or the writer at 330.841.2591 or tangelo@warren.org.

Sincerely,

Thomas Angelo
President, OWEA

c: Dianne M. Sumego, PE, OWEA Technical Review Group Chair

PotashCorp®
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PCS Nitrogen - Lima

July 29, 2013

VIA ELECTRONIC MAIL AND OVERNIGHT DELIVERY

Rule Coordinator
Ohio EPA
Division of Surface Water
P.O. Box 1049
Columbus, Ohio 43216-1049
dsw_rulecomments@epa.ohio.gov

Re: Comments of PCS Nitrogen Ohio, L.P., on the Early Stakeholder Outreach—OAC 3745-1 and Ohio's Draft Nutrient Strategy

Dear Rule Coordinator:

PCS Nitrogen Ohio, L.P. (PCS) respectfully submits the enclosed comments on OEPA's Early Stakeholder Outreach—OAC 3745-1 (ESO) and OEPA's draft nutrient strategy as described in the support materials related to the ESO. PCS operates a facility in Lima, Ohio that discharges wastewater to the Ottawa River pursuant to an NPDES permit issued by OEPA, which operations have the potential to be adversely impacted by the anticipated rulemaking described in the ESO. While these comments are submitted outside of the courtesy Early Stakeholder Outreach comment period (because PCS did not become aware of the initial ESO until after its conclusion), PCS' comments nonetheless address many of the questions outlined in the ESO Fact Sheet as well as addressing the proposed framework, including the Trophic Index Criterion.

PCS appreciates OEPA's consideration of these comments as it moves from the Early Stakeholder Outreach process towards further consideration of a possible rulemaking. Given the potential impact of the rulemaking on a number of parties, including PCS, we request that OEPA establish an advisory panel or similar stakeholder workgroup and that PCS and other point source dischargers be represented in that process. In the meantime, please feel free to call Lisa Strbik at (419) 879-0896 with any questions.

Very truly yours,

Todd Sutton
General Manager

Enclosure

cc: Mr. Dan Dudley, OEPA DSW
Mr. Michael Brom (w/encl.)
Mr. Bill Hall (w/encl.)
Ms. Lisa Strbik
Brian E. Johnson, Esq. (w/encl.)
Christine M. Morgan, Esq. (w/encl.)

PCS Nitrogen Ohio, L.P.'s Initial Comments on Ohio EPA's Early Stakeholder Outreach-OAC 3745-1 and Draft Nutrient Strategy

PCS Nitrogen Ohio, L.P. ("PCS") operates a facility in Lima, Ohio that discharges wastewater to the Ottawa River pursuant to an NPDES permit issued by the Ohio Environmental Protection Agency ("OEPA"). This facility has the potential to be adversely affected by the potential requirements addressed in the Early Stakeholder Outreach-OAC 3745-1 and by OEPA's draft nutrient strategy described therein. PCS respectfully submits these comments for consideration by OEPA as part of the Early Stakeholder Outreach process and as it moves towards further evaluation, development and implementation of this potential rulemaking.

BACKGROUND

OEPA's Early Stakeholder Outreach requested comments from the regulated community regarding OEPA's proposed approach to deriving numeric nutrient criteria for Ohio rivers and streams. This approach was documented in two articles prepared by Robert J. Miltner and a summary document prepared by OEPA. The summary document is titled, "Trophic Index Criterion – Rationale and Scoring". (OEPA, March 2013) This document provides a synopsis of the method, which is more fully described in the two articles. The first article, "A method and rationale for deriving nutrient criteria for small rivers and streams in Ohio", was published in the journal, Environmental Management in 2010. The second article, "Technical Support Document for Nutrient Water Quality Standards for Ohio Rivers and Streams" (December, 2011), is a draft document prepared by OEPA with contributions from Tetra Tech and submitted to the US EPA for review. This Technical Support Document (TSD) was developed using the data and analyses included in the journal article, and the enclosed comments are primarily based on our review of the TSD.

The proposed approach uses biological assemblages to assess whether streams may be impaired by nutrients. Stream trophic indexes provide important information on the overall health of a resource and whether the aquatic life objectives of the CWA are attained. While they describe <u>what</u> exists at a location, they do not explain <u>why</u> the extant condition is present. Trophic Indices are affected by literally dozens if not hundreds of factors, natural and man-induced. In situations where the habitat has been greatly altered compared to "unaffected" conditions, seeking to ascribe an impact to a particular parameter (such as nutrients) is fraught with uncertainty. The cost of erroneously presuming nutrient control will "fix" the problem is enormous.

This rulemaking, if adopted using the conceptual framework as proposed, will have a significant adverse impact on our business and on all point source dischargers permitted in Ohio. While nutrient regulation in the State is appropriate where it is confirmed that nutrients are a primary factor causing adverse impacts on aquatic resources, the approach presented in the TSD is likely to result in most of Ohio's rivers and streams being declared impaired based on an unreasonable presumption of nutrient impairment without a reasonable means of restoring designated uses <u>*and without nutrients actually being the controlling factor.*</u> A primary reason for this observation is that even where plant growth is found to be excessive **in streams**, factors other than nutrient load likely control the degree of plant growth occurring because fixed algae can proliferate even under extremely low nutrient concentrations. Unless this reality is factored into the state's

approach, the implementation of the proposed rules will have significant negative repercussions for the entire State without providing the anticipated use restoration.

PCS' primary concerns with the proposed approach are summarized below. These comments and concerns are offered only as initial thoughts and subject to a full reservation of rights to comment further, in all regards and on all issues, in the requested advisory process and thereafter in any rulemaking process in accordance with Ohio's administrative procedures.

COMMENTS

1. Trophic Index Criterion (TIC)

A. General Construction of the TIC

The TIC converts thresholds and relationships presented in the TSD into a numeric index in an effort to characterize the condition of the waterbody relative to nutrient enrichment. The factors considered in the TIC include the biological assemblage (macroinvertebrates, fish), benthic algae, diel dissolved oxygen range, minimum dissolved oxygen, and nutrient concentration. Presumably, if the TIC score is in the acceptable region, no numeric nutrient limitations are required regardless of ambient nutrient concentration. This should be confirmed prior to any future rulemaking. Additionally, it is not clear how nutrient controls will be applied if the TIC falls in the "Threatened" range as illustrated in the March 2013 publication and we therefore reserve comment on that element of the ESO documentation.

If the TIC score is in the impaired range, the various criteria would apply based on the aquatic life use and habitat score. The applicable criteria are buried in the text of the TSD (at page 32). These criteria should be presented in a table to make it more apparent that these are the numeric nutrient criteria being proposed by OEPA as part of the overall proposed water quality standard. Additionally, the proposal must also specify the averaging period associated with these concentrations (i.e., growing season average). Presently, one cannot tell whether these are daily maximums, monthly averages, growing season averages, annual averages, or something else. (See Section 2 below for detailed comments on the proposed numerical nutrient criteria.)

B. Use of Limiting Nutrients

The reasonable potential analysis discussed in the TSD (at page 51) indicates that permit limits would include limits on the nutrient(s) causing the excursion – total phosphorus (TP) and/or dissolved inorganic nitrogen (DIN). Generally, we agree with OEPA's assessment that a "limiting nutrient" approach be considered rather than using the "independent applicability" approach. OEPA needs to elucidate the specific conditions under which limitations for both phosphorus and DIN would apply. The analysis should also recognize that a parameter not presently limiting may be controlled to the level where it would be limiting in the future. Thus, for example, in a situation where nitrogen is the limiting nutrient (because ambient phophorus levels are elevated), it may still be possible to control phosphorus such that instream algal growth is controlled. This allows the most cost effective parameter to be selected for control to achieve the desired reduction in algal growth.

C. TIC Scoring Methodologies

The description of TIC scoring presented in the TSD does not match up with the scoring presented in the TIC – Rationale and Scoring (OEPA, March 2013). For example, the TSD identifies the maximum biological condition score as "6" (See, TSD Table 11 at 36), while the Rationale sets the maximum biological assemblage score as "12". The TSD needs to be updated to include and describe the updated scoring procedure.

With regard to the TIC scoring, the objective of this approach is to restore aquatic life uses impaired by nutrients. Regardless of any other measurements, it would seem evident that if the biological assemblages are meeting designated uses, the level of nutrients present in the stream are not "causing" use impairment and there is no need, or legal basis, to reduce existing loads. The TIC needs to be restructured to clarify that nutrient controls are not triggered when aquatic life uses are being achieved.

D. Basis for Nutrient Control

As discussed above, the TIC attempts to relate impairment status to nutrient enrichment. The TSD presents a conceptual model to illustrate factors influencing EPT taxa richness (a surrogate for aquatic life use) in Figure 8 from the report (TSD at 27), presented below for consideration.

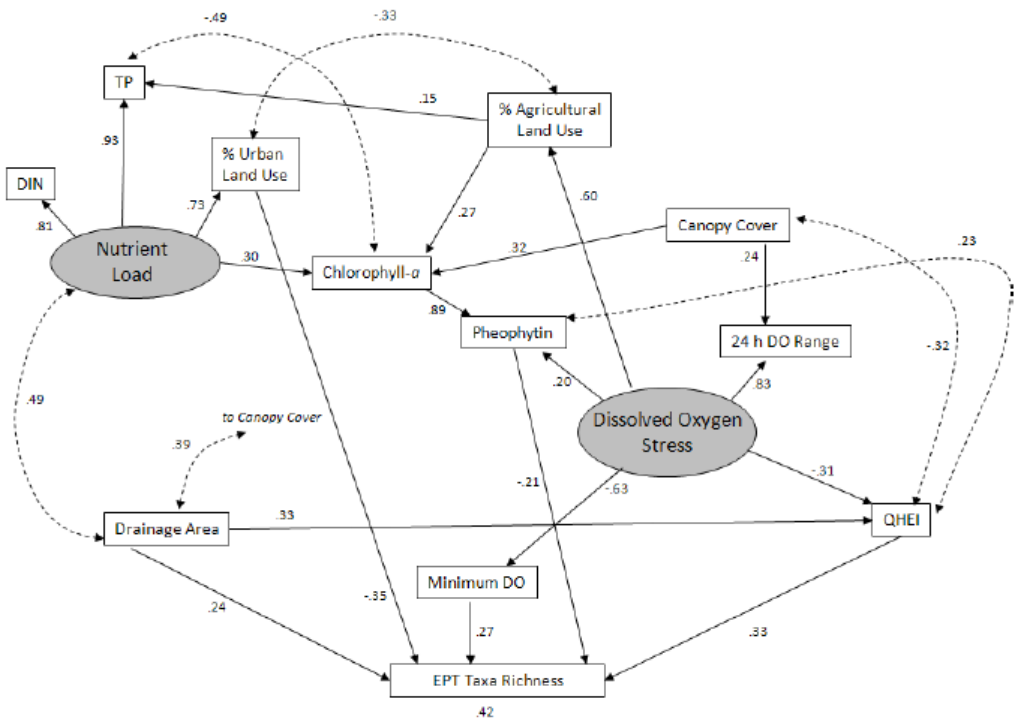


Figure 8. Final SEM for the nutrient data set where EPT taxa richness is the modeled biological response variable. Numbers adjacent arrows are standardized coefficients[2]. The model accounted for 42% of the variance in EPT taxa richness.

The figure indicates that the most significant stressors influencing EPT taxa richness are habitat, urban land use, minimum D.O., and drainage area – nutrients do not directly impact the index. Consequently, it is evident that nutrient control is not always deemed necessary or able to restore aquatic life uses without also or first addressing these other stressors. For example, high nutrient levels may accompany excessive erosion which adversely impacts EPT. However, sedimentation control, not nutrient control, would be the solution. In fact, many EPA TMDLs have made this distinction. In addition, in many cases, nutrient control is not needed if the other stressors are addressed (e.g., habitat restoration); in these instances, there would be no basis for additional nutrient controls. The TIC approach must account for these situations.

Before proceeding down the TIC path, which as proposed will likely force regulated parties to unnecessarily incur significant costs, OEPA should conduct studies to demonstrate that nutrient control is, in fact, necessary and functionally appropriate to restore aquatic life uses in streams where the habitat has been degraded. Similarly, OEPA should conduct studies to determine whether habitat restoration, alone, is sufficient to restore such uses. The results of these studies should be used to develop an adaptive management approach to restore aquatic life uses employing a combination of habitat restoration and nutrient reduction in a cost-effective manner.

2. Numeric Nutrient Criteria Derivation Concerns

A. Basis for Derivation

The TSD and the TIC – Rationale and Scoring (OEPA, March 2013) document identify three sets of numeric nutrient criteria, as follows:

Aquatic Life Use and QHEI	TP (mg/L)	DIN (mg/L)
Exceptional warmwater habitat and all QHEI scores	0.060	3.0
Warmwater habitat and QHEI score = 12 to 64	0.13	3.0
All other aquatic life uses and QHEI scores	0.30	3.0

The TSD indicates that these nutrient criteria were developed using logistic regression analysis (TSD at 31 – 32).

> Logistic regression was used to estimate the *probability* of fish and macroinvertebrate biotic indices meeting respective biological criterion given TP or DIN as stressors.
>
> Two basis models for each biological index were constructed, one testing the simple bivariate relationship against each nutrient stressor, and the other introducing habitat quality (QHEI scores) as an additional predictor variable. For the first model, data were selected for QHEI scores > 60 to minimize habitat as a covariate. For the latter model, all QHEI scores were included.
>
> Similarly, a set of logistic models were estimated using EPT taxa richness as a response variable, where the binary response was defined as ≤ or > 10 taxa.

> The logistics models including TP were more robust than those including DIN, though ***neither had very good predictive ability***. The logistic model for EPT taxa richness were suspect as the thresholds occurred close to the edge of the data range, though the subsidy-stress response was evident in the EPT richness model for DIN as well. In lieu of logistic regression, quantile regression plots of the residuals from a regression of EPT taxa richness on QHEI were examined to determine the point where taxa richness becomes less than expected relative to TP and DIN. [Emphasis added.]

B. Data Supporting Criteria Derivation Must Be Provided

Based on these descriptions, it appears that the draft numeric nutrient criteria for TP and DIN were developed using stressor-response analyses using some form of conditional probability analysis. However, the actual data or graphs illustrating these relationships were not presented. These data should be presented and made available for analysis by interested parties. Furthermore, the EPA Science Advisory Board (SAB) specifically criticized the use of conditional probability as inappropriate for criteria development because it simply presumes a numeric change in the index was "caused" by the changing nutrient level. This is regulation by presumption, not by causal demonstration. Finally, OEPA itself concludes that neither the TP nor the DIN models that it used had very good predictive ability and thus the values derived from these models should not serve as the basis for a regulation.

C. Explanation for Derivation of Nitrogen Criteria Required

The logistics regressions for DIN, summarized in Table 6 of the TSD (at 32), show results of **3.55 mg/L** for EPT taxa richness (quantile regression), **3.62 mg/L** (Fish IBI, QHEI = 64), and **6.7 mg/L** (Fish IBI, QHEI > 60). While the TP criteria were mostly taken directly from these regressions, the recommended DIN criterion was reduced to < 3.0 mg/L for all conditions without explanation. In addition to the concerns noted above and below regarding these values, it is unclear why the regression analysis results for TP were sufficient to use as criteria while the same regression analysis results for DIN were all reduced to 3.0 mg/L.

D. Conformance with SAB and EPA Guidance Necessary

The use of regression analyses to develop numeric nutrient criteria was the subject of a U.S. EPA SAB peer review[1] and a U.S. EPA Guidance Document[2]. Since the TIC approach is based on regression analyses to derive the draft numeric nutrient criteria, it would seem appropriate that the TSD reference and follow the SAB report and U.S. EPA Guidance Document, but it does not. The TSD report needs to be revised to demonstrate that the methodologies utilized by OEPA

[1] See, http://yosemite.epa.gov/sab/sabproduct.nsf/02ad90b136fc21ef85256eba00436459/E09317EC14CB3F2B85257713004BED5F/$File/EPA-SAB-10-006-unsigned.pdf.

[2] USEPA. November 2010. Using Stressor-response Relationships to Derive Numeric Nutrient Criteria. EPA-820-S-10-001.

conform to the guidance and comments of the SAB which precisely addressed what demonstrations are needed to develop scientifically defensible criteria.

E. Probability Basis Requires Justification

With regard to the derivation of the numeric nutrient criteria, the proposed nutrient criteria correspond to a 0.5 probability of the biological indicators meeting the designated use thresholds for Fish IBI or the EPT taxa richness target. If the EPT taxa richness target (> 10) is not an adopted OEPA threshold for aquatic life use attainment, it is not appropriate to use this target to set an aquatic life criterion.

Based on the description in the TSD, we understand that the regressions do not have very good predictive ability. With respect to use of the 0.5 probability from the regression, please provide the confidence interval for the regression as well as the coefficient of determination (R^2) for the regression. In other cases, EPA itself has only been able to demonstrate an $R^2 < 0.2$. (e.g., December 2012 Florida stream criteria proposal). This indicates that less than 20% of the observed variability is explained by the nutrient level present, while the overwhelming balance is unexplained. The SAB provided the following comment concerning relationships with such a low explanatory ability.

> [A] large degree of scatter remains, as indicated by the R^2 value of 0.19. A TN "candidate criterion" of 320 ug/L is obtained by finding the point of intersection of an assumed designated use total species richness threshold of 40 and the mean regression line log(TN) = ~ 2.5. Unfortunately, the points where the lower and upper 90% prediction interval lines cross a species richness threshold of 40 cover a TN concentration range from about log(TN) = 1.25 to log(TN) = 4 based on inspection of Figure 13. This corresponds to a TN concentration range of 16 ug/L to 10,000 ug/L. It is important to understand the management consequences of this considerable uncertainty.

(SAB Final Report at 25)

It would not be reasonable for OEPA to adopt instream standards with such a very low probability of actual environmental need. The 1985 National Guidelines indicate that where there is a high degree of uncertainty either (1) do not adopt criteria or (2) add additional factors to ensure that the criteria are appropriate. OEPA must address and resolve the considerable uncertainty associated with these regressions if it is to rely on these approaches to nutrient control. We do not believe criteria compliance can be mandated given that nutrients account for such a small fraction of the overall variability.

3. Full Consideration of Confounding Factors

The approach presented in the TSD includes an assessment of the TIC factors to determine whether nutrients are causing aquatic life use impairments and application of numeric nutrient criteria that were developed with consideration for habitat condition. On its face, the proposed

approach does not appear to sufficiently account for confounding factors that influence the potential adverse effects of nutrients.

A. SAB Concerns Must Be Addressed

The SAB provided the following comments concerning the use of stressor-response analysis for the derivation of numeric nutrient criteria:

> Without a mechanistic understanding and a clear causative link between nutrient levels and impairment, there is no assurance that managing for particular nutrient levels will lead to the desired outcome.

(SAB Final Report at 6) (Emphasis provided)

> The statistical methods in the Guidance require careful consideration of confounding variables before being used as predictive tools. … Without such information, nutrient criteria developed using bivariate methods may be highly inaccurate.

(SAB Final Report at 24) (Emphasis provided)

> The statistical methods in the Guidance require careful consideration of confounding variables before being used as predictive tools. … Without such information, nutrient criteria developed using bivariate methods may be highly inaccurate.

(SAB Final Report at 24) (Emphasis provided)

> For criteria that meet EPA's stated goal of "protecting against environmental degradation by nutrients," the underlying causal models must be correct. Habitat condition is a crucial consideration in this regard (e.g., light [for example, canopy cover], hydrology, grazer abundance, velocity, sediment type) that is not adequately addressed in the Guidance. Thus, a major uncertainty inherent in the Guidance is accounting for factors that influence biological responses to nutrient inputs. Addressing this uncertainty requires adequately accounting for these factors in different types of water bodies.

(SAB Final Report at 38) (Emphasis provided)

The focus of these comments was primarily on streams and the SAB commented that the use of simple linear regression for these systems is unlikely to account for a substantial amount of variation. The use of multiple linear regression to address the known confounding variables would be required in cases where such factors influence the biological response, as is the case in Ohio (e.g., see TSD Figure 8 at 27).

Moreover, if criteria developed from a stressor-response analysis are to be applied to a specific waterbody, specific conditions particular to that waterbody must be considered to ensure that application of such criteria is appropriate.

> Numeric nutrient criteria developed and implemented without consideration of system specific conditions (e.g., from a classification based on site types) can lead to management actions that may have negative social and economic and unintended environmental consequences without additional environmental protection.

(SAB Final Report at 38) (Emphasis provided)

B. EPA Guidance Must Be Considered

The U.S. EPA's final Stressor-Response Guidance incorporated these recommendations made by the SAB. In addition to describing the various statistical methods for analyzing data, the Guidance presented detailed information on the need to prepare conceptual models and to classify the data. Data are classified in an effort to account for confounding factors that significantly influence the response of aquatic ecosystems to nutrients. The response variables must be linked to the designated use such that the candidate criterion represents a threshold above which designated uses are likely to be impaired. Finally, the Stressor-Response Guidance discusses evaluations necessary to ensure that the candidate criteria are scientifically defensible based on a consideration of the accuracy and precision of the regression analyses.

> Conceptual model diagrams and their accompanying narrative descriptions (together, referred to as ***conceptual models***) are useful tools for stressor-response analysis for two reasons: they depict accepted scientific knowledge, and they help guide model development.
>
> Conceptual models identify relationships that can be modeled with statistical analyses and help analysts identify variables, in addition to the main nutrient and response variables, that should be considered during analysis. More specifically, conceptual model diagrams provide a graphical means of identifying potentially ***confounding variables***, which are defined as variables that can influence estimates of the stressor-response relationships

(EPA Stressor-Response Guidance at 5) (Emphasis provided)

> [M]any **confounding variables** must be considered when estimating the effects of nitrogen/phosphorus pollution on a measure of aquatic life in streams (e.g., a macroinvertebrate index).

(EPA Stressor-Response Guidance at 11) (Emphasis provided)

Data classification is particularly important in streams because of the numerous factors that influence the effect of nutrients on use attainment.

> [I]n the first step of the analysis, **classification**, the analyst attempts to control for the possible effects of other environmental variables by identifying classes of waterbodies that have similar characteristics and are expected to have similar stressor-response relationships. Classifications for a stressor-response analysis are typically based on statistical analysis; however, existing classes can be used as

> a starting point. The most widely used existing classification for analyses of nutrient data are the fourteen national nutrient ecoregions.

(EPA Stressor-Response Guidance at 32) (Emphasis provided)

> The first step for **classifying** data is to identify variables to include in the analysis that will help improve the **accuracy** and **precision** of estimated stressor-response relationships.
>
> * * * * *
>
> [E]xploratory data analysis can indicate other variables that should be included in the **classification** analysis. In particular, other variables that are strongly correlated with the stressor variable or with the response variable should be evaluated for inclusion in classification analysis.

(EPA Stressor-Response Guidance at 56 – 57) (Emphasis provided)

> Finalizing a **classification** scheme likely requires repeated iterations and adjustments based on an evaluation of the **accuracy and precision** of the resulting stressor-response relationships.

(EPA Stressor-Response Guidance at 64) (Emphasis provided)

> Before finalizing candidate criteria based on stressor-response relationships, one should systematically evaluate the scientific defensibility of the estimated relationships and the criteria derived from those relationships. More specifically, one should consider whether estimated relationships **accurately** represent known relationships between stressors and responses and whether estimated relationships are **precise** enough to inform decisions.

(Guidance at 65) (Emphasis provided)

> Beyond the possible effects of **confounding variables**, one should also consider whether **assumptions** inherent in the chosen statistical model are supported by the data.

(EPA Stressor-Response Guidance at 67)

As discussed in the TSD, the numeric nutrient criteria concentrations were developed using regression analyses of IBI (fish) and ICI (macroinvertebrate) metric scores against nutrient concentration. This approach presumes that nutrients cause the observed response even though the OEPA has identified numerous non-nutrient factors that contribute to the response. This approach is bound to introduce significant unexplained variability that makes the confidence interval around the regression line so broad that the necessity of the criteria cannot be affirmed.

The proposed Trophic Index Criterion must address these concerns of the SAB and the U.S. EPA's guidance document. In particular, it must explain how the separate treatment of the TIC indicators and the numeric nutrient criteria development account for the classifications

recommendations to improve the accuracy and precision of the relationships presented in the TSD.

C. Additional Analyses Needed for Criteria Derivation

Based on the SAB and EPA's Stressor-Response Guidance the following analyses should be presented to ensure the application of nutrient criteria is defensible:

(i) Detailed Conceptual Models

Detailed conceptual models should be provided illustrating the factors influencing the aquatic life use endpoints linked to use impairment (i.e., ICI, IBI). The conceptual model should break out habitat characteristics that influence periphyton, macroinvertebrates, and fish (e.g., canopy, hydrology, sedimentation). It should also account for other factors influencing dissolved oxygen stress (e.g., organic loads).

(ii) Classification to Isolate Significant Non-Nutrient Factors

Based on the detailed conceptual models, the data should be classified in accordance with the SAB recommendations and EPA Guidance. This classification should be able to demonstrate habitat alteration conditions where nutrient control is incapable of restoring uses.

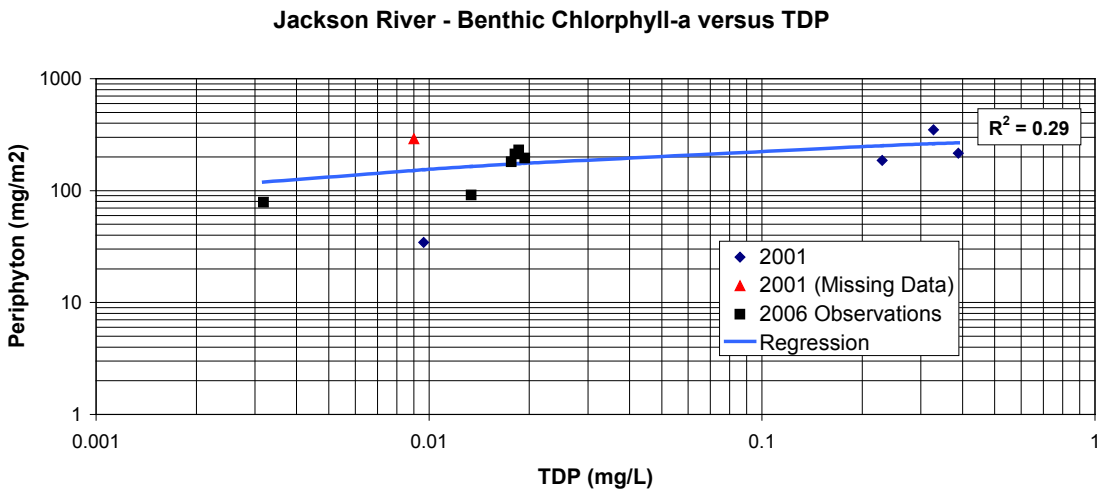
(iii) Accuracy and Precision

Graphical analyses should be presented to illustrate the strength of the final relationships and include confidence intervals to illustrate the likelihood that the proposed criteria will achieve the intended results.

4. Further Concerns Regarding Nutrient Control to Achieve Aquatic Life Uses

Aquatic life use impairments attributed to nutrients often arise from a combination of factors that include habitat alteration. However, nutrient control may not be able to restore aquatic life uses where habitat alterations make excessive periphyton growth a certainty. This is illustrated in the case of the Jackson River (Virginia) nutrient TMDL. This TMDL identified phosphorus as the primary stressor causing impairment of aquatic life uses due to excessive periphyton growth and D.O. criteria excursions. Phosphorus load reduction was implemented through a cooperative agreement with the single, primary point source discharger to the river. Following implementation of phosphorus reductions at the point source, water quality monitoring was conducted to assess periphyton growth. The results are illustrated in Figure 1. These results show that, although the instream concentration of total dissolved phosphorus (TDP) decreased from about 0.3 mg/L to less than 0.02 mg/L, there was no change in the seasonal average periphyton growth in the river below the outfall, with periphyton chlorophyll-a averaging 200 mg/m^2.

Figure 1. Regression Analysis for Seasonal Average 2001, 2006 Jackson River Data



Subsequently, EPA[3] determined that periphyton reduction cannot be achieved by nutrient reduction. An alternative management plan is being considered to periodically scour the river using dam releases to achieve the target periphyton concentration in the river.

> The results of the modeling indicate that the selected PO_4-P endpoint of 0.038 mg/L and the corresponding chlorophyll a target of 100 mg/m^2 cannot be reached in the Jackson River with nutrient reductions alone. This is due to the fact that the Jackson River is not a free flowing river, and also due to the fact that MeadWestvaco, the main nutrient contributor to the Jackson River, has reached its limits of technology in terms of phosphorus reductions. The remaining option that will help the Jackson River achieve the TMDL endpoints and a healthy, balanced biologic community is to mimic the natural hydrology and flows that existed before the operation of the Gathright Dam.

(Decision Rationale at 6)

As illustrated in this example, nutrient control could not reduce periphyton growth because hydrologic modifications prevented occasional scouring. Without that scouring, periphyton accumulation could not be controlled, even at phosphorus concentrations well below OEPA's targets. If stream habitats are altered to favor such growth, exceedingly low (background) levels of nutrients will support excessive periphyton growth and the use impairments associated with such growth.

[3] Decision Rationale. Total Maximum Daily Load. Dissolved Oxygen and Aquatic Life Use (Benthic) Impairments in the Jackson River. Alleghany, Bath, Craig and Highland Counties, Virginia. USEPA Region III. July 21, 2010. http://www.epa.gov/waters/tmdldocs/38981_JacksonRiveDR.pdf.

5. Additional Concerns

A. Administrative Review of TIC Decisions

The ESO does not address the administrative review protections that will need to be established should OEPA proceed with the multi-level decision-making structure set forth in the TIC framework and the ESO generally. Clear and protective administrative review procedures must be included in any proposed rule to allow aggrieved parties to seek review of decisions made by OEPA under the TIC rubric. Such protections are essential to ensure the rights of aggrieved parties to challenge TIC-based decisions as they are made for each water body and applied to individual dischargers.

B. Implementation of TIC in NPDES and TMDL Scenarios

We share the concerns raised by the City of Lima and other commenters regarding the need for further explanation and discussion of how the TIC concept will be implemented in both basic NPDES permitting and in TMDL scenarios. See City of Lima Comments, Section III.11-12

C. Application of Site-Specific Standards

The TP and DIN criteria presented in the TIC framework are generic values that in some cases will not be applicable to a specific water body, in which case a site-specific value should be developed. The framework should specifically allow for this as should any future rule.

D. Economically Reasonable and Technically Feasible Permit Limits

OEPA must perform a technical feasibility and economic reasonableness analysis on any proposed permit limits. If this rulemaking proceeds, OEPA will need to clarify that any permit limit resulting from the rule, including the default limits identified in the TIC framework, will be subject to this analysis. R.C. 6111.03(J)(3). This analysis would be performed in addition to, as well as, in some cases, in coordination with the site-specific review identified in comment 5. C above.

E. Default Permit Limits Need Further Evaluation

The TIC – Rationale and Scoring (OEPA, March 2013) calls for default numeric nutrient limits of 1.0 mg/L TP and 10 mg/L DIN on a demonstration of impairment or a determination that there is reasonable potential for the receiving water body to be impaired. The Rationale goes on to clarify that these limits are anticipated to be iterative to allow for pursuing other options including habitat restoration and water quality trading. This approach, generally and subject to all the comments outlined herein, may be reasonable "if" the aquatic life use impairment is due to nutrients. However, OEPA has also acknowledged that use restoration may be contingent upon habitat restoration, which may not require nutrient control at all. In this case, default numeric nutrient limits are not necessary because the use impairment is due to habitat destruction. Before any default limits on nutrients are included in NPDES permits, an

affirmative determination must be made that nutrients are the cause of the impairment. Only then should limits be contemplated, but not necessarily at the values outlined in the TIC framework. The minimum requirement would be to maintain load at current levels (e.g., no increase above current conditions). This approach should be used rather than imposing default limits that may be over-restrictive (i.e., where a WQBEL would require less restrictive limits to meet the instream requirements) or unnecessary.

CONCLUSION

PCS appreciates the opportunity to provide this feedback on OEPA's nutrient rule concept. Given the potential impact of this rule, PCS requests that OEPA establish, and PCS be invited to join, an advisory panel or similar working group to help in the further evaluation, development and implementation of this anticipated rulemaking. In the meantime, PCS offers these comments and concerns only as initial comments and fully reserves all rights to comment further, in all regards and on all issues, in the requested advisory process and thereafter in any rulemaking proceeding.

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May 22, 2013

Rule Coordinator
Ohio EPA
Division of Surface Water
P.O. Box 1049
Columbus, Ohio 43216-1049

Comments on Developing Rules to Reduce the Impacts of Nutrients in Surface Waters

Dear Rule Coordinator:

These comments are in response to the Agency's notice of March 21 for the Early Stakeholder Outreach related to "Developing Rules to Reduce the Impacts of Nutrients in Surface Waters." We appreciate the opportunity to comment and encourage Ohio EPA to continue developing these important rules. We would like to emphasize that we appreciate the effort of the Agency to quantify the amount of nutrient impacts through the Trophic Index Criterion, and the high quality and transparent effort the Agency has made to use their data and directly demonstrate links between nutrients and water quality.

Our summarized comments are:

- There is a clear need for Ohio to adopt water quality standards for nutrients in Ohio's streams, based on the data Ohio has collected and the analyses that have been done in the Technical Support Document and previous reports (e.g., Integrated Reports, Total Maximum Daily Load Reports).
- The proposal should state how Ohio plans to address downstream impacts of these WQS, especially if the Trophic Index Criterion (TIC) is used.
- The proposed standards need to include larger streams greater than 500 mi^2 in drainage area, based on maintaining and improving quality in those streams, and downstream impacts to larger bodies of water, such as Lake Erie, the Ohio River and the Gulf of Mexico.
- Higher contributions of total phosphorus (TP) in MWH streams (0.30 mg/l allowable) will dominate and not allow downstream streams to reach the needed and considerably lower TP concentrations (0.06 or 0.13 mg/l).
- Ohio EPA, ODNR, ODA and others should work to structure more incentives to reach nutrient reduction goals when the source of the problem is altered habitat.
- Headwater stream contributions.
- Coordination with ORSANCO's Nutrient Criteria Plan and Lake Erie LaMP.
- How these rules have been evaluated to help meet drinking water standards.
- Mussel sensitivity to nutrients, NH_3.
- Providing additional examples in plain language for the general public.
- A forum for discussion and review in the next stages of this rule's implementation.

100% post-consumer materials

Again, thank you for the opportunity to review the draft concepts. We believe the nutrient standard based on the Tropic Index Criterion is sufficiently technically justified, and the TIC provides a needed, focused quantification to a multi-parameter analysis. It is an acceptable route for proceeding, provided it includes adaptive management, an extensive effort by Ohio EPA to explain this technical approach, a margin of safety and diligent attention and implementation on the part of the Agency and affected parties.

Sincerely,

Bill Stanley
Assistance Director for Conservation

cc:
Dan Dudley/Bob Miltner, DSW, Ohio EPA
Anthony Sasson/John Stark, The Nature Conservancy in Ohio

The Nature Conservancy
Comments on Proposed Rules to Reduce the Impacts of Nutrients in Surface Waters
May 22, 2013

Need for nutrient management

There is a clear need for Ohio to adopt water quality standards for nutrients in streams.

As you know, nutrients are one of the top five aquatic life impairment causes according to Ohio EPA's 2012 Integrated Report. Without such standards for streams, and progress measured using these standards, we expect Ohio will continue to document nutrients as a major stressor to Ohio water bodies. Many streams in Ohio are failing to meet Clean Water Act goals, especially smaller streams, where only about half are in full attainment. While it is a matter of degree of impact, the Nutrient Criteria Technical Support Document accompanying this proposal clarifies that around 52% of Ohio streams are affected by nutrients or might be nutrient threatened. These nutrient problems continue to degrade stream ecology, contribute to harmful algal blooms, harm drinking water quality, and lead to negative economic impacts, particularly to recreation and tourism-related businesses in Ohio. The general public recognizes many of these problems and expects improvements through Ohio EPA leadership. Water quality standards provide measurable goals with which to gage progress.

We strongly support the use of Ohio EPA's data to demonstrate the relationship between nutrients and stream quality. Our experience shows that Ohio has a superior database and understanding of the relationships between nutrients and water quality, offering a strong foundation upon which to base the standards. We especially appreciate the "Technical Support Document for Nutrient Water Quality Standards for Ohio Rivers and Streams" that accompanied this Early Stakeholder Outreach effort, which provides an abundance of relevant references and statistical evidence of the effects of nutrient enrichment on Ohio streams, and uses Ohio data to show these relationships.

Downstream impacts

The proposal should state how Ohio plans to address downstream impacts of these WQS, especially if the Trophic Index Criterion (TIC) is used.

If the TIC is implemented, it appears possible that within some stream reaches, higher nutrient concentrations and loads would meet the proposed standards, but these concentrations and loads would consequently be transported downstream. Cumulative downstream impacts seem likely and larger rivers and lakes/reservoirs with longer residence times could be particularly impacted. Many of these downstream resources would not yet be subject to a nutrient standard, at least not under this proposal. Consequently, there could be limited attainment of water quality goals for the downstream resources (lakes, Lake Erie, reservoirs, larger streams, Gulf of Mexico). How will these proposed rules encourage and meet improvement and protection goals for these downstream resources? Ohio EPA needs to set upstream nutrient standards with not only the immediate stream reach impact in mind, but

also driven by downstream considerations. We expect that tools are available to assign loading contributions from upstream reaches so that downstream conditions can be modeled and goals are met downstream. Standards need to be set for these downstream reaches.

WQS for large rivers over 500 mi^2

The proposed standards need to include larger streams greater than 500 mi^2 in drainage area. The need is based on:

1. Maintaining and improving quality in those streams; and
2. Downstream impacts to larger bodies of water, such as Lake Erie, the Ohio River and the Gulf of Mexico.

Also, the proposal needs to determine how streams that have higher nutrient concentrations and met the standard through reliance on the TIC will affect these larger rivers/streams. As stated above, there is a need to set upstream nutrient standards with not only the immediate stream reach impact in mind, but also downstream considerations. We expect that tools are available to assign loading contributions from upstream reaches so that goals are met downstream.

As you know, some other states are attempting to establish criteria for large rivers. While we would assume appropriate caution in applying these criteria to Ohio rivers, as one example, Smith and Tran (2010) have recommended criteria for rivers in New York. The Ohio EPA's Technical Support Document documents other evidence of impacts to larger rivers.

Modified Warmwater Habitat (MWH)

Our concern is that the higher allowable TP in MWH streams (0.30 mg/l) will dominate and not allow downstream streams to reach the needed and considerably lower TP concentrations (0.06 or 0.13 mg/l).

Nutrients in streams of higher quality tend to be at least somewhat assimilated by higher-quality physical habitat (such as riffles and instream or riparian vegetation). In some cases, negative nutrient impacts are somewhat masked and less pronounced when instream habitat quality is relatively high. Modified Warmwater Habitat (MWH) streams are those that have been channelized or ditched to encourage rapid drainage major delivery conduits for nutrients. At the same time, the degraded habitat condition encourages rapid downstream transport of their nutrient loads, and limits nutrient processing. For nutrients, these MWH streams need protective standards related to downstream impacts in WWH and EWH streams. Our concern is that the higher contributions of total phosphorus (TP) in MWH streams (0.30 mg/l allowable) will dominate and not allow downstream streams to reach the needed and considerably lower TP concentrations (0.06 or 0.13 mg/l). We ask that the Agency conduct a specific analysis of high-nutrient MWH streams investigating to what degree MWH streams and this proposed concentration would affect attainment of downstream WWH and EWH. In this or a related review, we also ask that MWH streams be reassessed concerning the potential for upgrades to at least WWH.

The rule should include strong incentives to improve habitat and the rate of attainment in MWH streams, including minimizing the impact on downstream WWH and EWH streams. The TSD clearly

makes the case that habitat quality, which is degraded in an MWH stream, is a controlling factor for the probability of meeting WWH. Especially where MWH streams are common or predominant, it is not clear how higher concentrations in MWH streams would allow for attainment in downstream WWH, EWH or CWH streams.

Also, it is not clear what the incentives are for attainment in MWH streams.

Ohio EPA, ODNR, ODA and others should work to structure more encouragement and incentives to reach nutrient reduction goals when the source of the problem is altered habitat, such as in MWH streams. For example, recommended ditch designs, reducing channelization impacts, stormwater permit oversight, Best Management Practice payments and educational efforts could influence

Headwater streams contributions

While we appreciate the attention to the larger, use-designated streams, there might be additional value in focusing on nutrient concentrations from headwater streams. Headwater streams (e.g., first and second order) constitute a major portion of the flows and loads to the larger streams: "the flow contributions of headwater catchments to the mean water volume in downstream reaches decline only marginally to about 55% in fourth- and higher-order streams. The large contributions of headwater nitrogen sources and flow volumes to mean-annual nitrogen loads and flow in streams of all sizes are generally consistent with the high density of headwater streams and the high frequency of their connections to the channels of all higher-order streams; these are intrinsic properties of dendritic river networks" (Alexander et al 2007; pg. 54). Where headwater streams also constitute a major portion of the load, there might be value in creating a way, through the standard, to focus nutrient reduction efforts.

Coordination with ORSANCO and Lake Erie LaMP

ORSANCO's stated intention is to involve states including Ohio "in the criteria development process to assure consistency in water quality standards." (ORSANCO Nutrient Criteria Plan (9/2011) - http://www2.epa.gov/sites/production/files/documents/orsancoplan92011.pdf) The Lake Erie LaMP's Nutrient Science Task Group includes water quality objectives for phosphorus (U.S. EPA. 2009. *Status of Nutrients in the Lake Erie Basin*, Prepared by the Lake Erie Nutrient Science Task Group for the Lake Erie Lakewide Management Plan. Available from www.epa.gov/lakeerie/erie_nutrient_2010.pdf). The background material provided by Ohio EPA also cites the Lake Erie LaMP of 2011. Ohio's nutrient rules should address:

- How will this rulemaking help meet these regional and national goals;
- How have these rules been analyzed to quantitatively demonstrate they will help these goals;
- If they have not been, what might be a plan for addressing these points; and
- How Ohio River and Lake Erie goals will determine standards in the tributary networks.

Drinking water standards

States including Ohio have noted the need to reduce nutrient concentrations in order for water supply utilities to provide high quality and suitable drinking water. Ohio EPA should explain how these rules been evaluated to help meet drinking water standards, such as noted in "An Urgent Call to Action -

Report of the State-EPA Nutrient Innovations Task Group" (http://water.epa.gov/scitech/swguidance/standards/criteria/nutrients/upload/2009_08_27_criteria_nutrient_nitgreport.pdf).

Mussel sensitivity to nutrients, NH_3

We encourage Ohio EPA to evaluate the effects of nutrients and their breakdown products (such as NH_3) on mussels and include that group in an analysis and rule. Mussels are the most at-risk group of aquatic animals in Ohio's streams, with a large number of Ohio species in decline and/or listed as threatened or endangered. These proposed standards might not be adequate to protect mussels, especially the many species in Ohio that are listed as threatened or endangered, and we encourage investigation into the nutrient concentrations that might affect them.

For example, Strayer and Malcom (2012) stated "In contrast, recruitment failure was strongly associated with high concentrations (0.2 ug N/L) of un-ionized ammonia." This is a rather low concentration, as noted by these authors, and well below the "chronic criterion of ~ 1.0 mg/l" noted in the Agency's "Nutrient Criteria TSD" (page 47). The issue of ammonia toxicity is addressed by U.S. EPA (2009), i.e., (page v) "While declining mussel populations may be due to many factors, the newly published ecotoxicological data indicate that freshwater mussels are more sensitive to ammonia when compared to other freshwater aquatic organisms."

Providing examples

While the Technical Support Document does provide some examples of application of the potential standard, it could be beneficial for the Agency to provide examples and a summary of the proposal in common language terms for the general reader.

This would provide examples of how the WQS and TIC would work in real situations, but with a minimum or jargon and technical references.

Nutrient Standard Forums

To ensure progress and understanding, we ask that the Agency convene "Nutrient Standard Forums" that review and discusses this proposal during the Interested Party Review and Draft Rule steps. Such a format could allow representatives from various perspectives (e.g., environmental and other NGOs, business, wastewater treatment plant owners, recreation interests, general public) to provide their review of the proposed standard and encourage open dialogue.

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SENT VIA EMAIL AND U.S. MAIL

June 7, 2013

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Re: Ohio EPA Early Stakeholder Outreach Nutrient Criteria Strategy
Our File No. 043595

To Whom It May Concern:

In March, Ohio EPA made available for early stakeholder comment a draft nutrient criteria strategy. The following comments regarding this action are submitted on behalf of the Ohio Utility Group and its member companies ("OUG" or "the Utilities"),[1] which is an association of individual electric utilities in the State of Ohio. The electric utilities own and operate power plants and other facilities that generate electricity for residential, commercial, industrial, and institutional customers. These power plants and other facilities are subject to Ohio's NPDES permit program.

The Utilities are pleased to provide the following comments on the Ohio EPA draft reports, "Trophic Index Criterion – Rationale and Scoring" and "Technical Support Document for Nutrient Water Quality Standards for Ohio Rivers and Streams," dated December 1, 2011. First, the Utilities appreciate the Agency's willingness to consider these comments past the early stakeholder outreach comment deadline. Second, the Utilities provide some general comments on the Agency's goal to derive numeric nutrient criteria (also referred to as "thresholds" or "target values" in the draft report) as part of the overall nutrient reduction strategy policy. Finally, specific comments on technical aspects of the reports follow.

[1] The member companies include: Buckeye Power, Inc., The Dayton Power and Light Company, Duke Energy Ohio, FirstEnergy Solutions, Ohio Power Company (a unit of AEP), and Ohio Valley Electric Corporation.

General Comments

The Utilities understand the need to develop additional tools that, when implemented, can reasonably be expected to reduce the loading of nutrients to water bodies where biological impairment occurs or can be expected to occur without additional controls. Excessive eutrophication can cause impaired water quality and adverse recreational effects. The Utilities participated in the point-source nutrient reduction strategy workgroup and there were recommendations identified that could, in some instances, provide real cost-effective reductions in nutrient loads. The Utilities are also aware of the importance of "buy-in" from the agricultural community, as nutrient loads in some watersheds are clearly dominated by runoff from agricultural practices.

To the extent that Ohio EPA utilizes a stressor-response approach based on data from well-designed and conducted studies, the Utilities do not object to this approach. The proposed nutrient targets are founded on measurable biological responses that emanate from the Agency's water quality and biological watershed studies. While there may be some disagreement on how the underlying data are interpreted or analyzed (or what level of protection is chosen), the Utilities believe that effects-based nutrient targets are more prudent and robust than a reference-based approach. In reviewing the draft technical support documents and resulting trophic index criteria, our review centered on the following questions:

- Did the Agency strive to elucidate a mechanistic platform of how nutrient concentrations affect primary productivity considering knowledge found in the technical literature?
- Where one or more nutrients were thought to be the primary cause of some biological shift or effect, was there adequate verification that no other water quality parameters caused or worked synergistically with nutrients to cause the observed biological response?
- Were the data analysis methods transparent and appropriate?
- Were the interpretations of results reasonable or did they lead to overly-conservative target values?

Based on these considerations, the following Section addresses specific technical or scientific issues. The Utilities believe that consideration of these comments may result in a more strengthened technical rationale for the proposed target values.

Specific Technical Comments

Comments on "Trophic Index Criterion – Rationale and Scoring"

- On Table 1, there is a typo under DO for "modest swings" – it reads ">6 mg/" instead of >6 mg/L."

- On Table 1, the minimum "Acceptable" value for the Trophic Index Criterion ("TIC") is 22. Should this be changed to 25?

- Regarding the "normal variation" and "modest swings" cutoffs for dissolved oxygen ("DO") daily variation, where would a value of 6 mg/L be placed?

- How the maximum and minimum values for the "threatened" and "impaired" categories are calculated is confusing. It is unclear how the ranges of 14 – 21 (Threatened) and 0 – 13 (Impaired) are derived. Can Ohio EPA provide explanatory text on how these values are calculated?

- In Table 2, how are the total phosphorus ("TP") and dissolved inorganic nitrogen ("DIN") concentration categories expressed? As a 30-day average?

- One page 3, in the text under paragraph entitled "A Note on TIC Categorical Levels," the first part of the paragraph appears to indicate that evidence of nutrient enrichment based on chemical analyses would have more weight in categorizing the TIC condition than full attainment of the adopted biological criteria. The fourth sentence reads: "This approach [i.e., evidence of chemical impairment trumps biological attainment] recognizes that the biological indicators can be stressed by nutrient enrichment before showing statutory impairment as defined by the biocriteria." This seems to cast doubt on the long-defended policy of Ohio EPA that biological criteria fully integrate presiding chemical and physical attributes, as these parameters often show high temporal variability. The next sentence then states that full biological attainment with normal variation in daily DO range yields an acceptable TIC rating, even if the other nutrient measures indicate over-eutrophication. If the Agency is saying that DO levels are more closely aligned with whether or not biological criteria are attained relative to TP and DIN (i.e., the biological response is more sensitive to DO ranges), then what is the need for scoring the nutrient component in Table 1? In addition, sentence six in this paragraph states that "[t]his construct [i.e., biological performance and DO measures trump measured nutrient levels] recognizes and dampens the reality of environmental variability inherent in chemical measures." If Ohio EPA has actual data indicating that low or marginal nutrient levels often cause "false positives" (i.e., biological criteria attainment is predicted but the applicable biological criteria are actually not attained), then this would indicate that an over-emphasis on nutrient levels relative to biological attainment is not really appropriate.

- Under the paragraph entitled "Implementation in NPDES Permits," a statement is made that "[t]he default limits are 1.0 mg/L TP and 10 mg/L DIN." The Utilities request that some information be provided concerning the basis of these limitations – are these default limits technology-based? If so, for what kinds of facilities? The Utilities believe it is

important to define the basis of these limitations because the biological-response based draft nutrient targets are an order of magnitude more stringent. Is the Agency saying that the implementation of the default nutrient limitations in NPDES permits has not resulted in adequate loading reductions of nutrients such that restoration of existing use designations or the attainment of applicable biological criteria has not been observed? The Utilities believe that the Agency needs to make a stronger case to the public that more stringent nutrient criteria are needed ***because the default TP and DIN limitations are not adequately protective, if this is indeed the case.***

- For the draft TP and DIN nutrient criteria for the three categorized aquatic life uses, the warmwater habitat values are to apply where QHEI habitat scores range between 12 and 64. The Utilities believe that the Agency should give further consideration as to the extent of this range. Both fish and macroinvertebrate metrics are sensitive to habitat quality. Increasing values of the Index of Biotic Integrity and individual fish metric scores (e.g., number of sensitive species) increase with increasing QHEI values whereas the percentage of tolerant fish species declines with increasing QHEI values.[2] Moreover, at least one macroinvertebrate community index metric (qualitative EPT taxa) is also sensitive to habitat quality.[3] In the TSD document, Ohio EPA uses this metric as a key biological response variable in describing how nutrient over-enrichment affects several components of stream function. On page 27, Figure 8 indicates that EPA taxa richness is sensitive to habitat quality and the standardized coefficient for QHEI's effect on EPT taxa richness is 0.33. This indicates that an increase in the standard deviation of QHEI scores results in a predictable increase in standard deviation of EPT taxa richness values. Considering the extensive evidence (made by Ohio EPA biologists) that the habitat quality can have a substantive effect on biological metrics, the Utilities believe that a stratification of QHEI scores and resulting TP and DIN criteria should be considered.

<u>Comments on "Technical Support Document for Nutrient Water Quality Standards for Ohio Rivers and Streams"</u>

- In general, the Utilities believe that this document is technically astute and well-written. The authors conducted considerable research on the fundamental effects of nutrient enrichment on stream structure and function. The literature citations (Tables 1 – 3) are representative

[2] Rankin, E.T. 1995. Habitat indices in water resource quality assessments, pp. 181-208 in W.S. Davis and T.P. Simon (editors), <u>Biological assessment and criteria: tools for water resource planning and decision making</u>. Lewis Publishers, Boca Raton, FL.

[3] DeShon, J.E. 1995. Development and application of the invertebrate community index (ICI), pp. 217-244 in W.S. Davis and T.P. Simon (editors), <u>Biological assessment and criteria: tools for water resource planning and decision making</u>. Lewis Publishers, Boca Raton, FL.

and the authors have attempted to elucidate general theories and trends from the extensive literature, which in most cases documents observations from site-specific studies.

- The report discusses a series of statistical procedures which, taken as a whole, appear to be somewhat disjunctive. For example, it is problematic to connect the procedures and discussion in section 2.1.3 (Statistical Analyses) with the analyses and discussion in section 3.1 (Structural Equation Modeling). In discussing the relationship between the analyses and interpretation in section 2.1.3 with the forthcoming structural equation modeling discussed in section 3.1, the text reads: "[t]he preceding results are an abridged version to show the basic casual pathway of enrichment from primary nutrients to the condition of biological assemblages, as the thresholds identified at individual steps along the path form the technical basis of water quality criteria for nutrients" (p. 23). While the Utilities cannot suggest more appropriate alternate statistical methods, the Utilities believe that the final version of the report should show concisely how the key statistical analysis results connect with each other. A flowchart depicting the various statistical analyses – with salient results identified at each step – should be considered.

- Page 13, Figure 1: On the x-axis, the abbreviation "SRP" is provided as the form of nitrogen which was measured in studies concerning algal saturation. Please clarify what this abbreviation stands for. In addition, the interquartile ranges of effects caused by DIN versus TP differ significantly. This suggests that dissolved inorganic nitrogen is a more bioavailable form of nitrogen compared to all nitrogen forms. The Utilities believe that the expression of a nitrogen criterion should be based on the most bioavailable form and, thus, the Utilities agree that nutrient targets based on DIN are much more appropriate than thresholds based on total nitrogen.

- Page 13, Section 2.1.1: This section on methods used indicates that land use at the 119 study areas (percentage of urban versus agricultural acreage) was based on Landsat imagery collected during September – October 1994. Due to the time interval (almost 20 years), the Utilities suggest that a selected number of study sites be ground-truthed to evaluate whether substantive changes in land use have occurred.

- Page 14, Section 2.1.2: With regard to the detection limits for the various nutrients measured during the chemical/biological studies, the report indicates that 61% of all nitrogen-ammonia analyses were less than the method detection limit ("MDL") and these "less thans" were uniformly transformed to one-half the applicable MDL. This transformation would lead to a distribution pattern strongly deviating from a normal distribution. The Utilities suggest that the Agency consider using a statistical method that estimates the concentration of an analysis reported as less than MDL based on the distribution of analyses reported as greater than the MDL.

- Page 16, last paragraph: The term "change point" in the first sentence should be defined.

- Page 17, second paragraph, fifth sentence: Does the phrase "...because pheophytin was strongly correlated with benthic chlorophyll," indicate the strength of the relationship with a *P* value or correlation coefficient?

- Page 19, Figure 3: In Figure 3(c), the x-axis contains values for "degree of open canopy" that exceed 100. Please explain how "degree of open canopy" can be measured at greater than 100%.

- Page 20, Figure 4(a): In this graph, "benthic chlorophyll" is depicted as the independent variable while 24-hour DO range is indicated as the dependent variable. Should the labels on the x and y axes be switched?

- Page 23, third paragraph, second sentence: This sentence (beginning with "Estimation was by...") should be re-written or split into two separate sentences.

- Page 23, third paragraph: In the structural equation modeling ("SEM"), the biological metric – number of EPT taxa – was chosen to construct a hypothesized framework of how abiotic variables, individually and collectively, influence biological receptors. While the refined model in Figure 8 is helpful in understanding the linkages and the strength of influence among the variables, can additional discussion be provided on why EPT taxa richness was used? While this metric is clearly sensitive to a wide range of water quality perturbations, it is a qualitative biological score. Was the SEM conducted using the Invertebrate Community Index ("ICI") as a biological response? The ICI does contain qualitative EPT taxa as one of the metric scores and has aquatic life use attainment implications.

- Page 27, Table 5: The Utilities recommend that additional information be provided on to what these values pertain. The terms "RMSE" and "CFI" are not found in the text. In addition, for the chi-square statistic, to what does the degree of freedom value of 39 refer? On page 24 the text reads in the first paragraph that "Model fit indices (Table 5) suggested that the final model is consistent with the variance/covariance matrix." Additional text is needed to explain how this conclusion was drawn.

- Pages 31 – 33 regarding Logistic Regression Analysis: This analysis was conducted to "...estimate the probability of fish and macroinvertebrate biotic indices meeting respective biological criterion given TP or DIN as stressors" (p. 31). At the top of page 32, the text indicates that the data for this analysis were from the Agency's biological and chemical studies conducted during 1982 through 2010. During this time period, it is likely that the MDLs for nutrient analyses varied. Can information be provided on what range of MDLs

was observed and how analyses reported as "less than MDL" were managed for data analysis purposes?

- For all of the statistical analyses conducted, were monitoring data for sites that were affected by water quality variables other than nutrients deleted or otherwise flagged? Did some study sites show evidence of biological impairment in which the cause of impairment was both nutrients and other stressors? Please explain the steps taken to minimize potentially spurious relationships between nutrient levels and biological response where both nutrients and other stressors were identified as the cause of impairment.

- Page 32, fourth sentence: What figure or figures are referred to concerning the sentence "[w]ith respect to DIN, and to a lesser extent TP, the macroinvertebrates show a subsidy-stress response, where the probability of meeting WWH increases with increasing DIN concentrations, presumably due to a stimulatory effect, before a threshold is reached and a stress response is induced"? Figures 13 and 15 clearly do not show a response consistent with a hormesis-type of action. In the next sentence, please clarify what is meant by "[t]he logistic models including TP were more robust than those including DIN…"? The text then indicates that Figure 15 (figure on right side) also shows a subsidy-stress response. Please explain how this interpretation was made, considering the suspect response of EPT taxa residuals to DIN.

- Page 34 – Synthesis of Field Studies and Derivation of the TIC: The first paragraph represents a very succinct and helpful summary of the statistical analyses conducted in previous sections. These analyses obviously serve as building blocks to how the draft TIC was derived. As previously indicated, a user-friendly flowchart summarizing the various analysis methods – and how these contributed to the construction of the TIC – is highly recommended.

- Page 36, Table 11: Confusion exists as to how the "biological condition" scores relate to EPT taxa richness. Figures 17(c) and 17(d) indicate how EPT taxa richness varies with DO parameters. The various "biological condition" scores are placed on the y-axis of both these graphs. The narrative descriptions of the biological condition scores in Table 11 discuss all of the biological indices, not just the EPT taxa richness metric.

  In addition to previous figures that plot biological responses versus nutrient or dissolved oxygen variables, Figures 17(c) and 17(d) at times show little evidence of a strong correlation (that may be inferred as a cause-and-effect relationship). Can the figures be modified to indicate how well the dependent and independent variables are associated?

- Page 47, Implementation of TIC and Numeric Nutrient Criteria: The Utilities agree with the discussion related to managing nutrient load reductions through an iterative or phased

approach. We agree with the sentence "[t]his iterative approach recognizes the greater level of uncertainty in the biological response to nutrients compared to conventional pollutants."

- The Utilities support a water quality trading approach for reducing nutrient loads and encourage Ohio EPA to streamline this approach and maximize ease of implementation to the extent possible. Further, the Utilities note that in U.S. EPA's proposed Effluent Limitations for Steam Electric Generators, the rules contain a prohibition on nutrient trading for numeric limits. Will the Agency be submitting comments on this proposal?

- The Utilities appreciate the Agency's consideration of the relative costs to remove total phosphorus versus total dissolved nitrogen. The differential costs of reducing either total phosphorus, or total phosphorus and nitrogen, was summarized by Lewis et al. (2011):

> Sole focus on phosphorus as a means of controlling algal biomass may seem advantageous because it is much less expensive than control of both N and P. Some researchers also continue to argue that nitrogen control does not work because N2 fixation can provide algae with labile nitrogen.[4] (p. 10303)

- Page 50, Calculation of WQBELs: Section C indicates that stream design flows for the regulation of TP and DIN shall be equivalent to the stream flow exceeded 80% of the time for both summer months and winter months. On page 51, the Agency indicates that this flow is the 80th percentile flow. Actually, it represents the 20th percentile flow value.

The Utilities thank Ohio EPA for the opportunity to comment on this draft strategy. Should you have any questions, please do not hesitate to contact me.

Very truly yours,

Cheri A. Budzynski

Cheri A. Budzynski

CAB\bd

[4] Lewis, W.M. Jr., W.A. Wurtsbaugh, and H.W. Paerl. 2011. Rationale for control of anthropogenic nitrogen and phosphorus to reduce eutrophication of inland waters. *Environmental Science & Technology* 45: 10300 - 10305.