JUNE 12, 2014, OEPA NUTRIENT TECHNICAL ADVISORY GROUP MEETING HANDOUTS

Discussed Fairfield County Utilities NPDES appeal - Oral arguements to be presented to Ohio Supreme Court next week. TMDL

Draft AGENDA MEETING 8

Ohio Nutrient WQS Technical Advisory Group

June 12, 2014 10:00 AM – 2:00 pm Short Lunch Break

Ohio EPA Groveport Lab Facility
4675 Homer Ohio Ln
Groveport, OH 43125

EPA Bridgeline – (614) 644-4743

Review Agenda, Meeting Date and Misc. Topics

Dan Dudley Member Questions / Discussion

- Review agenda, adjust as needed
- Review minutes of last meeting
- Hypoxia Task Force News
  - Re-cap of May 2014 meeting
  - Ohio to host Spring 2015 HTF meeting
- 2014 study plans available

Report from TIC Scoring Subgroup

Guy Jamesson Member Questions / Discussion

Report Out on Implementation Groups (if available

Subgroup Leaders Member Questions / Discussion

Follow Up on Questions from Meeting 7

Dan Dudley / Gary Stuhlfauth Member Questions / Discussion

- Refer to handout

Wrap up, review action items

- Next meeting scheduled for July 10th
  - Will there be enough products available?
- Interest in Big Darby field demonstration day?

Handout for 6/12/14 TAG meeting

The "impracticable" question

From OAC 3745-33-05:

(C) Characterization of discharge levels.
(1) Expression of permit limits for continuous discharges. These requirements shall apply unless the director determines that expressing limits in these terms is impracticable. (*e.g.* - Limits for POTWs must be written as monthly and weekly averages.)

What does "impracticable" mean?

In this context, impracticable means that there are scientific and policy rationales that support an alternative approach to having limits expressed as monthly + weekly averages (POTWs) or monthly average + daily maximum (other facilities).

Examples

For metals – In POTW permits, why do we write limits for metals as a monthly average and daily maximum, not monthly and weekly?

Rationale: The basis for monthly/weekly limits for POTWs is rooted in the secondary treatment regulations and is not related to the need for assuring attainment of water quality standards. In addition, metals are toxic pollutants. A weekly average limit, which could be the average of up to seven daily discharges, could average out peak toxic concentrations and the discharge's potential for causing acute toxic effects might be missed. A maximum daily limit is more likely to identify potential acutely toxic impacts.

For phosphorus – Read U.S. EPA's March 3, 2004 memo addressing annual nutrient limits for Chesapeake Bay dischargers. Pay special attention to the section on page 4, "Why is it impracticable to express limits for nutrients on a daily, weekly or monthly basis?"

Why it's important how TMDLs are written - While the Chesapeake Bay study was not a TMDL, it was similar in scope and provided the rationale for the annual limits.

From 40 CFR 122.44(d)(1):
(vii) When developing water quality-based effluent limits under this paragraph the permitting authority shall ensure that:

(B) Effluent limits developed to protect a narrative water quality criterion, a numeric water quality criterion, or both, are consistent with the assumptions and requirements of any available wasteload allocation for the discharge prepared by the State and approved by EPA pursuant to 40 CFR 130.7. *(i.e.* - an approved TMDL)

Handout for 6/12/14 TAG meeting

Summary - How nutrient limits have been expressed in Ohio NPDES permits

Permits with total phosphorus limits:

	LEB	ORB
Minors	43	106
Majors	79	37

Total P limits 0.7 mg/l or greater (in order of frequency):

1) Monthly average + weekly average, concentration and mass, year-round (1.0/1.5) – All plants in Lake Erie basin > 1 MGD, minors in Lake Erie basin based on TMDL or lake rule, Ohio River basin plants based on TMDL, lake rule or other.

2) Monthly average only, concentration and mass, most year-round, a few summer (most 1.0 mg/l, some lower or higher) –minors, TMDL- based

3) Monthly average + weekly average, concentration and mass, year-round, monthly averages between 0.7 and 1 mg/l – Lake Erie basin majors and minors, Ohio River basin plants, based on TMDL or other.

4) Monthly average + weekly average, concentration and mass, summer (1.0/1.5), monitoring during winter – lower LMR expansions.

TMDL mass loads + extended compliance schedules:

1) Upper LMR model (Monthly average + weekly average, concentration and mass, summer - 1.0/1.5) + summer season mass load limit from TMDL. Compliance with 1.0/1.5 in 3 years. Compliance with TMDL mass load limit in 10 years. Monitoring during winter.

* Compliance with TMDL mass load limit determined as follows:

(med Qeff x med Peff x F) - (water quality credits) must be less than or equal to mass load limit

- med Qeff = 5-year median daily effluent flow rate during May - October (MGD)
- med Peff = median daily effluent total phosphorus concentration during May - October (mg/l)
- F = conversion factor
- Water quality credits = water quality credits accrued through participation in a water quality trading program developed in accordance with chapter 3745-5 of the Ohio Administrative Code

2) (Monthly average + weekly average, concentration and mass year round, 0.7/0.7) + year-round mass load limit from TMDL included in a compliance schedule to meet in 2 years if by treatment or 10 years if through trading – Tinkers Creek permits. TMDL mass load compliance like *, above, except year-round flows and concentrations.

3) (Monthly average + weekly average, concentration and mass year-round, 1.0/1.5) + year-round mass load limit from TMDL included in extended compliance schedule (15 years) to allow for a new stream survey and update of the TMDL. Mass load compliance like *, above, except year-round flows and concentrations. – BCUMC

What about the smaller plants in the upper LMR watershed?

- 5 minor POTWs with design flows 0.240 – 0.900 MGD received phosphorus allocations and have summer 1.0/1.5 mg/l monthly/weekly limits + summer season TMDL-based mass load limit in their permits; monitoring during the winter.

- 7 minor POTWs with design flows less than 29,000 gpd did not receive phosphorus reductions in the TMDL

Other questions

Q - If you meet your month/weekly limits but violate a seasonal limit – how many violations would that be?

A - If a facility reports one value for the summer season and that value is higher than the seasonal limit, the facility would receive one NOV from Ohio EPA. If that facility were to find itself in an enforcement action with the attorney general's office, that single NOV would be considered 184 days of violations when it comes to calculating a penalty.

Q - If a TMDL calls for phosphorus limits during the summer months, then there are no limits during other months. Correct?

A - This is correct in the Ohio River basin. In the Lake Erie basin, there would be 1.0/1.5 mg/l limits during the winter months for plants with a design flow of 1 MGD of larger.

Q - If using alum for treatment to meet summer phosphorus limits, are you allowed to not treat in the winter? If using biological nutrient removal to meet summer limits, could you operate differently in winter?

A - The Agency is going to begin including a requirement in NPDES permits for plants to identify measures that can reasonably be expected to optimize the ability **of existing facilities** to remove total phosphorus and nitrate+nitrite. After evaluating these measures, the permit will require implementation of ones that are successful.

We had some discussion of this at the April TAG meeting, though it's not in the minutes. The members were generally supportive of this approach but as something that would be done in lieu of effluent limits.

In light of this coming permit requirement, and the fact that the Agency is still considering details about implementation, the answer to these two questions is unclear at this time.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

MAR 3 2004

OFFICE OF
WATER

MEMORANDUM

SUBJECT: **Annual Permit Limits for Nitrogen and Phosphorus for Permits Designed to Protect Chesapeake Bay and its tidal tributaries from Excess Nutrient Loading under the National Pollutant Discharge Elimination System**

FROM: James A. Hanlon, Director
Office of Wastewater Management

TO: Jon Capacasa, Director
Water Permits Division, EPA Region

Rebecca Hanmer, Director
Chesapeake Bay Program Office

This memo responds to your proposal to use National Pollutant Discharge Elimination System (NPDES) permit effluent limits for nitrogen and phosphorus expressed as an annual limit in lieu of daily maximum, weekly average, or monthly average effluent limitations, for the protection of Chesapeake Bay and its tidal tributaries from excess nutrient loading. Based on the information provided by your staff and for the reasons and under the circumstances outlined herein, I concur that permit limits expressed as an annual limit are appropriate and that it is reasonable in this case to conclude that it is "impracticable" to express permit effluent limitations as daily maximum, weekly average, or monthly average effluent limitations. This memo describes the scientific and policy rationales that support this approach.

EPA Region 3 has developed recommended water quality criteria for certain parameters designed to protect water quality in Chesapeake Bay and its tidal tributaries.[1] The main cause of water quality impairment for these parameters in the main stem of the Bay is loading of nutrients, specifically nitrogen and phosphorus, from point and nonpoint sources throughout the entire Chesapeake Bay watershed. The States are in the

[1] See EPA's Ambient Water Quality Criteria for Dissolved Oxygen, Water Clarity and Chlorophyll for the Chesapeake Bay and Its Tidal Tributaries, April 2003. "Chesapeake Bay and its tidal tributaries" is the portion of the Chesapeake Bay watershed subject to the ebb and flow of ocean tides. This area encompasses all of the mainstem Bay and the area north and east to the fall line. The fall line is a physical barrier on the Bay's larger tributaries marked by waterfalls and rapids.

process of adopting revised water quality standards based on EPA Region 3's recommended water quality criteria and developing wasteload allocations for point sources discharging to the Chesapeake Bay watershed that are designed to protect water quality in Chesapeake Bay and its tidal tributaries from excess nutrient loading.

Establishing appropriate permit limits that implement nitrogen and phosphorus wasteload allocations for discharges that cause, have the reasonable potential to cause, or contribute to excursions of water quality criteria for Chesapeake Bay and its tidal tributaries is different from setting limits for other parameters such as toxic pollutants because: the exposure period of concern for nutrients loadings to Chesapeake Bay and its tidal tributaries is very long; the area of concern is far-field (as opposed to the immediate vicinity of the discharge); and the average pollutant load rather than the maximum pollutant load is of concern. Thus, developing appropriate effluent limitations requires innovative implementation procedures.

Applicablility

Your proposal addresses implementation of wasteload allocations for nitrogen and phosphorus designed to achieve compliance with water quality standards of Chesapeake Bay. Your proposal and the rationale discussed in this memorandum are not intended to address wasteload allocations to meet other water quality standards in areas outside of Chesapeake Bay and its tidal tributaries. Smaller scales such as embayments and smaller tributaries than the major Eastern and Western shore rivers were not examined and therefore the rationale in this memorandum does not address and may not apply to the protection of these smaller scale situations.

This rationale also does not apply to parameters other than nitrogen and phosphorus that may exhibit an oxygen demand to waters of the Bay. Such parameters include dissolved oxygen, biochemical oxygen demand, and ammonia.

Of course, all local water quality standards apply and must be met when evaluating appropriate point source permit effluent limits. States are developing water quality standards for nutrients to be applied to local waters as stand-alone criteria. In any case where the nutrient wasteload allocations for protection of water quality in a river, tributary, or other part of Chesapeake Bay are expressed on a shorter term basis, i.e., seasonal, monthly, weekly or daily values, the permit limits that derive from and comply with the wasteload allocation expressed on such shorter term basis must be used. Shorter averaging periods might be appropriate and necessary to protect against local nutrient impacts in rivers or streams in the basin.

Additionally, it is important to note that the nutrient dynamics of the Bay may not be unique. The establishment of an annual limit with a similar finding of "impracticability" pursuant to 40 CFR 122.45(d) may be appropriate for the implementation of nutrient criteria in other watersheds when: attainment of the criteria is dependent on long-term average loadings rather than short-term maximum loadings; the

circumstances match those outlined in this memo for Chesapeake Bay and its tidal tributaries; annual limits are technically supportable with robust data and modeling as they are in the Chesapeake Bay context; and appropriate safeguards to protect all other applicable water quality standards are employed.

Why are annual loadings appropriate for wasteload allocations for nutrients for Chesapeake Bay and its tidal tributaries?

The nutrient dynamics of Chesapeake Bay and its tidal tributaries are complex. Unlike toxics and many conventional pollutants that have a direct and somewhat immediate effect on the aquatic system, nutrients have no direct effect, but instead are "processed" in several discreet steps in the Bay ecosystem before they have their full effect. Each processing "step" further delays and buffers the time between the time of nutrient discharge in an effluent and the resultant nutrient effect on the receiving waterbody.[2] Chesapeake Bay and its tidal tributaries' biological and physical processes can be viewed as "integrating" variations of nutrient load magnitude over time. The integration of nutrient loads from all sources over time ameliorates intraannual load fluctuations from individual sources, with the Bay responding to overall loads on an annual scale, while showing little response to monthly variations within an annual load.[3]

EPA has conducted complex modeling of the effect of nutrient loading to the Bay specifically from individual point source discharges.[4] Based on the results of the model, EPA concluded that Chesapeake Bay and its tidal tributaries in effect integrate variable point source monthly loads over time, so that as long as a particular annual total load of nitrogen and phosphorus is met, constant or variable *intraannual* load variation from individual point sources has no effect on water quality of the main bay.[5]

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[2] More specifically, nutrients are taken up by algae throughout the year, and once taken up, settle to the bottom to decay in the warmer summer waters, contributing to summer anoxia/hypoxia. Thus, summer anoxia is the result of organics, primarily from algal deposition, which accumulates throughout the year, with peak algal biomass generated in the bloom of early spring, and that these organics are stored in Chesapeake Bay and tidal tributary sediments throughout the year and between years.

[3] The seasonal build-up of the volume of hypoxic water in the deep channel results from the integration of effects of microbial metabolism acting over long time scales. With respect to the Chesepeake Bay, Boynton et al. stated "... the coupling between nutrient loading, water column production of organic matter, and recycling of nutrient from sediments occurs over time scales of about several years or less."

[4] The complex movement of water within Chesapeake Bay and its tidal tributaries, particularly the density-driven vertical estuarine stratification, is simulated with a Chesapeake Bay hydrodynamic model of more than 13,000 cells. The Water Quality Model is linked to the hydrodynamic model and uses complex nonlinear equations describing 26 variables of relevance to the simulation of dissolved oxygen, water clarity and chlorophyll *a*. Coupled with the Water Quality Model are simulations of settling organic material into and upon the sediments and its subsequent decay and flux of inorganic nutrients from the sediment, as well as a coupled simulation of underwater Bay grasses in the shallows.

[5] The Water Quality Model was used to examine the differences between a constant monthly load and a variable monthly load, but each at the same annual load levels. For nitrogen, the constant monthly discharge estimate is based on a scenario that assumes the level of point source loads based on a constant 5 mg/l discharge applied against point source flow. The variable load scenario is based on the records of 54 sewage treatment plants (STPs) that discharge to Chesapeake Bay that have complete monthly records. The Total Nitrogen average concentration for each month was calculated and then converted to a concentration

Based on the model, EPA and the affected States are developing "tributary strategies" that will assign wasteload allocations expressed as annual loads for the point source dischargers to the Bay and it tributaries that achieve the water quality standards of Chesapeake Bay and its tidal tributaries.[6]

Why is it impracticable to express limits for nutrients on a daily, weekly or monthly basis?

The NPDES regulations at 40 CFR 122.45(d) require that all permit limits be expressed, unless impracticable, as both average monthly limits and maximum daily limits for all dischargers other than publicly owned treatment works (POTWs), and as average weekly limits and average monthly limits for POTWs.

The Office of Wastewater Mangement cautions that the steady-state statistical procedures described in EPA's *Technical Support Document for Water Quality-based Toxics Control*[7] (TSD) are not applicable or appropriate for developing nutrient limits for the main stem of Chesapeake Bay and its tribal tributaries. Developing permit limits for nutrients affecting Chesapeake Bay and its tidal tributaries is different from setting limits for toxic pollutants because the exposure period of concern for nutrients is longer than one month, and can be up to a few years, and the average exposure rather than the maximum exposure is of concern. The statistical derivation procedure described in the TSD for acute and chronic aquatic life protection is not applicable to exposure periods more than 30 days (see TSD page 105). If the procedures described in the TSD for aquatic life protection (i.e., criteria with 1-day and 4-day averaging periods) were used for developing permit limits for nutrients (with much longer averaging periods), both the maximum daily limit or the average weekly limit (as appropriate) and average monthly limit would be less stringent than the wasteload allocation necessary to protect the criteria. Thus, even if a facility was discharging in compliance with permit limits calculated using these procedures, it would be possible to constantly exceed the wasteload allocation. Such an approach clearly is unacceptable.

The TSD in Section 5.4.4 provides guidance for establishing daily and monthly effluent limits for human health protection based on long term exposure periods. However, this approach is also not appropriate for deriving permit limits for nutrients. This is because this TSD procedure is a steady-state approach that assumes that the

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that would be at the same annual loads as the constant 5 mg/l case, but still preserve the observed monthly variations. Monthly changes in flow were also taken into account. The variation in monthly concentrations varied from a low of 3.76 mg/l in August to a high of 8.46 mg/l in January. The derived monthly variation, equivalent on an annual basis to the constant 5 mg/l monthly loads was applied to all point source dischargers in the Chesapeake Bay watershed. Water quality results of the two scenarios were indistinguishable, no difference was seen in the achievement of Chesapeake Bay water quality criteria. A similar analysis was performed for phosphorus and the same conclusion was reached.

[6] The "tributary strategies" determine appropriate load and wasteload allocation designed to achieve water quality standards for the Chesapeake Bay and its tidal tributaries. The analysis is similar in scope to what EPA would expect in a TMDL.

[7] Document reference EPA/505/2-90-001, March 1991.

distribution of effluent load is constant. However, the efficiency of treatment of nutrients by biological nutrient removal is highly sensitive to ambient temperature and is not effective at lower temperatures. Thus, the effluent loading of nutrients is not constant due to seasonal temperature fluctuations in northern climates. Even a simple steady-state model for permit development such as dividing the annual limit by 12 and establishing that value as the monthly limit is therefore, not appropriate. Such a limit does not account for seasonal fluctuations in effluent loading. To establish appropriate weekly or monthly limitations, due to the effect of temperature on treatment efficiency for nutrients, the permitting authority would need to be able to predict with some accuracy the expected annual temperature over that time frame, which is virtually impossible to do given the normal temperature variability in any given week or month.[8] Because of the effect of temperature on the treatment efficiency and the normal variation in ambient temperature over shorter time periods, it is impracticable to develop appropriate daily, weekly or monthly limits for nutrients that are protective of the wasteload allocation expressed as an annual load.

Thus, we conclude that due to the characteristics of nutrient loading and its effects on the water quality in Chesapeake Bay and its tidal tributaries and because the derivation of *appropriate* daily, weekly or monthly limits is not possible for the reasons described above, that it is therefore "impracticable" to express permit effluent limitations as daily maximum, weekly average, or monthly average effluent limitations.

Recommendations for implementing an annual limit

The permit should state the method for determining compliance with the annual limit. When expressing an effluent limit as an annual value, it is recommended that the permit provide the ability to assess compliance at interim dates.[9]

The frequency of compliance monitoring should also be specified in the permit. The Office of Wastewater Management recommends that the effluent discharge volume should be monitored continuously. Nutrient monitoring should be specified on at least a weekly basis, and the monthly mass load should be summarized based on the total flow during the month and reported as a monthly load.

cc: Water Management Division Directors, Regions 1-10
NPDES Branch Chiefs, Regions 1-10
Mark Pollins
Susan Lepow

[8] For example, the National Weather Service reported that for Baltimore, MD the month of November 2003 was one of the warmest on record, the first three weeks of December 2003 were "decidedly cold," followed by a last 10 days of the month that were "unseasonably warm," however, the annual average temperature for 2003 at the same weather station was within 1°C of the annual norm.

[9] Permit compliance is regularly determined on a monthly basis, and Discharge Monitoring Reports are prepared and submitted on a monthly basis.

Sequencing: Another Approach to Developing Numeric Nutrient Criteria

Numeric Nutrient Criteria are an effective tool to drive nutrient reductions, providing clear and transparent numeric targets for a host of implementation actions including permitting, assessment and listing, and the development of watershed implementation plans.

Recognizing that no one approach fits all waters in a state, EPA has provided a variety of scientific approaches (e.g., reference condition, stressor-response, mechanistic modeling) that states might use to derive numeric nutrient criteria [see http://www2.epa.gov/nutrient-policy-data/technical-support-numeric-nutrient-criteria-development]. However, EPA recognizes that states may not have the resources to simultaneously adopt numeric nitrogen and phosphorus criteria for all major classes of water bodies.

Numeric Nutrient Criteria Goal: EPA strongly encourages states to adopt nitrogen and phosphorus numeric criteria for all major classes of water bodies within the state, as described in Element 8 of the 2011 Framework Memo. For those states still lacking sufficient resources to establish numeric criteria for all their water bodies in the near term, EPA suggests the state consider a sequenced approach. In such an approach, numeric nitrogen and phosphorus criteria are adopted in phases, starting with those waters with long retention times (e.g., lakes/reservoirs and estuaries), because they are typically the most sensitive to nutrient pollution. For example:

Phase 1: adopt numeric nitrogen and phosphorus criteria for the entire class of waters (e.g., lakes/reservoirs or estuaries). States that are unable to target the entire class of water body type, might prioritize waters within that class using one or more of the following considerations:

- Waters most impacted by nutrients
- High quality waters in most need of protection
- Waters with highest nutrient loads
- Waters most sensitive to nutrient pollution
- Waters used as drinking water supply

Phase 2: for flowing waters upstream of the Phase 1 waters, adopt numeric nitrogen and phosphorus criteria, or develop numeric interpretations of narrative criteria, to protect the downstream Phase 1 waters.

Phase 3: evaluate whether the stream criteria (or numeric interpretations) intended to protect downstream waters also protect the in-stream water quality of Phase 2 flowing waters. If not, adjust the values. If so, adopt them as criteria if they were previously considered to be narrative interpretations.

Phase 4: evaluate results from the first 3 phases and adopt numeric nitrogen and phosphorus criteria, or develop numeric interpretations of narrative criteria, for any remaining waters.

	Lakes/Reservoirs		Rivers/Streams		NNC development milestones, provided by state
	TN	TP	TN	TP	
Arkansas					none provided
Illinois		site-specific			2016: TP for rivers with natural watersheds
					TN & TP data for all water bodies have been collected and analyzed
Indiana					2015: TP for lakes/reservoirs
					Data for TP for lakes, and TN & TP for rivers/streams have been collected and analyzed
Iowa					none provided
Kentucky					2018: TN & TP for lakes/reservoirs and wadeable rivers/streams
Louisiana					none provided
Minnesota		✓			none provided
					TN & TP data for all water bodies have been collected and analyzed
Mississippi					2013: TN & TP for non-deltaic lakes/reservoirs, non-deltaic rivers/streams, estuaries
					2015: TN & TP for deltaic lakes/reservoirs, deltaic rivers/streams
Missouri	site-specific	site-specific			TN & TP data for all water bodies have been collected and analyzed
					2015: state plans to add TN & TP for remaining lakes/reservoirs in triennial review
Ohio					Developing a Trophic Index Criterion (i.e., biocriterion) that evaluates biological integrity while considering primary production measurements and nutrient concentrations.
Tennessee					none provided
Wisconsin		✓		✓	no date provided for TN in lakes/reservoirs or rivers/streams

- 1 state with TP for all major water body types (Wisconsin)
- 1 state with TP for lakes (Minnesota)
- 7 states have indicated they are planning NNC for 1 or more major water body type over the next few years

MISSISSIPPI RIVER COLLABORATIVE

May 21, 2014 Public Comments Given to:

Mississippi River Gulf of Mexico Watershed Nutrient Task Force:

Nancy Stoner (Task Force Co-Chair), U.S. Environmental Protection Agency
Ann Bartuska, U.S. Department of Agriculture, Research, Education and Economics
Michael Bolt, National Tribal Water Council
Lori Caramanian, U.S. Department of the Interior
Ann Mills, U.S. Department of Agriculture, Natural Resources and Environment
Brigadier General Peter A. DeLuca, U.S. Army Corps of Engineers
Paul Sandifer, U.S. Department of Commerce, National Oceanic and Atmospheric Administration
Bill Northey (Task Force Co-Chair), Iowa Department of Agriculture and Land Stewardship
Trudy Fisher, Mississippi Department of Environmental Quality
Rebecca Flood, Minnesota Pollution Control Agency
Jerome "Zee" Zeringue, Louisiana Governor's Office of Coastal Activities
Joe Engeln, Missouri Department of Natural Resources
Vacant, Indiana State Department of Agriculture
Robert F. Flider, Illinois Department of Agriculture
Russell Rasmussen, Wisconsin Department of Natural Resources
Larry Taylor, Kentucky Department for Environmental Protection
Jai Templeton, Tennessee Department of Agriculture
J. Randy Young, Arkansas Natural Resources Commission

Thanks to the Task Force for the opportunity to publicly comment.

My name is Anna Weeks, Environmental Policy Associate for the Arkansas Public Policy Panel, and I am speaking on behalf of members of the Mississippi River Collaborative, a group of environmental organizations focused on the health and sustainability of the Mississippi River. The Collaborative includes state-based, regional, and national organizations, including the Arkansas Public Policy Panel

You have heard from our representatives at most of your meetings, and several of our members are involved in legal action against EPA regarding nitrogen and phosphorus pollution issues. As we have stated before, we do not feel that current actions are adequate to address the environmental problems caused by nitrogen and phosphorus pollution in the Mississippi River Basin. These issues vary from toxic algae infestations in lakes, nitrate and other pollution of rivers and other drinking water sources, to the Gulf Dead Zone.

We have watched two "Action Plans" come and go without real improvement to the health of the Gulf or the rivers that flow into it. This is particularly distressing as the currently stated goal of the Action Plan is to reduce the size of the Dead Zone to 5,000 square kilometers, or 1,930

MISSISSIPPI RIVER

To: Nancy Stoner, Acting Assistant Administrator for Water, USEPA

From: Environmental Law & Policy Center, Natural Resources Defense Council, Iowa Environmental Council, Prairie Rivers Network, Gulf Restoration Network, Minnesota Center for Environmental Advocacy, Missouri Coalition for the Environment, Kentucky Waterways Alliance, Public Employees for Environmental Responsibility, Tennessee Clean Water Network, Midwest Environmental Advocates, Arkansas Public Policy Panel and Hoosier Environmental Council

Date: February 13, 2014

Re: Lack of State Progress in Developing Numeric Nutrient Criteria to Control Nitrogen and Phosphorus Pollution Under the Clean Water Act.

Dear Ms. Stoner:

As you are aware, the Mississippi River Collaborative (MRC) has been working for many years to reduce nitrogen and phosphorus pollution that is causing impairment of aquatic life, loss of recreational uses, toxic algae outbreaks, and the "dead zone" in the Mississippi Basin and the Gulf of Mexico. We have worked through cooperative efforts in our states, targeted advocacy at EPA, and litigation in state and federal courts. As an important part of this work, we have emphasized the need for states to develop numeric nutrient criteria to serve as concrete benchmarks for nitrogen and phosphorus pollution reductions in the Mississippi River Basin states.[1] We have also lobbied for effective state controls on nonpoint-source pollution that go beyond the business-as-usual voluntary efforts that have been largely ineffective at reducing pollution.

As you also know, in 2011, EPA denied the Petition for Rulemaking filed by several of the undersigned groups ("Petition Denial"); and shortly prior to the denial issued a "Framework Memo" calling on all stakeholders to "work in partnership" to reduce nutrient pollution.[2] In the Petition Denial Letter, EPA stated its preference to "work cooperatively with states" to reduce nutrient pollution instead of exercising EPA's rulemaking authority under Section 303(c)(4)(B) of the Clean Water Act. At the time EPA denied the Petition, it was apparent that EPA's "cooperative" approach would only work if states are willing to cooperate. Unfortunately, it is now increasingly clear that in several states this "partnership" approach in lieu of federal criteria is not working, either to spur states' development of numeric criteria or to reduce nutrient loading through other means. EPA's continued insistence on asking states for voluntary

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[1] Petition for Rulemaking Under the Clean Water Act for Numeric Water Quality Standards for Nitrogen and Phosphorus and Total Maximum Daily Loads for the Mississippi River and the Gulf of Mexico (July 30, 2008), (hereinafter "Rulemaking Petition").

[2] U.S. EPA, *Working in Partnership with States to Address Phosphorus and Nitrogen Pollution through Use of a Framework for State Nutrient Reductions* (March 16, 2011) (available at http://www.epa.gov/region7/water/pdf/comment_letter_iowa_nutrient_reduction_strategy.pdf) (hereinafter "Framework Memo"). **(Attachment 1)**

cooperation is thwarting prompt implementation of numeric nutrient standards that EPA has acknowledged are ultimately necessary for effective state programs.[3]
The 2011 Framework Memo required states to establish a "work plan and phased schedule" for numeric nitrogen and phosphorus criteria development, stating that "[a] reasonable timetable would include developing numeric N and P criteria for at least one class of waters within the state (e.g., lakes and reservoirs, or rivers and streams) **within 3-5 years.**" EPA's 2011 Petition Denial letter promised that the Agency would "periodically assess progress" on the states' adoption of effective nutrient controls to determine whether federal standards are necessary.

States are not meeting the deadlines and expectations outlined in these 2011 documents. Nearly three years have now passed since EPA established the latest "reasonable timetable" for state action, and several of the states that are most responsible for Gulf Hypoxia now appear to be *further away* from the development of numeric nutrient criteria than they were in 2011. Some examples of such negligible or backward progress include the following:

- Illinois is the #1 contributor of nitrogen and phosphorus pollution to the Gulf of Mexico, but it has not developed a work plan or schedule for the development of numeric nutrient criteria for streams.[4] Although the state historically identified phosphorus as a potential cause of impairment for aquatic life use impairment, IEPA recently reversed course and is no longer identifying phosphorus as a cause of impairment in the state's 305(b) report.
- Iowa ranks #2 for nitrogen and #3 for phosphorus pollution to the Gulf, yet Iowa lacks any work plan or schedule for the development of numeric nutrient criteria for any class of waters. The Iowa Environmental Protection Commission recently determined that numeric criteria are "not necessary at this time" even for protection of swimming uses in Iowa's significant public lakes.
- Indiana is the #3 contributor of nitrogen to the Gulf, but it appears to have abandoned efforts to develop numeric nutrient criteria. The state's lake criteria website has not been updated since August 2012, and the first milestone in Indiana's Nutrient Reduction Strategy ("Propose P criteria for lakes") is now eight months overdue with no indication that a proposal is imminent.
- Despite ranking #2 for phosphorus and #4 for nitrogen deliveries to the Gulf, Missouri has apparently abandoned any effort to establish numeric criteria for

[3] The Framework Memo states at 2,

> It has long been EPA's position that numeric nutrient criteria targeted at different categories of water bodies and informed by scientific understanding of the relationship between nutrient loadings and water quality impairment are ultimately necessary for effective state programs. Our support for numeric standards has been expressed on several occasions ..."
>
> "[N]umeric standards will facilitate more effective program implementation and are more efficient than site-specific application of narrative water quality standards. We believe that a substantial body of scientific data, augmented by state-specific water quality information, can be brought to bear to develop such criteria in a technically sound and cost-effective manner.

[4] Although the state has had a phosphorus water quality standard for lakes since 1979 (P= .05 mg/L), IEPA has never implemented the standard in permits.

any of its waters. The Missouri Department of Natural Resources (MDNR) cancelled its nutrient criteria work groups in late 2011, and they have not met since. MDNR did not include nutrient criteria in the state's 2013 Triennial Review of water quality standards and there is no indication that the issue will be taken up any time soon.

- Kentucky Division of Water (KDOW) submitted a nutrient criteria development plan to EPA back in 2003 with a goal to propose numeric nutrient criteria for the 2008 Triennial Review. Now, in 2014, after years of delays, KDOW has *still* failed to propose numeric criteria and has publicly stated that numeric criteria "may not be the most effective approach to addressing nutrient challenges."

Making matters worse, states rarely use their existing narrative standards to set nutrient limits in NPDES permits, and State "Nutrient Reduction Strategies" often lack concrete and effective controls for reducing nonpoint source pollution. Iowa's Nutrient Reduction Strategy, for example, was developed with heavy influence from the agricultural industry – in many places adopting the Farm Bureau's comments verbatim – and emphasizes "voluntary" efforts to reduce agricultural pollution instead of a regulatory approach. While the states dabble with "voluntary" approaches, the nation's algae problem – particularly in the Mississippi River basin – is getting worse. For example:

- Seventy four (74) % of Illinois' lakes are impaired by phosphorus and 72% by excess algae.[5] Thirty eight of these impaired lakes are a source of drinking water for nearly one million people.[6]
- In 2013, the Des Moines Water Works announced "historic nitrate levels" and was forced to take emergency actions to protect residents from "dangerous levels" of nitrates.[7] Six rivers and one lake in Iowa that are used as public sources of drinking water are impaired because of high nitrate that exceeds the safe drinking water standard of 10 mg/l.[8]
- In the summer of 2013, the Indiana State Department of Health reported high levels of blue-green algae at many of Indiana's reservoirs and lakes.[9] ISDH advised swimmers and boaters to avoid all contact with visible algae and to contact a doctor if they experienced rashes, skin, eye irritation, nausea, stomach aches, and tingling in fingers and toes. The Department also advised that livestock, pets and wild animals can be poisoned by cyanobacteria, which can result in vomiting, diarrhea, decreased appetite, weakness, seizures and sudden death.

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[5] See Illinois Integrated Water Quality Report and 303 (d) list 2012 **(Attachment 2)** (available at: http://www.epa.state.il.us/water/tmdl/303-appendix/2012/iwq-report-surface-water.pdf)

[6] Hecht JS, Knapp HV. 2008. Data for Assessing Drought Vulnerability of Illinois' Community Surface Water Systems. Illinois State Water Survey, Center for Watershed Science, Contract Report 2008-02. **(Attachment 3)** (available at: http://www.isws.illinois.edu/pubdoc/CR/ISWSCR2008-02.pdf)

[7] Des Moines Water Works Press Release, *Historic Nitrate Levels in Des Moines Water Works' Source Water* (May 28, 2013) **(Attachment 4)** (available at http://www.dmww.com/about-us/announcements/historic-nitrate-levels-in-des-moines-water-works-source-water.aspx).

[8] *See* Iowa's 2012 List of Impaired Waters, p. 5, Fig. 1 and p. 7, Fig. 3 (April 2013) **(Attachment 5)** (available at http://www.iowadnr.gov/Portals/idnr/uploads/watermonitoring/impairedwaters/2012/Fact%20Sheet%20for%20final%202012%20list-final.pdf).

[9] See http://www.in.gov/idem/algae/ **(Attachment 6)**

- The number of Kentucky stream miles listed as impaired for nutrients/eutrophication has risen from 787.4 in in 2006 to 1,457.8 (2008), then 1,629.0 (2010), and 1,673.26 on the recent 2012 report, still under review by EPA.[10]

In addition to the local impacts described above, the dead zone in the Gulf of Mexico is not improving. The average size of the dead zone over the past five years has been 5,176 square miles, more than twice the 1,900 square mile goal set by the Gulf of Mexico / Mississippi River Watershed Nutrient Task Force in 2001 and reaffirmed in 2008.[11] This threatens ecosystems that support valuable commercial and recreational Gulf fisheries that, according to NOAA, have a commercial dockside value exceeding $800 million and an estimated 23 million annual recreational fishing trips.

In Gulf Restoration Network v. Jackson, a federal district court judge ordered EPA to take action in response to our Rulemaking Petition by no later than March 30, 2014.[12] The judge noted that EPA could not simply refuse to make a decision about whether federal standards are "necessary" under the CWA. We are very disappointed that EPA has chosen to appeal this Order. However, EPA's appeal does not justify further delay of a straightforward, up-or-down decision regarding the need for EPA to develop federal nutrient criteria for states that refuse to do so themselves.

When making this "necessity determination," it is very important that EPA consider the situation that exists in the states *today* – nearly three years since EPA denied our petition and issued the 2011 Framework Memo. The States' continuing lack of progress on numeric nutrient criteria since 2011 contrasts with the optimistic predictions in EPA's Petition Denial and undermines EPA's decision to work exclusively on state-based voluntary and non-regulatory programs instead of using the tools Congress provided in the Clean Water Act. EPA may have tried in good faith to "work cooperatively with states," but cooperation requires two willing partners.

It is now more certain than ever that achievement of the Clean Water Act's goals will continue to be delayed until EPA takes concrete actions to move recalcitrant states forward. EPA must take action now to end the cycle of missed deadlines and broken promises on nutrient pollution that have characterized the past fifteen years. EPA should at least *begin* with the states that are not making sufficient progress on their own and are contributing significantly to localized impairments or Gulf hypoxia.[13] It is not reasonable for EPA to decline to initiate a federal rulemaking process for *any* states simply because EPA may not have the resources to complete a rulemaking process for *all* states at this time.

To aid in your determination on remand, or any future determination you may make concerning numeric nutrient standards, we are enclosing information concerning select Mississippi River basin states in exhibits to this letter.[14] EPA should also use this information and the information

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[10] http://ofmpub.epa.gov/waters10/attains_state.control?p_state=KY **(Attachment 7)**

[11] *See* http://www.noaanews.noaa.gov/stories2013/2013029_deadzone.html. **(Attachment 8)**

[12] Gulf Restoration et al. v. Jackson, No. 12-677, 2013 U.S. Dist. LEXIS 134811 (E.D. La. Sept. 20, 2013).

[13] In other words, it is not necessary for EPA to initiate a federal rulemaking for "50, 31 or 10" states all at the same time, a possible scenario suggested in the Petition denial letter.

[14] *See* Exhibit A – Illinois, Exhibit B – Indiana, Exhibit C – Iowa, Exhibit D – Kentucky, Exhibit E – Louisiana, Exhibit F – Missouri. The summaries include a brief description of the states' respective failures to move on the development of numeric nutrient criteria, the failures to adequately control nutrient pollution using existing tools in

it has gathered through the Agency's "tracking, accountability and transparency tools" to determine whether states are making reasonable progress.[15] We respectfully request that EPA include a summary of current state progress in its response to our Petition and explain, for each state individually, the basis for its determination whether federal numeric criteria are necessary to meet the requirements of the CWA.

Sincerely,

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NPDES permits, and the associated environmental damage that is occurring as a result of the states' failure to adequately address nutrient pollution. A CD with electronic copies of all attachments has been included and provided to all recipients of this letter.

[15] According to the Petition Denial Letter (p. 3) EPA tracks "state progress from year to year," including "whether a state is providing current and specific milestone information regarding N and P criteria adoption." The link provided in the Petition Denial letter, however, no longer appears to be working. However, it does appear that EPA is tracking state progress at the following link: http://cfpub.epa.gov/wqsits/nnc-development/.

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Exhibit A – Illinois

Failure to Promulgate Numeric Nutrient Criteria

Despite being the number one contributor of nitrogen and phosphorus pollution to the Gulf of Mexico,[16] Illinois has not developed a work plan or schedule for the development of numeric nutrient criteria for streams. Numerous stakeholder groups for the development of numeric criteria have been organized at various times over the last decade, only to be abandoned.

Failure to Control Nutrient Discharges

Although the state has had a phosphorus water quality standard for lakes of 0.05 mg/L[17] since 1979, the Illinois Environmental Protection Agency (IEPA) has never implemented the standard in permits, opting instead to impose an effluent limit of 1.0 mg/L.

Illinois continues to fail to implement its narrative water quality standards in NPDES permits despite repeated instructions from EPA to do so. For example, in 2011, Region 5 wrote that Illinois "must" perform a reasonable potential analysis and set nutrient effluent limit limitations that are derived from and comply with Illinois' narrative water quality standards and dissolved oxygen criteria.[18] IEPA is not doing so. Instead, IEPA has apparently established a policy to include a 1 mg/L P limit for certain facilities discharging to impaired waters without investigating whether more stringent limits are necessary to prevent nutrient-related impairments and without regard to the Illinois narrative standards.[19]

Although the state historically identified phosphorus as a potential cause of impairment for aquatic life use, IEPA recently reversed course and is no longer identifying phosphorus as a cause of impairment in streams. In addition, despite objections by EPA Region 5, IEPA is refusing to list any waters as impaired by total nitrogen and lists only ammonia violations and violations of the 10 mg/L nitrate standard for drinking water sources.

Environmental Problems Attributable to the Lack of Nutrient Control

Not only is Illinois the top contributor to the Dead Zone in the Gulf, the state's waters are suffering from severe nutrient pollution:

- Seventy four (74) % of Illinois' lakes are impaired by phosphorus and 72% by excess algae.[20]

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[16] https://water.usgs.gov/nawqa/sparrow/gulf_findings/ES&T_states.pdf **(Attachment 9)**
[17] See 35 Ill. Admin. Code 302.205; 304.123.
[18] See Letter from Tinka Hyde, EPA Region 5, to Marcia Wilhite, IEPA (Jan. 21, 2011). **(Attachment 10)**
[19] See Responsive Summary for MWRDGC Calumet, O'Brien and Stickney WWTP NPDES permits. **(Attachment 11)**
[20] Attach. 2

- Thirty eight of these impaired lakes are a source of drinking water for nearly one million people.[21]

- A recent study by the United States Geological Survey of Illinois lakes indicated that concentrations of both total cyanobacterial cells and microcystin in Illinois lakes were commonly at levels likely to result in adverse human health effects, according to World Health Organization guidance values.[22]

- Data collected by the Metropolitan Water Reclamation District of Greater Chicago has found very high levels of chlorophyll a levels (> 40ug/L) in numerous segments of the Illinois River and the Des Plaines River and the Chicago Area Waterways.[23]

- Scientists who have studied Illinois waters have found very few sites with total P levels that would be protective of Illinois rivers and streams.[24]

[21] Hecht JS, Knapp HV. 2008. Data for Assessing Drought Vulnerability of Illinois' Community Surface Water Systems. Illinois State Water Survey, Center for Watershed Science, Contract Report 2008-02. (Attach. 3) (also available at: http://www.isws.illinois.edu/pubdoc/CR/ISWSCR2008-02.pdf)

[22] Paul J. Terrio, Lenna M. Ostrodka,, Keith A. Loftin,, Gregg Good, Teri Holland. "Initial Results from a Reconnaissance of Cyanobacteria and Associated Toxins in Illinois," August–October 2012, USGS. **(Attachment 12)**

[23] MWRDGC, Report No. 13-34. "Ambient Water Quality Monitoring in the Chicago, Calumet, and Des Plaines River Systems," pp. 28-29 (August 2013). **(Attachment 13)**

[24] Todd V. Royer, *et al.* "Assessment of Chlorophyll-*a* as a Criterion for Establishing Nutrient Standards in the Streams and Rivers of Illinois," p. 442, J. Environ. Qual. 37:437–447 (2008). **(Attachment 14)**

Exhibit B - Indiana

Failure to Promulgate Numeric Nutrient Criteria

Indiana's numeric criteria development process has stalled and there is no indication that it will resume in the near future. IDEM issued a first notice of comment for a rule limiting phosphorus in lakes and reservoirs in June 2010. It convened an external stakeholder workgroup to discuss the rule and convened seven workgroup meetings in 2011 and 2012. However, there have been no additional meetings and IDEM has not updated its lake criteria website since August 2012.[25] There has been no movement towards the development of phosphorus criteria for rivers and streams or nitrogen criteria for any class of waters.

Indiana's Nutrient Reduction Strategy acknowledges that numeric nutrient criteria are required by the Clean Water Act.[26] However, the first milestone in the Strategy's "tentative timeline" ("Proposal of phosphorus criteria for lakes") is now eight months overdue with no indication that a proposal is imminent. From all indications, the rulemaking process in Indiana is dormant.

Failure to Control Nutrients

According to U.S. EPA's own materials, IDEM has only "committed" to set water-quality based effluent limits in permits if either the receiving water is impaired by nutrients or if a TMDL is completed. (It is not clear if this is actually occurring.) Other than limits based on TMDLs, "IDEM has not developed WQBEL-based phosphorus limits."[27] Total nitrogen is only included in permits if the water is listed on the 303(d), or if a TMDL has been approved with reductions for this parameter.[28]

Environmental Problems Attributable to the Lack of Nutrient Control

Excess nutrients in Indiana's waterways continue to harm the environment and public health. In summer 2013, for example, the Indiana State Department of Health reported high levels of blue-green algae at many of Indiana's reservoirs and lakes.[29] ISDH advised swimmers and boaters to avoid all contact with visible algae and to contact a doctor if they experienced rashes, skin, eye irritation, nausea, stomach aches, and tingling in fingers and toes. IDEM issued high-cell count recreational alerts for seven lakes around the state. The three reservoirs in the Indianapolis area also had high cell counts. Indiana is the #3 contributor of nitrogen to the Gulf of Mexico.[30]

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[25] See http://www.in.gov/idem/6752.htm **(Attachment 15)**
[26] Indiana Nutrient Reduction Strategy: *A framework to reduce nutrients entering Indiana's waters*, page 16-17 **(Attachment 16)** (also available at: http://www.in.gov/isda/files/Indiana_Nutrient_Reduction_Strategy_(2).pdf)
[27] U.S. EPA, Indiana Nutrient Profile, p. 5 **(Attachment 17)**
[28] *Id.*
[29] Attach. 6
[30] Attach. 9

Exhibit C - Iowa

Failure to Promulgate Numeric Nutrient Criteria

Iowa has not developed any work plan or schedule for the development of numeric nutrient criteria for any class of waters. According to U.S. EPA's tracking website, Iowa has made no progress towards the development of numeric criteria and has failed to provide any milestones for future state progress.[31]

The Iowa Department of Natural Resources' official 2012-2014 Work Plan, produced as part of its triennial review process, does not make any reference to the development of numeric nutrient criteria as either an existing or planned effort.[32] The State's Nutrient Reduction Strategy states that "numeric criteria may not be the best approach for achieving reductions in nutrient loads."[33] The Strategy includes a "conceptual flow chart" of "potential steps" but no timelines or milestones for next steps.[34]

The Iowa Environmental Protection Commission recently denied a rulemaking petition which sought to reinitiate the nutrient criteria development process at least for Iowa's significant public recreational lakes.[35] The denial makes clear that Iowa has abandoned any efforts to adopt numeric nutrient criteria in the foreseeable future. The EPC denial declares that Iowa's Nutrient Reduction Strategy represents the State's "primary effort" to reduce statewide nutrient-related impacts and that numeric criteria are "not necessary at this time."[36] The Denial does not mention any milestones or plan for developing numeric criteria in the future.

Failure to Control Nutrients

Iowa's point source approach to nutrient control ignores existing law and uses a patchwork that focuses on the economic circumstances of the point source rather than water quality goals. Iowa DNR has rejected the idea of using narrative water quality standards in its NPDES permits. Iowa has also ignored TMDL nitrate wasteload allocations in NPDES permits. Instead, the Iowa Nutrient Reduction Strategy only focuses on the largest 130 municipal and industrial dischargers. The strategy has point sources collect data on nutrient pollution, evaluate alternatives for controlling nutrient pollution, and then uses those results to establish a case-by-case determination on technology-based effluent limits.

Environmental Problems Attributable to the Lack of Nutrient Control

At approximately the same time that the Iowa Environmental Protection Commission determined that nutrient criteria were "not necessary," the State of Iowa experienced near record levels of

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[31] *See* http://cfpub.epa.gov/wqsits/nnc-development/. **(Attachment 18)**
[32] DNR, Triennial Review Work Plan, 2012. **(Attachment 19)** (Also available at http://www.iowadnr.gov/Portals/idnr/uploads/water/standards/files/triennial_workplan.pdf.)
[33] Iowa Nutrient Reduction Strategy, Section 1.2. **(Attachment 20)**
[34] *Id.* p. 26.
[35] Iowa Environmental Protection Commission, *Denial of Petition for Rulemaking* (Oct. 14, 2013) **(Attachment 21)**
[36] *Id.* p. 4.

nitrate readings in rivers across the states.[37] The Des Moines Water Works announced "historic nitrate levels" and took emergency actions to protect residents from "dangerous levels" of nitrates.[38] News outlets have decried the "algae scourge" that continues to impair Iowa waters, threatening human health and the environment.[39] Instead of making reasonable progress, all trends in Iowa point to an increasing nutrient problem with no milestones or plans for numeric criteria in the future.

- 75 lakes in Iowa are listed as impaired for aquatic life and/or recreational uses due excess nitrogen and phosphorus pollution causing low oxygen levels and frequent algae blooms that harm fish and other aquatic life and cause nuisance conditions that make the water unsuitable for swimming and other recreational uses.[40]
- The number of beach advisories in Iowa due to dangerous levels of microcystin has been increasing over time.[41]
- 6 rivers and 1 lake in Iowa that are used as public sources of drinking water are impaired because of high nitrate that exceeds the safe drinking water standard of 10 mg/l.[42]
- In May 2013, nitrate levels reached record highs in the Raccoon River (24.39 mg/L) and Des Moines River (18.62 mg/L) which provide water for 500,000 people in Des Moines and central Iowa. The Des Moines Water Works was forced to temporarily stop using water from the rivers to avoid illness and violations of the federal safe drinking water standard.[43]
- In addition to the local health and environmental impacts, Iowa's nutrient pollution is also a major contributor to Gulf Hypoxia. According to USGS, Iowa contributes 11.3% of Total Nitrogen and 9.8% of Total Phosphorus flux to the Gulf of Mexico, making it the second and third leading state, respectively.[44]

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[37] *See, e.g., Farm Fertilizer Runoff Wreaking Havoc*, Cedar Rapids Gazette (Aug. 4, 2013) **(Attachment 22)** (also available at: http://thegazette.com/2013/08/04/farm-fertilizer-runoff-wreaking-havoc/).

[38] Des Moines Water Works Press Release, *Historic Nitrate Levels in Des Moines Water Works' Source Water* (May 28, 2013) **(Attachment 23)** (also available at http://www.dmww.com/about-us/announcements/historic-nitrate-levels-in-des-moines-water-works-source-water.aspx).

[39] Cedar Rapids Gazette, *Algae Scourge Impairs Iowa Waters* (Oct. 15, 2013) **(Attachment 24)** (also available at http://thegazette.com/2013/10/15/algae-scourge-impairs-iowa-waters/).

[40] Figure 3 on page 7 of Iowa's 2012 List of Impaired Waters, April 2013 **(Attachment 25)** (also available at: http://www.iowadnr.gov/Portals/idnr/uploads/watermonitoring/impairedwaters/2012/Fact%20Sheet%20for%20final%202012%20list-final.pdf).

[41] DNR monitors microcystin at 39 beaches. Since 2006, there have been 92 recorded instances of microcystin reaching dangerous levels (20 micrograms/L) at 16 of these 39 beaches. The number of beach advisories in Iowa due to dangerous levels of microcystin has increased from 14 in 2012 to 24 in 2013. The 24 beach advisories for 2013 are posted on the IEC website at http://www.iaenvironment.org/waterQuality/lakealgae.php.

[42] Attach. 25

[43] Des Moines Water Works Press Release (July 24, 2013) **(Attachment 26)** (also available at http://www.dmww.com/about-us/news-releases/nitrate-concentrations-in-rivers-have-decreased-des-moines-water-works-lifts-request-to-reduce-irrig.aspx).

[44] Attach. 9

Exhibit D - Kentucky

Failure to Promulgate Numeric Nutrient Criteria

Kentucky Division of Water (KDOW) has made very little progress on numeric nutrient criteria since the first nutrient criteria development plan was submitted to EPA in 2003. That plan included a goal to propose numeric nutrient criteria for the 2008 Triennial Review of Water Quality Standards. In 2007, KDOW delayed the proposed adoption of numeric criteria to the 2011 Triennial Review. KDOW modified the timeline again in 2008, moving the criteria to the 2014 Triennial Review. As of early 2014, DOW has not put forth draft criteria, and it is unclear whether it will do so for the 2014 Triennial Review.

In the 2011 Triennial Review, KDOW also modified and weakened Kentucky's narrative nutrient criteria and the definition to eutrophication used to identify impaired waters. While ostensibly intended to clarify protection of designated uses, the change further diluted and weakened the narrative standard and KDOW's role under the Clean Water Act. The change makes the narrative standard reactive to "adverse effects" of eutrophication, rather than anticipatory and preventative of allowing eutrophic conditions to occur.

Unfortunately, EPA approved the weakening of the narrative standard – prior to consultation with U.S. Fish and Wildlife Service. USFWS stated its concerns in recent comments to EPA and KDOW:

> *"It is evident from the information presented that these criteria alone are insufficient to avoid adverse effects to federally-listed species.....the Service is concerned that adverse effects to federally-listed species could occur prior to the occurrence of a situation where displacement by tolerant species occurs. The narrative modification is insufficient to avoid adverse effects of nutrient pollution and eutrophication, particularly to sensitive aquatic species."*[45]

EPA's approval however did make clear to KDOW that it still expects the state to develop numeric criteria:

> *"EPA states that the amended narrative criterion along with the supporting amended eutrophication definition clarify the protection of the designated use. However USEPA emphasizes the development and incorporation into water quality standards of numeric criteria. Numeric nutrient development plans should be updated."*[46]

[45] U.S. Fish and Wildlife Service Biological Evaluation, #2014-B-0086, for EPA's approval of new and revised water quality standards for Kentucky **(Attachment 27)**

[46] Statement of Consideration Relating to 401 KAR 10:031, Amended After Comments. **(Attachment 28)**

Failure to Control Nutrient Discharges

Kentucky has yet to finalize a Nutrient Reduction Strategy, as required by the "Framework Memo." In November 2013, DOW finally brought a draft outline of a nutrient reduction strategy to stakeholders. The draft outline, while quite bare, depends primarily on the Kentucky Agriculture Water Quality Act of 1994 to secure nutrient pollution reductions from farms. The AWQA, carried out through the Division of Conservation, requires development of Ag Water Quality Plans for all farms of greater than 10 acres. These plans require Best Management Practices to effectively manage and reduce water pollution contributions from farms, including nutrient losses. Though there have been upwards of 60,000 Ag Water Quality Plans developed, there has been very little enforcement and implementation of these plans. The track record of this Act, combined with declining state agency budgets, demonstrates that the Act will not be nearly enough to result in substantial reductions of nutrient pollution.

Additionally, KDOW has maintained a very inconsistent approach to nutrient control for Kentucky Pollutant Discharge Elimination System Permits (KPDES). KDOW has often refused to calculate and impose water quality based effluent limits, insisting that nutrient limits are not necessary unless the receiving water body is currently listed as impaired for nutrient/eutrophication biological indicators. Specifically, KDOW has responded to comments on multiple occasions that: "*The Division has determined that this segment of [waterway] is not impaired for nutrients. Limitations for total phosphorus and total nitrogen are therefore not necessary.*"[47]

KDOW is similarly inconsistent in the application of technology based effluent limits, stating in the associated permit fact sheet:

> "*...DOW has proposed total phosphorus limitations of 1.0 mg/l as a monthly average and 2.0 mg/l as a weekly average. ...DOW will consider a demonstration by the permittee that these limitations are not practically achievable and alternate limitations shall be developed.*"[48]

KDOW, therefore, has suggested that although technology-based limits on total phosphorus are practically achievable, the permittee is invited to attempt to demonstrate otherwise and seek alternative limits.

[47] Kentucky Division of Water Response to Public Comments Regarding Beattyville WWTP **(Attachment 29)**
[48] Division of Water Fact Sheet for Mountain Water District WWTP **(Attachment 30)**

Environmental Problems Attributable to the Lack of Nutrient Control

As KDOW's efforts have stalled, progressed, shifted, and stalled again, the state's waterways continued to see the impacts of nutrient pollution rise.

- For the 2006 305(b) report, Kentucky finally began collecting nutrient water quality data. It resulted in the listing of 787.4 stream miles as impaired for nutrients/eutrophication biological indicators. That has since risen from that 2006 report to 1,457.8 (2008), then 1,629.0 (2010), and 1,673.26 on the recent 2012 report, still under review by EPA.[49] With all these impairments, KDOW has just in the past year begun significant work on the first nutrient TMDL in the state, and still inconsistently applies limits to permits.

- Through the recreational season of 2013, DOW began testing lakes on a limited basis for cyanobacteria, and discovered that four Kentucky lakes had levels exceeding 100,000 cells per milliliter, which falls within the World Health Organization's "moderate probability of adverse health effects"[50] to humans and animals, including skin irritations, gastrointestinal illness, and possible long-term illness.[51]

- The Louisville District of the Army Corps of Engineers (COE) also tested for cyanobacteria in several of the reservoirs they manage in the state, and found cyanobacteria levels above the moderate threshold at five Kentucky lakes over the summer.[52] COE monitoring continued at the same five lakes through parts of the winter, with cell counts for certain cyanobacteria species remaining above the 100,000 cells per milliliter threshold at all five as of December 17, 2013, and at three as of January 14, 2014.

[49] http://ofmpub.epa.gov/waters10/attains_state.control?p_state=KY **(Attachment 31)**
[50] http://www.who.int/water_sanitation_health/bathing/srwe1-chap8.pdf **(Attachment 32)**
[51] http://kydep.wordpress.com/2013/10/21/harmful-algal-blooms-found-at-four-more-kentucky-lakes/ **(Attachment 33)**
[52] http://www.lrl.usace.army.mil/Missions/CivilWorks/WaterInformation/HABs.aspx **(Attachment 34)**

Exhibit E - Louisiana

Failure to Promulgate Numeric Nutrient Criteria

Louisiana Department of Environmental Quality has made little to no progress towards numeric nutrient criteria. While Louisiana completed a draft document in 2006 entitled "Developing Nutrient Criteria for Louisiana," none of the final deadlines to propose numeric nutrient criteria have been met.[53] According to this document, draft criteria for rivers and streams and freshwater wetlands were to be proposed by January 2009, draft criteria for freshwater lakes and reservoirs were to be proposed by January 2010, and draft criteria for "big, interstate rivers" were to be proposed by January 2013. Again, none of these deadlines have been met.

There has been no evident progress in developing these criteria, and the draft "Louisiana Nutrient Management Strategy" does not chart a course for their development.[54] LDEQ publicly told attendees of a "stakeholder meeting" held before the release of the draft plan that regulatory measures would not be discussed at the meeting.

Delving into the Louisiana Nutrient Management Strategy, one would expect a numeric nutrient criteria development strategy to at least be mentioned in the section entitled "Regulations, Policies, & Programs." Numeric criteria are not mentioned once. In fact, no actual regulations are mentioned at all. Similarly, Appendix A of the Strategy lays out timelines for myriad activities, and yet there is no mention of numeric nutrient criteria, or any numeric goals for reducing nutrient pollution.

Louisiana is clearly not abiding by the elements of a strategy outlined by EPA. One just need look at the EPA's website, "State Development of Numeric Criteria for Nitrogen and Phosphorus Pollution."[55] According to this website, Louisiana has not provided any milestones, and criteria are not even predicted by 2016.

Failure to Control Nutrient Discharges

To our knowledge, Louisiana has *never* calculated and imposed a water quality based effluent limit (WQBEL) for nitrogen or phosphorus. Even in waters that have dissolved oxygen impairments, LDEQ is not requiring nutrient limits. For example Louisiana issued a draft permit for an alligator farm with nutrient-rich waste to discharge into a waterbody impaired for low dissolved oxygen without a WQBEL, even though there was an obvious violation of narrative standards.[56]

Other examples of Louisiana actively backing away from real nutrient reduction include:

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[53] http://www.deq.louisiana.gov/portal/Portals/0/planning/LA%20Nutrient%20Strategy%20Plan%20Final%20FOR%20WEB.pdf **(Attachment 35)**

[54] http://lanutrientmanagement.org/review-draft **(Attachment 36)**

[55] http://cfpub.epa.gov/wqsits/nnc-development/ **(Attachment 37)**

[56] Wall Gator GRN Comments 2013Jan18 **(Attachment 38)**

- Louisiana attempted to remove the Louisiana near shore Gulf of Mexico waters from the state 303(d) list as impaired for low dissolved oxygen, despite the widespread knowledge of the Gulf Dead Zone. It fell to EPA to add these waters to the 303(d) list to begin with, and to ensure that these waters stay on the list.

- Louisiana has been actively removing nutrient monitoring and nutrient-related limits from existing permits. For example:
    - In 2014, LDEQ has released a draft for a sewage treatment plant in the Lake Pontchartrain Basin that removes ammonia and dissolved oxygen limits and increased BOD limits, without adequate data to justify these changes.[57]
    - LDEQ has removed nitrogen and phosphorus monitoring for one of the state's largest sewage treatment plants, the New Orleans East Bank Sewage Treatment Plant, despite the potential that this plant may be moving some of its discharge into existing wetlands.[58]

Environmental Problems Attributable to the Lack of Nutrient Control

It is important to also note that Louisiana consistently says that they are not a major contributor to the Dead Zone. While it is true that the state does not contribute at the level of states like Iowa and Illinois, Louisiana has been charged by EPA with addressing the hypoxic zone through TMDL preparation. It is clear that the state is unwilling to fulfill this role. Neither are local nutrient-related pollution problems being adequately addressed. While LDEQ announces that algae blooms and fishkills are likely in the summer, little has been done to reduce the nutrients that cause them.[59]

[57] Gulf Restoration Network comments on 2012 Louisiana 303(d) list **(Attachment 39)**
[58] New Orleans East Bank WWTP-GRN Comments-092208 **(Attachment 40)**
[59] 2013 LA Algae Bloom **(Attachment 41)**

Exhibit F - Missouri

Failure to Promulgate Numeric Nutrient Criteria

Missouri has tried to develop numeric nutrient criteria for some of its lakes, but after eight years of workgroups and draft proposals, the only waters within Missouri borders that are subject to numeric nutrient criteria are 25 lakes.[60]

In its 2009 Triennial Review, the Missouri Department of Natural Resources proposed Total Phosphorus, Total Nitrogen and chlorophyll numeric criteria for Missouri's larger lakes.[61] The criteria did not specify which designated uses were to be protected (to the extent that the lakes had been assigned any uses at all) and did not explain how the criteria would allow "year-round maintenance of a warm-water biota," for example.[62] EPA Region 7 had pointed out the flaws in MDNR's approach at the rule-making stage, but MDNR did not correct the criteria or make available the information EPA requested. Accordingly, Region 7 disapproved the criteria.[63] Missouri responded to the disapproval by abandoning any attempt to rein in nutrient pollution in any of its waters. The previously scheduled nutrient criteria work groups were canceled in late 2011. They have not met since. Nutrient criteria were not part of the latest Triennial Review package in 2013. Missouri has no nutrient criteria development work groups scheduled at this time.

Missouri has not completed its Nutrient Reduction Strategy document. An earlier timeline aimed for a completion date of September 30, 2013.[64] However, in October 2013, a new timeline extending that date to June 2014 was presented.[65] Stakeholder committees organized by nutrient sources have developed some first drafts. The drafts rely on nutrient trading for implementation, but, without clear nutrient standards to drive adoption of strategies and create a viable nutrient trading market, the document may remain little more than a list of good ideas with little hope of implementation.

Failure to Control Nutrient Discharges

Missouri has a poor performance in regard to implementation of the Clean Water Act, having failed to assign designated uses to the vast majority of its rivers and streams until November 2013.[66] Because so few waters have been subject to numeric criteria, and because only a few of

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[60] *See* 10 C.S.R. § 20.7-031(4) (N)(3) and Table M. These 25 lakes have the lowest TP, TN and chlorophyll levels in the state and are in the lowest 25 percent of Missouri lakes for nutrient contamination. Nonetheless, 9 of those 25 lakes are now listed on the 303(d) list for nutrient impairments.

[61] 10 CSR 20.7-031(4)(N)(3)(A)-(C).

[62] Letter from Karl Brooks, Administrator, EPA Region 7, to Sarah Parker Pauley, Director, Missouri Department of Natural Resources, dated August 17, 2011, at pages 27-29. **(Attachment 42)**

[63] *Id.* at 29.

[64] Missouri Department of Natural Resources, Presentation, Nutrient Reduction Strategy (Oct. 2013) **(Attachment 43)** (also available at http://www.mpua.org/_lib/files/NRC_5_(2).pdf.)

[65] Missouri Department of Natural Resources, Nutrient Reduction Loss Strategy – October 2013 **(Attachment 4)** (also available at http://www.dnr.mo.gov/env/wpp/mnrsc/nutrient-red-strategy-powerpoint10-15-13.pdf.)

[66] *See* 39 Mo. Register, No. 2, at 259 (Jan. 15, 2014). Missouri Coalition for the Environment estimates that approximately 80,000 miles of rivers and streams remain without designated uses and are not presumed fishable/swimmable as required by EPA regulation.

Missouri's permitted dischargers have been located on classified streams, it has been virtually impossible to use the NPDES permitting program to control nutrients. Even if the state were willing to incorporate WQBELs into permits (which it currently is not), there are no numeric criteria applicable to the receiving streams.

Environmental Problems Attributable to the Lack of Nutrient Control

The 2014 303(d) list contains 123 streams with impairments that suggest nutrient issues, even though no nutrient standards apply to those waters. The types of impairments range from a catch-all of "nutrients" to dissolved oxygen to the specific naming of nitrogen, phosphorus and chlorophyll.

In the meantime, blue-green algae continues to threaten Missouri waterways[67] and Missouri's nutrient pollution remains a major contributor to Gulf Hypoxia. According to USGS, Missouri contributes 9.6% of Total Nitrogen and 12.1% of Total Phosphorus flux to the Gulf of Mexico, making it the fourth and second leading state, respectively.[68]

[67] CBS St. Louis, "Blue-Green Algae Threat to Humans, Animals." (July 23, 2013) (**Attachment 45**) (also available at http://stlouis.cbslocal.com/2013/07/23/blue-green-algae-threat-to-humans-animals/).
[68] Attach. 9

Hypoxia Task Force meeting (May 20-22, 2014)

Dan Dudley attended the Hypoxia Task Force (HTF) meeting in Little Rock, Arkansas last week. U.S. EPA used the occasion to officially announce the recently signed MOA between Land Grant Universities (LGU) in all 12 member States and the HTF. Other highlights from last week's meeting include:

- States only meeting – Nine of twelve member States reported that their State Nutrient Strategies are either final or undergoing public review prior to completion. Other items discussed included:
  - progress and plans for adopting nutrient WQS criteria (general reluctance was the theme);
  - waters of the U.S. (WOTUS) proposed rule (widespread confusion & concern was voiced);
  - HABs on inland waters (issue on Corps operated reservoirs);
  - U.S. EPA's proposed antidegradation rule (KY concerned); and
  - need for more dedicated funding to implement practices and monitor environmental results.
- Watershed tour – a lengthy tour of delta farms was instructive on several fronts:
  - There are 13 Mississippi River Basin Initiative (MBRI) USDA funded projects in Arkansas, mostly in the delta where row crop agriculture predominates. Local Conservation Districts, Irrigation Districts, Ducks Unlimited and other local partners are given credit for sponsorship and the high level of landowner participation.
  - Rice growers have shifted from ground water irrigation to surface water. Land leveling along with water conservation practices have been installed (some with MRBI cost share) on many farms to capture <u>all</u> runoff for irrigation re-use.
  - The USDA Wetland Reserve Program (re-structured/re-named in the 2014 Farm Bill as Agricultural Conservation Easement Program) has been used extensively in the delta States to restore natural wetland habitat and to manage "working wetlands" (rice fields used for winter duck habitat).
  - Unlike Ohio "farm ditches" the irrigation canals and ditches are isolated from nearby streams and bayous (an example of waters <u>excluded</u> from the WOTUS rule).
  - Arkansas has established nine *Discovery Farms* based on the Wisconsin model; touted as a very successful program to promote good soil and water quality practices.

- Public Session – A full day with 24 presentations, here are the highlights:
  - Overview of 2014 Farm Bill conservation programs, but many details yet to be released as administrative rules are still being drafted;
  - Panel of private industry representatives discussed recent advancements in nutrient use efficiencies, efforts to influence

fertilizer and soil management practices using supply chain initiatives and sustainability initiatives;
    - A common theme of many speakers was the opportunity to strengthen the connections between Certified Crop Advisors and University Extension agents; and
    - Comments from the Mississippi River Collaborative – This group of environmental organizations filed a rulemaking petition several years ago to force U.S. EPA and the States to adopt *numeric nutrient criteria* (NNC). Rulings made in the lower courts are presently under appeal. Remarks at the meeting were professional, thanking the HTF for their continued work but also urging greater attention to State rulemaking progress. A more confrontational letter from the Collaborative to Nancy Stoner dated 02/13/2014 was made available. **The letter names six States where the Collaborative believes NNC development has stalled (IA, IL, LO, KY, MO, IN).** The risk of future legal action over these State programs appears to be elevated.
- Executive Session – The most significant topic discussed during executive session was a status report on revising the long-stated, but un-realistic goal of reducing the size of the Gulf hypoxia zone to 5000 km^2 by 2015. A sub-committee of coordinating committee members outlined this plan for revising the HTF goal:
    - Keep the original areal extent goal the same but with no target date;
    - Add an interim goal or milestone for an *achievable nitrogen load reduction* goal in 10 years (maybe a 10-25 % reduction in load); and
    - Add other interim implementation goals (acres under practices, etc.) and a second interim goal/milestone for load reduction(TBD).

  Nancy Stoner briefing discussed some additional guidance for use by States in adopting numeric nutrient criteria (NNC). The main point was to stress a **suggested sequence of water body types for development of NNC**. No handouts provided at the meeting. Prior to the meeting ACWA circulated the attached items on this topic.

  These **action items** for HTF members were identified:
    - All members were asked to voice support for re-authorization of the federal law that funds NOAA's work on HABs and hypoxia (important for two reasons: 1) continued monitoring of Gulf hypoxia zone and 2) *increased ability to monitor HABs on inland waters*);
    - All Coordinating Committee members were asked to assist the objectives sub-committee in preparing a final recommendation by October 2014;
    - The HTF should name a point of contact for working with the LGU team leaders who are coordinating the MOA; and
    - Each HTF State should name a point of contact to work with the LGU contacts in their respective State.

The next HTF meeting will be October 20-23, 2014 in Alton Illinois (St. Louis)

COMPARISON OF DRAFT ORIGINAL TIC TO THE ALTERNATIVE PROPOSED BOX MODEL

Trophic Index Criterion – Rational and Scoring

The Trophic Index Criterion

The Trophic Index Criterion (TIC) is a composite index that brings together the measures of nutrients, periphyton, dissolved oxygen, and biological assemblages by awarding points to successive ranges of each indicator, where the ranges are defined by benchmarks identified in the nutrient study. Hence, the TIC provides a structured method of aggregating data collected on Ohio's streams and rivers into a nominal scale that is essentially a translator for the condition of a water body relative to nutrient enrichment. As such, it can be applied independently to dictate the imposition of appropriate nutrient management programs including NPDES permit limits, waste-load allocations, and abatement strategies for landscape pollution.

Table 1. The Trophic Index Criterion (as currently proposed in draft form).

Biological Assemblages	Dissolved Oxygen	Benthic Algae	Nutrients†	Trophic Index Criterion
Meet applicable biocriteria (12)	Normal variation‡ <6 mg/l (12)	<107 mg/m^2 (8)	Concentrations typical of low disturbance systems (6)	**Acceptable (38-22)**
	Modest swings >6 mg/ (6)	107-183 mg/m^2 (4)	Concentrations typical of healthy streams in working landscapes (3)	
Within the range of non-significant departure (6)	Wide swings >7 mg/l (1)	Enriched 183-320 mg/m^2 (1)	Concentrations observed with high-intensity land use and WWTP loadings (1)	**Threatened 21-14**
Fail biological criteria (0)	Extreme swings >9 mg/l or swings >7 mg/l and minimum D.O. <WQS (0)	Thick to nuisance levels >320 mg/m^2 (0)	Concentrations typical of highly disturbed systems; effluent domination; >50% chance of biological impairment (0)	**Impaired 13-0**

†See Table 2 for nutrient concentration ranges

‡Measured as the difference between the daytime maximum concentration and the morning minimum

4/10/20

Alternate Proposed Box Model for Trophic Condition

1	2	3	4
Biological Criteria	DO Swing	Benthic Chlorophyll	Trophic Condition Status
All indices attaining or non-significant departure	Normal or low swings (<6.5 mg/l)	Low to moderate (<__ mg/m²)	Attaining use / not threatened
		High (>__ mg/m²)	Attaining use, but may be threatened
	Wide swings (>6.5 mg/l)	Low (<__ mg/m²)	
		Moderate to high (>__ mg/m²)	
Non-attaining (one or more indices below non-significant departure)	Normal or low swings (<6.5 mg/l)	Low to moderate (<__ mg/m²)	Impaired, but cause(s) other than nutrients
		High (>__ mg/m²)	Impaired / likely enriched
	Wide swings (>6.5 mg/l)	Low (<__ mg/m²)	
		Moderate to high (>__ mg/m²)	Impaired / nutrient over-enriched

Issue: Selection of threshold values for response variables in box model

	A		B	
DO Swings	"normal variation"	<6 mg/l	"normal or low"	<6.5 mg/l
	"modest swings"	6 to 7 mg/l		
	"wide swings"	>7 mg/l	"wide swings"	>6.5 mg/l
Benthic Chlorophyll	"low level"	<107 mg/m^2	"low"	<125 mg/m^2
	"typical healthy stream"	107 to 183 mg/m^2	"moderate"	125 to 250 mg/m^2
	"enriched"	183 to 320 mg/m^2		
	"thick to nuisance levels"	183 to 320 mg/m^2	"high"	>250 mg/m^2

QUESTIONS FOR PROFESSOR RECKHOW AND LIST OF KEY REMAINING ISSUES FOR THE TIC OR THE ALTERNATIVE PROPOSED BOX MODEL

TALKING POINTS/QUESTIONS

I. WHETHER PROFESSOR RECKHOW CAN HELP TO IMPROVE THE CURRENT DRAFT BOX MODEL??

A. THE BOX MODEL USES ONLY DO SWING AND BENTHIC CHLOROPHYLL AS THE FACTORS TO BE MEASURED TO DETERMINE DEGREE OF ENRICHMENT.

1. ARE THESE TWO FACTORS STRONGLY CORRELATED TO ENRICHMENT? PRESUMING THAT THEY ARE, CAN ONE LATE SUMMER SAMPLING EVENT OF A WEEK OR SO FOR THESE TWO FACTORS BE SUFFICIENT TO DRAW CONCLUSIONS ABOUT THE SEVERITY AND DURATION OF THE ENRICHMENT CONDITION? CAN THESE TWO FACTORS BE PRESENT AT ELEVATED LEVELS FOR ONLY VERY SHORT PERIODS OF THE YEAR, WHILE NOT PRESENT FOR THE REMAINDER OF THE YEAR, AND CAN THEY BE CAUSED BY CONDITIONS OTHER THAN ELEVATED NUTRIENT LOADINGS? HOW MUCH DATA SHOULD BE COLLECTED AND OVER HOW LONG A PERIOD OF TIME TO DRAW DEFENSIBLE CONCLUSIONS ABOUT DO SWING AND BENTHIC CHLOROPHYLL? THE ANSWERS TO THESE QUESTIONS AFFECT THE STRENGTH OF AN ENRICHMENT CONCLUSION DRAWN FROM AN INDEX THAT USES ONLY THESE TWO FACTORS.

2. IF THE INTENT OF THE BOX MODEL IS TO MORE CLOSELY RESEMBLE A NUTRIENT ENRICHMENT INDEX, SHOULD OTHER ENRICHMENT FACTORS BE INCLUDED IN THE INDEX IF IT IS NOT TOO EXPENSIVE OR CUMBERSOME TO COLLECT THE INFORMATION, AND IF THEY WOULD STRENGTHEN THE DETERMINATION OF THE DEGREE AND PERSISTENCY OF ENRICHMENT?

a. VISUAL OBSERVATION OF ALGAL BLOOMS OR DENSE MATTING OF SURFACE ALGAE OR BENTHIC PERIPHYTON, ETC.

b. ELEVATED ALGAL TOXINS IN THE WATER COLUMN.

c. POLLUTANT TOLERANT DIATOMS.

d. INCREASE IN POLLUTANT TOLERANT SPECIES IN ICI SURVEY OR REDUCTION IN DIVERSITY/RICHNESS OF SPECIES.

e. DETRIMENTAL CHANGE IN ALGAL TAXONOMIC STRUCTURE.

f. OTHER FACTORS?

3. WHAT IS THE ROLE OF BIOCRITERIA ATTAINMENT (BA) IN THE REVISED, DRAFT ENRICHMENT INDEX?

a. IF BA IS IN THE INDEX TO ESTABLISH THAT FULL BA WILL NOT RESULT IN A DETERMINATION OF UNACCEPTABLE ENRICHMENT, EVEN WHEN DO SWING IS HIGH AND BENTHIC CHLOROPHYLL IS HIGH, THEN BA HAS A VERY USEFUL PURPOSE IN THE BOX MODEL.

b. IF BA STAYS IN THE INDEX, HOW DO WE DECIDE WHETHER ATTAINMENT IF FULL OR PARTIAL? WILL ONE BIOLOGICAL SURVEY SUFFICE? HOW DO WE DEAL WITH MULTIPLE SURVEYS COMPLETED OVER A NUMBER OF YEARS?

c. IF OEPA WANTS BA TO BE A FACTOR IN THE INDEX BECAUSE THE AGENCY BELIEVES THAT THERE IS A DIRECT CORRELATION BETWEEN BA AND ENRICHMENT, THEN THE DRAFT INDEX CONTINUES TO PRESENT A RISK THAT OEPA WILL BELIEVE THAT NUTRIENT LIMITS ARE REQUIRED WHENEVER BA IS LESS THAN FULL AND ELEVATED ENRICHMENT CONDITIONS ARE PRESENT, EVEN THOUGH THERE ARE MANY OTHER KNOWN CAUSES OF NONATTAINMENT OF BIOCRITERIA INDEPENDENT OF ENRICHMENT.

B. IF ONLY DO SWING AND BENTHIC CHLOROPHYLL LEVEL ARE NEEDED TO DETERMINE DEGREE OF ENRICHMENT, ARE THE SCORING RANGES IN THE REVISED BOX MODEL CONSISTENT WITH THE RANGES AND CUTOFFS FOUND IN THE PEER-REVIEWED SCIENTIFIC LITERATURE?

II. WHETHER PROFESSOR RECKHOW CAN BEST PROVIDE ASSISTANCE AT THE DISCUSSION AND DRAFTING OF AN IMPLEMENTATION RULE FOR A BOX MODEL ENRICHMENT INDEX??

A. CRITICAL ISSUES REMAIN TO BE DISCUSSED AND POTENTIAL LANGUAGE DRAFTED FOR AN IMPLEMENTATION RULE.

1. CAUSATION.

a. LESS THAN FULL BA CAN BE CAUSED BY MANY OTHER FACTORS THAT ARE INDEPENDENT OF THE DEGREE OF ENRICHMENT.

(1) POOR HABITAT

(2) LOWER QUALITY STREAM MORPHOLOGY

(3) HIGH FLOW FLUCTUATIONS, SCOURING OF BENTHIC COMMUNITIES, ETC.

(4) CHEMICAL/POLLUTANT CAUSES, INCLUDING HIGH MINERAL CONTENTS, HIGH TDS, HIGH SEDIMENTATION, URBAN STORMWATER RUNOFF POLLUTANTS, ETC.

b. ELEVATED DO SWING AND BENTHIC CHLOROPHYLL CAN BE PRESENT ON A REGULAR BASIS EVEN IN A STREAM THAT HAS EXTREMELY LOW NUTRIENT LOADINGS, DEPENDING ON THE PHYSICAL ATTRIBUTES OF STREAM.

(1) LACK OF CANOPY/COVER

(2) WIDE, SHALLOW, SLOW-MOVING STREAMS WITH HIGH FLOW FLUCTUATIONS

(3) LOW QUALITY SUBSTRATES AND POOR OVERALL STREAM MORPHOLOGY

(4) WATERSHEDS WITH HIGH DEGREE OF UPSTREAM AGRICULTURAL USE CAN CONTRIBUTE NUTRIENTS IN RUNOFF AND DRAINAGE TILES THAT FEED ENRICHMENT CONDITIONS EVEN AFTER FERTILIZER/TILLING IS COMPLETED AND FLOW HAS SETTLED DOWN.

d. HOW CAN AN IMPLEMENTATION RULE BE DRAFTED THAT FAIRLY ACCOUNTS FOR THESE OTHER CAUSATIVE FACTORS, AND DOES NOT UNFAIRLY PUT THE BURDEN ON THE POINT SOURCE DISCHARGES TO DISPROVE A NEGATIVE?

e. IF POOR HABITAT AND POOR PHYSICAL STREAM ATTRIBUTES ARE THE CAUSES OF LESS THAN FULL BA AND ENRICHED CONDITIONS, EVEN IF PERMIT HOLDERS SPEND LOTS OF $ TO REDUCE NUTRIENT LOADS TO EXTREMELY LOW LEVELS OR EVEN ND LEVELS, BA WILL NOT IMPROVE AND ENRICHED CONDITIONS MAY STILL OCCUR EACH YEAR.

f. IF THE DECISION UNDER A BOX MODEL ENRICHMENT INDEX IS THAT FURTHER INFORMATION IS NEEDED TO DETERMINE THE CAUSES OF ENRICHMENT, WHO WILL HAVE THE BURDEN TO COLLECT THE NECESSARY INFORMATION?

g. EVEN IF POINT SOURCES OF NUTRIENTS ARE A SUBSTANTIAL CAUSE OF ENRICHMENT, IF NP AG. SOURCES ARE ALSO A SUBSTANTIAL CAUSE, FORCING POINT SOURCE REDUCTIONS IS UNLIKELY TO FIX THE PROBLEM.

2. ADAPTIVE MANAGEMENT PERMITS THAT ALLOW FOR HABITAT IMPROVEMENTS, STREAMBED IMPROVEMENTS, AND TRADING WITH AG SOURCES FOR NP SOURCE IMPROVEMENTS, SPREAD OVER SEVERAL PERMIT

TERMS, WILL OFTEN BE THE BEST SOLUTION FOR IMPROVING BA SCORES AND REDUCING ENRICHMENT CONDITIONS.

3. IF NUMERIC NUTRIENT LIMITS ARE NEEDED FOR POINT SOURCES, WHETHER SUCH LIMITS SHOULD BE LIMITED TO SEASONAL SUMMERTIME CONCENTRATION LIMITS, TOTAL ANNUAL LOADING LIMITS, OR SOME VARIATION OF THE TWO.

a. IMPACT OF HOW NUTRIENTS GET TO THE STREAM AND WHETHER AG. SOURCES ARE A DOMINANT SOURCE OF LOADINGS.

b. WHETHER POINT SOURCE LOADINGS DOMINATE OVER NP SOURCES IN THE SUMMERTIME, OR WHETHER NP AG. SOURCES CONTINUE TO FEED AND CAUSE ENRICHMENT CONDITIONS IN THE LATE SUMMER.

III. SHOULD PROFESSOR RECKHOW BE EMPLOYED FOR BOTH THE REMAINDER OF THE BOX MODEL REVIEW AND DEVELOPMENT, AS WELL AS FOR THE REST OF THE IMPLEMENTATION PHASE OF THE COMMITTEE'S WORK??

IV. POLITICS OF THE GROUP AND RELATIONSHIP WITH BOB MILTNER???

SCOPE OF OHIO CLEAN WATER ACT AUTHORITY COMPARED TO FEDERAL CLEAN WATER AUTHORITY OVER WATERS AND POINT AND NON-POINT SOURCES

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Via Email and Regular Mail

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Re: ELI Report: "STATE CONSTRAINTS-State-Imposed Limitations on the Authority of Agencies to Regulate Waters Beyond the Scope of the Federal Clean Water Act," May 2013 – Response to Analysis of Ohio Law

Dear Ms. Albrecht and Ms. Clements:

I respectfully disagree with ELI's opinion in the above-referenced report that Ohio has laws that act as a "qualified prohibition" against our State's ability to regulate waters as broad as, or perhaps broader than, the definition of "waters of the United States" under the Federal CWA. *See* ELI State Constraints, May 2013, at pp. 173-176. The only authority cited by ELI for its opinion is a statute that is part of Ohio's Administrative Procedures Act for rulemaking, a statute that requires that Ohio EPA provide an explanation and rationale if a proposed rule to implement a delegated federal program would be more stringent than its federal counterpart. *Id.* (*citing* R.C. 121.39). Although R.C. 121.39(D)(3) requires that Ohio EPA explain why it is proposing a rule that is more stringent, it does not limit or otherwise restrict the ability of the Agency to promulgate such rules as part of Ohio's delegated federal programs. *Id.*

Although Ohio's Water Pollution Control Act (R.C. Chapter 6111) has a provision (R.C. 6111.03(S)(2)) that requires that Ohio EPA administer the statute "…consistent with the laws of this State and federal law, and in the same manner that the Federal Water Pollution Control Act is required to be administered," this language has never been interpreted by Ohio's courts as restricting Ohio EPA's authority to regulate waters more broadly than waters regulated under the federal CWA. Indeed, the following statutes and regulatory programs in Ohio demonstrate that Ohio EPA currently regulates waters broader in many respects than the federal CWA's definition of "waters of the United States:"

1. Ohio's Water Pollution Control Act defines "waters of the State" to include (i) groundwater at any depth or strata, (ii) lakes and ponds regardless of size, (iii) irrigation and drainage systems, (iv) private bodies of water that connect to surface or groundwaters, and (v)

man-made watercourses. R.C. 6111.01(H). Unlike the federal definition of "waters of the United States," Ohio's definition includes groundwater, and does not limit the definition of waters to those that are navigable or susceptible to navigation, adjoin navigable waters, or have a significant nexus with navigable waters.

2. Ohio's Water Pollution Control Act defines "pollution" of "waters of the State" broadly to include any act that places pollutants where they cause pollution of "waters of the State." R.C. 6111.04 Such acts are declared to constitute a nuisance unless authorized by a permit, and only a limited number of activities are exempted from the permit requirement. *Id.* The language of R.C. 6111.04 is broad enough to authorize Ohio EPA to regulate non-point sources of pollution. This language is considerably broader than the counterpart language in the Federal Clean Water Act. Ohio EPA has previously taken enforcement against non-point sources that allegedly polluted groundwater, and against non-point sources that allegedly caused a fish kill in surface waters. However, to the best of my knowledge and belief, to date the Agency has not used the language of R.C. 6111.04 as authority to support regulating, through rules or permits, non-point sources of pollution, although the language of the statute is certainly broad enough to support such regulation.

3. In response to the U.S. Supreme Court's 2001 decision (*Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers*, 531 U.S. 159 (2001)) that prohibited the Army Corps from regulating isolated, non-jurisdictional waters, Ohio EPA persuaded the General Assembly to enact legislation to amend R.C. Chapter 6111 to specify Ohio EPA's authority to regulate the dredging or filling of isolated, non-jurisdictional wetlands. *See* 2001 Ohio Legis. Serv. L-1455 *et seq.* (H 231) (Banks-Baldwin) effective July, 17, 2001 (*codified at* R.C. 6111.021-6111.029). Implementing rules have been promulgated at Ohio Admin. Code 3745-1-50 to 3745-1-54.

4. Using its broad CWA-related antidegradation authority (R.C. 6111.12 and Ohio Admin. Code 3745-1-05), Ohio EPA developed guidance that regulates the dredging or filling of primary headwater habitat ("PHH") waters, defined as small streams with a drainage area less than one square mile. *See* http://www.epa.ohio.gov/dsw/wqs/headwaters/index.aspx. Such waters must be scored and classified, using an Ohio EPA-developed evaluation index, before any dredging or filling is permitted. Whether dredging or filling is permitted, and the extent of mitigation required, depends on the classification of the stream (I, II or III), based on whether the stream is ephemeral, intermittent or perennial, and the presence or absence of higher-order aquatic species, such as salamanders. This regulatory program covers both jurisdictional and non-jurisdictional PHH streams.[1]

[1] Ohio EPA's authority to regulate dredging/filling of PHH streams through its antidegradation authority and the use of a guidance document was challenged in the case of *Oxford Mining Co. LLC v. Scott Nally, Director of Environmental Protection*, Case No. ERAC 12-256581, September 18, 2013. Certain conditions imposed in the Section 401 certification for Oxford Mining's CWA Section 404 permit were declared unlawful because the PHH guidance from which the conditions were taken had not undergone rulemaking procedures. *Id.* at pp. 32-33. Therefore, whether Ohio EPA will continue to regulate the dredging/filling of PHH streams without first undergoing rulemaking procedures is uncertain at this time.

Based upon this summary of statutory and regulatory authority, Ohio does not prohibit the regulation of waters broader than the federal CWA.

In addition, Ohio has legal authority to regulate land-based, non-point sources of pollution. R.C. 6111.04 prohibits pollution of waters of the State regardless whether the source of the pollutants is a point source or a non-point source. Although to date Ohio EPA has not required permits for non-point sources of pollution, nor has promulgated rules for non-point source activities that might cause pollution of waters of the State, the language of R.C. 6111.04 is broad enough to support such regulation at the state level. However, such regulation by local governments is unlikely to occur in Ohio, because Ohio's courts have consistently declared unlawful, on grounds of preemption, the enactment of local ordinances that sought to prohibit activities determined to be within the regulatory authority of Ohio EPA.

Based on Ohio's broad definition of the term "waters of the State," and Ohio's broadly-worded prohibition against placing or causing to be placed pollutants that cause "pollution" of any waters of the State, Ohio also has authority to regulate discharges to groundwater, and discharges from non-point sources. As a result, because the federal CWA defines the terms "discharge of pollutants" and "waters of the United States," narrower than the comparable terms in Ohio, our State has authority broader than the federal CWA, and can regulate excavation activities that would not constitute a "discharge" as that term is defined under the federal CWA.

With respect to a dredge and fill program, Ohio also has such authority. R.C. 6111.03(S)(2) authorizes Ohio EPA to issue dredge and fill permits in accordance with the federal CWA. This is in addition to the Agency's separate authority to require permits for the dredging or filling of isolated wetlands and PHH streams. However, to date the Agency has not sought authorization from the Army Corps of Engineers to administer the federal CWA Section 404 dredge and fill program in the State of Ohio. Bills were introduced in 2012 and in 2013, as part of omnibus funding legislation, that would have authorized Ohio EPA to petition the Corps to take over the federal Section 404 program in Ohio, but each time the authority was removed from the bill before enactment. Consequently, as discussed above, Ohio currently regulates dredging/filling of isolated, non-jurisdictional waters, while permits for dredging/filling of jurisdictional waters are issued by the Army Corps.

Finally, if an Ohio water constitutes a jurisdictional "water of the United States," additional requirements are triggered under Ohio law in order to dredge or fill the water. For example, Ohio requires the use of its own evaluation index and scoring criteria to classify all wetlands and PHH streams before dredging or filling is permitted. This requirement applies regardless whether the waters are jurisdictional or non-jurisdictional waters under the federal CWA. In addition, once classified, enhanced avoidance, minimization, and mitigation is required for the dredging/filling of a higher quality wetland or a higher quality PHH stream, regardless whether they are jurisdictional waters of the United States. These enhanced requirements are enforced primarily through Ohio EPA's wetland antidegradation rule (Ohio

Admin. Code 3745-1-54), general waters antidegradation rule (Ohio Admin. Code 3745-1-05), Section 401 water quality certification rule for individual Corps permits (Ohio Admin. Code Chapter 3745-32), and the Agency's conditions for certification of the Army Corps' Nationwide permits (*available at* http://epa.ohio.gov/portals/35/401/NWP_2012.pdf).

For all of the foregoing reasons, Ohio has authority to regulate waters more broadly than the scope of the Federal Clean Water Act. In several respects, our State currently regulates waters more broadly than under its federal counterpart. If you have any questions regarding this issue under Ohio law, please do not hesitate to contact me. Thank you.

Very truly yours,

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