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Regarding

Nutrient Pollution: An Overview of Nutrient Reduction Approaches – The Essential State Role

Good afternoon, Chairman Cardin, Ranking Member Sessions, and Members of the Subcommittee.

My name is Shellie Chard-McClary. I am the Water Quality Division Director for the Oklahoma DEQ. I have 19 years of experience in implementing Clean Water Act (CWA) and Safe Drinking Water Act (SDWA) programs. An important caveat to ODEQ's CWA authority that is worth noting is that while the ODEQ does not have the responsibility of setting Water Quality Standards (WQS), we do have the daunting task of implementing the WQS through the permitting process. I also serve on the Board of Directors for the Association of Clean Water Administrators (ACWA), the national representative for state, interstate, and territorial officials responsible for Clean Water Act implementation. Today, I am testifying on behalf of both ODEQ and ACWA.

Over its nearly 40 years, the CWA has allowed us to successfully reduce many sources of pollution to our nation's waters. One of the areas we are currently addressing is how to reduce the presence in our waters of two pollutants that present particularly unique challenges – nitrogen and phosphorus (together, "nutrients"). Today, nutrient pollution is a leading cause of water quality impairments across the nation, and causes adverse impacts on drinking water sources, aesthetics, recreational uses, and

aquatic life (such as nuisance algae growth, dissolved oxygen reductions, and pH increases). EPA's database indicates that 21 percent of all listed impairments are nutrient related. In Oklahoma, we have 10 stream segments and 22 lakes that are listed as impaired for nutrients. EPA's database also shows that 18 percent of approved Total Maximum Daily Loads (TMDLs) have been developed to address nutrient impairments. Oklahoma has completed three lake TMDLs for nutrients and is working on six others. One important message I would like you to take away today is that states are taking action to address this very complicated and important issue. I will provide additional examples later in my testimony.

First, I would like to address why nutrient pollution control is so difficult. Our traditional approach to controlling a pollutant is to identify the level at which that pollutant is "too toxic" to the environment, and then set water quality-based numeric and/or narrative standards to keep that pollutant below the toxic level. Nutrients are different. There is not a consistent, definitive level at which we can say across an entire state – or even across a water body or watershed – that this level is "too much." Nitrogen and phosphorus are widely variable, naturally occurring, ubiquitous, and are necessary components of healthy ecosystems. Ecosystems can be healthy under a wide variety of nutrient levels. Just as the amount of calories a person needs changes based on the individual's height, weight, metabolism, percent of body fat, exercise habits, etc.; an ecosystem's need for nutrients depends on many factors. The extent to which nutrients' adverse effects (for example, algae growth, pH increases, drinking water taste and odor problems, and in extreme cases, fish kills) occur within a water body depends on a wide range of critical factors such as sunlight, optimal stream substrate, stream flow, temperature and background water chemistry. These factors are site-specific. Therefore, states have found that nutrient levels that may cause impairments in one stream under one set of conditions will not have the same negative impact in a different water body.

A single number for nitrogen or phosphorus is not often an accurate indicator of adverse ecological or water quality effects. We have to look at other factors – like biology – and develop with EPA a flexible approach to controlling nutrients in the environment. In fact, there is a meeting tomorrow between EPA and the states to discuss the approaches states are already using and that integrate biological and ecological assessments to characterize nutrient impairments and develop a viable science-based integrative approach to their control.

Another factor complicating our approaches to addressing nutrient loading to our water bodies is that under the CWA, states only have direct authority over point sources, leaving most of us in a position to only incentivize and encourage nonpoint source reductions (for example, from agriculture). In many watersheds, nonpoint sources may account for a large percentage of nutrient loads. Therefore,

expenditures by municipalities and industries aimed at achieving reductions from the end of the pipe may produce little overall gain.

Due to the variation in the natural systems, nutrient control and management calls for a wide range of solutions. States are using a variety of CWA tools to achieve nutrient reductions. These include: nitrogen and phosphorus standards; total maximum daily loads (TMDLs), individual permit limits; wastewater treatment plant optimization; best management practices (BMPs); control of other water quality parameters such as sediment; voluntary nutrient coalitions that involve trading; and other innovative approaches. These diverse approaches require that a variety of nutrient accountability frameworks exist for measuring reductions.

States understand the appeal of a single water quality standard for nitrogen or phosphorus in implementation in order to gain what appears to be a consistent national approach. However, this approach does not acknowledge the real need for a more flexible system, which would allow for nutrient standards to work more effectively in the wide number of applications in which they are used by permitting authorities (for example, NPDES permit effluent limits or the calculation of TMDLs). EPA's Office of Water recently acknowledged our reality in a March 16, 2011 memorandum to its Regional Administrators, stating that, "States need room to innovate and respond to local water quality needs, so a one-size fits all solution to nitrogen and phosphorus pollution is neither desirable nor necessary." States are concerned, however, that this memorandum still establishes the expectation of numeric nitrogen and phosphorus standards.

At this point, I would like to highlight some of the approaches that Oklahoma has been implementing to address nutrient impaired water bodies. The Oklahoma Water Resources Board (OWRB) established narrative criteria for certain water bodies in order to protect them from nutrient loadings that "…impair[ ] any existing or designated beneficial use." Additionally, OWRB established a standard for chlorophyll a, which, although not a nutrient, is a good indicator of the presence of nutrients at levels that may adversely impact water body uses. At the same time, the OWRB established a numeric standard of 0.037 mg/L for phosphorus for the Scenic Rivers. Currently, this standard is being reviewed by a technical advisory panel made up of representatives from Oklahoma, Arkansas, EPA, and the Cherokee Nation. This review exemplifies what can be accomplished when states have the flexibility to set nutrient standards on a site-specific basis.

These three very different standards to address nutrients have resulted in aesthetic improvements to the water bodies that are a part of Eastern Oklahoma's vibrant tourism industry. However, these improvements have come at significant costs to cities and towns in both Oklahoma and Arkansas. The Oklahoma cities of Tahlequah (population 15,000) and Westville (population 1,600) have spent millions of dollars to meet the established criteria.

The Oklahoma Conservation Commission achieved success using a combination of EPA Clean Water Act §319 and state funds to address nonpoint source impaired water bodies through a cooperative program that involves local, state, and federal agencies, as well as local land owners. These partnerships offer a combination of education and voluntary cost-share implementation programs to address nutrient, sediment, and bacteria related impairments. In order to evaluate the success of these programs, there is a monitoring network in place that evaluates water body conditions at over 250 sites.

These efforts have resulted in nutrient loading reductions of between 60% and 70% in Oklahoma's highest priority watersheds. There have been numerous waters taken off our 303(d) list of impaired waters. In fact, in the last two years, Oklahoma has been one of the top five states in the nation for estimated nutrient load reductions due to implementation of the §319 program. Our most recent data suggests significant water quality improvements due to reduced nutrient loading in the top three priority watersheds in the state (Illinois River, Lake Spavinaw, and Grand Lake/Honey Creek). Finally, each year, these programs help hundreds of Oklahoma landowners reduce their impacts and improve their property, helping to ensure that Oklahoma agriculture will continue to play a primary role in feeding the nation and the world. In doing so, the program educates and impacts thousands of people each year about the importance of water resources and what can and is being done to protect them.

I, like most people, enjoy being able to tell others our success stories. However, I feel that it is important that I share with you one of Oklahoma's biggest challenges this year. Late, on June 23, 2011, ODEQ received a call from the Grand River Dam Authority (GRDA). That telephone call was only the beginning of what would turn out to be a very difficult summer and fall. GRDA was calling ODEQ to seek advice on what actions to take based on samples from Grand Lake showing a high presence of toxic Blue Green Algae (BGA). As of October 1, 2011, there were six lakes that were either totally or partially restricted from body contact recreation. The warnings were issued to protect individuals from upper respiratory distress, gastrointestinal disorders and/or skin rashes. The state health department confirmed 17 cases of illnesses from exposure to BGA with two additional still pending.

You may be wondering what this has to do with nutrient levels in water bodies. BGA is routinely present in lakes and rivers in Oklahoma. However, it does not have large blooms or impact recreational activities, or drinking water treatment when it is present in the "normal" levels. However, when the temperature gets very hot and rainfall is limited, the water is likely to become stagnant and when nutrients are present in high concentrations, BGA becomes the dominant algae species. These conditions lead to very large, very rapid BGA growth. Once the BGA completes its life cycle, it releases a toxin, which causes illness from body contact recreation and if consumed in drinking water. With the BGA present in several of the state's larger surface water reservoirs, drinking water systems were faced with additional challenges to filter the BGA without killing it to prevent the release of the toxin.

While we recognize the progress we are making in reducing the impact of nutrients to water bodies; we clearly still have much work to do. The BGA incident that began in late June, and is continuing today, clearly illustrates the impacts that occur to the environment when balance is disrupted.

Because of our experience with BGA this year, we are beginning an internal process that will result in the development of a plan to assist us and public water supply systems, should we find ourselves faced with this situation in the future. These localized events that are driven by many conditions, including those that we cannot control, such as temperature and drought, are another reason why it is so important that states maintain their flexibility in implementing nutrient criteria so that we can take necessary actions to avoid these toxic algal blooms in the future. States need to be able to take into account what happens in a local water body under different conditions in order to adequately protect it. While we have not yet been completely successful in adequately controlling nutrients in our water bodies, we are making progress and will continue to move forward, make adjustments and create more opportunities for success stories.

As ODEQ works with its sister agencies to implement nutrient criteria, we recognize the high cost to reduce the impacts these pollutants have on our water bodies. In a study we conducted, we determined that the estimated costs to reduce nutrient impacts to our sensitive water supply lakes are $29 to $53 million. However, the reduction in the treatment costs required by the drinking water treatment facilities was estimated to be $106 to $600 million. This is a clear example of, "An ounce of prevention is worth a pound of cure."

In conclusion, states share the Administration and Congress's concerns about nutrients and have adopted a variety of approaches, including narrative standards, nitrogen and phosphorus standards,

BMPs, watershed plans, etc. In my state, we have developed a variety of approaches since the nutrient issues are dependent on many site-specific issues. State economies, small communities in particular, are already under financial stress and will face additional infrastructure costs if we don't continue to reduce nutrient impairments in water bodies in the most effective environmental and economic manner. In addition, we agree with EPA that it is imperative to prevent additional nutrient impairments from developing, as it is much more economical to prevent impairments than it is to restore a system once it is impaired. We encourage EPA to continue to work with states to develop and implement the most appropriate tools for nutrient reduction and control, and to allow states the flexibility that is crucial to effectively address this important water quality challenge. The right tool is not always a number. The right tool for large urban areas is not always the right tool for small rural areas.

Mr. Chairman, Members of the Subcommittee, I thank you for this opportunity to share ODEQ's and ACWA's thoughts on the importance of the states' role and our on-going efforts in nutrient pollution reduction and control. I will be happy to answer any questions that you may have.

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