



## American Water Works Association

The Authoritative Resource on Safe Water <sup>SM</sup>

### **Cyanotoxins in Drinking Water**

**Presented by  
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&  
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**Before the House Subcommittee  
on Environment and the Economy  
November 19, 2014**

Good morning, Chairman Shimkus and members of the subcommittee. My name is John Donahue, and I am Chief Executive Officer of the North Park Public Water District, based in Machesney Park, Illinois. I deeply appreciate this opportunity to offer input on the critical issues surrounding algae blooms, cyanotoxins and our nation's sources of drinking water.

The North Park Public Water District provides high-quality, affordable and reliable water service to more than 33,000 people in the Machesney Park, Roscoe and Loves Park area of Illinois. I have worked in water and wastewater treatment for 34 years, in roles ranging from Chief Operator, to Superintendent of Water and Wastewater to CEO.

In addition to my day job at North Park Water District, I am currently serving as President of the American Water Works Association (AWWA). My remarks today reflect the experiences and

perspectives of AWWA's members. Established in 1881, AWWA is the world's oldest and largest non-profit scientific and educational association dedicated to water, the world's most important resource. With approximately 50,000 members, we provide solutions to improve public health, protect the environment, strengthen the economy and enhance the quality of life for millions of North Americans. In keeping with AWWA's vision of a better world through better water, our utility members are proud to provide safe and affordable water every day to more than 70 percent of the American population.

**Overview.** As you know, last August an algal bloom in western Lake Erie resulted in the formation of a toxin known as microcystin in the part of the lake from which the city of Toledo draws its drinking water. For three days, the city had to issue a "do not drink" advisory, affecting more than 400,000 people served by the city water system.

The factors leading to algal blooms and the occasional subsequent formation of a class of toxins called cyanotoxins are very complex and not completely understood. So, too, are the possible human health effects of the various kinds of cyanotoxins that algae can produce, at least at the low levels likely to be encountered in drinking water. Because of the uncertainties surrounding the human health effects of cyanotoxins, city officials felt it wise to issue the "do not drink; do not boil" order last August. Officials at every level of government involved in that emergency acted out of an abundance of caution to protect human health.

There may be uncertainty as to which combination of events – water temperatures, water flow patterns, presence of bacteria, etc. – may lead to a specific type of algal bloom and whether cyanotoxins will be produced. There may be uncertainty about all of the possible human health effects resulting from exposure to cyanotoxins. However, there is no uncertainty about one critical aspect of this problem: it is always associated with excessive amounts of nitrogen and

phosphorus in the water. Moreover, we know a great deal about the sources of those contaminants in our nation's lakes and rivers. Although each watershed is unique and has its own mix of nutrient sources, across the nation the most prominent uncontrolled sources of nitrogen and phosphorus are nonpoint sources, that is, runoff. These sources are at the same time both the hardest to manage and the furthest from being subject to meaningful federal regulatory authority.

According to a 1999 report by the U.S. Geological Survey, nonpoint sources – predominantly runoff and air deposition – account for 90 percent of the nitrogen and 75 percent of the phosphorus in U.S. waters. We know that is an old report, but there is no reason to think the situation has fundamentally changed since that study. Indeed, it is likely that as point sources of pollution, mainly municipal and industrial wastewater treatment plants, have been made subject to ever-tighter permit conditions under the Clean Water Act, the relative importance of nonpoint sources has only grown larger.

While point sources, such as Publicly Owned Treatment Works, storm sewers, sewer overflows, and industrial discharges contribute to overall loadings of nutrients in the nation's waters, it remains beyond dispute that nonpoint sources are the predominant source of phosphorous and nitrogen in many watersheds.

On the time-tested wisdom that an ounce of prevention is worth a pound of cure, I have come here today to say straightforwardly that the fairest and best strategy for reducing the scope, scale, and impact of this problem in the future is to bring nonpoint sources of nutrient pollution under more effective management. At present, these sources lie largely outside the jurisdiction of the Clean Water Act.

To be sure, there are some federal programs that can have a bearing on the contaminants we are talking about today, such as the conservation title of the Farm Bill. However, the conservation programs of the Farm Bill are voluntary in nature, and the program requirements are not based upon the quality of receiving waters or the need to protect downstream sources of drinking water. In contrast, Clean Water Act regulations require point sources to obtain water quality and technology-based permits with fixed terms. Permit conditions are reviewed on a regular basis and are routinely ratcheted towards greater stringency based on the quality of the receiving stream. These important features are absent from the Farm Bill's voluntary programs.

It is true that states have authority to control nonpoint sources, but most state programs are limited and are too weak to adequately protect U.S. water supplies. If these programs were stronger, the unfortunate events in Toledo might not have occurred.

Drinking water treatment technology does exist to allow drinking water utilities to remove toxins produced by algal blooms in source waters, but this technology is very expensive to acquire and maintain. In addition, removing these toxins after they occur versus preventing them from occurring in the first place does absolutely nothing to protect the ecosystem and the people within the watershed impacted by these algal blooms.

The question to be answered is this: Should the financial burden of solving this important problem fall solely on the customers of the affected public water systems, or also on those responsible for creating or contributing to the overall problem in the first place?

I'd like to describe what we do not think would be a fair response to the problem of excessive nutrient pollution. It would not be fair to put the entire burden of addressing this problem on municipal wastewater and drinking water utilities. It would not be fair to them or their customers

to require that municipal utilities spend more of their financial resources attempting to buy a pound of cure to this problem, when many ounces of prevention are available at a lower cost.

For drinking water professionals the protection of public health is clearly the most important priority, and we will do whatever is necessary to ensure that the water we deliver to our customers is safe every day. But water systems and their customers are in a real sense the victims of this pollution. It would not be fair to put the entire burden of response on them.

**What AWWA Is Doing.** Because we recognized the problem of algal blooms and cyanotoxins even before the unfortunate episode this summer, AWWA has undertaken certain proactive steps towards helping water systems at risk from this kind of event. Among other things:

1. AWWA is developing and distributing information to assist water systems in anticipating and responding to source water challenges, including cyanobacterial blooms and cyanotoxins. We are preparing a water utility manager's guide to cyanotoxins, which is now undergoing final review. This will be available to utility managers who have to cope with the problem of algal blooms, providing an overview of the current knowledge on algal blooms, their health effects, methods for testing for cyanotoxins, and treatment options for removing cyanotoxins from drinking water.
2. AWWA is encouraging water systems to evaluate their circumstances to determine whether they might have an unrecognized cyanotoxin concern, and to establish appropriate safeguards.
3. AWWA is assisting water systems with guidance and training on emergency preparedness so that water systems have protocols in place to respond to events like that experienced by Toledo, including early and effective communication with the public.

**What Can the Federal Government Do?** To help prevent future incidents like that experienced in Toledo, it is critical that this nation brings nonpoint sources of water pollution under more effective control. We recommend that Congress consider ways to greatly increase the effectiveness of nonpoint source pollution programs, including the question of whether nonpoint sources of pollution should be brought under the jurisdiction of the Clean Water Act.

In the shorter run, federal agencies, including EPA and USDA, should use existing authorities to give much higher priority to nutrient reduction projects that protect downstream drinking water supplies and therefore, public health. Among other tools available, the Clean Water State Revolving Loan fund and Farm Bill programs can be targeted and used more effectively to protect drinking water sources.

With regard to drinking water regulation, we support the science-based standard setting process embodied in the Safe Drinking Water Act. EPA should use the Unregulated Contaminant Monitoring Rule and the Contaminant Candidate List processes as the first steps in determining whether the regulation of cyanotoxins affords a meaningful opportunity to protect public health. If it does, EPA should set a National Primary Drinking Water Regulation for these contaminants.

Finally, we also recommend that EPA and USDA emphasize water quality objectives that specifically recognize the protection of drinking water supplies, rather than thinking of drinking water as an indirect beneficiary of generic nutrient reduction.

**Conclusion.** In closing I want to thank the subcommittee for the leadership it is taking today in holding this hearing. The American Water Works Association is eager to help in any way it can as the nation moves forward in addressing this important issue.

I will be happy to answer any questions you may have concerning my statement, either today or in the future.

Attached to this statement is a summary of current technical knowledge concerning algae and cyanotoxins.

**Attachment to Testimony of John Donahue  
Before the House Subcommittee on Environment and the Economy  
November 19, 2014**

**Technical Issues Concerning Cyanobacteria and Cyanotoxins.**

Cyanobacteria, also known as blue-green algae, are photosynthetic bacteria that can live in many types of water, and are important components of aquatic ecosystems. While critical to water and soil resources, excessive cyanobacteria growth can cause ecological and public health concerns, as we have seen. Rapid, excessive cyanobacteria growth is commonly referred to as a “bloom.”

Cyanobacteria blooms can be inches thick, especially those located near the shorelines of lakes and reservoirs, and they commonly occur during warm weather. They sometimes appear foamy or accumulate as mats or scum covering the water surface. Some cyanobacteria sink and rise through the water column, depending on the time of day. Cyanobacteria blooms may appear blue, blue-green, brown and other colors depending on many factors. Sometimes blooms are mistaken for materials such as spilled paint because they can have a similar appearance.

Cyanobacteria can cause problems for water utilities, including

- Unpleasant tastes and odors, usually earthy and musty;
- Interference with water treatment plant performance;
- Increased disinfection byproduct precursors; and
- Production of **cyanotoxins**. As of November 2014, EPA has not established a safe level for cyanotoxins in drinking water.



## **Blooms Are Not Always Harmful**

Cyanobacteria blooms that produce cyanotoxins are sometimes called Harmful Algal Blooms (HABs). This can be misleading because cyanobacteria that are capable of producing cyanotoxins do not always produce those toxins. Further complicating the picture, while some cyanobacteria that produce cyanotoxins also produce taste and odor problems, not all taste and odor-producing blooms produce cyanotoxins, and not all cyanotoxin-producing blooms produce taste-and-odor problems.

Cyanotoxins make up a large and diverse group of chemical compounds that differ in molecular structure and toxicological properties. They are generally grouped into major classes according to their toxicological targets: liver, nervous system, skin, and gastrointestinal system. A single bloom may contain multiple types of cyanotoxins, and some cyanobacteria can simultaneously produce several toxins.

## **Cyanotoxins and Human Health**

Human exposure to cyanotoxins can occur in several ways:

- (1) Ingestion of contaminated water, fish, or shellfish;
- (2) Dermal contact with water containing cyanotoxins;
- (3) Inhalation or ingestion of aerosolized toxins; and
- (4) Consumption of drinking water impacted by a toxic cyanobacterial bloom.

While confirmed occurrences of adverse health effects in humans are rare, some incidents have been documented in different parts of the world. In 1931, approximately 8,000 people fell ill when their drinking water originating from tributaries of the Ohio River that had been contaminated by a massive cyanobacteria bloom. In 1975, approximately 62% of the population

of Sewickley, Penn., reported gastrointestinal illness, which the Centers for Disease Control attributed to cyanotoxins created in open finished water storage reservoirs.

Health effects of cyanotoxins can be acute or chronic, and have been observed in the liver, nervous system, and gastrointestinal system. Liver cyanotoxins (i.e. microcystins) seem to be the most commonly found in cyanobacteria blooms and the most frequently studied. Scientists have identified at least 80 varieties of microcystins. Both acute and chronic effects of microcystins have been investigated through laboratory animal studies. In studies, microcystins have rapidly concentrated in the livers of test animals.

Animal studies for the effects of microcystins conducted using high doses have reported organ damage, heart failure, and death. Long-term animal studies of chronic effects from repeated exposure have found liver injury, renal damage, and an increased number of tumors.

The impacts of chronic or acute cyanotoxin exposure in humans are not clear, especially in the low levels more likely to be found in treated drinking water. Studies in China have reported a correlation between liver or colorectal cancer with the consumption of water contaminated by microcystin-producing cyanobacteria blooms. More research is needed to understand whether and how cyanotoxins may promote tumor growth and cancer.

Anatoxin-a targets the nervous system and can induce paralysis and death by respiratory failure at very high levels of exposure. Other non-lethal cyanotoxins can trigger fevers, headaches, muscle and joint pain, diarrhea, vomiting, or allergic skin reactions. Children are at a higher risk than adults of experiencing toxic effects.

## **Previous Episodes with Cyanotoxins**

Although they have been observed and reported more frequently in recent years, cyanobacterial blooms are not a new problem. At least 35 states have reported cyanobacterial blooms, with many of those blooms producing cyanotoxins. When considering cyanobacterial blooms and cyanotoxin events, it is important to distinguish between **recreational water** and **drinking water**. Cyanotoxin producing blooms have been identified in recreational waters more frequently in recent years, and contact recreation (such as swimming) has been restricted more often in the last decade than in previous decades. In the summer of 2006, at least 12 states posted advisories or closed lakes and rivers due to elevated levels of cyanotoxins, out of concern for people and animals.

Cyanotoxins have been found less often in drinking water supplies than in recreational waters. A 2000 Florida finished-drinking water survey reported cyanotoxins ranging from below detection level to 12.5 ug/L microcystin, 8.46 ug/L anatoxin-a, and 97.1 ug/L cylindrospermopsin. As of late 2014, nationwide occurrence data for finished drinking water has not been gathered, although it could be conducted in the future through the fourth round of the Unregulated Contaminant Monitoring Rule (UCMR).

## **Regulations and Advisories**

As of late 2014, there are no federal regulatory standards or guidelines for cyanobacteria or cyanotoxins in drinking water. The Safe Drinking Water Act (SDWA) requires EPA to publish a list of substances of potential concern that warrant further study, known as the Contaminant Candidate List (CCL). EPA uses the CCL to prioritize research efforts to help determine whether a contaminant should be considered for regulatory action. Cyanotoxins are listed on the third CCL as a group, with EPA identifying research needs for them and prioritizing development of information on anatoxin-a, microcystin-LR, and cylindrospermopsin. AWWA strongly supports

such science-based decision making regarding drinking water regulations for contaminants that may pose a risk to human health.

For microcystin-LR, the World Health Organization (WHO) has developed a provisional finished drinking water guideline of 1 µg/L, based upon chronic exposure. Results from a 2014 survey of state drinking water administrators indicate that five states out of the 34 states responding to the survey have established drinking water advisory thresholds for microcystin, and two states have established drinking water advisory thresholds for other cyanotoxins. In addition to these five states, four states have draft policies and eight more are preparing policies.

### **Factors Leading to an Algal Bloom**

Field experience shows that the following conditions are the most important factors leading to a cyanobacterial bloom:

- The many types of cyanobacteria and diversity of their habitats. This diversity makes it complicated to predict the precise conditions favoring the growth of cyanobacteria. Physical factors that affect whether cyanobacteria grow include available light, weather conditions, water flow, temperature, and mixing within the water column. Chemical factors include pH and nutrient concentrations (primarily nitrogen and phosphorus).
- Water Temperature. Most algae favor temperatures between 60 and 80°F; optimum conditions for many cyanobacteria are in even warmer waters, but some cyanobacteria will grow at temperatures below 60°F.
- Nutrients. Elevated levels of nutrients favor algae and cyanobacteria growth. Cyanobacteria are favored by a low nitrogen to phosphate ratio (<6:1 total N to P).

- Flow. Quiescent or low flow conditions favor cyanobacteria blooms. Turbulence disrupts the bacteria's buoyancy and light can be limiting at depth when there is vertical circulation in the water column.
- Thermal stratification. Cyanobacteria can regulate their buoyancy giving them a competitive edge when the water column is stratified. Stratification can also affect nutrient availability to favor cyanobacteria.
- Rainfall. Large and frequent storm/heavy rain events can temporarily disrupt cyanobacteria blooms by flushing and de-stratification within a water body; frequent small rainfall events can lead to cyanobacteria blooms by contributing nutrients that favor cyanobacterial growth without disrupting water body stratification.

Cyanobacteria blooms usually develop in waters rich in nutrients, especially phosphorus. Such nutrients originate from both point and nonpoint sources. Municipal wastewater and stormwater as well as agricultural runoff are common sources of nutrients. Failing septic systems can also be contributors. Some water bodies already contain enough "stored" nutrients in their sediments and aquatic ecosystem that cyanobacteria blooms can occur without additional nutrient input from any of these sources. Most of our nation's lakes and reservoirs are from 50 to more than 100 years old and many of them have been accumulating sediment and nutrients for a long time. In some cases, the cycling of nutrients within the reservoir is the major cause of algae blooms. In-lake mitigation practices may need to be considered alongside watershed management measures to effectively deal with this problem.

Managing cyanobacteria blooms effectively requires an understanding of the limnology of the water supply. The conditions that trigger blooms reflect site-specific conditions (e.g., the presence of cyanobacteria, nutrient levels, and hydraulic conditions). Some utilities experience blooms in surface water supplies in early summer when the water reaches a sufficiently warm

temperature. Others witness blooms when the thermocline begins to destratify in late summer or early fall (i.e. when turnover begins in the water column). Blooms may take place after a rain event or they may occur after a series of sunny days. Algae and zooplankton as well as cyanobacteria can flourish under particular source water conditions and can have implications for drinking water treatment. By understanding the limnological conditions of their particular source waters, utilities gain a better understanding of the conditions that are most likely to lead to a bloom.

Experiencing a cyanobacteria bloom does not always mean there is a cyanotoxin problem. Multiple strains of cyanobacteria can exist in a single bloom, and not all strains are capable of producing cyanotoxins. Even strains that can produce toxins do not always do so in all conditions, and the conditions that trigger or inhibit production of cyanotoxins remain poorly understood. Laboratory analysis is usually needed to determine if the cyanobacteria are actually producing toxins.

While some of the same types of cyanobacteria can produce cyanotoxins along with taste and odor compounds, such as geosmin and 2-Methylisoborneol (MIB), *a taste and odor episode does not necessarily mean cyanotoxins are also present*. In addition, some cyanobacteria that produce cyanotoxins do not produce these musty and earthy compounds. Cyanotoxin production and taste and odor production should not be assumed to always occur together. However, a history of taste and odor concerns linked to cyanobacteria blooms in a particular water body indicates at least the potential for cyanotoxin contamination.

### **Detection of Cyanotoxins**

Several assays and analytical methods have been developed to either screen for or quantify cyanotoxins. In some cases, a utility's laboratory may be able to perform testing, provided the

necessary laboratory equipment and expertise are available. In other instances, especially for advanced techniques, an external laboratory with experience and appropriate approvals may be recommended. Not all laboratories are equipped to analyze samples for cyanotoxins.

### **Treatment of Drinking Water**

Identifying which cyanobacteria and cyanotoxins are present helps utilities know they are using the appropriate treatment processes. Key factors to consider are the type of cyanotoxin and whether it is intracellular (contained within the cyanobacteria cells) or extracellular (dissolved in the water). Intracellular toxins can be eliminated by removing the cyanobacteria cells.

Extracellular toxins are generally more difficult to remove. Under some circumstances water treatment can release toxins from cyanobacteria, turning the toxins from intracellular to extracellular. Research is currently underway concerning the most effective means of removing cyanobacteria cells and their toxins from drinking water. Treatment selection is context-specific and depends upon the concentration of cyanobacteria and/or cyanotoxins to be removed or inactivated. Careful site-specific examination is necessary prior to making definitive treatment decisions. The exact configuration of treatment systems may determine the effectiveness of any particular treatment option.

## Common cyanotoxin treatment practices and their relative effectiveness

| Treatment Process  | Relative Effectiveness  |
|--|---|
| <b><i>Intracellular Cyanotoxins Removal (Intact Cells)</i></b>             |   |
| Conventional coagulation, sedimentation, filtration                        | Effective for the removal of intracellular/particulate toxins by removing intact cells. It generally is more cost effective than chemical inactivation/degradation, removes a higher fraction of intracellular taste and odor compounds, and is easier to monitor.  |
| Flotation  | Flotation processes, such as Dissolved Air Flotation (DAF), are effective for removal of intracellular cyanotoxins since many of the toxin-forming cyanobacteria are buoyant.   |
| Pretreatment oxidation (oxidant addition prior to rapid mix)               | Overall, pretreatment oxidation can either assist or make treatment more difficult, depending upon the situation. Pre-oxidation processes may lyse cells, causing the cyanotoxins contained within to release the toxins. Ozone may be an exception (see "Ozone" below) because it both lyses cells and oxidizes the cyanotoxins. |
| Membranes (microfiltration or ultrafiltration)                             | Microfiltration and ultrafiltration are effective at removing intracellular/particulate toxins. Typically membranes require pretreatment.   |
| <b><i>Extracellular Cyanotoxins Removal/Inactivation</i></b>               |   |
| Chlorination   | Effective for oxidizing extracellular cyanotoxins (other than anatoxin-a) when the pH is below 8  |
| Chloramines  | Not effective.  |
| Potassium Permanganate   | Effective for oxidizing microcystins and anatoxins. Not effective for cylindrospermopsin and saxitoxins.  |
| Chlorine dioxide   | Not effective with does typically used for drinking water treatment.  |
| Ozone  | Very effective for oxidizing extracellular microcystin, anatoxin-a and cylindrospermopsin.  |
| Activated Carbon (Powdered Activated Carbon and Granular Activated Carbon) | Most types of carbon are generally effective for removal of microcystin, anatoxin-a, saxitoxins and cylindrospermopsin. Because adsorption varies by carbon type and source water chemistry, each application is unique; activated carbons must be tested to determine effectiveness.   |
| UV Radiation   | When used at high doses UV degrades toxins. UV doses used for disinfection are not adequate to destroy cyanotoxins.   |



|   |   |
|---|---|
| Membranes (reverse osmosis or nanofiltration) | Reverse osmosis is effective removing extracellular cyanotoxins. Typically, nanofiltration has a molecular weight cut off of 200 to 2,000 Daltons, which is larger than some cyanotoxins. Individual membranes must be piloted to verify toxin removal. |
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## Controlling Nutrient Levels

It is always more effective to prevent contamination of sources of drinking water than it is to clean up the water after contamination. In that light, we point out that:

1. Managing nutrient levels in surface waters, especially nitrogen and phosphorus, is critical to reducing the likelihood of cyanobacteria blooms and thus the potential for the production and release of cyanotoxins.
2. Elevated levels of nutrients in the water supply can contribute to a number of other drinking water quality challenges, including taste and odor complaints, reduced filter run times in water treatment plants, and increased potential for disinfection by-product formation.
3. Managing nutrient levels in public water supplies is already a major policy objective for EPA and USDA.

The events last August in Toledo place an exclamation point on the urgency of protecting the nation's water supplies and highlights the need to make the management of nutrients in those supplies a national priority. No city should be put in the position that Toledo found itself in, and we strongly recommend steps to prevent such events in the future.

Each watershed has its own unique mix of major nutrient discharges, but universally, the most challenging source of nutrients to manage is non-point source pollution. It is within Congress'

power to set new policy objectives for managing non-point source pollution under the Clean Water Act. Under the current law, communities across America are shouldering significant costs as storm water systems and wastewater treatment facilities face more and more stringent nutrient control requirements. These control requirements carry significant cost and lead to significant rate increases for utility customers. In many cases these costs are borne to reduce nutrients by a meaningless percentage compared to uncontrolled or relatively uncontrolled nonpoint sources in the watershed, because municipal sources are subject to permits while other important sources are not. The rate increases borne by customers of municipal water and wastewater systems also reduce the utility's ability to address other problems, such as aging infrastructure or improving resilience to disasters or unforeseen events. Communities cannot afford to bear the entire cost of managing nutrients just because the municipal facilities that serve them are subject to Clean Water Act permits, and no community should be expected to do so if we fail as a nation to bring nonpoint sources of nutrient pollution under control.

### **The Federal Role in Managing Cyanotoxins**

The federal government has a number of programs that can provide significant and immediate assistance in helping drinking water systems anticipate and respond to the potential risk posed by cyanotoxins. There are already considerable synergies between several current program goals and the kinds of assistance helpful to water systems. Ready examples include:

1. Coordinated federal focus. Nationally, responsibility for managing in-stream water quality is typically delegated to EPA, based on the Clean Water Act and other statutes. However, programs in a wide cross-section of federal agencies are central to evaluating and ultimately managing cyanotoxins. As an example, Farm Bill conservation title funds could be used more effectively to reduce nonpoint nutrient runoff as a preventative

measure, and could be targeted to water bodies threatened with excessive nutrients that also serve as drinking water supplies.

2. Data aggregation. EPA and CDC have both organized websites focused on harmful algal blooms. Due to the limited resources and historic purposes of these sites, there is substantial opportunity to consolidate water quality data, incorporate remote sensing information, and make available other data important to inform the management of nutrient levels in water supply watersheds. Data sites like those provided by USGS on stream flows and USDA on drought have been central to effective resource management and leverage limited federal dollars very effectively.
  
3. Clean Water Act stream body assessments for nutrients. Current CWA programs enumerate nitrogen and phosphate levels, but limited consideration is given to determining the potential for cyanobacteria blooms or to correlate nutrient conditions with available cyanotoxin concentrations with respect to water supplies. Providing more information on nutrient loadings and known cyanotoxin levels would be extremely helpful. Congress should also examine renewed funding of Clean Lakes program under EPA, Section 314 of the Clean Water Act. This program was used in the 1980s and '90s to fund research into limnology and make assessments of the nation's lakes. It could be used to study the cost effectiveness of in-lake techniques.
  
4. Harmful Algal Bloom and Hypoxia Research and Control Act. We applaud Congress for passing the Harmful Algal Bloom and Hypoxia Research and Control Act Amendments last June. We urge Congress to make sure that the research contained in this act receive robust funding, and that Congress to pay close attention to the research reports

that will result from this act.

5. Scrutiny under the SDWA. Several cyanotoxins are on the SDWA contaminant candidate list and the agency anticipates including some of these cyanotoxins in the next cycle of required unregulated contaminant monitoring. These actions are the first steps in a science-based SDWA regulatory decision-making process. AWWA's members appreciate that EPA is taking steps to inform water utilities about cyanotoxins now, while this regulatory process proceeds.

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**Summary of Statement**  
**by John J. Donahue, CEO North Park Public Water District**  
**before the House Subcommittee on Environment and the Economy**  
**Nov. 19, 2014**

- North Park Public Water District provides water service to more than 33,000 people in the Machesney Park, Roscoe and Loves Park area of Illinois.
- I am testifying today on behalf of the American Water Works Association (AWWA).
- The factors leading to algal blooms and the occasional subsequent formation of a class of toxins called cyanotoxins are very complex and not completely understood.
- So, too, are the possible human health effects of the various kinds of cyanotoxins that algae can produce, at least at the low levels likely to be encountered in drinking water.
- There is no uncertainty about one critical aspect of this problem: it is always associated with excessive amounts of nitrogen and phosphorus in the water.
- According to a 1999 report by the U.S. Geological Survey, nonpoint sources – predominantly runoff and air deposition – account for 90 percent of the nitrogen and 75 percent of the phosphorus in U.S. waters.
- The fairest and best strategy for reducing the need to issue “do not drink” orders in the future is to bring nonpoint sources of nutrient pollution under more effective management.
- AWWA is educating and preparing water utility managers for cyanotoxins threats.
- We recommend that Congress consider ways to greatly increase the effectiveness of nonpoint source pollution programs, including the question of whether nonpoint sources of pollution should be brought under the jurisdiction of the Clean Water Act.
- In the shorter run, federal agencies, including EPA and USDA, should use existing authorities such as the Clean Water Act state revolving loan fund and conservation programs under the Farm Bill to give much higher priority to nutrient reduction projects that protect downstream drinking water supplies and public health,
- EPA should use the Unregulated Contaminant Monitoring Rule and the CCL processes as the first steps in determining whether the regulation of cyanotoxins affords a meaningful opportunity to protect public health. If it does, EPA should set a National Primary Drinking Water Regulation for these contaminants.
- We also recommend that EPA and USDA emphasize water quality objectives that specifically recognize the protection of drinking water supplies, rather than thinking of drinking water as an indirect beneficiary of generic nutrient reduction.
- We thank the Subcommittee for its leadership in pursuing these topics and offer the experiences and expertise of our membership in further addressing cyanotoxins and related issues.