

Mike Baker:

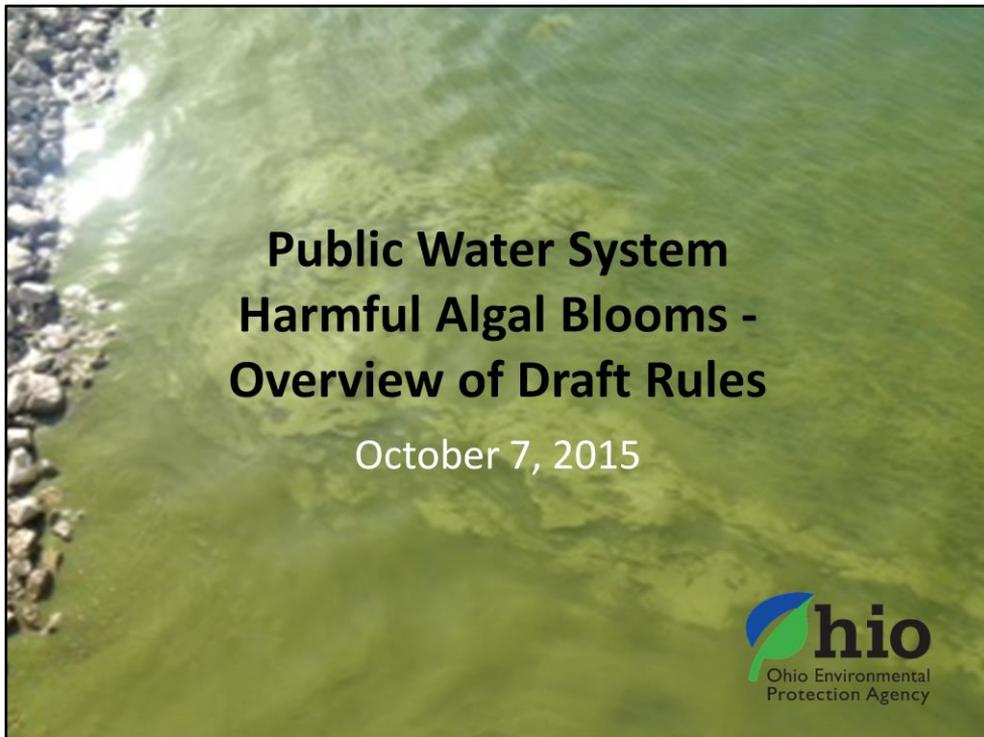
Good morning everyone and thank you for joining us today.

I want to start by reviewing the purpose of this morning's webinar.

Ohio EPA published draft rules that would establish requirements for public water systems to address HABS with a particular focus on microcystins.

The purpose of this morning's webinar is to review those rules, and the requirements they would establish, and to provide an opportunity for clarifying questions and answers about the rules.

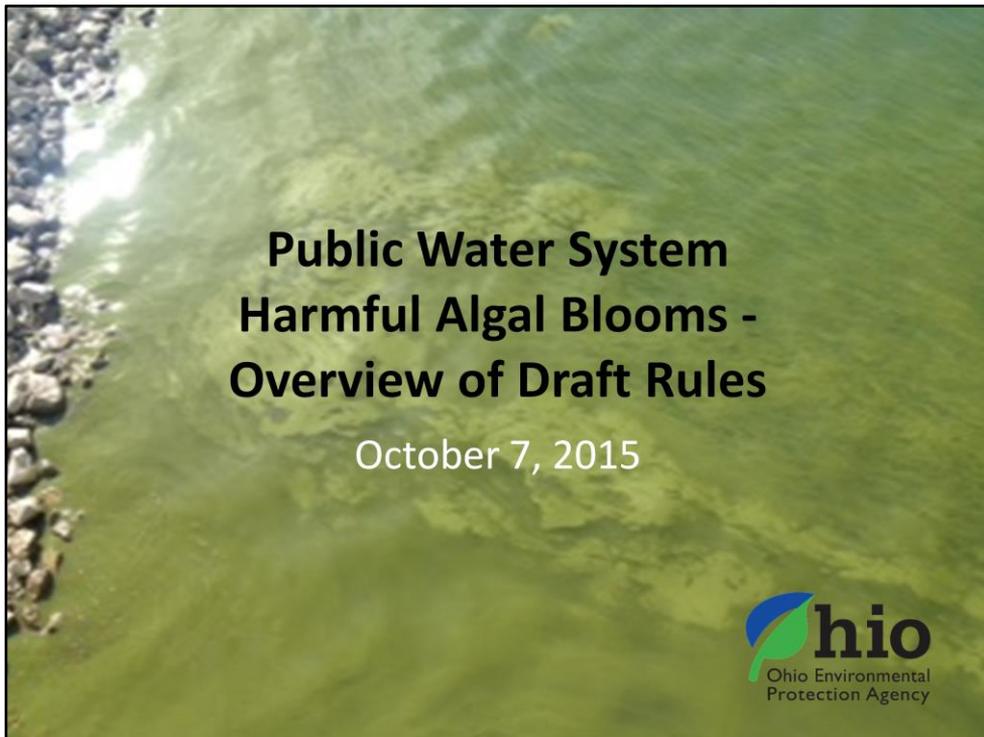
It is important to note that this is not a public meeting where we are seeking comments on the rules. We welcome you submit written comments prior to October 23, however, we will not be addressing comments during this webinar. I am hopeful this morning's webinar will help clarify the rules and aid your review and understanding of requirements prior to submitting comments.



I also want to quickly speak to why Ohio EPA is proposing rules at this time. While it is not unprecedented, it is somewhat unusual for the State of Ohio to establish regulations for public water systems beyond those established by USEPA under the SDWA.

Two good examples are the cross-connection backflow prevention rules and the well constructions standards. Both of those are examples of rules that address situations that present short term public health risks. Similarly, we believe the conditions in Ohio warrant additional actions to protect public health and wellbeing from the occurrence of HABs impacting public water systems.

As Holly Kaloz will outline in just a few moments, we have seen an increasing occurrence of HABs in water bodies being used as a source of drinking water over the last several years. Lake Erie has experienced the two most extensive blooms on record in the last 5 years, the Ohio River has just experienced the worst bloom on record extending over 600 miles. Numerous inland lakes and rivers have also had significant blooms. Six public water systems have detected cyanotoxin in finished water just this year.



Largely as a result of the blooms seen in the Western basin of Lake Erie over the last several years and impacts to Lake Erie public water systems, the Ohio General Assembly passed SB 1 this last Summer. That law establishes a new section in the Ohio Revised Code that requires Ohio EPA to take a number of actions to address HABs in Lake Erie and at public water systems. The law requires among other things, that Ohio EPA develop and implement protocols and actions including analytical protocols for monitoring, establishing public health advisories and public notification triggers. These rules will implement several of the requirements of that law.

More important, besides implementing provision of SB1, we know that these toxins can have public health implications. While we know we are seeing an increase in occurrence of HABs we only have limited data from about 50% of our surface water systems. The draft rules will give us and public water systems the information needed to take appropriate actions to protect the people they serve.

With that I will now turn this over to Holly Kaloz to provide an overview of the rules.

Background

- **2010:** Ohio EPA began sampling for cyanotoxins at PWSs
- **2011:** OEPA/ODNR/ODH created Ohio HAB Strategy
- **2012:** Separate Strategy documents developed for recreational and drinking water use (updated annually)
- **2015:**
 - **June** - U.S. EPA's health advisory levels for microcystin and cylindrospermopsin released
 - **July** - Ohio law (SB 1) passed directing Ohio EPA to implement actions to protect against cyanobacteria in the western basin of Lake Erie and in public water supplies
 - **September** - Draft rules distributed for Interested party comment (comments due October 23)



Sampling for cyanotoxins has been ongoing by Ohio EPA, and voluntarily by some public water systems, since 2010. This sampling has been conducted in accordance with the PWS HAB strategy, which has been updated annually. In 2015, USEPA issued Health Advisory Levels for microcystins and cylindrospermopsin. Also in 2015, a law was passed in Ohio which directs Ohio EPA to implement actions protecting against cyanobacteria, and therefore cyanotoxins, in public water systems, among other directives.

In September 2015, Ohio EPA distributed draft rules for interested party comment. Comments on these draft rules are due to Ohio EPA by October 23rd.

Draft Rules - Overview

- PWS requirements - new rules in OAC Chapter 3745-90
 - Microcystins action levels in drinking water
 - Monitoring requirements
 - Treatment technique requirements
 - Public notification and Consumer Confidence Report (CCR) requirements
 - Recordkeeping requirements
- Laboratory Certification requirements – new OAC rule 3745-90-04 and amended rules in Chapter 3745-89
 - Laboratory certification
 - Analytical techniques
 - Reporting deadlines



Ohio EPA has drafted new and amended rules, which will establish:

- Action levels for microcystins based on U.S. EPA's health advisory levels;
- Monitoring requirements for public water systems using surface water;
- Treatment technique requirements if certain triggers are hit;
- Public notification requirements for monitoring or reporting violations, treatment technique violations and exceedance of action levels in repeat samples of finished water;
- Requirements for action level exceedances to be included in consumer confidence reports;
- Recordkeeping requirements, and
- Requirements for laboratory certification, analytical techniques and reporting deadlines.

I'll go into each of these in more detail during this presentation.

Microcystins Action Levels

- Based on U.S. EPA's health advisory levels
 - Based on oral ingestion of drinking water at these levels for up to ten days
 - Applied to total concentrations of all congeners/variants
 - Includes nursing and pregnant women, individuals with liver disease and those on dialysis

Action Level	Total Microcystins (µg/L)
Children under 6 and sensitive populations	0.3
Children 6 and older and adults	1.6

- Exceedance in a finished water sample will require:
 - Additional monitoring
 - Treatment optimization
 - Potentially other actions (e.g. public notification)



The action levels for microcystins are based on U.S. EPA's health advisory levels. Ohio EPA has converted the same two-tiered approach from the HAB strategy into the action levels. There is an initial, lower level for children less than 6 years old and sensitive populations; and a second, higher level for children 6 and older and adults.

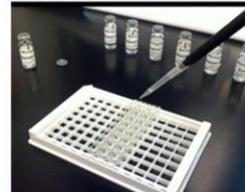
For microcystins, the advisory level for children less than 6 and sensitive populations is 0.3 ug/l and it is 1.6 ug/l for older children and adults. U.S. EPA guidance indicates that certain sensitive populations may want to consider following the guidelines for children less than 6. Ohio EPA specifically includes sensitive populations in the use advisory for children less than 6, including nursing and pregnant women, individuals with liver disease and those on dialysis.

The action levels are based on oral ingestion of drinking water at these levels for up to ten days, and is applied to the total concentration of all congeners (also called variants).

Exceeding an action level in finished water will trigger additional monitoring, treatment optimization and potentially other actions.

Monitoring Requirements

- Applies to surface water systems
- Routine weekly monitoring for cyanobacteria screening (raw)
 - Information will be used to determine if monitoring for cyanotoxins other than microcystins needs to be conducted by Ohio EPA (or voluntarily by the PWS)
- Routine weekly monitoring for microcystins (raw and finished)
 - Year-round
 - Option for a decreased monitoring schedule, after a year of data collection



All surface water systems will be required to monitor weekly for cyanobacteria screening and microcystins. I'll get into analytical methods a little later, when we discuss laboratory certification.

Weekly cyanobacteria screening of the raw water will be required, and the results will be used by Ohio EPA to determine if monitoring for cylindrospermopsin or saxitoxin needs to be conducted by Ohio EPA. Ohio EPA will continue to accept results for these cyanotoxins conducted voluntarily by a PWS, if they are collected and analyzed in accordance with the HAB strategy. The screening data collected under this rule will be used to determine whether or not future rules should include monitoring and reporting requirements for the other cyanotoxins.

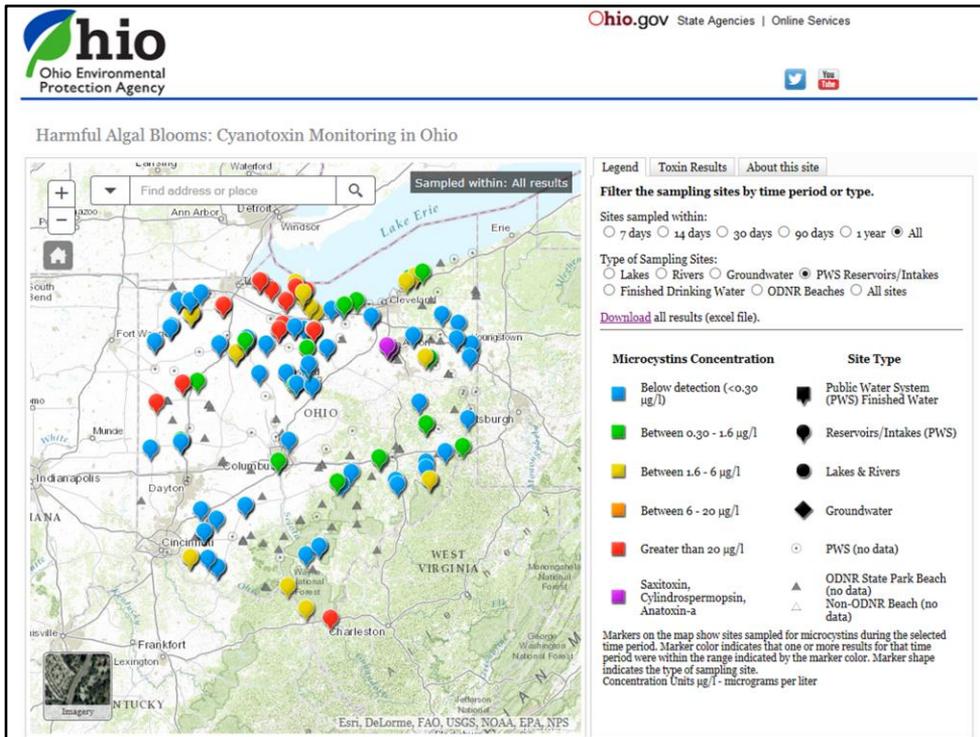
Microcystins will initially be required weekly, year-round, in both raw and finished water. Ohio EPA has included year-round sampling requirements, rather than limit it to just the warmer seasons, because microcystins have been detected, sometimes in high concentrations, in the sampling that has been conducted so far during the "off season". In addition, microcystins occurrence data has not been collected for all surface water systems in Ohio. The rule does allow for decreased monitoring in the future once data is collected to support a reduction.

Microcystins Occurrence

- Over 3000 raw water samples have been collected at Ohio public drinking water sources
 - Sampled ~1/2 of all surface water systems
 - 46% of samples had microcystins concentrations > 0.30 ug/L
 - 23% of samples were > 1.6 ug/L
 - Maximum concentration >20,000 ug/L
- Finished water microcystins detections at 7 public water systems
 - 5 finished water detections in 2015: No advisories



So far, about half of the surface water systems in Ohio have been sampled for microcystins. In this sampling, we have seen detections in raw water almost half of the time, and almost a quarter had concentrations in raw above 1.6 micrograms per liter, which is the health advisory level for all people including adults. Microcystins has been detected in finished water at 7 public water systems. 5 water systems detected microcystins in their finished water in 2015. Ohio EPA followed the HAB strategy following these detections, and there were no advisories issued.



You can see from this map that, in the sampling conducted so far, microcystins are present in source waters all over the state. The green, yellow, orange and red icons on this map indicate locations where microcystins have been detected at the intake for source waters used by a public water system. In addition, some of the water systems on the map that are showing no detections at the intake have had microcystins detections in secondary reservoirs or surface samples that are not included here.

This is not just a Lake Erie or Grand Lake St Marys issue.

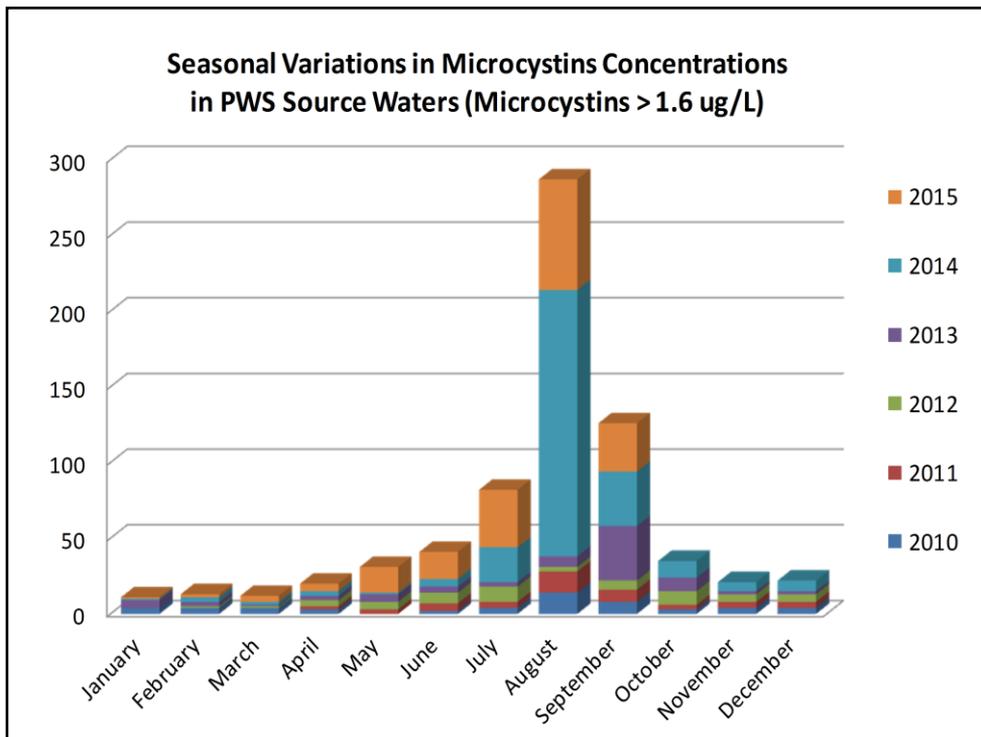


In fact, just as recently as this past month, a large bloom impacted water systems on the Ohio River. This map shows the bloom extended over 600 miles.

Site 7: Maysville Intake



This image is from some aerial surveillance of the Ohio River bloom.



This graph shows the amount of detections above the adult health advisory level of 1.6 micrograms per liter in PWS source waters, by month. You can see here, that while microcystins are most often found during the warmer months, it has been detected in source waters all year round. Also note that the majority of sampling so far has focused on the warmer months, so this could be an underrepresentation of occurrence in the “off season”. While you often see a lot pictures of blooms that are obvious and striking, HABs are not always visually apparent, and can be present and produce large amount of cyanotoxins in winter... including under ice. The only way to know if microcystins are present is to sample for them.

As I mentioned before, the draft rules do allow for the possibility of decreased monitoring in the future, once data is collected to support a reduction.

Increased Monitoring

- 3 days/week, if microcystins above 5 µg/L in the raw water
- Daily if microcystins detected in finished water
- Action level exceedance in finished water: Initiate 3 R's
 - **Reanalyze.** As soon as possible but no later than 24 hours, reanalyze sample with finished water detection
 - Refer to Contingency Plan; optimize treatment
 - **Resample.** As soon as possible but no later than 24 hours, collect and analyze another raw and finished water sample
 - Consider extracellular and intracellular toxin analysis; treatment train sampling
 - **Repeat.** Collect and analyze raw and finished repeat samples within 24 hours of receiving resample results.
 - If a finished water resample or repeat sample exceeds an action level, notify any consecutive systems and collect distribution samples



Increased monitoring frequency will be required if certain levels are hit in raw or finished water.

If raw water levels exceed 5 µg/L, monitoring 3 days per week will be required until concentrations are less than 5 µg/L in two consecutive samples collected at least one day apart.

If microcystins are detected in finished water above the reporting level, daily monitoring will be required until microcystins are not detected in two consecutive daily finished water samples.

If an action level is exceeded, the water system will be required to initiate the same 3 Rs that are in the current HAB strategy. That is:

- The initial sample must be reanalyzed immediately, but no later than 24 hours of receiving the results of the initial action level exceedance. After any finished water detection a PWS should immediately start optimizing their treatment. They should also pull their contingency plan off the shelf and begin thinking about what actions they may have to take if detections above the threshold continue. At this point the PWS staff may want to take some proactive avoidance strategies such as using an alternative source of water, limiting production and/or isolating storage.

- Also as soon as possible but no later than 24 hours of receiving the results of the initial action level exceedance, the water system will be required to collect raw and finished resamples. These samples must also be analyzed within this 24 hour period. When conducting the resamples, it is beneficial to request analysis for intracellular and extracellular concentrations of cyanotoxins, as that can help guide treatment adjustments. The water system may also want to collect samples at various stages of treatment to determine where toxins are being removed and identify opportunities to improve treatment.
- A set of raw and finished repeat samples will be required to be collected and analyzed within 24 hours of receiving the resample results.
- Then, if any of the finished water resamples or repeat samples exceed an action level, the water system will be required to notify any consecutive systems, and both the system with the exceedance and all of their consecutive systems will be required to collect distribution samples within 24 hours. These samples must be taken in accordance with the system's contingency plan, and may provide useful information enabling the PWS to limit the geographic area of an advisory or possibly not issue one at all.

Tier 1 Public Notification

- Repeat finished water sample exceeds an action level
 - unless Director approves extension or waiver based on extenuating circumstances
- Based on the results of resamples or distribution system samples, if required by the Director
- Failure to collect repeat samples
- May limit distribution of public notice (see Policy revisions)
 - Demonstrate cyanotoxins remain below the action level in portions of the distribution system which would not be included
 - Ongoing daily distribution monitoring (microcystins and chlorine residual)
 - Modeling, finished water travel time, and chlorine residual contact time
 - Include procedures for making this demonstration in Contingency Plan
 - Obtain written permission (email is acceptable)



Tier 1 public notice will be required using a similar approach to the current HAB strategy. That is, it will be required based on the results of the repeat samples, unless it is required earlier based on resample results. Depending on the specific circumstances, the rule also allows the director to extend or waive the requirement until additional repeat samples are collected. Using the current approach worked well in 2015. The flexibility of the 10 day standard to collect resamples and repeats gives the system some time to adjust treatment. As noted before, there have been no advisories issued so far in 2015 based on our strategy.

As I mentioned earlier, the geographic extent of the public notice may be limited, with written permission from Ohio EPA, if the public water system can demonstrate that microcystins are below the action level in the portions of the distribution system that would not be included. For example, you could have a detection above the action level at the entry point tap, but not have any detection in the distribution system because toxins have degraded due to the additional chlorine contact time. Or there may be only limited portions of the distribution system where water samples contain cyanotoxins above the action level.

Making this demonstration would entail including detailed procedures in the system's contingency plan ahead of time. During the event, information about the distribution system such as travel time and contact time would need to be paired with ongoing daily monitoring for microcystins and chlorine residual in the distribution.

Treatment Technique Requirements – Treatment Optimization Protocols

- Required if microcystins are detected in raw or finished drinking water in samples
 - Detected between 7/16/15 and effective date of rule, submit within 30 thirty days of the effective date of the rule
 - Detected after effective date of rule, submit within 30 days of detection (unless previously required)
- Describe treatment adjustments that will be made under various raw and finished water conditions
- Review and optimize existing treatment for microcystins
 - avoid lysing cyanobacterial cells
 - optimize removal of intact cells
 - optimize barriers for extracellular cyanotoxin removal or destruction
 - optimize sludge removal
 - discontinue or minimize backwash recycling



The draft rules also include two different treatment technique requirements.

First, if microcystins are detected in either raw or finished water, the water system will be required to submit written treatment optimization protocols. The deadline for this is dependent on when the detection occurs. If the water system has detected microcystins between July 16, 2015 (the date the 2015 HAB Strategy was issued) and the effective date of the rule, the protocols are due within 30 days of the effective date of the rule. If the water system has a detection after the effective date of the rule, and has not already submitted these protocols, then the protocols are due 30 days following the detection.

The protocols must describe what treatment adjustments will be made under different water conditions, using the basic tenets of effective strategies for cyanotoxin treatment. The AWWA Ohio Section has developed a Cyanotoxin Treatment White Paper that can be useful and should be reviewed when developing these protocols. This white paper is currently undergoing some revisions, but a draft version is available on the Ohio EPA website.

Treatment Technique Requirement – Cyanotoxin General Plan

- Required if microcystins exceed 1.6 µg/L in raw water, or are detected in finished drinking water
- Within 120 days, submit general plan and implementation schedule for approval
 - \$150 fee for general plan
- Implement in accordance with approved schedule
- Include one or a combination of source water protection activities, reservoir management and in-plant treatment technologies
 - May document existing treatment is sufficient for cyanotoxin destruction or removal
 - Gives the PWS time to assess all its treatment objectives



Also, if microcystins are detected in finished water or exceed 1.6 micrograms per liter in raw water, the water system will be required to submit a cyanotoxin general plan for approval, along with a \$150 plan review fee, within 120 days. The plan can include a combination of different strategies to address HABs and microcystins, tailored to meet the specific situation of the water system. These can include source water protection and reservoir management activities, and/or treatment within the plant. In some cases, it may be acceptable to document that the existing approach and treatment has been proven to be sufficient. The plan must include a schedule for implementation, and must be implemented in accordance with the approved schedule.

The plan can take into account all treatment objectives the PWS is trying to achieve. If short term approaches to treat for HABs is causing other compliance issues, the general plan should evaluate long term compliance with all the source water issues. For example, if disinfection byproducts and HABs are both of concern, long term planning for organics removal needs to be considered.

Tiers 2 & 3 PN, CCR and Recordkeeping

- Tier 2 PN
 - Failure to submit treatment optimization protocols
 - Failure to submit or implement cyanotoxin general plan
- Tier 3 PN
 - Failure to monitor or report
- CCR
 - Include any finished water action level exceedance (including distribution sites)
- Recordkeeping
 - Keep records for 10 years



Tier 2 public notices are required for failure to comply with any of the treatment techniques, including failure to submit the optimization protocols, failure to submit a cyanotoxin general plan, or failure to implement an approved general plan.

Tier 3 public notices are required for failure to monitor or report for either cyanobacteria screening or for microcystins.

Finally, any finished water action level exceedance must be included in the consumer confidence report, and records must be kept for at least 10 years.

Applicability

- Surface water systems
 - All requirements apply
- Consecutive (purchased) water systems
 - Routine monitoring and treatment technique requirements do not apply
 - If wholesale water system has an action level exceedance, conduct monitoring at distribution sampling points; may also be required to:
 - issue public notification
 - include in their Consumer Confidence Report
 - keep records
- Ground water systems
 - Routine monitoring requirements do not apply
 - If samples collected voluntarily by a ground water system or Ohio EPA exceed an action level, may be required to
 - issue public notification
 - include in their Consumer Confidence Report
 - fulfill treatment technique requirements
 - keep records



All of the rules I've discussed today apply to water systems which use surface water as a source. There is also some limited applicability to other types of public water systems.

The routine monitoring and treatment technique requirements do not currently apply to consecutive water systems. However, if their wholesale water system has an action level exceedance, consecutive systems will be required to conduct monitoring at distribution sampling points, and may be required to issue public notification, include the exceedance in their Consumer Confidence Report and/or keep records.

The routine monitoring requirements also do not apply to ground water systems. However, if samples are collected voluntarily by a ground water system or Ohio EPA, and they exceed an action level, the ground water system may be required to issue public notification, include the exceedance in their Consumer Confidence Report, fulfill treatment technique requirements and/or keep records.

Certified Laboratory Requirements

- Microcystins and cyanobacteria screening are being incorporated into the existing laboratory certification program
- \$1,550 laboratory certification fee will be deferred until May 1, 2017
- Microcystins
 - Analytical method “Ohio EPA Total (Extracellular and Intracellular) Microcystins - ADDA by ELISA Analytical Methodology” version 2.1 (August 2015)
 - Ohio EPA may accept other analytical methods in the future
 - Samples must be analyzed within 5 days of collection, except in limited circumstances (e.g., following detection or action level exceedance) which require analysis within 24 hours



Now, to provide an overview of the certified laboratory requirements, including analytical methods and reporting requirements.

These rules incorporate microcystins and cyanobacteria screening into the existing laboratory certification program. The laboratory certification fee for these parameters will be \$1,550, but will be deferred until May 1, 2017.

The approved analytical method for microcystins will be the ELISA ADDA methodology developed with a number of public water systems, U.S. EPA, researchers and commercial laboratories. Minor revisions to this analytical methodology, mostly to incorporate the use of an autoanalyzer as an option, are available for interested party review along with the draft rules.

Ohio EPA continues to evaluate new analytical methods as they become available, and there is a provision in the rule that may allow use of an alternate analytical method in the future.

Microcystins samples must be analyzed within five days of collection, except in limited circumstances which require analysis within 24 hours.

Cyanobacteria Screening: qPCR

- Cyanobacteria screening
 - Quantitative polymerase chain reaction (qPCR) – identifies and quantifies the presence of total cyanobacteria along with genes responsible for production of microcystins, cylindrospermopsin and saxitoxin
 - Test completed within 2-3 hours (includes extraction)
 - Scalable
 - Cost effective
 - Utilizes certified reference material
 - Specific: no gene, no toxin
- Method and certification beginning in 2017
- Until there is sufficient capacity at certified laboratories to perform this method, DES will conduct these analyses
- Samples must be analyzed within 7 days of collection



Ohio EPA is moving toward using quantitative polymerase chain reaction (or qPCR) as a new method for cyanobacteria screening in lieu of algal identification. This test identifies and quantifies whether the genes responsible for production of cyanotoxins are present. The test is fast, cost effective, specific and uses certified reference material. As I mentioned before, the results will be used by Ohio EPA to determine if monitoring for cylindrospermopsin or saxitoxin needs to be conducted by Ohio EPA.

Ohio EPA's Division of Environmental Services (or DES) intends to be prepared to certify laboratories in this method beginning in 2017. Until such time as there is sufficient capacity at certified laboratories to perform this method, samples required under this rule will be sent to DES for analysis. Cyanobacteria screening samples must be analyzed within seven days of collection.

Reporting Deadlines

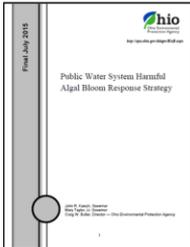
- Report by the end of the next business day
 - all detections of microcystins in finished water samples
 - all results above 5 µg/L microcystins in raw water samples
 - all results of cyanobacteria screening that indicate the potential for cylindrospermopsin, saxitoxins or anatoxin-a
- All others, report by the 10th day following the month in which the sample was collected



Results must be reported by the tenth day following the month in which the sample was collected, except for any results that would prompt an immediate need for follow up, which must be reported by the end of the next business day. These include all detections of microcystins in finished water samples; all results above 5 micrograms per liter in raw water samples; and all results of cyanobacteria screening that indicate the potential for production of cylindrospermopsin, saxitoxins or anatoxin-a.

Integration of Rules with HAB Strategy

Ohio EPA will update the HAB strategy to incorporate the regulatory approach:



- Microcystins monitoring (and associated requirements if an action level is exceeded) will replace the current approach in the HAB Strategy
- Cyanobacteria screening will be used to determine if monitoring for cyanotoxins other than microcystins needs to be conducted by Ohio EPA (or voluntarily by the PWS)

Ohio's Public Water System Harmful Algal Bloom Response Strategy is available online at:

<http://epa.ohio.gov/ddagw/HAB.aspx>



Ohio EPA intends to update the HAB strategy to incorporate this regulatory approach to microcystins and cyanobacteria screening into the broader, statewide HAB program. The requirements for microcystins monitoring and associated potential requirements if an action level is exceeded will replace the approach to microcystins in the current HAB Strategy.

As I've mentioned previously, the results of the cyanobacteria screening required by these rules will be used by Ohio EPA to determine if additional monitoring is needed and determine whether any future rulemaking for other cyanotoxins is warranted.

The current HAB strategy is available on the Ohio EPA HAB website at the address shown.

Rulemaking Process and Timeline

- Early Stakeholder Outreach completed June 1 to 30, 2015
- Interested party review -
 - Draft rules available at <http://epa.ohio.gov/ddagw/rules.aspx>
 - Submit comments **by October 23** to ddagw_rulecomments@epa.ohio.gov
- Propose rules to JCARR winter 2015/2016
- Adopt final rules by approximately June 2016
- Subscribe to our electronic mailing list at <http://ohioepa.custhelp.com/ci/documents/detail/2/subscriptionpage>



We are currently in the interested party review period for the draft rules, and any comments can be submitted to the email address listed by October 23rd.

After considering interested party comments, Ohio EPA will start the rules filing process required by the Joint Committee on Agency Rule Review (JCARR), and Ohio EPA intends to adopt final rules by approximately June 2016.

If you haven't already, I urge you to subscribe to our electronic mailing list to stay informed about current rule-making and opportunities to provide comments during the process.

Questions?



Thank you for participating in this webinar. Now, I'll turn it back to Mike for the question and answer portion.