

What You Need to Know About Harmful Algal Blooms and Cyanotoxins

In May, the USEPA hosted a public meeting to solicit input on potential actions to prepare for - and respond to - cyanotoxins in drinking water. A target date of June 15th was identified for public release of final guidance information related to these topics, with the goal of systems implementing monitoring and treatment guidelines by the summer of 2015. The following information is key for utility managers to understand the potential implications of this EPA initiative.



HABs and Algal Toxins

HABs are overgrowths of blue/green algae (a.k.a. cyanobacteria), with some species producing taste and odor compounds MIB and geosmin, and a range of toxic compounds known collectively as algal toxins or cyanotoxins. These toxins have been implicated in fish kills, animal illnesses and deaths, and shut-downs of recreational waters. Recently, several drinking water utilities have detected low levels of cyanotoxins in their finished water, with one incident resulting in a health preventative shut-down of the Toledo (OH) system in the summer of 2014. A holistic approach for reducing risk from HABs and cyanotoxins considers monitoring and managing HABs in source water, and treatment barriers for algal toxins in the plant. Conventional treatment options such as PAC, free chlorine, and permanganate are effective for reducing cyanotoxins under certain conditions, and advanced treatment such as ozone and GAC also provide reductions of the toxic compounds.

The EPA has developed initial health advisory values for microcystin and cylindrospermopsin based upon acute exposure and non-cancer endpoints:

10-day advisory levels

	Bottle-fed infants and pre-school kids	School-age kids and adults
microcystins	0.3 µg/L	1.6 µg/L
cylindrospermopsin	0.7 µg/L	3 µg/L

What Can Utilities Do in Preparation for this Algae Season?

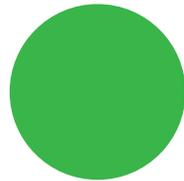
To prepare for the upcoming summer algae season and the potential for algal toxins of concern, the EPA is suggesting a step-wise approach for systems to reduce risks from cyanotoxins in drinking water. The approach is summarized on the back of this sheet, and there are several prudent steps utilities can take in preparation for the upcoming summer.

- Understand vulnerability to HABs in the source water, and develop a HAB and cyanotoxin monitoring program.
- Determine appropriate algal toxin analysis method (Elisa, HPLC/UV, HPLC/MS).
- Develop action plans to control cyanotoxins if they are detected in the raw or finished water
- Evaluate treatment process for robustness of barrier(s) to cyanotoxins.
- Understand the implications and proactively set up communication plans related to detecting cyanotoxins in finished water (see reverse for EPA suggested protocols).

For more information on HABs, see hazenandsawyer.com for regular updates and helpful materials including an **Algae Monitoring and Action Plan** wall poster and a white paper on the topic.

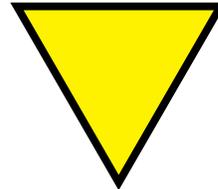
EPA Guidelines to Monitor, Treat, Communicate

In May 2015, the USEPA issued official guidance at its public meeting on cyanotoxins in drinking water. The EPA-suggested approach to minimizing the risks and adverse effects of algal toxins is outlined below.



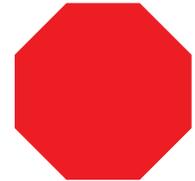
Low Level

Microcystins $\leq 0.3 \mu\text{g/L}$



Medium Level

Microcystins
 $> 0.3 \mu\text{g/L} \leq 1.6 \mu\text{g/L}$



High Level

Microcystins $> 1.6 \mu\text{g/L}$

Monitor

Continue sampling raw and finished water at least 2-3 times per week until levels are below quantification in at least 2-3 consecutive samples in raw water.

Continue sampling raw and finished water daily until finished water levels are below quantification in at least 2-3 consecutive samples.

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Treat

Modify treatment as necessary to keep algal toxins below HA values.

Adjust existing treatment to reduce the concentration to below $0.3 \mu\text{g/L}$ (MC) as soon as possible. Modify or amend treatment as necessary.

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Communicate

Continue communication with State primary agency and local health officials on monitoring results.

Notify local public health agency, primary agency, and the public. Recommend use of alternative water sources for children younger than school age.

Notify local public health agency, primary agency, and the public. Recommend "Do Not Drink/Do Not Boil Water" advisory for all consumers.

Adapted from the USEPA Public Meeting and Webinar: Input on Potential Actions to Prepare and Respond to Cyanotoxins in Drinking Water (May 2015).