

FACT SHEET

Harmful Algal Blooms:

Preparedness and Response for Public Water Systems

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KENTUCKY DEPARTMENT FOR ENVIRONMENTAL PROTECTION

Introduction

Once cyanobacteria (also known as harmful algae) and/or their cyanotoxins are detected in the surface water supplying a drinking water system, drinking water plant operators can act to remove or inactivate them in a number of ways. Treatment options vary according to the type of algae or toxin present. Therefore, drinking water operators need to know the growth patterns and species of cyanobacteria in the bloom, the properties of the cyanotoxins (i.e., intracellular or extracellular) and the most effective treatment process. Applying the wrong treatment or at the wrong time could damage cells and result in the release rather than removal of cyanotoxins.

Response

Drinking water systems should develop a contingency plan for cyanobacteria/harmful algal blooms. Most algal blooms are not toxic and the plan should address how to determine the risk associated with each event. Elements of such a plan should include a sampling component as well as a response strategy should cell counts or toxin levels be above an identified threshold.

Should a harmful algal bloom (HAB) occur, the drinking water system is typically the first to respond, using alternate sources or intake levels and treatment to lessen the impact of the bloom on the treated water. Other entities that could be involved include local governments, the Division of Water (Regional Offices, drinking water program staff and water quality staff), local and/or state Health Departments, emergency management at the local and state level and technical assistance organizations.

- Local and state government roles cover regulatory guidance, media and public relations and resource assessment and deployment (such as alternate finished water supplies).
- Health departments provide public health-related information and work with the medical community to disseminate information.
- Technical assistance providers can help drinking water plants optimize treatment for algae and toxin removal.

Public and media relations

Drinking water systems, in their HAB contingency plan, should identify a person to handle public and media relations. Messages should be developed that address the situation and the concerns.

Source Water Strategies

To avoid the release of cyanotoxins into the water, operators can use different source water strategies to deal with cyanobacteria blooms. These include:

- Using an unaffected source water;
- Using an alternate intake level;
- Providing in-source aeration to disrupt the cyanobacteria and formation of surface scums;
- When cell counts are high, be cautious with the use of algaecides in the source water or plant, such as copper sulfate; and
- Discontinue use of the affected raw water and purchase water from another PWS.

Treatment Strategies

Drinking water treatment strategies to consider during a HAB event are:

- Improving the coagulation/flocculation/sedimentation process to remove whole algal cells;
- Stopping or postponing the addition of oxidants (such as permanganate and chlorine) to prevent lysing the algae and releasing toxins;
- Feeding powdered activated carbon (PAC) at appropriate dosages to absorb any toxins that may be released;
- Optimizing the filtration process;
- If spent filter backwash water is recycled, discontinuing the recycle during the event to prevent the re-introduction of toxins into the plant; and
- Providing sufficient free chlorine contact time to degrade some toxins.