



Distribution System Monitoring in Response to Finished Water Microcystins Action Level Exceedances

Rule Requirements - Chapter 3745-90-03 (A)(4)(c) of the Ohio Administrative Code (OAC)

If a surface water system has a microcystins action level exceedance in finished water and the exceedance continues in the resample or repeat sample, that system - and any consecutive systems served by that system - must collect samples at representative distribution sampling points. Distribution samples must be collected within 24 hours of receiving the resample or repeat sample results and analysis of those distribution samples must be completed within 24 hours of collection. Samples must be collected at sampling points identified in the water system's contingency plan required by rule 3745-85-01 of the Administrative Code. Additional distribution system monitoring may be required by the director based on sampling results and other relevant circumstances.

Goal of Sampling

The goal of distribution sampling is to identify the extent of the microcystins occurrence in the distribution system and to potentially isolate portions of the distribution system in order to limit the extent of an advisory. Since chlorine can destroy microcystins with increased contact time, the microcystins concentration in the entry point to distribution sample may not be representative of microcystins concentrations throughout the distribution system. In addition, the Ohio Department of Health (ODH) may use the distribution system data to help determine human exposure risk following microcystins detections in finished water samples.

Where to Sample — Surface Water Systems

The surface water system should evaluate its distribution system, determine areas of possible physical or hydraulic isolation, and select representative sampling points that could help confirm isolation. The system should evaluate if portions of the distribution can be physically isolated through valving. If the system wants to consider use of valving as an isolation option, it should map the distribution system and have an ongoing valve exercising program. Hydraulic isolation can be determined by evaluating the system design for potential areas of isolation based on flow patterns and pressure zones. Sampling before and after elevated or ground level storage can help the water system determine the impact of storage tank residence time or booster chlorination on microcystins destruction. Hydraulic isolation can also be determined by preparing a model to help estimate hydraulic residence time and contaminant transport through the distribution system. The model can be used to develop a sampling plan to monitor the contaminant transport and help confirm areas of hydraulic isolation.

If the water system has not evaluated the potential for physical or hydraulic isolation using modeling or other techniques, the microcystins sampling points may coincide with existing sampling points for total coliform. However, total coliform sampling locations may not meet all the intended objectives for distribution sampling after an action level exceedance. Ensure the selected sampling locations include interconnections with other public water systems, input and output from finished water storage and any areas of the distribution system served by different sources.

Water providers are encouraged to discuss sampling roles and responsibilities with their consecutive systems prior to an action level exceedance, so they can be prepared to respond appropriately.

Where to Sample — Consecutive Systems

Smaller consecutive systems, such as mobile home parks or home owners associations, may only need to sample at the first customer within distribution, to help determine if microcystins have been degraded through additional contact time prior to entry into the system. Larger consecutive systems with elevated storage and/or the ability to isolate portions of the distribution, may want to collect additional samples following the recommendations listed under "Where to Sample – Surface Water Systems." It is the consecutive system's responsibility to sample within their distribution system, but in some instances the seller may be able to provide sample collection and analysis assistance. Consecutive systems are encouraged to discuss sampling roles and responsibilities with their water provider prior to an action level exceedance, so they can be prepared to respond appropriately.

Distribution System Monitoring in Response to Finished Water Microcystins Action Level Exceedances

Distribution Sampling After Transition to an Unaffected Source

Distribution samples must be collected at representative areas after transition to an unaffected source to ensure microcystins have been adequately flushed from distribution. Representative sites may coincide with existing sampling points for total coliform, but additional consideration should be given to sampling dead ends and areas with lower flow that may be more difficult to flush. Ensure sampling locations also include points after elevated and ground level storage, if applicable.

Access to Sampling Locations

Public water systems need to ensure the sampling points are accessible 24 hours a day, seven days a week.

Requirements for Limiting Extent of Public Notice

The conditions under which Ohio EPA will grant permission to limit the extent of a public notice are contained in policy WQ-06-002: epa.ohio.gov/portals/28/documents/rules/proposed/WQ-06-002_LimitedDistPN.pdf

The system must document that areas of the distribution are either physically or hydraulically isolated in their written contingency plan or the contingency plan must include the evaluation criteria used to identify areas which can be isolated and describe how these areas would be identified during any particular water emergency. In order to meet the criterion for physical isolation, a public water system must show that the affected portion of the distribution system is separated from other parts of the distribution system with no interconnections. To meet the criterion for hydraulic isolation, a community public water system must show the design of the distribution system and/or system operation creates a situation where water in the affected portion is effectively isolated from the water in all other parts of the distribution system because of water flow patterns and water pressure zones. Ohio EPA may consider information about chlorine levels, travel times and distribution modeling demonstrating that an exceedance of the microcystins action level will not occur in other portions of the distribution system.

All requests to limit the extent of an advisory must be submitted to Ohio EPA in writing (email is acceptable) and include a map showing the boundaries of the isolated or physically separated area and documentation for how those areas were identified. This could include but is not limited to, hydraulic modeling, water quality monitoring data, pump station operational data, tank operational data, valve position data, water demand, etc.

Ohio EPA's Division of Drinking and Ground Waters grants or denies permission to limit the public notice distribution to the system in writing. Written permission or denial may be in the form of an email or fax to the water system. Ohio EPA will attempt to respond to requests within a reasonable amount of time. However, failure of Ohio EPA to respond to a written request does not relieve the public water system from its responsibility to issue the public notice as specified in OAC 3745-81-32.

Distribution Sampling in Response to Threshold Exceedances for Other Cyanotoxins

Ohio EPA recommends that distribution sampling be conducted by the water system following resample or repeat threshold exceedances of cylindrospermopsin, saxitoxins, or anatoxin-a in finished water. Ohio EPA may be able to provide assistance with sample collection and analysis. The guidelines presented in this fact sheet for microcystins can be applied to all cyanotoxins. More information regarding sampling for cylindrospermopsin, saxitoxins, and anatoxin-a is available in the State of Ohio PWS HAB Response Strategy, which is available on Ohio EPA's website: epa.ohio.gov/Portals/28/documents/HABs/PWS_HAB_Response_Strategy.pdf.