

Title:	PROCESS FOR MANAGING ANATOXIN, CYLINDROSPERMOP SIN, AND MICROCYSTIN DETECTIONS IN RAW AND FINISHED WATER SAMPLES FOR PUBLIC SURFACE WATER SYSTEMS
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Purpose: To establish a process between the Department of Environmental Conservation (DEC), Department of Health (VDH), and public drinking water suppliers with surface water intakes for managing detections of toxins from cyanobacteria, including anatoxin, cylindrospermopsin, and microcystin in raw and finished water samples. These toxins are not regulated by USEPA, but considering potential health risks, monitoring is warranted.

Keyword(s): harmful algal blooms, cyanobacteria (also known as blue-green algae), cyanotoxins, microcystin, anatoxin, cylindrospermopsin, source water monitoring, unregulated contaminants, public notice requirements

I. General Policies and Procedures

Toxins Addressed by this Practice. Throughout this Practice, "anatoxin" refers to Anatoxin-a (CAS: 64285-06-9), and "microcystin" refers to Microcystin-LR (CAS: 101043-37-2) and is reported as microcystin-LR equivalents. "Cylindrospermopsin" refers to Cylindrospermopsin (CAS: 143545-90-8). Results are reported as micrograms per liter ($\mu\text{g/L}$). For more information on the health effects of these toxins, see: http://healthvermont.gov/enviro/bg_algae/bgalgae.aspx.

Encouragement of Voluntary Monitoring

Although there are currently no rules or laws regarding cyanotoxin monitoring, it is the policy of the Drinking Water and Groundwater Protection Division (DWGWPD) to encourage source water monitoring by public surface water systems, and to facilitate appropriate public notification and operational actions if cyanotoxins are detected in finished water at concentrations at or above health advisory levels established by VDH.

Public water systems with surface water intakes are encouraged to participate in daily visual source water monitoring for cyanobacteria throughout the summer and fall. Public water systems should also monitor for changes to source water quality commonly associated with cyanobacteria including pH increases, shortened filter run times, increased chlorine demand, increased turbidity, increased disinfection byproduct (DBP) formation, or altered taste and odor. If changes are noted and daily visual inspections indicate a potential cyanobacteria bloom, the water system should coordinate with the DWGWPD to determine if cyanotoxin testing is necessary. The DWGWPD Blue-Green Algae Coordinator ("Blue-Green Algae Coordinator") can be reached at 802-585-4893 or 802-828-1535 during normal work hours, or use the after-hours

pager at 802-741-5311. DWGWPD will contact VDH at 800-439-8550, or after-hours duty officer at 802-863-7200.

The DEC Watershed Management Division, in cooperation with VDH and the Lake Champlain Committee, conducts surface water sampling of Lake Champlain and other selected lakes under the umbrella of a lake-wide cyanobacteria monitoring program. Public surface water systems receive lake-wide data published in DEC Watershed Management Division email alerts. The VDH Blue Green Algae Tracker, an interactive map, is searchable by lake region and town: <https://webmail.vdh.state.vt.us/vttracking/bluegreenalgae>.

Routine Cyanobacteria Monitoring by Drinking Water Systems

Public water systems that use Lake Champlain as its water source are encouraged to participate in weekly sampling of raw (source) and finished water analyses for two of the toxins produced by certain cyanobacteria, microcystin and cylindrospermopsin, during the sampling season.

The DWGWPD, in conjunction with VDH, will ensure test kits are available for participating drinking water systems. Water systems will collect and coordinate delivery of weekly raw and finished water samples for microcystin and cylindrospermopsin analyses with VDH. The sampling season will be defined and adjusted by the DEC and VDH.

Water Supplier Initiated Targeted Monitoring

Raw and finished water analyses for cyanotoxins, including anatoxin, cylindrospermopsin, and microcystin may occur when changes are noted and daily visual inspections indicate a cyanobacterial bloom event or when other changes to source water quality are observed. In the event that a public surface water system collects raw and finished water for cyanotoxins outside of the weekly sampling due to a visual cyanobacterial bloom or other changes to source water quality, VDH will notify the Blue-Green Algae Coordinator, as well as the Director, and Deputy Director of the DWGWPD.

Data Reporting

VDH will report all raw and finished water test results for anatoxin, cylindrospermopsin and microcystin to the DWGWPD. The Blue-Green Algae Coordinator will review the test results upon receipt and send them to the participating systems via email or mail, in addition to posting on the DWGWPD website: <http://www.vermontdrinkingwater.org>.

II. Procedures for Initial Raw Water and Confirmed Raw Water Detections

Initial and confirmed raw water test results for anatoxin or cylindrospermopsin levels equal to or greater than 0.5 µg/L, or microcystin levels equal to or greater than 0.16 µg/L.

Notification of Personnel

VDH will notify the DWGWPD Blue-Green Algae Coordinator, Director, and Deputy Director by phone and email. If after hours, in addition, VDH will call the DWGWPD pager at 802-741-5311.

Immediate Resampling (confirmation samples)

Upon notification from VDH of initial detection and consultation with appropriate DWGWPD staff, the Blue-Green Algae Coordinator will directly contact the PWS Administrative Contact via phone and email, and notify the PWS Certified Operator that a confirmation raw water sample and finished water sample must be taken immediately. The Blue-Green Algae Coordinator will notify the VDH Laboratory via phone and email that confirmation samples have been requested. The Blue-Green Algae Coordinator will also send a letter to the system/authorized representative, with a copy to the certified operator, documenting the request for a confirmation raw sample and finished water sample. No further action will be required of the PWS until the confirmation raw water and finished water sample analyses are completed.

Increase to Daily Monitoring

If the confirmation raw water sample validates the presence of anatoxin or cylindrospermospin levels equal to or greater than 0.5 µg/L, or microcystin levels equal to or greater than 0.16 µg/L, the system will be provided testing kits to begin daily monitoring of both raw and finished water. The Blue-Green Algae Coordinator will call, email, and send a letter to the water system, copying VDH, stating the requested monitoring.

Cessation of Daily Monitoring

Monitoring may be discontinued when two consecutive raw and finished water daily samples confirm that the cyanotoxins are no longer detectable at or above the health advisory, unless otherwise advised by the DWGWPD.

III. Procedures for Initial Finished Water Analytical Results Equal to or Greater than Health Advisories

Initial finished water test results for which anatoxin or cylindrospermospin levels equal to or greater than 0.5 µg/L, or microcystin levels equal to or greater than 0.16 µg/L.

Notification of Personnel

VDH will notify the DWGWPD Blue-Green Algae Coordinator, Director, and Deputy Director by phone and email. If after hours, in addition, VDH will call the DWGWPD pager at 802-741-5311.

Immediate Resampling (confirmation samples)

Upon notification from VDH of initial detection and consultation with appropriate DWGWPD staff, the Blue-Green Algae Coordinator will directly contact the PWS Administrative Contact via phone and email, and notify the PWS Certified Operator that a confirmation raw water sample and finished water sample must be taken immediately. The Blue-Green Algae Coordinator will notify the VDH Laboratory via phone and email that confirmation samples have been requested. The Blue-Green Algae Coordinator will also send a letter to the system/authorized representative, with a copy to the certified operator, documenting the request for a confirmation raw sample and finished water sample. No further action will be required of the PWS until the confirmation raw water sample and finished water sample analyses are completed, except in circumstances when DWGWPD and VDH agree that the results from the initial finished water confirmation samples warrant immediate action to protect public health.

IV. Procedures for Confirmed Finished Water Analytical Results Equal to or Greater than Health Advisories

Confirmed finished water test results for which anatoxin or cylindrospermopsin levels equal to or greater than 0.5 µg/L, or microcystin levels equal to or greater than 0.16 µg/L.

Notification of Personnel

VDH will notify the DWGWPD Blue-Green Algae Coordinator, Director, and Deputy Director by phone and email. If after hours, in addition, VDH will call the DWGWPD pager at 802-741-5311.

Increase to Daily Monitoring

If the confirmation finished water sample validates the presence of cylindrospermopsin or anatoxin levels equal to or greater than 0.5 µg/L, or microcystin levels equal to or greater than 0.16 µg/L, the system will be provided testing kits to begin daily monitoring. The DWGWPD Blue-Green Algae Coordinator will call, email, and send a letter to the water system, copying VDH, stating the requested monitoring.

Cessation of Daily Monitoring

Monitoring may be discontinued when the confirmed anatoxin, cylindrospermopsin, and/or microcystin is no longer above the health advisory in results from two consecutive raw and finished water daily samples, unless otherwise advised by the Blue-Green Algae Coordinator.

Determination of Risk and Appropriate Public Health Notice Advisories

VDH will provide DWGWPD with a recommendation for a DO NOT DRINK or other appropriate advice. DWGWPD will provide language for the water system to include in any public health notice.

Public Notice

Based on VDH recommendations, the DWGWPD Blue-Green Algae Coordinator will call, email, and issue a letter requiring the water system to issue public notice informing all customers of the exceedance of the VDH health advisory, and stating that the water system is working on the problem in conjunction with DWGWPD. The DWGWPD Blue-Green Algae Coordinator will use the public notice template with appropriate health language as determined by VDH. All correspondence between the DWGWPD and public water systems regarding case-specific public notification requirements shall be copied to the VDH State Toxicologist.

Consumer Confidence Report. For all community water systems, the DWGWPD requires that all confirmed finished water anatoxin, cylindrospermopsin, and microcystin detections be referenced in the annual Consumer Confidence Report.

Operational Response: The water system will notify DWGWPD at 802-585-4893, or 802-828-1535 or via the after-hours pager 802-741-5311, when the emergency response plan (ERP) is activated.

Protection of Public Health and Welfare. Water systems with cyanotoxin concentrations chronically exceeding health advisories may, at the discretion of the Secretary in accordance with Subchapter 21-6 (Health Advisories) and Subchapter 21-1 (Authority and Purpose) of the Water Supply Rule, be required to provide treatment or to modify the drinking water system infrastructure in order to protect public health or welfare.

Approved by:

Date: June 30, 2015



Director, Drinking Water and Groundwater Protection Division

Prepared by: The Drinking Water and Groundwater Protection Division, in consultation with Vermont Department of Health-Environmental Health Division, and the Lake Champlain Coalition of Municipal Water Suppliers.

Revision/ Review Date	Reason for Revision
1/23/2009	First version expired June 15, 2008
6/30/2015	Second version expired January 1, 2015

This Practice and related environmental information are available electronically via the internet. For information visit us through the Vermont Homepage at <http://www.vermont.gov> or visit DWGWPD directly at

<http://www.drinkingwater.vt.gov>

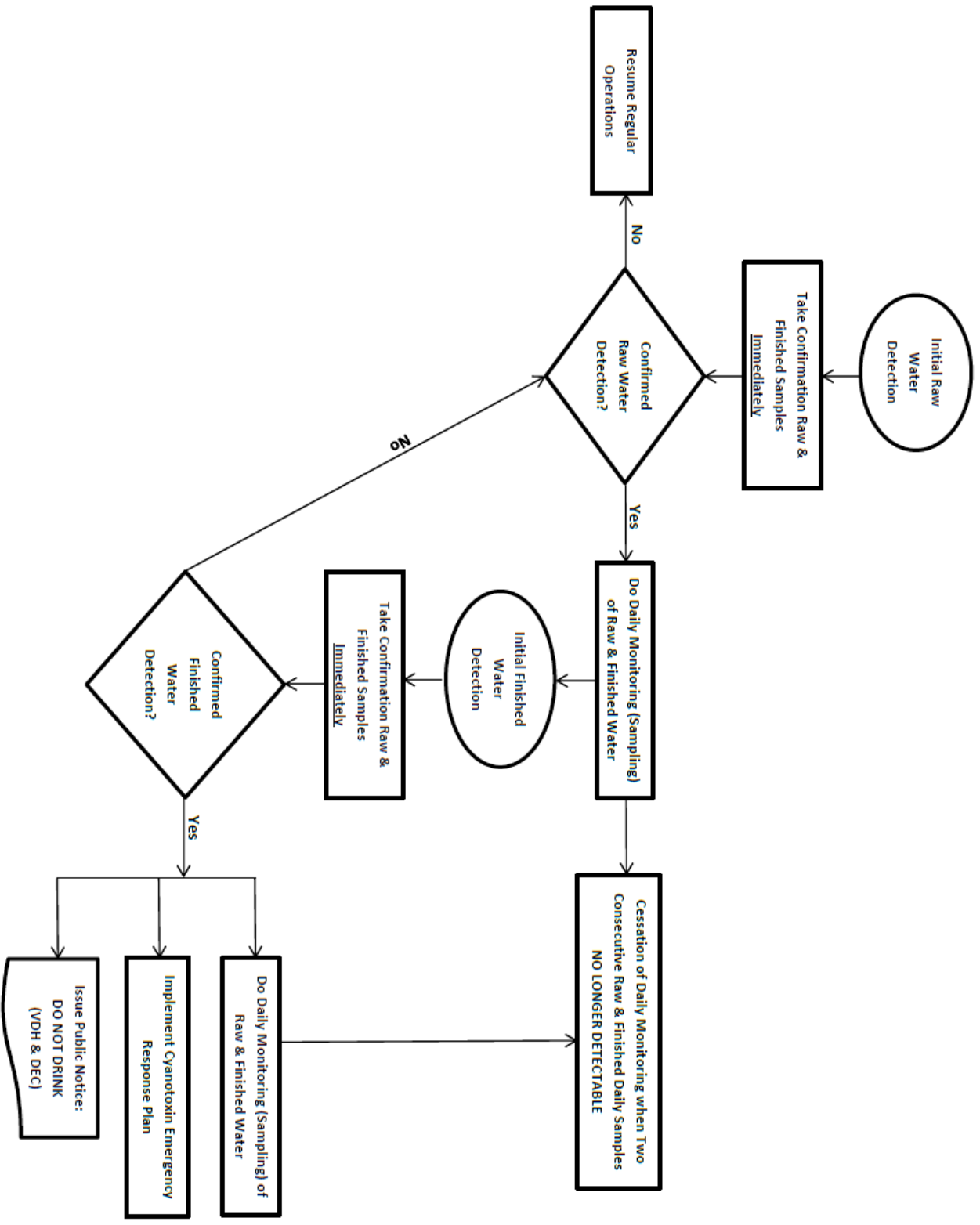
Drinking Water and Groundwater Protection Division

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DRINKING WATER WARNING

[Enter Water System Name]

Water is Contaminated with the Cyanotoxin:

[Enter Anatoxin/Cylindrospermospin/Microcystin]

DO NOT DRINK THE WATER

Toxins from cyanobacteria were found in our treated water supply. A sample collected on [Enter Date] shows the cyanotoxin: [Enter Anatoxin/Cylindrospermospin/Microcystin] at [Enter Level] micrograms per liter ($\mu\text{g/L}$). The Vermont DEC Drinking Water and Groundwater Protection Division **strongly recommends** that you do not drink the water at Anatoxin or Cylindrospermopsin levels at or above **0.5 $\mu\text{g/L}$** , or Microcystin levels at or above **0.16 $\mu\text{g/L}$** .

The Vermont Agency of Natural Resources and Department of Health recommend that users consider taking the following precautions:

- **DO NOT DRINK THE WATER.** Alternative water without elevated levels of the cyanotoxin: [Enter Anatoxin/Cylindrospermospin/Microcystin] listed in this public notice should be used for drinking, making infant formula or food, making ice, brushing teeth, and preparing food. Pets and animals should not drink the water.
- **DO NOT BOIL THE WATER.** Boiling the water will not destroy toxins.
- Adults and older children may use the water for bathing, washing hands, washing dishes and doing laundry. Special attention may be needed when bathing children to prevent swallowing. The water may be used for flushing toilets.
- Consuming water containing cyanotoxins may result in numbness and dizziness/skin irritation and abdominal pain/muscle pain and gastrointestinal distress.
- If you are experiencing adverse health effects due to cyanotoxins, contact your health care provider.

What happened? What is being done?

[Enter Surface Water Source], which is a source of drinking water for the [Enter Water System] is experiencing a cyanobacterial bloom near the intake that serves the water system. Some algal blooms produce toxins that may pose a risk to human and animal health. Additional monitoring of your drinking water is being conducted, and you will be notified when the situation has been resolved. The water system is [Describe what is being done]. We are working closely with [Insert Partners] to minimize any potential harm.

For more information, please contact [Enter Contact Person] at [Enter Contact Phone]. Additional information about cyanobacteria can be found at: http://healthvermont.gov/enviro/bg_algae/bgalgae.aspx

For questions regarding the health effects of cyanotoxins, contact the Vermont Department of Health at 1-800-439-8550. You may also contact the Drinking Water and Groundwater Protection Division at 802-828-1535.

Please share this information with all who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools and businesses). You can do this by posting this notice in a public place or distributing by hand.

This information is being sent to you by [Enter Water System Name Here]. WSID Number: [Enter WSID Number Here]. Date Distributed: [Enter Date Here]