WATERWORKS ADVISORY COMMITTEE MEETING AGENDA

Twin Hickory Area Library, 5001 Twin Hickory Rd., Glen Allen, VA 23059

March 24, 2025; 10:00 AM to 1:00 PM

Subject	Time (Estimated)
• Establish quorum, welcome new member – Dwayne Roadcap	10:00 – 10:05 AM
Waterworks Advisory Committee Administrative Matters • Introduction and review of agenda items – Chair David Van Gelder • Review and adoption of minutes from December meeting – Grant Kronenberg	10:05 – 10:10 AM
Legislative Update • 2025 General Assembly Session – Dwayne Roadcap	10:10 – 10:20 AM
ODW Staffing Update • Status update – Dwayne Roadcap	10:20 – 10:25 AM
ODW Finances Update • Federal funding update – Dwayne Roadcap • Update on WAC Finances Subcommittee Activities – ODW staff and Subcommittee Members	10:25 – 11:00 AM
Source Water Manual Update • Source Water Manual Update – Bob Edelman	11:00 – 11:20 AM
PFAS/LCRR Study Update • Study findings and general PFAS update – Bailey Davis	11:20 – 11:40 AM

Development of Amendments to the Waterworks Regulations • Updates to proposed amendments to the Waterworks Regulations – Jane Nunn	11:40 AM – 12:10 PM
LCRR/LCRI Update • Status update – Bob Edelman	12:10 – 12:20 PM
Compliance and Enforcement Update • Serious Violators and Enforcement Actions Update – Grant Kronenberg • Introduction to the State Violation Scoring System – Grant Kronenberg	12:20 –12:40 PM
Plan Review and Data Management Update • Status update – Aaron Moses	12:40 – 12:45 PM
Public Comment Period	12:45 – 12:50 PM
Other Business • Planned upcoming meeting dates: June 11, 2025, 10:00 a.m. – electronic meeting	12:50 – 12:55 PM

The method by which the Waterworks Advisory Committee chooses to meet shall not be changed unless the Waterworks Advisory Committee provides a new meeting notice in accordance with Code of Virginia § 2.2-3707.

Information and Protocol for Joining the Meeting Electronically

Access to the meeting can be achieved via computer, phone or mobile device with the meeting link below:

If accessing via a mobile device, you will need to download the WebEx Meet app prior to joining the meeting.
https://vdhoep.webex.com/vdhoep/j.php?MTID=m56f84622d7812bf03ce3ff724b0ec91f

When joining the meeting, please use the meeting number and password below:
Meeting number (access code): 2631 222 8096
Meeting Password: wjFPpMJR459

You can use your computer audio or join via telephone by calling 1-844-992-4726 United States Toll Free.

Please log into the meeting at least 10 minutes before the meeting begins.

If you have problems logging in or if there is any interruption in transmission, please call Fiora Deborous at 804-837-9835.

Please sign into the meeting and identify yourself so we can verify that you are attending the meeting.

After you have identified yourself, please mute your phone to reduce any unwanted noise.

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Waterworks Advisory Committee Meeting Minutes
Electronic Meeting via WebEx
Tuesday, December 10, 2024, 1:00 p.m.

Members Present: David Van Gelder (Chair), Water Operator; Chris Pomeroy, Virginia Municipal Drinking Water Association; Jesse L. Royall, Jr., P.E. Sydnor Hydro; Michelle Caruthers, VWEA; Andrea Wortzel, Troutman Pepper; Ben Barber, Virginia Catalyst; Caleb Taylor, Virginia Municipal League; Joey Hiner, VA SERCAP; Tom Fauber, VA ABPA; Skip Harper, Virginia Plumbing and Mechanical Inspectors Association; Shane Wyatt, DCLS; Scott Morris, DEQ; Russ Navratil, VA AWWA

Members Absent: Ignatius Mutoti, VSPE; Geneva Hudgins, VA AWWA; Whitney Katchmark, Principal Water Resources Engineer; Mark Estes, VRWA

Stakeholders and Public: Charlie Paulin, Sarah Ramsey, Barbara Walsh, Ivy Ozmon. Mark Titcomb, Mitchell Smiley, Vincent Gray, Taylor Valencia, Tanya Pettus, TJ Gordon, Chris Gill, Brian Redder

Virginia Department of Health (VDH) Staff: Anthony Hess, Barry Matthews, Dwayne Roadcap, Fiora DeBorous, Grant Kronenberg, Jane Nunn, Julie Floyd, Rebecca Bliley, Robert Edelman, Ray Weiland, Bailey Davis, Daniel Horne, Jeremy Hull, James Reynolds, Jessica Coughlin, Dan Horne, Mark Wise, Steve Kvech, Dwight Flammia, Amy Hayes

Introductory Remarks

The Waterworks Advisory Committee met online via WebEx on Tuesday, December 10, 2024, at 1:00 p.m. In addition to the WAC members in attendance, ODW stakeholders, Virginia Department of Health staff, and the public also joined. WAC Chair David Van Gelder presided at the meeting.

Dwayne Roadcap, Director, Virginia Department of Health, Office of Drinking Water (ODW), recognized newly appointed WAC member Ben Barber, Virginia Catalyst. Mr. Barber previously served on the WAC.

Chair David Van Gelder provided a brief overview of the agenda.

Review and Adopt Minutes of Meeting

The WAC unanimously approved the September meeting minutes on a voice vote.

Source Water Manual Revisions

Bob Edelman introduced the Source Water Manual and the policy on harmful algal blooms (HAB). He provided an overview of the waterworks owner's responsibilities and process required in the event of a HAB occurrence. Mr. Edelman discussed plans to update the policy to simplify health advisory levels for Microcystins and Cylindrospermopsin and to add levels for

Anatoxin-a and Saxitoxins. Mr. Edelman introduced Ms. Amy Hayes, VDH toxicologist, to present recommendations on Anatoxin-a and Saxitoxins.

Ms. Amy Hayes, Ph.D., introduced herself to meeting participants. Dr. Hayes discussed notable bloom levels in the Shenandoah region and potential effects to the surrounding areas when levels rise. Dr. Hayes reviewed slides detailing information on Anatoxin-a and Saxitoxins. Dr. Hayes reviewed slides showing advisory level calculations. Dr. Hayes reviewed a slide comparing levels for Anatoxin-a and Saxitoxins by several states, the World Health Organization, and New Zealand. The slides presented by Dr. Hayes can be found within the WAC meeting materials.

Ms. Michelle Caruthers pointed out the December 2023 HAB toolkit indicates Ohio and Iowa have an Anatoxin-a advisory level of 20 ppb. Dr. Hayes advised that Ohio currently has 0.3 and 1.6 ppb and suggested that 20 ppb could be the recreational advisory level. Dr. Hayes was not familiar with the HAB Toolkit published on VDH's website and would need to review it further. Ms. Caruthers requested VDH to look into the advisory levels in the HAB toolkit, including why they are different.

Mr. Chris Pomeroy requested Mr. Edelman expand or clarify what is the effect of the health advisory level numbers, how are they put into force, are they mandatory or advisory, and do they go through an administrative process or the committee like the WAC?

Mr. Edelman advised that the advisory levels for Anatoxin-a and Saxitoxins are proposed and would become policy, not regulation. VDH would expect waterworks to take action if finished water concentrations are above the advisory levels. Mr. Roadcap advised that as this would become policy, and it would need to go through the public vetting process, posting on the Virginia Regulatory Town Hall for public input and VDH would respond to feedback. It would also go through Executive Branch review, including a review by the Office of Regulatory Management. If a water system detection of cyanotoxins exceeding the advisory levels in the finished water for over 10 days, VDH would recommend the water system issue advisories based on the policy. It would not be regulatory per se. The EPA does not have data to support maximum contaminant levels (MCLs) and has issued health advisories for two cyanotoxins.

Mr. Pomeroy observed the policy is serious and nearly or practically has the force of regulation and has some judgment calls on the degree of stringency. Mr. Roadcap advised that if a water system felt that a different advisory level would be appropriate, this could cause problems with the communication to the public if the messaging is not consistent.

Mr. Pomeroy questioned the stringency in comparison to other states. Dr. Hayes advised that VDH is generally similar to other states. For Anatoxin-a, EPA is currently carrying out a toxicity study and the results will be out this summer and there would be an opportunity to review and update VDH's calculations.

Ms. Caruthers asked about the Anatoxin-a and Saxitoxins testing at the North Fork of the Shenandoah River. Dr. Hayes advised that the water testing was by another VDH program and showed that Anatoxin-a was detectable in the North Fork of the Shenandoah River. Saxitoxins were detected elsewhere in subsequent blooms.

Mr. Pomeroy asked about cyanotoxin data for the Shenandoah River bloom and the cyanotoxins levels of stream water in comparison to finished water. Dr. Hayes advised the VDH Waterborne Hazards has the data, but if she recalls correctly, the finished water cyanotoxin levels were less than half of the untreated water.

Mr. Pomeroy asked if a "do not drink" advisory would be expected under this guidance. Mr. Edelman stated that a "do not drink" advisory would be expected if the advisory levels are exceeded for 10 or more days, based on the finished water. Water treatment plants can make adjustments to optimize removal of cyanotoxins. EPA has published some guidance on this topic.

Mr. Pomeroy questioned if this is a widespread or common issue, for example using surface water data across Virginia and how often this might be triggered. Dr. Hayes advised that the VDH Waterborne Hazards program has water sampling data to support recreational use advisories. Where there is no bloom happening, detecting cyanotoxins is not likely. Mr. Roadcap advised that VDH has observed blooms in the North Fork of the Shenandoah River, and as a result of this experience, VDH is proactively looking to provide a clear policy.

Mr. Pomeroy observed that this proposal represents a significant change, with potential significant impacts. He requested to understand the statewide impacts and the process going forward to implement the policy. Mr. Roadcap advised that VDH will update the Source Water Manual, ask the Waterworks Advisory Committee to provide input, submit the policy to the Office of Regulatory Management, and publish it on the Virginia Regulatory Town Hall for a public comment period. Depending on the public comments, the policy would be implemented. Even without a formal policy, VDH still has recommended advisory levels and would still make recommendations to waterworks regarding the advisories to the public. Mr. Edelman commented that as a next step, VDH will prepare an updated draft of the policy.

Mr. Russ Navratil questioned if the 10-day period of exposure for the health advisories is new. Mr. Edelman advised that this is not new, and it is based on the cyanotoxin health advisories issued by the U.S. Environmental Protection Agency.

Mr. Grant Kronenberg advised that a discussion will be held internally to determine how to proceed with the creation of the policy. VDH could send out a draft of the policy and WAC members could provide written feedback. Based on the extent of the feedback, VDH could make a decision if to bring it back to the WAC.

Mr. Pomeroy asked for more information on incident occurrences of the cyanotoxins in source water in Virginia. Mr. Roadcap advised that water systems do not routinely sample for cyanotoxins and if they did sample, VDH does not necessarily have the cyanotoxin data. Mr. Edelman advised that Anatoxin-a and Saxitoxins are new, so water systems have not been sampling for these on a routine basis.

Waterworks Regulations

Ms. Jane Nunn presented an update on the draft proposed amendments to the Waterworks Regulations. The WAC members present provided feedback on the draft proposals. The slides presented by Ms. Nunn as to each item can be found with the WAC meeting packet.

Ms. Nunn presented on two amendments, well abandonment and Remote Monitoring Credits.

Item #1 – 12VAC5-590-475 B
Ms. Nunn reviewed the updated language changes relating to well abandonment. Ms. Nunn advised that a clean copy of the changes would be made available for review and consensus. The WAC did not raise concerns with the proposed language.

Item #2 – § 32.1-172.1(B), Remote Monitoring Credit
Ms. Nunn reviewed the remote monitoring credit policy and proposed amendment to the Waterworks Regulations: 12VAC5-590-461.F.

Remote monitoring attendance credit. Ms. Nunn provided an overview of the subsection. The WAC provided feedback. Mr. Pomeroy provided feedback, including noting an email he sent to Ms. Nunn and Mr. Kronenberg during the meeting with specific suggested edits to the proposed regulatory language. Mr. Van Gelder and Mr. Pomeroy discussed aligning the need for a cybersecurity assessment or reassessment with the AWIA assessment, which has a five-year requirement.

Ms. Nunn advised an updated document with suggested updates will be forthcoming.

Item #3 – Regulatory Amendments for PFAS and CCR3

Ms. Nunn provided a brief update on amendments for the Consumer Confidence Report Rule Revisions and PFAS. An updated packet will be available for review during the March 2025 WAC meeting.

Licensed Operator Temporary Waiver Policy and Remote Monitoring Policy

Mr. Kronenberg reviewed the draft proposed licensed operator temporary waiver policy and remote monitoring policy. The presentation slides are included in the WAC meeting packet.

Mr. Kronenberg reviewed changes that had been made since the last version of the licensed operator temporary waiver policy that had been shared with the WAC. These changes included decoupling the regulatory requirement that a waterworks owner notify ODW of a waterworks' inability to meet its operator requirements from eligibility for the waiver; changing the focus of what qualifies as a "vacancy" from the operator's perspective to the owner's perspective; highlighting that a variance may be applied for even if the waterworks does not qualify for a waiver; and the addition of language about ODW's tracking of waivers.

Mr. Kronenberg reviewed changes that had been made since the last version of the remote monitoring policy. Mr. Kronenberg noted that if a waterworks owner chooses not to use ODW's template application, they must still provide the verification set forth in the template. The new

draft policy includes a list of cybersecurity tools that are acceptable to ODW, which includes a catch-all for other tools approved by ODW. The new draft policy removes the distinction between "active" and "passive" monitoring, based on prior feedback from the WAC that there is an active aspect to all remote monitoring. The new draft policy requires certification of the existence of a cybersecurity risk mitigation and response plan.

Mr. Kronenberg noted that the feedback received from the WAC about the draft proposed regulation concerning remote monitoring will be taken into account when considering further edits to the draft remote monitoring policy.

WAC Finances Subcommittee

Mr. Roadcap discussed the WAC Finances Subcommittee and presented an overview of the topics discussed.

Mr. Kronenberg advised that the Subcommittee and ODW will be generating talking points to outline the risk associated with the impending 2027 financial cliff and outlining the fiscal challenges that may potentially occur.

Mr. Van Gelder mentioned the timeframe as imminent and expressed the importance in understanding that this needs to be discussed in 2025 per the Commonwealth's biannual budget.

Mr. Kronenberg agreed and advised that additional information would be available after the conclusion of the next Subcommittee meeting, which is in January.

Hurricane Helene: An Emergency Response Case Study

Ms. Jessica Coughlin presented on ODW's emergency response surrounding Hurricane Helene. The presentation slides are available in the WAC meeting packet.

Ms. Coughlin reviewed the extensive damage incurred throughout the affected areas in Southwest Virginia. Ms. Coughlin discussed the extensive number of hours and resources used to aid and assist in the recovery needs following Hurricane Helene. Ms. Coughlin discussed the need to increase technical trainings and staffing to maintain the appropriate level of coverage and care for future emergency preparedness needs. Ms. Coughlin advised that ODW is currently working to update the current response plan, which will also include additions to the policy.

Lead and Copper Rule Revisions/Lead and Copper Rule Improvements and Lead Service Line Inventory Update

Mr. Edelman provided an update on activities related to the Lead and Copper Rule Revisions (LCRR). Mr. Edelman presented statistics on the Initial Service Line Inventories submitted by Virginia waterworks and VDH's progress in reviewing the submittals. VDH is sharing the inventory status information with EPA Region 3, who will undertake enforcement since VDH does not have primacy. Mr. Edelman outlined requirements effective October 16, 2024, and

identified some items in the LCRR that EPA has deferred to the Lead and Copper Rule Improvements (LCRI), with a compliance deadline of November 1, 2027.

Mr. Edelman provided additional details on the requirement to notify customers of known or potential service lines containing lead, revised health effects language for public notices and public education, a new requirement for a Tier 1 (24-hour) public notice upon a lead action level exceedance, and changes to the Consumer Confidence Reports due in 2025. Mr. Edelman provided recommendations for waterworks to prepare for the LCRI with a compliance deadline of November 1, 2027. The presentation slides are available in the WAC meeting packet.

PFAS Update

Mr. Bailey Davis discussed PFAS and the planned changes to the regulations. Mr. Davis discussed pending regulation deadlines for initial sample monitoring, April 26, 2027, with compliance monitoring to commence immediately following this deadline. Waterworks are required to meet the MCLs by April 2029.

Mr. Davis reviewed the EPA policy on use of previously collected data and covered the requirements for monitoring and sampling, which advises that samples collected after June 24, 2024, must be from an EPA or Virginia certified laboratory. Mr. Davis advised that once the initial compliance inventories are received, compliance frequency will be determined. Mr. Davis recommended all waterworks develop a plan to sample for initial monitoring requirements and ensure the required number of samples and timeframes are met with enough time to resample in one of those timeframes should the need arise.

Mr. Davis advised that a cost study was completed relating to the implementation of LCRR and PFAS. He stated that the study is complete and is currently under Executive review. Additional information on approvals or adjustments will be forthcoming.

The presentation slides are available in the WAC meeting packet.

Compliance, Enforcement & Policy Update

Mr. Kronenberg provided an update on Compliance and Enforcement. Mr. Kronenberg stated the number of "serious violators" under the EPA's scoring system declined from 11 in the prior quarter to five in the current quarter. Of those five serious violators, three of them have returned to full compliance and another serious violator is the subject of a proposed consent order.

Mr. Kronenberg advised that eight Consent Orders have been issued for the year thus far and one administrative order has been issued by the Commissioner.

Plan Review and Data Management Update

Mr. Aaron Moses advised the group of the recent hiring of two Plan Review Engineers. Mr. Moses advised that the average plan review time maintains its average of a 25-day cycle.

Mr. Moses discussed the future implementation of two new software products that will be used to aid in project tracking and reporting. Mr. Moses advised that in addition to the software updates, ODW will be transitioning to the new federal database which will replace the SDWIS database. The anticipated roll-out date is the end of 2026. EPA assistance will secure help secure the transition.

ODW Staffing

Mr. Roadcap advised meeting participants that ODW has staffed the multiple vacant Field Director positions, which were filled with internal applicants.

Mr. Roadcap further discussed the turnover and vacancy rates, stating that ODW's 10% turnover and 16% vacancy rates align with other state agencies. Mr. Roadcap stated that ODW will continue to fill vacancies as resources are available.

Public Comment

Ms. Sarah Ramsey, a member of the public, discussed her concerns on water fluoridation. Ms. Ramsey reviewed and cited several articles addressing the potential harmful effects of the use of fluoride in the public drinking water supply. Ms. Ramsey requested the reconsideration of fluoride usage.

Mr. Van Gelder thanked Ms. Ramsey for her input.

Mr. Ben Barber, WAC member, discussed the positive effects of fluoride in the public drinking water supply.

Mr. Van Gelder thanked Mr. Barber for his input.

Mr. Van Gelder questioned if any additional concerns needed to be addressed.

Several meeting participants requested a copy of the meeting recording. Mr. Kronenberg advised that the meeting recording, packet and chat will be made available and shared for requestors and the public.

Other Business

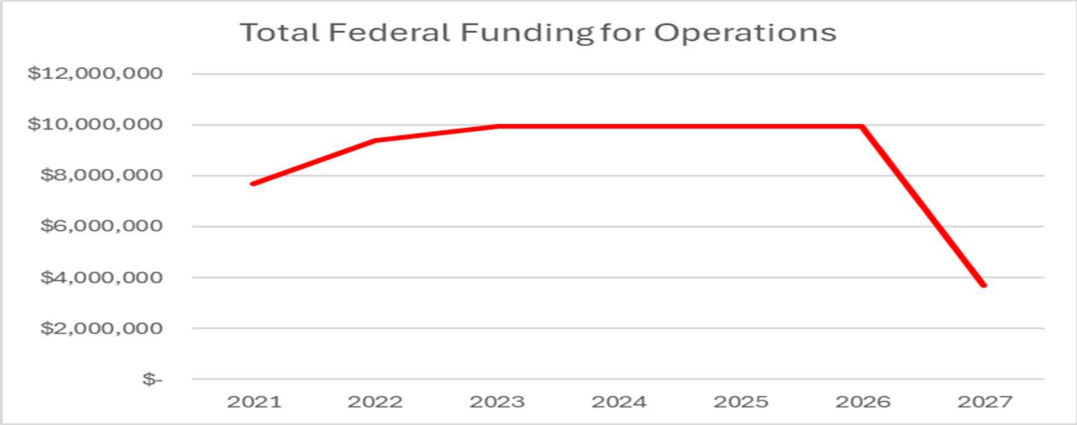
Mr. Kronenberg asked the WAC about how it prefers to have meetings scheduled for 2025. Mr. Kronenberg said that historically meetings have been set by ODW, but for the Finances Subcommittee and for the December WAC meeting, a poll was sent to the WAC members. Mr. Van Gelder noted that scheduling polls are regularly used and expressed a preference for scheduling through a poll.

Mr. Van Gelder adjourned the meeting at 3:29 p.m.

Fact Sheet Regarding Office of Drinking Water's (ODW) FY27 Expected Finances

Current Situation

- The chart below shows federal funding for VDH ODW operations for FY21 through FY27 with Bipartisan Infrastructure Law (BIL) funding ending and the continuation of congressionally directed spending.



- ODW operations (121 FTEs, 6 field offices) are supported by about $10 million in federal funds.
  - Sources: Drinking Water State Revolving Fund (DWSRF) and BIL.
  - BIL funding stops after FY26.
- The Continuing Resolution for FY25 removes congressionally directed spending, resulting in an increase of DWSRF funding. If this continues for FY27, then the estimated $6,239,645 decrease in federal funding for ODW operation is instead estimated to be a $1,369,910 decrease.[1] The chart does not reflect this change in DWSRF funding.
- Virginia's BIL funding match is $6,464,800, which ends when BIL funding stops.
- Three reports recommend significant increases to ODW's funding and staff.[2]
  - Reports issued before new federal rules (PFAS, CCR3) and state laws (new operator alternatives) in 2024.
  - Passed legislation (HB2749 & SB1408) require additional staff hours, but ODW will absorb those costs.
- Virginia's 2025 budget bill includes an additional $1,803,598 to support ODW operations, which could be used for approximately 15 new FTEs.
- FY25 waterworks operation fee revenue is estimated to be $4,989,612 (includes FY24 late payments).

If the 2027 Fiscal Cliff Happens

- Up to 48 of ODW's 121 FTEs would need another funding source.
- Reduced ability or inability to:
  - Monitor waterworks compliance with SDWA;
  - Enforce waterworks compliance with federal and state law;
  - Assist at training events and conferences that ODW historically been involved in; and
  - Review the technical, managerial, and financial capacity of waterworks to receive infrastructure improvement funds.
- Reduced ability or inability to pay for:
  - Travel expenses;
  - ODW's staff training;
  - Waterworks operator training;
  - Operator Certification Training Program[3];

[1] FY26 and FY27 are projections. FY26 begins on July 1, 2025, and FY27 begins on July 1, 2026.

[2] A 2022 VDH-DPB report found ODW understaffed by 20 to 25 FTEs over the next three years. A 2023 Cadmus Group report for EPA found ODW needs approximately 65 (12 for LCRR) more FTEs and over $26 million in yearly funding. A 2024 analysis by the Assoc. of State Drinking Water Administrators concluded ODW likely needs 36 more FTEs to implement the Lead and Copper Rule Improvements.

[3] Can be viewed by EPA as "backsliding" and could result in an additional 20% reduction in DWSRF funding.

- ODW's Capacity Development program and failure to meet the conditions of the Virginia Capacity Development Strategy[4];
- Receivership fund program;
- Waterworks technical assistance;
- Basics of Financial Management for Small Systems (SERCAP);
- Auto-dialer services;
- Source Water Protection program (TetraTech, CHA);
- VA-WARN Website Database Hosting (AWWA);
- Distance Learning Website (Mountain Empire Community College);
- Small Systems Operator Training (EPA);
- LSL Technical Assistance (TruePani);
- Engineering Consultants - Small Scope Engineering (H&P, T&L);
- Cross Connection Control (AWWA);
- Security Training - Physical and Cyber (Virginia Tech);
- Course on Contaminants of Concern (Virginia Tech);
- Administrative Services (Virginia Tech);
- Operator Subsidy Short School (Virginia Tech);
- Distribution System Operator Courses (Virginia Tech);
- Management, Methods and Money; Concepts in Capacity Development (Virginia Tech);
- Establishing a Successful & Sustainable Waterworks (Virginia Tech);
- Hands-On Training - Full Scale Water Plant (Virginia Tech);
- Applied Math and Basic Science (Virginia Tech);
- Groundwater Course for Very Small Systems (Virginia Tech);
- Groundwater Math Course (Virginia Tech);
- Water Operations Math Course (Virginia Tech);
- Professional Development Seminars Continuing Education (Virginia Tech);
- Virginia Optimization Program;
- Special Sampling - Non-Compliance; and
- Technical Assistance Planning and Design Grants.

To Maintain the Status Quo

- Avoid the fiscal cliff by redirecting the $6,464,800[5] line item for BIL funding to ODW's General Fund.

Additional Needs

- Need about $10 million to fund an estimated 41 new FTEs and other increased operational costs identified in the three reports.

Potential Funding Sources

- Seek additional state funding and/or federal funding if available.
- Increase operation fees. Some options are:
  - Remove the $160,000 statutory cap – generates approximately $1.8 million more in fees.
  - Remove cap and increase per connection fee from $3 to $6 – generates about $8.5 million more in fees.

[4] Can be viewed by EPA as "backsliding" and could result in an additional 20% reduction in DWSRF funding.

[5] This amount is based on Congress continuing congressionally directed spending in FY27. If DWSRF funding remains at levels consistent with the FY25 Continuing Resolution, an estimated $1,369,910 would be needed to maintain the status quo.

ODW's $15.9 Million Annual Operating Budget under Various Financial Scenarios

Operations Fee Cap	Operations Fee Connection Fee	Operations Fee Estimated Revenue	Current General Fund Allocation State FY25	PWSS Funding Fed FY25	DWSRF Funding Fed FY25 (Just approved, earmarks removed)	DWSRF Funding Fed FY26	BIL Funding Fed FY 25[1]	BIL Funding Fed FY 26[1]	Redirect DWSRF State Match (ends if SRF = $0) to General Fund)	Redirect BIL State Match (ends when BIL ends) to General Fund	Operating Budget Shortfall State FY25: DWSRF, no BIL (no transfer of state matches to General Fund)	Operating Budget Shortfall State FY26: DWSRF[2] but no BIL; with BIL State Match	Operating Budget Shortfall State FY26: No BIL, No DWSRF; with DWSRF & BIL State Matches
No Cap	$3	$ 6,728,076.00	$ 3,600,000.00	$ 2,000,000.00	$4,869,735.00	?	?	?	$3,624,600.00	$6,464,800.00	$1,297,811.00	$7,762,611.00	$6,517,476.00
No Cap	$4	$ 8,970,768.00	$ 3,600,000.00	$ 2,000,000.00	$4,869,735.00	?	?	?	$3,624,600.00	$6,464,800.00	$3,540,503.00	$10,005,303.00	$8,760,168.00
No Cap	$5	$ 11,213,460.00	$ 3,600,000.00	$ 2,000,000.00	$4,869,735.00	?	?	?	$3,624,600.00	$6,464,800.00	$5,783,195.00	$12,247,995.00	$11,002,860.00
No Cap	$6	$ 13,456,152.00	$ 3,600,000.00	$ 2,000,000.00	$4,869,735.00	?	?	?	$3,624,600.00	$6,464,800.00	$8,025,887.00	$14,490,687.00	$13,245,552.00
$160,000.00	$3	$4,944,024.00	$ 3,600,000.00	$ 2,000,000.00	$4,869,735.00	?	?	?	$3,624,600.00	$6,464,800.00	($486,241.00)	$5,978,559.00	$4,733,424.00
$160,000.00	$4	$6,105,248.00	$ 3,600,000.00	$ 2,000,000.00	$4,869,735.00	?	?	?	$3,624,600.00	$6,464,800.00	$674,983.00	$7,139,783.00	$5,894,648.00
$160,000.00	$5	$7,151,390.00	$ 3,600,000.00	$ 2,000,000.00	$4,869,735.00	?	?	?	$3,624,600.00	$6,464,800.00	$1,721,125.00	$8,185,925.00	$6,940,790.00
$160,000.00	$6	$8,165,668.00	$ 3,600,000.00	$ 2,000,000.00	$4,869,735.00	?	?	?	$3,624,600.00	$6,464,800.00	$2,735,403.00	$9,200,203.00	$7,955,068.00
$240,000.00	$3	$5,530,182.00	$ 3,600,000.00	$ 2,000,000.00	$4,869,735.00	?	?	?	$3,624,600.00	$6,464,800.00	$99,917.00	$6,564,717.00	$5,319,582.00
$240,000.00	$4	$6,832,296.00	$ 3,600,000.00	$ 2,000,000.00	$4,869,735.00	?	?	?	$3,624,600.00	$6,464,800.00	$1,402,031.00	$7,866,831.00	$6,621,696.00
$240,000.00	$5	$8,000,370.00	$ 3,600,000.00	$ 2,000,000.00	$4,869,735.00	?	?	?	$3,624,600.00	$6,464,800.00	$2,570,105.00	$9,034,905.00	$7,789,770.00
$240,000.00	$6	$9,157,872.00	$ 3,600,000.00	$ 2,000,000.00	$4,869,735.00	?	?	?	$3,624,600.00	$6,464,800.00	$3,727,607.00	$10,192,407.00	$8,947,272.00
$320,000.00	$3	$5,897,630.00	$ 3,600,000.00	$ 2,000,000.00	$4,869,735.00	?	?	?	$3,624,600.00	$6,464,800.00	$467,365.00	$6,932,165.00	$5,687,030.00
$320,000.00	$4	$7,373,576.00	$ 3,600,000.00	$ 2,000,000.00	$4,869,735.00	?	?	?	$3,624,600.00	$6,464,800.00	$1,943,311.00	$8,408,111.00	$7,162,976.00
$320,000.00	$5	$8,712,100.00	$ 3,600,000.00	$ 2,000,000.00	$4,869,735.00	?	?	?	$3,624,600.00	$6,464,800.00	$3,281,835.00	$9,746,635.00	$8,501,500.00
$320,000.00	$6	$9,888,444.00	$ 3,600,000.00	$ 2,000,000.00	$4,869,735.00	?	?	?	$3,624,600.00	$6,464,800.00	$4,458,179.00	$10,922,979.00	$9,677,844.00

HAB Policy Update
Waterworks Advisory Committee
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Office of Drinking Water
Safe Drinking Water for a Healthy Virginia

VDH VIRGINIA DEPARTMENT OF HEALTH
Protecting You and Your Environment

HAB Policy Update

HAB Policy Overview

Step 1 – Monitor for algal bloom

Step 2 – Monitor raw water for cyanotoxins

Step 3 - Monitor finished water for cyanotoxins

Step 4 – Consider issuing a Do Not Drink Notice

HAB Policy Update

Current Policy

Toxin	Health advisory levels for children less than 6 years old	Health advisory levels for children 6 years old through adults
Microcystins	0.3 µg/L	1.6 µg/L
Cylindrospermopsin	0.7 µg/L	3.0 µg/L

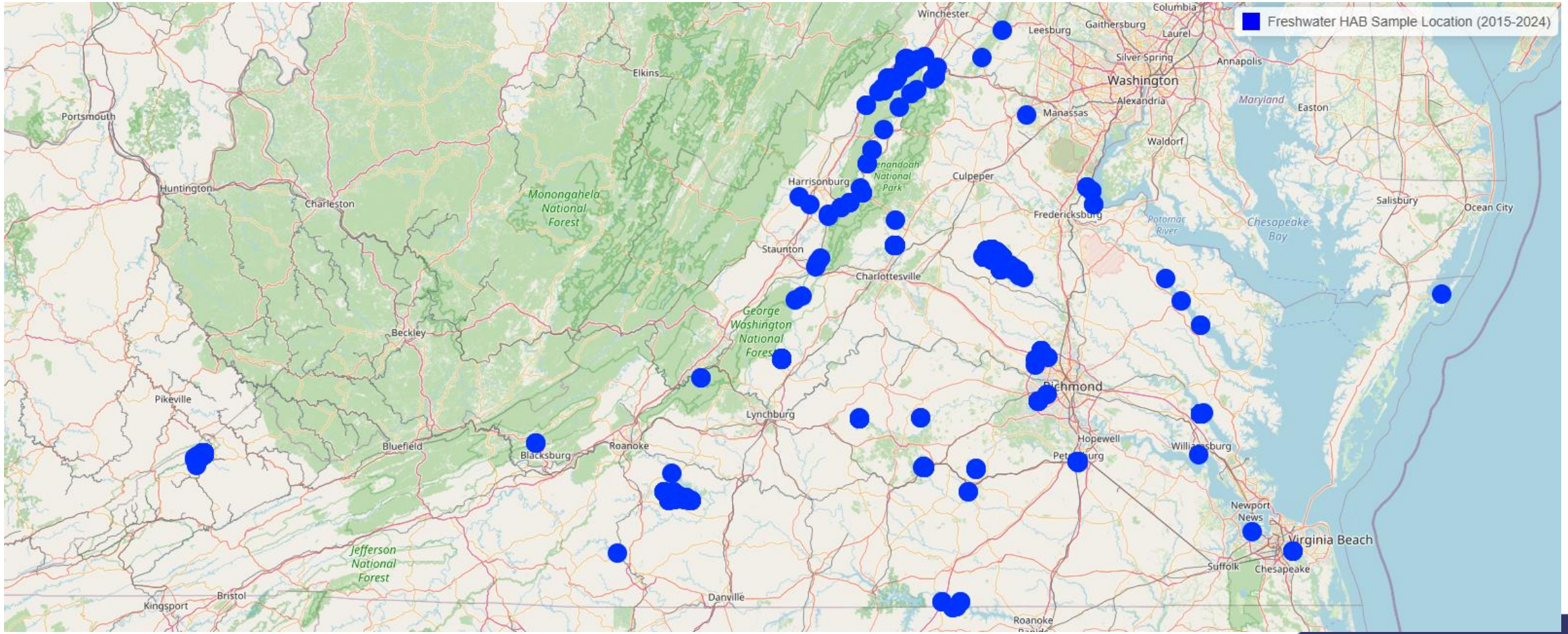
Proposed Policy

Toxin	Health Advisory Level (10-day)
Microcystins	0.3 µg/L
Cylindrospermopsin	0.7 µg/L
Anatoxin-a	0.4 µg/L
Saxitoxins	0.2 µg/L

Region	Anatoxin-a (ppb)	Assumptions	Saxitoxins (ppb)	Assumptions
Virginia	0.4	Protective of all age groups, NOAEL from Fawell 28-day mouse study	0.2	Protective of all age groups
California	4	NOAEL from Fawell 5-day mouse study	0.5	RSC 0.2, single day exposure. No short-term value provided.
Minnesota	0.1	UF 300, RSC 0.8, included dose adjustment factor	--	N/A
New Jersey	0.7/3.3		0.025/0.11****	
Ohio*	0.3/1.6	Different NOAEL chosen (Astrachan and Archer 1981, Astrachan et al. 1980), body weight and water intake slightly vary	0.3/1.6	Body weight and water intake slightly vary
Oregon	3.0	Assumed adult body weight of 60 kg (132 lbs)	1.0	Assumed adult body weight of 60 kg (132 lbs)
Vermont	0.5	No details available	--	N/A
Washington	0.3		--	N/A
WHO	30**	UF 100, assumed adult body weight of 60 kg (132 lbs)	3***	Assumed infant body weight 5 kg and lower water intake, UF 3
New Zealand	6	Assumed adult body weight of 70 kg (154 lbs)	3	NOAEL from LD_{50} of saxitoxin in mice, assumed adult body weight of 70 kg (154 lbs), UF 3000, RSC 0.8

*The first value is for children under 6 years old, the second is for those older than 6 years.
**"Short-term drinking water value", also recommend bottled water for infant formula and small children when levels exceed 6 ppb for "short periods".
***Acute drinking water guidance value, shall not be exceeded even for a short period.
****Draft until feasible testing is available

HAB Task Force Investigations 2016 - 2024



HAB Task Force – HAB Monitoring & Response

- Freshwater HAB investigations are triggered by observation of a bloom
- Public recreational freshwaters
- DEQ field sample collection

Recreational Advisories

- Triggered by either toxins or cell densities exceed thresholds

Purpose

- Protect public health from cyanotoxin exposure (recreational activities)

Conclusions from HAB Task Force

Cyanotoxins (in water samples) do not appear in the absence of cyanobacteria.

However:

1. Cyanotoxin levels in water do not correlate with cell densities.
2. Elevated cell densities were observed in water samples with no detectable cyanotoxins. However, cyanotoxins may be present inside cells.
3. Concentrations of the four cyanotoxins are not correlated.
4. Analysis for all four cyanotoxins is important.

HAB Task Force Data Set (2016 – 2024)

Toxin	Health Advisory Level (10-day)	Samples Above HAL	Samples Above Detection Limit	Total Samples	DW Sources
Microcystins	0.3 µg/L	108 samples 15 water bodies	339 samples 0.15 µg/L	723	Flannagan Lake Shenandoah River
Cylindrospermopsin	0.7 µg/L	0	16 samples 0.05 µg/L	723	None
Anatoxin-a	0.4 µg/L	18 samples 5 water bodies	80 samples 0.05 µg/L	440	North Fork, Shenandoah River
Saxitoxin	0.2 µg/L	1 sample 1 water body	54 samples 0.02 µg/L	448	None

HAB Task Force Data Caveats

1. Data collection is triggered by field observations.
2. Data collection is limited to public water bodies used for recreation.
3. Data collection stops at the end of the recreation season.
4. Data collection typically continues for cyanobacteria advisories.
5. Data collection typically stops for algal mat alerts.
6. Data collection is limited by budget and staff resources.
7. Potential for change in the future

Conclusions from HAB Task Force Data

Microcystins

1. Are detected most frequently (339).
2. Are above the proposed HAL in 15 water bodies.
3. Flannagan Lake, Shenandoah River above the HAL.
4. Potential for impacts to Virginia waterworks.

Cylindrospermopsin

1. Occasional detections (16).
2. No detections above the proposed HAL.
3. Unlikely for impacts to Virginia waterworks.

Conclusions from HAB Task Force Data

Anatoxin-a

1. Detected 80 times
2. Above the proposed HAL in 5 water bodies
3. North Fork, Shenandoah River above the HAL
4. Potential for impacts to Virginia waterworks

Saxitoxin

1. Detected 54 times
2. Above the proposed HAL in 1 water body
3. No water supplies impacted
4. Unlikely for impacts to Virginia waterworks

QUESTIONS?

Chapter 4 – Harmful Algal Bloom Monitoring and Response

Summary

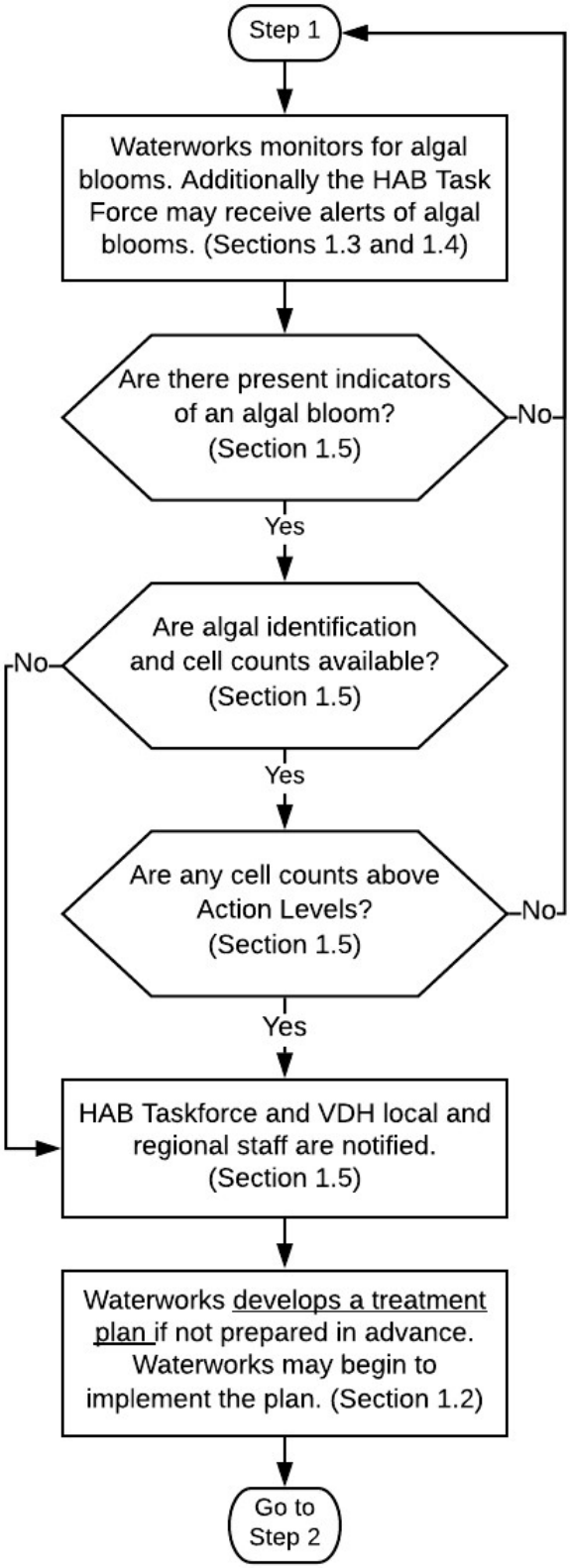
This chapter is an informational resource for ODW staff and waterworks owners and operators. It includes recommendations for waterworks using surface water to assess, monitor for, and respond to a harmful algal bloom (HAB). It also includes directions for ODW staff to support waterworks' efforts to detect and respond to HABs. This chapter recommends coordination between waterworks, ODW, and Virginia's HAB Task Force, and provides information about cyanotoxin analysis, waterworks operational changes, coordination within VDH and external state agencies, and public notification.

ODW encourages waterworks to develop site-specific plans to assess, monitor for, and respond to a HAB based on the source water history of algae blooms and the needs and treatment capabilities of the waterworks.

Although this chapter includes recommendations for managing cyanotoxin issues in raw and potable water, the recommendations may not be appropriate for all situations and alternative approaches may be applicable.

Mention of trade names or commercial products does not constitute a VDH-ODW endorsement or recommendation for use.

1. Monitor for Algae



Flow Chart 1. *Recommended Process for Step 1: Monitor for Algae.*

1.1. Introduction

Algal blooms are overgrowths of algae in a saltwater, brackish water, or freshwater environment. In fresh water, a bloom that consists of "blue-green algae" or cyanobacteria, a class of photosynthetic bacteria, has the potential to create problems, since cyanobacteria can produce cyanotoxins, which can affect human health. Certain conditions, such as high concentration of nutrients in warm water, can allow a cyanobacterial bloom, also known as a HAB, to form.

The EPA has not established a standard in the National Primary Drinking Water Regulations for cyanotoxins but has issued health advisories on two cyanotoxins in drinking water: microcystins and cylindrospermopsin. Health advisories provide information on the chemical and physical properties, occurrence and exposure, health effects, quantification of toxicological effects, and other regulatory standards, analytical methods, and treatment technology for drinking water contaminants. Health advisories describe concentrations of drinking water contaminants at or below which adverse health effects are not anticipated to occur over specific exposure durations (e.g., one-day, ten-days, several years, or a lifetime). Health advisories also contain a margin of safety to address uncertainties. Health advisories serve as informal technical guidance to assist federal, state, and local officials, as well as managers of public or community water systems, in protecting public health when emergency spills or contamination situations occur.

Due to the risks that cyanotoxins from a HAB can pose to humans and the potential for a HAB to form in a waterworks' surface water source, ODW has developed guidance to provide recommendations for waterworks using surface water to assess, monitor for, and respond to a HAB. This guidance also includes direction for ODW staff to support waterworks' efforts to detect and respond to HABs.

1.2. HAB Planning and Prevention

Advanced planning for a HAB may allow a waterworks to optimize treatment to address cyanotoxins, prevent a cyanotoxin health advisory exceedance, or potentially prevent a HAB from forming. The EPA has developed a cyanotoxin management plan template and example plans that are available for use by waterworks to develop a plan to prevent or respond to HABs. A link to this template is in section 5 of this chapter. Waterworks may choose to implement source water protection or source water treatment strategies to reduce the amount of cyanotoxins present in the source water.

<u>Source Water Protection (SWP)</u>

SWP measures that reduce the nitrogen and phosphorus load on a watershed have the potential to decrease the frequency and severity of HABs. The following are three categories of source water protection measures that may reduce nutrient loading:

- Public education – This can include informing residents of the need for best practices that they can perform to reduce nutrient pollution. Information about these best practices is on the

EPA's "Nutrient Pollution, What You Can Do" webpage located at https://www.epa.gov/nutrientpollution/what-you-can-do.

- Agricultural and stormwater Best Management Practices (BMPs) – These can include a wide variety of practices and constructed facilities such as detention and retention ponds to settle out nutrients, or conservation buffers, which are strips of vegetation along stream banks to remove nutrients before they reach the water.
- Wastewater improvements – These can include improvements intended to reduce combined sewer overflows or to improve nutrient removal at wastewater treatment plants.

ODW can aid waterworks serving total populations less than or equal to 50,000 in developing and implementing SWP plans through ODW's SWP contractors (consultants contracted by ODW to provide assistance). ODW's central office can also provide direct technical assistance or aid the field offices in providing direct technical assistance, to waterworks serving a total population of greater than 50,000. For more information on these programs, see ODW's Source Water Protection webpage: http://www.vdh.virginia.gov/drinking-water/source-waterprograms/source-water-protection-assistance-funding-opportunities/

For general instructions on SWP planning, ODW recommends "AWWA G300-14 Source Water Protection". ODW staff can access this document through a link in section 5 of this chapter.

Source Water Treatment

There are a wide variety of methods available to limit the growth of algae or remove algae from source water. The waterworks must exercise caution in selecting a source water treatment method. Some treatment methods, such as algaecides and ultrasound, have the potential to release cyanotoxins from the cyanobacterial cells, which makes the removal of the toxins at the water treatment plant much more difficult. For further information on available source water treatment methods see the resources in section 5 of this chapter.

Water Treatment Optimization

ODW recommends that all surface water treatment plants assess their capability to remove or inactivate cyanotoxins and develop a strategy or treatment plan to optimize treatment for cyanotoxin removal. Owners may choose to implement some optimization strategies following the identification of an algal bloom, following detection of cyanotoxins, or throughout the bloom season as a precautionary measure.

The following documents provide information on optimization of water treatment for cyanotoxin removal, and links to this information are in section 5 of this chapter:

- Water Treatment Optimization for Cyanotoxins, Section 2.5 (EPA, 2016)
- Generalized Cyanotoxin Treatment Optimization Recommendations (Ohio EPA, 2016)
- Algae: Source to Treatment, AWWA Manual M57, Chapter 14 (AWWA, 2010)

1.3. State Monitoring Programs – HAB Task Force

The Virginia HAB Task Force (HAB Task Force) was formed in 1997. The HAB Task Force's primary members are VDH, the Virginia Department of Environmental Quality (DEQ), Old Dominion University, and the Virginia Institute of Marine Science at the College of William and Mary. The HAB Task Force monitors Virginia's waters for harmful algae to prevent illness associated with these organisms. These primary support members coordinate and conduct surveillance in shellfish growing areas, estuaries, coastal beaches, and inland freshwater lakes and rivers. The HAB Task Force communicates routinely with a large group of secondary support members throughout the state to facilitate awareness and discussions, and to share research findings in order to protect human health. VDH's representatives on the HAB Task Force are from the Office of Environmental Health Services (OEHS) and ODW. The HAB Task Force member information is in the "Commonwealth of Virginia Harmful Algal Bloom Response Plan," located at:

http://www.vdh.virginia.gov/content/uploads/sites/12/2018/05/Virginia_HAB_ResponsePlan_Final_2018.pdf.

DEQ and OEHS have programs that specifically monitor freshwater bodies for cyanotoxins. Most of these freshwater bodies do not serve as drinking water supplies. Additionally, OEHS monitors the HAB Hotline (1-888-238-6154) and operates the Harmful Algal Bloom Report Form (https://www.vdh.virginia.gov/waterborne-hazards-control/harmful-algal-bloom-online-report-form/), a service that allows community members to report an algae bloom, fish kills, and suspected HAB-related health effects. When a waterworks notifies ODW of an algal bloom related to the waterworks' source water, ODW field staff complete the Harmful Algal Bloom Report Form.

When the HAB Task Force becomes aware of a potentially harmful algae bloom in a drinking water supply, the ODW HAB Task Force member shares this information with the HAB Task Force. The ODW Special Projects Engineer, a member of the HAB Task Force, shares the information with the respective ODW field office. The ODW field office contacts the potentially impacted waterworks to inform them of the condition and recommended response.

1.4. Source Water Observation and Monitoring

EPA guidelines referenced in section 5 of this chapter recommend that waterworks owners and operators that use surface water sources monitor for the following algal bloom indicators throughout the algal bloom season, typically from March to November in Virginia:

Visual Indicators – Waterworks owners and operators should perform visual inspections of the water source on at least a twice per week basis during the season in which blooms typically occur. More frequent inspections may be called for during the hottest months of the year, or during hot sunny weather following a storm. Visual indicators of a bloom can include reduced water clarity, discoloration, surface scum formation, or mats on the bottom. Surface scum is more visible early in the morning when most HAB species are near the water surface. Note that some HAB species

remain distributed throughout the water column and do not produce a surface scum. Reference information for visually identifying a bloom is in section 5 of this chapter.

Not all cyanobacteria will appear as accumulations on the surface of water or within the water column at various depths, as some are benthic (i.e., attached to the bottom of the waterbody). Cyanobacteria that predominantly grow on the bottom (benthos) of waterbodies are referred to as "benthic cyanobacteria." These groups form dense material that can become quite extensive and appear as a film (biofilm), clumps of colonies, and mats that are attached to the bottom substrate. The color of the bloom material is diverse, ranging from vibrant yellow-green and drab olive, to burgundy and dusky brown or black. The bloom material may also include non-toxic algae as many groups of cyanobacteria grow with algae - forming algal mats. The risk of exposure to benthic blooms increases significantly when the cyanobacteria mats dislodge from the bottom, become buoyant, and accumulate along shorelines, backwater channels, or eddies via wind or water current.

Other Indicators - Operators should closely watch the following parameters during algae bloom season:

- Raw water pH - The most reliable algal bloom indicator routinely monitored by waterworks is raw water pH. During an algal bloom, pH increases during daylight hours as algae grow and consume dissolved CO_2 from the water. Decreases in pH may occur at night.
- Dissolved oxygen (DO) - During the early and peak growth phases of a HAB, DO can increase significantly due to high photosynthetic activity during the day. As the bloom fades and dies, the algae become food for bacteria and other things that consume oxygen and DO levels can drop precipitously.
- Raw water odor – Most species of HAB can produce earthy or musty odors.
- Raw water turbidity, decreased filter run times, need for increased coagulant dose, and increased chlorine demand – These parameters can indicate an algae bloom, but are of less use as an indicator because other suspended matter in the water may significantly affect them.

When possible, monitoring of the following parameters is also useful for detecting an algae bloom:

- Algae identification and counts
- Algal bio volumes
- Chlorophyll-a and phycocyanin concentrations

1.5. Is an Algal Bloom Occurring?

Knowing when to initiate raw water cyanotoxin monitoring is complicated by the variability of HAB species and further hampered by the inability of many Virginia waterworks to identify and count algae at the water treatment plant.

When observing visual or other indicators of an algal bloom:

Cyanobacteria identification and counts are useful parameters to quickly evaluate the risk imposed by an algal bloom. The World Health Organization has developed the following Cyanobacteria Cell Count Action Levels[1] that trigger toxin sampling for raw water:

Table 1: Cyanobacteria Cell Count Action Levels

Species	**Action Level**
Microcystis spp.	2,000 cells/mL
Combination of all potentially toxic cyanobacteria species present	15,000 cells/mL

When cyanobacteria identification and counts are not available or they indicate a risk of cyanotoxin contamination, ODW recommends proceeding to section 2: "Monitor Raw Water".

If the waterworks reports indicators of an algal bloom to ODW, the ODW field office director[2] will inform the local health director(s) that ODW received such a report and may provide a brief description of the actions that will be taken to respond to the potential bloom. Additionally, ODW field staff will complete the online Harmful Algal Bloom Report Form or request that the waterworks complete the HAB Report Form located at https://www.vdh.virginia.gov/waterborne-hazards-control/harmful-algal-bloom-online-report-form/

ODW field office staff will contact all potentially impacted waterworks and offer to coordinate with waterworks owners and operators to develop a strategy to optimize treatment for cyanotoxin removal if a cyanotoxin optimization treatment plan has not been developed as described in section 1.2 of this chapter.

Caution: If the waterworks utilizes algaecides, oxidants, or other treatment methods with the potential to cause algae cell lysis (rupture of cells) prior to filtration, this may compromise the capacity of sedimentation and filtration treatment processes to remove cyanotoxins. In this case, the waterworks may choose to proceed to section 3: "Monitor Finished Water".

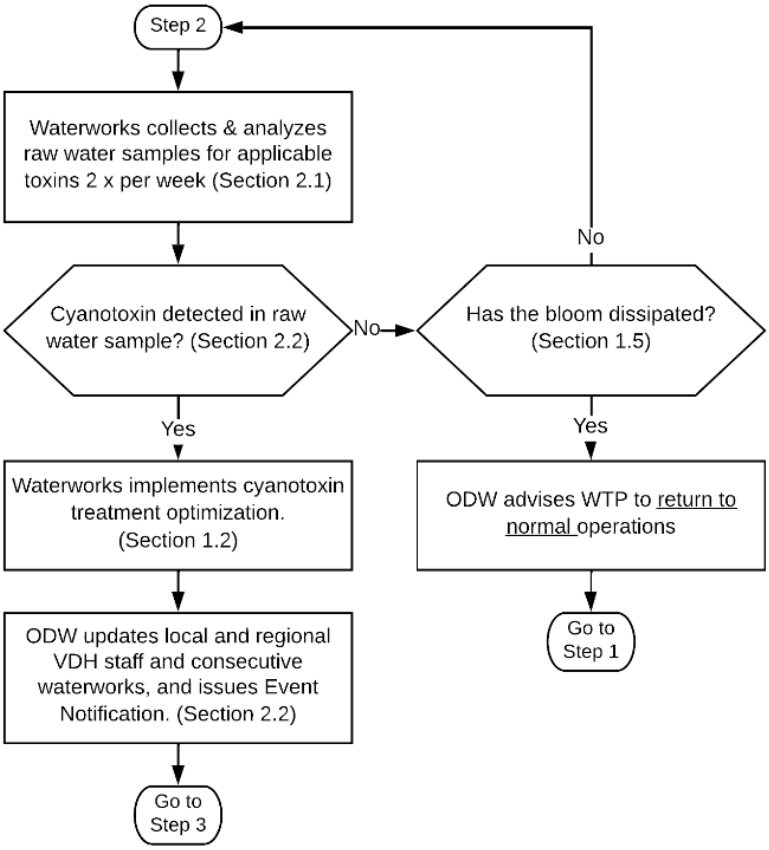
When there are no visual or other indicators of an algal bloom:

Waterworks with a history of frequent HABs may perform raw water cyanotoxin monitoring throughout the season in which blooms historically occur. Otherwise, ODW recommends that waterworks continue Step 1 - Monitor for Algae.

[1] See Alert Level 1 in Figure 5.3 on page 326 and Figure 4.2 on Page 221 of *Toxic Cyanobacterial in Water – Second Edition (2011)* published by the World Health Organization. https://www.who.int/publications/m/item/toxic-cyanobacteria-in-water---second-edition

[2] Or designee if this responsibility is delegated by the ODW field office director.

2. Monitor Raw Water



2.1. Raw Water Cyanotoxin Analysis

ODW recommends that waterworks run field tests or onsite laboratory analyses for detection of cyanotoxins in the raw water following the determination of a bloom as described in section 1.5 of this chapter. ODW field office staff may perform field test kit raw water cyanotoxin analysis or provide field kits to the water plant operators if the waterworks does not have the ability to perform the analysis.

ODW maintains Eurofins Abraxis field test kits at the following locations. To ensure adequate supply, test kits should be replaced as soon as the first strip is used. Test kits should also be replaced on or before the expiration date. During a HAB, ODW may wish to purchase a 20-strip kit instead of the standard 5-strip kit to ensure adequate supply.

Toxin	Quantity	Location	Colonial Scientific Model No.
Microcystins	2 5-strip kits	CO (1), AFO (1)	99-520020-5PK
Anatoxin-a	2 5-strip kits	CO (1), LFO (1)	99-520042-5PK
Cylindrospermopsin	1 5-strip kit	CO	99-520029-5PK
Saxitoxin	1 5-strip kit	CO	99-520044-5PK

When providing field kits to operators, ODW staff should remind the operator that the field tests are time and temperature sensitive. The operator must take care to ensure that analysis of samples occurs within the required temperature range, and each step of the analysis process is accurately timed. In addition to the instructions that are provided with each test kit, the operator should use the Eurofins Abraxis Test Strip Visual Interpretation Guide (https://abraxis.eurofins-technologies.com/media/6659/test-strip-interpretation-reference-guide-r110519.pdf) to interpret the results.

ODW will request that operators report test result(s) to the ODW field office immediately after completing each analysis. ODW will request that operators submit a photograph of the test results including the test strip, type of toxin, water tested (source, raw, or finished), date, time, and interpretation, as shown in Figure 1 below. If the ODW field office receives monitoring results, staff will evaluate and record those results in the Cyanotoxin Results Recording Spreadsheet (link provided in section 5 of this chapter).

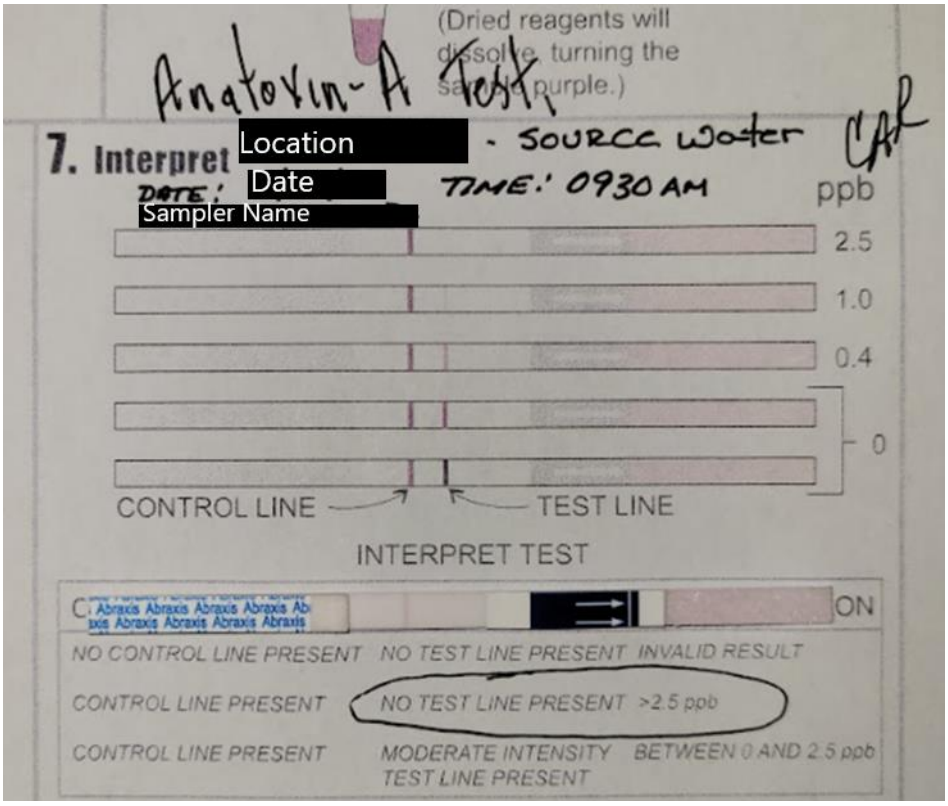


Figure 1. Example test strip photograph including test strip, toxin type, water source, date, and interpretation.

Waterworks should continue raw water cyanotoxin analysis two to three times per week until the bloom has dissipated, or a positive result triggers laboratory analysis as described in section 3 of this chapter. If ODW is providing the test kits, then the responsible ODW field office will need to order replacements through the ODW business office. Note that each field test kit contains five test strips.

2.2. Raw Water Cyanotoxin Analysis Results Evaluation & Communication

Raw water cyanotoxins below the limit of detection:

If the raw water cyanotoxin analysis results indicate cyanotoxins below the limit of detection, field office staff will recommend the waterworks owner or operator continue raw water cyanotoxin analysis two to three times per week until the bloom has dissipated or a positive result triggers laboratory analysis.

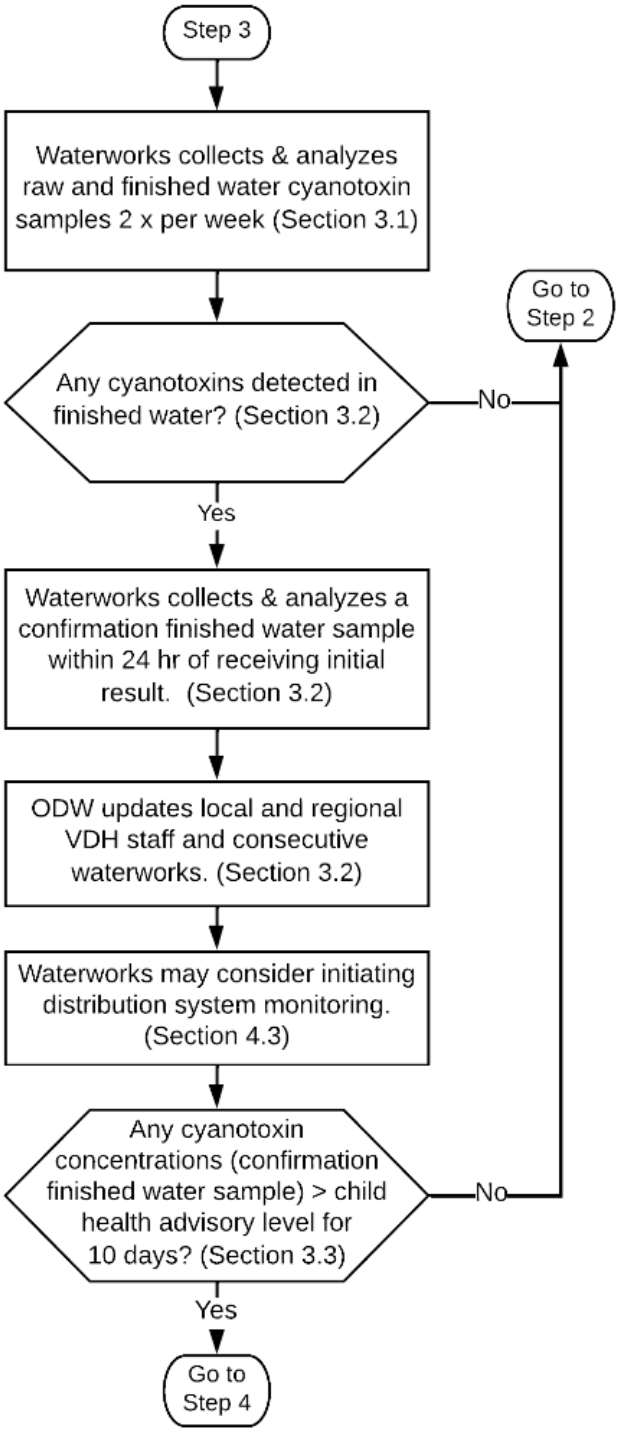
If the raw water cyanotoxin analysis results indicate a positive result, ODW field office staff will:

- Recommend to the operator the collection of raw and finished water samples for cyanotoxin analysis, as described in section 3 of this chapter.
- Recommend implementation of cyanotoxin treatment optimization to the operator (see section 1.2 of this chapter).
- Notify the Emergency Services Coordinator.

The Emergency Services Coordinator will:

- Update local and regional VDH staff, OEHS, and the HAB Task Force.
- If the ability of the water treatment plant to treat the cyanotoxin is unknown, issue an Event Notification in compliance with the VDH Communications Handbook.

3. Monitor Finished Water



Flow Chart 3. *Recommended Process for Step 3: Monitor Finished Water.*

3.1. Raw and Finished Water Cyanotoxin Analysis

Following the detection of cyanotoxins in a raw water sample as described in section 2.2 of this chapter, additional sampling and analysis from the raw water and finished water sample taps provide information to assist the decision-making process. ODW will perform or recommend that the waterworks perform analysis for microcystins, cylindrospermopsin, anatoxin-a, and saxitoxin using laboratory enzyme-linked immunosorbent assay (ELISA), liquid chromatography–tandem mass spectrometry (LC/MS/MS), or high-performance liquid chromatography–tandem mass spectrometry (HPLC/MS/MS) techniques. If the waterworks performs cyanobacteria cell counts and identification, then the analysis can be limited to the specific cyanotoxins produced by the cyanobacteria identified. If test strip results indicate the presence of one cyanotoxin, the field office may allow the waterworks to limit laboratory analysis to the detected cyanotoxin.

Note that laboratory cyanotoxin analysis can significantly delay a HAB response. To ensure the timeliness of a HAB response, maintain a supply of sample bottles and dechlorination reagent, collect samples as soon as possible, contact the laboratory in advance to arrange for expedited analysis and reporting, and ship the samples via overnight delivery.

The following list provides information on some laboratories available to waterworks for cyanotoxin analysis (as of June 2022). The Office of Drinking Water does not endorse any specific laboratory, and this list may not be exhaustive.

Table 2. Laboratories.

Laboratory	**Testing Offered**	**Standard TAT & Notes**	**Contact**
GreenWater Laboratories (Florida)	ID & Enumeration ELISA LC-MS/MS qPCR	Usually 2-3 business days, but no more than 5 business days	386-328-0882 info@greenwaterlab.com
BSA Environmental Services (Ohio)	ID & Enumeration ELISA LC-MS/MS	ELISA – results on Friday if samples received by Thu. AM; LC-MS/MS – 7-10 business days	Dr. John Beaver 216-765-0582 j.beaver@bsaenv.com
Northeast Ohio Regional Sewer District (Ohio)	ID & Enumeration ELISA LC-MS/MS	Different pricing tiers for 1-10 business days	Cheryl Soltis-Muth 216-641-6000 x2501 soltis-muthc@neorsd.org
Eurofins Eaton Analytical (Indiana or California)	ELISA LC-MS/MS	10 business days Uses in-house LC-MS/MS method at IN lab; can perform EPA methods in CA.	Taylor Sullivan 304-207-3467 taylor.sullivan@et.eurofinsus.com
Wayne State University (Michigan)	ELISA LC-MS/MS	2-3 weeks (48 hours with >10 samples)	Dr. Judy Westrick 313-577-2579 judy.westrick@wayne.edu
EnviroScience (Ohio)	ID & Enumeration ELISA qPCR	No LC-MS/MS	Jen Vydra 330-688-0111 jvydra@enviroscienceinc.com

If the waterworks is unable to take responsibility for laboratory cyanotoxin analysis, ODW may provide for the laboratory analysis. If ODW arranges for the laboratory analyses, the following laboratories may be used.

Table 3. Laboratories.

Laboratory	**Testing Offered**	**Standard TAT & Notes**	**Contact**
GreenWater Laboratories (Florida)	ID & Enumeration ELISA LC-MS/MS qPCR	Usually 2-3 business days, but no more than 5 business days	386-328-0882 info@greenwaterlab.com
BSA Environmental Services (Ohio)	ID & Enumeration ELISA LC-MS/MS	ELISA – results on Friday if samples received by Thu. AM; LC-MS/MS – 7-10 business days	Dr. John Beaver 216-765-0582 j.beaver@bsaenv.com

ODW may utilize other laboratories if the laboratories can perform the required analysis in the required timespan and if the laboratories are in the eVa system. Laboratory procurement should be performed in accordance with VDH's standard or emergency procurement procedures as appropriate. See attachments for a Statement of Work template should a quote be required.

Raw and finished water cyanotoxin analysis should continue two to three times per week until cyanotoxin results fall below the detection limit in both the raw and finished water.

3.2. Finished Water Cyanotoxin Analysis Results Evaluation/Confirmation Sampling & Communication

ODW requests that the waterworks report all laboratory analysis results to the ODW field offices. If ODW has arranged for laboratory analyses, the laboratory will report results to ODW directly and ODW will share the results with the owner. The ODW field office will evaluate and record the cyanotoxin results in the Cyanotoxin Results Recording Spreadsheet (link provided in section 5 of this chapter).

If any cyanotoxin concentration exceeds the detection limit in the finished water, the waterworks should collect a finished water confirmation sample within 24 hours of receipt of results. ODW recommends that the confirmation sample be analyzed using LC/MS/MS or HPLC/MS/MS analysis because there appears to be potential for ELISA analysis to result in a false positive.

LC/MS/MS analysis takes longer to perform than ELISA analysis. If the waterworks owner/operator would like to pursue LC/MS/MS analysis for confirmation sampling, they should research options in advance to ensure they can receive results within an appropriate timeframe.

The ODW field office director will inform all consecutive waterworks and the regional public information officer of the initial sample results and of any additional follow-up steps, including the decision to issue a "Do Not Drink" notice depending on the results of confirmation sampling. The ODW field office director will issue an Event Notification in accordance with the ODW Event Notification guidance document.

3.3. Confirmation Finished Water Cyanotoxin Analysis Results Evaluation

ODW has adopted the following 10-day health advisory levels based on EPA Health Advisory Levels where available and VDH toxicologist analyses when EPA recommendations were not available. EPA designates separate advisory levels for children less than 6 years old and for individuals who are 6 years and older. To avoid public confusion, ODW does not recommend distinguishing between these two health advisory levels.

Table 4. VDH Cyanotoxin 10-day drinking water health advisories

Toxin	Advisory Level (10-day)
Microcystins[3]	0.3 µg/L
Cylindrospermopsin[4]	0.7 µg/L
Anatoxin-a	0.4 µg/L
Saxitoxins	0.2 µg/L

<u>All entry point cyanotoxin results less than the health advisory level:</u>

ODW will recommend continuing raw and finished water cyanotoxin analysis as described in section 3.1.

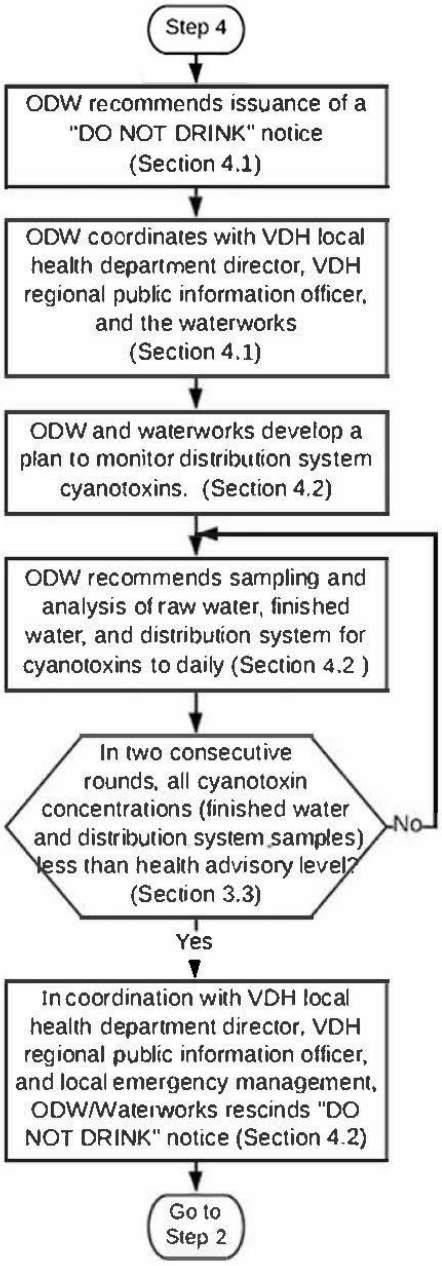
<u>Any entry point cyanotoxin result greater than the health advisory level:</u>

The basis of health advisories is a 10-day exposure duration; ODW will recommend that the waterworks issue a "Do Not Drink" Notice, as described in Section 4, within 10 days of collection of the initial finished water sample exceeding the child health advisory level.

[3] Drinking Water Health Advisory for the Cyanobacterial Microcystin Toxins, June 2015, EPA-820R15100
[4] Drinking Water Health Advisory for the Cyanobacterial Toxin Cylindrospermopsin, June 2015, EPA-820R15101

NOTE: There is potential for issuing a recreational water advisory by the Office of Environmental Health Services – Division of Shellfish Safety and Waterborne Hazards (Waterborne Hazards) and the local health department when cyanotoxin concentrations in the finished water are below the health advisory levels. In this case, ODW and the waterworks will collaborate with Waterborne Hazards to inform the public that measures are in place to treat and monitor their drinking water.

4. Consider Issuing a "Do Not Drink" Notice



Flow Chart 4. *Recommended Process for Step 4: Issue Advisory.*

4.1. Consider Issuance of a "Do Not Drink" Notice

When one or more of the health advisory levels are exceeded (or about to be exceeded) for 10 days, the ODW field office director will recommend issuance of a Do Not Drink notice. They will further coordinate with the local health department director and the waterworks owner to recommend immediate actions to minimize risks to public health (including the issuance of a public notice.)

If a waterworks issues a "Do Not Drink" notice:

ODW recommends owners communicate with their consumers if cyanotoxins in finished water are confirmed in additional samples. ODW recommends this action, although the *Waterworks Regulations* do not require owners to notify consumers of any bloom or cyanotoxin occurrence and they are not required to include detections as part of the waterworks' Consumer Confidence Report.

The ODW field office director will contact the ODW Emergency Services Coordinator and refer to the ODW Emergency Response Plan for emergency response guidance. The ODW Emergency Services Coordinator will issue an updated Event Notification in accordance with the ODW Event Notification guidance document.

The ODW field office director will provide the waterworks owner with a draft "Do Not Drink" notice for distribution by the waterworks. A HAB "Do Not Drink" notice template is available in Attachment 2 of this chapter. Adequate communication between VDH and the waterworks owner is essential to ensure that everyone stays informed prior to the issuance of an advisory.

In conjunction with the issuing of a "Do Not Drink" notice, the ODW field office director will coordinate with the VDH regional Public Information Officer to ensure the dissemination of clear and accurate information to the public. ODW has provided a message mapping template for this purpose in Attachment 3 of this chapter. ODW has also provided links in section 5 of this chapter to the EPA's Drinking Water Cyanotoxin Risk Communication Toolbox and the AWWA's Public Communications Toolkit, which provide tools and information that may aid in this process.

4.2. Distribution System Cyanotoxin Analysis

Following the issuance of a "Do Not Drink" notice, ODW recommends monitoring the distribution system for cyanotoxins. The ODW field office should work with the waterworks owner to develop a plan to monitor and address residual cyanotoxins in the distribution system. This plan should consider water age and cyanotoxin oxidation, and determine monitoring locations and plans for flushing, if deemed necessary. The AWWA CyanoTOX© tool kit can be used to estimate the rate of cyanotoxin oxidation in the distribution system. ODW has provided a link to the tool kit in section 5 of this chapter. Note that this tool kit may overestimate cyanotoxin oxidation.

The monitoring plan should require continued cyanotoxin sampling from the finished water entry point and from distribution system locations defined in the plan. Ideally, this sampling should occur daily while the "Do Not Drink" advisory is in effect. ODW recommends LC/MS/MS or HPLC/MS/MS techniques for these samples. In addition, waterworks should consider requesting expedited sample analysis and reporting.

All finished water entry point and distribution system cyanotoxins less than health advisory levels:

After two consecutive finished water samples indicate that all cyanotoxins are below all health advisory levels and all distribution system sample results indicate that all cyanotoxins are less than the health advisory level:

- ODW field office director will notify the waterworks, consecutive waterworks, the local health department, and local emergency management of results.
- ODW field office director will coordinate with the waterworks, the local health department, and the regional public information officer to issue a notice to rescind the "Do Not Drink" notice. The model notice includes tap flushing instructions for the public. A "Do Not Drink" rescission notice template is available in Attachment 4 of this chapter and a message-mapping template is available in Attachment 5.
- ODW will recommend that the waterworks return to raw water monitoring as described in section 2 of this chapter.

5. Resources

Online resources:

1. Harmful Algal Blooms webpage (VDH-OEHS) http://www.vdh.virginia.gov/environmental-epidemiology/harmful-algal-blooms-habs/
2. Visual Guide for Observing Blooms (CA SWAMP, 2017) http://www.ccamp.net/Swamp/images/3/33/SOP-Visual_Guide_to_Observing_Blooms.pdf
3. Water Treatment Optimization for Cyanotoxins, Version 1.0 EPA 810-B-16-007 (EPA, 2016) https://www.epa.gov/ground-water-and-drinking-water/water-treatment-optimization-cyanotoxins-document
4. Developing a Harmful Algal Bloom (HAB) Treatment Optimization Protocol, Version 2.2 (Ohio EPA, 2022) https://epa.ohio.gov/static/Portals/28/documents/habs/TreatmentOptimizationProtocol.pdf
5. Drinking Water Cyanotoxin Risk Communication Toolbox (EPA) https://www.epa.gov/ground-water-and-drinking-water/drinking-water-cyanotoxin-risk-communication-toolbox
6. AWWA's Resources for strengthening public trust https://www.awwa.org/resource/strengthen-public-trust/#technical-resources
7. CyanoTOX, Ver. 3.0 (AWWA) https://www.awwa.org/Resources-Tools/Toolbox
8. Recommendations for Public Water Systems to Manage Cyanotoxins in Drinking Water (EPA, June 2015) https://www.epa.gov/sites/production/files/2017-06/documents/cyanotoxin-managementdrinking-water.pdf

9. Cyanotoxin Management Plan Template and Example Plans (EPA, 2016) https://www.epa.gov/ground-water-and-drinking-water/cyanotoxin-management-plan-template-and-example-plans
10. Nutrient Pollution Policy and Data (EPA) https://www.epa.gov/nutrient-policy-data
11. Public Water System Harmful Algal Bloom Response Strategy (Ohio EPA, 2022) https://epa.ohio.gov/static/Portals/28/documents/habs/PWS-HAB-Strategy.pdf

Other resources are available to ODW staff at:

12. ODW Algae and HABs Technical Resources
    Y:\06-Technical Resources\670-Contaminants\Algae-HABs
13. Virginia HAB Task Force Contact List
    Y:\30-HABs\HAB Taskforce
14. Cyanotoxin Results Recording Spreadsheet
    Y:\13-Manuals\06-Source Water Manual\Attachments
15. Cyanotoxin Lab Information
    Y:\30-HABs\ODW HAB Response Plan\archive\HAB analysis data\Cyanotoxin Labs.xlsx
    Y:\05-Incidents\511-HAB Events\2022 HAB Manual Updates\Laboratory Services
16. Algae: Source to Treatment, AWWA Manual M57, Chapter 14 (AWWA, 2010)
    Y:\06-Technical Resources\611-AWWA Publications\AWWA M57 1ST ED (2010).pdf
17. Source Water Protection, AWWA G300-22 (AWWA, 2022)
    Y:\06-Technical Resources\610-AWWA Standards\Most Current\Latest Updates\G\G300-22 Source Water Protection.pdf

Attachments are located at: \\odwsrv1\odwshare\13-Manuals\06-Source Water Manual\attachments

SWM-C4-Attachment 1-Laboratory Statement of Work Template
SWM-C4-Attachment 2-Do Not Drink Notice Template
SWM-C4-Attachment 3-Do Not Drink Notice Message Map Template
SWM-C4-Attachment 4-Do Not Drink Rescission Template
SWM-C4-Attachment 5-Do Not Drink Rescission Message Map Template

Instructions: Complete the italicized text. Modify as required for the specific incident.

Laboratory Statement of Work

Approximately *[Number]* Enzyme-Linked Immunosorbent Assay (ELISA) tests of drinking water for anatoxin-a, microcystin, cylindrospermopsin, and saxitoxin, including the cost of a sample collection kit shipped to the affected waterworks *[Insert waterworks name and address]* and overnight shipping of the sample back to the laboratory. Maximum turnaround time of three business days from receipt of sample. Method detection limits of no greater than 0.05 ppb for microcystin and cylindrospermopsin, and 0.1 ppb for anatoxin and saxitoxin.

Approximately *[Number]* liquid chromatography-mass spectrometry (LC-MS/MS) tests of drinking water for anatoxin-a, microcystin, cylindrospermopsin, and saxitoxin, including the cost of a sample collection kit shipped to the affected waterworks *[Insert waterworks name and address]* and overnight shipping of the sample back to the laboratory. Maximum turnaround time of three business days from receipt of sample. Method detection limits of no greater than 0.05 ppb for microcystin and cylindrospermopsin, and 0.1 ppb for anatoxin and saxitoxin.

SWM-C4-Attachment 2: Do Not Drink Notice Template
Instructions: Complete the italicized text. Modify as required for the specific incident.

Notice to Customers of *Name of Waterworks* Waterworks

Este informe contiene información muy importante sobre su agua potable.
Tradúzcalo o hable con alguien que lo entienda bien.

DO NOT DRINK TAP WATER

Failure to follow this advisory could result in illness.

The Virginia Department of Health in conjunction with the *Local Health Department Name* Health Department, and *Name of Waterworks* are advising residents to only use bottled water for drinking and cooking purposes as a safety precaution. This precaution is necessary because *Cyanotoxin name*, a toxin produced by cyanobacteria (formerly known as blue-green algae) was detected in the drinking water from *Name of Waterworks* on *date*.

Only bottled water should be used for drinking, beverage, and food preparation, making infant formula, brushing teeth, and making ice until further notice.

The tap water is safe to use for washing dishes and clothes, cleaning, flushing toilets, and bathing. However, infants and young children under the age of six should be supervised while bathing and during other tap water-related activities to prevent accidental ingestion of water.

Do not drink tap water that you have boiled. Boiling water will not remove the contamination.

Potable water is available at the following locations: *Provide locations where bottled water is available, and any special instructions.*

We will inform you when your tap water is safe to drink. We are *describe corrective actions*. We anticipate resolving the problem within *provide estimated days/date*.

For more information, call:
Waterworks contact: *contact name, address, phone*

Please share this information with all the other people 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 copies by hand or mail.
Date: *Date of notice*

SWM-C4-Attachment 3: Do Not Drink Notice Message Map Template

Instructions: Complete the italicized text. Modify as required for the specific incident.

SCENARIO/CONCERN: "DO NOT DRINK" NOTICE ISSUED

STAKEHOLDER: GENERAL PUBLIC, MEDIA

KEY MESSAGE 1 →	KEY MESSAGE 2 →	KEY MESSAGE 3
Cyanotoxin name, a toxin produced by cyanobacteria, was detected in the drinking water from *Name of waterworks* on *date*.	Customers of *Name of waterworks* are advised to only use bottled water for drinking and cooking purposes as a safety precaution.	The Virginia Department of Health is working with the *Name of waterworks* to resolve this issue and will inform you when the water is safe for drinking and cooking purposes.
Support Point 1.1	**Support Point 2.1**	**Support Point 3.1**
Cyanotoxin name was detected in the drinking water at a concentration exceeding the U.S. Environmental Protection Agency's national drinking water Health Advisory of *concentration*.	Potable water is available at the following locations: *Provide locations where bottled water is available, and any special instructions.*	The *Name of waterworks* has made appropriate treatment adjustments to minimize the breakthrough of harmful toxins into the final drinking water produced.
Support Point 1.2	**Support Point 2.2**	**Support Point 3.2**
The *Cyanotoxin name*, is the result of a harmful algal bloom in the *waterbody name*.	Do not drink tap water that you have boiled. Boiling water will not remove the contamination.	The *Name of waterworks* will continue testing the drinking water produced *testing frequency*, until they have confirmed that the water is safe to drink.
Support Point 1.3	**Support Point 2.3**	**Support Point 3.3**
The *Cyanotoxin name*, has *health effects*.	The tap water is safe to use for washing dishes and clothes, cleaning, flushing toilets, and bathing. However, infants and young children under the age of six should be supervised while bathing and during other tap water-related activities to prevent accidental ingestion of water.	The Virginia Department of Health and the *Name of waterworks* will issue an alert when it has been determined that the water is safe to drink.

SWM-C4-Attachment 4: Do Not Drink Rescission Template

Instructions: Complete the italicized text. Further modifications may be required specific to each incident.

DRINKING WATER PROBLEM CORRECTED

Customers of *Waterworks name* were notified on *date of original notice* of a problem with our drinking water and were advised to only use bottled water for drinking and cooking purposes as a safety precaution. We are pleased to report that the problem has been corrected and that it is no longer necessary to only use bottled water for drinking and cooking purposes as a safety precaution. We apologize for any inconvenience and thank you for your patience.

Samples collected from *Name of waterworks* on *dates* show *Cyanotoxin name* in the drinking water at *concentration range*, which is less than the Virginia Department of Health drinking water Health Advisory level of *concentration*.

Because ***Cyanotoxin name*** **may still be present within household plumbing, your taps should be flushed as a safety precaution prior to use of water for drinking and cooking purposes.** Allow the water to run at each tap for 5 minutes before using it for drinking or cooking. If hot water is to be used for drinking or cooking, first drain the water heater according to the manufacturer's instructions, and then allow hot water to run at each tap for 30 seconds to 2 minutes before using it for drinking or cooking.

As always, you may contact *name* at *phone number* or *address* with any comments or questions.

This notice is being sent to you by *Waterworks name*
For more information, call:
Waterworks contact: *contact name, address, phone*

Date *Insert date*

Please share this information with all the other people 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 copies by hand or mail.

SWM-C4-Attachment 5: Do Not Drink Rescission Message Map Template

Instructions: Complete the italicized text. Further modifications may be required specific to each incident.

SCENARIO/CONCERN: "DO NOT DRINK" RESCISSION ISSUED

STAKEHOLDER: GENERAL PUBLIC, MEDIA

KEY MESSAGE 1 →	KEY MESSAGE 2 →	KEY MESSAGE 3
The problem has been corrected.	Household taps should be flushed as a safety precaution prior to use of water for drinking and cooking purposes *(if applicable)*.	*If applicable:* A recreational advisory remains in place for the *waterbody name.*

Support Point 1.1	SUPPORT POINT 2.1	SUPPORT POINT 3.1
Samples collected from *name of waterworks* on *dates* show *cyanotoxin name* in the drinking water at *concentration range*.	*Cyanotoxin name* may still be present within household plumbing.	*Contact Office of Environmental Health Services – Waterborne Hazards Division for supporting points*
Support Point 1.2	**Support Point 2.2**	**Support Point 3.2**
These detected levels are less than the Virginia Department of Health drinking water Health Advisory level of *concentration*.	Allow the water to run at each tap for 5 minutes before using it for drinking or cooking *(if applicable)*.	*Contact Office of Environmental Health Services – Waterborne Hazards Division for supporting points*
Support Point 1.3	**Support Point 2.3**	**Support Point 3.3**
It is no longer necessary to only use bottled water for drinking and cooking purposes as a safety precaution.		*Contact Office of Environmental Health Services – Waterborne Hazards Division for supporting points*

PFAS/LCRI Cost Study Findings and PFAS Rule Updates

March 24, 2025
Bailey Davis
Chief of Field Operations

Office of Drinking Water
Safe Drinking Water for a Healthy Virginia

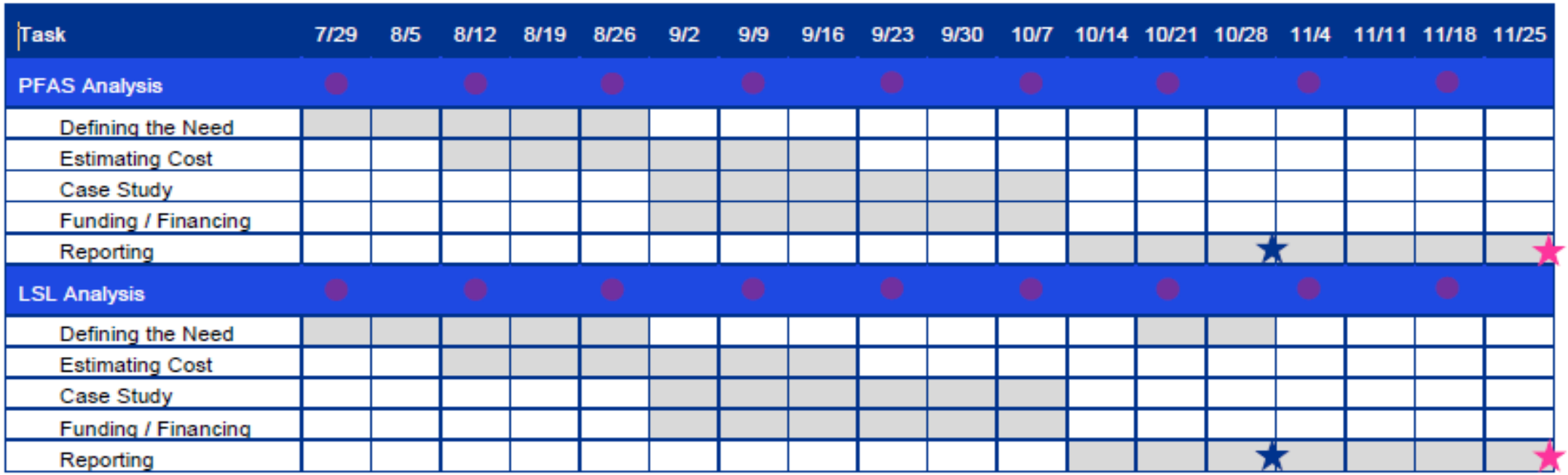
2024 Budget Bill – SB6001 Line item 280
effective 7/1/24

G. Out of this appropriation, $500,000 the first year from the general fund shall be provided for the Virginia Department of Health to conduct a cost analysis of implementing pending federal Per- and Polyfluorinated Substances (PFAS) regulations for Virginia local water systems and to implement pending federal Environmental Protection Agency Copper Rules for water system lead service lines. **The report shall include the results of the cost analysis, possible funding models, and identify federal funding that may be available.** The department shall submit the report to the Chairs of the House Appropriations and Senate Finance and Appropriations Committees **by December 1, 2024**.

Study Approach

1. Defining the Need
2. Estimating Scope & Cost
3. Evaluate Funding and Financing Options
4. Telling the Story

Proposed Study Schedule



★ Draft report due to VDH by November 1

★ Final report due to Virginia General Assembly by December 1

● VDH and KPMG check-in meetings

Note: Schedule to be agreed with VDH, specifically with regard to the draft report submission date, which may need to be brought forward to allow for sufficient review time.

PFAS Study Findings

PFAS Compliance Costs (Present day estimates)

- Capital Expenditures (CapEx) between $643M and $904M
  - Anticipated to be incurred by compliance date of 2029
- Annual Operational Expenditures (OpEx) between $72M and $88M
  - These will continue indefinitely
- Ongoing annual monitoring for compliance will add $0.7M
- Estimated population served by waterworks with MCL exceedances is greater than 2.6M people
  - This number is expected to grow as more systems perform required monitoring analysis

PFAS Study Findings

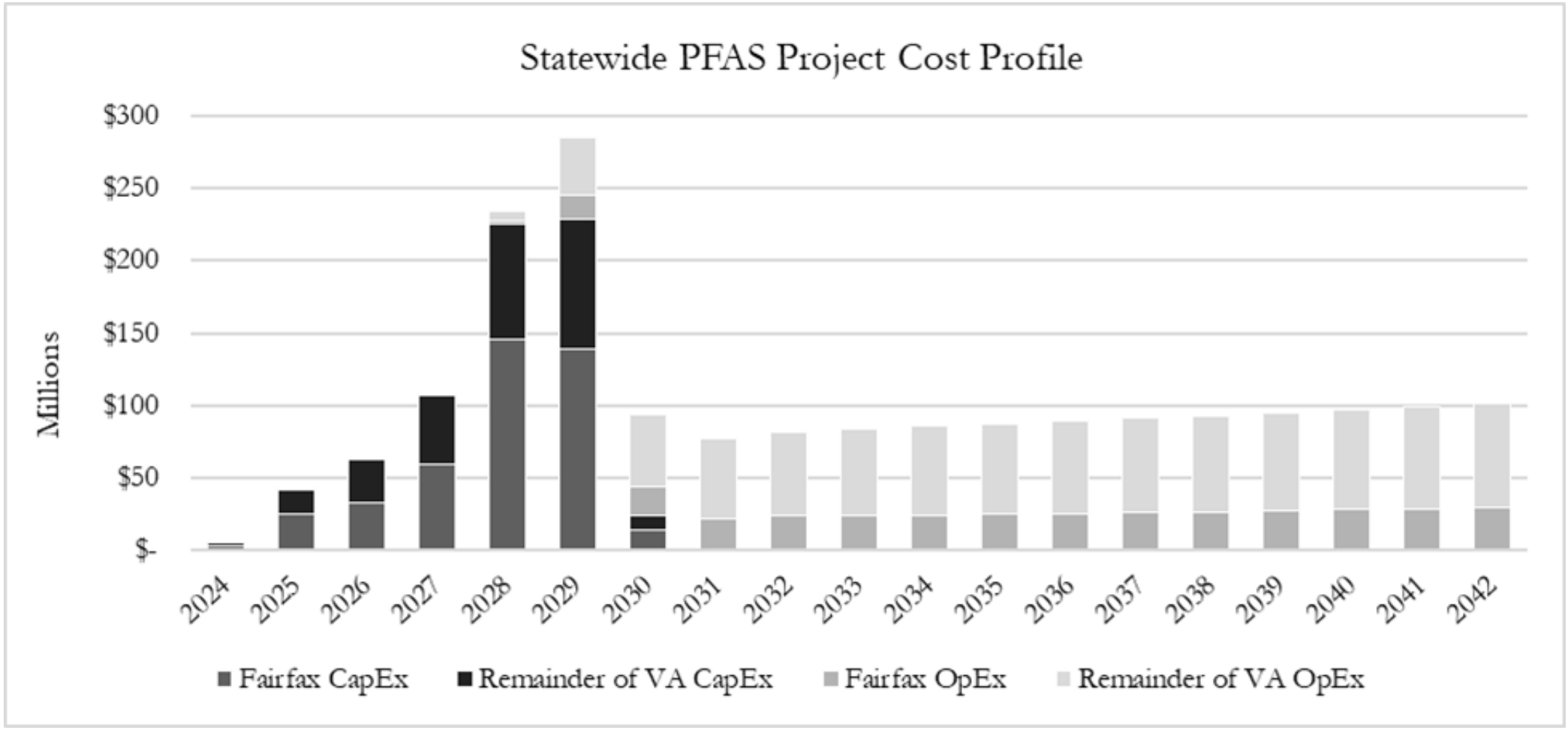


Table 2: PFAS Cost Estimates (in 2024 dollars)

Category	CapEx		OpEx			System Size	No. of Systems	Population Associated with Systems
			Annual Treatment		Annual Monitoring			
	Low	High	Low[6]	High[7]				
Waterworks Estimated Costs for Known PFAS Contamination	$490M	$529M	$51M	$43M		Very Small	6	614
						Small	1	2,362
						Medium	-	0
						Large	1	47,574
						Very Large	5	2,170,105
Estimated Costs for Known PFAS Contamination	$123M	$233M	$34M	$25M		Very Small	23	3,169
						Small	3	5,940
						Medium	4	27,016
						Large	1	80,995
						Very Large	1	234,220
Estimated Costs for Possible PFAS Contamination	$30M	$142M	$3M	$4M		Very Small	56	10,237
						Small	11	16,531
						Medium	-	-
						Large	-	-
						Very Large	-	-
Estimated Costs for Other Compliance Activities					$0.7M			
Total	**$643M**	**$904M**	**$88M**	**$72M**	**$0.7M**		**112**	**2,598,763**

Lead/Copper Rule Findings

Lead Compliance Costs (Present Day Estimates)

- CapEx (Overall Cost to replace LSLs and GRRSs) between $290M and $670M
  - Projected to be incurred by LSL replacement compliance date of 2037
- OpEx for additional compliance activities (e.g. public outreach and maintaining an LSL inventory) is $43M.

- OpEx for annual monitoring costs is between $1M and $2M

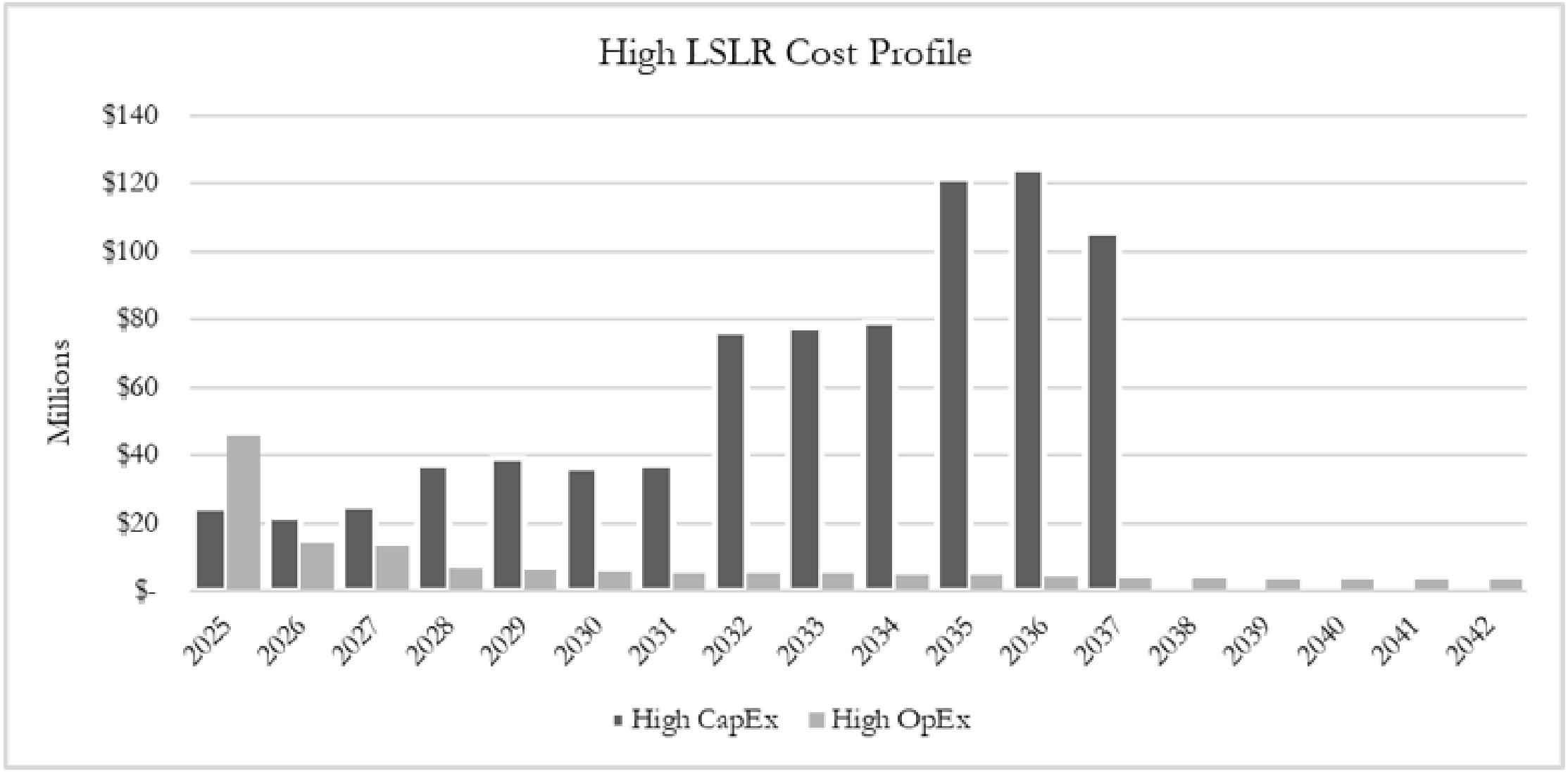


Figure 2: Time Profile of "High" Estimated LSL Costs

Funding Findings

Project Funding

- Larger waterworks are better positioned to afford needed CapEx and OpEx using rate increases to over larger customer bases (and resulting economy of scale)
- Smaller waterworks will have more difficulty in affording needed CapEx and OpEx using rate increases because of smaller rate bases
- To deliver needed projects most waterworks are expected to utilize a funding model comprised of a combination of:
  - Low interest rate loans through programs like DWSRF
  - State and Federal Grants when available
  - Bonds obtained through Virginia Resources Authority
  - Rate increases
  - Funds from litigation claims

Table 7: Estimated DWSRF and BIL Funding

Virginia	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
DWSRF Supplemental	$29,357,000	$29,732,000	$31,767,300	$34,566,150	$34,566,150
Lead Service Lines	$46,256,000	$48,717,000	$48,717,000	$48,717,000	$48,717,000
Emerging Contaminants	$12,327,000	$10,789,000	$10,789,000	$10,789,000	$10,789,000
Emerging Contaminants in Small or Disadvantaged Communities Grant	$27,239,000[10]		$13,519,000	TBD	TBD
Total	**$101,559,500**	**$102,857,500**	**$104,792,300**	**$94,072,150**	**$94,072,150**

Table 8: Funding for lead and PFAS projects applied for and awarded from 2022 through 2025 [11]

Year	Lead			PFAS		
	Project Count	Applied For	Received	Project Count	Applied For	Received
2022	50	$46,047,135.00	$45,922,135.00	3	$12,327,000.00	$12,327,000.00
2023	52	$48,045,134.57	$48,045,134.57	3	$10,789,000.00	$10,789,000.00
2024[12]	5	$9,871,122.00	$9,871,122.00	2	$33,478,824.00[13]	$10,789,000.00
2025	0 YTD	0 YTD	N/A	3	$10,789,000.00	$10,789,000.00

PFAS Regulatory Update

ODW activities

- Monitoring existing legal challenges and EPA communications
- Data capture and monitoring schedule development
- Developing communications to waterworks
- Primacy application
- Waterworks regulation update
- Participation in PFAS expert advisory committee and transfer of existing data to DEQ
- Publishing ODW phase 3 data results/updated interactive Map
- Developing training for internal and external partners

Waterworks Regulations and Primacy Package

- Primacy application package received 11/8/24
- Primacy package to be completed before submission of the regulation updates
- Update to waterworks regulations which incorporates federal language “quote for quote” drafted and in review
- Regulation update will be submitted following the “exempt process” which can shorten timeline to as little as 6 months
- Regulations need to undergo revision for LCRR/LCRI incorporation as well with competing timelines

Initial Monitoring – Due by April 26, 2027

Surface Water Systems
serving all population sizes

- Quarterly within 12-month period
- Samples collected 2 to 4 months apart.

Groundwater Systems
serving > 10,000 customers

- Quarterly within 12-month period
- Samples collected 2 to 4 months apart.

Groundwater Systems
serving ≤ 10,000 customers

- Twice within 12-month period
- Samples collected 5 to 7 months apart.

EPA guidance on previously collected data
Memorandum received November 21, 2024

UCMR 5 monitoring data

- UCMR laboratories only report values at or above UCMR 5 MRLs to the EPA
- EPA working with EPA-contracted laboratories to reprocess data for small systems (10,000 or fewer customers)
- Large systems will need to work with laboratories to reprocess data for use for initial monitoring

Data reporting

- ODW encourages waterworks to produce a plan to meet initial monitoring requirements that will allow for repeat data collection if necessary
- ODW will be posting information on submission of initial monitoring data in early 2025.

Waterworks Regulations

March 24, 2025

Jane S. Nunn, JD, MPA
Policy and Program Coordinator

Office of Drinking Water
Safe Drinking Water for a Healthy Virginia

VDH VIRGINIA DEPARTMENT OF HEALTH
Protecting You and Your Environment

Remaining Topics

1 amendment remaining for discussion:

- § 32.1-172.1(B) Remote monitoring credit

1 new proposed amendment:

- Remove all the forms and update regulatory language

Proposed regulatory language is in red

Update on regulatory amendments for federal PFAS Rule and Consumer Confidence Report Rule Revisions (CCR3)

Item # 1 – § 32.1-172.1(B), Remote Monitoring Credit

§ 32.1-172.1(B) Where a waterworks or treatment facility identified as a classified waterworks or treatment facility by the Department is equipped with adequate technological capability, the Department shall credit remote monitoring of the facility by a licensed operator of the appropriate class as operator attendance, provided that the owner submits and the Department approves a remote monitoring plan demonstrating that the waterworks or treatment facility possesses sufficient technology for the remote operator to adequately monitor the waterworks or treatment facility and manage onsite operators with a lower license class, mechanics, or other staff to operate the waterworks or treatment facility under the remote operator's direct supervision. In determining whether to approve a remote monitoring plan for multiple waterworks or treatment facilities, the Department may consider the number of waterworks or treatment facilities the remote operator is monitoring simultaneously, whether the multiple facilities being monitored remotely are under common ownership, whether the remote operator is employed by the owner of the multiple facilities, and whether occasional in-person attendance is provided, among other factors. The Department may cease crediting remote monitoring if the Department finds that continued operation pursuant to the remote monitoring plan presents a public health threat due to statutory, regulatory, or permit violations. The Department shall not credit remote monitoring by an operator without the appropriate license class who is operating the waterworks or treatment facility pursuant to a temporary waiver issued under paragraph A of this section.

Item #1 cont. – § 32.1-172.1(B)
Remote Monitoring Credit

New subsection, 12VAC5-590-461.F. Remote monitoring attendance credit.

1. In accordance with § 32.1-172.1 of the Code of Virginia, the department shall consider the following factors in determining whether to approve a remote monitoring plan:

a. The ability of the waterworks to continue to comply with applicable statutory, regulatory, and permit obligations;

b. The ability of the waterworks to timely respond to any emergency;

c. Whether the remote monitoring plan accounts for cybersecurity risks and potential disruptions to remote monitoring or the remote operator's communications with onsite staff;

d. A certification to the department of the existence of a Cybersecurity Plan (CP) that includes the following:

(1) An active cybersecurity program including risk assessment procedures appropriate to the waterworks or a current cybersecurity risk assessment or reassessment using a department-approved assessment method that was performed within 12 months prior to the request for approval of a remote monitoring plan;

(2) A written strategy to address identified risks and a timeline for addressing the identified risks; and

(3) A cybersecurity incident response plan.

e. Other relevant factors identified by the department.

Item #1 cont. – § 32.1-172.1(B) Remote Monitoring Credit

12VAC5-590-461.F (cont.)

2. For multiple waterworks or treatment facilities, the department shall consider the following factors in determining whether to approve a remote monitoring plan:

a. The requirements listed in subpart 1 of this section;

b. The number of waterworks or treatment facilities the remote operator is monitoring simultaneously;

c. Whether the multiple facilities being monitored remotely are under common ownership;

d. Whether the remote operator is employed by the owner of multiple facilities;

e. Whether occasional in-person attendance is provided; and

f. Other relevant factors identified by the department.

Item #1 cont. – § 32.1-172.1(B) Remote Monitoring Credit

12VAC5-590-461.F (cont.)

3. To continue to receive remote monitoring attendance credit after initial department approval of the remote monitoring plan, the owner shall annually:

a. Review the strength and breadth of the waterworks' CP as described in subdivision 1 d of this subsection;
b. Update the CP's written strategy to address identified cybersecurity risks, timeline for addressing the identified risks, and incident response plan; and
c. Certify to the department within 90 days of the CP's annual review that these requirements have been completed. An extension beyond 90 days may be granted for good cause at the discretion of the department.

4. The department may cease crediting remote monitoring upon finding that continued operation pursuant to the remote monitoring plan presents a public health threat due to statutory, regulatory, or permit violations.

5. Remote monitoring will not be credited as operator attendance in the circumstance of an operator who does not possess a license with a classification equal to or higher than the classification of the waterworks or water treatment plant being operated and is operating such facility pursuant to a temporary waiver issued under § 32.1-172.1 A of the Code of Virginia.

Item #2 - 12VAC5-590-200, -475, and -840 Uniform Water Well Completion Report, Form GW-2 (rev. 8/2016)

Form GW-2 was created by DEQ and was revised in 2023

Current language: A completed Uniform Water Well Completion Form, GW-2…

Proposed language: A completed DEQ water well completion report form…

Item #2 cont. - 12VAC5-590-373 F 3 Application for Monitoring Waivers (rev. 3/2019)

Relevant current language: The owner shall submit a monitoring waiver application for evaluation on a form approved by the department.

Proposed language: The owner shall submit a monitoring waiver application for evaluation in a form acceptable to the department.

Item #2 cont. - 12VAC5-590-200 A 2
Waterworks Permit Application, ODW-001

WAC has already approved a change from Waterworks Permit Application to Waterworks Construction Permit Application

Current WAC-approved language: The owner shall submit a Waterworks Construction Permit Application to the department on a form approved by the department.

Proposed language: The owner shall submit a waterworks construction permit application to the department in a form acceptable to the department.

Item #2 cont. - 12VAC5-590-384 B 1 d(1) Operational Evaluation Reporting Form

Current language: The owner of a waterworks that exceeds the operational evaluation level shall conduct an operational evaluation and submit a written report of the evaluation to the department on a form approved by the department no later than 90 days after being notified of the analytical result that caused the waterworks to exceed the operational evaluation level.

Proposed language: The owner of a waterworks that exceeds the operational evaluation level shall conduct an operational evaluation and submit a written report of the evaluation to the department in a form acceptable to the department no later than…

Item #2 cont. - 12VAC5-590-392 C 3 a
Waterworks Level 1 Assessment

Current language: The owner shall complete the assessment and document the assessment on a form approved by the department.

Proposed language: The owner shall complete the assessment and document the assessment in a form acceptable to the department.

Item #2 cont. - 12VAC5-590-392 C 4 a Waterworks Level 2 Assessment

Current language: The department will complete the assessment and document the assessment on a form approved by the department. The department will consult with the owner during the assessment and complete the assessment within 30 days upon learning that the waterworks has exceeded any trigger in subdivision B 2 of this section.

Proposed language: The department will document the assessment, consult with the owner during the assessment, and complete the assessment within 30 days upon learning that the waterworks has exceeded any trigger in subdivision B 2 of this section.

Item #2 cont. - 12VAC5-590-840 H 1
Well Yield and Recovery Report Form, ODW-002

Current language: Data to be collected during the yield and drawdown test shall be recorded on the Well Yield and Recovery Report form provided by the department.

Proposed language: Data to be collected during the yield and drawdown test shall be recorded in a format acceptable to the department.

Item #3 – Regulatory Amendments for PFAS and CCR3

Primacy package for PFAS received but date for receipt of the primacy package for CCR3 is unknown at this time.

Amendments to the Waterworks Regulations will be as strict as but no stricter than the federal rules (ODW will not be making any changes).

A copy of the proposed amendments is available upon request.

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Lead and Copper Rule Revisions
Lead and Copper Rule Improvements
Waterworks Advisory Committee

Robert D. Edelman, PE

Director, Division of Technical Services

Office of Drinking Water

Safe Drinking Water for a Healthy Virginia

VDH VIRGINIA DEPARTMENT OF HEALTH

Protecting You and Your Environment

Initial Service Line Inventory – Statistics

1,569	Total active community and NTNC waterworks
1,482	Waterworks submitted Initial Service Line Inventories
87	Waterworks without Initial Service Line Inventories
28	Waterworks with lead service lines
3,658	Lead service lines
147	Waterworks with galvanized requiring replacement service lines
10,484	Galvanized requiring replacement service lines
1,643,412	Non-lead service lines
704,988	Unknown material service lines
2,392,602	Total service lines inventoried

Data pulled 3/10/25

What should waterworks do to prepare for November 1, 2027? Recommendations:

1. Continue work on service line inventories
2. Prepare your Replacement Plan if you have LSLs, GRR or Unknowns
3. Replace SLs if you have Lead Service Lines and/or GRR
4. Prepare for lead sampling in schools and child care centers
5. Corrosion Control Treatment
6. Tap Sampling

QUESTIONS?


Office of Drinking Water
Safe Drinking Water for a Healthy Virginia
"Water is the only drink for a wise man."
~Henry David Thoreau

Compliance, Enforcement & Policy Update

March 24, 2025

Grant E. Kronenberg
ODW Director of Division of
Compliance, Enforcement & Policy

Compliance, Enforcement & Policy Update

- The January Enforcement Targeting Tool (ETT) report – 6 “serious violators” under EPA’s scoring system. Up from 5 in the October ETT report.
- Three of the systems are related, as one provides water to the other two. ODW has sent proposed consent orders to all three.
- One serious violator has entered into a consent order.
- One serious violator is under a consent order and ODW is looking at a superseding consent order.
- One has returned to compliance, but state violations are causing us to look at a consent order.

Compliance, Enforcement & Policy Update

- 20 Warning Letters sent from the January ETT report. Up from 12 for the prior quarter.

Compliance, Enforcement & Policy Update – State Violation Scoring System (SVSS)

- New metric to quantify state-only regulatory violations.
- State-only violation companion to ETT/ETTA scores.
- Will help guide compliance outreach and enforcement decisions.
- SVSS will be formally put into place through an update to the Enforcement Manual.

STATE VIOLATION SCORING SYSTEM REVIEW

Phase 1

SDWIS State Code	Approved 2021 WWs Regs	Violation Type	State NOAV Score	Specified Use
A0	12VAC5-590-190 A and E (Permits) 12VAC5-590-260 B (Issuance of the operation permit)	Acute	10	The owner does **not** have a valid Operation Permit and is serving customers.
A1	12VAC5-590-190 B and E (Permits)	Non-Acute	5	**Unauthorized** construction for which a construction permit is required.
A2	12VAC5-590-520	Chronic, Non-Acute	1	Failure to submit the required written plan to address three consecutive months of a community waterworks being above 80% of permitted capacity. Regulatory Requirement: "When water production of a **community** waterworks reaches 80% of the permitted capacity for any **consecutive three-month period**, the owner shall prepare and submit a written plan within 30 days of notification by the department to address capacity needs. This plan shall be evaluated by the department and corrective actions shall be approved by the department."
A3	12VAC5-590-260 C	Chronic; Non-Acute	1	Use this state violation if the WWs has exceeded operating conditions established by the operation permit <or> exceeded/violated special operating requirements <or> the Waterworks Description Sheet (WDS). Regulatory Requirement: "The Commissioner shall establish the type: community (C) waterworks (WWs), Nontransient Noncommunity (NTNC), or Transient Noncommunity (TNC), classification, and permitted capacity of the WWs and specify these on the operation permit. Conditions may be included with the permit for operator, monitoring, and reporting requirements."
A4	12VAC5-590-260 A & B	Non-Acute	5	A WWs Owner or authorized agent did **not** receive **approval** prior to **operating** new component, source, or entire waterworks. This is for a situation where there

				is an existing operation permit for the waterworks, a construction permit is issued and the construction is performed, but the expanded/revised waterworks is operated without an updated operation permit being issued. (Construction permit issued, no Statement of Completion, no final inspection, no satisfactory test results, etc.)

SDWIS State Code	Approved 2021 WWs Regs	Violation Type	State NOAV Score	Specified Use
B0				DO NOT USE
B1				DO NOT USE
B2	12VAC5-590-461 A.5-6, B.2, and C.4-5.	Non-Acute	5	This violation occurs when: 1. There is no properly licensed C or NTNC Water Operator for a WWs **without primary or secondary disinfection or chemical addition** and/or the **Water Operator license class does not meet WWs Class** requirement. (If you have a classified C or NTNC WWs with disinfection or chemical addition but no licensed operator of any class, use FED Code 12) or 2. A TNC is classified.
B3				DO NOT USE
B4	12VAC5-590-290 F (Issuance of a temporary operation permit)	Chronic; Non-Acute	1	Waterworks Business Operation Plan (WBOP) must be submitted by a WWs owner, as required. (Va. Code § 32.1-172 F, no permit shall be assigned or transferred to a new owner.)
B5	12VAC5-590-580; No Cross Connection Control Program (CCCP)	Chronic; Non-Acute	1	This violation only occurs when there is **NO** approved program at an operating WWs and does **not** apply to minor revisions of an existing CCCP.
B6	12VAC5-590-600; FAILURE TO IMPLEMENT CCCP	Chronic; Non-Acute	1	The WWs has an approved CCCP Plan, but there is no evidence that the program is being implemented appropriately. (i.e. A sanitary survey reveals there are no records of customer surveys, no inspections of devices, no installation of cross connection control devices.)

B7	12VAC5-600-50 Community 12VAC5-600-60 NTNC	Chronic; Non-Acute	1	The violation occurs when the owner fails to pay the annual Technical Assistance Fee (i.e. Waterworks Operation Fee.) (Note: It can be used as a reason to revoke an operation permit pursuant to 12VAC5-590-320.A.5.)

SDWIS State Code	Approved 2021 WWs Regs	Violation Type	State NOAV Score	Specified Use
C1	12VAC5-590-530 A 12VAC5-590-570 A STATE LATE REPORTING, INCLUDING MOR	Chronic; Non-Acute	1	Use when the WWs is late reporting during a compliance period or the WWs failed to monitor the raw water Most Probable Number(s) (MPN), failed to conduct the increased monitoring for Groundwater Under Direct Influence of Surface Water (GUDI or GUDISW) or failed to submit the Monthly Operation Report (MOR) by the 10th of the month following the report month.
C2	12VAC5-590-370 - 379	Chronic; Non-Acute	1	Failure to sample in the compliance period, or sampling at unapproved sites or inappropriate times (State required compliance monitoring; not operational control). Applies to: "routine" raw water MPNs, increased monitoring for GUDIs.
C3	12VAC5-590-360 RELIABILITY (Incorporates all of Part II: 340 - 630)	Non-Acute	5	Use when the WWs is unable to demonstrate the ability to provide water of adequate quantity and quality. As determined by the Field Office in conjunction with Technical Services: **RELIABILITY PROBLEM** See Attachment 2 for examples of reliability problems.
C4	12VAC5-590-330; LACK OF MONITORING EQUIPMENT	Non-Acute	5	Use this state SDWIS code when an owner was notified that they needed specific monitoring equipment and have failed to install, use, and maintain it within the time period given. (Notification of the equipment needed must have been made in writing and not just given verbally.) There is **no specific timeframe associated with this regulation** and therefore ODW must set a time period in the written documentation to the waterworks. CEP suggests using a **minimum of 30 days to comply.** (The timeframe will be evaluated on a case-by-case basis.) NOTE: **Required monitoring equipment is absent, inoperable, or inaccurate.**
C5	12VAC5-590-700; FAILURE TO	Chronic; Non-Acute	1	Use if there is a: failure of a community waterworks to meter total water production; failure of an NTNC that provides treatment or has a design capacity of

	METER WATER PRODUCTION			greater than 300,000 gallons per month to meter total water production; failure of a TNC that provides treatment or has a design capacity of greater than 300,000 gallons per month to meter total water production. Waterworks treatment process that results in a waste flow, including filter backwash, ion exchange regenerate, or residual solids, must be metered as part of the total source water withdrawn and finished water produced. (i.e. Issue an NOAV when a sanitary survey, other inspection, or MOR reveals no meter present and the owner does not have a metering variance for a system that meets the applicable conditions described above).
C6	12VAC5-590-510 C (Acceptable operating practices.)	Non-Acute	5	**All** waterworks shall provide a **minimum** working pressure of 20 psi gauge (psig) at all service connections. If ODW can demonstrate that the pressure of the WWs has been less than 20 psig at one or more service connections, then this state violation should be issued.
C7			-	NOT FOR USE
C8	12VAC5-590-570 B FAILURE TO TIMELY REPORT A LISTED INCIDENT TO VDH	Non-Acute	5	Use if the waterworks fails to **report** any of the following to VDH within 24 hours: 1. Water pressure below the 20 psi minimum required in the distribution system, including zero or negative pressure. Examples of these events include treatment plant or pump station shutdowns due to equipment failure, power outages, emptying of storage tanks, and draining of the distribution system during fire flow events. 2. Flooding of clearwells. 3. Flooding of groundwater wells. 4. Any other situation that occurs with the waterworks that presents or may present an imminent and substantial threat to public health.
C9				NOT FOR USE

NOTES
1 Assess risk to human health and notify HQ and LHD of any immediate risk, take corrective action (issue BWN) immediately, if necessary
2 New owner must submit in writing that he is adopting the previous plan as is or with changes noted.
3 C3: Refer to Attachment 2 for examples.
4 C9: Public Notifications for Variances & Exemptions (12VAC5-590-540.) are not included here

SDWIS State Code	Approved 2021 WWs Regs	Violation Type	State NOAV Score	Specified Use
D1				DO NOT USE NOT FOR CURRENT USE (May be used when WWs with seasonal components are addressed in the VA Waterworks Regulations.)
D2				DO NOT USE NOT FOR CURRENT USE (May be used when WWs with seasonal components are addressed in the VA Waterworks Regulations.)

SDWIS State Code	Approved 2021 WWs Regs	Violation Type	State NOAV Score	Specified Use
E1	12VAC5-590-530 A (Reporting.)	Chronic; Non-Acute	1	Failure of a WWs owner or authorized agent to report required **chemical results** to the department no later than the **10th day of the month following the monitoring period**. **NOTE: Do not use E1 for C1 "late reporting MPN" violations.**

SDWIS State Code	Approved 2021 WWs Regs	Violation Type	State NOAV Score	Specified Use
N1	12VAC5-590-540 A.4. Public Notices associated with state violations	Chronic; Non-Acute	1	Use for public notices that ODW deems necessary for a State WWs Regulation Violation. **NOTE: Do not use this code with a Federal Violation.** (Subsection A requires that the owner give public notice to "(i) persons served by the waterworks and (ii) the owner of a consecutive waterworks to which it sells or otherwise provides water" for violations and situations listed in Subsection A.1 through 4.)

SDWIS State Code	Approved 2021 WWs Regs	Violation Type	State NOAV Score	Specified Use
Z1	NON VIOLATION FOR ODW TRACKING INFO ONLY	NA	-	-
Z2	NON VIOLATION FOR ODW TRACKING INFO ONLY	NA	-	-
Z3	NON VIOLATION FOR ODW TRACKING INFO ONLY	NA	-	-

VDH-ODW Criteria for Scoring State Violations

Violation Type[1]	Examples	ODW Response Time[2]
Acute (10 Points)	A0	**Within 24 hours** of discovery of an alleged violation. A non-response by the owner/operator to an acute violation will move these violations to formal enforcement at an accelerated rate.
Non-Acute (5 Points)	A1, A4, B2, C3, C4, C6	**Within 7 days** of discovery of the alleged violation.
Chronic, Non-Acute (1 Point)	A2, A3, B4, B5, B6, B7, C1, C2, C5, C8, E1, N1	**Within 30 days** of discovery of the alleged violation.

[1] The suggested designations (Acute, Non-Acute, Chronic Non-Acute) were taken from the Fed Criteria for scoring Fed Violations.
[2] Response time refers to the timeframe by which ODW must initiate appropriate action in response to an alleged violation, which may include, but is not limited to, contacting the owner, issuing an NOAV, and ordering DCLS sample kits.