Waterworks Advisory Committee (WAC) Meeting Summary

Webinar – Webex
9:00 am, Wednesday, December 16, 2020

FINAL (Approved 2/17/21)

Members Participating: Dwayne Roadcap (ODW), Chair; David F. Van Gelder, Water Operator; Steven Herzog, PE, VWEA; Bailey Davis, DCLS; Skip Harper, Virginia Plumbing and Mechanical Inspectors Association; Joe Grist (Sub), DEQ; Geneva Hudgins, AWWA; Roger Cronin, ACEC

Guests Participating: Office of Drinking Water (ODW) staff – Tony Singh, Robert Edelman, Christine Latino, Nelson Daniel, Holly Brown, Dan Horne, Jeremy Hull, James Reynolds, Brian Blankenship, Jeff Wells, Barry Matthews, Jennifer Coleman, Jack Hinshelwood, Mark Perry

Tom Fauber, VA ABPA; Russ Navritil, AWWA; Laura Bauer, VA American Water Company; Paul Nyffeler, Chem Law; Steve Edgemon, Fairfax Water; Katie Krueger, HRPDC; Chris Gill, Christian Barton LLP; Christine Noonan, Amanda Waters, Aqua Law; Josh Harris, Aqua Law; Theresa O'Quinn, Prince William County Service Authority; Chris Pomeroy, Aqua Law; Jillian Terhune, City of Norfolk

1. **Meeting Overview and Agenda**

ODW Director Dwayne Roadcap called the meeting to order at 9:04 a.m. and provided an overview of the meeting agenda.

Committee members voted unanimously to approve and adopt the minutes from the September 16, 2020 meeting. ODW will post the minutes as final on Town Hall.

2. **Amendments to the Waterworks Regulations** –

On December 3, 2020, the Board of Health approved the final amendments to the Waterworks Regulations. ODW staff are in the process of submitting them to the Registrar to begin the Executive Branch review process. Policy and Program Director Nelson Daniel's presentation (attached) contains a summary of the remaining steps for review and approval. Mid-2021 is the earliest expected date to complete review and public notice.

Dwayne expressed appreciation for all of the work the WAC and others put into getting the amendments to this point.

3. **Drinking Water Program Updates** –

House Joint Resolution 92 (2020) requires ODW to study the drinking water infrastructure and report on it and the oversight of the drinking water program. In October, ODW staff submitted the report to the State Health Commissioner. Dwayne announced that the Governor's Office has approved the report and said that it includes several recommendations from the Office of the State Inspector General (OSIG). OSIG reviewed ODW's operations during 2020.

ODW will send the WAC members a copy of the approved report. It is also available on the Legislative Information System (LIS) website.

The report ODW submitted for HB1257 (2020; on the status of efforts to establish maximum contaminant limits for specified polyfluoroalkyl substances (PFAS), Chromium (VI) and 1,4-Dioxane) is still under review in the Governor's Office.

4. ODW Budget –

Following the 2020 General Assembly Session that concluded in March, the Governor amended the 2021-2022 state budget in response to the economic fallout from the coronavirus (the legislature subsequently approved most of the Governor's amendments). Two amendments affected ODW directly – unallotting $482,400, a portion of the 20% state match for the Drinking Water State Revolving Fund grant from the U.S. Environmental Protection Agency (EPA), and $150,000 (FY2021) / $250,000 (FY2022) for data management costs. ODW has allocated other funds for the match and adjusted spending on data system updates. Still, the unallotted funds, along with expenses for staff, adding new positions for the Richmond Field Office, and other costs have created a budget shortfall. ODW will hold some positions vacant, reduce travel and training, and explore other options such as shifting several positions to other funding sources to meet budget needs. ODW has also submitted budget requests through the Commissioner's Office for consideration in the upcoming General Assembly Session.

5. PFAS Updates –

The General Assembly passed two bills in 2020, HB 586 and HB 1257, that require ODW to take action to evaluate the occurrence of PFAS in drinking water and develop maximum contaminant levels (MCLs) for specified PFAS. Deputy Director Tony Singh reported that ODW had convened a PFAS workgroup as required by HB586 and provided an update on the workgroup's activity. The slides from Tony's presentation follow the meeting minutes. Additional information and records from the workgroup meetings are on Town Hall.

6. Lead in Drinking Water at Schools and Child Care Programs (WIIN Grants) –

Tony told WAC members that ODW received two grants from EPA that will be used to support efforts to test for lead in drinking water at schools and child care programs and to pay for remediation efforts. ODW has received $1.1M for testing and expects $1.3M for remediation. The pandemic has delayed testing because so many schools are not open, or only serving small numbers of students. Neither grant is sufficient to cover testing and/or remediation at all schools/child care programs, so ODW will use EPA's guidelines for the grants to prioritize funding for those schools/programs with the greatest need.

Dwayne noted that the work staff are doing to support the two grants and PFAS bills are examples of the drinking water program being asked to take on additional responsibilities that are outside the scope of the Public Water Supplies Law.

7. Division of Technical Services (DTS) Initiatives –

DTS Director Robert Edelman presented information about several initiatives his team is working on:

Compliance Monitoring Data Portal (CMDP) – About a year ago, ODW asked labs to start using CMDP to submit analytical results directly to ODW in an electronic format. ODW set a target date of September 2020 for all labs to be using CMDP. Bob reported this has been a success – the majority of labs met the Sept. 2020 deadline. ODW is still working with a few labs to complete the transition; a few smaller labs are not going to transition and have made the business decision to not run samples for drinking water

compliance. Submitting through CMDP will reduce errors and staff time. It will also help ODW and EPA transition to updated versions of EPA's drinking water database, SDWIS. DTS staff requested EPA to facilitate cryptosporidium results entry through CMDP and EPA made the necessary changes. Separately, ODW is working on updating procedures for reporting consumer-requested lead sample results (when a waterworks collects the lead sample at the request of a customer).

Drinking Water Watch (DWW) – provides real time access to information in the SDWIS database. Registered users (waterworks) can see sample results as soon as they are added to SDWIS, sample schedules, and detailed information about their waterworks. The public can see sample results 45 days after entry (allowing waterworks time to review sample results) and general information about waterworks.

Dwayne indicated that ODW has a grant from EPA to make improvements to DWW, including removing lead and copper sample locations from public view because they are residential addresses. He asked registered users to review DWW and provide feedback about improvements while ODW has the grant. ODW will formally share an invitation for waterworks to register in the near future.

The slides from Bob's presentation follow the meeting minutes.

8. Training, Capacity Development, and Outreach –

Training, Capacity Development, and Outreach (TCDO) Division Director Barry Matthews provided an overview of ODW's TCDO program. The Capacity Development program provides training and assistance to help waterworks serving fewer than 10,000 consumers develop technical, managerial, and financial capability. Capacity Develop currently employs four Sustainability Coordinators, Julie Floyd, Tamara Anderson, Susan Miner and Jarrett Talley. Training and Outreach staff includes Jason Yetter and Susan Hinderliter. TCDO is supported by set-asides from the Drinking Water State Revolving Fund Grant and submits a number of reports to EPA and the Governor on their programs. The reports are available on ODW's website.

The slides from Barry's presentation follow the meeting notes and contain information about Planning and Design grants, operator training, and division accomplishments during 2020.

9. Waterworks Updates / Coronavirus Pandemic –

Dwayne reported that ODW has seen very little in the way of impacts to drinking water availability / quality during the pandemic. He recognized the Committee and waterworks owners statewide for the great work everyone has done to maintain a safe, reliable water supply. DCLS reported they have been affected by the Governor's latest Executive Order (Number 72, requiring DCLS staff to wear masks in the laboratories and offices), but noted they are continuing to maintain their workload and lab procedures.

Southeast Virginia Field Office Director Dan Horne mentioned efforts by the Hampton Roads Planning District Commission and area utility providers to spread the word about the availability of funds from the Cares Act to provide relief from delinquent utility bills.

10. Drinking Water Program Policies –

Compliance and Enforcement Director Jennifer Coleman discussed ODW's new Enforcement Manual (effective November 26, 2020, following a 30-day public comment period). It replaces older memos

which described enforcement tools, but didn't provide procedures. The new manual provides procedures which give field office staff more decision making power and ability to act proactively – keeping compliance issues from becoming bigger problems – allowing central office staff to focus more on consistency statewide and program/policy considerations. The new manual has procedures for use of civil charges and adding charges (penalties) to administrative orders. Jenn emphasized the manual is a work in process and it will continue to evolve, adapt and adjust based on what is working and what needs improvement.

Dwayne discussed OSIG's review of the drinking water program and their special interest in enforcement and the use of penalties – OSIG's recommendations included focusing more attention on penalties to ensure compliance. Jenn said ODW is seeing some success with this as several waterworks owners have signed orders and paid penalties. The manual does take ability to pay into account – considering type of violation, severity, potential health impact, culpability, economic benefit, compliance history, etc.

Bob provided an update on the Permit Manual. It also ended a public comment period on November 25. ODW received comments from three people. The comments were consistent. DTS staff have reviewed the comments and, where appropriate, have made revisions to the manual. The revisions are not expected to result in any substantive change, but staff will review and decide whether or not to put the manual back out for public comment, or make it effective.

Nelson described the periodic review process for regulations and noted the Operation Fee Regulations are due for review in 2020-2021. With ODW's focus shifting from the coronavirus response back to more routine business (manuals, CMDP, DWW as examples) and the amendments to the Waterworks Regulations going to Executive Branch review, Nelson said ODW will start the periodic review for the Fee Regulations as soon as January. Other priorities for 2021 will be PFAS and lead – EPA has not said when they will release the Lead and Copper Rule Revisions, but they are expected in the near future and, based on the draft revisions, will be significant.

The slides from Bob's presentation about the Permit Manual and Nelson's presentation about Periodic Review follow the meeting minutes.

11. Public Comment Period –

Dwayne invited any of the meeting participants who are not on the advisory committee if they would like to make any comments. No one commented.

12. Other Business –

Nelson review meeting dates for 2021 – February 17, April 21, July 21, September 22, and December 15. All are the third Wednesday of the month, except the September meeting which is on the fourth Wednesday to avoid the week that is traditionally used for Water Jam. Nelson reminded everyone that the General Assembly is scheduled to convene the 2021 session on January 13, 2021.

Dwayne concluded the meeting at 11:00 am.

WAC Meeting December 16, 2020 Attachments and PowerPoint Presentations

WATERWORKS ADVISORY COMMITTEE MEETING

Via WebEx

Hosted by the Office of Drinking Water, 109 Governor Street, Richmond, VA 23219

Wednesday, December 16, 2020
8:30 AM – 12:00 PM

DRAFT AGENDA

Subject	Time
Connect to Webex and Meeting Instructions https://vdhoep.webex.com/vdhoep/j.php?MTID=m0e968b714a21a2d8ac262196f25c8b6d Meeting number (access code): 132 690 4912 Meeting Password: hpPvVqgS844 or join via telephone by calling 1-844-992-4726	8:30 – 9:00 AM
Call to Order Meeting Overview Adoption of Minutes from the 9/16/20 meeting	9:00 – 9:10 AM
WW Regulations	9:10 – 9:20 AM
Drinking Water Program	9:20 – 11:00 AM (5 min break follows)
EPA LCRR	11:05 – 11:15
Drinking Water Policy	11:15 – 11:30 AM
Public Comment Period	11:30 – 11:35 AM
Other Business, Conclude meeting (Proposed WAC Meetings for 2021 – February 17, April 21, July 21, September 22, (moved a week due to Water Jam), December 15)	11:35 – 11:55 AM

Waterworks Advisory Committee (WAC) Meeting Summary

Webinar – Webex
9:00 am, Wednesday, September 16, 2020

Final

Members Participating: Dwayne Roadcap (ODW), Chair; David F. Van Gelder, Water Operator; Mark Estes, VRWA; Jesse L. Royall, Jr, PE, Syndor; Steven Herzog, PE, VWEA; Bailey Davis, DCLS; Skip Harper, Virginia Plumbing and Mechanical Inspectors Association; Scott Kudlas, DEQ;

Guests Participating: ODW staff – Tony Singh, Robert Edelman, Christine Latino, Nelson Daniel, Holly Brown, Dan Horne, Jeremy Hull, James Reynolds, Brian Blankenship, Jeff Wells, Barry Matthews, Jennifer Coleman, Susan Miner, Jack Hinshelwood

Tom Fauber, VA ABPA; Laura Bauer, VA American Water Company; Paul Nyffeler, Aqua Law; Steve Edgemon, Fairfax Water; Jeff Brown, DHDC; Katie Krueger, HRPDC; Jason Early, Cardno; Chris Gill, Christian Barton LLP; Whitney Katchmark, HRPDC; Gary Williams, Amherst County; Jessica Edwards-Brandt, Loudoun Water; Christine Noonan, Reed Smith LLP; Yann Le Goeullec, Newport News.

1. Meeting Overview

The Waterworks Advisory Committee (WAC) met remotely on Wednesday, September 16, 2020, using Webex (Polycom's Websuite). Before the meeting started, Office Director Dwayne Roadcap and Policy and Program Director Nelson Daniel identified meeting participants.

Dwayne started the meeting at 9:00 am by providing an overview of the agenda.

WAC members (Roadcap, Estes, Royall, Van Gelder, Kudlas, Harper) agreed to adopt the minutes from the July 15, 2020 meeting as final. A copy follows the minutes from this meeting.

2. Waterworks Regulations

Division of Technical Services Director, Bob Edelman provided an update on staff efforts to complete a draft of the final amendments to the Waterworks Regulations. Once complete, ODW will provide the final amendments and supporting documents (primarily the agency background document, TH-03) to the Department of Health leadership team for review and approval. The objective is to present the final amendments to the Board of Health during the December 3, 2020 meeting. If the Board approves the amendments, they will begin the executive branch review process. Bob's presentation follows the meeting minutes.

Next Steps: The next steps in the regulatory process include presenting the final amendments to the Board of Health for approval, submitting them for Executive Branch review, and posting them for a 30-day public comment period. Staff expect this process to take at least 6 months after the Board approves the final amendments, pushing the effective date to the second half of 2021 at the earliest.

3. Fee Regulations

ODW intends to revisit the Fee Regulations once the final amendments to the Waterworks Regulations are under review/approved. The objective is to begin a conversation about how to make the operation fees more equitable, balancing who pays the fees and which waterworks receive the most technical assistance and engagement from ODW staff. The *Code of Virginia* caps the fee at $160,000 per waterworks and the state budget limits the fee to $3.00 per connection; ODW will focus on things that the agency can change through the rulemaking process. Dwayne acknowledged the coronavirus pandemic means that many waterworks are already facing hardships and it will be difficult to discuss increased fees for waterworks. WAC members acknowledged the need to start a conversation about fees. One WAC member suggested asking noncommunity waterworks to pay more to account for the technical assistance provided to them. ODW staff intend to start work on the Fee Regulations in 2021, with a goal of presenting a proposal to the Board of Health in 2021.

4. COVID-19

General Assembly update: Nelson discussed the State Corporation Commission's (SCC) moratorium on service disconnections during the coronavirus pandemic and legislation that has been introduced during the Special Session that began on August 18, 2020. Nelson's presentation follows the meeting minutes.

Financial Impacts: Dwayne opened a discussion among WAC members about financial impacts to waterworks caused by the coronavirus pandemic. He noted that most utilities are following the SCC guidelines related to service disconnections, but some are talking about resuming service disconnections for delinquent accounts. He said that the Department of Health considers access to clean water to be a priority for public health protection. WAC members expressed understanding, but also had concerns about requirements to offer repayment plans that would not be compatible with their billing systems – causing them to expend more money to hire people to program and manage billing on a customer-by-customer basis. They also discussed the need for flexibility, sustainability, and customers simply ignoring the issue (taking no action - not paying for service or seeking debt relief or a repayment plan). Members commented that waterworks cannot shoulder the financial burden without outside assistance and said they need customers to work with waterworks to address financial difficulties related to unpaid bills for water (and wastewater) service.

Waterworks Updates – PPE and COVID-19 cases: The field directors commented that there had been a few COVID-19 cases reported at waterworks, but they had not had an impact on waterworks' ability to maintain water service and meet water quality standards. There had been some cases where smaller waterworks had delays in collecting and submitting samples because of insufficient staff. A few waterworks have requested that ODW staff not come on site – to reduce the possibility of transmitting the coronavirus to/from waterworks staff.

DCLS has experienced a large increase in the overall number of samples they are being asked to analyze. The lab has reduced some activities to allow staff to prioritize critical areas during the state of emergency, including drinking water analysis (which remains a high priority).

Program Guidance Revisions: The latest version of the program guidance, dated August 21, 2020, is posted on the VDH/Drinking Water website (https://www.vdh.virginia.gov/drinking-water/) and it adds procedures for tracking and monitoring waterworks that have temporarily stopped operation, that are

operating at a reduced capacity for an extended period of time, or have permanently closed. A copy follows the meeting minutes.

5. Drinking Water Program

PFOA/PFAS Workgroup (HB586, HB1257): ODW is required to form a workgroup to evaluate occurrence of PFAS in drinking water and develop maximum contaminant levels for specific PFAS. Plans are for the workgroup to consist of roughly 20 members, with quarterly meetings beginning this fall. ODW will provide notice of workgroup meetings via email and through the Virginia Regulatory Town Hall. The General Assembly did not provide funds in the budget to cover the costs of sampling/analysis or workgroup expenses. However, the U.S. Environmental Protection Agency will provide funds for PFAS sampling. ODW Deputy Director Tony Singh's presentation follows the meeting minutes.

Emergency Preparedness: ODW Emergency Services Coordinator Holly Brown said the online reporting tool, which staff demonstrated to the WAC at a meeting in 2019, is now set up for ODW to input data received from waterworks about outages and incidents. Waterworks will not self-report using the tool. Once ODW staff input information, the tool sends a report to coordinating state agencies, including the affected health district and the Virginia Department of Emergency Management.

Holly also discussed changes to spill reporting. Under Section 2018 of the America's Water Infrastructure Act (AWIA), DEQ will report more information about hazardous materials spills to ODW, which staff will pass along to potentially affected waterworks. Holly's presentation follows the meeting minutes.

Policy Process Flow Chart: Nelson presented a diagram showing the process ODW follows to develop policy and guidance. The process is meant to keep the regulated community and WAC informed about, and engaged in, the development of policies and guidance, not to be surprised. Dwayne acknowledged that greater transparency and vetting means the process may not be as quick, but we expect to end up with a better product. A copy of the flow chart follows the meeting minutes.

WIIN Grants: Tony said efforts to begin sampling lead in drinking water at schools and child care facilities have been delayed by the coronavirus and remote learning (buildings are closed, or use is limited).

Newsletter: Nelson and Dwayne said that ODW staff suggested creating a periodic newsletter for waterworks owners and operators. Nelson showed an example of a newsletter ODW staff produced in 2012-2013. Dwayne asked for comments from WAC members about a newsletter. One member responded that staff at his waterworks meet with their district engineer about three times a year and they find the 1:1 time to be very valuable. He also suggested ODW could contribute to an existing publication (such as the VA AWWA magazine) on regular basis instead of producing its own newsletter. Another WAC member liked the idea and thought it would be a good tool to help disseminate information to his staff and customer base. Dwayne will take the feedback from WAC members back to the leadership team for consideration. A newsletter from 2013 follows the meeting minutes.

6. Division of Technical Services

Compliance Monitoring Data Portal: Bob presented statistics about the number of laboratories that have completed, or are in progress to complete, the conversion to electronic data transmissions as of mid-September, 2020. Not all labs in the state met the September 1 deadline, but ODW has provided

flexibility for those that are actively transitioning. Bob's presentation on CMDP and the draft Permit Manual follow the meeting minutes.

Permit Manual: ODW staff completed a draft update to the Permit Manual (former Working Memo 784) and plan to share the draft with WAC members before posting it on Town Hall for public comment. The Commissioner's Office is reviewing the draft. (Va. Code § 2.2-4002.1 (effective July 1, 2018) requires state agencies to provide 30 days for public comment on guidance documents before they become effective.)

Drinking Water Watch: Bob demonstrated the new version of Drinking Water Watch that is available on the Drinking Water program webpage (https://odw.vdh.virginia.gov/DWW-VA/DWW_login.jsp). With implementation of this tool, ODW intends to discontinue sending copies of laboratory reports and sample schedules to owners and operators, saving significant resources. Users need to register to gain access to certain information specific to their waterworks, including immediate access to sample results and sample schedules. The public access does not show points of contact and shows sample results after 45 days. Drinking Water Watch has sample schedules and results for each waterworks. ODW staff will follow up with a WAC member that had questions about data errors.

Bob also informed WAC members about the information for schools related to water management plans that is on the Drinking Water Program website. ODW staff added information to help schools plan for and meet the requirements in SB410 (requiring public schools to develop and implement water management plans to prevent Legionnaires' disease). See https://www.vdh.virginia.gov/drinking-water/implementing-sb-410-in-school-building-startup/

7. EPA Updates/Rules

Lead and Copper Rule Revisions: the final Lead and Copper Rule Revisions (LCRR) are still under review at the Office of Management and Budget (OMB). The final LCRR was sent to OMB for its review on July 31, and EPA Administrator Andrew Wheeler has consistently stated over the summer that the final LCRR will be published in September. This is a significant rule for EPA, primacy agencies, water systems, and the public that will take a major effort by all to implement.

Perchlorate: On June 18, 2020, the U.S. Environmental Protection Agency (EPA) issued a final action regarding the regulation of perchlorate under the Safe Drinking Water Act (SDWA). Considering the best available science and the proactive steps that EPA, states and public water systems have taken to reduce perchlorate levels, the agency determined that perchlorate does not meet the criteria for regulation as a drinking water contaminant under the SDWA. Therefore, the agency withdrew the 2011 regulatory determination and decided to not issue a national regulation for perchlorate.

The Natural Resources Defense Council sued the EPA in the D.C. Circuit on Sept 3 for failing to set drinking water standards for perchlorate. The advocacy group petitioned the U.S. Court of Appeals for the District of Columbia Circuit to review the Environmental Protection Agency's decision on perchlorate, announced in June and published in the Federal Register in July.

PFAS: Southeast Virginia Field Office Director Dan Horne briefly reviewed EPA activities related to Per- and Polyfluorinated Alkyl Substances (PFAS) over the past several months. He discussed a proposed Regulatory Determination to regulate PFOA and PFOS (two specific PFAS chemicals), analytical methods for certain PFAS (EPA methods 533, 537 and 537.1), an EPA final rule listing certain PFAS chemicals

under the Toxics Release Inventory, and an EPA final rule prohibiting manufacture, use, or importation of products containing certain PFAS chemicals (under the Toxic Substances Control Act). A summary of Dan's presentation follows the meeting minutes.

8. <u>Other Business</u>

ODW staff are working on the assessment of the drinking water program required by House Joint Resolution 92 (2020). The report is due in December and ODW hopes to include results from the Office of State Inspector General audit that is wrapping up now. Staff expect to have a draft of the report ready for review by the Commissioner's Office by the end of October.

Dwayne reminded the WAC that the next meeting is scheduled for December 16, 2020. WAC members did not request a meeting in November to consider any of the work underway in ODW before the next meeting.

Dwayne concluded the meeting at 11:50 am.

Policy and Program Briefing

Nelson Daniel
ODW Policy and Program Director

Final Amendments to the Waterworks Regulations

Dwayne Roadcap presented the Final Amendments to the Waterworks Regulations to the Board of Health at their December 3, 2020 meeting.

- The Board approved the final amendments.

VDH is in the process of submitting the amendments to the Registrar through the Town Hall.

- Initiates the Executive Branch Review process.
- The OAG reviews regulatory proposals at the at the final stage if changes with substantial impact, as determined by either the promulgating agency or DPB, have been made since the proposed stage.

Final Amendments to the Waterworks Regulations

Executive Branch Review consists of:

Department of Planning and Budget (DPB) review - ensures the regulation complies with the requirements of Governor Northam's Executive Order 14 and assess the effect of any substantive changes made since the publication of the proposed regulation and ODW's responsiveness to public comment

- 21 days (may extend);

Health and Human Resources (HHR) review

- 14 days (may extend); and

Governor's Office review

- no time limit.

Final Amendments to the Waterworks Regulations

Final Adoption Period:

If the Governor approves the final amendments, the Registrar will publish them in the *Virginia Register of Regulations*,

- Initiates a 30-day final adoption period
- The public can review, request opportunity to submit oral & written comments.

If at least 25 persons request an opportunity to submit comments on any substantive changes to the regulations between proposed and final amendments, ODW will suspend the regulatory process for 30 days to solicit comments…

Otherwise the regulations become effective at the end of the 30-day final adoption period.

Waterworks Operation Fee Regulations

Periodic Review:

Every four years to determine whether they should be continued without change or be amended or repealed, consistent with the stated objectives of applicable law, to minimize the economic impact on small businesses in a manner consistent with the stated objectives of applicable law.

Waterworks Operation Fee Regulations

Procedural requirements:

Prior to commencement, the agency shall publish a notice of the review in the *Register* and post the notice on Town Hall.

The agency shall provide a minimum of 21 days for public comment after publication of the notice. VDH will allow 30 days.

No later than 120 days after close of the public comment period, the agency shall publish a report of the findings of the regulatory review in the *Register* and post the report on Town Hall. (Form TH-07)

Waterworks Operation Fee Regulations

The review shall include:

(1) the continued need for the rule;

(2) the nature and complaints or comments received concerning the regulation from the public;

(3) The complexity of the regulation;

(4) the extent to which the regulation overlaps, duplicates, or conflicts with federal or state law or regulation; and

(5) the length of time since the regulation has been evaluated or the degree to which technology, economic conditions, or other factors have changed in the area affected by the regulation.

Waterworks Operation Fee Regulations

Periodic Review:

Last review: 10/7/2016 – no comments received

Agency Findings (TH-07): 3/1/2017 “VDH believes the continuation of this regulation, without amendment or change, will provide for the ongoing existence of an important public health protection program.”

Next review due: 12/29/2020

Waterworks Operation Fee Regulations

Expectations:

Based on budget needs, possibility of public comment on existing requirements…

Publish Notice of Intended Regulatory Action (NOIRA)

Initiate stakeholder engagement to develop amendments to the regulations.

Coronavirus Vaccine

COVID-19 Vaccinations for the Water and Wastewater Sector

The Water Sector Coordinating Council, comprising representatives of the national water and wastewater organizations, urges drinking water and wastewater utilities across the country to contact their state and local public health agencies to ensure their staff members are included in Phase 1-B of their communities' COVID-19 vaccine distribution plans.

Based on the Centers for Disease Control and Prevention's COVID-19 Vaccination Program Interim Playbook for Jurisdiction Operations, water and wastewater utility employees should be among those eligible for inclusion in this early phase given their federal designation as "essential workers." However, it is critical for utilities to work with local agencies to ensure this federal guidance translates into local action.

Full WSCC Statement

Coronavirus Vaccine

Water Sector Coordinating Council

TO: U.S. Water and Wastewater Utilities
FR: Water Sector Coordinating Council
DT: December 14, 2020

RE: COVID-19 Vaccinations for the Water and Wastewater Sector

The Water Sector Coordinating Council, comprising representatives of the national water and wastewater organizations, urges drinking water and wastewater utilities across the country to contact their state and local public health agencies to ensure their staff members are included in Phase 1-B of their communities' COVID-19 vaccine distribution plans. Based on the Centers for Disease Control and Prevention's COVID-19 Vaccination Program Interim Playbook for Jurisdiction Operations, water and wastewater utility employees should be among those eligible for inclusion in this early phase given their federal designation as "essential workers." However, it is critical for utilities to work with local agencies to ensure this federal guidance translates into local action.

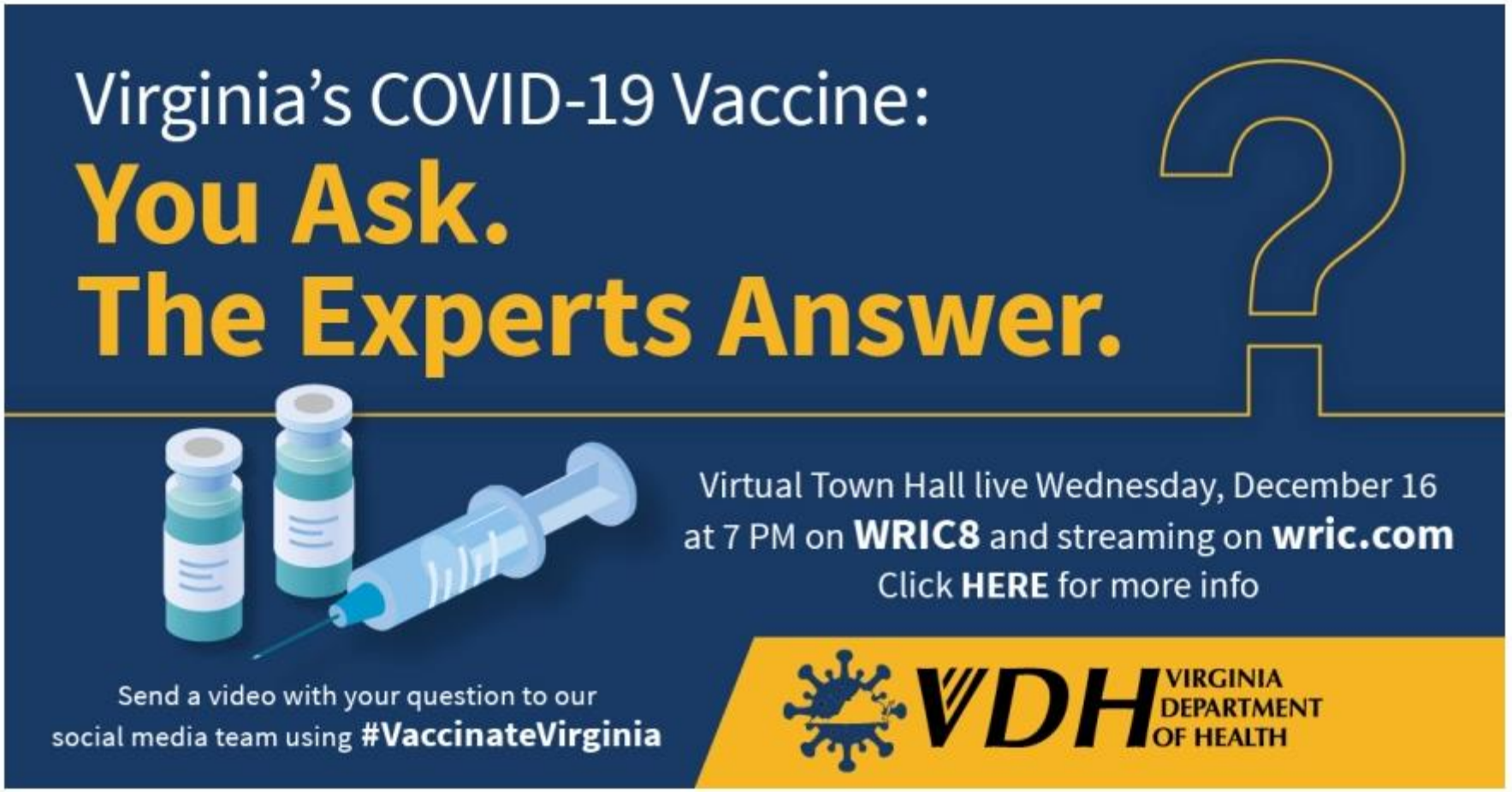
Vaccinating frontline water and wastewater utility staff members is particularly important because, as a lifeline sector, water and wastewater sector services underpin all aspects of society, including hospitals and long-term care facilities. Due to the specialized skills and licenses required for utility operations, and the corresponding challenges in finding replacements for staff members who may become ill or exposed, it is essential to mitigate staff members' COVID-19 risks through all possible means, including vaccinations.

Local engagement is critical because, while the federal government has issued recommendations for vaccine prioritization, the final decisions related to planning and distribution will occur at the state and local levels. In a December 7 email to Water and Wastewater Sector partners, the U.S. Environmental Protection Agency's Water Security Division recognized the CDC's interim playbook "recommends non-health care essential workers, which include water utility staff, receive priority in Phase 1-B" and stated it "recommends water utilities coordinate with their state and local governments and health departments regarding vaccination distribution planning."

It is important to reach out to state and local public health agencies soon, as prioritization decisions are being made now. Following these conversations, utilities should begin to develop internal priorities for vaccinations, recognizing that utilities may not receive enough doses to vaccinate every staff member. These priorities will be unique to the operational requirements of each utility and should ensure that allocated doses are distributed in a way that effectively protects the sector's core public health mission.

The council thanks the nation's water and wastewater utilities for their contributions to the national response to the COVID-19 pandemic.

Coronavirus Vaccine



Coronavirus Vaccine

COVID-19 Vaccine Town Hall, Dec. 16 at 7 PM

Posted on December 11, 2020

Virginia's COVID-19 Vaccine Town Hall: You Ask. The Experts Answer. Community and medical leaders answer your questions about the COVID-19 vaccine on **Wed., December 16 at 7 p.m.** Learn more about the town hall: https://www.wric.com/vaccinate-virginia/.

Send your questions prior to the show to news@wric.com or post them on Facebook, Twitter or Instagram using the hashtag #VaccinateVirginia.

This event will be live broadcast and streaming at:

- WRIC8 / wric.com
- WAVY10 / wavy.com
- WDCW / dcw50.com
- FOX43 / wavy.com
- WFXR / wfxrtv.com
- WDVM / localdvm.com
- News Channel 11 / wjhl.com

Town Hall Panelists Include:

- DR. NORM OLIVER
  Virginia State Health Commissioner, VDH
- DR. EBONY J. HILTON
  Anesthesiology / Critical Care, UVA Health
- DR. COSTI SIFRI
  Infectious Diseases and International Health, UVA Health
- DR. ETHLYN GIBSON
  Hampton University School of Nursing, Associate Professor
- DR. REBECCA VARGAS-JACKSON
  Physician Manager Support of the COVID-19 Health Equity Group, VDEM

Learn more about Virginia's COVID-19 Vaccination Response: https://www.vdh.virginia.gov/covid-19-vaccine/

REPORT OF THE OFFICE OF DRINKING WATER OF THE VIRGINIA DEPARTMENT OF HEALTH

A Study on Virginia's Drinking Water Infrastructure and Oversight of the Drinking Water Program (HJR 92, 2020)

TO THE GOVERNOR AND THE GENERAL ASSEMBLY OF VIRGINIA

HOUSE DOCUMENT NO. 13

COMMONWEALTH OF VIRGINIA
RICHMOND
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A Study on Virginia's Drinking Water Infrastructure and Oversight of the Drinking Water Program

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VDH VIRGINIA DEPARTMENT OF HEALTH
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Office of Drinking Water
Safe Drinking Water for a Healthy Virginia

Table of Contents

Executive Summary

The Virginia Department of Health (VDH), Office of Drinking Water (ODW) protects public health through its oversight of Virginia's drinking water program. ODW regulates 2,811 waterworks in the Commonwealth of Virginia, collectively serving approximately 7.5 million consumers--about 89% of the Commonwealth's total population. The drinking water program is vital. Safe and adequate drinking water directly influences community health and economic prosperity. Businesses use drinking water every day for processing, cooling, and product manufacturing. New businesses need drinking water to serve communities. Although Virginia's drinking water is among the safest and most reliable in the world, several case studies offered in this report serve as reminders of the importance of capital improvements and asset management to address aging infrastructure.

ODW collaborates with owners, operators, and stakeholders to protect public health and the environment. ODW ensures compliance with applicable laws and regulations by conducting sanitary surveys and inspections; providing training and technical assistance; issuing permits and plan approvals; tracking compliance monitoring; managing data and information; training licensed operators; and where appropriate, taking enforcement actions and offering low interest loans. Virginia's drinking water program protects public health from "source to tap" by assessing the vulnerability of water sources and preparing communities for resilient response to natural and manmade hazards. ODW's program has high compliance rates with water quality standards. Core metrics for the program include the percent of waterworks with an unresolved health-based violation (less than 2%), the percent of waterworks that sample on time (better than 98%), and the percent of waterworks inspected on time (over 99%).

Climate change can impact availability of water and water quality in Virginia. More intense weather can cause more severe droughts or worsening run-off, both adversely affecting water quality and quantity. Good water infrastructure and planning creates resilience to combat the effects of climate change and ensure public health and safety. Old and unmaintained water infrastructure leaks can allow contaminants to enter the drinking water supply with weak pressure. Significant leaks also reduce revenues and unnecessarily deplete aquifers and surface water sources affected by climate change.

During the SARS-CoV-2 pandemic, ODW actively monitored and helped waterworks, focusing on community waterworks. ODW encouraged and promoted water shut-off moratoriums to ensure citizens had access to drinking water, essential in the pandemic fight to keep surfaces clean and for personal hygiene. ODW also established guidance to ensure essential staff, such as licensed operators and maintenance workers, were available and had sufficient policies in place to protect drinking water. ODW worked with stakeholders to ensure minimal impacts to waterworks during the pandemic. The pandemic highlighted the critical importance of the drinking water program's sustainability and resiliency.

In 2015, EPA estimated Virginia had an $8.135 billion need over the next 20 years at its 1,100 community waterworks, which represented an 8% increase from EPA's last assessment in 2011. EPA's assessment suggests Virginia has a $407 million annual average of water infrastructure need. EPA is currently updating its 2015 needs assessment. One tool Virginia has to address infrastructure need is the Drinking Water State Revolving Fund (DWSRF), a federal grant program that funds construction projects at waterworks. Virginia must provide a 20% match, and combined with interest and principal repayments, ODW can offer about $22.5 million per year to support waterworks infrastructure funding in small and disadvantaged communities. ODW offers construction loans below private market rates and can oftentimes provide funding when a small or disadvantaged community cannot get funding in the

private marketplace. In addition, research shows that each $1 of DWSRF investment in water infrastructure provides almost $3 in economic benefit. Adding one job in the water sector creates an estimated 3.68 jobs in the local economy to support that job.[1] Non-economic benefits include public confidence in the drinking water supply and safety, which promotes health and financial stability as citizens look for options other than sugary beverages and more expensive bottled water.

Lead in drinking water is a risk to public health. There is no safe level of lead consumption. Several communities in Virginia receive DWSRF benefits through the lead service line replacement (LSLR) program. ODW has awarded $3.69 million for eight projects in four localities over the past several years using DWSRF funding. Alexandria, Henry County, Richmond, and Chesapeake all received help to replace lead service lines. Other communities are also seeking help with LSLR, but there is limited federal funding and no dedicated state funding to more proactively remove lead service lines.

The Public Water System Supervision (PWSS) program, funded by another federal grant, provides about $2.1 million in funding each year, with a 25% state match. The PWSS grant primarily funds staffing needs to oversee waterworks. Operation fees that community and nontransient noncommunity waterworks pay annually provide approximately $4.8 million per year in additional support to program. Over the past three years, the drinking water program's operating budget has remained flat while expenses have increased, creating a funding need for the program.

More funding would ensure a robust program in Virginia. As of October 2020, ODW had two vacancies. ODW currently has 119 full time employees (including two vacancies) budgeted for FY 2021. ODW estimates it needs more funding for operations to implement core federal grant programs to maintain primacy. However, because of funding concerns, ODW has instituted a hiring freeze on critical positions. The DWSRF grant allows up to 32% of funding to go towards "set-aside" programs. These set-asides provide significant funding for ODW programs. With the PWSS and operation fee funding flat over several years,[2] ODW has increasingly relied on the set-aside funds under the DWSRF to support staff positions and operations.

Lead sampling and legionella in schools, harmful algal blooms, injection of highly treated wastewater into drinking water aquifers, per- and polyfluoroalkyl substances (PFAS), and various responses for coal ash disposal and planned natural gas pipelines stress limited resources required to operate the drinking water program. Emerging contaminants and unregulated contaminants also remain a public health concern and increasing resource needs. The 2020 Virginia General Assembly session resulted in more work directed to ODW to address lead in drinking water at schools and child day programs (SB392, SB393, HB797, and HB799), PFAS (HB586 and HB1257), and legionella at schools (SB410). ODW anticipates more non-regulatory and regulated activities requiring more resources. For example, the U.S. Environmental Protection Agency expects to issue lead and copper rule revisions (LCRR) soon. Due to the complexity of the proposed LCRR, ODW estimates it will likely require 12 more full-time employees (FTEs) to properly implement, but no additional funding is provided for this need.

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[1] The U.S. Conference of Mayors. Local Government Investment in Municipal Water and Sewer Infrastructure: Adding Value to the National Economy. Richard A. Krop, Ph.D., Charles Hernick, and Christopher Frantz. The Cadmus Group, Inc. August 14, 2008. See also the 2017 Drinking Water State Revolving Fund Eligibility Handbook. EPA, June 2017.

[2] Operation fees are capped at $3.00 per service connection, not to exceed $160,000 per year, by Code of Virginia § 32.1-171.1 and the Budget Bill.

Eight waterworks had lead action level exceedances during 2019. As of the first quarter of 2020, 33 active waterworks had LCR monitoring/reporting violations and four had LCR treatment technique violations. With lower action levels in the LCRR, ODW expects the number of waterworks with lead violations to increase.

ODW has undertaken several initiatives since 2017 to improve business process and efficiency. ODW requires laboratories to submit sampling results electronically through the EPA's Compliance Monitoring Data Portal (CMDP). Requiring data submission through CMDP reduces errors, improves data quality, and allows ODW to focus on higher priority needs. Next, ODW is on-boarding new software to remove old, unsecure databases and allow staff to perform inspections with tablets that automatically upload and share results in real time.

Finally, ODW reworked some staff duties to create a compliance specialist position in each field office and a compliance coordinator in the central office. With one position in each field office focused on compliance issues, central office staff worked with field directors and compliance specialists to implement several new policies and procedures to reduce the number of waterworks that EPA classified as "serious violators" because of ongoing non-compliance (generally related for a failure to monitor). ODW revised its Enforcement Manual to reflect the new roles and approach. During 2019, VDH issued 1,250 NOAVs, 80 warning letters, and one Special Order. In the past five years (2015-2019), the number of community waterworks with health-based violations has continued to decline. As of August 2020, only 1.8%, or 20 community waterworks had health-based violations. Serious violators decreased from 30 in 2019 to 11 in 2020.

The Office of the State Inspector General (OSIG) is performing a programmatic review of Virginia's drinking water program to determine whether ODW effectively monitors waterworks in Virginia. OSIG's interim report and recommendations are found in Section VI. Agency recommendations are found in Section V.

Definitions

"Action level" means the concentration of lead or copper in water specified in 12VAC5-590-385, which determines, in some cases, the treatment requirements contained in 12VAC5-590-405 that an owner is required to complete.

"Community waterworks" means a waterworks that serves at least 15 service connections used by year-round residents or regularly serves at least 25 year-round residents.

"Consumer" means any person who drinks or uses water from a waterworks for human consumption.

"Level 1 assessment" means an evaluation to identify the possible presence of sanitary defects, defects in distribution system coliform monitoring practices, and, when possible, the likely reason that the waterworks triggered the assessment.

"Level 2 assessment" means an evaluation to identify the possible presence of sanitary defects, defects in distribution system coliform monitoring practices, and, when possible, the likely reason that the waterworks triggered the assessment in a more comprehensive investigation than a Level 1 assessment.

"Maximum contaminant level" or "MCL" means the maximum permissible level of a contaminant in pure water that is delivered to any user of a waterworks. MCLs are set as close to EPA's maximum contaminant level goals as feasible using the best available treatment technology. MCLs may be either

"primary" (PMCL), meaning based on health considerations, or "secondary" (SMCL) meaning based on aesthetic considerations.

"Nontransient noncommunity waterworks" or "NTNC" means a waterworks that is not a community waterworks and that regularly serves at least 25 of the same persons over six months out of the year. Schools, factories, and long-term health care facilities that operate their own waterworks are examples of NTNC waterworks.

"Service connection" means the point of delivery of water to a customer's building service line as follows:

1. If a meter is installed, the service connection is the downstream side of the meter;

2. If a meter is not installed, the service connection is the point of connection to the waterworks;

3. When the waterworks owner is also the building owner, the service connection is the entry point to the building.

"Small waterworks" means a waterworks that serves 3,300 persons or fewer.

"Transient noncommunity waterworks" or "TNC" means a noncommunity waterworks that is not a nontransient noncommunity waterworks. A TNC serves at least 25 persons daily for at least 60 days out of the year. Restaurants, campgrounds, and marinas that operate their own waterworks are examples of TNC waterworks.

"Very small waterworks" means a waterworks that serves 1,000 persons or fewer.

"Waterworks" means a system that serves piped water for human consumption to at least 15 service connections or 25 or more individuals for at least 60 days out of the year and includes all structures, equipment, and appurtenances used in the storage, collection, purification, treatment, and distribution of pure water except the piping and fixtures inside the building where such water is delivered.

Acronyms

AL	Action level
AMP	Asset Management Plan
AWIA	America's Water Infrastructure Act
BSSP	Bacteriological Sample Siting Plans
CFR	Code of Federal Regulations
CIP	Capital Improvement Plan
CDBG	Community Development Block Grant
CMDP	Compliance Monitoring Data Portal
CWDF	Coalfield Water Development Fund
DWINSA	Drinking Water Infrastructure Needs Survey and Assessment
DWSRF	Drinking Water State Revolving Fund
EMMA	Electronic Municipal Marketing Access
EPA	U.S. Environmental Protection Agency
ETT	Enforcement Targeting Tool
FCAP	Financial & Construction Assistance Program
FOIA	Freedom of Information Act
FY	Fiscal year
GIS	Geographic Information Systems

HUD	Housing and Urban Development
IUP	Intended Use Plan
LCR/LCRR	Lead and Copper Rule / Lead and Copper Rule Revisions
LSL	Lead service lines
LSLR	Lead Service Line Replacement (Program)
MCL	Maximum contaminant level
mg/l	Milligrams per liter (which are equivalent to parts per billion)
NOAV	Notice of Alleged Violation
NPDWR	National Primary Drinking Water Regulations, 40 CFR Part 141
NTNC	Nontransient Noncommunity Waterworks
ODW	Office of Drinking Water
OSIG	Office of the State Inspector General
PMCL	Primary maximum contaminant level
PFAS	Per and Polyfluoroalkyl substances
ppb	Parts per billion (which are equivalent to milligrams per liter)
PWSS	Public Water System Supervision
PWSL	Public Water Supply Law, Code of Virginia §§ 32.1-167 through 32.1-176
RTCR	Revised Total Coliform Rule
SDWA	Safe Drinking Water Act, 42 U.S.C. § 300f et seq.
SDWIS	Safe Drinking Water Information System
SERCAP	Southeast Rural Community Assistance Project
SWAP	Source Water Assessment Program
SWPP	Source Water Protection Program
TMF	Technical, managerial and financial
TNC	Transient Noncommunity Waterworks
VAC	Virginia Administrative Code
VDH	Virginia Department of Health
VPFP	Virginia Pooled Financing Program
VRWA	Virginia Rural Water Association
VRA	Virginia Resources Authority
WEP	Rural Utilities Service Water and Environmental Programs
WIFIA	Water Infrastructure Finance and Innovation Act

I. Purpose of Study

ODW prepared this report in response to House Joint Resolution No. 92 (HJ92), which Delegate Lopez sponsored during the 2020 General Assembly session. The bill text is as follows:

HOUSE JOINT RESOLUTION NO. 92
Agreed to by the House of Delegates, February 10, 2020
Agreed to by the Senate, February 25, 2020

Requesting the Office of Drinking Water of the Department of Health to study the Commonwealth's drinking water infrastructure and oversight of the drinking water program. Report.

Patron—Lopez

WHEREAS, the Office of Drinking Water of the Department of Health is responsible for protecting the public health by ensuring that all people in the Commonwealth have access to an adequate supply of clean, safe drinking water that meets federal and state drinking water standards; and

WHEREAS, the National Primary Drinking Water Regulations and state Public Water Supplies Law 14 (§ 32.1-167 et seq. of the Code of Virginia) and state regulations governing waterworks and waterworks operators set out standards for drinking water quality, drinking water infrastructure, and oversight of the drinking water program; and

WHEREAS, problems or issues with the existing drinking water infrastructure or oversight of the drinking water program may result in an increased risk of contamination of drinking water with lead, copper, and other substances or organisms; and

WHEREAS, contamination of drinking water may have serious negative effects on the health and well-being of residents of the Commonwealth; now, therefore, be it

RESOLVED by the House of Delegates, the Senate concurring, That the Office of Drinking Water of the Department of Health be requested to study the Commonwealth's drinking water infrastructure and oversight of the drinking water program.

In conducting its study, the Office of Drinking Water of the Department of Health shall (i) evaluate the existing drinking water program infrastructure and oversight of the drinking water program to identify problems or issues that may result in contamination of drinking water with lead or copper or other substances or organisms or increase the likelihood of contamination of drinking water with lead or copper or other substances or organisms and (ii) develop recommendations for addressing such problems or issues.

All agencies of the Commonwealth shall provide assistance to the Office of Drinking Water of the Department of Health for this study, upon request.

The Office of Drinking Water of the Department of Health shall complete its meetings by November 30, 2020, and shall submit to the Governor and the General Assembly an executive summary and a report of its findings and recommendations for publication as a House or Senate document. The executive summary and report shall be submitted as provided in the procedures of the Division of Legislative Automated Systems for the processing of legislative documents and reports no later than the first day of the 2021 Regular Session of the General Assembly and shall be posted on the General Assembly's website.

ODW compiled data on Virginia waterworks and reports from professional organizations, the federal government, and academia to develop this report. Staff presented a working draft to the Waterworks Advisory Committee, a stakeholder group established through Virginia's Waterworks Regulations,[3] to

[3] See 12VAC5-590-40 (5).

receive their input and recommendations on the draft report. ODW also worked with OSIG regarding its review of program activities.

II. Oversight of Drinking Water Program

The Public Water Supplies law (PWSL) authorizes the Board of Health to supervise and control all water supplies and waterworks in the Commonwealth insofar as the bacteriological, chemical, radiological, and physical quality of waters furnished for human consumption may affect public health and welfare.[4] Enacted in 1950, the PWSL is broader than the Safe Drinking Water Act (SDWA) in that it authorizes the Virginia Department of Health (VDH) to regulate not just drinking water standards and treatment practices, but also waterworks construction, operation, and maintenance, permitting, enforcement, and receivership.

Congress passed the SDWA in 1974, which authorized EPA to promulgate the National Primary Drinking Water Regulations (NPDWR). The NPDWR set forth uniform, nationwide standards for drinking water to protect the public against adverse health effects from exposure to naturally occurring and man-made contaminants. Congress amended and reauthorized the SDWA in 1986, 1996, 2005, 2015, 2016, and 2018. The 1986 amendments directed EPA to establish standards for 83 additional contaminants and to incorporate filtration at surface water treatment plants. The 1996 amendments focused on risk-based decision-making, sound science, transparency, consumer education and awareness.

In addition to setting drinking water standards and treatment techniques, the SDWA also allows EPA to award states with primacy (i.e., primary responsibility for implementing the federal program). To maintain primacy, Virginia promulgated the Waterworks Regulations, which may be no less stringent than the federal requirements in the SDWA and NPDWR. Through primacy, VDH oversees monitoring and reporting requirements, routine operations, plans for construction and modification, sanitary surveys, training and technical assistance, and enforcement of drinking water standards. VDH has been the primacy agency for the federal law and regulations since 1977.

If a waterworks violates a water quality standard or other requirement, then VDH's priority is to work with the waterworks to address the issue and return to compliance. VDH issues notices of alleged violation to inform the waterworks of the regulatory requirement not met and what the waterworks must do to return to compliance. If the waterworks is either unwilling or unable to address the violation in a timely and appropriate manner, then enforcement may be necessary. Enforcement can include informal letters and meetings, or formal administrative orders requiring compliance actions. Enforcement also works with the Financial and Construction Assistance Program (FCAP) and Capacity Development to identify resources and provide technical, managerial and financial (TMF) capacity assistance to waterworks. Waterworks with health-based violations are reported to the EPA, the Enforcement Targeting Tool, which weighs violations based on the history of noncompliance and the potential for harm to human health.

The PWSL also authorizes the State Health Commissioner to issue an emergency order to protect public health from imminent dangers. In most cases, emergency responses are left up the waterworks owners and operators that are most familiar with the waterworks' design and operation, condition of infrastructure, system capabilities, and governing resources. ODW typically provides a supporting role by providing technical assistance, information to various entities and waterworks, and other compliance

[4] See Code of Virginia § 32.1-167, et seq.

assistance as needed. Most incidents involve water main breaks, equipment failures, pressure loss, or boil water notices.

a. ODW Management and Organizational Structure

VDH is the primacy agency for implementing the SDWA in the Commonwealth of Virginia. Within VDH, the Office of Drinking Water (ODW) is responsible for implementing the drinking water program. ODW has six regional field offices and a central office to support field office activities. The Office Director oversees the Divisions of Compliance and Enforcement; Policy and Program Guidance; Capacity Development, Training and Outreach; Financial and Construction Assistance Program; Emergency Preparedness and Security; and business management working through VDH's Shared Business Services.

Reporting to the Office Director, the Deputy Office Director supervises six field offices and the Division of Technical Services, which includes oversight of the sanitary survey and permit programs, data management, source water protection, and laboratory coordination. In 2019, following the suggestion of an organizational study by Virginia Commonwealth University's Performance Management Group, ODW converted a support office into a sixth field office, the Richmond Field Office. ODW redrew boundaries and rebalanced workload among the six field offices in 2020. Field offices work directly with waterworks owners, operators, and consultants to review construction plans, draft and issue permits, inspect waterworks for compliance, and provide technical and operational assistance. They also evaluate monthly and quarterly operation reports to ensure waterworks are providing adequate water quality and quantity, flag potential compliance issues, and help waterworks return to compliance when there are monitoring, reporting, or other alleged violations of the Waterworks Regulations. ODW's central office in Richmond supports the field offices through following core programs:

Technical Services

The Division of Technical Services oversees the sanitary survey program, including monitoring sanitary survey metrics, schedule attainment, completion of the eight elements of a sanitary survey[5], development of program documents, revisions to the program, record keeping, and reporting to EPA. VDH considers sanitary surveys as a cornerstone of the drinking water program to ensure safe, adequate, and reliable supply of drinking water that meets both state and federal drinking water standards.

A sanitary survey is a review of a public water system to assess its capability to supply safe drinking water. Sanitary surveys provide an opportunity for ODW to visit the waterworks and educate the operator about proper monitoring and sampling procedures and provide other technical assistance. Sanitary surveys are a proactive public health measure and an important component of the SDWA and PWSS grant. Over the years, VDH has maintained a strong sanitary survey program with surveys conducted more frequently than the federal requirement.

The PWSL and Waterworks Regulations require a permit from the State Health Commissioner to construct or operate any waterworks. The Commissioner has delegated this authority to ODW to issue permits. The Division of Technical Services oversees the statewide project review program and operation

[5] 12VAC5-590-350. A sanitary survey includes an evaluation of all of the following eight components: source; treatment; distribution system; finished water storage; pumps, pumping facilities, and controls; monitoring, reporting, data verification, and a special monitoring evaluation during each sanitary survey to determine whether the waterworks monitoring is appropriate or needs modification; waterworks management and operation; and number and classification of licensed operator(s).

permit program, including developing program documents, guidance documents, recordkeeping, related training, and ongoing quality control.

Field staff review project documentation, including plans, specifications, engineer reports, and other construction data to confirm that the proposed construction will comply with the design requirements established in the Waterworks Regulations. Following a satisfactory review, ODW issues waterworks construction permits to waterworks to complete upgrades and modifications. When construction is complete, ODW inspects the work, evaluates water quality, and, following approval, issues operation permits. ODW may issue a temporary permit if the waterworks does not fully comply with the Waterworks Regulations, but the conditions do not jeopardize public health.[6] A temporary permit will contain conditions required to achieve compliance and a specific time to achieve compliance.

Field staff provide technical assistance to waterworks owners, operators, consultants and the public on a variety of drinking water topics during sanitary surveys, preliminary engineering conferences, training events, and calls or meetings. Technical assistance is a critical part of ODW's efforts to help waterworks achieve and maintain compliance with the regulations. The Division of Technical Services develops guidelines, policies, and standards for field staff to provide technical assistance.

Source water programs include the Source Water Assessment Program (SWAP), the Source Water Protection Program (SWPP), and the Interagency Project and Permit Review (IPPR) program. The SWAP facilitates and promotes source water protection measures among the waterworks community. ODW delineates an assessment area for each drinking water source and creates an inventory of potential sources of contamination using Geographic Information Systems (GIS). ODW uses this information to make a susceptibility determination of the drinking water source in relation to the potential source of contaminants found in the assessment area. The 1996 Amendments to the SDWA require ODW to develop a SWAP that will delineate the boundaries of assessment areas, identify contaminants, determine source susceptibility, and make these results available to the public.

The SWPP protects the quality of drinking water sources by preventing and reducing contamination. This is one of the best approaches to ensuring the sustainability of Virginia's drinking water supply. ODW provides resources to help fund local protection activities, such as wellhead protection programs for ground water and watershed management programs for surface waters. ODW encourages waterworks to add source water protection as part of a multi-barrier approach to providing safe drinking water.

The IPPR helps sister agencies and federal environmental reviews of large projects, including road projects and other development. Staff works with local health districts and other offices within the agency to collate comments and offer advice on possible concerns related to environmental health, epidemiology risks, and drinking water concerns.

VDH keeps an inventory of waterworks and reporting requirements. The Data Management team maintains the data systems and reporting requirements. The SDWA requires Virginia to maintain records of tests, measurements, analyses, decisions, and determinations performed on each waterworks. Virginia reports quarterly information about waterworks and violations to EPA. ODW has collaborated with

[6] See Code of Virginia § 32.1-172 E. Whenever application shall be made to the Commissioner for a permit, he shall examine the application and, as soon as practicable thereafter, shall issue the permit if, in his judgment, the proposed waterworks will furnish pure water. If the proposed waterworks is not in compliance with all regulations of the Board but, in the opinion of the Commissioner, the public health will not be jeopardized, the Commissioner may issue a temporary permit for such period of time and subject to such conditions as the Commissioner may deem appropriate for the owner to achieve compliance with such regulations.

certified laboratories, serving as waterworks owners' authorized agents, to receive analysis results in electronic format through CMDP for direct upload into the required databases. Data requires quality checks and corrections. In addition to maintaining the integrity of the data, data management is instrumental in response and recovery for all hazardous emergencies by providing information about waterworks status and laboratory analysis results. Through quality assurance, user training, tool development, laboratory results processing, and strong relationships and involvement in EPA data governance, the Data Management team ensures that the other divisions have the data necessary to perform their program functions effectively.

Training, Capacity Development and Outreach

ODW facilitates the development of TMF competencies for waterworks staff by offering and sponsoring on-going training. The curricula for these programs include technical topics such as: equipment operation and maintenance, drinking water chemistry and microbiology, water treatment technologies, and operator math. Managerial aspects of waterworks operation are addressed through course offerings on: the Virginia Waterworks Regulations, capacity development, financial planning, asset management, waterworks administration, and waterworks security.

The Waterworks Operator Short School is the preeminent water and wastewater operator training in Virginia. ODW actively participates in the Short School by providing many of the course instructors. This annual training is a week-long course held at Virginia Tech since the 1940's. There have always been three levels to the course: introductory, intermediate, and advanced. Each level provides approximately 15 classes and focuses on a variety of waterworks operations topics. The curricula for the intermediate and advanced courses build on the preceding year's course. A supervisory level course was added in 2018 to address skills that supervisors and lead operators need to be successful. Virginia Tech held the course July 27 through August 1, 2020 and 96 people attended this training.

Several additional training courses are offered through ODW. These courses are held in association with Virginia Tech, Mountain Empire Community College and other service providers. Course offerings can vary yearly; however, ODW maintains a core of training courses which assist waterworks develop employees and TMF capacity.

Capacity Development ensures that owners have the TMF capability to successfully operate, maintain, and sustain its waterworks over the long term. TMF capacity demonstrates the waterworks' ability to reliably produce and deliver drinking water that meets state and federal drinking water standards. A waterworks demonstrates technical capacity through its physical infrastructure, including its water source, and in its knowledge and skill in operating the facility. Managerial capacity is evidenced by a waterworks' planning, customer service, organization, and ability to operate the waterworks. Financial capacity is documented by the waterworks' ability to balance revenues and expenditures, maintain acceptable reserves, and achieve overall financial strength and stability.

These components directly correlate with a waterworks' ability to achieve and maintain compliance with the regulatory requirements, as well as plan and prepare for future maintenance and upgrades. The TMF components that constitute capacity are interdependent; all three are essential for ensuring the sustainability of a waterworks. Weakness in one area of capacity can in turn impair the other components. For example, waterworks that demonstrate a lack of managerial capacity by establishing inadequate service rates cannot set aside resources for future maintenance, limiting their financial capacity.

During the previous five years, the Capacity Development program has undergone tremendous growth. ODW reclassified four positions between 2014 and 2019 to provide direct technical assistance to waterworks. These positions quickly developed full workloads by assisting waterworks personnel with business operations plans, asset management plans, small engineering projects, planning and design funds, deployment of third party assistance, training, and numerous other outreach activities. ODW authorized the last position to provide services to transient and nontransient non-community waterworks.

Financial and Construction Assistance Program

The 1996 amendments to the SDWA established the DWSRF Program. Funds for the DWSRF are awarded to eligible states through an EPA capitalization grant. ODW administers the capitalization grant for the DWSRF and associated state funds. Funds awarded to a state through a capitalization grant are categorized into two uses: (i) non-project funds or set-asides and (ii) funds that are used for construction projects at waterworks. Construction funds address public health problems and ensure compliance with the applicable laws and regulations.

Virginia provides a 20% state match, which must be deposited into a dedicated state loan fund on or before the date the state receives the federal grant payments. The Virginia Water Supply Revolving Fund (Fund) is Virginia's dedicated state loan fund.[7] Under this state law and in conjunction with ODW, the Virginia Resources Authority (VRA) has been tasked by the General Assembly with the financial management of the Fund, and activities include: the disbursement and collection of DWSRF Program funds, verifying the credit worthiness of potential borrowers, and managing program assets through investments in securities or obligations. ODW must provide EPA with an annual Intended Use Plan (IUP) for the capitalization grant, which describes how the capitalization grant will be expended, including all set-aside and construction funds.

Congress has set the following goals for the DWSRF funds:

- Assistance to Small Waterworks: A minimum of 15% be awarded as loan assistance to waterworks that regularly serve fewer than 10,000 persons.
- Green Project Reserve: A minimum of 20% to address green infrastructure, water or energy efficiency improvements, or other environmentally innovative activities.
- Additional Subsidization: A minimum of 20% of the grant can be awarded to any project and up to an additional 35% in additional subsidies can be provided to communities that could not otherwise afford such projects. Additional subsidies should be directed to: 1) repair, replacement, and upgrade of infrastructure in existing communities; 2) investigations, studies, or plans that improve the technical, financial and managerial capacity of the assistance recipient to operate, maintain, and replace financed infrastructure; and/or 3) preliminary planning, alternatives assessment and eligible capital projects that reflect the full life cycle costs of infrastructure assets, conservation of natural resources, and alternative approaches to integrate natural or "green" systems into the built environment.

EPA conducts annual reviews of ODW's DWSRF program as part of their required responsibility to oversee and ensure ODW complies with their grant conditions. FCAP continues to initiate new metrics and programs, and customer service surveys indicate the program is effective and well received.

[7] See Code of Virginia § 62.1-233 et seq.

In FY 2020, EPA awarded Virginia $17.965 million for the DWSRF program, an amount that is consistent with previous years. Virginia's 20% match was almost $3.593 million. The state budget included this amount as passed in March 2020. However, during the budget session in April 2020, the Governor proposed and the legislature adopted amendments that included, among other things, unallotting $482,400 in FY2021 and the same amount in FY2022 as an increase related to the DWSRF capitalization grant. In order for VDH to provide the full 20% match for the grant, ODW will need to use DWSRF program assets, maintained outside of the Fund, and established to reimburse VRA's costs and expenses incurred in the administration of the Fund. ODW sold bonds this year to increase funds available for the construction project authorized in FY 2018 and FY 2019.

In FY2020, the DWSRF received $16,179,242 in principal repayments, $1,584,248 in interest repayments, $855,945 in administrative fees, and $1,749,940 in investment income. The weighted average interest rate on DWSRF-executed loan commitments was 2.31%, compared to the state market interest rate of 3.29%. Based on these returns and current DWSRF commitments, roughly $41.3 million will be available in FY2021 for DWSRF applicants. However, the unalotted funding directly reduces the program's ability to provide loans and grants, which reduce public health threats to drinking water. In FY 2020, VDH received 38 applications requesting $66.2 million, but could only offer funding to 15 projects for $20.2 million.

Emergency Preparedness and Security

The susceptibility of critical infrastructure to natural disasters and terrorist attacks makes security and protection of waterworks a priority. ODW's Emergency Preparedness Coordinator works with water utilities throughout Virginia to protect, prepare, mitigate, respond to, and recover from these types of incidents. This work unit engages in emergency response planning, continuity planning, and safety guidance for ODW staff, and works with the Virginia Department of Emergency Management as the primary lead for water and wastewater for the Virginia Emergency Support Team.

ODW also works with the Critical Infrastructure Security Program Coordinator and Cyber Security Program Coordinator in the Public Safety and Homeland Security Secretary's Office to provide training and information to waterworks. This work includes threat information and security assessments that are available through the Federal Department of Homeland Security. This work unit communicates water advisories and helps water utilities during emergency events by establishing partnerships in the local community, the private sector, and other state agencies as subject matter experts in emergency preparedness and security.

In an emergency, response mostly is left up to the waterworks owner and operator who are most familiar with the waterworks' design and operation, condition of infrastructure, system capabilities, and governing resources. ODW typically supports waterworks by providing technical assistance, information to various entities and waterworks, and other compliance assistance as needed. Most incidents involve water main breaks, equipment failures, pressure loss, or boil water notices.

Compliance and Enforcement

ODW uses a decentralized approach for enforcement actions. Field offices, each with one Compliance Specialist, take on most administrative work of formal enforcement actions, such as issuance of Consent Orders, and monitoring of enforcement cases with close support from the division director and staff in the Central Office. Central Office staff coordinate with agency counsel as needed, provide real-time compliance information, and help evaluate enforcement priorities as well as ensure consistent

enforcement actions and collaborate on enforcement strategies with the field offices. Compliance and enforcement staff work with the field offices to determine the best course of action. If there were an imminent and substantial risk to public health, VDH has emergency authorities it can invoke.

The enforcement process starts with a Notice of Alleged Violation (NOAV) to the owner/operator of a waterworks followed by various assistance including informal meetings, issuance of temporary permits, site visits, technical assistance, education, etc. to help the waterworks return to compliance. If not returned to compliance, ODW then considers enforcement strategies that are best suited to the situation. Enforcement actions can be informal (warning letters, enforcement meetings) or formal (bilateral Consent Orders or non-consent procedures such as informal fact-finding proceedings, formal hearings or unilateral Special Orders). Special Orders may include a civil penalty of not more than $1,000 for each day of violation.

Failure to comply with Consent Orders or Special Orders may result in ODW initiating state judicial enforcement actions. ODW refers the cases to agency counsel at the Office of the Attorney General to consider a civil action seeking enforcement of the order, injunctive relief, or a civil penalty; or requesting a direct criminal indictment through the Circuit Court by the local Commonwealth's Attorney. Although never done, ODW could petition the Circuit Court for receivership. ODW may also refer cases to EPA for enforcement. ODW may deploy the capacity development program and the DWSRF staff to assist waterworks with returning to compliance.

Policy and Program Guidance

This division monitors bills during the General Assembly session, provides oversight of FOIA, regulations, policies and procedures that affect ODW and its regulated community. During the 2020 General Assembly session, ODW monitored over 40 bills that could have impacted the drinking water program. ODW was lead analyst for seven bills, all of which passed and imposed responsibilities on ODW. During 2019, ODW proposed significant amendments to the Waterworks Regulations and the Policy and Program Guidance Director helped lead conversations with stakeholders and move the work product through the Administrative Process Act requirements. Public comment on the proposed amendments closed in January 2020. Staff are preparing final amendments to submit to the Board of Health for approval. During the pandemic, the Policy and Program Guidance Director developed program guidance for staff safety and managing permit requirements for waterworks that shut down or significantly reduced operations. The program continues to focus on simplifying business process, reducing paper-based processes.

b. Drinking Water Program in Virginia

EPA's 2019 annual primacy review of Virginia's PWSS program concluded that ODW continues to implement an effective drinking water program. This section provides an overview of the data presented in EPA's 2019 report.[8]

VDH regulates 2,811 public water systems serving 7,509,763 citizens of Virginia. As presented in the table below, these water systems are divided into 1,099 community waterworks (CWS), 512 non-transient non-community waterworks (NTNC), and 1,200 transient waterworks (TNC). The number of community systems continues to decline, reflecting consolidation.

[8] Annual Review of the Public Water System Supervision Program for the Commonwealth of Virginia. Environmental Protection Agency. Report date, August 2020.

Virginia Waterworks Inventory

	CWS	Pop.	NTNC	Pop.	TNC	Pop.	Total Systems	Total Pop.
2019	1,099	7,031,012	512	285,278	1,200	193,473	2,811	7,509,763
2018	1,103	7,004,875	519	286,728	1,173	193,592	2,795	7,485,195
2017	1,117	6,979,954	519	286,979	1,129	182,995	2,765	7,449,928
2016	1,124	6,960,875	512	286,610	1,061	178,860	2,697	7,426,345

Administration and oversight of the drinking water program (i.e., staff salaries and fringe benefits) has been historically funded by the PWSS grant, fees from the regulated community, and "set-asides" from the DWSRF grant. The DWSRF grant allows up to 32% of funding to go towards "set-aside" programs. These set-asides also provide significant funding for ODW programs. With the PWSS funding flat over several years, ODW has increasingly relied on the set-aside funds under the DWSRF to support staff positions that were historically funded by the PWSS grant. The percentage of staff positions supported by the set-asides has steadily increased from 10% in 2006, 15% in 2012, to 31% in 2019.

As of May 2020, ODW had 10 vacancies, which is in line with the historical average. ODW currently has 129 total full time employees (including 10 vacancies) budgeted for FY 2021. ODW estimates $8.4 million per year is necessary for operations to implement core federal grant programs to maintain primacy. ODW currently has a hiring freeze on critical positions as a result of funding concerns.

The Water Infrastructure Improvements for the Nation Act (WIIN) has provided Virginia additional federal funding assistance. Under the Voluntary Lead Testing in Schools and Child Care grant program, Virginia received $737,000 in EPA funding on January 17, 2020. VDH will receive an additional $420,000 as an amendment to the original grant with work plan revisions and supporting documents. ODW can only use 4% of the grant funds for administrative costs. The current grant funding will assist with voluntary testing for lead contamination in drinking water at schools and childcare facilities with a priority in low-income areas. The goals of the grant include:

- Test all potable water outlets (regularly used for consumption) at 35% of all schools and child care facilities in low-income areas by the end of the project period;
- Test 8% of total child care facilities in the state with a plan to continue testing after the project period; and,
- Test 10% of the total schools in the state with a plan to continue testing after the project period; and provide education about lead and the importance of testing to all 132 school divisions in the state.

Under the Assistance for Small and Disadvantaged Communities grant program, Virginia is eligible to receive $691,000 in EPA funding during 2020. ODW submitted grant proposals to EPA in September 2020. Pursuant to the "Reducing Lead in Drinking Water" grant program, EPA expects to provide four to fifteen awards of up to $39.9 million in total under two National Priority Areas (reducing lead exposures through infrastructure and treatment improvements, and reducing children's lead exposure in schools and childcare facilities). The awards are competitive and VDH submitted its proposal on May 30, 2020. EPA announced in October, 2020 that Virginia will receive approximately $1.3 million for reducing lead in drinking water.

ODW reviews performance metrics each month during a leadership meeting with division and field directors. The continued focus on metrics ensures accountability and continuous improvement. In 2019, VDH field office staff conducted 1,294 routine sanitary surveys and responded to 7,320 technical assistance requests. In 2019, VDH averaged only 3.4% of waterworks with a monitoring violation. VDH has reduced this number since implementing performance metrics in 2018 by making sample schedules available to waterworks through the Drinking Water Watch webpage, piloting a sampling reminder auto-dialer project, and by providing additional technical assistance to waterworks.

In the past five years (2015-2019), the number of community waterworks with health-based violations has continued to decline. As of August 2020, only 1.8%, or 20 community waterworks had health-based violations. Stage 2 Disinfection Byproduct Rule violations accounted for most of these violations, followed by issues with fluoride, the Revised Total Coliform Rule, and the Ground Water Rule. For many waterworks listed as potential serious violators on EPA's Enforcement Targeting Tool (ETT) report, ODW actively engages owners to return to compliance. During 2019, VDH issued 1,250 NOAVs, 80 warning letters, and one Special Order. The table shows that ODW successfully met the targets of the EPA National Water Program Measures focusing on community water systems for July 1, 2018 through June 30, 2019.[9]

EPA National Water Program Measures	Virginia Results	National Average: All states	EPA Region 3 Results
Percent of the population served by CWSs that receive drinking water that meets all applicable health-based drinking water standards through approaches including effective treatment and source water protection.	98.0%	91.9%	91.4%
Percent of CWSs that meet all applicable health-based standards through approaches that include effective treatment and source water protection.	96.1%	92.9%	90.7%
Percent of "person months" (i.e. all persons served by CWSs times 12 months) during which CWSs provide drinking water that meets all applicable health- based drinking water standards.	98.8%	94.2%	94.8%
Percent of CWSs that have undergone a sanitary survey within the past three years (five years for outstanding performers or those ground water systems approved by the primacy agency to provide 4-log treatment of viruses).	100%	92.4%	90.7%

[9] Source: SDWIS/FED 2019 Q3 submission.

The Capacity Development Strategy focuses on TMF components to improve a waterworks' ability to reliably produce and deliver safe drinking water to consumers. ODW enforces rules and regulations and provides technical assistance to improve performance and sustainability of waterworks.

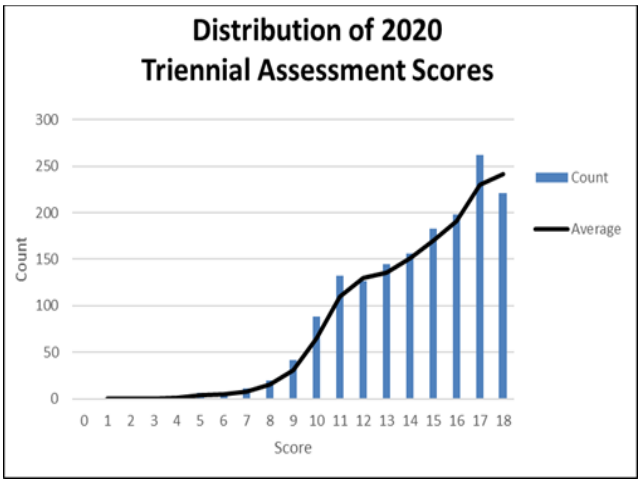
Small waterworks must develop and improve TMF capacity for long-term viability. With the complexity and number of federal drinking water regulations is increasing over time, ODW must implement, monitor, and enforce these changes. Staff provide technical assistance, track routine sanitary surveys, and evaluate the capability of waterworks to ensure compliance with state and federal drinking water standards. The Strategy helps ODW deploy assistance from many technical assistance partners to waterworks responsible for providing safe drinking water to people of the Commonwealth of Virginia.

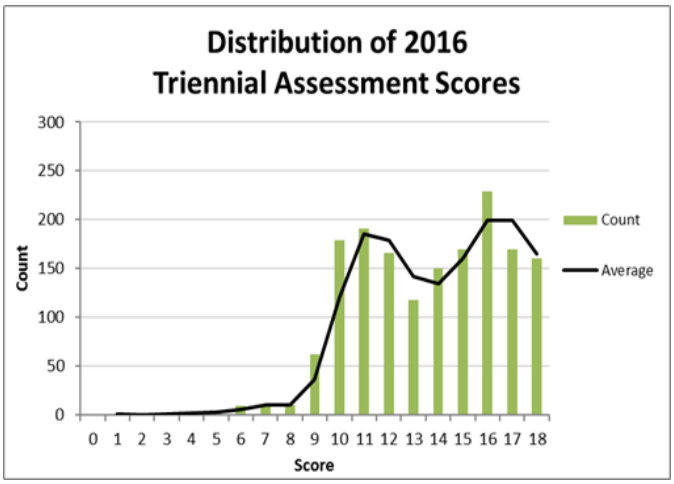
State grant matching funds pay a 20% match to the DWSRF capitalization grant that supports capacity development programs. Technical assistance fees from the regulated community pay less than 25% of salary and benefits for staff positions that offer technical assistance. The DWSRF capitalization grant additionally provides funds for the capacity development, source water, training and security staff through the set-asides. Dedicating more state funding to programmatic initiatives would benefit struggling waterworks.

In the last three years, ODW reclassified one position to make it part of the Capacity Development team and converted an existing position to a supervisory role. The new position focuses on assistance to noncommunity waterworks. The supervisor focuses on strategy implementation and team leadership. Five full-time and one part-time staff actively support the Capacity Development Strategy and accomplished the following in the past three years:

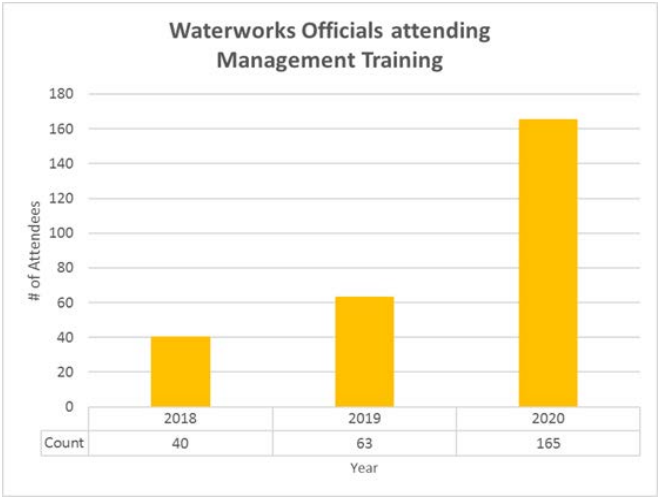
- Published seven articles in industry periodicals;
- Produced Consumer Confidence Report Hip Pocket Tool for waterworks;
- Developed and deployed an "Asset Management for your Waterworks" workshop for small waterworks, collaborating with SERCAP, VRWA, and Draper Aden and Associates;
- Initiated and/or coordinated several training events for waterworks;
- Advanced the use of an Auto-dialer system to remind waterworks to collect samples, thus reducing monitoring violations;
- Made numerous marketing efforts to increase the number of waterworks personnel attending training events;
- Collaborated with United States Department of Agriculture-Rural Development (USDA-RD) and planning district commissions on funding workshops for water and wastewater utilities; and,
- Worked with many utility boards to provide regulatory insight, discuss technical issues, and offer suggestions for funding options.

In 2020, ODW conducted a TMF assessment of all community and NTNC waterworks. The EPA requires an assessment at least once every three years. The current data indicates a general improvement in TMF capacity from 2016, with more waterworks scoring higher overall. Waterworks are given a total of 1 to 18 points based on overall TMF capacity; the higher the score, the better the TMF. In 2016, data peaked around 11 points and 16 points. In 2020, this double peak no longer exists and scores trend upward. These upward trends in the data indicate an increase in overall TMF capacity at waterworks and a positive impact from capacity-building measures ODW implemented in the past three years.





ODW continues to implement an exemplary Operator Certification Program that is responsive to changing circumstances. The number of waterworks requiring licensed operators is 1,637. The percentage of waterworks with a properly licensed operator is over 99 percent in Virginia. The table below shows that the number of waterworks "decision-makers" who have attended ODW-sponsored management training is increasing. Virginia Tech, Mountain Empire Community College, and other service providers hold courses through contracts with ODW. Course offerings vary yearly; however, ODW ensures a core of training courses to develop employees and the waterworks' TMF capacity. Owners and operators find course offerings on the ODW website.



ODW implemented two new rules during FY 2019 – the RTCR and LCR. As such, ODW reviewed and approved 126 Bacteriological Sample Site Reports (BSSRs), reviewed 145 Level 1 assessments, and conducted 66 Level 2 assessments in FY2019. Implementation of the new RTCR rule turned out to be far more resource intensive than expected, particularly evidenced by the number of Level 2 assessments. In 2019, 37 waterworks completed a Material Survey and a sampling plan for lead and copper. Fifty large and 28 medium/small waterworks continued to monitor and report Water Quality Parameters. Eight waterworks had lead action level exceedances during 2019. As of the first quarter of 2020, 33 active waterworks had LCR monitoring/reporting violations and four had LCR treatment technique violations.

During FY 2019, 37% of community waterworks minimized the risk of public health through source water protection (falling short of the national goal, which is 49%), which is 48% of the population served by community waterworks (the national goal was 59%). ODW's Source Water Protection Program executes important work by using two contractors, ODW staff, and Wellhead Protection Implementation Project grants to assist small community waterworks and localities with developing and implementing source water protection plans. During 2019, ODW delivered 826 preliminary or updated assessments, developed Source Water Protection Plans through contracts for five waterworks, and awarded four Wellhead Protection Implementation grants totaling $36,932.

ODW refined the Source Water Assessment Program (SWAP) procedures and geographic information systems database layers in 2020, which resulted in updating SWAP outputs for 826 sources. The program integrates Clean Water Act and Safe Drinking Water Act activities by working with the Virginia Department of Environmental Quality to provide well development data of new public wells to assist with their groundwater characterization and management programs and reviewing 148 Virginia Pollution Discharge Elimination System permits and 24 Virginia Pollution Abatement permit applications. Through the Interagency Environmental Review program, in collaboration with source water protection partners, staff reviewed 260 projects for impacts to drinking water sources.

Drinking water infrastructure is one of the most important aspects of drinking water security and sustainably. Both activities are unregulated in Virginia. The next section provides an overview of aging infrastructure across the nation, sources of contamination in drinking water, indicators of aging infrastructure, and funding sources and needs for addressing improvements to the Commonwealth's vital water infrastructure.

III. Aging Infrastructure

Approximately 300 million Americans rely on public water systems (waterworks) for drinking water every day. Waterworks use an estimated 1.2 million miles of distribution mains to move water from the source, through treatment, and on to the 300 million consumers. Water treatment, storage, and distribution system infrastructure has successfully delivered clean, safe, and reliable drinking water to consumers in the United States for many decades. However, many communities have not updated or replaced their water infrastructure since economic expansion following World War II, which is now near or past its retirement or replacement age.[10] As a result, breaks, leaking pipes, water loss, and contamination are more likely, increasing the health risk to consumers and negatively affecting the reliability of the nation's drinking water system. Virginia's drinking water infrastructure resembles this national trend.

A recent study, funded by the American Concrete Pressure Pipe Association and completed by the College of William & Mary's Public Policy Program, assesses the return on investment for water infrastructure improvements and quantifies the public health benefits resulting from those improvements.[11] The William & Mary report states, in part:

> *There is a severe pattern of underinvestment in water infrastructure across the United States. It is estimated that as much as $1 trillion will be needed to meet the needs of a growing society and*

[10] Walton, B., 2016. Infographic: The Age of U.S. Drinking Water Pipes- Form Civil War Era to Today. https://www.circleofblue.org/2016/world/infographic-the-age-of-u-s-drinking-water-pipes-from-civil-war-era-to-today/ (accessed July 17, 2018).

[11] Murray, S., Aboagye, D., Luketich, A., The College of William and Mary Public Policy Program, 2018. *Investment in American's Drinking Water Infrastructure: Benefits, Financing Mechanisms, and Best Practices.*

repair our rapidly crumbling system. Adequate financing will be essential to keeping pace with this need for investment… The current system for funding upgrades and expansions to drinking water infrastructure relies heavily on user-fees and the operating and maintenance budgets of water structure owners. Because of the large need for investment and low price of water to maintain affordability, this system does not provide enough funding to meet existing needs for upgrading and expansion.

The lack of adequate funding from current sources is compounded when waterworks do not know the extent of maintenance and expansion needs. Distribution systems are usually buried underground, so the condition and structural integrity cannot be easily evaluated. The William & Mary study found that there is not even a standard auditing practice for evaluating the structural integrity of the water system. Each waterworks owner is responsible for developing asset monitoring and evaluation criteria and methods, but for many owners, competing resources prioritize short-term needs over long-term asset management. As a result, waterworks use assets past their usable life and many waterworks owners have a "wait until it fails" mentality.

Public support for asset management is often lacking. Often, consumers are not aware of the resources required to collect, treat, store, and distribute potable water to homes, businesses, and industries, or the associated costs of maintaining, repairing, replacing, and protecting the millions of miles of water lines that deliver water. This lack of awareness makes funding water infrastructure even more challenging, especially when the people who live and work in, or visit Virginia expect drinking water to be clean, safe, and readily available at the turn of the tap. With the public pressure on affordable water that is in sufficient quantity and complies with drinking water standards, waterworks are strapped to invest in future infrastructure needs.

Water loss from failing infrastructure can also be devastating on our finite water resources. One EPA report shows that there are about 240,000 water main breaks in the United States every year, and $2.6 billion are lost from water mains that leak trillions of gallons of treated drinking water.[12] Water loss, or unaccounted (unbilled) water, has other consequences as Virginia tries to protect aquifers within groundwater management areas and address climate change. The Richmond, Tidewater, and Northern Virginia regions have many water mains that are nearly a century old. The materials used for these systems were the best available technology for that time; however, some of those materials can be intrinsically harmful, such as lead lines, while other materials, such as wood, cannot last for a 100-year life span. These old, leaking pipes cost utilities extra money because the waterworks already incurred the cost to treat the lost water, but cannot bill customers for it.

a. Case Studies

A large percent of Virginia's water infrastructure was built in the post-World War II era, over 60 years ago,[13] and a significant portion more predates even that period. According to the Municipal Association of South Carolina, the life expectancy of water distribution lines range from 70-120 years.[14] For Virginia's waterworks and distribution systems to remain viable, we must invest in regular and

[12] US Environmental Protection Agency (USEPA), 2011. Addressing the Challenge through Science and Innovation. EPN600/F-111010, Cincinnati.
[13] American Water Works Association (AWWA), 2012. "Buried no longer: Confronting America's water infrastructure challenge." AWWA, Denver, CO.
[14] Municipal Association of South Carolina (MASC), 2016. Life expectancy of water distribution lines. http://www.masc.sc/Pages/newsroom/uptown/March-2016/Life_expectancy_water_lines.aspx (accessed June 16, 2018).

routine replacement of the aging components. Incidents such as those in Goshen,[15] Petersburg,[16] and Pocahontas,[17] Virginia demonstrate the serious public health consequences that result from a lack of infrastructure maintenance. Despite these examples of failed infrastructure, 91% of Virginia's waterworks still have not reported water quality violations.

City of Petersburg

On January 26, 2018, the City's Acting Director of Utilities reported a major break in a 20-inch water main and four other 6-inch diameter water line breaks in parts of the City. The extent and number of leaks reduced storage capacity. Some city officials expressed concern that crews might not complete necessary repairs to maintain water pressure. City officials contacted local medical facilities and emergency agencies and arranged for backup water supplies. The City ultimately did not issue a boil water notice or advisory because city crews and contractors maintained minimum water pressure through quick repairs. To ensure public safety, ODW required thorough flushing and chlorine residual checks downstream from the breaks. ODW also required bacteriological samples to confirm satisfactory water quality. ODW began meeting with City officials on a quarterly basis to develop and implement capital improvement plans and asset management plans. From this effort, the City has not had significant system-wide leaks.

Town of Goshen in Rockbridge County

In June 2007, the residents of Goshen found themselves without drinking water. Goshen, a rural town located in northern Rockbridge County, has a waterworks consisting of a spring, chlorine disinfection, duplex high service pumps, gravity storage and distribution lines. The town constructed the majority of the waterworks in the 1930's.

On June 13, 2007, the waterworks began to lose water pressure. Storage tank levels dropped. By June 15, significant water was still being lost and by mid-day, the water loss depleted all water storage, leaving the Town's residents without water. Rockbridge County declared a local state of emergency, triggering emergency management activities to support the Town and its residents. ODW and the local health director issued a boil water advisory from the loss of water pressure throughout the Town.

The Virginia Rural Water Association, ODW, and volunteers arrived June 15 and began to search for system leaks. To get water into the system, three 5,500-gallon tanker trucks hauled in water from neighboring waterworks. Over the next several days, workers identified multiple leaks and repaired waterlines. However, the water system could not recover. On June 20, after nearly 6 days without water service, the Governor declared a State of Emergency, allowing additional state resources to become available, including support and resources from the Virginia Department of Emergency Management, the Virginia National Guard, and American Red Cross.

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[15] Virginia Department of Emergency Management (VDEM), June 29, 2007 Goshen Sitrep. http://www.vaemergency.gov/wp-content/uploads/drupal/sitrep10_4.pdf (accessed August 27, 2018).

[16] WTVR.com, 2018. The 2 things causing multiple water main breaks in Petersburg. https://wtvr.com/2018/01/03/the-2-things-causing-multiple-water-main-breaks-in-petersburg/ (accessed August 27, 2018). During the month of January, 2018, several breaks in Petersburg's water mains resulted in significant portions of the City loosing water service for several hours while contractors worked to repair breaks in the primary 20-inch diameter main line.

[17] U.S. Environmental Protection Agency, 2018d. Water Finance Forum. https://www.epa.gov/sites/production/files/2016-06/documents/agenda_water_finance_forum_virginia_6_13_16.pdf (accessed August 27, 2018).

Workers finally restored water service to the residents of Goshen on Sunday June 25, 2007. Over the 10-day ordeal, crews located and repaired 14 major leaks. Based on the amount of water produced at the waterworks before the storage failure, ODW estimates that over 80% of the water leaving the treatment facility was lost before reaching consumers. Direct costs to the Town for personnel overtime, materials and supplies, and contractual services exceeded $49,000. Direct costs to Rockbridge County totaled nearly $11,000 and included personnel overtime, purchases of bottled water, pump rental, lodging, and contractual services.

The long-term solution for Goshen was the replacement of 12,500 feet of 6-inch diameter cast pipe. The total cost of the pipe replacement was approximately $2 million. The Town had very limited resources and was unable to fund the needed pipe replacement. Various funding agencies, including ODW, Virginia Department of Housing and Community Development, Southeast Rural Community Assistance Project and the United States Department of Agriculture – Rural Development, stepped in and offered financial assistance.

Tauxemont in Fairfax County

The Tauxemont Community Association owns a waterworks in Fairfax County that has 114 connections and serves approximately 250 people from three wells to a looped network of distribution mains. The waterworks began operations in the 1940s. In September 2015, contractors drilled a replacement well. After the drilling contractor completed the new well, the engineering firm never finalized plans and specifications for it. In September 2018, ODW matched Tauxemont with an engineering firm through the VDH Small Project Engineering (SPE) program to develop as-built schematic drawings, record components of the pumping system, and provide hydraulic calculations. In January 2019, ODW approved the as-built plans and specifications and Tauxemont began using the well to support its community. The well is vital for the sustainable operation of the waterworks and was only made possible with ODW's technical and financial assistance.

Town of Richlands in Tazewell County

ODW helped the Town of Richlands (population 4,564) in Tazewell County complete an asset management plan (AMP). With the assistance of a contract engineer funded through the Special Projects Engineering (SPE) program, the Town completed an AMP that identified infrastructure in poor condition, which was critical to operations. The Town prioritized the replacement of this infrastructure in a phased approach and paid project costs from revenue generated from water service billings. The Town plans to implement a small rate increase to offset the cost of the remaining projects.

Town of Bluefield in Tazewell County

Staff assisted the Town of Bluefield in Tazewell County complete an AMP using the SPE contract engineer. The Town serves a population of 5,811 persons. Town officials prioritized future capital projects into several phases. The Town also received DWSRF construction funding to complete the first of two project phases. Construction is underway for these projects now. The Town will request additional DWSRF funding in the future to complete projects identified by the AMP. As part of the current funding offer, ODW required the Town to complete a waterworks business operation plan (WBOP). The Town identified gaps from the WBOP. ODW will help produce standard operating procedures for the water treatment plant and distribution system. The Town also plans to build financial reserves for the waterworks, separate from other Town reserve funds.

Town of Port Royal in Caroline County

The Town of Port Royal with a population of 327 is located in rural Caroline County. In 2014, representatives from the Town began seeking funds for several improvements to comply with the Waterworks Regulations and eliminate significant deficiencies with the waterworks. The Town's waterworks pumped groundwater from two drilled wells to a 22,000-gallon elevated water storage tank. The Town obtained the tank in used condition from Fort A.P. Hill in 1967.

During an inspection in August 2013, the Town discovered holes in the storage tank's roof. The Town needed to replace the existing tank and start emergency repairs. While the efforts to secure funding for replacing the tank were ongoing, SERCAP awarded the Town a $30,000 grant and provided technical assistance for emergency tank repairs. The Town subsequently received an award of $990,684 in DWSRF funding. ODW forgave $594,410 as principal forgiveness, and an additional $429,000 grant/loan mix from USDA-RD helped complete the project.

The Town installed a new 20' x 20' precast concrete building for two booster pumps and two bladder tanks with emergency standby power, installed approximately 5,400 linear feet of waterline, and installed new meter box assemblies. In 2019, contractors for the Town carefully took down the elevated water storage tank. ODW staff conducted a final inspection in May 2019. The Town held a ribbon-cutting ceremony in August 2019.

Town of Orange in Orange County

On June 9, 2018, a strong storm hit the Town of Orange. The water treatment plant suffered a lightning strike, which damaged the Supervisory Control and Data Acquisition (SCADA) system and rendered it inoperable. The waterworks, serving approximately 6,584 persons through 3,056 service connections, had substantial damage. The Town's operator managed the treatment system in manual mode for weeks. The Town reached out to the USDA-RD and ODW for funding assistance to replace the SCADA system. USDA-RD had emergency funding available, but limited time to use it. ODW staff quickly began working with field office staff, gathering information from waterworks records, interviewing the Chief Water Operator for specifics about the interim operational conditions, and drafting a letter of support. The Town added that letter of support to the packet and sent it to USDA-RD for approval. USDA-RD approved the project as an "emergency" and provided $115,275 in grant funds to replace the SCADA system.

Town of Monterey in Highland County

In early August 2017, the Town of Monterey waterworks in Highland County suffered a catastrophic event resulting in a water outage to the approximately 450 residents served. The infrastructure impacts included empty water storage tanks, inadequate water pressure, and inadequate well pumping rates from well pump malfunctions and low well water levels. Officials declared a local emergency, and issued a Boil Water Advisory with assistance from ODW. Neighboring localities and VDH (ODW and the local health department) provided assistance.

The Town restored the operation of the waterworks, but did not have adequate monitoring and fail-safes to prevent a repeat occurrence. In April 2019, the Town applied for $215,000 in DWSRF funding to install a SCADA system. Capacity Development staff determined the Town did not have adequate TMF capacity to meet DWSRF funding requirements. The Town recognized that more TMF capacity would require a long-term commitment. ODW requested that the Town complete two action

items for funding: a water rate analysis and a WBOP. In November 2019, the Town presented and adopted a Board resolution committing to the completion of both items. The Town completed a water rate analysis with the Environmental Finance Center Network's help and a draft WBOP with Capacity Development staff's help. The Town's DWSRF construction project is moving forward.

Town of Buchanan in Botetourt County

The Town of Buchanan in Botetourt County, population 1,220, had a major water leak in March 2020. Town officials contacted the Virginia Rural Water Association (VRWA) regarding an estimated 40,000 gallons per day of water loss from the Town's distribution system. A VRWA technical expert, known as a "circuit rider," determined the Town needed an exact location of pipe leakage to make repairs. After isolating a section of pipe and re-pressurizing the system, the Town could not determine a location of leakage. VRWA's circuit rider used a leak correlator to pressure test water mains for leaks. VRWA provided direction about repairs to abate the water loss. ODW provided the leak detection equipment to VRWA through a set-aside grant, showing the success of this funding.

Town of Charlotte in Charlotte County

The Town of Charlotte Courthouse in Charlotte County has a population of about 1,975 people. Maintenance staff from the Town called VRWA and requested help finding a water line. The circuit rider located the water main, found the water leak, and shut the water off at a pool house near a private club to prevent the Town from losing all its stored water. The circuit rider found the water line going to the pool house had its own cut off valve. Town staff shut off the valve to allow the main building to continue getting water. Again, ODW provided the leak detection equipment to VRWA through a set-aside grant.

Rye Valley Water Authority in Smyth County

Rye Valley Water Authority in Smyth County serves approximately 1,276 people. The Authority contacted VRWA on January 13, 2020, to help with a major water loss within the Authority's drinking water distribution system. At the time of the call, Rye Valley had 27% water revenue accountability, meaning that 63% of the costs to treat and distribute drinking water had no revenue generating potential. A VRWA circuit rider arrived on Jan. 16, 2020. After surveying valves, meters, and hydrants, the circuit rider found a leak. VRWA decided that ground-penetrating radar could find the service line better than the use of other water loss detection instrumentation. The circuit rider and Town found a point of interest and marked it for excavation. Rye Valley Water Authority reported that VRWA's circuit rider found the appropriate line leak. The Authority repaired the line, and the circuit rider recommended that the authority replace the aging galvanized pipe service line. The Authority's water revenue accountability improved. Again, ODW provided the leak detection equipment to VRWA through a set-aside grant.

Tangier Island

The Town of Tangier waterworks serves approximately 650 persons. On January 20, 2019, a water line ruptured along a bridge replacement project. The rupture drained the Town's water storage tank and interrupted water service. Town officials issued a Boil Water Advisory and issued a restriction on water use. The Town partially restored some water service about 7 days later by connecting fire hoses to hydrants on each side of the break and began boating bottled water to the Island. Several production meters were not operational, and ODW staff discovered many more leaks in the distribution system. Several isolation valves and fire hydrants were not operable and others could not be located. Town officials speculated that some isolation valves had either been paved over or were covered with

vegetation. The Town's licensed operator for the Waterworks was not available on the Island during the incident. This event took several weeks to resolve. ODW is currently working with the Town to improve its infrastructure.

b. Potential Sources of Contamination in Drinking Water

Aging infrastructure can cause contaminated drinking water. Two sources of potential contamination strongly tied to aging infrastructure are lead and copper and microorganisms (total coliform bacteria and E. coli).[18] Lead was used in water systems, especially premise plumbing, years before the health effects were known. The same conditions that can cause lead contamination in drinking water (primarily water that is too corrosive) can also lead to elevated levels of copper; however, the action level (AL) for copper is higher than lead (15 ppb for lead verses 1300 ppb for copper) and the health effects of copper exposure are not as severe. Microorganisms can persist in the distribution system when low pressure, leaks, and openings occur in the system piping and can cause illness.

Lead and Copper

Lead is a naturally occurring element usually found in small amounts in the earth's crust. While there are certainly some beneficial uses for lead, it is harmful when ingested, especially in young children. Exposure to lead can come from many sources, including the past use of leaded gasoline, lead-based paint, and industrial sources. Additionally, lead and lead-based compounds are present in a wide range of products found in and around homes, including paint, plumbing materials, solders, batteries, ceramics, ammunition, cosmetics, and lead glazed porcelain.[19]

Lead can have significant adverse health effects and affects almost every organ and system in the human body. It can accumulate in the body over time and even low levels of lead in the bloodstream of children can result in behavioral and learning problems, lower IQ, slow growth, hearing problems, and anemia. Children six years of age and younger are especially vulnerable. Lead can also be harmful in adults resulting in cardiovascular effects, increased blood pressure, decreased kidney function, and reproductive problems in both men and women.[20]

Like lead, copper is a naturally occurring element. Copper is widely used and is common in many products, including coins, electrical wiring, and water pipe used in premise plumbing. Copper is an essential element to living organisms. Too much copper, however, can result in adverse health effects, including vomiting, diarrhea, stomach cramps and nausea. Elevated copper has also been associate with liver damage and kidney disease.

Lead and copper are rare in source waters (i.e. wells, springs, rivers, or impoundments). Rather, lead and copper enter drinking water when pipes and premise plumbing fixtures containing lead or copper corrode and leach into the water. This is especially significant when the water has corrosive characteristics, such as low pH and high acidity. These conditions accelerate the corrosion of lead and

[18] Coliform bacteria are organisms that are present in the environment and in the feces of all warm-blooded animals and humans. Total coliform, fecal coliform, and *E. coli* are all indicators of drinking water quality. The total coliform group is a large collection of different kinds of bacteria. Fecal coliforms are types of total coliform that mostly exist in feces. *E. coli* is a sub-group of fecal coliform. When a water sample is sent to a lab, it is tested for total coliform. If total coliform is present additional sampling and testing is required to confirm the result, source of contamination, and if *E. coli* is present.

[19] USEPA, 2018c. Learn about Lead. https://www.epa.gov/lead/learn-about-lead (accessed June 16, 2018).

[20] USEPA, 2018c.

copper containing materials within our plumbing systems. Older homes built prior to the mid 1950's may still have service lines made entirely from lead. Lead service lines were replaced by galvanized piping service lines, which still contained lead and copper. Copper premise piping was commonly joined with lead based solder until the mid-1980's. In addition, brass used in many commonly installed faucets can contain significant amounts of lead.

For most contaminants, EPA sets an enforceable regulation called a "maximum contaminant level" (MCL). In establishing MCLs, EPA considers the costs, benefits, and ability of public water systems to detect and remove contaminants using suitable treatment technologies. However, because lead and copper contamination of drinking water often results from corrosion of the plumbing materials belonging to waterworks' customers, EPA established treatment techniques that are triggered by an action level rather than an MCL for lead and copper. A treatment technique is an enforceable procedure that waterworks must follow to ensure control of contamination.

The Waterworks Regulations follow federal requirements for lead and copper. The Lead and Copper Rule (LCR) contains treatment techniques when the 15 ppb lead AL is exceeded, which includes corrosion control treatment and source water monitoring and treatment. To reduce exposure to lead in drinking water, waterworks must monitor for lead at the point of consumption. Sample locations are selected based on the presence of lead containing piping or plumbing fixtures and the highest risk for elevated lead exposure. The number of samples required is based on the population served. If sampling indicates lead concentrations above the 15 ppb AL, then the waterworks owner must notify its consumers and initiate a series of treatment techniques to reduce the water's corrosiveness.

Lead and copper regulations are complicated and difficult to implement. Even well managed community waterworks have a difficult time meeting all of the lead and copper requirements. The location of lead service line replacement is difficult because water lines are not readily visible for identification, records of pipe materials and construction are missing or incomplete, and waterworks staff who supervised the distribution system construction are no longer available.

ODW ensures compliance with lead and copper requirements by making sure all lead and copper tap samples are collected from identified high-risk locations. Staff carefully review all sample results and determine compliance with the AL. Staff assist waterworks owners in the selection of appropriate corrosion control treatment technologies and the target pH and phosphate residuals necessary to minimize lead corrosion and thus exposure at consumers' taps. Staff review monthly operation reports to ensure that the target water quality parameters are maintained at appropriate levels and ensure that required public education requirements are fully met too.

Staff encourage waterworks owners to voluntary replace their lead service lines as soon as possible and ODW provides grants to remove lead service lines as well. ODW works with VDH health directors and local health department staff on elevated lead issues and prioritizes efforts to address lead in drinking water at schools and day care facilities since they serve particularly vulnerable populations.

Effectively eliminating the use of lead in piping and thus minimizing exposure to lead in drinking water are ultimately a shared responsibility – waterworks owners, consumers, building owners, public health officials, and state legislatures each have important roles to play.

Lead Service Line Replacement Program (LSLR)

ODW supports requirements for water systems to develop distribution system inventories for every service line (both public and private sides), including LSLs in its service area. ODW recognizes

that these inventories will evolve over time, given that the initial inventories will comprise paper and electronic records, not field verification. Developing an inventory that is as accurate as possible over several years is critical to ultimately replacing all lead service lines and lead goosenecks, pigtails, and connectors in the Commonwealth.

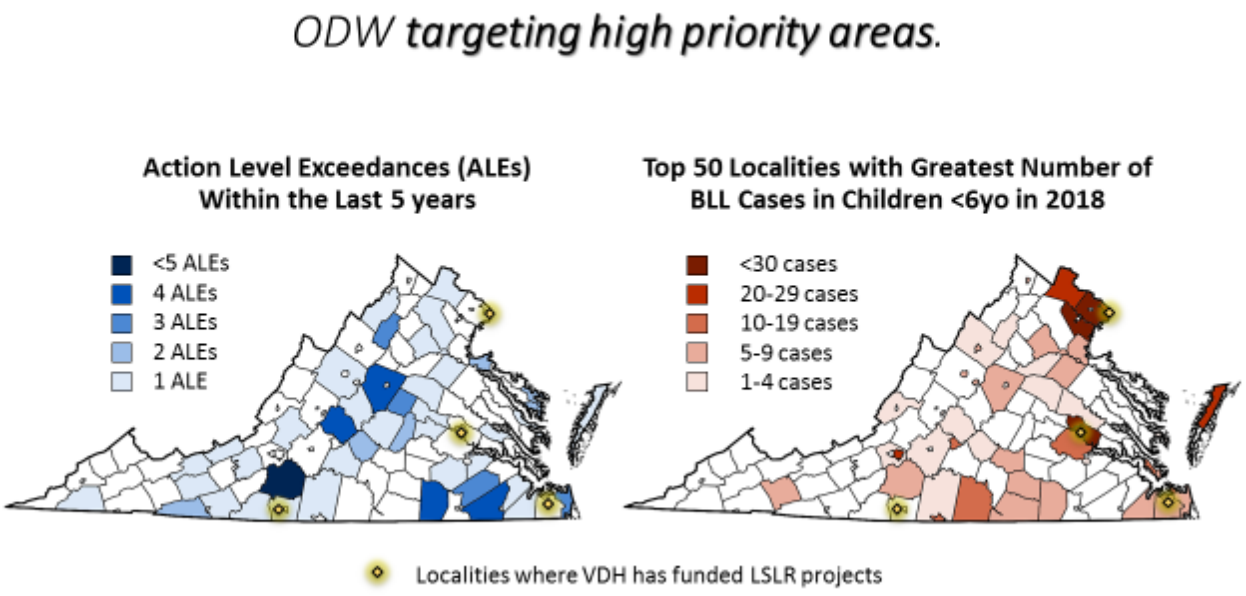
Replacement of galvanized service lines is also covered by the LSLR program and will be included in the inventory, as they have been found to be a source of lead in drinking water. Galvanized service lines can contain lead released from upstream lead service lines, and in addition, their zinc coating contains lead that can corrode and leach into drinking water. Over the past few years, ODW has awarded $3.69 million to Alexandria, Henry County, Richmond, and Chesapeake (see table below). Other localities, including Newport News and Pulaski County, are exploring LSLR funding.

Locality	Phase	Funding Amount	Amount Disbursed
City of Richmond	I	$500,000	$307,845.15
City of Richmond	II	$500,000	
City of Alexandria	I	$425,000	$48,257.08
City of Alexandria	II	$250,000	
Henry Co./Fieldale	I	$500,000	$500,000.00
Henry Co./Fieldale	II	$500,000	$473,734.48
Henry Co./Fieldale	III	$515,000	
City of Chesapeake	I	$500,000	

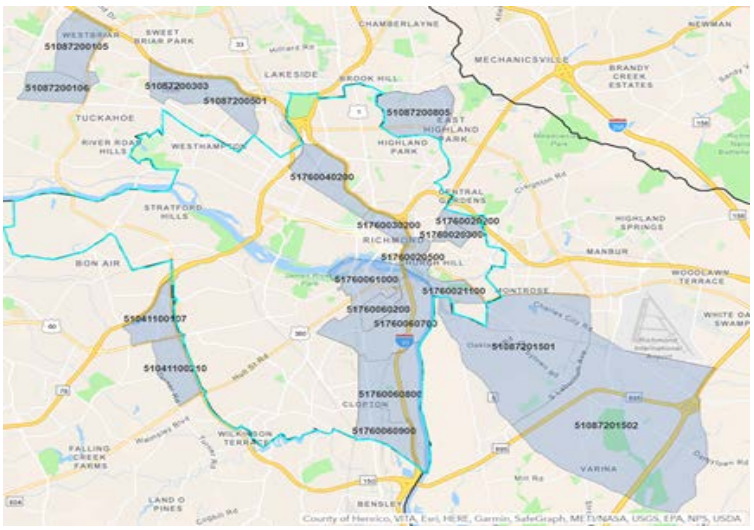
ODW has worked with each of the above localities to develop forms for submitting and documenting reimbursement. Each locality has its own forms and outreach materials, but each disbursement package contains the same elements. In general, the package includes (1) a list of serviced addresses with dates of completion for both the public and private side, (2) photos before and after replacement, (3) any additional supporting documentation including invoices, construction permits, and a signed Contractor Compliance Certification Statement if photos and invoices are not available or are of unsatisfactory quality. Once reviewed and verified by ODW staff, the localities may be reimbursed for their service line replacements.

There are several challenges with funding LSLR projects. Homeowners are reimbursed up to $5,000 per lead service line replacement, but because the federal grant requires payment as reimbursement, property owners can have difficulty. This presents an equity issue for low income areas of the population centers. ODW targets funding by examining Lead Action Level exceedances (ALEs), Blood Lead Levels (BLL) in children, and Qualified Opportunity Zones (QOZs).

In the map below, the darker the color, the higher the value for ALEs and BLLs, respectively. Yellow markers indicate locations of LSLR projects. For ALEs, the blue map, there are more ALEs in the central and southeastern parts of the state. For BLLs, the red map, there is more focus on densely populated areas such as Northern Virginia, the City of Richmond, and Henrico County.



QOZs are low-income census tracts that have been identified by the Commonwealth as areas available to investors to promote economic and community development. Examining QOZs helps ODW to prioritize LSLR needs at a more granular level. While ALEs and BLLs provide an overview at a county level, QOZs are at a neighborhood level. In the map below, the blue shaded areas represent QOZs in and adjacent to the City of Richmond.



Microorganisms

The Revised Total Coliform Rule (RTCR) focuses on eliminating potential pathways for contamination. If analytical results for bacteriological contaminants indicate the presence of total coliform or *E coli* bacteria, owners are required to assess the system to identify and eliminate potential sources of contamination. The assessments, called Level 1 and Level 2 assessments, identify the presence of sanitary defects in the distribution system or in the monitoring practices, and, when possible, the likely reason the waterworks triggered the assessment. A Level 2 assessment is more comprehensive than a Level 1 assessment.

The table below summarizes the number of Level 1 and Level 2 assessments ODW and waterworks owners/operators performed between April 2016 and September 2020.

Year	No. Level 1 Assessments	No. Level 2 Assessments
2016 (8 months)	146	29
2017 (12 months)	189	61
2018 (7 months)	101	39
2019 (12 months)	147	66
2020 (9 months)	81	33

From April 1, 2016 to July 31, 2018, only 10 waterworks failed to conduct a Level 1 assessment. Exceedances of the primary maximum contaminant level (PMCL) for *E. coli* resulted in 29 Level 2 Assessments. The remaining 100 Level 2 assessments were because the waterworks had two Level 1 assessments within a 12 month period. Only four waterworks failed to correct a sanitary defect by the due date established in either a Level 1 or Level 2 assessment during that time.

A deeper examination of the data from April 1, 2016 to July 31, 2018 indicates that the majority of both Level 1 and Level 2 assessments were required at smaller, noncommunity waterworks. Community waterworks accounted for 26% of Level 1 assessments and 18% of Level 2 assessments. Among noncommunity waterworks, transient noncommunity waterworks were required to perform 75% of the Level 1 and Level 2 assessments. Waterworks serving a population less than 50 people accounted for 30% of Level 1 and 2 assessments. Waterworks serving a population less than 100 people accounted for 55% of Level 1 and 2 assessments. Only 2% of Level 1 and 2 assessments were conducted at waterworks serving greater than 1,000 people.

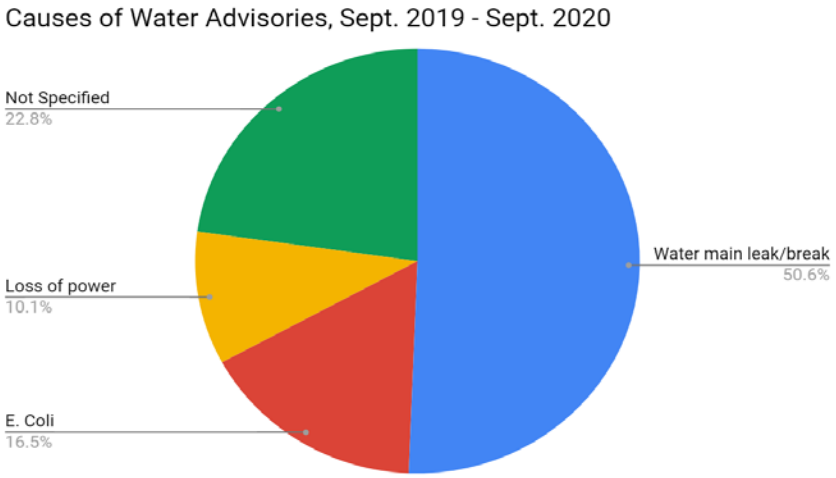
There were 29 *E. coli* PMCL violations between April 1, 2016 and July 31, 2018. Waterworks serving populations less than 50 people had 45% of the violations while waterworks serving less than 100 people accounted for 76% of the violations. Community waterworks had 2% of the *E. coli* PMCL violations and transient noncommunity waterworks had 79% of the noncommunity waterworks violations. Overall compliance with RTCR is excellent for community and nontransient noncommunity waterworks.

c. Indicators of Aging Infrastructure

Boil Water Advisories

In 2019, waterworks reported 51 boil water advisories and three low pressure notices to ODW. From January through September of 2020, ODW has been notified of 47 boil water advisories, four do not drink notices, one do not use notice, and two low pressure notices. In September 2019, ODW

started collecting information to determine the cause for boil water advisories, do not drink notices, and do not use notices. Since implementing the new tracking system in 2019, waterworks have issued boil water advisories for the following reasons: 40 for a water main leak or break, 13 for confirmed E. Coli, eight for a loss of power, and 18 for unspecified reasons. While the waterworks did not report a root cause for the water main breaks, most likely the breaks resulted from aging infrastructure (freezing or deterioration of piping) or construction work that inadvertently broke a water main.



Estimated Water Loss

Water loss may indicate aging infrastructure. Generally, physical water losses from aging infrastructure result from the storage tanks or pressurized system (e.g., water mains and customer service connections) up to the point of the customer's consumption. In metered systems, this is at the meter or service connection. In unmetered systems, it is the first point of consumption (stop tap/tap) within the property. The annual volume lost through all types of leaks, breaks and overflows depends on frequencies, flow rates, and average duration of individual leaks, breaks and overflows. Many waterworks can determine water loss based on the amount of water (volume per day or month) produced at a treatment facility compared to the amount sold to customers.

Apparent water loss includes all types of inaccuracies associated with customer metering (worn meters, improperly sized meters, or wrong type of meter); data handling errors (meter reading, billing, archiving and reporting); unauthorized consumption (theft or illegal use); and meter under-registration (can be caused by old meters). Real water loss excludes apparent water loss, including approved or authorized water losses due to firefighting activities, construction activities, line flushing, and other maintenance-type activities. All well managed systems have real water loss.

Waterworks do not have a standard for defining the maximum real water loss allowed in quantities, percentages, or gallons per mile of water line. In some cases, the extent of the problem cannot be readily determined, as some waterworks do not meter service connections. Often, real water loss will include estimates, even for metered systems. No national standard exists for excessive real water loss, but some states use 20% of water produced and the American Water and Wastewater Association Standard M36 suggests the goal for unaccounted-for water loss should be zero.

Nationally, public waterworks process nearly 40 billion gallons of water per day. Of this amount, almost 6 billion gallons escapes through real physical water loss.[21] This loss is approximately 15% of production. System water loss can be attributed to pipe material, age, improper installation, excessive external loading, vibrations, freeze/thaw of soil, or corrosion. The costs for correcting real water loss can vary considerably depending on the requirements for repair. ODW estimates line replacement costs ranging from $30 to $80 per linear foot and emergency line replacements costs of about $4,000 to $5,000 per connection. Eliminating leakage from the waterworks not only saves money but also improves public health and reduces the potential for contamination.

ODW does not capture water loss data; however, the DWSRF application requests that the waterworks provide water loss information. For 2018, 2019 and 2020, waterworks provided the following information for water loss as a percent of total production (unbilled, authorized use was excluded):

	2018	2019	2020
Number of Applications:	38	19	25
Mean:	42.5%	38.8%	31.8%
Median:	43%	36.2%	29%
Standard Deviation:	20.1%	18.14%	18.9%
Minimum:	8.7%	10%	2.5%
Maximum:	75%	73.07%	67.53%

Strategies for waterworks to reduce water loss include source-water metering, service connection metering, public use water metering, accounting for water use, and locating and repairing leaks. The cost of water leakage can be measured in terms of the operating costs associated with water supply, treatment, and delivery. Water lost produces no revenues for the utility. Repairing larger leaks can be costly, but it also can produce substantial savings in water and expenditures over a long period. Virginia Rural Water Association (VRWA) has a free program that provides equipment and staff to locate leaks, which is partially funded by the DWSRF grant.

d. Funding Needs

EPA's sixth national assessment of public water infrastructure shows that $472.6 billion is needed in the United States for a 20-year capital improvement.[22] This estimate represents infrastructure projects that are eligible for funds from the DWSRF through December 31, 2034. The national total comprises the infrastructure investment needs for about 49,250 community water systems, and 21,400 not-for-profit, non-community water systems, American Indian water systems, and the Alaska Native Village water

[21] American Water Works Association (AWWA), 2012. "Buried no longer: Confronting America's water infrastructure challenge." AWWA, Denver, CO.

[22] The 1996 SDWA Amendments mandated that EPA conduct an assessment of the nation's public water systems' infrastructure needs every four years and use the findings to allocate DWSRF capitalization grants to states. Throughout this report, information presented in the tables and figures is derived from survey data from the referenced year unless otherwise noted. Data for small systems (serving 3,300 or fewer people) is extrapolated from information collected in 2007; data for American Indian and Alaska Native Village systems is extrapolated from information collected in 2011; and data for not-for-profit non-community water systems is extrapolated from information collected in 1999 (USEPA, 2018a). For the 2015 Assessment, EPA did not directly survey small systems but estimated the infrastructure investment needs for these systems by adjusting the findings from the field survey completed for small systems in states, Puerto Rico, and the U.S. territories for the 2007 Assessment. In making the adjustment, EPA applied 2015 cost models using the current inventory of small systems (USEPA, 2018a).

systems. The survey response rate was 99.7 percent (2,592 responses from 2,600 systems surveyed), which provides a high degree of confidence in findings. Cost estimates reflect comprehensive construction costs, including engineering and design, purchase of raw materials and equipment, construction and installation labor, and final inspection.

EPA captures and assesses the impact of emerging drinking water challenges on the total national need in its Needs Assessments. Survey response data and feedback from the Drinking Water Infrastructure Needs Survey and Assessment (DWINSA) workgroup identifies trends and data gaps, which allows EPA to improve and refine the design of future surveys to more fully capture and assess system needs. The last national survey was performed in 2015 and should have been updated in 2019, but lack of funding and the COVID-19 pandemic have delayed the survey for over a year. The upcoming survey is not expected to be completed until the summer of 2021 and the data released by 2022.

In Virginia, EPA's Needs Assessment identified that $8.02 billion is needed for drinking water infrastructure improvement over the next 20 years, or approximately $401 million per year.[23] Funding agencies in Virginia provide only a fraction of the estimated $401 million per year need. Over the last five years, the total amount of funding requested for DWSRF infrastructure improvement averaged $46 million per annum. The funding requested for federal FY 2017 through 2018 from the four largest funding agencies was only $123.8 million.

Large waterworks often sell bonds or use general funds to self-fund drinking water improvement projects and do not request help from Virginia's funding agencies. In Virginia, 17 very large waterworks typically self-fund capital improvements projects. Other municipalities that own a waterworks will also self-fund infrastructure improvements. ODW estimates annual self-funding to be $31 million. Hence, ODW estimates the following funding gap in Virginia: $401 - ($123.8 + $31) = $246.2 million funding "gap," which represents about half of the total need in Virginia. ODW estimates that at least $1 billion in drinking water revenues are generated in Virginia annually. As such, the possible funding gap might be more easily resolved with better AMPs and CIPs. Deferral of necessary improvements can result in degraded water service, water quality violations, risk of harm to public health, and higher costs. For waterworks to avoid future problems, Virginia needs a more robust plan to maintain drinking water infrastructure.

e. Funding Sources

Waterworks use many different financial tools and income sources to fund ongoing operational expenses and pay for investments in infrastructure. The majority of funding for drinking water infrastructure comes from revenue generated by ratepayers. Additional funding comes from loans and grants from the state and federal governments, commercial lenders, bond markets, and other entities that tend to focus their resources on specific regions or populations. Funding sources, the amount of funding, and their impact on waterworks in Virginia are addressed below.

Waterworks have several methods of self-funding capital improvements. These typically include user rates and fee increases, borrowing in the municipal bond market, taxes, and general funds. User rates represent a primary source of revenue for waterworks. For community waterworks, customers pay monthly or bi-monthly for water and sewer. Waterworks can also charge for in-town and out-of-town customers, connection fees, and capital recovery charges. Publicly owned waterworks are not required to

[23] The March 2018 assessment need is modeled and not based on current data. EPA used data collected in 1999.

seek approval from the State Corporation Commission to increase rates; private/investor owned waterworks must justify rate increases and seek approval.

In early 2018, ODW sent a survey to over 600 waterworks in Virginia for information on financial aspects of operations. The response rate, less than 10%, was too low to determine any statistically significant data. Additional research would help determine the amount of self-funding waterworks in Virginia are dedicating to asset management. This information would help ODW determine whether and to what degree there is a funding gap for replacing aging infrastructure.

Each community waterworks in Virginia has different rate structures and consumption patterns. Given the variability of billing, and no oversight of billing and collections for publicly operated waterworks, ODW cannot determine whether total revenue meets the needs for operations, capital improvements, and asset management. However, using US Census data, EPA water usage data, and a 2017 Draper Aden Associates Water and Wastewater Rate Report (Draper Aden, 2017), ODW can calculate the approximate annual revenue collected from ratepayers.

According to the Draper Aden Report, the median water charge in Virginia for 5,000 gallons per month is $32.28. In Virginia, there are approximately 2,204,000 billable connections.[24] The annual revenue generated by water user rate collections is approximately $854 million.[25] The Draper Aden Report also captures the median connection and capital recovery fees for new connections, which collectively amount to approximately $3,000. The US Census reports there were 33,760 building permits issued for new housing in Virginia in 2017 (US Census Bureau, 2017). Assuming each building permit results in a new connection, the annual revenue generated by combined connection fees would be approximately $101 million[26] and total annual revenue for residential connections would be in the range of $955 million. Adding commercial and industrial connections, ODW expects annual revenue is over $1 billion.

Issuing a municipal bond in the public markets to fund drinking or wastewater system improvements is a capital funding option for local governments (including authorities) that own a waterworks. Often the security is a pledge of water system revenues, but a general obligation pledge may also be used. When the general obligation is used, the bond-offering document may or may not disclose the detailed amounts intended specifically for drinking water system improvements. Additionally, a revenue bond containing both water and sewer system requirements, may comingle amounts for drinking water improvements with sewer improvements. A review of the local government's capital improvement plan can provide additional clarification or a means to estimate how much of a bond issue's proceeds will be used for each type of water system improvements.

Bond offering documents are required to be posted to the Electronic Municipal Marketing Access (EMMA) website (https://emma.msrb.org/) operated by the Municipal Securities Rulemaking Board. Virginia Resources Authority (VRA) estimated the drinking water improvements amounts based on historical information since the drinking water and wastewater amounts were not segregated.

[24] Based on the state FY 2017 VDH Technical Assistance Fee billing to waterworks, total count of billable connections.

[25] $32.28 monthly bill x 2,204,000 connections x 12 months = $854 million

[26] $3,000 total connection fee x 33,760 new connections/year = $101 million.

Fiscal Year 2018 Public Bond Issuance	*Water Improvements Estimate*
$10,735,000 City of Charlottesville General Obligation Public Improvement Bonds, Series 2018	$3,900,000
$102,410,000 County of Henrico, Virginia Water and Sewer System Revenue Bonds, Series 2018	50,000,000
$26,700,000 City of Norfolk Water Revenue Bonds, Series 2018	31,000,000
	$84,900,000

VRA can make loans to local governments including authorities that own a waterworks using its Virginia Pooled Financing Program (VPFP). This program provides an easy, cost-efficient method to access capital for a number of project areas. Since 2005, VRA has funded about $4.6 billion in total. Over the last two years, VRA has funded the following drinking water projects for local governments:

VPFP FY 2020	
Local Government	**Amount (Est.) Millions**
NRV Regional Water Authority	9,900,000
Washington County Service Authority	9,200,000
Total:	19,100,000
Local Government FY2019	
City of Lexington	1,462,500
Rivanna Water and Sewer Authority	20,000,000
Surry County	3,730,000
Western Virginia Water Authority	6,000,000
Total:	$ 31,192,500
Public Issuance Local Government FY 2020	
Spotsylvania County	16,495,058
Local Government FY 2019	
Henrico County	70,000,000

VPFP borrowers realize savings from VRA's unique state credit enhancements based in part on Virginia's moral obligation, shared expenses, and a straightforward and customer-friendly loan process. VRA's high credit ratings, "AAA" for the senior bonds and "AA" for the subordinate bonds, results in favorable access to the capital markets for Virginia localities without the need for additional credit enhancements.

The Rural Utilities Service Water and Environmental Programs (WEP) provides funding for the construction of water and waste facilities in rural communities. WEP is the only federal program exclusively focused on water and waste infrastructure needs of rural communities with populations of 10,000 or less. WEP also provides funding to organizations that provide technical assistance and training to rural communities in relation to their water and waste activities. Rural Development administers WEP

through the National Office staff in Washington, DC, and a network of field staff in each State. For FY 2018, Rural Development appropriated $109,329,000 as loans and $17,259,000 for grants. Out of this total, $4,413,000 in loans and $2,601,000 in grant funding was for drinking water infrastructure.

The Department of Housing and Urban Development (HUD) administers the Community Development Block Grant (CDBG) program to improve the economic, social and physical environment of eligible low- and moderate-income communities. The CDBG program offers general purpose and specialty grants that can fund a wide range of activities that principally benefit low and moderate-income persons. Small, rural cities/towns and counties that are not entitled to receive CDBG funds directly from HUD can apply for a state CDBG grant.

ODW manages two funding sources under FCAP, the DWSRF and Water Supply Assistance Grant Fund Program. FCAP receives and considers construction applications for both funding sources on a year round basis. DWSRF combines federal and state funds to offer a mix loan, grant and refinancing opportunities.

Forty-one percent (41%) of respondents to a recent state and utility survey conducted by the Eastern Research Group for the American Water Works Association indicated demand for DWSRF funding is currently lower than availability of funds. The primary reasons provided by state respondents for why waterworks with existing infrastructure needs may not be pursuing DWSRF funds include a reluctance to take on debt (71%), preference for other sources of funding (67%) and other reasons (49%), including reluctance to work with the federal government, lack of political will to raise rates to cover the cost of debt repayment, and poor credit. (ERG, 2018)

The burden of federal requirements associated with federal grant and loan dollars and the ability of some waterworks, particularly those with strong credit ratings, to obtain interest rates on the bond market that are comparable to or better than the DWSRF mean that some waterworks are seeking outside funding assistance. Federal requirements associated with DWSRF and the Water Infrastructure Finance and Innovation Act (see below) grant and loan dollars can include compliance with the Davis-Bacon Prevailing Wage Act, American Iron and Steel Act Requirements, the National Environmental Review Act, Civil Rights Act, and many others.

The Southeast Rural Community Assistance Project (SERCAP) is one of six non-profit organizations in a national network that are dedicated to empower and assist rural low income people improve the quality of life in their communities by bringing safe drinking water, environmentally sound wastewater disposal facilities, housing rehabilitation, and community development assistance to local residents. SERCAP serves the states of Delaware, Maryland, Virginia, North Carolina, South Carolina, Georgia, and Florida.

SERCAP's Facilities Development program is intended to provide significant financial assistance to Virginia's rural communities for the development and maintenance of their water and wastewater systems. Assistance is provided in the form of grants to local government bodies and water and wastewater systems through SERCAP's state appropriation administered by the Virginia Department of Housing & Community Development. SERCAP's Facilities Development program only funds projects located within Virginia. The current funding level of the annual appropriation is approximately $500,000. SERCAP accepts applications for grant funding on a first-come, first served basis contingent on funding availability. Only units of local government, sub-units of local government, or regional consortia of local governments (e.g. water district authorities, public service authorities, planning district commissions, etc.) and private not-for-profit community systems (e.g. nursing homes, non-profit hospitals, etc.) are eligible to apply. Private for-profit businesses and individuals are not eligible.

The Coalfield Water Development Fund (CWDF) provides grant assistance for waterworks construction in Lee, Scott, Wise, Dickenson, Russell, Buchanan, and Tazewell Counties and the City of Norton. Waterworks have used the fund to expedite water development by providing gap financing, encouraging regional water system development and local investments in water, and addressing public health problems related to the quantity and quality of water. The CWDF is a 501 c (3) non-profit organization created as a national demonstration project from the 1996 amendments to the SDWA. EPA, VDH, Mountain Empire Community College, federal, state, and local elected leaders, and the CWDF's 17-member board support the demonstration project. The CWDF is managed through an administrative contract with a consultant and a private accounting firm. The CWDF has an $8.2 million endowment originating from a $10 million loan with a 30-year term from the DWSRF. It also has a $294,000 endowment originating from an EPA grant. Zero coupon bonds ensure repayment of the loan. Individuals, companies and foundations associated with the coal industry have also made private gifts to the CWDF.

CWDF schedules grant solicitations annually. Local governments, as well as public and private water operators, are eligible to apply for grants. The typical grant "fills in the gaps" in a funding package to allow a water project to go forward. Priority has been given to projects establishing new water service; in the future, it is expected that the focus will be on rehabilitating or upgrading existing service. Since inception, the CWDF has awarded $8 million in grant funding for drinking water projects, which has leveraged $89 million in other funding. The endowment that has been established through the demonstration project will continue to provide grants for drinking water projects in perpetuity.

The Water Infrastructure Finance and Innovation Act of 2014 (WIFIA) established a federal credit program administered by EPA for eligible water and wastewater infrastructure projects. In the Consolidated Appropriations Act, 2018, signed by the President on March 23, 2018, Congress provided at least $55 million in budget authority for the WIFIA program to cover the subsidy required to provide a much larger amount of credit assistance. EPA estimates that this budget authority may provide approximately $5.5 billion in credit assistance and may finance approximately $11 billion in water infrastructure investment, while covering increased costs associated with implementing a larger program. WIFIA and the WIFIA implementation rule outline the eligibility and other requirements for prospective borrowers. Eligible borrowers are local, state, tribal, and federal government entities; partnerships and joint ventures; corporations and trusts; and DWSRF programs.

Private bank lending is possible for credit worthy waterworks. ODW does not have access to data from private lenders. When private lenders make loans, the typical loan term is 15 years or less. Interest rates in the private market are always higher than the rates provided by the DWSRF program and many small and disadvantaged communities only have access to DWSRF funding.

f. Asset Management Plans and Capital Improvement Plans

Data from triennial assessments completed in 2017 indicate that 45.1% of waterworks have some form of an AMP. The new 2020 triennial assessment data demonstrate an increase to 48.6% of systems with an AMP. While AMPs are not required under the SDWA or the Waterworks Regulations, the America's Water Infrastructure Act (AWIA) of 2018 requires AMPs be included and encouraged in the Capacity Development Strategy. ODW requires waterworks without an AMP to develop one as part of the DWSRF loan process. Because this is a new requirement, ODW does not have enough data to estimate funding needs.

ODW formed an ad-hoc committee of interested parties to assist with AMP training and technical assistance to waterworks. Virginia could formalize this committee into an Asset Management Advisory Group to train, educate, lend assistance and direct the emergence of Asset Management in the water utility sector in the Commonwealth. Further, Virginia could demonstrate a comprehensive support of this initiative through the funding of Asset Management Plans for waterworks under 10,000 persons, and associated training for waterworks staff and operators.

Capacity Development provides funding for AMPs through the Planning and Design Grants and the Small Project Engineering Program. FCAP also will provide funding for AMPs. However, waterworks owners often consider ODW's request to obtain copies of financial information about waterworks to be outside the scope of the DWSRF program. Even AMPs and CIPs are considered "intrusive" and so ODW lacks the data to provide estimates of aging infrastructure needs from these planning tools. As AMPs are more commonly adopted, funded, and required as a condition of construction funding, ODW hopes to capture more of this data so it can develop, track, and project aging infrastructure replacement needs in Virginia.

Other states have already enacted similar proposals.[27] For example, the West Virginia Infrastructure and Jobs Development Act created the West Virginia Infrastructure and Jobs Development Council. The Act requires the Council "to develop a comprehensive statewide inventory of water supply systems… and an assessment of current and future needs" at least once every three years.[28] In the assessment, the Council is required to identify areas with inadequate public water systems and recommend construction projects to meet those needs and identify obstacles to developing adequate infrastructure.[29]

Similarly, Ohio enacted legislation requiring that "[a] public water system… demonstrate the technical, managerial, and financial capability of the system to comply with this chapter and rules adopted under it by implementing an asset management plan…" The law is implemented by the state's environmental protection department and requires that it inventory and evaluate all public water system assets, approved capacity projections, contingency planning programs, a capital improvements plan for long-term funding, an asset rehabilitation and replacement program, operations and maintenance programs, and a long-term funding strategy.[30]

While other states imposed regulatory requirements on water systems, Virginia still only has authority to encourage AMPs and CIPs through its Capacity Development program. West Virginia's water infrastructure council and Ohio's inventory of all public water system assets is a novel approach, but requires an enormous amount of effort and resources. VDH would need considerable more staff and funding to maintain such an inventory and support regulatory oversight. Additionally, AMPs and CIPs are expensive and challenging, especially for smaller waterworks with limited TMF capacity. ODW has seen an increasing willingness for waterworks to worth with staff to develop an AMP or CIP through education and training, but smaller systems may require more incentivizing and assistance. In addition,

[27] See, State Asset Management Initiatives, https://www.epa.gov/sites/production/files/2016-04/documents/state_asset_management_initiatives_11-01-12.pdf; see also, https://efc.sog.unc.edu/sites/default/files/2017/Report%205%20-%20How%20States%20Inventory%20Infrastructure%20Needs.pdf.
[28] See, W. Va. Code § 31-15A-6.
[29] Id.
[30] See, 61 Ohio Rev. Code. § 6109.24 (2017), available at http://codes.ohio.gov/orc/6109.24v1.

the state lacks overall funding necessary to manage asset management for waterworks or funding for the regulated community.

IV. Analysis and Discussion

Based on low numbers of health-based violations, the low number of waterworks with ETT scores greater than 10, and other measures including an American Society of Civil Engineers (ASCE) 2015 Report Card score of A- for Compliance and B+ for Capacity Development, VDH has a robust program that is monitoring and protecting public health in the Commonwealth of Virginia. Challenges remain with replacing lead service lines, managing water loss, operator certification, and funding aging infrastructure projects. ODW should publicize its success stories, provide more data visualizations, and continue educating stakeholders and the public.

Funding water infrastructure creates jobs and boosts economic output. The Council of Economic Advisers estimates the economy creates 10,854 full-time jobs with each one billion dollars of water infrastructure spent (includes direct, indirect and induced jobs). The U.S. Conference of Mayor's Water Conference cites that for each additional dollar of revenue (or the economic value of the output) of the water and sewer industry, the increase in revenue (economic output) that occurs in all industries is $2.62 in that year. Further, adding one job in water and sewer creates 3.68 jobs in the national economy to support that job.[31] As such, investment in Virginia's water infrastructure has numerous benefits.

In conducting this study, ODW found that infrastructure expenditures related to replacement, refurbishment, or repair of aging infrastructure are unknown and are not tracked by any agency or organization. EPA demonstrated a need for more funding; however, no organization appears to be tracking the actual financial investments by waterworks across the state. Anecdotal evidence indicates that medium to large waterworks (those serving more than 10,000 consumers) appear to have adequate access to infrastructure funding, whether from federal, state, or local programs, self-funding through bonds and commercial lending, general funds, or reserves. The Virginia DWSRF preferentially directs funds towards small, financially disadvantaged waterworks. However, ODW does not track waterworks' needs unless the waterworks approaches ODW for DWSRF assistance. When waterworks come to the program for construction funding, ODW works with the systems to improve financial strength and provide low interest loans and grants.

Dedicated state funds, above the amount required for state matches on federal grants, appropriated by the General Assembly would provide greater financial assistance to waterworks and individual property owners for expenditure reimbursements associated with aging infrastructure including lead service line replacement. Virginia's LSLR program could use more funding to the Water Supply Assistance Grant Fund and more staff, depending on the size and scope of program implementation. Authority for the program is based on Code of Virginia § 32.1-171.2 B, which states that the Board "shall use the moneys appropriated as matching funds for that purpose and, subject to other available funds, may make Water Supply Assistance Grants from the Fund to localities and the owners of waterworks to assist in the provision of drinking water."

[31] The U.S. Conference of Mayors. Local Government Investment in Municipal Water and Sewer Infrastructure: Adding Value to the National Economy. Richard A. Krop, Ph.D., Charles Hernick, and Christopher Frantz. The Cadmus Group, Inc. August 14, 2008. See also 2017 Drinking Water State Revolving Fund Eligibility Handbook. EPA, June 2017.

ODW urges waterworks owners to establish and fund a capital reserve account that adequately supports capital improvements and asset replacements. Owners are encouraged to raise or adjust water rates to ensure adequate financial resources, as this is crucial to maintaining a successful and sustainable waterworks. Furthermore, ODW suggests that waterworks owners implement a revenue growth model that includes automatic annual rate adjustments that equal or exceed the rate of inflation to provide adequate debt capacity to fund capital improvements. ODW further encourages waterworks self-evaluate their financial position annually. Experience has shown that appropriately structured utility rates gradually increased annually over time are most effective in keeping revenue at pace with costs.

Waterworks that use the DWSRF must have adequate debt coverage through the VRA funding agreement. Other waterworks receiving funding from other lenders may be required to have debt coverage too; however, ODW is not recommending additional authority for requiring adequate debt coverage outside of the DWSRF. Having adequate financial capacity and an acceptable credit review is a DWSRF program requirement, and additional financial coverage outside of the DWSRF to prove a waterworks can operate its facility is not well supported. The debt service coverage ratio is the Net Revenue (revenue minus operations and maintenance) available for debt service divided by applicable debt service. ODW evaluates debt ratio using the first two fiscal years after project completion. A ratio of 1.15 or greater is required for funding under the DWSRF program. ODW and VRA consider a ratio of 1.50 or greater, strong.

ODW works with any waterworks serving a population less than 10,000 consumers on financial indicators regardless of whether the waterworks applies for funding to the DWSRF program for construction funding, or to any of the other funding agencies. However, ODW does not track waterworks that do not seek assistance for construction expenditures. This can include the very large systems (e.g., Fairfax Water, City of Richmond, Loudon County, and Henrico County) and the very small systems. In either case, if the funds spent on aging infrastructure are not part of a federal or state funding program, the amount and type of expenditure is not tracked.

Through the Capacity Development program and other technical assistance providers, waterworks are using AMPs more frequently. The 2020 TMF Assessment revealed a 3.5% increase in waterworks reporting having an AMP, from 45.1% to 48.6%. While this is a sign of progress, additional authority and funding for AMPs may help accelerate the use of this management tool. Virginia has formed an ad-hoc committee of interested parties to assist with AMP training and technical assistance to waterworks. Virginia could formalize this committee into an Asset Management Advisory Group to train, educate, lend assistance and direct the emergence of Asset Management in the water utility sector in the Commonwealth. Further, Virginia could demonstrate a comprehensive support of this initiative through the funding of Asset Management Plans for waterworks serving fewer than 10,000 consumers, and associated training for waterworks staff and operators.

The number and complexity of federal drinking water rules that must be implemented, monitored, and enforced has continued to increase ODW's workload. Staff dedicated solely to capacity development allows engineers and other positions to focus on monitoring and enforcing standards. ODW has an efficient and effective capacity development strategy, which will continue to achieve the fundamental goals of collaborating across Virginia to improve TMF capacity. Adequate funding and staffing are essential to implementing activities most critical to enabling waterworks achieve and maintain sufficient TMF capacity and provide safe, reliable drinking water to all people who are serviced by a waterworks.

V. Recommendations

1. Consider providing Virginia's required 20% match to the DWSRF program. The Governor's 2020 budget amendments unallotted $482,400 from the DWSRF program, which is necessary to provide the full 20% match to the annual federal grant if it reaches its most recent amount of $18.1 million.

2. Consider providing additional funding for the drinking water program to decommission outdated and unsecure data systems. The Governor's 2020 budget amendments unallotted $150,000 in the first year, and $250,000 in subsequent years to decommission and replace outdated systems.

3. Consider appropriating new funding to support Virginia's Lead Service Line Replacement (LSLR) program. This will reflect the General Assembly's dedication to the program and allow easier entry into the program for new participants by avoiding certain federal grant requirements.

4. Consider additional funding to hire more drinking water staff to fully implement the Lead and Copper Rule Revisions (LCRR). ODW estimates that an additional 12 full time employees are necessary to fully implement new federal requirements in the LCRR. ODW expects the LCRR, when released, will have a lower lead action level, will require waterworks to complete inventories of lead service lines and connections, will require waterworks to perform more sampling, and primacy agencies will have to monitor compliance, compile data, and provide additional oversight and technical assistance.

5. Consider additional funding to hire more drinking water staff to fully implement split sampling and more quality assurance, quality control (QA/QC) to ensure waterworks properly sample and take samples in accordance with sampling plans as recommended by the Office of the State Inspector General.

6. Consider amending the Public Water Supplies law, at Code of Virginia § 32.1-171 A, to give the Board of Health authority to include requirements in the Waterworks Regulations for asset management plans (AMPs), inventorying lead service lines, monitoring water loss by waterworks, and other infrastructure monitoring and maintenance.

7. Consider funding for small waterworks to develop AMPs and capital improvement plans.

8. Consider providing statutory authority for VDH to regulate aging infrastructure and water loss as part of its drinking water program. Collaborate with the Environmental Finance Center Network or a similar center of higher education to study infrastructure funding through local general fund, bond fund, reserve fund, and private investor mechanisms.

9. Incentivize counties to assist failing waterworks and struggling and distressed towns (within their county) as a condition for accessing state grant and low interest loan funds through the state agencies. Assistance could be consolidation, purchase, or an aid agreement.

10. Incentivize small and very small waterworks in Virginia to establish capital improvement, emergency management, and operation and maintenance cash reserves.

11. Encourage waterworks to review their water rates and rate setting procedures regularly.

12. Incentivize waterworks, managing utilities, and public service authorities to undertake asset management programs.

13. As funding allows, continue the program's move away from a paper-based program toward an electronic program.

14. Encourage waterworks to conduct TMF self-assessments and compare progress against a benchmark. Expect waterworks below a defined threshold to develop a business operation plan and define strategies to improve TMF performance.

15. As funding allows, develop a process to define and identify communities with aging infrastructure. Provide priority assistance to communities with managerial and technical capacity, but that lack strong financial capacity.

VI. Office of State Inspector General Program Review

The Office of the State Inspector General (OSIG) is performing a programmatic review of Virginia's drinking water program to determine whether ODW effectively monitors waterworks in Virginia. OSIG's interim report and recommendations follow.

COMMONWEALTH OF VIRGINIA
Office of the State Inspector General

Michael C. Westfall, CPA
State Inspector General

P.O. Box 1151
Richmond, Virginia 23218

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Fax 804-786-2341
www.osig.virginia.gov

October 15, 2020

M. Norman Oliver, MD, MA
State Health Commissioner
Virginia Department of Health
P.O. Box 2448
Richmond, Virginia 23218-2448

Dear Dr. Oliver,

The Office of the State Inspector General (OSIG) is engaged in a performance audit of the Virginia Department of Health's Drinking Water Regulation program and provides an interim report on the planning of the audit and the first phase of audit fieldwork below. OSIG has completed the interim report at the request of the Office of Drinking Water (ODW) in connection with A Study on Virginia's Drinking Water Infrastructure and Oversight of the Drinking Water Program (HJ92) for issuance to the General Assembly. OSIG is performing the audit in accordance with Generally Accepted Government Auditing Standards (GAGAS) and is focusing on identifying potential improvements to the Commonwealth of Virginia's safe drinking water monitoring and compliance processes.

Virginia Department of Health – Office of Drinking Water Performance Audit
Interim Report – October 2020

The overall objective of the performance audit is to determine whether ODW effectively monitors Virginia's public waterworks in accordance with the U.S. Environmental Protection Agency's Safe Drinking Water Act (SDWA) and the Commonwealth of Virginia Waterworks Regulations.

The scope of the ODW performance audit spans fiscal year 2015 through the current operating environment. OSIG's preliminary methodology, referred to as survey, consisted of interviewing key staff members; documenting processes and procedures related to ODW public water system

monitoring and inspections; reviewing information used to track and maintain Virginia's safe drinking water; and benchmarking with other states.

Based on information obtained during survey, OSIG designed the following objectives to evaluate the efforts made by ODW to enforce the SDWA and to ensure public waterworks are providing the citizens of Virginia water fit for human consumption. OSIG address objectives A, B and C in this interim report.

A. Determine whether ODW effectively monitors public water systems (PWS) in Virginia to ensure safe drinking water by continuous monitoring and water sample testing for various identified contaminates.
B. Determine whether ODW effectively monitors PWS in Virginia to ensure safe drinking water by conducting sanitary surveys (i.e., on-site inspections) of PWS.
C. Determine if ODW conducts systematic reviews of water testing data in the State Drinking Water Information System and if staff reviews results for indications of problems that may develop over time and questionable results that could indicate mistakes or fraud.
D. Examine the violations issued from 2015 through 2019 to assess the effectiveness of ODW monitoring and enforcement efforts.
E. Determine if ODW has taken formal enforcement actions against public water systems that incurred significant violations for maximum containment level, treatment technique, or monitoring and reporting requirements.
F. Determine if ODW is assessing or collecting civil penalties for drinking water violations.

OSIG's summary observation of ODW is that the agency has proactively taken steps to improve current monitoring and compliance processes. ODW has developed and tracks timeliness and health-based performance metrics to evaluate the success of its program. In addition, ODW recently developed and implemented the Drinking Water Enforcement Manual to improve its oversight of the PWS. The implementation of policies and procedures included in the manual will provide consistency among ODW field offices and direction to ODW compliance specialists stationed in field offices.

Based on audit work for objectives A, B and C, OSIG details preliminary findings and recommendations in Attachment #1 and summarizes below. The audit is still in progress and some potential exists that the final phase of OSIG's audit work or discussions with ODW management in preparation of the final report will affect the findings and recommendations. Specifically, OSIG found that:

- ODW should strengthen enforcement practices.

- ODW should use administrative orders and civil penalties as a means of enforcing safe drinking water laws.
- ODW water sampling processes have limited oversight.
- ODW should improve monitoring and analyzing of compliance performance.

While this interim report focuses on objectives A, B and C, OSIG will be issuing a final report on all six objectives following the completion of fieldwork.

Sincerely,

10/15/2020

X Michael C. Westfall

Michael C. Westfall, CPA
State Inspector General
Signed by: Westfall Michael wzg39453

CC: The Honorable Clark Mercer, Chief of Staff to Governor Northam
The Honorable Daniel Carey, M.D., Virginia Secretary of Health and Human Resources
Dwayne Roadcap, Director, Office of Drinking Water
Maisha Beasley, VDH Internal Audit Director

Office of Drinking Water
Interim Report – October 2020
Attachment #1
Preliminary Findings and Recommendations

Items	*Findings*	*Recommendations*
1	Only one of six regional field offices have a formal process for documenting and tracking notices of violations and administrative orders. ODW regional offices employ informal means of communication, e.g. phone call, verbal confirmation during site visits, etc., to notify public waterworks owner operators of a return to compliance.	Assess enforcement processes and develop better management practices and tracking systems to ensure issuance of enforcement actions for all violations and closing of violations in a timely manner, along with the recommendations stated in Item #2.
2	Across the six field offices, OSIG randomly sampled 30 violations. Three of the violations resulted in administrative orders. None of the three administrative orders resulted in civil penalties even though clearing the violations took six months or longer for the public water system to return to compliance. In addition, OSIG noted that serious health-based violations for maximum containment level and treatment technique identified in the sample resulted in one administrative order and, as stated above, no escalated civil penalties.	• Continue the process of finalizing written guidelines for the escalation of enforcement actions from informal to formal, including the imposition of civil penalties. • Clearly define appropriate enforcement timeframes, particularly for health-based violations. • Monitor and report the performance of enforcement actions in annual compliance reports, including the median number of days it takes for violations to return to compliance by violation type and number of violations remaining open at year-end.

	Findings	*Recommendations*
3	ODW has not fully utilized administrative orders and civil penalties as a means of enforcing Virginia waterworks regulations, specifically for public water systems that are habitual and nonresponding violators.	Enforce *Code of Virginia* §§ 32.1-27 and 32.1.175.01 because the purpose of these statutes is to support the agency's efforts to ensure that public water systems comply with Virginia waterworks regulations. Continue implementation of updated administrative order and civil penalty policies and procedures within the new enforcement manual. The following items should be added to ensure that enforcement and reporting is occurring: • A reporting mechanism for ODW management to identify habitual and nonrespondent public water system violators. • An outline of escalation procedures to ensure timely enforcement of water regulations consistently among the regions in the state. • A consent order and civil penalty tracking system shared between ODW central office and regional field offices to monitor assessments, correspondence, collections, etc. • Regular training and guidance for staff, especially compliance specialists, on the new enforcement manual's methodology for calculating, adjusting and recording penalties to ensure practices are appropriate, fair and consistent with statutory requirements.

	Findings	*Recommendations*
4	ODW water sampling processes rely on the integrity of water system owner operators, licensure training and technical assistance to guide the proper collection and submission of water samples. Current processes do not cover the following risk areas: • ODW does not inspect the sample collection process. The department approves a sampling site plan for certain chemicals, but does not check that an individual sample actually came from the designated location on the plan. Although drinking water labs are required to conduct internal audits, any deviations from sampling requirements may go undocumented and therefore go undiscovered. Specific vulnerabilities could include water samples collected from sources outside the actual water supply, taken from the same location or altered to remove impurities. • ODW does not perform an independent systematic sampling of public water systems as a check on the entire system. ODW may conduct internal tests of drinking water under special sampling circumstances, such as consumer complaints. • The sample process for certain chemicals relies on public water system customers. They are provided instructions on how to perform the sampling procedures, but no one knows how well customers actually implement the instructions. • Some certified labs are in-house and are part of a large public water system. Therefore, the in-house lab conducts sample collection, recording, testing and reporting.	Strengthen existing strategies and procedures to maintain or improve the integrity of water sampling processes such as: • Developing a process for checking samples used for analysis to ensure systems took samples from locations on their sampling plan. • Implementing policies and procedures that allow for random water sampling and testing of public water systems to verify and confirm the validity of water samples that are required for monitoring. This could be performed during the course of performing sanitary surveys or by an alternate schedule established by the agency. • Developing oversight policies and procedures to ensure proper and valid collection of water samples.

	Findings	*Recommendations*
5	ODW has developed internal reports that track three timeliness-based and one health-based performance metrics. ODW's current performance metric reports do not include data that will allow management to evaluate the effectiveness of water monitoring and compliance processes. ODW has self-identified the need for expanded performance data analysis.	Develop evaluation, analysis and reporting of monitoring and compliance performance metrics to include: • Days late in reference to inspections, sampling, etc. • Days between sampling, notice of violations and notification of the return to compliance. • Current and historic chemical testing results with a focus on exceedances. • Habitual violators and nonrespondent waterworks. • Other criteria for determining the effectiveness of monitoring and compliance processes. Include performance analysis and reporting in discussions with the Office of Information Management and Global Environmental Consulting to ensure any updates to current software platforms and/or implementation of new software will have the capability to track appropriate monitoring and compliance data.

Establishing Regulatory Limits for PFAS in Virginia Drinking Water - Updates

Tony Singh

December 16, 2020

HB586

Patron: Delegate Guzman (GA 2020)

- The State Health Commissioner to convene a PFAS workgroup,
- Conduct a detailed investigation on current literature and what other states are doing,
- Conduct PFAS occurrence study at no more than 50 waterworks and source waters,
- May develop MCL guidelines
- **Timeline**: December 01, 2021

Potential Issues: No state funding

HB1257

Patron: Delegate Rasoul (GA 2020)

- Establish MCLs for PFOA, PFOS, and other PFAS compounds, 1,4-Dioxane, and Chromium (VI)
- Provide status report by 11/01/2020
- Provide detailed report by 10/01/2021
- Effective Date: 01/01/2022

Potential Issues:

- No comprehensive PFAS,1,4-dioxane, or Cr(VI) occurrence data in VA
- No funding

Office of Drinking Water - Priorities

HB586 Implementation require –

(1) Form a PFAS Workgroup

(2) A literature review on what other State have done on regulating PFAS

(3) PFAS Sampling/Monitoring study

(4) Workgroup may develop recommendations for MCLs

Funding & Resources

HB586 Deliverables –

- Reports Due 12/01/2021
- Recommendation to the Board of Health on PFAS MCLs

Outreach for PFAS Workgroup

ODW reached out to stakeholders via:

- Waterworks Advisory Committee (WAC)
- VA Water/Wastewater Agency Response Network (VA WARN)
- Other VDH communications

PFAS Workgroup Member Expectations

- Possess knowledge / expertise in “emerging contaminants in the environment”
- Participate and contribute to the topic of interest (PFAS and emerging contaminants in drinking water) at meetings (3 - 4 hours)
- Commitment of 5-10 hours per month to study, review, interpret and develop new documents / guidelines / recommendations
- Participate and contribute to at least one sub-workgroup

Virginia PFAS Workgroup -Scope

- Perfluorooctanoic acid (PFOA)
- Perfluorooctane sulfonate (PFOS)
- Perfluorobutyrate (PFBA)
- Perfluoroheptanoic acid (PFHpA)
- Perfluorohexane sulfonate (PFHxS)
- Perfluorononanoic acid (PFNA)

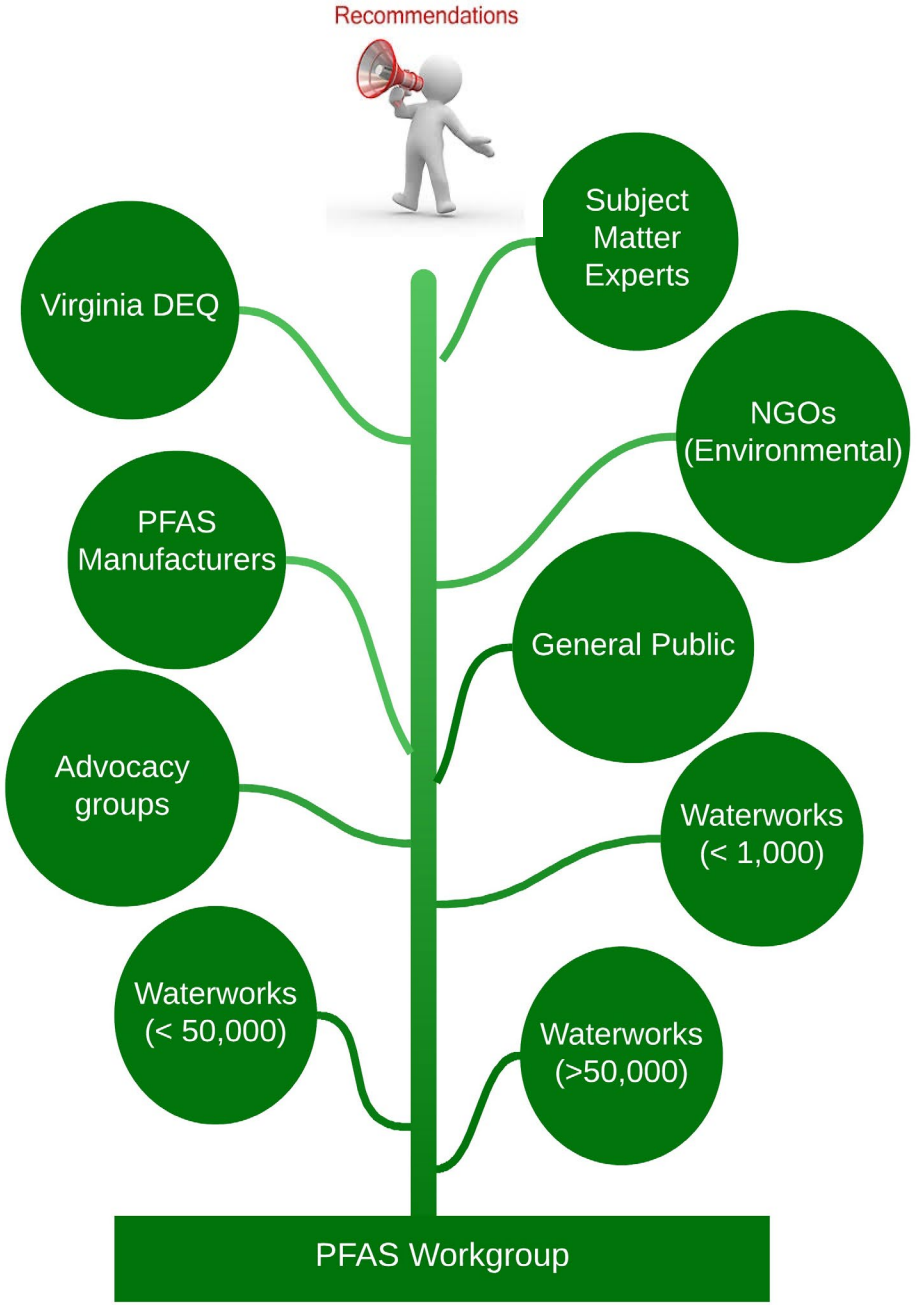
And other PFAS “as deemed necessary”

Virginia PFAS Workgroup - Scope

Scope: PFAS contamination in Drinking Water (including source waters)

https://nwbiosolids.org/whats-happening/research-short-story/2020/january/pfas-talking-points

Virginia PFAS Workgroup



4 people - Community waterworks that serve >50,000 persons.*
1 person - Community waterworks that serves < 50,000 persons.*
1 person - Community waterworks that serves < 1,000 persons.*
2 people - Advocacy groups that represents waterworks in VA.

1 person - A manufacturer with chemistry experience.
2 people - Non-governmental environmental organizations.
1 person – A consumer of public drinking water.

1 person - ODW's technical staff
1 person - Commonwealth of Virginia State Toxicologist.
1 person - VDH local health department (District Health Director)
1 person - The Virginia Department of Environmental Quality (DEQ).

***At least one representative from community waterworks will be from a private company that operates waterworks.**

Newport News
Where Great Things Are Happening

VDH VIRGINIA DEPARTMENT OF HEALTH
Protecting You and Your Environment

AQUA SM
An Essential Utilities Company

THE CITY OF NORFOLK

MISSION H2O Virginia

WESTERN VIRGINIA WATER AUTHORITY
540.853.5700 | info@westernvawater.org

Chesapeake VIRGINIA

VWEA EST 1947
Virginia Water Environment Association

James River ASSOCIATION

American Chemistry Council

Fairfax Water

POTOMAC RIVERKEEPER NETWORK

American Water Works Association
VirginiaSection

COUNTY OF HALIFAX
HALIFAX COUNTY Virginia

VIRGINIA LEAGUE OF CONSERVATION VOTERS

VIRGINIA AMERICAN WATER

New River HEALTH DISTRICT

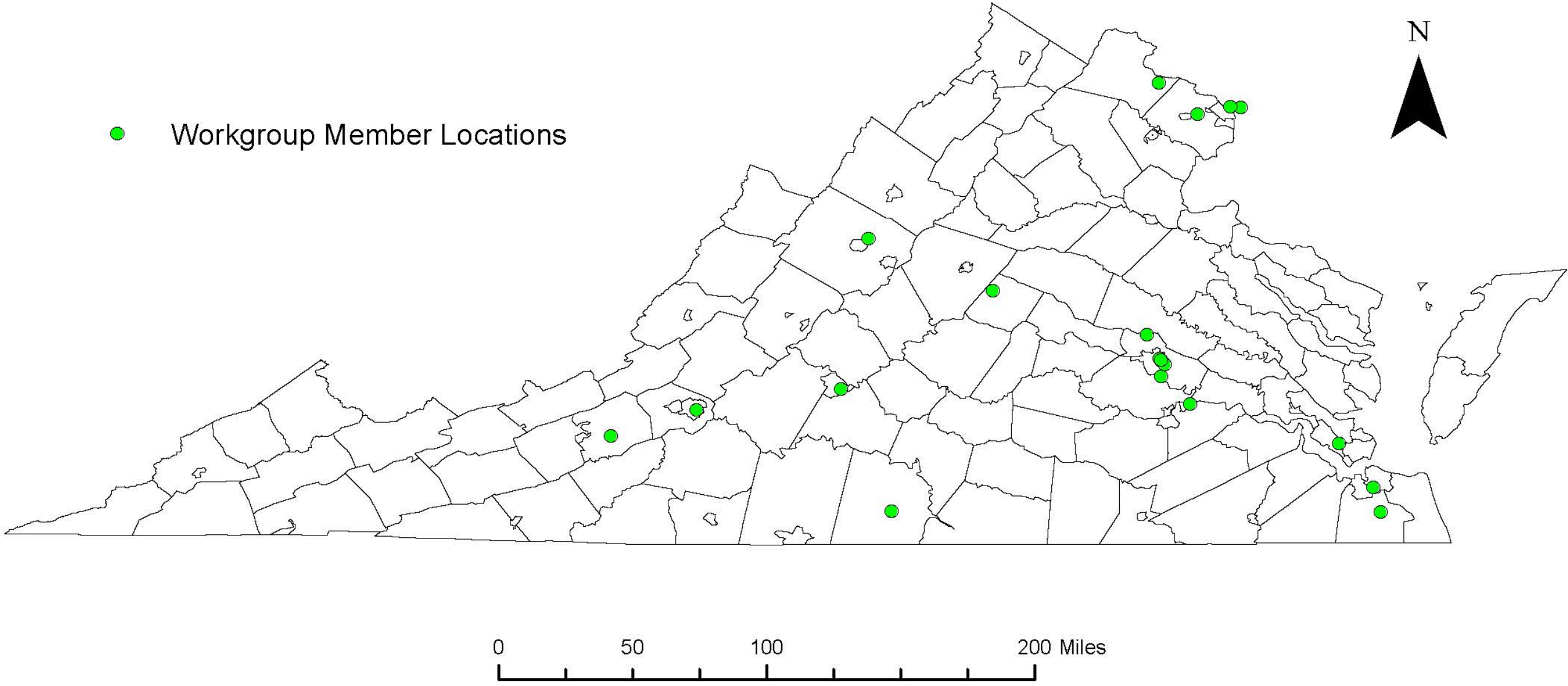
LOUDOUN WATER

DEQ
VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

ACASA

VDH VIRGINIA DEPARTMENT OF HEALTH
Protecting You and Your Environment

Geographical Coverage



Proposed - Workgroup Logistics

Data sharing – An electronic file sharing platform (Google Drive)

Facilitation - A facilitator will assist with quarterly meetings

Meeting information on Town Hall (www.townhall.virginia.gov).

Admin support – Office of Drinking Water (ODW) staff

Meeting Information –

Meeting #	When (Tentative)	Where
1	October 2020	Virtual
2	January 2021	Virtual
3	April 2021	Tidewater (or Virtual)
4	July 2021	Northern Virginia (or Virtual)
5 (if needed)	October 2021	Southwest Virginia

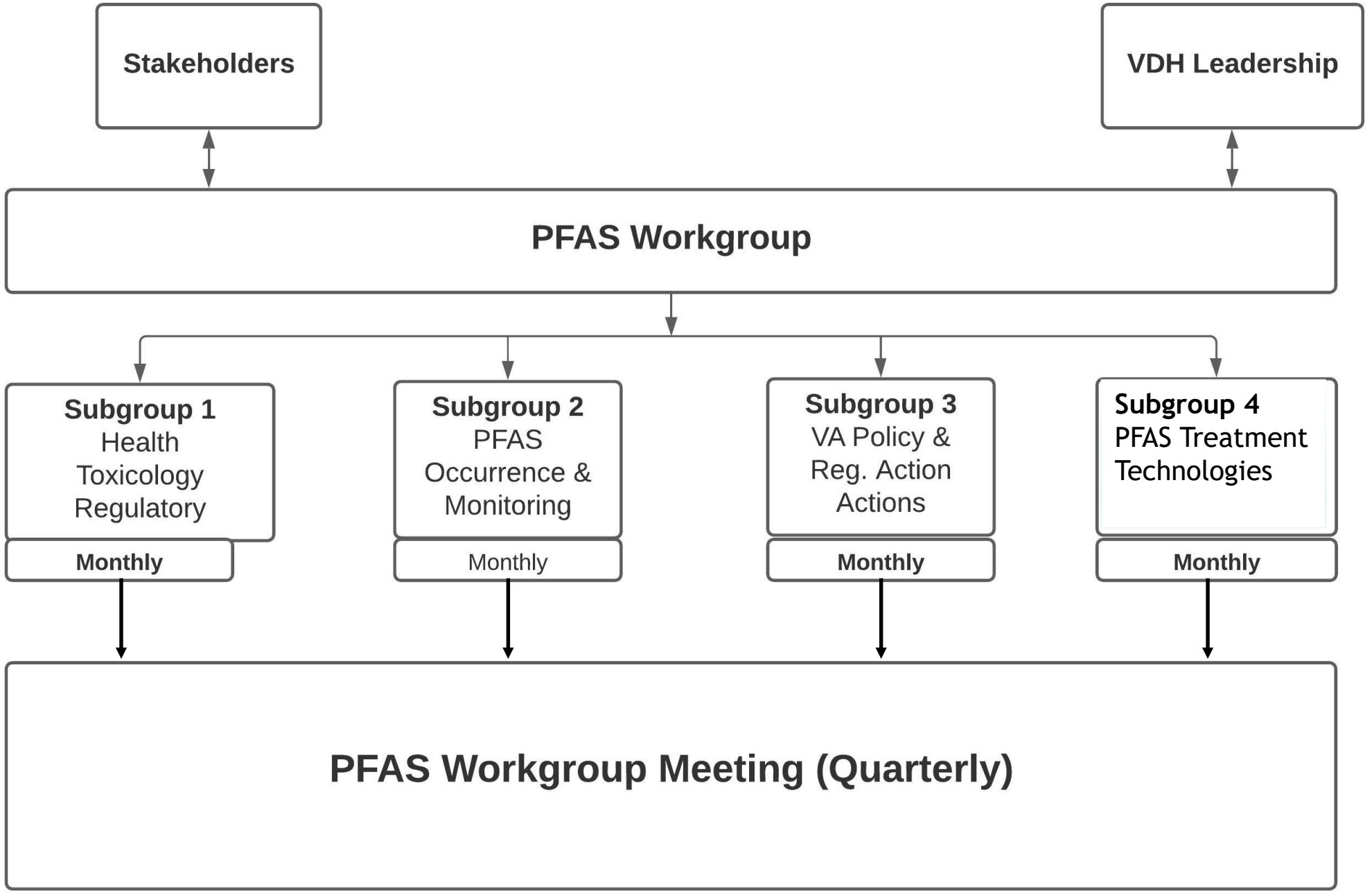
Workgroup Kick off - October 20, 2020

Agenda–

- Introductions
- Welcome Remarks by State Health Commissioner Dr. Oliver

- Major Items Discussed
  1. VA PFAS Workgroup Scope, Structure & Functioning
  2. PFAS Sampling & Monitoring Approaches
  3. VDEQ perspective on PFAS in the Commonwealth

PFAS Workgroup Structure



VA PFAS Subgroups

- **PFAS Health & Toxicology**
  - What is happening in other states
- **PFAS Occurrence & Monitoring**
  - VDEQ and VDH data to identify sampling locations
- **VA Policy & Regulatory**
  - How the above data/info could be used for Virginia?
- **PFAS Treatment technologies**
  - Best Available Treatment Technologies, economics & relevance to VA

Virginia PFAS Subgroups

Health & Toxicology	Policy & Regulations	Occurrence & Monitoring	Treatment Technologies
Andrea Wortzel, (Mission H2)) Jillian Terhune (City of Norfolk) Kelly Ryan (VA American Water) Mark Estes (Halifax County Service Authority) David Jurgen (City of Chesapeake) Erin Reilly (James River Association) Mike Town (VCLV) Steve Risotto (ACC) DoD/Navy Representative (TBD) DEQ representative (TBD) Bill Mann Subject Matter Expert-2 (TBD) **Dwight Flammia (State Toxicologist) Lead**	Philip Musegaas (Potomac Riverkeeper Network) Paul Nyffeler (AquaLaw) Jamie Hedges (Fairfax Water) Anna Killius (James River Association) Jillian Terhune (City of Norfolk) Wendy Eikenberry (Augusta County Service Authority) Mark Estes (Halifax County Service Authority) John Aulbach (Aqua Virginia) Russ Navratil (VA AWWA) Jessica Edwards (Loudoun Water) Mike McAvoy (Western Virginia Water Authority) **Nelson Daniel (VDH Office of Drinking Water) - VDH Lead**	David Jurgen (City of Chesapeake) Jamie Hedges (Fairfax Water) Mark Estes (Halifax County Service Authority) Jessica Edwards (Loudoun Water) Mike McAvoy (Western Virginia Water Authority) Andrea Wortzel (Mission H2O) Henry Bryndza (DuPont) Navy Representative Jeff Steers (VDEQ) Dwight Flammia (State Toxicologist) Tony Singh (VDH Office of Drinking Water) **Bob Edelman (VDH Office of Drinking Water) - VDH Lead**	Jamie Bain Hedges (Fairfax Water) Wendy Eikenberry (Augusta County Service Authority) Mark Estes (Halifax County Service Authority) Russ Navratil (VA AWWA) Chris Harbin (City of Norfolk) Kelly Ryan (Virginia American Water) Jessica Edwards (Loudoun Water) Mike McAvoy (Western Virginia Water Authority) Mike Hotaling (Newport News) DoD Representative (TBD) **Dan Horne (VDH Office of Drinking Water) VDH lead**

Proposed PFAS Sampling/Monitoring Study

Approaches based on:

- Available funding → number of sampling sites
- Maximum public health risk reduction
- Proximity to potential PFAS contamination

Proposed strategy (depends on budget):

1. Largest waterworks (17) in Virginia serve appx. 4.5 million consumers
2. Sampling – based on potential for PFAS contamination – VDH - DEQ data/risk maps
3. Major water supplies – James River, Potomac River, etc.
4. Hybrid approach
5. Statewide comprehensive PFAS occurrence study (Not considering in this study)

4. Hybrid Approach

- Sampling at the 17 large + select high PFAS risk waterworks + select source waters (as dictated by the available budget)
- Waterworks can volunteer to participate at the reduced rate ($ per sample)
- More ideas from the Virginia PFAS Workgroup

Pros:

- More waterworks and source waters can be covered
- Can generate more valuable information on the PFAS occurrence in VA drinking water
- Better understanding will lead to better recommendations

Cons:

- Difficult to design and manage such hybrid study

Virginia PFAS Activities - Summary

- Form a Workgroup
- Conduct a detailed investigation on current literature and what other states are doing,
- Conduct PFAS occurrence study at no more than 50 waterworks and source waters,
- Develop MCL guidelines/recommendations

- Completed ✓
- Approved by Workgroup - State University ($10k)
- Ongoing - Preliminary study design
- **Not yet started**

Questions, Comments or Suggestions

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Lead in Drinking Water at Schools & Childcare

WIIN 2107 grant

- Lead testing in drinking water at VA schools & child care
- EPA 3T methodology
- Prioritization on EPA criteria
  - Children age 6 years or below
  - Schools on meal plans
  - Building older then 1978
- Duration: 2020 - 2023
- **Funding: $1,159,000**

WIIN 2105 grant

- A Statewide program on funding Lead Remediation
- Schools and child care programs in disadvantaged communities are eligible
- Remediation costs upto certain value will be reimbursed
- Collaboration with VDOE and VDSS
- Duration: 2021 - 2024
- **Funding: $1,300,000**

Division of Technical Services Briefing

Robert Edelman
Director, Division of Technical Services

Compliance Monitoring Data Portal (CMDP)

- EPA's electronic laboratory result portal
- ODW requirement issued - all compliance results through CMDP after Sept 1, 2020

Why?

- Required for future versions of SDWIS
- Cross-Media Electronic Reporting Rule (CROMERR) compliance
- Reduce errors – improve customer service to waterworks
- Reduce ODW staff time
  - Data entry
  - Error resolution

Compliance Monitoring Data Portal

Commercial Labs & Waterworks Labs:

- Transition to CMDP is essentially complete
- Using CMDP for routine reporting
- 1 on 1 training to help reduce mistakes
- Fewer problems/errors noted by Field Offices
- Labs not graduated to Production run only a few DW samples
- ODW has essentially stopped hand-keying lab results except for cryptosporidium

Cryptosporidium Results:

- EPA has enabled data entry through CMDP
- ODW will reach out to Crypto Labs

Customer-Requested Lead Sample Results

- ODW is developing a policy and procedure to capture results
- Likely will involve CMDP

- EPA Expects States to review CR lead results
- EPA Expects States to include CR lead results in 90th percentile, when appropriate.

Permit Manual Update

- 30-day public comment period ended November 25
- Received three sets of comments:
  - Mission H2O
  - City of Norfolk
  - Loudoun Water
- Comments were consistent:
  - Clarifications between DEQ and VDH programs
  - Clarify language on “Grandparented” facilities
  - Storage design standard
  - Design exception for storage design based on hydraulic modeling
- ODW will provide written responses to comments
- ODW is making editorial changes to the Manual to clarify
- ODW will decide if the changes necessitate a second public comment period

Other Manuals in Progress

- Field Manual
- Sampling Manual
- Data Management Manual
- Compliance Determinations Manual

Drinking Water Watch

- https://odw.vdh.virginia.gov/DWW-VA/Login
- Real-time access to sample data
- Registered users can:
  - View sample results
  - Determine if results meet standards
  - View sample schedules

Levels of Access

Registered Users:

- See immediately after submitted by the laboratory:
    - sample results
    - compliance calculations

Public Access:

- Allows viewing after 45 days

Updates to Drinking Water Watch

EPA Multipurpose Grant will facilitate:

- Removing LCR sample locations from public view

Changes to Sample Schedule:

- Add pop-up to show sample point name and ID (currently shows the facility name and ID only)
- Add new column to indicate if the schedule is satisfied (Y or N)

EPA Updates

Lead and Copper Rule Revisions

- Was expected to be final September 2020
- Coming very soon?
- Stuck in OMB review?
- Perhaps just before inauguration day?
- Perhaps in the new administration, with some tweaks?

Consumer Confidence Report Rule

- AWIA, Section 2008 amends SDWA CCRs
  - Include additional information on corrosion control, exceedances and violations
  - Improve readability and accuracy, biannual delivery for large systems and facilitate electronic delivery.
  - ASDWA commented to EPA in September 2020

Training, Capacity Development and Outreach

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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

Training, Capacity Development and Outreach

- Provides Technical, Managerial and Financial Assistance to Small (<10,001) Waterworks
- Part of the 1996 SDWA Amendments
- Supports the National Capacity Development Strategy
- Virginia's Capacity Development Strategy
- Reports to the Governor every three years
- Assess Waterworks TMF capacity every three years

Office of Drinking Water
Capacity Development

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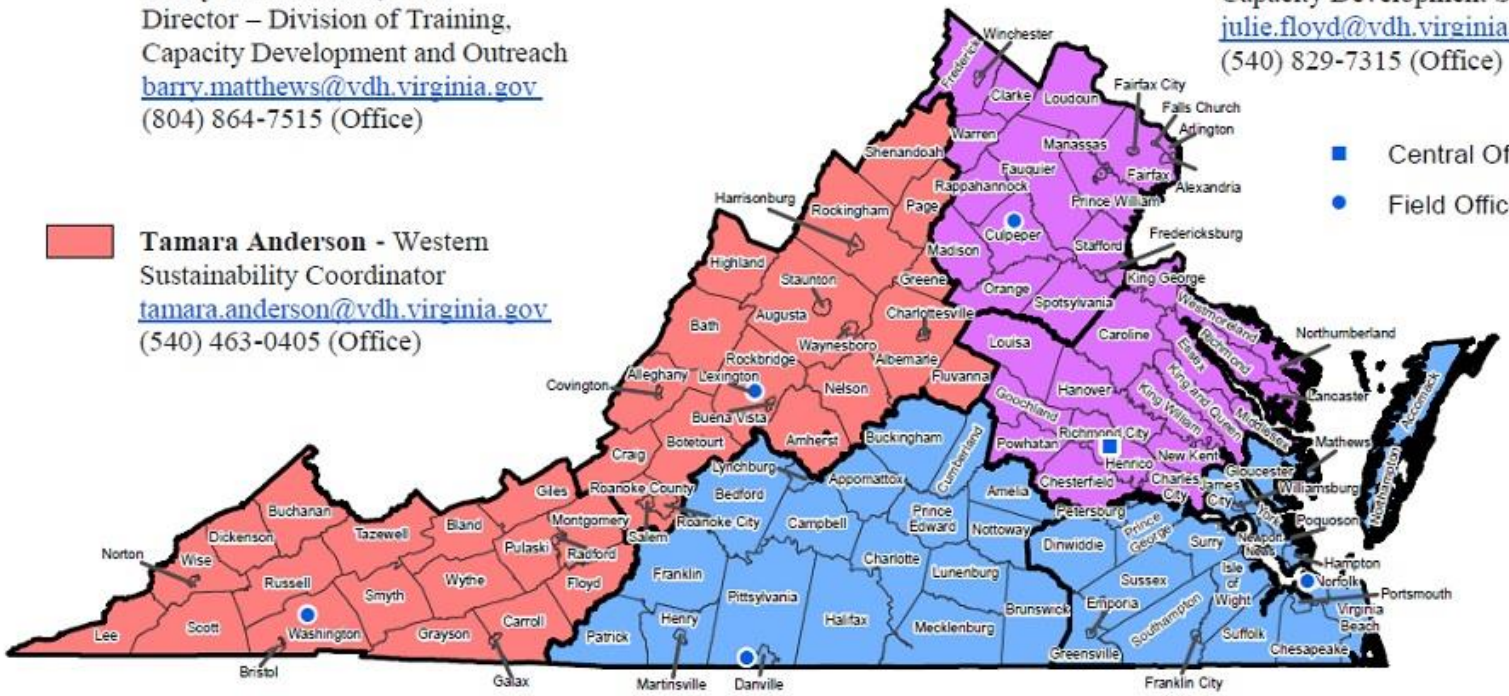

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VDH VIRGINIA DEPARTMENT OF HEALTH
Protecting You and Your Environment

The mission of the Office of Drinking Water is to protect public health by ensuring that all people in Virginia have access to an adequate supply of affordable, safe drinking water that meets federal and state drinking water standards.

Office of Drinking Water
Safe Drinking Water for a Healthy Virginia

VDH VIRGINIA DEPARTMENT OF HEALTH
Protecting You and Your Environment

- Operator Training Coordinator
  - Jason Yetter
- Staff Training Coordinator
  - Sarah Hinderliter

15% Set-Aside:
Local Assistance and Other Programs

Examples/Activities Funded:

- 4 to 8 Planning and Design grants per year
- Small Project Engineering contracts

Planning & Design Grants

- 2020

10 applications Totaling $348,355

5 funded projects Totaling $162,100

- 2019
- 3 open projects Totaling $105,000.

Planning & Design Projects

- Disinfection byproduct (DBP) reduction - Pittsylvania County Service Authority (PCSA) - Grit Road ($35,000)

- Pressure zone evaluation, Town of Tazewell- Buskill Subdivision ($35,000)

- Distribution system evaluation for water loss, Russell County PSA- Castlewood ($35,000)

Planning & Design Projects

- Iron and Manganese treatment design, Floyd County PSA ($35,000)
- Combined radium evaluation, Pittsylvania County Service Authority – Robin Court ($21,100)

Small Project Engineering Services

- 2020

  Hurt & Proffitt, Whitman Requardt, and Thompson & Litton
- Four new projects
- Six previous projects
- Yearly Total $90,784.14

Small Project Engineering Services

- Lead and copper - Cottage Edge, Franklin County ($15,000)
- Copper treatment evaluation and chlorination treatment - The Light Academy, Fluvanna County ($19,939)
- Chlorination System - Town of Edinburg, Shenandoah County ($15,321)

Small Project Engineering Services

- Failing storage tank / Distribution system - Hardy Road Mobile Home Park, Bedford County ($17,000)

- Previous open projects include Town of Iron Gate, Alleghany County, AMP ($15,000)

15% Set-Aside:
Local Assistance and Other Programs

Examples/Activities Funded:

- VT Trainings for waterworks operators
- Professional Development Seminars (operators and others)
- Waterworks scholarships
- Mountain Empire Community College distance learning
- Cyber Security Training for Waterworks

Operator Certification

- Required to maintain 20% of Capitalization Grant (DWSRF Grant)
- Reports Annually to EPA
- Coordinates with Department of Professional and Occupational Regulation
- Classes / Training through contracts (AWWA, MECC, VT, Others)

Operator Certification Training

February 11-13 In Person course - 25 attendees (95% positive feedback)
Richmond, Virginia
Basic Groundwater Course for Small Systems

April 15 – 55 attendees (94% positive feedback)
Webinar Topic: Sample Collection, Analysis & Interpretation

May 21 – 88 attendees (92% positive feedback)
Webinar: Enhancing Teamwork Through Ethical Leadership

Operator Certification Training

June 17 – 109 attendees (87% positive feedback)
Webinar Topic: The Future of Pathogen Detection for the Water Industry

July 1 – 71 attendees (90% positive feedback)
Webinar Topic: Asset Management and Rate Impacts

Sept. 16 – 130 attendees (87% positive feedback)
Webinar Topic: Classifying Water Main Break Types, Waterworks' Responsive Actions and Distribution System Disinfection Practices

Operator Certification Training

October 21 – 120 attendees (92% positive feedback)
Webinar Topic: Managing the Assets of a Water Distribution System

Nov. 18 – 101 attendees (83% positive feedback)
Webinar Topic: Harmful Algal Blooms: A Threat to the Waters of the World

15% Set-Aside:
Local Assistance and Other Programs

Examples/Activities Funded:

- Security staff salaries
- Source Water Protection and Wellhead Protection
- Receivership (unfunded)
- Graphical Information Systems

10% Set-Aside: State Program Management

Examples/Activities Funded:

- Staff Training salary
- Training registration and travel
- Conferences
- Training venues

Staff Training

Responsible for:

- Lead for Training Team Committee
- Staff Training Policy & Manual
- Orientation
- TRAIN agency online learning management system
- Logistics
- Coordination

Outreach

Information and education directed to:

- Regulated Community (Waterworks)
- Support Community (Associations, Engineering Firms, Organizations, etc.)
- Public

Examples include: Proclamations, HipPocket Tools, Training Announcements, Videos, National Drinking Water Week, A Day without Water, Work for Water, ODW Booth, and Public Health Week

TCDO 2020 Accomplishments

- Hired new Small Systems Sustainability Coordinator Position
- Triennial Assessment of 1,697 waterworks completed
- Governors Triennial Report submitted on time
- Annual Capacity Development Report submitted to EPA on time

TCDO 2020 Accomplishments

- Annual Operator Certification Report submitted to EPA on time
- Establishing new TNC Procedures
- Completed Training Manual
- Revising Waterworks Business Operation Plan
- Revised Capacity Development Strategy for EPA submission pursuant to AWIA

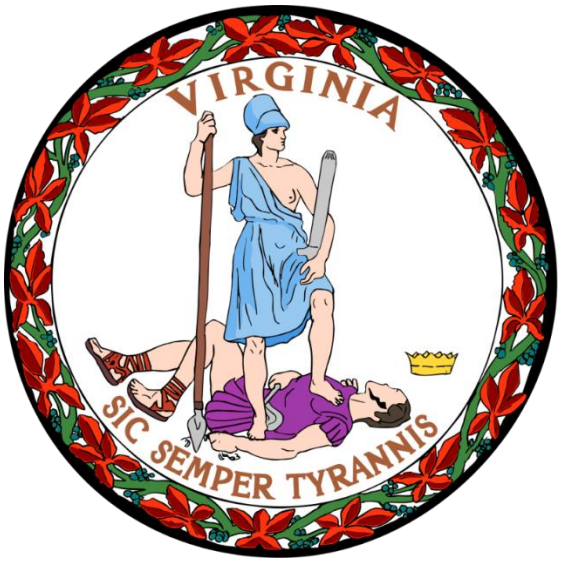
TCDO 2020 Accomplishments

- Submitted WIIN 2104 Grant Application
- Led Committee developing EHS Career Ladder Proposal
- Revised ODW Orientation Training to Virtual Platform – October 5 -16, 2020 18 new employees
- Training Committee finalized EHS Onboarding Training for Field Offices

Report to the Governor

Efficacy of Virginia's Waterworks Capacity Development Strategy

July 1, 2017 to June 30, 2020



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www.vdh.virginia.gov

Office of Drinking Water
Safe Drinking Water for a Healthy Virginia

COMMONWEALTH OF VIRGINIA

Ralph Northam, Governor

VIRGINIA DEPARTMENT OF HEALTH
M. Norman Oliver, MD, MA
State Health Commissioner

OFFICE OF DRINKING WATER
Dwayne Roadcap, Director

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This report is available to the public on the VDH Office of Drinking Water website at: https://www.vdh.virginia.gov/drinking-water/capacity-development/

Contents

Figures

1.0 Executive Summary

The Virginia Department of Health (VDH), Office of Drinking Water (ODW) is the primacy agency for implementation of the Safe Drinking Water Act (SDWA) in the Commonwealth of Virginia. The SDWA defines a public water system, also known as a waterworks in Virginia law and regulations, as "a system that serves piped water for human consumption to at least 15 service connections or 25 or more individuals for at least 60 days out of the year." There are currently 2,808 waterworks in the Commonwealth of Virginia collectively serving approximately 7.6 million consumers--about 89% of the total population of Virginia (8.5 million people). The SDWA categorizes waterworks into three system types: community, nontransient noncommunity (NTNC), and transient non-community (TNC). Approximately 7.1 million Virginians receive water from 1,093 community waterworks that serve year-round residents. VDH regulates 509 NTNC waterworks, which provide drinking water to schools, day care centers, industrial centers, factories and other facilities that serve at least 25 of the same persons 6 months out of the year. Finally, VDH regulates 1,206 TNC waterworks, which serve 25 or more different people for at least 60 days a year. TNCs include hotels, restaurants, campgrounds, and marinas.

Pursuant to Section 1420(c)(3) of the SDWA (42 U.S.C. § 300g-9 (c)(3)), VDH must submit a report to the Governor on the efficacy of VDH's Capacity Development Strategy (Strategy), including VDH's progress to improve the technical, managerial, and financial (TMF) capacity of waterworks in Virginia. The Strategy describes VDH's work to evaluate and assist waterworks with TMF capacity. The Strategy incorporates programmatic and individualized assistance based on need. TMF capacity drives the success of a waterworks' program to comply with state and federal regulations.

In July 2020, VDH updated its Strategy to incorporate requirements in America's Water Infrastructure Act (AWIA); U.S. Environmental Protection Agency (EPA) approval for the updated Strategy is pending. Virginia's currently approved Strategy has three main objectives:

1) Posses and exercise sufficient authority to prevent nonviable community and NTNC waterworks;
2) Assess, prioritize, and respond to correct TMF capacity limitations; and,
3) Ensure waterworks offered financial assistance have, or will develop, sufficient TMF capacity prior to fund disbursement.

VDH's drinking water program centers on permitting, compliance, TMF assistance, and enforcement. VDH's program identifies waterworks lacking TMF capacity, provides assistance to improve capacity, and permits the operation of regulatory compliant waterworks.

During the reporting period (July 1, 2017 – June 31, 2020), the Capacity Development Program grew and accomplished many programmatic goals. VDH issued 553 construction permits and 701 operation permits for new waterworks or modifications of existing waterworks. Staff completed 1,577 source water assessments and 70 well site inspections. VDH ensured 1,598 waterworks had a properly licensed operator. In implementing its Strategy, VDH accomplished the following:

- Offered $58,338,275 in low interest or interest-free construction loans to 77 waterworks through the Drinking Water State Revolving Fund (DWSRF).

- Awarded $1,065,600 for lead service line replacements to four localities (Alexandria, Chesapeake, Henry County, and Richmond).
- Awarded $900,750 in planning and design grant funds to 25 waterworks.
- Provided $217,000 in small project engineering assistance to 17 waterworks.
- Completed 3,857 routine sanitary surveys of waterworks facilities.
- Conducted 168 special sanitary surveys in response to complaints or water quality issues.
- Evaluated 2,665 requests for water quality monitoring waivers for man-made chemicals.
- Issued 4,942 notices of alleged violation for noncompliance with the SDWA and Virginia Waterworks Regulations.
- Produced 190 warning letters to waterworks that were persistently in noncompliance with the regulations.
- Issued 15 administrative orders to waterworks substantially and persistently out of compliance with regulations, eight of which have been fully resolved.
- Responded to 31,560 requests for technical assistance from waterworks and operators.
- Evaluated 1,597 community and NTNC waterworks for TMF capacity.
- Reviewed 35 source water protection plans, with an additional 11 plans in draft format.
- Collaborated with technical assistance partners who provided 1,068 hours of leak detection services to 74 waterworks using equipment paid with DWSRF funding.

VDH's Strategy provides training to ensure managerial capacity at waterworks. VDH trains and assists waterworks owners on business operation plans. VDH contracts with Virginia Tech to provide two classes a year on managerial capacity. During the reporting period, Virginia Tech held four courses for waterworks decision makers. VDH and Virginia Tech canceled two courses in 2020 because of the pandemic.

Waterworks lacking TMF capacity were required to complete Waterworks Business Operations Plans as part of DWSRF funding. Virginia's Strategy helped waterworks reliably produce and deliver safe drinking water to consumers through direct technical assistance and regulatory compliance help. The Strategy incorporates VDH's major program activities, which maximizes capacity development in Virginia. This report documents VDH's assistance to waterworks, especially small waterworks (those serving 10,000 of fewer consumers), which tend to have the greatest need.

2.0 Background

The SDWA defines a waterworks as "a system that serves piped water for human consumption to at least 15 service connections or 25 or more individuals for at least 60 days out of the year." The capacity to operate, maintain, and sustain a waterworks successfully over a long period is comprised of TMF components. TMF components demonstrate a waterworks' ability to reliably produce and deliver safe, affordable drinking water that meets federal and state quality standards to Virginians. TMF assessments measure a waterworks' ability to plan, achieve, and maintain compliance with the SDWA, Virginia's Public Water Supplies law, and associated federal and state regulations.

VDH evaluates TMF of a waterworks through on-site inspections and other evaluations:

- *Technical Capacity* represents the physical infrastructure of the waterworks, including its water source, and the knowledge and skill required to operate the facility in accordance with regulations and best management practices;
- *Managerial Capacity* means the waterworks' ability to plan, organize, and regularly achieve compliance with applicable laws and regulations that protect drinking water; and,
- *Financial Capacity* reflects the waterworks' ability to balance revenues and expenditures, have acceptable loan ratios, and to maintain overall healthy financial data.

The TMF elements are interdependent--all three are essential for ensuring the sustainability of a waterworks. Weakness in one area of capacity will impair other components. For example, a waterworks that lacks financial capacity might have inadequate service rates, which affects the waterworks' ability to hire qualified and licensed staff, to plan and implement necessary repairs and maintenance, and to manage the waterworks effectively.

There are currently 2,808 waterworks in the Commonwealth of Virginia collectively serving approximately 7.6 million consumers (roughly 89% of the Commonwealth's total population of 8.5 million people). Most Virginians receive water from community waterworks, which have at least 15 service connections with year-round residents, or that regularly serve at least 25 year-round residents. Community waterworks include systems serving hundreds of thousands of consumers, small towns, and individual neighborhoods. NTNC waterworks serve at least 25 of the same persons over six months out of a year. Examples of NTNCs include schools, hospitals, or manufacturing plants. TNC waterworks serve at least 25 persons daily for at least 60 days out of the year. Examples include restaurants, campgrounds, and hotels. Figure 1 shows the composition and population served by each classification.

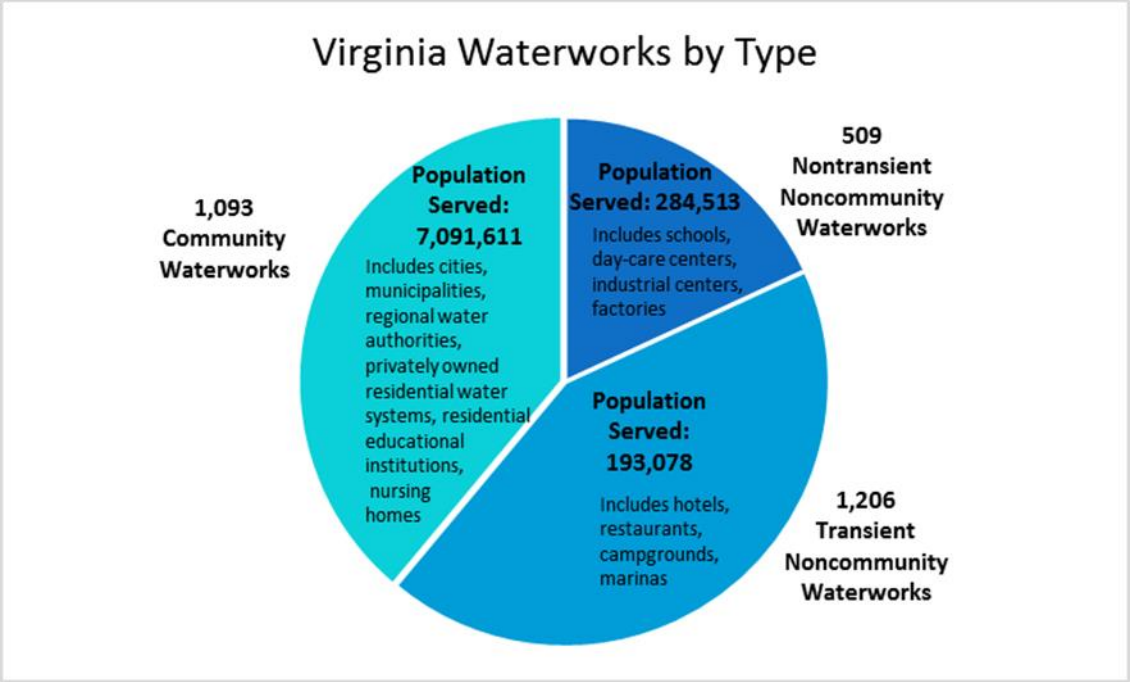

Figure 1: Virginia Waterworks by Type

VDH has well-established procedures to address TMF through routine interactions and inspections. VDH's sanitary survey program evaluates the condition of a waterworks' infrastructure, operational practices, and drinking water quality indicators. VDH can identify TMF strength and weakness at the waterworks through its routine business process. Staff provides waterworks with ongoing, daily help with TMF.

3.0 Technical Capacity

Technical capacity encompasses the physical infrastructure of a waterworks, including its: water source, treatment facility and distribution system. Equally important are the knowledge, skills, best management practices, and training required to operate the facility in accordance with regulations. Technical capacity includes the permits and regulations that establish operational requirements. Described below are VDH-specific operational areas that provide support to waterworks.

3.1 Construction Plans and Permit Review

VDH issued 553 Construction Permits and 701 Operation Permits from July 1, 2017, to June 30, 2020. Applicants document TMF in the process of securing a permit from VDH. Virginia Code §§ 32.1-169 and 172B, and the Virginia Waterworks Regulations, at 12VAC5-590-190, prohibit the establishment, construction, or operation of a waterworks without a written permit. Hence, TMF is a part of every application. Construction and operation permits ensure that waterworks have TMF sustainability before operating the waterworks. Waterworks owners must satisfactorily complete a five-step application process before receiving a permit. The application process includes:

- Notification of Intent (Permit Application),
- Preliminary Engineering Conference,
- Submission of a Waterworks Business Operations Plan,
- Submission of a Preliminary Engineering Report, and
- Submission of Final Plans and Specifications.

After installation and construction of the plans, a professional engineer must certify that the final construction complied with approved plans and specifications. Upon receipt of the engineer's completion statement, VDH will issue an Operation Permit, which also establishes operator licensure and other requirements. The above procedures ensure that a new waterworks is properly designed, constructed, and inspected, and has sufficient TMF with licensed operators on staff. VDH procedures compel prospective waterworks owners to plan for long-term financial sustainability.

3.2 Sanitary Survey Program / On-site Inspections

VDH staff perform on-site inspections of waterworks through the sanitary survey program. Inspections include thorough evaluations of the waterworks' infrastructure and water treatment processes, a review of drinking water quality monitoring records, and an examination of the operational practices and controls. VDH also reviews waterworks staff qualifications. Currently, staff complete sanitary surveys in paper format. However, VDH is finalizing an electronic sanitary survey platform to reduce survey reporting time, increase consistency, and allow for analysis of statewide sanitary survey data to reveal trends.

During a sanitary survey, if VDH staff identify "Significant Deficiencies," they develop "Corrective Action Plans" for these deficiencies. Significant Deficiencies are defects that cause or have the potential to cause an unacceptable risk to health or that could affect the reliable delivery of safe drinking water. Corrective Action Plans are designed to resolve Significant Deficiencies by a specific date.

VDH staff conduct special sanitary surveys of waterworks to evaluate new construction, investigate consumer complaints, and respond to specific requests for assistance. Staff also make site visits to perform source water assessments and to evaluate locations of proposed new wells. These visits provide VDH with opportunities for direct, face-to-face interaction with waterworks owners and operators, and allows guidance for TMF capacity improvement.

Through the sanitary survey program, staff identify waterworks' capacity needs, and prioritize and target waterworks for additional guidance and assistance. VDH staff document sanitary surveys through a written report that also serves as an action plan for waterworks owners to correct deficiencies and improve operations.

Figure 2 summarizes VDH field activities in the current and previous reporting periods, offering trends over time for the number of sanitary surveys and groundwater assessments.

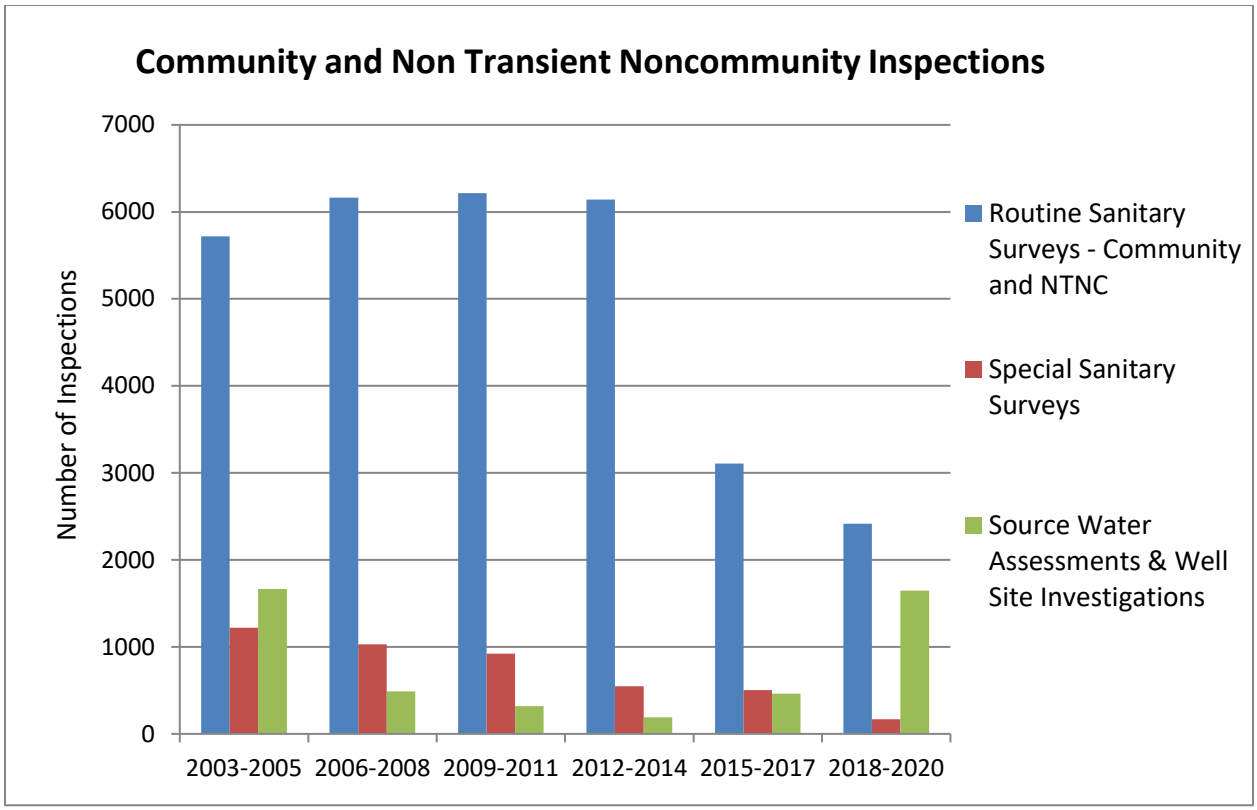

Figure 2: Community and Non-transient Noncommunity Inspections

During this reporting period, VDH staff performed 2,417 routine sanitary surveys at community and NTNC waterworks, 168 special sanitary surveys (including inspection of new construction, complaint investigations requiring field visits, and delivery of on-site assistance), and 70 well site inspections.

Source water assessments use GIS tools and other database records to identify sources of contamination and provide insights on protecting the water supply. Staff occasionally require field verification of sources of contamination with the permitting or sanitary survey processes.

The SDWA requires inspection of certain waterworks once every three years. In prior reporting periods, VDH conducted more routine and special sanitary inspections. Beginning in 2015, VDH modified its inspection frequency to align with the minimum inspection frequency established by the SDWA and the Waterworks Regulations. The adjustment allowed staff to onboard new, previously unregulated TNC waterworks. In other words, VDH now inspects more systems less frequently. This trend is likely to continue as laws and regulations expand to cover more contaminants and facilities. ODW did not receive additional full-time employees to handle the additional workload, which is one reason why inspection frequencies decreased over time. VDH now regulates hundreds more TNCs than prior to 2015. VDH also increased attention in source water assessments. The next section provides details on work with TNCs.

3.3 Transient Noncommunity Inspections

The Commonwealth of Virginia has 32 health districts and a local health department (LHD) in 109 counties and cities. The LHD issues permits for restaurants, food service facilities, campgrounds, hotels, migrant labor camps, and other businesses. The LHD forwards copies of permits for commercial establishments to the regional Office of Drinking Water. If a business meets the definition of a waterworks, then ODW will help the applicant with permitting and TMF. Hence, a business could have multiple permits from VDH, one for the food establishment, one for the hotel/motel, one for the sewage system, and another permit for the drinking water supply.

ODW works with the LHD to ensure all businesses have proper permits for drinking water. Many times the water quality and production is ancillary to the business. The business owner may treat the water supply as a lower-priority as compared to the primary business operation (e.g., serving food, manufacturing, etc.). TNCs in particular often lack TMF capacity. Compliance with the Virginia Waterworks Regulations can be challenging, which is why VDH created and hired a specific position in 2019 to focus on these waterworks. The noncommunity Sustainability Coordinator works directly with TNC owners and operators to enhance understanding of TMF responsibilities and requirements. Staff develops training and outreach materials, provides technical assistance on compliance with regulations, including sampling frequency, and evaluates policy and procedures to improve compliance and sustainability. VDH performed 1,440 sanitary surveys at TNC facilities during the reporting period.

3.4 Source Water Assessment and Source Water Protection

Beginning in April 2003, VDH started an EPA-required effort to perform source water assessment susceptibility rankings for all active public water supplies. EPA and VDH designed the assessments to reveal potential vulnerabilities from manmade sources of contamination. The assessments help with water supply planning, source water protection, and managerial capabilities. VDH performs assessments on new water supplies and records conditions found from field observations and sanitary surveys. During the reporting period, VDH completed 1,577 source water assessments. Source water assessments have increased substantially since the last reporting period by streamlining business processes and renewing the focus on this important work. Performance metrics track assessments completed and waterworks that need an assessment.

In July 2003, VDH created a Wellhead Protection Plan program for small community groundwater systems, which VDH continues to implement. VDH requires a qualified consultant to assist in plan development. The program helps waterworks with a high contamination susceptibility to develop a wellhead protection plan. Waterworks serving less than 50,000 persons receive technical support from a qualified contractor. The resulting protection plans ensure the participating waterworks safeguard drinking water sources by managing and controlling activities near the source, which could compromise water quality and quantity. Staff expanded the program from groundwater systems with 10,000 or less persons to waterworks that use surface water and serve less than 50,000 persons. Approximately 12 small waterworks prepare site-specific Source Water Protection Plans (SWPPs) each year. Program contractors contact an average of 30 waterworks to determine interest. In this reporting period, contractors made eight program presentations at local advisory committee meetings. To date, approximately 500 waterworks have received an offer of assistance.

During this reporting period, waterworks and their consultants completed 35 SWPPs, facilitated 13 local advisory committee meetings, drafted 11 more SWPPs (waiting on approval by the waterworks' management), and offered assistance to 375 waterworks.

3.5 On-site Assistance and Outreach to Operators and Owners

Owners and operators of small waterworks have difficulty finding the time and financial resources to attend formal classroom-style training events. VDH leadership encourages staff to provide in-field training during inspections and other in-person visits. Staff answer questions and provide guidance on regulations, technical topics, and best management practices. Staff handle technical assistance informally during sanitary surveys, telephone conversations, or by emails. Technical assistance represents a cornerstone of the ODW program and includes sharing information and expertise, answering questions, providing instruction or training, conveying working knowledge, and the transfer of technical data. Staff offer technical assistance during site visits, training, meetings, letters, telephone calls, emails and other communications. Effective relationships developed over time ensure community partners, customers, and the regulated community receive the most up-to-date information available.

Staff encourages and Virginia law requires in certain instances, a Waterworks Business Operations Plan (WBOP). Capacity Development staff meet with waterworks owners to evaluate, document, and codify processes and resources vital for sustainability. The WBOP is a useful roadmap for waterworks to follow. The WBOP serves as an educational tool for staff to provide one-on-one training on topics such as water rates, maintenance procedures, asset management, and capital improvement planning.

VDH continues to develop "Hip Pocket Tools" to increase individualized training to waterworks operators. Recognizing that society increasingly prefers digital content for ease of portability, use, and access, VDH has converted the Hip Pocket Tools into electronic format and posted these field guides on the VDH website. To support and encourage the use of Asset Management Plans (AMP), VDH posted specific content to the website that supports in-person and online AMP training. VDH staff can use this material during field visits and at other technical assistance meetings. The on-site training meets specific needs and can make significant improvements in TMF capacity. This tool and approach provides immediate on-site coaching. Additionally, owners and operators can access the information when they have time, and then follow up with questions if in-person coaching does not happen.

3.6 Assistance Contacts by VDH Staff

VDH staff interacts with waterworks owners and operators through a variety of informal contacts including meetings, telephone calls, and emails. Staff gives assistance that covers a full range of TMF capacity concerns. For instance, staff may help to address drinking water quality sampling needs, to follow-up on corrective measures described in a sanitary survey report, or to review and assist with the preparation of an annual Consumer Confidence Report. Staff inform waterworks operators of upcoming training opportunities or offer help with water treatment dosage calculations. Staff can advise owners of potential impacts from, or requirements of, pending state or federal regulations. During the reporting period, VDH staff received and responded to 31,560 technical assistance requests from waterworks owners and operators.

3.7 Vulnerability Assessments for Issuing Monitoring Waivers for Some Classes of Contaminants

Waterworks owners must collect water samples to test for regulated contaminants. For some man-made chemical contaminants, waterworks may forgo routine water quality monitoring when the drinking water source is located and constructed to eliminate susceptibility to the contaminants. The source water cannot be vulnerable to contamination because there is no use of the chemicals near the source. A waterworks owner may request a waiver from regulation of certain contaminants in these situations.

The waiver application process requires the waterworks owner to conduct a self-assessment of the source water's susceptibility and vulnerability to contamination. VDH screens the waterworks for conditions that may impair source water quality. The waiver process encourages TMF capacity by highlighting beneficial planning efforts that the owner can implement through programs, such as wellhead and surface water protection plans. VDH staff reviewed and assessed 2,665 applications for monitoring waivers from eligible waterworks during the reporting period.

3.8 Water Loss and Evaluation Assistance

VDH increased efforts to provide assistance to waterworks experiencing water loss and leakage in distribution systems. Staff requested water loss information from DWSRF applicants and planning grant applicants. Staff discusses water loss and unbilled water during sanitary surveys and when issuing operation reports. This effort has improved understanding about the number of waterworks experiencing significant water loss and the potential need for assistance to small waterworks.

During the reporting period, VDH partnered with Southeast Rural Community Assistance Project (SERCAP) through a set-aside suggestion for the purchase of leak detection equipment. SERCAP purchased the equipment from DWSRF set-aside funding for capacity development activities. SERCAP provided leak detection assistance to four waterworks, representing approximately 20 hours of direct in-field technical assistance. Once SERCAP locates a water line leak, the waterworks repairs the section of pipe to eliminate the water loss.

Since July 1, 2014, VDH and the Virginia Rural Water Association (VRWA) have coordinated leak detection technical assistance. VRWA staff includes "circuit riders," experienced and specifically trained staff who provide on-site assistance locating leaks in distribution systems using leak detection equipment. In February 2020, VRWA purchased leak detection equipment with DWSRF set-aside funding. VRWA increased leak detection services to waterworks during the reporting period. VDH referred water loss information collected during sanitary surveys and from funding applications to VRWA to improve prioritization of assistance to waterworks. During the reporting period, VRWA staff provided 70 individual water systems with leak detection assistance, which represents 1,047.75 person-hours of in-field leak detection efforts. Appendix 1 lists the systems assisted with leak detection and Appendix 2 details success stories related to leak detection.

3.9 Asset Management Planning

Asset management planning is an important part of long-term prioritization of the maintenance, repair, improvement, and sustainability of waterworks. This is reflected in America's Water Infrastructure Act of 2018 (AWIA) Section 2012, which amends the SDWA to require Virginia to

amend its Capacity Development Strategy. The revised Strategy must describe how Virginia will encourage the development and use of Asset Management Plans (AMPs). VDH staff revised the Strategy based on feedback received from EPA in August 2020. Staff will submit the revised Strategy before the end of the year.

VDH began to formalize a process to use AMPs in Virginia prior to the enactment of AWIA. VDH and participating organizations trained technical service providers' staff on AMPs and encouraged their use as a sustainability tool. VDH provides funding mechanisms for waterworks to develop AMPs that include the five core components: (1) Asset Inventory, (2) Life Cycle Costs, (3) Level of Service, (4) Criticality and (5) Long-term Funding. VDH can fund AMPs through the Planning and Design Fund Program, the Small Project Engineering Program, and as an additional engineering cost associated with a DWSRF-funded construction project. VDH requires an AMP as part of a DWSRF project when a waterworks does not already have a current plan or has not updated it within the last 5 years. To encourage asset management planning, VDH will make available the lesser of the actual cost of an AMP or $15,000 as principal forgiveness when requested as part of a construction funding offer.

VDH partnered with SERCAP and Draper-Aden and Associates to train VDH, SERCAP, and VRWA staff on effective methods for training waterworks staff on AMPs. This train-the-trainer effort forms the backbone of the asset management collobarative effort in Virginia. VDH staff trains waterworks staff on AMPs, but also refers water utilities to technical assistance partners when completing AMPs. VDH is continuing to provide in-person and virtual training to waterworks owners and operators on this important tool to enhance TMF capacity and move towards waterworks sustainability.

4.0 Managerial Capacity

Managerial capacity is a waterworks' planning, organization, and ability to achieve compliance with applicable laws and regulations. This capacity is where an organization must make the decisions that affect technical and financial capacities. A strong managerial capacity will achieve results even when the other capacities may not be as robust.

4.1 Data Collection and Analysis

VDH maintains and uses the Safe Drinking Water Information System (SDWIS), which is an extensive electronic inventory of waterworks facilities, personnel, sampling data, and compliance status. SDWIS is the primary vehicle by which VDH reports required information to EPA. A SDWIS interface called "Data Reports and Retrieval" is the principal repository of data that VDH uses to manage contacts with waterworks, inspection schedules, and compliance sampling schedules. Staff uses associated electronic tracking tools for application and plan review activities. Use of these electronic tools facilitates interaction with waterworks and provides a quick way to assess many elements related to waterworks TMF capabilities. VDH is currently replacing legacy, interface applications that work with SDWIS through a private vendor.

EPA requires VDH to conduct a triennial capacity assessment. Since July 2001, VDH has used an electronic tool to complete a capacity baseline assessment of all community and NTNC waterworks. The scoring system accounts for compliance status, infrastructure condition, managerial and financial indicators, and preparedness to comply with regulations. The higher the

score, the better the result. Staff conducts this "triennial capacity assessment" once every three years.

During the reporting period, VDH conducted a required triennial assessment. In early 2020, VDH assessed all community and NTNC waterworks in Virginia. The assessment consisted of 18 "yes" or "no" questions. The questions related to the three TMF capacities. VDH staff used official records to answer questions and directly contacted waterworks for additional information as needed. Staff compared results of this assessment to the baseline assessment conducted in 2016. Technical questions explored whether the waterworks had sufficient operator coverage for sick leave and vacation as well as asking whether the facility addressed recommendations from recent sanitary surveys. Managerial questions included asking whether the waterworks facilities and appurtenances were in good operating condition and whether the waterworks met all established National Drinking Water Standards. Financial questions included asking whether the waterworks had at least 45 days cash on-hand to cover expenses and whether the waterworks had adjusted rates in the past three years. If staff were unable to get a response to a particular question, then staff answered that question "No" per the process instructions. Appendix 2 has the complete list of questions asked during the triennial assessment.

Staff evaluated 1,597 systems, 1,093 were community waterworks and 504 were NTNC waterworks. The maximum score possible was 18 and waterworks scoring 10 or lower tend to demonstrate substantial TMF capacity and operational challenges. Overall, the average score of all waterworks surveyed was 14. The average score of all community waterworks was slightly higher at 15 and the average score of all non-transient noncommunity waterworks was lower at 13. Waterworks in Virginia perform well with smaller systems scoring lower than the large community waterworks. Further analysis of the data provides additional insights and areas needing attention.

Composite data in Figures 3 and 4 show a change from the 2016 baseline assessment. The current data indicates a general improvement, with more waterworks scoring higher overall. In the 2016 data there was a peak centered around 11 points. In 2020, this peak no longer exists and scores trend upward. The data no longer indicates a distinct peak at 16 points, but rather a less pronounced peak at 17 points. These upward trends in the data indicate an increase in overall TMF capacity at waterworks and a positive impact from capacity-building measures VDH implemented through the Strategy in the past three years.

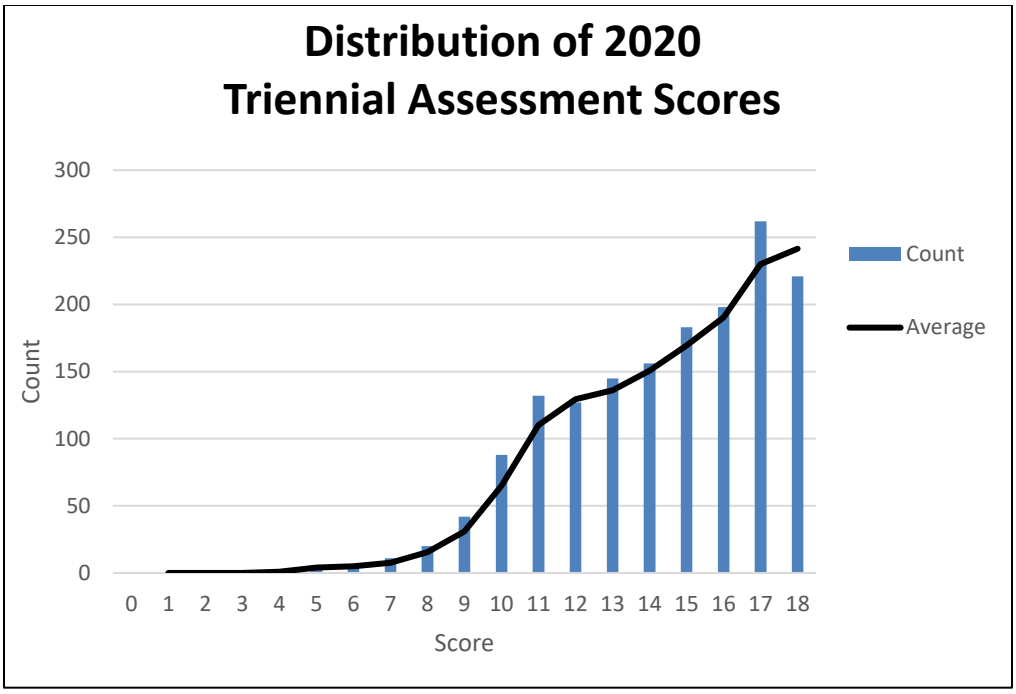

Figure 3: Distribution of 2020 Triennial Assessment Scores (Community and NTNC)

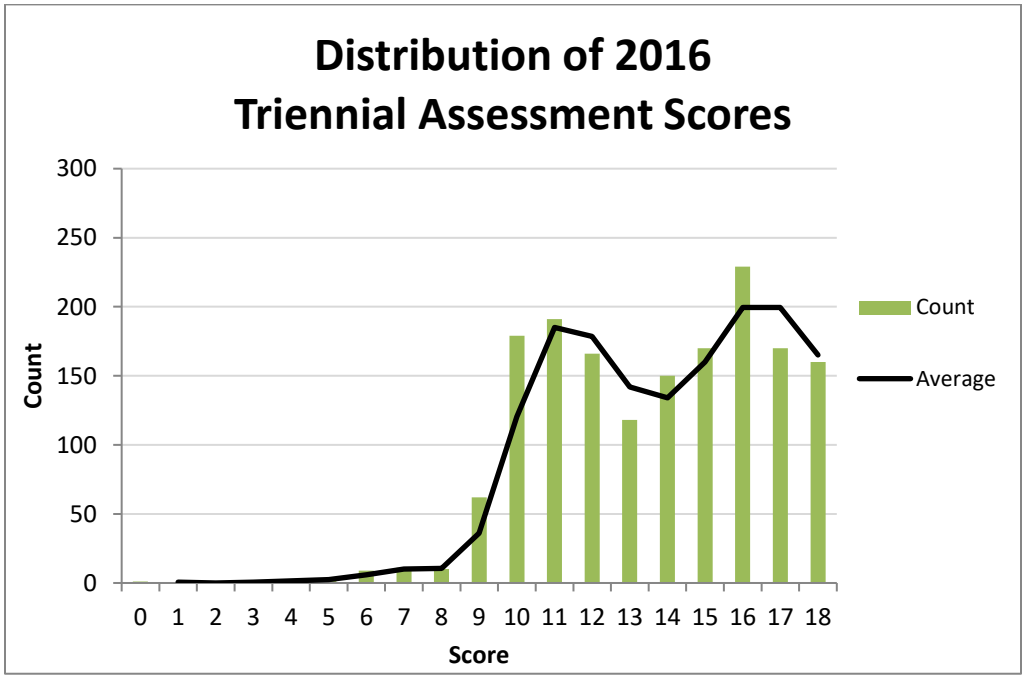

Figure 4: Distribution of 2016 Triennial Assessment Scores (Community and NTNC)

The 2020 data reveals that 14% of waterworks scored the maximum 18 points. This demonstrates an improvement from 10% of waterworks achieving a score of 18 during the baseline triennial assessment. The lowest score reported in 2020 was 4 points; two waterworks fell into this lowest bin and both are located in southeast Virginia. In the 2016 assessment, one waterworks scored a

zero, with four waterworks scoring four or less. This indicates improvement on the lower end of the spectrum.

Further review of both the 2016 and 2020 data shows other trends. Most notably, waterworks in southeast Virginia, roughly bounded by Rt. 29 to the west and I-64 to the north, and generally encompassing "Southside Virginia" tend to have lower TMF capacity scores than those in other geographic areas of the state. In 2016, 63% of waterworks that scored less than 10 were located in the territories covered by the Danville, Richmond, and Southeast Virginia Field Offices. In 2020, that percentage increased to 80%. This would indicate that the areas in the northern and western portions of the Commonwealth are improving in TMF capacity. Conversely, the central and southern areas of the state continue to struggle with TMF capacity.

VDH will prioritize training, funding workshops, technical assistance, and financial resources in south-central Virginia to address this trend. Planning district commissions in southwest Virginia have helped waterworks apply for DWSRF funding. These organizations have resources and expertise that benefit their member communities. Staff will contact Planning District Commissions (PDCs) in the south-central part of the Commonwealth to increase funding opportunity awareness. During the reporting period, staff collaborated with PDCs to hold funding workshops with multiple drinking water funding partners.

A review of statewide responses for the triennial assessment provides other insights. The following questions generated the lowest scores, with less than 50% of all waterworks meeting the criteria (Figure 5):

- Question 5: Does the waterworks have a written policy for responding to customer complaints? (45%)
- Question 17: Has the waterworks adjusted rates in the past three years? (48%)
- Question 18: Does the waterworks have an Asset Management Plan? (49%)

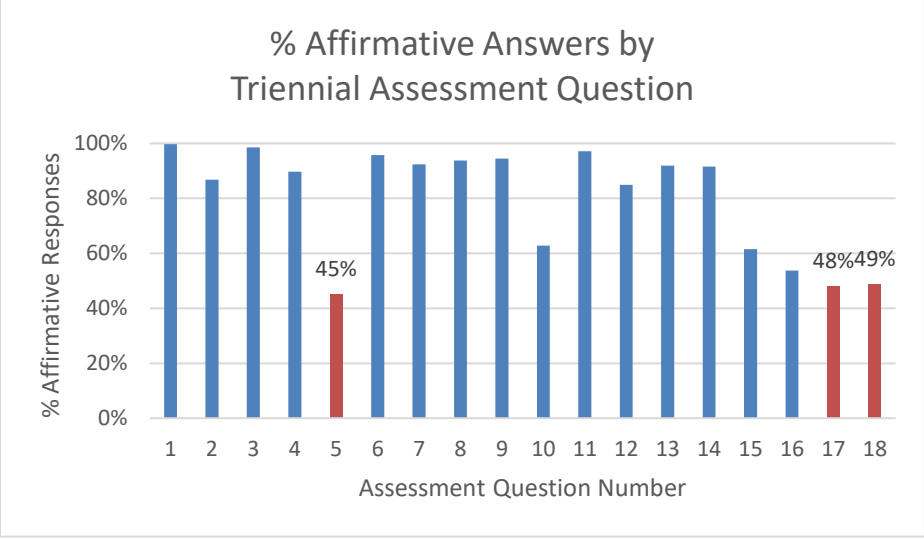

Figure 5: Percentage Affirmative Answers by Triennial Assessment Question

These three questions provide guidance on where VDH can focus programmatic attention. VDH has focused training on AMPs and rate adjustments as the model for waterworks' financial sustainability. Customer service at waterworks is an opportunity area. Waterworks with clear customer service policies and practices enhance customer experience and trust, which help the waterworks support needed improvements with rate and policy adjustments.

Small waterworks can benefit from improved customer service. A written customer service plan codifies actions that ensure a similar response to each customer. Although statewide trends may appear positive, VDH will provide system-by-system help to address specific challenges, no matter the size of the waterworks, its location, or its financial condition.

4.2 Compliance and Enforcement Program

VDH routinely reviews water quality data submitted by waterworks, and issues Notices of Alleged Violation (NOAVs) for sample results that do not appear to meet the Virginia Waterworks Regulations. VDH may also issue NOAVs for the failure to monitor and report water quality results, the failure to employ licensed operators, recordkeeping violations, and other conditions that deviate from the regulatory requirements. The SDWA, the National Primary Drinking Water Regulations, and the Virginia Waterworks Regulations establish standards. During the reporting period, VDH issued approximately 4,943 NOAVs to waterworks; approximately 3,602, or 73%, of those were for monitoring violations, typically associated with a waterworks' failure to collect and analyze required water quality samples. Staff enter violations into the SDWIS database where the system tracks and can generate reports.

VDH uses EPA's Enforcement Response Policy and its associated Enforcement Targeting Tool (ETT) to identify waterworks with violations of significant noncompliance. VDH focuses on waterworks with health-based violations and those that show a history of violations across multiple rules. EPA compiles data for the ETT quarterly from the NOAVs that VDH issues and records in SDWIS.

The enforcement targeting formula in the ETT identifies waterworks with the highest total noncompliance across all rules, within a designated time. The ETT formula places a higher weight on health-based violations, including treatment technique and maximum contaminant level violations. The formula calculates a score for each waterworks based on unresolved violations and violations that have occurred over the past five years. Scores do not include violations that have returned to compliance or are on a "path to compliance" through a specified enforceable action. VDH uses the quarterly ETT report to prioritize staff assistance to waterworks with numerous or serious compliance issues. The ETT can also help identify waterworks that are in danger of becoming priority systems.

EPA generates the ETT quarterly report based on SDWIS/State data. EPA considers waterworks with ETT scores greater than 10 a "serious violator;" waterworks with ETT scores of 5-10 are considered "potential serious violators;" and the approach to waterworks with an ETT score less than five is discretionary. Figure 6 shows the number of systems with an ETT score greater than 10 for each quarter of the July 1, 2017 through June 30, 2019 reporting periods, which represents less than 1.0% of all waterworks in the Commonwealth.

In 2019, VDH implemented several new policies and procedures that contributed to the steep decline in serious violators during the first quarter 2020 reporting period. VDH moved away from a centralized approach of enforcement actions to a more decentralized approach that enabled field offices to return waterworks to compliance expeditiously. Field offices, each with one Compliance Specialist, began to take the lead on formal enforcement actions, such as issuing consent orders and monitoring cases for compliance. The Compliance Specialists work closely with central office for legal advice, enforcement strategy, fairness, and consistency. The central office hired a Compliance Coordinator to provide real-time compliance information to the field offices, evaluate enforcement priorities, as well as ensure consistent enforcement approach and collaborative strategies with various assistance programs. VDH is revising its Enforcement Manual to reflect the new approach.

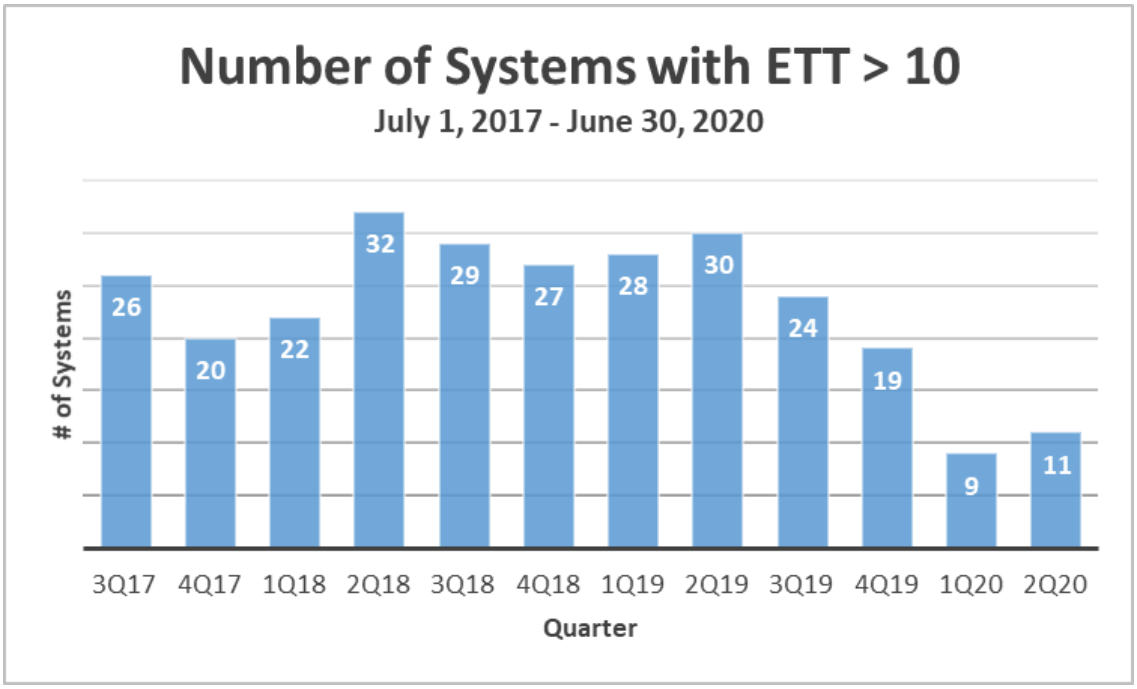

Figure 6: Number of Systems with ETT>10, July 1, 2017 - June 30, 2020

VDH also uses the ETT as a guide for the issuance of warning letters to encourage waterworks owners to take actions necessary to return to compliance. Warning letters summarize the waterworks' violations, corrective action deadlines, and consequences for failure to act. VDH issued 190 warning letters to noncompliant waterworks during the July 1, 2017 - June 30, 2020 reporting period.

The ETT helps direct staff actions to encourage and require compliance with applicable laws and regulations. VDH uses administrative consent orders and special orders to enforce requirements. The State Health Commissioner has authority to issue binding, bilateral consent orders and unilateral special orders to waterworks owners who have violated the Virginia Waterworks Regulations. As required by Virginia law, VDH conducts hearings to provide parties due process before issuing adverse decisions that could result in a unilateral special order. Both orders set timelines to compel corrective measures. During the reporting period, the Health Commissioner

issued 15 orders to bring waterworks into compliance and eight waterworks satisfied the terms of the consent orders, concluding the enforcement action.

VDH's enforcement approach is highly focused on identifying solutions to the underlying causes of waterworks' noncompliance with state and federal drinking water regulations. VDH uses various tools to direct attention and provide guidance to waterworks owners on ways to correct deficits in TMF capabilities. For instance, during an administrative enforcement hearing, staff may determine that inadequate revenues are the ultimate cause of the waterworks' chronic monitoring failures. Staff may ask the waterworks to submit a WBOP as a budgeting tool or give assistance with rate setting to address the lack of financial capacity.

Noncompliance with the regulations reflects on the effectiveness of the Capacity Development Strategy. Tracking and addressing compliance failures help staff learn what activities, grant awards, and metrics are the most effective. Staff must continue to improve and develop methods to assist priority waterworks on the ETT. Staff are developing metrics to assess the Capacity Development Strategy.

4.3 Waterworks Classification and Operator Licensure

The Virginia Waterworks Regulations classify waterworks from Class 6 to Class 1 based on the population served, source, and operational complexity. Regulations require each community and NTNC waterworks to have a licensed operator of equal or higher classification as their waterworks. This person can be a member of staff or otherwise contracted. In June 2020, a licensed operator is required at 1,598 community and NTNC systems. VDH encourages small waterworks with TMF capacity deficiencies to connect to a larger municipal water distribution system or service authority when possible.

As of January 1, 2017, the Virginia Department of Professional and Occupational Regulation (DPOR) adopted the Association of Boards of Certification (ABC) national examination requirements. DPOR regulates licensure of waterworks operators in the Commonwealth. Operators must have applicable experience and education. DPOR requirements include passing an examination of the minimum required knowledge, skills, and abilities to receive a license. Requirements limit experience credits to the operation and maintenance of water distribution systems, laboratory work, and treatment plant maintenance. Minimum experience requirements depend on the operator classification: less experience is required for Class 6 compared to Class 1. The minimum educational requirement for a Virginia operator's license is a high school diploma or General Educational Development certificate. Candidates without a high school diploma may get a license by substituting more operator-in-training experience for education.

During the reporting period, the number of licensed waterworks operators increased from 2,116 to 2,201, an increase of 85 licensed operators. Staff attribute this increase to operators taking advantage of learning opportunities and the upward trends of licensure testing pass rates. VDH offers low cost education solutions to increase operators' knowledge, skills and abilities. This training and education also increases the number of licensed operators available for hire.

4.4 Emergency Preparedness

Virginia is vulnerable to many hazards. Waterworks owners must prepare for, respond to, and recover from tornados, hurricanes, winter storms, earthquakes, floods, terrorism, vandalism, and other natural and man-made hazards. VDH provides a variety of all-hazards training, exercises, and planning tools to assist with waterworks preparedness. VDH assists waterworks during incidents and emergencies by serving as the lead agency of Emergency Support Function 3 at the Virginia Emergency Operations Center. VDH staff also provides technical assistance during the recovery stages of incidents and emergencies.

VDH staff prepares waterworks owners for hurricanes and winter weather by offering preparedness materials to community waterworks during the Governor's proclamation of Winter Preparedness Week and at the beginning of hurricane season (June 1 – November 30). Preparedness materials are also available on the VDH website and include information for the issuance of boil water advisories, VDH after-hours emergency contact information, pre-incident preparedness planning, incident response planning, well disinfection procedures, information for generators, and backup power needs. VDH provides contact information for other organizations and agencies that assist with incident planning and response, such as the Virginia Water/Wastewater Agency Response Network.

Extended power outages resulting from hurricanes, severe weather and winter storms can pose technical and financial challenges. The Virginia Waterworks Regulations require that waterworks have an Emergency Management Plan (EMP) for extended power outages. About 35% of community waterworks have emergency power available for the entire waterworks. The drinking water industry and VDH need to improve outreach and training to achieve sustainable and resilient practices.

In 2018, VDH participated in the National Level Exercise hosted by Federal Emergency Management Agency (FEMA). This exercise included a water sector-specific tabletop component, as well as a functional exercise with participation from 43 counties, state government, and federal government. The exercise included a joint exercise at the Lee Hall water treatment plant in Newport News. In 2019, VDH held a Harmful Algal Bloom (HAB) tabletop exercise based on a HAB scenario at the Flannagan Reservoir, which is at high risk of HABs. Participants included the Cumberland Plateau Health District, the Department of Environmental Quality, and the Flannagan Water Authority. VDH partnered with the Department of Environmental Quality in 2019 to provide an "Emergency Planning & Community Right-to-Know Act" presentation for the Virginia Hazardous Materials Conference. This presentation explained the new reporting requirements enacted from AWIA.

4.5 Continuing Professional Education

VDH facilitates development of TMF competencies for waterworks staff through on-going training. The curricula for these programs include technical topics such as equipment operation and maintenance, drinking water chemistry and microbiology, water treatment technologies, and operator math. Sessions address managerial aspects of waterworks operation through instruction and training on the Virginia Waterworks Regulations, capacity development, financial planning, asset management, waterworks administration, and waterworks security.

The Water Operators Short School is the preeminent water and wastewater operator training in Virginia. VDH actively participates in the Short School by volunteering as course instructors. This annual training at Virginia Tech is a weeklong course held annually since the 1940s. Historically, there have been three levels to the course: introductory, intermediate, and advanced. Each level provides approximately 15 classes and focuses on a variety of waterworks operations topics. The curricula for the intermediate and advanced courses build on the preceding year's course. Starting in August 2018, Virginia Tech offered an additional level, "Year 4," for supervisors or operators looking to move into management. The Year 4 sessions include asset management, communications, human resources, as well as new technologies. In 2020, Virginia Tech moved the course online to allow students to participate during the COVID-19 pandemic. Virginia Tech held the Short School online from July 27 to August 1, 2020; 96 people attended it.

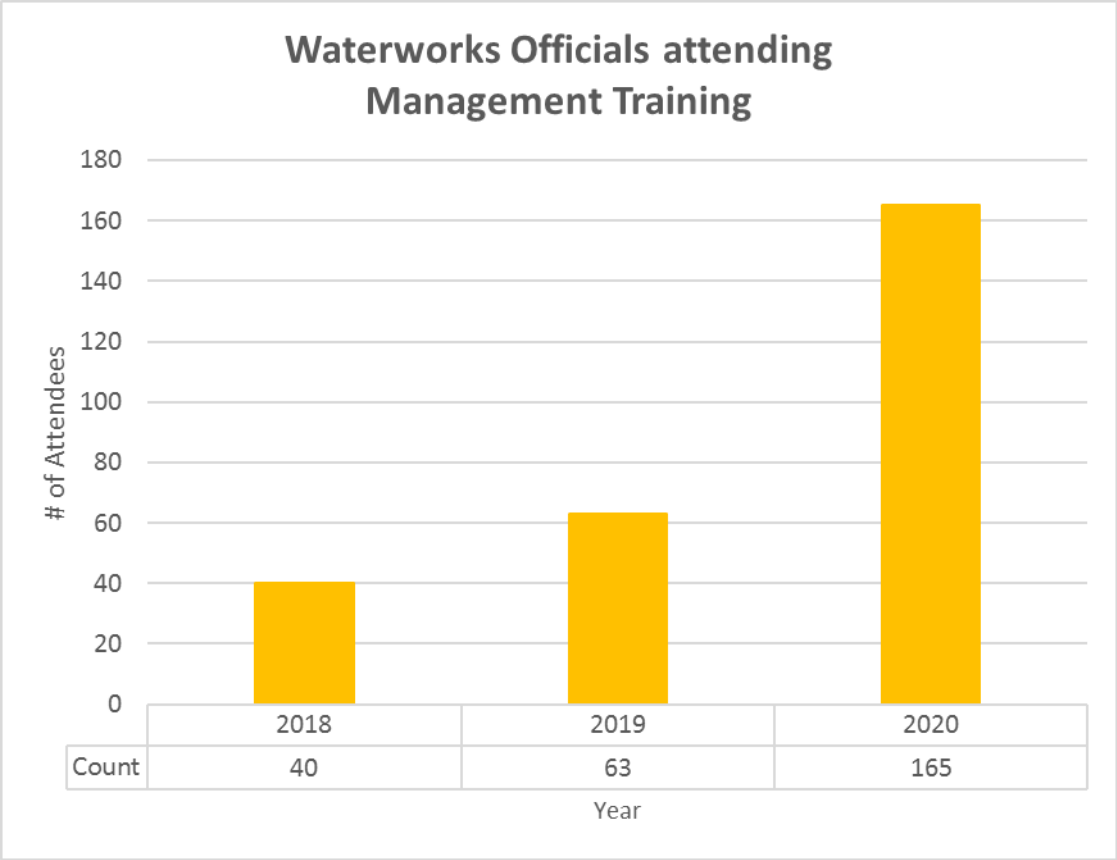

Figure 7: Waterworks Officials Attending Management Training

Figure 7 shows the number of waterworks "decision-makers" that have attended VDH-sponsored management training. VDH offers several additional training courses. Virginia Tech, Mountain Empire Community College, and other service providers hold these courses through contracts with VDH. Course offerings vary yearly; however, VDH ensures a core of training courses to develop employees and the waterworks' TMF capacity. Owners and operators find course offerings on the VDH website.

The COVID-19 pandemic created many challenges for in-person training. VDH cancelled all in-person courses on March 13, 2020 because of health risks. VDH and Virginia Tech transitioned some courses to webinar-based courses. Course attendees gave favorable feedback for these webinars. DPOR offered extensions for renewal and testing for licensure. VDH will return to in-person instruction when deemed safe. VDH will modify and offer online training either as pre-recorded modules or as instructor-led online courses going forward while the risks remain high.

4.6 Waterworks Advisory Committee

The SDWA requires states to identify persons with interest or involvement in the creation and execution of a capacity development strategy. VDH consults with the Waterworks Advisory Committee (WAC), which represents a diverse group of waterworks stakeholders throughout the Commonwealth. The WAC committee gives stakeholders and the public opportunities to address VDH policies and procedures, including training and capacity development. Staff consults with the WAC at least quarterly. From 2018 through 2019, the WAC met more frequently to revise the Waterworks Regulations. VDH expects final regulations to take effect in 2021. The WAC and VDH staff met 13 times during the reporting period.

5.0 Financial Capacity

Financial capacity reflects the waterworks' ability to balance revenues and expenditures, have acceptable loan ratios, and maintain overall healthy financial data. To secure loans and grants through the DWSRF and other lending agencies, waterworks must demonstrate financial capacity.

5.1 Drinking Water State Revolving Fund (DWSRF)

The DWSRF program provides financial aid through loans, principle forgiveness, and grants. This funding helps waterworks in need of infrastructure improvement, which can help with reliability, maintenance, and operational costs. VDH staff assesses qualifying applicants to determine whether the waterworks has TMF capacity before loan closing. If a waterworks does not have sufficient TMF capacity, then VDH, through its financial partner Virginia Resources Authority, sets requirements for waterworks restructuring as part of the funding process. Requirements may include; a WBOP, an AMP, waterworks rate increases, the completion of annual audits, or the completion of compliance plans and programs. During the reporting period, the DWSRF entered into binding commitments on low-interest or interest-free construction loans totaling $58,338,275 to 77 waterworks.

The DWSRF program funded important water infrastructure projects and guided those projects to completion during the reporting period. Since the 2017 Report on the Efficacy of the Capacity Development Strategy, staff incorporated several new objectives into the DWSRF program. The program now includes requirements and commitments to evaluate and adjust rates for applicants to receive principal forgiveness loans. This change furthers TMF capacity development at waterworks receiving DWSRF funding and applies to any waterworks whose water use rates appear below the target rate of 1.0% of median household income for the service area.

VDH initiated a rebate program to promote lead service line replacements. Lead is a neuro-toxin and there is no safe level of lead in drinking water. Removing lead services lines is an important measure to reduce health risks from lead. Waterworks are eligible for principal forgiveness loans with reimbursement to a maximum of $5,000 per lead service line replaced and a maximum of

$500,000 per year for individual waterworks. Since the last report, the program funded eight projects across four different localities and two projects are complete and closed. Of the $3,690,000 awarded, the program disbursed $1,065,600, and VDH received a new application requesting $500,000 in FY 2021. The current and expected results of this lead service line replacement funding are:

- Richmond - 146 line replacements completed in Phase I, 200 anticipated in Phase II
- Alexandria - 10 recorded addresses completed in Phase I, 50 anticipated in Phase II
- Henry County Fieldale Phase I - 54 lead goosenecks, 16 galvanized service lines, 4 fire hydrants, and 2 air release valves replaced in Phase I. Phase I also included construction and replacement of lines on the public side.
- Henry County Fieldale Phase II - project estimates 34 +/- homes, 10 addresses identified.
- Henry County Fieldale Phase III - project application estimates 23 +/- homes
- Chesapeake - anticipates approximately 100 homes according to their application

The DWSRF revised the program to allow waterworks to complete and submit Preliminary Engineering Reports (PERs) for cost reimbursement to facilitate design build/public private partnership projects and accelerate the application process. Previously, applicants submitted PERs (or a waiver by VDH) with the DWSRF application.

Since January 2019, VDH requires completion of an Asset Management Plan as part of a funded project, if the waterworks does not have one. An update is required if the current AMP is older than 5 years. AMPs help waterworks plan and respond to aging infrastructure conditions and replacement needs. To encourage asset planning and replacement, VDH will reimburse the actual cost of an AMP or $15,000 as principal forgiveness, whichever is less.

As a condition of funding, VDH may require rate changes, including annual rate increases to build long-term financial sustainability at the waterworks. To build waterworks financial capacity, VDH intends to offer reduced interest rates (up to 25 basis points or 0.25%) for recipients that commit to compound annual rate increases of at least 2% a year for five years, provided the additional funds are for the sole use of the waterworks. VDH now offers reduced interest rates of up to 25 basis points or 0.25% for recipients that can close loans within 12 months of the standard award date, to promote readiness to proceed and timely use of funds.

5.2 Planning and Design Grant Assistance

VDH awards Planning and Design funds to small, financially challenged, community and not for profit NTNC waterworks. This grant helps waterworks that would not have the financial ability to evaluate drinking water problems, identify solution alternatives, and make recommendations for correction. Eligible projects may include preliminary engineering planning, design of plans and specifications, source water quality and quantity studies, drilling, and installation of test wells to determine source feasibility, or other similar technical assistance projects.

Recipients may use funds to address distribution system leakage and water loss. These types of projects often include surveying and mapping of the distribution system (to include type of pipe material and estimated age), water audits to estimate loss from leakage, identification of suspected leak locations, training with leak detection equipment, and review of previous detection work. The resulting report typically recommends waterline replacement priorities and schedules, leak

detection and repair plans, water audit recommendations, and meter maintenance activities. These efforts improve resiliency and sustainability.

VDH increases awareness of grant opportunities available through the planning and design fund program by posting information on its website and in the Virginia Register. The Sustainability Coordinators make direct contact to waterworks about these opportunities. Staff remind waterworks owners of the program, answer questions, and provide information and resources for applicants. The program accepts grant applications year-round and reviews them for acute, chronic, and public health points. Staff reviews applications that do not have acute, chronic or public health needs in September every year.

During the reporting period, the maximum grant award was $35,000 per project and VDH committed $900,750 to fund 25 waterworks planning and design projects. This activity helps support TMF capacity. Waterworks benefit from the new or renovated infrastructure built from the planning activities.

5.3 Waterworks Business Operations Plan (WBOP)

VDH requires the completion of a WBOP as a financial evaluation tool before issuing an operation permit. The WBOP relates to proposed new waterworks, existing waterworks under new ownership, or waterworks with significant non-compliance. The DWSRF program may require a WBOP to correct ongoing enforcement actions. In the previous reporting period, VDH updated the WBOP documents to be more user-friendly and provided training on the revised documents. Tracking VDH acceptance of WBOPs needs improvement. Staff incorporated instructions into the Permit Manual and the SDWIS Manual, which increase the tracking consistency of WBOPs.

Waterworks gain valuable insights into strengthening TMF capacities from creating and implementing WBOPs. The planning process helps establish effective budgets, appropriate service rates, and financial reserves for long-term sustainability. Plans must include an inventory of infrastructure assets, anticipated operational and maintenance expenses, monitoring costs, and revenue sources. During the reporting period, VDH accepted 225 WBOPs as complete.

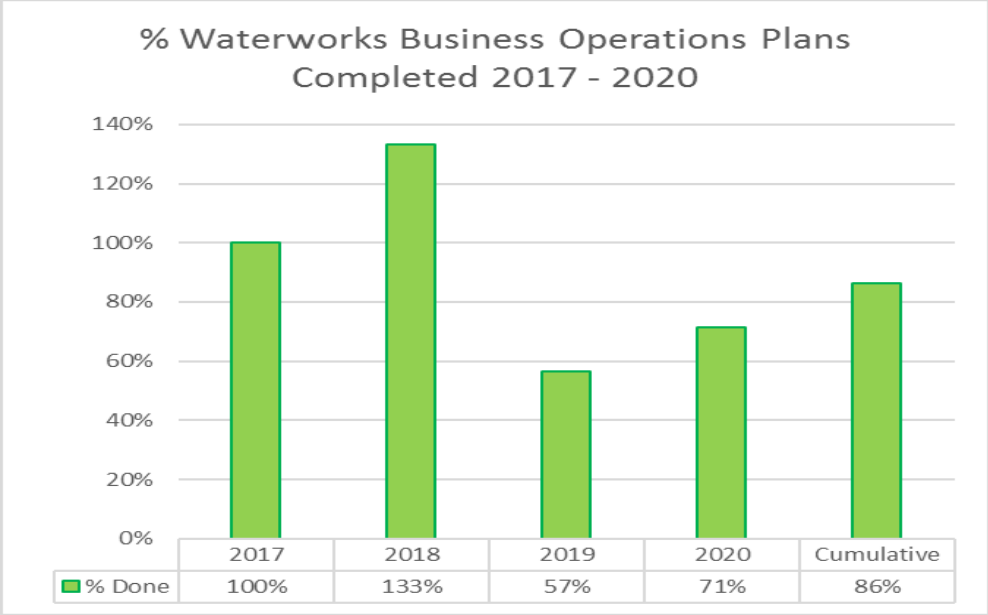

Figure 8: Percentage of Community and NTNC WBOPs Completed

Figure 8 depicts the progress of completed WBOPs based on the year in which VDH accepted each WBOP as complete. In 2018, VDH addressed both current and backlog WBOPs that resulted in a completed percent greater than 100%. The actual number of WBOPs processed each year fluctuates depending on the number of DWSRF-required and Field Office-required WBOPs added to the program during any given year.

5.4 Small Projects Engineering Program

The Small Projects Engineering (SPE) program, started in 2014, is an internal-referral program that VDH uses to provide engineering assistance to small community and non-profit NTNC waterworks. Waterworks who seek this help typically do not have the staff to apply for funding programs. VDH procures services from three engineering firms to provide this assistance. Each engineering firm serves a dedicated geographic area. Whitman, Requardt & Associates, LLC provides engineering services to the eastern part of Virginia, Hurt and Proffitt serves central Virginia, and Thompson & Litton, Inc. serves southwest Virginia. Typical projects include engineering drawings for small chlorination systems, evaluation of remedial options for lead and copper, and AMPs. During the reporting period, these three firms assisted seventeen waterworks with engineering services, totaling approximately $217,000.00.

6.0 Efficacy of Virginia's Waterworks Capacity Development Strategy

The Capacity Development Strategy focuses on TMF components to improve a waterworks' ability to reliably produce and deliver safe drinking water to consumers. VDH's focus on TMF capacity maximizes the Strategy's potential. VDH enforces rules and regulations and provides technical assistance to improve performance and sustainability of waterworks.

Small waterworks must develop and improve TMF capacity for long-term viability. The complexity and number of federal drinking water regulations is increasing over time. VDH must implement, monitor, and enforce these changes. Staff must provide technical assistance, track

routine sanitary surveys, and evaluate the capability of waterworks to ensure compliance with state and federal drinking water standards. The Strategy helps VDH provide assistance to waterworks who are responsible for providing safe drinking water to people of the Commonwealth of Virginia.

State grant matching funds pay a 20% match to the Capitalization Grant that supports the services described in this report. Technical assistance fees from the regulated community pay less than 25% of salary and benefits for staff positions that offer technical assistance. EPA's Capitalization Grant through the capacity development and source water set-aside pays for staff dedicated to capacity development, training, and security. Dedicating more state funding to programmatic initiatives would benefit struggling waterworks.

7.0 Success Stories

VDH provides the following success stories to highlight the types of projects and the impact that the Strategy had for specific waterworks, communities, and people in the Commonwealth of Virginia who receive and use water from a waterworks.

Since the beginning of the reporting period, VDH added one position to the Capacity Development team and converted an existing position to a supervisory role. The new position focuses on assistance to TNC waterworks. The supervisor focuses on Strategy implementation and team leadership. Five full-time and one part-time staff actively support the Capacity Development Strategy for the reporting period. During the reporting period, staff accomplished the following:

- Published seven articles in industry periodicals;
- Produced Consumer Confidence Report Hip Pocket Tool for waterworks;
- Developed and deployed an "Asset Management for your Waterworks" workshop for small waterworks, collaborating with SERCAP, VRWA, and Draper Aden and Associates;
- Initiated and/or coordinated several training events for waterworks;
- Advanced the use of an Auto-dialer system to remind waterworks to collect samples, thus reducing monitoring violations;
- Made numerous marketing efforts to increase the number of waterworks personnel attending training events;
- Collaborated with United States Department of Agriculture-Rural Development (USDA-RD) and planning district commissions on funding workshops for water and wastewater utilities; and,
- Worked with many utility boards to provide regulatory insight, discuss technical issues, and offer suggestions for funding options.

A selection of some projects where VDH staff helped waterworks are included below. Although not comprehensive, the summaries reflect the type of assistance staff provides through the Capacity Development Strategy.

The Tauxemont Community Association owns a water system in Fairfax County that serves 114 connections and approximately 250 people from three wells to a looped network of distribution mains. The system began operations in the 1940s. In September 2015, contractors drilled a replacement well for the system. After the drilling contractor completed the new well, the engineering firm never finalized plans and specifications for it. In September 2018, VDH matched

Tauxemont with an engineering firm through the VDH Small Project Engineering program to develop as-built schematic drawings, record components of the pumping system, and provide hydraulic calculations. In January 2019, VDH approved the as-built plans and specifications and Tauxemont began using the well to support its community. The well is vital for the sustainable operation of the waterworks.

Capacity Development staff helped the Town of Richlands (population 4,564) in Tazewell County complete an AMP. With the assistance of a contract engineer funded through the SPE program, the Town completed an AMP that identified infrastructure in poor condition, which was critical to their operations. The Town prioritized the replacement of this infrastructure in a phased approach and paid project costs from revenue generated from water service billings. The Town plans to implement a small rate increase to offset the cost of the remaining projects.

Staff assisted the Town of Bluefield in Tazewell County to complete an AMP using the SPE contract engineer. The Town serves a population of 5,811 persons. Town officials prioritized future capital projects into several phases. The Town also received DWSRF construction funding to complete first two project phases. Construction is underway for these projects now. The Town will request additional DWSRF funding in the future to complete projects identified by the AMP. As part of the current funding offer, VDH required the Town to complete a WBOP. The Town identified gaps in their operations from the WBOP. VDH will help produce Standard Operating Procedures (SOPs) for the water treatment plant and distribution system. The Town also plans to build financial reserves for the waterworks separate other Town reserve funds.

The Town of Port Royal, with a population of 327, is located in rural Caroline County, Virginia. In 2014, representatives from the Town began seeking funds for several improvements to comply with the Waterworks Regulations and eliminate significant deficiencies. The Town's waterworks pumped groundwater from two drilled wells to a 22,000-gallon elevated water storage tank. The Town obtained the tank in used condition from Fort A.P. Hill in 1967. During an inspection in August 2013, the Town discovered holes in the storage tank's roof. The Town needed to address the long-term need to replace the existing tank and the short-term need to effect emergency repairs. While the efforts to secure funding for replacing the tank were ongoing, SERCAP awarded the Town a $30,000 grant and provided them with technical assistance for the necessary emergency tank repairs. The Town received an award of $990,684 in DWSRF funding through VDH with $594,410 as principal forgiveness, and an additional $429,000 grant/loan mix from USDA-RD. The Town installed a new 20' x 20' precast concrete building for two booster pumps and two bladder tanks with emergency standby power, installed approximately 5,400 linear feet of waterline, and installed new meter box assemblies. In 2019, contractors for the Town carefully took down the elevated water storage tank. VDH staff conducted the final inspection in May 2019. The Town held a ribbon-cutting ceremony in August 2019. A large group including Mayor Alex Long, Congressman Robert Whitman, Delegate Margaret Ransone, and Chief Deputy Commissioner Dr. Parham Jaberi gathered at the Town for the ribbon-cutting celebration for this project.

On June 9, 2018, a strong storm hit the Town of Orange in Orange County. The Town water treatment plant suffered a lightning strike damaging the Supervisory Control and Data Acquisition (SCADA) system rendering it inoperable. The waterworks, serving approximately 6,584 persons

through 3,056 service connections, had substantial damage. Staff operated the treatment system in manual mode for weeks. The Town reached out to the USDA-RD and VDH Capacity Development for funding assistance to replace the SCADA system. USDA-RD had emergency funding available but the timeframe for accessing the funds was very tight. Capacity Development staff quickly began working with field office staff, gathering information from waterworks records, interviewing the Chief Water Operator for specifics about the interim operational conditions, and drafting a letter of support. The Town added that letter of support to the packet and sent it to USDA-RD for approval. USDA-RD approved the project as an "emergency situation," and awarded $115,275 in grant funds to the Town to replace the SCADA system.

In early August 2017, the Town of Monterey waterworks in Highland County suffered a catastrophic event resulting in a water outage to the approximately 450 residents served. The infrastructure impacts included empty water storage tanks, inadequate water pressure, and inadequate well pumping rates from well pump malfunctions and low well water levels. Officials declared a local emergency, and issued a Boil Water Advisory with assistance from VDH. Neighboring localities and VDH provided assistance. The Town restored the operation of the system to prior conditions and lifted the Boil Water Advisory. The Town did not have adequate monitoring and fail-safes to reduce the likelihood of a repeat occurrence. In April 2019, the Town applied for $215,000 in DWSRF funding to install a SCADA system. Capacity Development staff determined the Town did not have adequate TMF capacity to meet DWSRF funding requirements. The Town recognized that TMF capacity improvement would represent a positive, long-term commitment to the utility and community. VDH requested that the Town complete two action items in order to be eligible for funding: a water rate analysis and a WBOP. In November 2019, the Town presented and adopted a Board resolution committing to the completion of both items. The Town completed a water rate analysis with the Environmental Finance Center Network's help and a draft WBOP with Capacity Development staff's help. The Town's DWSRF construction project is moving forward.

The Town of Buchanan in Botetourt County, population of 1,220, had a major water leak in March 2020. The Vice Mayor contacted VRWA regarding an estimated 40,000 gallons per day of water loss from the Town's distribution system. A VRWA circuit rider arrived on-site and located an area that appeared to be the location of the leak. After isolating a section of pipe and re-pressurizing the system, the Town could not determine a location of leakage. VRWA used a leak correlator and pressure tested the main to find the leaking pipe's location. VRWA provided direction about the necessary repairs to abate the water loss. VDH provided the leak detection equipment to VRWA through a set-aside grant, showing the success of this funding.

The Town of Charlotte Courthouse in Charlotte County has a population of about 1,975 people. Maintenance staff from the Town called VRWA and requested help finding a water line that appeared to be leaking. The circuit rider located the water main, found the water leak, and shut the water off at a pool house near a private club to prevent the Town from losing all its stored water. The circuit rider found the water line going to the pool house had its own cut off valve. Town staff shut off the valve to allow the main building to continue getting water. Again, VDH provided the leak detection equipment to VRWA through a set-aside grant.

Rye Valley Water Authority in Smyth County serves approximately 1,276 people. The Authority contacted VRWA on January 13, 2020, to help with a major water loss within the Authority's drinking water distribution system. At the time of the call, Rye Valley had 27% water revenue accountability, meaning that 63% of the costs to treat and distribute drinking water had no revenue generating potential. A VRWA circuit rider arrived on Jan. 16, 2020. After a day and a half of surveying valves, meters, and hydrants, the circuit rider found a leak. VRWA used a correlator in survey mode to confirm the leak. VRWA decided that ground-penetrating radar could find the service line better than the use of other water loss detection instrumentation. The circuit rider and Town found a point of interest and marked it for excavation. Rye Valley Water Authority reported that VRWA's circuit rider found the location of the line leak. The Authority repaired the line, and the circuit rider recommended that the authority replace the aging galvanized pipe service line. VDH provided the leak detection equipment to VRWA through a set-aside grant.

APPENDIX 1

Virginia Rural Water Association Leak Detection Program Waterworks Assisted July 1, 2017 – June 30, 2020			
Hours of Leak Detection Service	**Waterworks Name**	**Hours of Leak Detection Service**	**Waterworks Name**
2.25	Luray, Town of	5.5	New Market, Town of
4	Warsaw, Town of	153.25	Rye Valley Water Authority
7	Va. Department of Forestry	10.75	U.S. Forest Service
5.25	Egypt Bend Estates	26.25	Charlotte Courthouse, Town of
35.25	Gloucester County Public Utilities	7.25	Young Life Camp
2.25	Cape Charles, Town of	18.75	St. Charles Water Authority
15.75	Cedar Bluff, Town of	9.25	Gloucester, Town of
60.75	Windsor, Town of	15.25	Montross, Town of
22	Waverly, Town of	53.5	Buchanan, Town of
19.75	Exmore, Town of	2.25	Hanover County Utilities
48.75	Appalachia, Town of	8.75	Wakefield, Town of
9.25	Nicklesville, Town of	2.25	Covington, City of
11.25	Pennington Gap, Town of	3	Pittsylvania County Service Auth.
4.5	Goshen, Town of	6.25	Strasburg, Town of
21.25	Campbell County Utilities	16.25	Gate City, Town of
13	Jonesville, Town of	17.25	Southhampton County Service Authority
8	Russell County Public Service Auth.	12	Boydton, Town of
2.75	Grottoes, Town of	84.5	Edinburg, Town of
8.25	Bluefield, Town of	7	Stanley, Town of
3.25	Kenbridge, Town of	2.25	Remington, Town of
2.25	Goochland County	1	Gretna, Town of
14.25	Va. Department of Corrections	14	Fauquier County Sanitation Auth.
7.75	Sussex County Service Authority	21.25	Iron Gate, Town of
22.75	Emporia, City of	12.5	Allegheny County Public Works
2.5	Amelia County Sanitary District	2.25	Henry County PSA
1.25	White Tail Park	2.25	Waynesboro, City of
18.75	Altavista, Town of	15	Amherst, Town of
17	Dungannon, Town of	25.25	Shenandoah, Town of
4.25	Pembroke, Town of	16.5	Bath County PSA
27	Montvale Water System	3	Greensville County
5.75	Pound, Town of	3.25	Rural Retreat
1	Vinton, Town of	7.25	Warm Springs Water Assoc.
2.25	Thomas Bridge Water Corp.	3	Holiday Acres Park
10.25	Clifton Forge, Town of	5	Northumberland County
5.25	Isle of Wight County	8	Lee County PSA

APPENDIX 2

2020 Triennial Capacity Assessment Questions

Technical	Is the waterworks score on the 2019 ETT ≤ 10?	Does the waterworks have sufficient operator coverage for sick leave and vacation?	Has the waterworks either not received significant deficiencies, or completed timely correction of all significant deficiencies?	Did the waterworks address recommendations from recent sanitary surveys?	Does the waterworks have a written policy for responding to customer complaints?	Are all plans and reports up to date and implemented (e.g. BSSP, LCR Plan, CCCP, CCR, WBOP, Sampling, etc.)?
Managerial	Did the waterworks consistently operate within 80% of its permitted capacity in the last 3 years?	Does the system meet Waterworks Regulations design and construction standards?	Are the waterworks facilities and appurtenances in good operating condition?	Are all service connections metered and is there a water accountability program in place?	Does the waterworks meet all established National Primary Drinking Water Standards?	Have all operators attended a technical training seminar or conference each year covered by this survey?
Financial	Did the waterworks pay the technical assistance fee?	Does the waterworks have at least 45 days cash on-hand to cover expenses?	Is the waterworks budget independent from subsidization by general funds, sewer funds or other funding sources?	Does the waterworks have a written Capital Improvement Plan?	Have the waterworks' rates been adjusted in the past three years?	Does the waterworks have an Asset Management Plan?

Enforcement Manual

Version 1.0

August 11, 2020

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VDH VIRGINIA DEPARTMENT OF HEALTH
Protecting You and Your Environment

Office of Drinking Water
Safe Drinking Water for a Healthy Virginia

Enforcement Manual

Table of Contents

Foreword

The Virginia Public Water Supplies law authorizes the Board of Health to supervise and control all water supplies and waterworks in the Commonwealth insofar as the bacteriological, chemical, radiological, and physical quality of waters furnished for human consumption may affect public health and welfare and may require that all water supplies be pure water.[1] In doing so, the Board may promulgate regulations governing waterworks that are designed to protect public health and promote public welfare.[2] The Board may issue administrative orders that include civil penalties or charges against a waterworks owner who violates the law or any Board order or regulation.[3] A violation of a regulation or Board-issued administrative order may result in civil penalties, permit suspension or revocation, injunctive relief, and criminal punishment.[4]

This Enforcement Manual provides ODW staff with a methodology for carrying out compliance and enforcement actions to ensure that ODW's approach to enforcement is logical and consistent.

This manual replaces, in part, ODW Working Memos 529 (Water – Procedure – Enforcement) and 764 (Water – Procedure – Enforc Acts, Orders, Court, Log Rev, - Phase II/V Notice of Violation and Informational Notices). This manual should serve as a training tool for new staff in administering compliance and enforcement.

Disclaimer

This manual provides procedural guidance to ODW staff. It only provides guidance and does not establish or affect the legal rights or obligations of the parties involved. Further, it is neither binding nor determinative of the issues addressed herein.

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[1] *See* Va. Code § 32.1-169 ("The Board shall have general supervision and control over all water supplies and waterworks in the Commonwealth insofar as … waters furnished for human consumption may affect the public health and welfare.").

[2] *See* Va. Code § 32.1-170 ("The regulations of the Board governing waterworks, water supplies, and pure water shall be designed to protect the public health and promote the public welfare…").

[3] Va. Code § 32.1-26 ("[T]he Board is authorized to issue orders to require any person to comply with the provisions of any law administered by it … or any regulations promulgated by the Board…"); Va. Code § 32.1-175.01 ("[T]he Board may issue a special order that may include a civil penalty against an owner who violates this article of any order or regulation adopted thereto by the Board.").

[4] *See* Va. Code § 32.1-27.A ("Any person willfully violating or refusing, failing or neglecting to comply with any regulation or order of the Board … or any provision of this title shall be guilty of a Class 1 misdemeanor unless a different penalty is specified."); Va. Code § 32.1-27.B ("Any person violating or failing, neglecting, or refusing to obey any lawful regulation or order of the Board .. or any provision of this title may be compelled in a proceeding instituted in an appropriate court … to comply therewith by injunction, mandamus, or other appropriate remedy…"); Va. Code § 32.1-27.C ("[A]ny person violating or failing, neglecting or refusing to obey any injunction, mandamus or other remedy… shall be subject… to a civil penalty not to exceed $25,000 for each violation…"); Va. Code § 32.1-27.D ("With the consent of any person…, the Board may provide, in an order issued by the Board against such person, for the payment of civil charges for past violations in specific sums…"); Va. Code § 32.1-174 ("The Commissioner may revoke any permit… whenever he determines that… [t]he owner has failed to abide by an order issued by the Commissioner…"); Va. Code § 32.1-176 ("[A]ny owner who violates this article or any order or regulation … shall, upon a finding by a court of competent jurisdiction, be assessed a civil penalty of not more than $5,000 for each day of violation."); 12VAC5-590-320 (identifying grounds on which the Commissioner may suspend or revoke a permit, and the procedure to be followed in pursuing such an action).

Revisions Summary

Date	Description of Changes
07-01-2019	Original

List of Abbreviations

12VAC5-590	Waterworks Regulations, which are codified in Title 12 of the Virginia Administrative Code
APA	Virginia Administrative Process Act, Va. Code §§ 2.2-4000 through 2.2-4033
Board	State Board of Health
BWA	Boil water advisory
CCR	Consumer confidence report
C/E	Compliance and Enforcement
CFR	Code of Federal Regulations
Commissioner	State Health Commissioner
EPA	Unites States Environmental Protection Agency
ERP	EPA Drinking Water Enforcement Response Policy, December 8, 2009
ETT	Enforcement Targeting Tool
ETTA	Enforcement Tracking Tool Assistant
FCAP	ODW Financial and Construction Assistance Programs
GWR	Groundwater rule
IFFP	Informal fact finding proceeding
LCR	Lead and copper rule
LOA	Letter of agreement
MCL	Maximum contaminant level
MRDL	Maximum residual disinfectant level
NOAV	Notice of alleged violation
NPDWR	National Primary Drinking Water Regulations, 40 CFR 141, 142 & 143
OAG	Office of the Attorney General
OCOM	Office of the Commissioner at the Virginia Department of Health

ODW	Office of Drinking Water
PN	Public notice
PWSID	Public water system identification
PWSL	Public Water Supplies law, Va. Code § 32.1-167 *et seq.*
Regulations	Waterworks Regulations, 12VAC5-590-10 *et seq.*
RPT	Reporting
RTC	Return to compliance
RTCR	Revised total coliform rule
SDWA	Safe Drinking Water Act, 42 U.S.C. § 300f *et seq.*
SDWIS	Safe Drinking Water Information System
SWTR	Surface water treatment rule
TCDO	ODW Division of Training, Capacity Development, and Outreach
TT	Treatment technique
U.S.C.	United States Code
VAC	Virginia Administrative Code
Va. Code	Code of Virginia
VDH	Virginia Department of Health
WL	Warning letter

Glossary of Terms

Acute violation	A violation with the potential to have serious adverse effects on human health as a result of short-term exposure. Examples include violations of the MCL for nitrate/nitrite; the presence of fecal coliforms or *E. coli* in the water distribution system; the occurrence of a waterborne disease outbreak; and violations of the MRDL for chlorine dioxide. 40 CFR Part 141.202.
Case Decision	Any agency proceeding or determination that, under laws or regulations at the time, a named party as a matter of past or present fact, either is, is not, or may or may not be in violation of such law or regulation or in compliance with any existing requirement for obtaining or retaining a license or other right or benefit. Va. Code § 2.2-4001.
Consent Order	A voluntary agreement between VDH and the waterworks owner to resolve violations of the PWSL and Regulations, setting forth corrective action to be completed and a schedule of compliance. Va. Code § 32.1-26.
Enforcement Priority	See Serious Violator.
Enforcement Response Policy	EPA's approach for targeting enforcement under the SDWA by focusing on waterworks with health-based violations and a history of noncompliance. The policy also ensures consistency, provides a model to escalate responses to violations, defines timely and appropriate actions, and defines what constitutes a formal action. *EPA Drinking Water Enforcement Response Policy.*
Enforcement Targeting Tool	A tool that implements the ERP by assigning each violation a number of points based on the assigned threat to public health, which are then added together to provide a total score for each waterworks. The tool helps identify waterworks with the most noncompliance across all rules within a 5-year period. *EPA Drinking Water Enforcement Response Policy.*
Enforcement Targeting Tool	A tool that analyzes SDWIS/State database data and calculates a real

Assistant	time assessment of waterworks that are out of compliance, and compares this data side-by-side with the latest State data reported to SDWIS/Fed database.
Formal Enforcement	An action that cites specific violations, requires corrective action to return to compliance, and includes an enforceable consequence if the schedule of compliance is not met. Examples include administrative orders with and without consent (i.e., a consent order or special order), penalties, and civil or criminal action. *EPA Drinking Water Enforcement Response Policy.*
Informal Fact Finding Proceeding	A proceeding in which ODW ascertains the fact basis for making a case decision. Va. Code § 2.2-4019.
Intractable	A community or non-community waterworks that serves fewer than 1,000 individuals and the owner or operator is (i) unwilling or unable to provide safe and adequate service to those individuals; (ii) has abandoned or effectively abandoned the waterworks, as applicable; (iii) has defaulted on a financial obligation relating to the waterworks, as applicable; or (iv) fails to maintain the facilities of the waterworks. *EPA America's Water Infrastructure Act: Study on Intractable Water Systems.*
Letter of Agreement	An informal enforcement action that may be used by ODW field office staff when a waterworks owner is demonstrating a good faith effort to comply with the Regulations that sets forth a corrective action plan and schedule that may be completed in less than one year. LOAs are unenforceable.
No Action/Unaddressed	The status of a violation on the ETT when either no action has been taken to return the waterworks to compliance or the initial informal action or compliance assistance has not been successful in returning the waterworks to being in compliance. In such a situation, further action is required. *EPA Drinking Water Enforcement Response Policy.*
Notice of Alleged Violation	A written statement from ODW to a waterworks owner notifying the owner that ODW has reason to believe that an alleged violation has occurred or is occurring. Notice includes the facts that form the basis for believing a

	violation has occurred or is occurring and a legal citation of the statute or regulations allegedly violated, and may include a request for corrective action. 12VAC5-590-110.
On Path to Compliance	The status of a violation that has been placed under a formal enforcement action to return the waterworks to compliance (meaning an enforceable consequence results if the schedule is not met). *EPA Drinking Water Enforcement Response Policy.*
Potential Serious Violator	A waterworks with an ETT score of 5 to 10 points.
Returned to Compliance	Following a violation, the waterworks has completed monitoring, reporting, implementation of treatment, or other activities necessary to be in compliance with the Regulations. All forms of compliance assistance and informal or formal enforcement actions are appropriate means to achieve a return to compliance. *EPA Drinking Water Enforcement Response Policy.*
Serious Violator	The status of a waterworks with an ETT score greater than 10 points (meaning the waterworks has at least one recent acute health-based violation, or at least two recent other non-acute health-based violations, or 11 non-health-based violations). This status may also be referred to as Enforcement Priority. *EPA Drinking Water Enforcement Response Policy.*
Special Order	An administrative order issued by the Commissioner without a waterworks owner's consent after an IFFP, compelling the owner to bring the waterworks into compliance with the Regulations. Va. Code § 32.1-175.01.
Unresolved	A status of a waterworks with continuing, ongoing violations, where there has been compliance assistance, and informal and/or formal enforcement response without a return to compliance. This category is for those waterworks with chronic failure to return to compliance. *EPA Drinking Water Enforcement Response Policy.*
Unresolved/On path to compliance	A status of a waterworks that has a state or federal enforceable order in place to resolve certain violations. In these cases, formal enforcement is expected to successfully

	implement a schedule for sampling, treatment or construction, and no further enforcement is required. ODW or EPA will continue to monitor compliance with schedules and other requirements of the order. *EPA Drinking Water Enforcement Response Policy.*
Warning Letter	A written statement notifying the waterworks that ODW intends to initiate enforcement actions for the waterworks' failure to comply with state or federal regulations. ODW also uses warning letters to notify a waterworks that it is listed on the ETT. The letter may schedule a compliance or enforcement meeting or request corrective action.
Waterworks	A system that serves piped water for human consumption to at least 15 connections or 25 or more people for at least 60 days out of the year. Va. Code § 32.1-167.

Chapter 1 – General Information

1.1. Enforcement Policy

VDH ODW's mission is to protect public health and help ensure that all waterworks provide a safe and adequate supply of drinking water. We accomplish this mission by advocating for safe drinking water; monitoring drinking water quality; providing technical assistance, training, and financing to waterworks owners and operators; and enforcing drinking water standards. ODW strives for full compliance with these regulations and as such, encourages compliance assistance as the first step towards resolving potential issues. This manual focuses on measures that ODW may take when assistance has failed to achieve compliance.

In strategizing the best ways to assure compliance, ODW seeks to respond to compliance issues in a consistent, timely, and appropriate manner. Although each case is fact-specific, consistency means treating "like situations" similarly. ODW takes all noncompliance seriously, but prioritizes health-based violations in accordance with state and federal drinking water policies.

In cases where insufficient technical, managerial, or financial resources present a barrier to compliance, ODW provides resources to waterworks in accordance with the EPA-approved Capacity Development Strategy. If ODW is unable to achieve compliance through technical assistance, due to a lack of resources or an unwillingness to cooperate, ODW may recommend enforcement. ODW encourages a waterworks owner to return to compliance at any time during the enforcement process; however, more serious enforcement measures may be necessary to carry out ODW's mission to protect public health.

The law provides ODW with enforcement tools that enable it to compel compliance and protect public health. Enforcement tools include consensual agreements, such as letters of agreements and consent orders, which develop a schedule and corrective action plan for returning the waterworks to compliance. ODW's enforcement tools also include informal proceedings and special orders, formal hearings, civil and criminal court actions, civil penalties, and permit suspension or revocation for owners that do not return to compliance. The failure to respond to or cooperate with ODW compliance assistance may result in enforcement actions of increasing seriousness. In becoming the healthiest state in the nation and striving for full compliance, more severe measures, such as civil or criminal action, may be necessary.

1.2. Enforcement Authority

In 1974, Congress passed and President Ford signed into law the Safe Drinking Water Act (SDWA), 42 USC § 300f *et seq.*, to protect public health by regulating the nation's public drinking water supply. The SDWA authorized EPA to promulgate regulations setting national standards for drinking water to protect the public against adverse health effects from exposure to naturally occurring and man-made contaminants. Congress amended and reauthorized the SDWA in 1986, 1996, 2005, 2015, 2016, and 2018.

Pursuant to the SDWA, EPA promulgated the NPDWR to carry out the mandates set forth in the SDWA. The NPDWR provide drinking water standards and treatment techniques that protect public health by limiting contaminants in drinking water. In addition to setting drinking water standards and treatment techniques, the SDWA also allows EPA to award states with primary enforcement responsibility (*i.e.* "primacy").

To be awarded primacy, a state must promulgate regulations no less stringent than the federal requirements. As such, VDH developed drinking water regulations for public water systems (also known as "waterworks" in Virginia) that are at least as stringent as the federal requirements. In Virginia, the PWSL, Va. Code 32.1-170 *et seq.*, provides the Board with authority to promulgate the Regulations, 12VAC5-590-10 *et seq*. The Regulations are at least as stringent as the federal NPDWR.

To maintain primacy, the SDWA also requires that states have mechanisms for enforcing the state and federal drinking water standards. As such, the PWSL and Regulations provide VDH with authority to compel compliance through enforcement. EPA has provided guidance on the enforcement process through the ERP (see Attachment 1).

The ERP prioritizes non-compliant waterworks by considering all violations in a comprehensive way. The policy identifies the most serious violators for enforcement response, provides a model for escalating responses, defines timely and appropriate actions, and defines what constitutes a formal action. This Manual is consistent with the ERP, in addition to state and federal laws and regulations.

1.3. Enforcement Workflow

ODW consists of a central office in Richmond and six field offices in Culpeper, Lexington, Abingdon, Danville, Norfolk, and Richmond, Virginia. Central office consists of an office director, a deputy office director, and five divisions. Central office divisions include Financial and Construction Assistance Programs (FCAP); Training, Capacity Development, and Outreach (TCDO); Technical Services; Policy and Program; and Compliance and Enforcement (C/E). Each division has a division director and one or more staff. C/E consists of the director and compliance coordinator.

Field office staff, in addition to and with the support of central office staff, interact directly with waterworks owners and operators to review construction plans and permit applications, draft permits, provide monitoring and reporting surveillance, inspect waterworks, and provide technical, engineering, operational, and managerial assistance to waterworks owners and operators to help achieve and maintain compliance.

Field office staff should perform most enforcement actions due to direct interaction with the waterworks owners and operators on a daily basis, while the C/E division coordinates statewide implementation of the enforcement program to ensure consistency, fairness, and effective strategies.

The enforcement workflow starts in the field offices with the district engineer, inspector, or compliance specialist who identifies noncompliance. The district engineer or inspector may identify a potential alleged violation during a sanitary survey, through laboratory data, or other monitoring and reporting. Once field office staff identify an alleged violation, the district engineer or inspector should work with the compliance specialist to draft the notice of alleged violation, monitor corrective actions, and return the waterworks to compliance. Field office staff should consult other divisions, such as FCAP and TCDO, to provide compliance assistance and additional technical, managerial, or financial resources, as needed.

If field office staff are unable to resolve alleged violations through compliance assistance, the field office should consult with the compliance coordinator and C/E director as to whether the case should be referred for further enforcement. It is recommended that the compliance specialist be responsible for drafting documents and managing case development once a case is referred for enforcement. However, in light of varying needs and workloads across field offices, the field office director may identify appropriate staff to manage enforcement cases, and will work collaboratively with the C/E director to resolve enforcement cases in a fair, consistent, expeditious, and appropriate manner.

If the waterworks is referred for enforcement, field office staff should provide to the C/E division a list of the alleged violations, regulatory citations, and a recommended course of action that includes the appropriate steps necessary to return the waterworks to compliance. The C/E director and field office director should review enforcement options and agree on an appropriate path forward before proceeding with enforcement.

Based on the agreed upon course of action, the field office will draft the appropriate correspondence and documents. The field office will be the lead on the case once an enforcement strategy is developed. The field office should update and consult with central office as the case develops. The compliance coordinator will review the waterworks' compliance history and enforcement documents to ensure consistency and accuracy as needed, and will also assist in monitoring and tracking enforcement actions and ensuring that noncompliance is resolved as expeditiously as possible.

The C/E director will review C/E documents and provide guidance on strategy, enforceability, and other legal considerations. The C/E director, with the support of the field office and the compliance coordinator, will take the lead on enforcement matters that involve the EPA, OAG, or Commonwealth's Attorney. The C/E director will consult with and copy the office director and deputy office director on communications between the field offices and external agencies, as needed.

See Attachment 2 for work flow diagrams.

1.4. Important Considerations

This section includes general guidelines to keep in mind when working with waterworks on C/E matters.

1.4.1. Public Health First

Acute violations are always a priority. Although this manual suggests compliance assistance as a first step to resolving noncompliance, compliance assistance alone may be inappropriate for health-based violations that represent a high risk of harm to public health.

1.4.2. Plain English

Be sure to communicate with owners, operators, and the public using "plain language." Try to avoid technical terms, acronyms, and slang. Be concise, specific, and accurate when communicating with waterworks owners and operators.

1.4.3. Written Correspondence

Written correspondences should comply with the VDH Correspondence Handbook. It is available on the VDH internal website.

1.4.4. Recordkeeping

Document communications with a waterworks regarding its compliance, including spoken, written, and email communications. The field office must document all NOAVs, formal enforcement actions, and related activities in SDWIS, in accordance with the SDWIS Manual. The record must include the appropriate C/E action, name of ODW staff who took the action, the date the action took place, and a description of the action. Document phone calls in writing; minor phone calls may be documented in a phone log.

Field office staff should consider documentation necessary to support an enforcement recommendation when providing assistance. The following are examples of documents that are commonly used to support an enforcement referral: permits, correspondence, compliance assistance, and documentation that the waterworks meets the definition of a waterworks.

1.4.5. Intra/Interagency Coordination

Consider other programs, agencies, or ODW staff that may be able to assist the waterworks. ODW staff should consider providing a copy of C/E letters to other programs or agencies when those other entities may be able to assist or may have an interest in drinking water quality. This includes notifying the appropriate local health district's Health Director and Environmental Health Manager about enforcement actions and providing them copies of enforcement correspondence. Attachment 3 includes a list of programs or agencies that may be interested in receiving copies of C/E letters.

1.4.6. Best Professional Judgement

Selecting the appropriate C/E action is complex because each situation is unique. Each waterworks has a different history of noncompliance, personality, construction, and operation. Judgement will always be a factor in choosing an appropriate course of action.

1.4.7. Identifying the Responsible Party

Direct informal or formal enforcement to the responsible party. The responsible party is usually the owner. A waterworks may be publicly or privately owned. The owner may be a city or small business, homeowner's association, or mobile home park. ODW should work with the representative of the waterworks and review documents to identify the responsible party.

ODW staff or the waterworks owner may request or designate a representative for routine correspondence, such as an operator, administrator, homeowner's association president, engineering consultant, or public works director, but any informal or formal enforcement must be directed to the owner (with a copy to the representative).

Appendix

Attachments are located at:
https://covgov.sharepoint.com/:f:/r/sites/vdh/PHP/odw/ecm/Shared%20Documents/71%20-%20Compliance%20and%20Enforcement/General%20Information/Enforcement%20Manual?csf=1&web=1&e=JI8MhQ

EM-C1-Attachment 1 – EPA Enforcement Response Policy
EM-C1-Attachment 2 – Enforcement Work Flow
EM-C1-Attachment 3 – List of Program and Agency Resources

Chapter 2 – Compliance Monitoring

Summary

This chapter outlines compliance monitoring once a violation has been issued, including how to prioritize violations, track and monitor the enforcement status, and when to proceed with an elevated enforcement response. ODW's Field Manual[5] provides detailed guidance on compliance determinations, including how to determine when a waterworks has violated a rule-specific requirement, identifying and validating violations, and issuing notices of violation. ODW uses SDWIS/State database[6] to track and determine waterworks' compliance. This section discusses how the compliance specialists primarily manage the status of waterworks on the ETT. For violations that ODW staff are unable to return to compliance, field and central office staff should consider referring the waterworks for enforcement.

2.1. Prioritizing Violations[7]

Compliance specialists should prioritize violations based on the risk of harm to public health. Acute violations present an immediate risk of harm to public health and thus are a greater enforcement priority than chronic violations, which present a risk of harm over time.

The follow table provides requirements for ODW's response time depending on violation type:

Violation Type	Examples	ODW Response Time
Priority Acute Violations (10 ETT Points)	Nitrate MCLs (Code 01)	**Within 24 hours** of discovery of an alleged violation. A non-response by the waterworks owner/operator to an acute violation will move these violations to formal enforcement at an accelerated rate.
	Acute MRDL (Code 13)	
	RTCR E. Coli MCL (Code 1A)	
	Turbidity TT - Treatment Technique exceeds 1 NTU (Code 43) or 0.3 NTU in 5% of monthly samples (Code 44)	
	SWTR TT - failure to maintain microbial treatment (Code 41)	

[5] The Field Manual is a compilation of policy positions derived from previously issued working memos on various field activities that staff are routinely engaged in concerning compliance determinations. As of the effective date of this manual, the Field Manual is under development, but is expected to be ready for publication in the 3rd or 4th quarter of 2020.

[6] EPA developed the SDWIS/State database to help States improve their quality of drinking water information. The database contains information about public water systems and their violations of EPA's drinking water regulations. Information is the SDWIS/State database is uploaded to SDWIS/FED database, which is EPA's national database that manages and collects public water system information from states, including reports of drinking water standard violations, reporting and monitoring violations, and other basic information, such as water system location, type, and population served.

[7] Section 2.4 of the Enforcement Manual cross-references with Section 20 of Chapter 14 of the Field Manual.

Violation Type	Examples	ODW Response Time
	Nitrate monitoring/reporting (M/R) (Code 03)	
Non-Acute Violations (5 ETT Points)	All chemical (excluding Nitrate), Radiological MCLs, or lead AL (Codes 01 and 02)	**Within 7 days** of discovery of the alleged violation.
	Non-acute MRDL (Code 11)	
	Non-acute Treatment Techniques (Codes 33, 37, 40, 42, 45, 46, 47, 48, 57, 58, 59, 63, 64, 65, 2A, 2B, 2C, 2D)	
	All other M/R, Treatment Technique, and other violations	
Chronic, Non-acute Violations (1 ETT Point)		**Within 30 days** of discovery of the alleged violation.

2.2. Tracking Federal Violations

Each quarter, ODW is required to transfer data from the SDWIS/State database to the EPA's federal SDWIS/Fed database. The transfer of data is completed 45 days after each quarter has ended to allow time for staff to run compliance reports, issue NOAVs, and ensure that all data has been entered into SDWIS/State database correctly. The data that ODW transfers quarterly includes violations, enforcement actions, inventory data, site visits, and some sample data (*i.e.* lead and copper 90th percentile sample data). EPA uses this data (through the ETT that it compiles and distributes each quarter) to help states identify waterworks that are consistently violating federal rules.

Due to the data file transfer schedule (see below), the information on the ETT may be obsolete by the time the EPA releases the ETT to the states. For example, a waterworks may have submitted sample results shortly after the file transfer, resulting in a RTC[8] but it would not be reflected on the ETT until the following quarter.

[8] RTC is an acronym used when speaking of or referring to a system that has "returned to compliance," or in other words satisfied the requirements set forth in the EPA's drinking water rule that was violated. Technically, in SDWIS, a violation that has been resolved is given a SOX Enforcement Code, and SOX means the violation has been Returned to Compliance, or RTD'c.

Quarterly ETT	Begin Date for Data Collection	End Date for Data Collection	Data Transfer	Data Lag Issues
July ETT	January 1st	March 31st	May 15th	Any RTC or action entered in SDWIS after **5/15** will not be reflected on the list.
October ETT	April 1st	June 30th	August 15th	Any RTC or action entered in SDWIS after **8/15** will not be reflected on the list.
January ETT	July 1st	September 30th	November 15th	Any RTC or action entered in SDWIS after **11/15** will not be reflected on the list.
April ETT	October 1st	December 31st	February 15th	Any RTC or action entered in SDWIS after **2/15** will not be reflected on the list.

2.2.1. Enforcement Targeting Tool (ETT)

The objective of the ETT is to assist states and waterworks owners and operators in focusing their efforts on violations with the highest potential to affect public health. EPA assigns a point value to each violation under the SDWA. Acute violations have a higher point value than chronic violations. A score is calculated for each waterworks based on the violations that have not been returned to compliance using the enforcement targeting formula below:

$$\textbf{ETT Score} = \textbf{Sum}\ (S_1 + S_2 + S_3 + \ldots) + N$$

S = Violation Severity Factor

N = number of years the waterworks' oldest violation has been unaddressed (0-5)

S Value	Violation Type (violation number)
10	**Acute violations, TTs, and MCLs**

	Nitrate MCLs, Acute MRDL (Violation Cole 13), RTCR *E. Coli* MCL (1A), Turbidity TT (43, 44), SWTR TT (41)
5	**Other health-based violations, including non-acute TTs, MRDL, and MCLs**
	Also Nitrate Monitoring/Reporting (03)
1	**Monitoring/reporting violations, or any other violation**
	All M/R violations (except Nitrate M/R)

EPA generates the ETT quarterly based on data reported from SDWIS/State database. Waterworks with ETT scores greater than 10 are considered "serious violators," waterworks with ETT scores of 5-10 are considered "potential serious violators," and the approach to waterworks with an ETT score less than 5 is discretionary. For waterworks with scores less than 5, ODW closely monitors for whether compliance assistance may help resolve the issue or if additional enforcement may be necessary. ODW staff try to respond to noncompliance proactively to prevent the waterworks from becoming a potential serious or serious violator.

EPA considers waterworks with a score greater than 10 to be an enforcement priority. EPA also sets criteria for how a waterworks can return to compliance and be removed from the ETT. The criteria for each violation type are outlined in the EPA RTC Table (Attachment 5).

EPA's ERP requires states to address waterworks on the ETT in a "timely" and "appropriate" manner (see Attachment 1). To be considered "timely," ODW must address the waterworks violations within two calendar quarters of their designation as a Serious Violator by EPA. "Appropriate" methods of addressing the waterworks violations are either the waterworks resolving its violations and returning to compliance, or through formal enforcement action. The EPA defines formal enforcement as an action that has the intent and effect of bringing a non-compliant waterworks back into compliance by a certain time with an enforceable consequence if the schedule is not met.[9] Generally, formal enforcement involves administrative orders (*i.e.* consent order or special order), but it could also involve a court order.

As a part of the ERP, and to address data lag issues, central and field office staff review all priority waterworks with an ETT Score greater than 10. Once the field office reviews the report and provide comments with details on the status of the waterworks, central office sends these responses to EPA with the current status for each waterworks. EPA then follows up with an email to schedule a call to discuss the ETT and updates on all of the priority waterworks, as well as to address any questions or concerns.

[9] Drinking Water Enforcement Response Policy, United States Environmental Protection Agency. 2009. *See* https://www.epa.gov/sites/production/files/2015-09/documents/drinking-water-erp-2009.pdf.

In the "Status of Violation" column on the ETT, the field office must choose one of the following to describe the waterworks' status:

- **No Action/Unaddressed** – Violation reported by state, with either no action by the waterworks owner to return the waterworks to compliance, or where the initial informal action(s) or compliance assistance have not been successful to return the waterworks to compliance. Further action will be needed.

- **Returned to Compliance** – The waterworks has completed monitoring, reporting, or implementation of treatment or other activities necessary to be in compliance with the Regulations. All forms of compliance assistance and informal or formal enforcement actions are appropriate means to return to compliance. The appropriate RTC code shall be entered into SDWIS.

- **Unresolved but on the Path to Compliance** – This category includes waterworks that have an EPA or state enforceable compliance order or schedule in place to resolve violations. In these cases, formal enforcement is expected to be successful toward implementing a schedule for sampling, treatment or construction, and therefore no further enforcement is required. The state and/or EPA will continue to monitor compliance with schedules and other requirements of the order.

- **Unresolved** – Waterworks with continuing, ongoing violations that have had compliance assistance, or informal and/or formal enforcement response without a return to compliance. This category is for those waterworks with a chronic failure to return to compliance.

Although the ETT allows the state to monitor noncompliance and report progress to EPA to ensure compliance with the states' primacy requirements, the ETT data lags behind real-time data. As such, ODW uses ETTA to maintain current information on waterworks compliance.

2.2.2. Enforcement Tracking Tool Assistance (ETTA)

EPA created ETTA to provide states an effective tool with real time data for assessing waterworks out of compliance with federal requirements, and for comparing this data with the most recent state data that states reported to SDWIS/Fed database. States can compare ETTA to the previous ETT to identify waterworks that are no longer on the ETT or have a greater score than on the last ETT report. ETTA greatly simplifies ODW's quarterly discussions with EPA by narrowing the focus to waterworks with the most compliance issues.

ETTA uses the same formula that EPA uses to calculate the ETT, but ETTA is able to provide a real time assessment of noncompliance because it retrieves its data from SDWIS/State database. By contrast, EPA calculates the official federal ETT score from SDWIS/Fed database. ODW updates SDWIS/State database continuously, whereas EPA only updates SDWIS/Fed database quarterly. Thus, ETTA is a real time assessment.

2.3. State-Only Violations[10]

"State-only" violations are those that are not based on federal requirements or reported to EPA. Although EPA does not track "state-only" violations, ODW tracks and reports state violations through SDWIS/State database. State violations are tracked in SDWIS/State database the same way as federal violations.

The following are examples of state-only violations:

Type	Description
A0	No waterworks operation permit
A1	No construction permit for modification
A2	Exceedance of permitted design capacity
A3	Operating facility beyond permit design capacity
A4	New waterworks or component in service without approval
B0	No BSSP or TSWMP (bacteriological sample site plan or triggered source water monitoring plan)
B1	Failure to follow approved BSSP or TSWMP
B2	Lacks properly licensed operator
B4	No WBOP (waterworks business operation plan)
B5	No CCCP (cross connection control plan)
B6	Failure to implement CCCP
C1	Failure to report by 10th day of month
C2	State monitoring violation
C3	Reliability problem
C4	Lack of monitoring equipment
C5	Failure to meter water production
C6	Less than 20 psi at service connection
C7	State MCL violation
C9	Failure to notify consumers

See Attachment 4 for a table of state violations. The table includes a description of the violation, what action ODW should take in response to the type of alleged violation, the action required of the waterworks owner to resolve the alleged violation, and enforcement options if the waterworks owner fails to resolve the alleged violation.

2.4. Returning a Waterworks to Compliance[11]

A waterworks comes into compliance with the Regulations by completing the appropriate sampling or reporting requirements, reducing a contaminant below a MCL, or completing other corrective actions, such as milestones in a compliance schedule. EPA published a comprehensive Return to Compliance (RTC) Table (see Attachment 5), which describes federal

[10] Section 2.4.2 of the Enforcement Manual cross-references with Section 28 of Chapter 14 of the Enforcement Manual.
[11] Section 2.4.3 of the Enforcement Manual cross-references with Sections 20 and 30 of Chapter 14 of the Enforcement Manual.

violations and their corresponding RTC definitions. The RTC Table should be used to help determine when a waterworks can be returned to compliance. An RTC enforcement action ("SOX" enforcement action code in SDWIS) must be entered into SDWIS to close or address the applicable alleged violations that have been issued to the waterworks.

Field offices should make every effort to determine that a waterworks has returned to compliance as soon as possible. Delays in entering a RTC into SDWIS can negatively affect a waterworks' ETT score. To avoid a waterworks being incorrectly listed on the ETT because a violation has not been identified as RTC, the compliance specialists should work collaboratively with field office staff to ensure that this information is current.

Compliance specialists should review the list of enforcement actions that have not been returned to compliance at least monthly to ensure that the compliance information is up to date.

Appendix

Attachments are located at:
https://covgov.sharepoint.com/:f:/r/sites/vdh/PHP/odw/ecm/Shared%20Documents/71%20-%20Compliance%20and%20Enforcement/General%20Information/Enforcement%20Manual?csf=1&web=1&e=JI8MhQ

EM-C2-Attachment 4 – State Violation Table
EM-C2-Attachment 5 – RTC Table

Chapter 3 – Enforcement

Summary
This chapter provides guidance on the enforcement process and steps that staff may take to address violations when waterworks owners have been unwilling or unable to return to compliance voluntarily. Enforcement may be appropriate when compliance assistance has been unsuccessful in returning a waterworks to compliance after two calendar quarters in accordance with the EPA's ERP. The enforcement process includes (1) resolving violations with or without the waterworks owner's consent; (2) monitoring enforcement actions; and (3) closing cases once the waterworks has returned to compliance.

Enforcement actions may be formal or informal, and are generally administrative in nature (*i.e.* non-judicial). Informal enforcement actions include warning letters and letters of agreements. Warning letters outline the violation and what actions the waterworks owner needs to take to return to compliance. Letters of agreement may be used for waterworks that have demonstrated a good faith effort to comply with the Regulations and are not on the ETT. Formal enforcement may include administrative orders (*i.e.* consent orders or special orders) or court actions. Formal enforcement may be required when the waterworks is listed as a "serious violator" or Enforcement Priority on the ETT (*i.e.*, it has a score greater than 10).

During the enforcement process, field office staff may continue to assist the waterworks owner with drafting public notices, boil water advisories, and action plans to enhance the waterworks' ability to return to compliance. However, for reoccurring violations, staff should consider proceeding with a binding and enforceable order to assure that the waterworks stays in compliance.

In determining what is the appropriate enforcement action, ODW may consider the size and type of the waterworks, the risk of harm to human health, and the willingness of the waterworks owner to cooperate. The following procedures listed in this chapter are generally listed in order of increasing seriousness. While staff may begin with a consensual means of achieving compliance, enforcement is not discretionary and staff should proceed as necessary to protect human health. ODW encourages cooperation and open discussions with the owner and operator of the waterworks, field offices, and divisions in developing a plan and facilitating compliance.

3.1. Referrals

For waterworks that have failed to return to compliance through meetings, technical assistance, and education, field office staff should refer the case to C/E for further assistance or enforcement.

ODW encourages coordination and communication among field office staff as early as a problem is known to exist. An open dialogue will allow the district engineer, inspector, compliance

specialist, and other divisions to know and understand compliance issues before the case is referred to enforcement. Likewise, C/E staff should provide updates to field office staff as a case develops.

Once field office staff refer a case to enforcement, they have responsibility for resolving the case with the support and coordination of the C/E division. Field office staff should work with the C/E division to evaluate the facts and appropriate legal authority, develop an enforcement recommendation, and keep central office staff apprised of the case status.

3.1.1. Scope of Enforcement Action

Enforcement actions should include all outstanding violations and requirements for the waterworks to return to compliance. However, in limited circumstances, it may be appropriate to address violations individually. For example, a waterworks may respond better to progressive requests for incremental improvement rather than a longer list of deficiencies in a single letter. Staff should consult with TCDO when considering the technical, financial, and managerial capacity of a waterworks as related to the scope of the enforcement action.

When sending letters to waterworks owners notifying them of a single violation, it is recommended that staff consider including a reminder in the letter of whether ODW has provided notice of other violations to be resolved.

Generally, the ETT considers up to 5 years of compliance history when calculating the ETT score. This is a good rule of thumb when processing violations. Older violations may be used to demonstrate poor compliance history; however, staff should consider whether new permits have been issued, if there has been a change in owner or operation, or if the violations have been resolved such that it would make older violations irrelevant.

3.1.2. Enforcement Options

In developing an enforcement recommendation, staff should consider the following:

No Longer a Waterworks

ODW staff should confirm that the facility meets the definition of a "waterworks" (*i.e.*, it serves at least 15 service connections or 25 or more individuals for at least 60 days out of the year). Facilities may change over time and drop under the regulatory threshold for qualifying as a waterworks under the law. Also, consider whether the waterworks has the ability to connect to another waterworks.

Other permits

ODW staff should consider whether the waterworks has any other permits or licenses.[12] Other permits or licenses may be used to determine whether a system meets the regulatory definition of

[12] *See* 12VAC5-421-30 (requires that food establishments be connected to an approved water supply); 12VAC5-421-2050 (requires that drinking water at food establishments be obtained from an approved source that is a public

a waterworks, or they may be affected by noncompliance with the waterworks permit. For example, the Department of Social Services issues licenses to operate childcare and adult nursing programs. The licenses may include the number of individuals that the facility is licensed to service. This number may be used to determine the population served in evaluating whether the system meets the definition of a waterworks.

Other program permits may require compliance with the waterworks permit. For example, the VDH Office of Environmental Health Services (OEHS) oversees food permits, which may specify the number of restaurant seats permitted. Food service permits also require an "approved" water source.[13] The failure to comply with the Regulations may result in revocation of the waterworks operation permit and subsequently, the food service permit. Copying the Environmental Health Manager for the local health district on correspondence with the waterworks is required so they can be aware of noncompliance. Other examples of facilities regulated by other agencies include marinas, campgrounds, motels, and those holding alcohol licenses.

Temporary Permits

ODW may use temporary permits to bring newly discovered waterworks into compliance with the Regulations, or for change in ownership or system improvements at known waterworks. The intent of issuing a temporary permit for a newly discovered waterworks is to allow time for the owner to complete regulatory requirements, including water quality testing, raw water sampling to support an evaluation of whether a groundwater source is under the direct influence of surface water, as well as completing sampling plan, a lead and copper material survey, a cross connection control plan, and a waterworks business operation plan. For known waterworks, the temporary permit is to allow time for infrastructure upgrades that may be necessary to comply with the Regulations. Refer to ODW's Permit Manual for more information and details on the use of temporary permits.

Field offices generally should not use temporary permits to address noncompliance. If the waterworks fails to comply with the Regulations or fails to complete temporary permit requirements, then the field office should take enforcement action to compel the waterworks to comply with the Regulations.

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water system or a nonpublic waster system connected, maintained, and operated according to law); 12VAC5-431-10 (defines approved water supply as a waterworks that has a valid waterworks operation permit); 12VAC5-431-400 (states that the water supply system serving hotels must comply with the waterworks regulations); 12VAC5-450-80 (states that all campgrounds must provide an adequate supply of safe, sanitary, potable water that shall be supplied from either an approved private well or a permitted waterworks maintained and operated in compliance with 12VAC5-590).

[13] *See* 12VAC5-421-2050 ("Pure water shall be obtained from an approved water system defined as: 1. A waterworks constructed, maintained, and operated in compliance with 12VAC5-590.") 12VAC5-421-2080 ("Water from a waterworks shall meet water quality and quantity standards in accordance with 12VAC5-590…").

The compliance specialists are responsible for monitoring and tracking compliance with temporary permits and the timelines specified within them. A temporary operation permit compliance schedule should be entered into SDWIS and used to track compliance with permit requirements (please refer to the ODW SDWIS Manual for more information). Failure to comply with temporary permit requirements should be addressed in a timely manner by following up with the waterworks to achieve compliance or issuing an NOAV for failure to comply.

Receivership

Receivership conveys possession of the waterworks' assets and responsibility to a receiver, who will operate the waterworks in the best interest of the customer.[14] This option is only appropriate when a court finds that conditions at the waterworks cannot be remedied, and the health and welfare of its customers are jeopardized. To initiate this action, ODW must ask the Commissioner to petition the circuit court to appoint a receiver when the Commissioner finds that the waterworks is unable or unwilling to provide adequate and safe drinking water.

In theory, receivership should be an effective tool, but when ODW has considered its use in the past, staff could not find an owner or operator with financial and technical capacity who was willing to act as a receiver for the subject waterworks.

Referrals to OAG

The OAG is counsel to VDH and, as such, represents the agency in civil court actions. Referrals to the OAG may be appropriate for cases in which there is a serious threat of harm to human health, an order or written agreement has been violated, or there are ongoing violations with a long history of noncompliance and ODW has been unable to achieve compliance through its administrative procedures.

If a referral is the best option, then the C/E director or other central office staff, in coordination with the field office, will prepare a referral package that includes a description of the case history and outstanding violations, as well as supporting documentation. Referrals to the OAG should be signed by the ODW office director, and routed through OCOM. The C/E director should be the point of contact on referrals to the OAG. The C/E director should include the office director and deputy office director in communications so they are apprised of major developments.

Criminal Actions

Criminal matters should be handled by the Commonwealth's Attorney in the jurisdiction where the waterworks is located. In consultation with central office and the OAG, field or central

[14] See Va. Code § 32.1-174.3.

office staff may request that the Commonwealth's Attorney pursue criminal charges for a waterworks owner failing to comply with the Regulations.[15]

Field office staff should consider referring a criminal matter for further action when there is evidence to support that the waterworks is willfully violating or refusing, failing or neglecting to comply with any Board regulations or orders. An example of a possible criminal matter is the falsification of data.

Referrals to EPA

ODW may consider referring a case to EPA when ODW's C/E efforts have been unsuccessful and EPA has more effective resources. EPA may be better equipped to handle complex cases with interstate or federal aspects, such as a waterworks that is owned by a federal agency. ODW should receive input from EPA on whether a referral is appropriate.

If a referral is the best option, then the central office, in coordination with the field office, will prepare a referral package that includes a description of the case history and outstanding violations, as well as supporting documentation. The referral package should be signed by the office director and routed through OCOM. The C/E director should be the point of contact on all referrals to EPA. The C/E director should communicate with the office director and deputy office director and copy them on communications so they are apprised of major developments.

3.1.3. Decelerating/Accelerating Enforcement Cases

Examples of when staff may choose to decelerate enforcement:

- Waterworks owner or operator change;
- Late water samples;
- BWA issued and further monitoring would be duplicative (*e.g.*, a negative bacti would not reverse BWA); and
- More time is needed to see if recent enforcement action was effective (only if waterworks is demonstrating "good faith").

Examples of when staff may accelerate enforcement:

- Violation represents acute public health risk and waterworks took no action;
- Long history of noncompliance; and
- Willful or egregious violations, such as falsifying data (NOTE: falsifying data is a criminal violation and staff should consider whether a referral to the Commonwealth's

[15] *See* Va. Code § 32.1-27.A ("Any person willfully violating or refusing, failing or neglecting to comply with any regulation or order of the Board or Commissioner or any provision of this title shall be guilty of a Class 1 misdemeanor unless a different penalty is specified.").

Attorney, the U.S. Attorney for federal violations, or the Department of Professional and Occupational Regulation is appropriate).

3.1.4. Civil Charges

The Va. Code authorizes ODW to assess by consent civil charges[16] (administrative) and seek civil penalties[17] (judicial) against any waterworks that violates any provision of the PWSL or Regulations. Civil charges and penalties are authorized to deter noncompliance and support ODW's mission to protect public health and ensure a safe and adequate supply of drinking water. Civil charges should consider the severity of the violation, extent of potential or actual harm to human health, compliance history of the waterworks, economic benefit realized from noncompliance, and the ability of the waterworks to pay.

Civil charges are not appropriate in every case. For example, consent orders requiring construction or modification of a waterworks operation, treatment, or distribution system likely should not include a civil charge due to the dedication of funds necessary to address the issue and as an incentive for the waterworks to cooperate with ODW and voluntarily agree to a schedule of compliance. On the other hand, consent orders for the failure to certify, public notice, or monitor for water quality should include a civil charge, as those violations are preventable and usually result from the waterworks owner's unwillingness to respond to compliance assistance to resolve these issues.

Informal fact finding proceedings (IFFP) that result in the issuance of a special order by the Commissioner should generally include the assessment of a civil charge if the waterworks has been unresponsive or uncooperative in responding to prior attempts to achieve compliance. An IFFP usually reflects a higher degree of culpability and therefore, a civil charge should be assessed to deter the waterworks owner from failing to comply with the Regulations in a timely manner.

ODW may assess civil charges when one or more of the following criteria applies

- Failure to adequately respond to compliance assistance;
- Violation of a consent order or special order without mitigating circumstances;

[16] Va. Code § 32.1-27.D ("With the consent of any person who has violated or failed, neglected or refused to obey any regulation or order of the Board or Commissioner… the Board may provide, in an order issued by the Board… for the payment of civil charges for past violations … not to exceed…" $25,000 for each violation.).

[17] Va. Code § 32.1-27.C ("[A]ny person violating or failing, neglecting or refusing to obey any injunction, mandamus or other remedy obtained pursuant to subsection B shall be subject, in the discretion of the court, to a civil penalty not to exceed $25,000 for each violation.").

Va. Code § 32.1-175.01 states, the Board may issue a special order that may include a civil penalty against an owner who violates this article or any order or regulation adopted thereto.

Va. Code § 32.1-176 states, "in addition to the provisions of 32.1-176, any owner who violates any provisions of this article or any order or regulation adopted pursuant thereto shall, upon such finding by a court of competent jurisdiction, be assessed a civil penalty of not more than $5,000 for each day of violation."

- Violations that are avoidable;
- Violations fundamental to the regulatory program;
- Noncompliance that is continuing or likely to recur absent a civil charge to serve as a deterrence;
- Knowing or willful violations;[18] or
- Violations resulting in harm to public health.

ODW may adjust the civil charge – excluding the economic benefit calculation – downward by up to 30% when assessed in consent orders based on cooperativeness and quick settlement, prompt responses and good faith effort to comply, and the size and sophistication of the waterworks.

See Attachment 9 for how to calculate a civil charge and 9A for the civil charge worksheet.

3.2. Informal Enforcement

Informal enforcement may be appropriate for waterworks that are responsive, cooperative, and demonstrate a good faith effort to return to compliance. Informal enforcement is encouraged for waterworks that are not listed on the ETT as a "serious violator." If the waterworks has an ETT score greater than 10, consider whether formal enforcement (with or without consent) is appropriate. In most cases, enforcement should start with informal actions and progress to formal, as necessary.

3.2.1. Warning Letters

Warning letters may be appropriate when a waterworks has the financial, technical, and managerial ability to comply with the Regulations but fails to do so.[19] Warning letters often schedule a compliance meeting so ODW has an opportunity to discuss noncompliance face-to-face. Warning letters are sometimes effective for prompting the waterworks to take action and return to compliance without further action.

Warning letters are issued to potential serious violators and serious violators quarterly in response to the ETT, as defined in EPA's ERP. In this case, the letter notifies the waterworks that it has been listed on the ETT. (See Attachments 6 and 7.)

Once a waterworks is listed on the ETT, ODW should notify the waterworks of its status and actions that it needs to take to return to compliance. After the C/E division reviews the ETT and reports its response to EPA, the compliance coordinator prepares the warning letters for review by the field offices. Once each field office reviews the Warning Letter and approves sending it,

[18] Va. Code § 32.1-27 states, "any person willfully violating or refusing, failing or neglecting to comply with any regulation or order shall be guilty of a Class 1 misdemeanor."
[19] This determination should be based on the most recent triennial assessment of waterworks technical, managerial, and financial capacity.

or provides a basis for withholding the letter, central office will send the letters to the appropriate waterworks notifying them of their status on the ETT.

When evaluating which waterworks should receive a warning letter, staff should assess not only the waterworks' ETT score, but also its current ETTA score. For example, a waterworks may have a score of 5 on the quarterly ETT but a current ETTA score of 12. Therefore, this waterworks should receive a Serious Violator rather than a Potential Serious Violator Warning Letter based on the ETTA score. Conversely, a waterworks with a score of 12 on the quarterly ETT but a current ETTA score of 3 may not receive a warning letter at all.

3.2.2. Letters of Agreement

Letters of agreement are appropriate when the waterworks is demonstrating a "good faith" effort to comply with the Regulations and is willing to agree to a set of corrective actions and schedule of compliance (see Attachment 10). LOAs are not recommended in cases where the corrective action and schedule is expected to take more than one year to complete. In instances where the corrective action is expected to last more than one year, a enforcement order is recommended.

Advantages of a LOA are that it is an informal, less resource and time intensive tool to compel compliance, and may be signed by the field director. It also creates a record of compliance efforts. Disadvantages are that they are unenforceable and so not considered "formal enforcement" according to EPA's ERP (*i.e.* it may not be used for waterworks that are listed on the ETT as serious violators with scores greater than 10).

3.3. Formal Enforcement

Formal enforcement is appropriate when ODW is required to have an enforceable, legally binding order with the waterworks or ODW believes it is unlikely to achieve compliance without one. EPA defines formal enforcement in its ERP as one that requires specific actions for the waterworks to return to compliance, cites specific violations, and is independently enforceable without having to prove the original violation.[20] Formal enforcement includes administrative orders (with or without penalties), and civil or criminal referrals.

Formal enforcement may be used with or without the consent of the waterworks. If the waterworks is cooperating with ODW to resolve an issue, then a consent order may be appropriate. If the waterworks is not cooperating, then ODW may need to hold an IFFP and

[20] EPA's ERP defines "formal enforcement" as meeting the following criteria:

1. Require specific actions necessary for the waterworks to return to compliance;
2. Be based on a specific violation(s);
3. Be independently enforceable without having to prove the original violation, meaning:
    a. Contains a description of the non-compliant violation, a citation to the applicable state or federal rule or law, a statement of what is required for the waterworks to return to compliance, and a compliance schedule; and
    b. Provide the state with authority to impose penalties for violating the state's enforcement document.

issue a special order in which the Commissioner compels compliance. Central office staff should send formal enforcement correspondences via certified mail.

Remember, most waterworks who are listed on the ETT as a "serious violator" with an ETT score greater than 10 require formal enforcement within six months of being listed (unless the violation has been returned to compliance).

3.3.1. Consent Orders

Consent orders are appropriate when the waterworks is working cooperatively with ODW staff to resolve noncompliance. A consent order is an administrative order issued on behalf of the Board to a waterworks, with its consent, requiring that the waterworks perform a set of actions to return the waterworks to compliance. See Attachment 11. Consent orders are considered case decisions that are authorized by statute and enforceable in court.

ODW staff should use consent orders to establish an enforceable schedule that compels a waterworks to return to compliance in an expeditious manner by:

1. Complying with statutes, regulations, permit conditions, and orders;
2. Applying for a construction or operation permit (in lieu of a temporary permit);
3. Installing, testing, or implementing new operation or treatment techniques;
4. Complying with a schedule for facility upgrades, and modifications; or
5. Completing repairs to the waterworks (*e.g.*, repairs to wells, pumps, tanks, and water plants).

Field office staff should develop consent orders with the concurrence of central office. The field director should review and approve the draft consent order for technical accuracy before the field office sends the draft to central office for review and approval. Collaboration among offices is essential for efficient and professional documentation that is factually correct, legally enforceable, and consistent statewide. Staff should also consider any other divisions that may need to review the corrective action set forth in the consent order, such as or FCAP or TCDO. See Attachment 8 for a checklist to consider when drafting and reviewing consent orders.

ODW staff should share the draft consent order with the waterworks owner and request that they provide comments within two weeks. Field office staff should provide the waterworks owner with an opportunity to meet and discuss the consent order at the time the draft is released. If the owner has no comments or declines to meet, then the owner may print two hardcopy originals, including a notarized signature on each original, and return both originals to the central office for the Commissioner's signature. ODW staff should have the owner sign two originals so that we may return one signed original to the waterworks owner and keep the other for ODW records. Electronic submittals are also acceptable and may be transmitted via email.

When ODW returns a signed original to the waterworks owner, it should include a cover letter with the consent order enclosed (see Attachment 12). Consent orders become effective not less than 15 days after mailing a copy by certified mail.[21]

In negotiating the terms of a consent order with the waterworks owner, ODW staff may consider comments and where appropriate, incorporate them into the draft consent order. When the waterworks makes substantive comments, staff may hold a meeting or use other means to resolve the differences. Generally, the OAG has approved the administrative provisions and so may not be altered unless approved by central office.

Consent orders may include a civil charge if it is determined appropriate to deter noncompliance and facilitate quick settlement. In negotiating the terms of the consent order, ODW may offer up to a 30% reduction in the assessed civil charge amount to encourage cooperativeness, prompt response and quick settlement, and the size and sophistication of the facility. Consent orders should cover violations dating back no more than 5 years. See Attachments 9 and 9A for how to calculate a civil charge and for the civil charge worksheet.

3.3.2. Informal Fact Finding Proceedings

The APA provides two ways of addressing alleged violations when the waterworks will not resolve a violation by consent – informal hearings (*i.e.* IFFPs) and formal hearings.[22]

Field office staff should seek compliance using the least resource-intensive means possible but in cases where the waterworks is uncooperative or unresponsive, it may not be possible to negotiate a consent order with a waterworks owner who is unwilling to agree to its terms and corrective actions. In cases where a waterworks refuses to cooperate, field office staff should recommend that ODW proceed with an IFFP.

Notice of IFFP

The APA requires that ODW provide reasonable written notice prior to an IFFP. Thirty days is generally considered reasonable. The notice must include contact information (*i.e.* name, telephone number, and government email address of the person designated by the agency to answer questions and assist the named party).[23] The C/E director may serve as the contact person for questions regarding the IFFP while field staff should respond to technical or

[21] Va. Code § 32.1-26 ("Such order shall become effective not less than fifteen days after mailing a copy thereof by certified mail to the last known address of such person.")

[22] *See* Va. Code § 2.2-4019.A ("Agencies shall ascertain the fact basis for their decisions of cases through informal conference or consultation proceedings…"); § 2.2-4020.A ("The agency shall afford opportunity for the formal taking of evidence upon relevant fact issues in any case in which the basic laws provide expressly for decisions upon or after hearing and may do so in any case to the extent that informal procedures under § 2.2-4019 have not been had or have failed to dispose of a case by consent.").

[23] Va. Code § 2.2-4019.A ("[N]otice shall include contact information consisting of the name, telephone number, and government email address of the person designated by the agency to answer questions or otherwise assist a named party…").

operational questions about the waterworks. The notice must also notify the party (owner) of the right to appear in person or by counsel or other qualified representative, provide any contrary information that the agency may rely upon in making an adverse case decision, and inform the party of the factual or procedural basis for an adverse decision.[24]

Preparing for an IFFP

In preparing for an IFFP, field office staff should collaborate with the compliance coordinator, field office director, and C/E director to develop an exhibit book that contains the following: documentation to demonstrate that the waterworks meets the definition of a waterworks, the operation permit, relevant NOAVs, correspondence between ODW and the waterworks, and any other documentation that may be relied upon to form the basis of a case decision. Other documentation may include laboratory results, SDWIS data, the waterworks questionnaire, the business operations plan, or other submittals. The exhibit book should accompany the IFFP notice. If it does not, ODW must provide it to the owner prior to the IFFP, allowing sufficient time for the owner to respond with additional or contradictory information that they want to present at the proceeding. (See Attachments 13 and 14 for the Notice of IFFP and exhibit list.)

Because an IFFP requires more time and resources, and staff have already dedicated considerable time in compliance assistance efforts to return the waterworks to compliance, a civil charge is considered appropriate. The Code allows for up to $1,000 per day per violation in a special order.[25] The civil charge worksheets break down this amount and may be used to assess civil charges for violations (see Attachment 9A). Civil charges are integral to deterring future violations and creating a level playing field.

Parties to an IFFP

The parties to an IFFP include a presiding officer, an agency advocate, the waterworks owner and any other waterworks representatives, and any witnesses who may be relied upon for testimony. The compliance specialist for the field office or the C/E director will serve as agency advocate. The agency advocate will present the case for ODW, interview the inspector or district engineer, and recommend a course of action to the presiding officer. The presiding officer will conduct the proceeding and hear evidence and testimony for the agency and the opposing party. The presiding officer should be an unbiased third party with knowledge and experience about waterworks. Generally, the presiding officer should be a field director or deputy field director from a different field office.

[24] Va. Code § 2.2-4019.A.

[25] Va. Code § 32.1-175.01 ("Notwithstanding any other provision of law and to the extent consistent with federal requirements, following a proceeding as provided in § 2.2-4019, the Board may issue a special order that may include a civil penalty against an owner who violates this article or any order or regulation adopted thereto by the Board."). *See also* § 32.1-167 (defining "special order" to mean "an administrative order issued to any person to comply with: (i) the provisions of any law administered by the Board, (ii) any condition of a permit, (iii) any regulation of the Board, or (iv) any case decision…of the Board. A special order may include a civil penalty of not more than $1,000 for each day of violation.").

IFFP Procedure

The proceeding is conducted to ensure that the waterworks owner has a fair and adequate opportunity to present information before the agency makes a case decision. The proceeding may be conducted in the field office that administers the Regulations for the waterworks or in the central office.

The presiding officer and agency advocate should follow guidelines for the proceeding to maintain order and professionalism. (Attachment 15.) The district engineer, inspector, and any other witnesses should be prepared to answer questions during the proceeding. The agency advocate may prepare the witnesses for their appearance at the IFFP.

Following the IFFP, the agency has 90 days from the date of the IFFP to issue a case decision.[26] This includes the time required for the agency advocate (*i.e.* the compliance specialist or C/E director) to prepare a recommendation, the presiding officer to recommend a case decision to the Commissioner based on information presented at the IFFP, and the Commissioner to issue a decision and special order, as appropriate. The presiding officer's recommendation should include whether the waterworks is or is not in violation of the law and Regulations. (See Attachment 16.)

If the presiding officer finds that the waterworks is in violation of the Regulations, then the presiding officer should provide a proposed special order to the Commissioner compelling action by the waterworks to return to compliance within a specified timeframe. (See Attachment 17.) The Commissioner will then approve, disapprove, or modify the presiding officer's recommendation within the remaining time.

The waterworks owner will have 30 days from the date they receive the decision to initiate an appeal process, which could be a request for a formal hearing under Va. Code § 2.2-4020 or a hearing in the circuit court with jurisdiction over the matter.[27] If the waterworks owner chooses not to appeal the decision, then the special order becomes effective not less than fifteen days after mailing a copy by certified mail to the last known address of the waterworks owner.[28]

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[26] Va. Code § 2.2-4021.B ("In any informal fact–finding…proceeding,… the board, commission, or agency personnel responsible for rendering a decision shall render that decision within 90 days from the date of the informal fact-finding…proceeding, or from a later date agreed to by the named party and the agency. If the agency does not render a decision within 90 days, the named party to the case decision may provide written notice to the agency that a decision is due. If no decision is made within 30 days from agency receipt of the notice, the decision shall be deemed to be in favor of the named party.").

[27] Rule 2A:2 of the Rules of the Supreme Court of Virginia ("Any party appealing from a… case decision shall file with the agency secretary, within 30 days…after service of the final order in the case decision, a notice of appeal signed by the appealing party or that party's counsel."). Pursuant to Rule 2A:4(a), the appealing party must file a petition for appeal with the clerk of the applicable circuit court within 30 days of filing the notice of appeal.

[28] Va. Code § 32.1-26.

3.3.3. Formal Hearing

Formal hearings are appropriate in cases in which the owner and ODW have been unable to resolve the matter through an informal proceeding, or the waterworks owner has requested, and ODW agrees, to go straight to a formal hearing. An owner may request a formal hearing because they might want to challenge a case decision resulting from an informal proceeding, for example, without seeking a court's review.[29]

In a formal hearing, ODW and the waterworks will have the opportunity to present evidence and arguments before a hearing officer appointed by the Executive Secretary of the Supreme Court of Virginia. The hearing officer will conduct the hearing. During a formal hearing, the waterworks owner may be represented by counsel, the parties may cross-examine witnesses, and the parties may subpoena witnesses.

The appointed hearing officer will make a recommended findings of fact and conclusion of law, submitting the recommendation to the Commissioner for review and final decision.[30]

3.4. Monitoring Enforcement Cases

Field office staff are responsible for monitoring and tracking compliance with the terms of a consent order or special order. An administrative order compliance schedule should be entered into SDWIS to track compliance with the requirements of the order (please refer to the ODW SDWIS Manual for more information). Field office staff should maintain an open dialogue with the waterworks owner and operator and notify them of upcoming deadlines. Field office staff should issue an NOAV for the failure to comply with a requirement listed in a consent order or special order unless ODW has agreed to extend a deadline or alter the schedule of compliance.

3.5. Closing Cases

ODW may close a case when the terms of the enforcement action have been satisfied and the waterworks has returned to compliance. For compliance statuses that can change quickly (*e.g.* sampling and monitoring), field office staff should confirm that the waterworks has remained in compliance for a reasonable time (*e.g.*, over several monitoring periods).

To close a case, field office staff should document that the waterworks has satisfied the terms of the administrative order and returned to compliance, and enter the corresponding information into SDWIS. The field office should send the waterworks owner a termination letter notifying the owner that the requirements in the order have been satisfied and is hereby terminated. (See

[29] Filed pursuant to Va. Code 2.2-4026; consistent with 12VAC5-590-180.

[30] Va. Code § 2.2-4020.C; 12VAC5-590-160.2.e. (The commissioner may designate a hearing officer or subordinate to conduct the hearing, as provided in § 9-6.14:12 of the Code of Virginia, and to make written recommended findings of fact and conclusions of law to be submitted for review and final decision by the commissioner. The final decision of the commissioner shall be reduced to writing and will contain the explicit findings of fact upon which his decision is based.)

Attachment 18.) The termination letter will be sent to the waterworks owner notifying them that the case has been closed once the information has been logged in SDWIS.

Appendix
Attachments are located at:
https://covgov.sharepoint.com/:f:/r/sites/vdh/PHP/odw/ecm/Shared%20Documents/71%20-%20Compliance%20and%20Enforcement/General%20Information/Enforcement%20Manual?csf=1&web=1&e=JI8MhQ

EM-C3-Attachment 6 – Serious Violator Warning Letter
EM-C3-Attachment 7 – Potential Serious Violator Warning Letter
EM-C3-Attachment 8 – Checklist for Compliance Coordinator
EM-C3-Attachment 9 – How to Calculate Civil Charges
EM-C3-Attachment 9A – Civil Charge Worksheets
EM-C3-Attachment 10 – Letter of Agreement
EM-C3-Attachment 11 – Consent Order
EM-C3-Attachment 12 – Consent Order Encl Letter
EM-C3-Attachment 13 – IFFP Notice Letter
EM-C3-Attachment 14 – IFFP Exhibit List
EM-C3-Attachment 15 – IFFP Presiding Officer Guidelines
EM-C3-Attachment 16 – IFFP Recommendation
EM-C3-Attachment 17 – IFFP Special Order
EM-C3-Attachment 18 – Case Closure Letter

Appendix

Chapter 1
EPA ERP
Enforcement Work Flow
List of Program and Agency Resources

Chapter 2
RTC Table
State Violation Table

Chapter 3
Serious Violator WL
Potential Serious Violator WL
Checklist for Compliance Coordinator
How to Calculate Civil Charges
Civil Charge Worksheets
Letter of Agreement

Consent Order
Consent Order Encl Letter
IFFP Notice Letter
IFFP Exhibit List
IFFP Presiding Officer Guidelines
IFFP Recommendation
IFFP Special OrderCase Closure Letter

WaterISAC Advisory on Current Egregor Ransomware Incident at Large Metropolitan Water Utility

Friday, October 30, 2020

This advisory is marked TLP:GREEN. See definition below.

WaterISAC is aware that a large metropolitan water utility is currently dealing with an Egregor ransomware incident. While the incident response is ongoing, the utility asked us to publish an advisory to members for broader sector awareness so everyone can take necessary actions to address this virulent threat.

What happened?

- The Egregor ransomware executed early Thursday morning.
- The initial infection vector was potentially a macro-enabled document attachment containing Qakbot – Qakbot is widely utilized to distribute ransomware payloads.
- After the initial infection, the threat actors leveraged RDP (remote desktop protocol) to traverse network resources.
- Thus far, over one hundred workstations and multiple servers, including a backup server have been impacted – the utility wishes to stress that the backup servers were targeted, making it imperative to have a robust and resilient backup strategy.
- The ransom note does threaten data leakage, and forensic reviews show definite attempts via FTP to steal files. Whether or not the actors were successful in exfiltrating data is unknown at this time.
- Furthermore, the utility urges members to enable deep packet inspection on firewalls for maximum effectiveness in detecting this threat.

Recommended actions to take immediately

WaterISAC continues reminding members to plan/prepare for the worst and hope for the best. When it comes to ransomware, regularly:

- Revisit, review, and discuss ransomware and data breach playbooks/policies/procedures, and keep them up-to-date. The CISA/MS-ISAC Ransomware Guide is a valuable resource to be used for prevention and response best practice guidance.
- Keep a reputable incident response firm on retainer before an incident occurs.
- Evaluate cyber insurance policies to confirm proper coverage.
- Send out security awareness reminders to all staff on how phishing is a very common initial infection vector for ransomware.

- Remind staff not to open attachments or click on links contained in emails, even if the email looks like it is from a trustworthy source. And if they already have received and/or actioned a suspicious email, encourage them to report the event now.
- Check device and network logs and events for potential intrusions, and consider configuring alerts for changes to files.
- Test backups and restore procedures before you need them and make sure you have a valid tested copy stored offline.
- Report ransomware incidents to authorities (and WaterISAC).

Additional resources on Egregor ransomware

- https://threatpost.com/egregor-ransomware-mass-media-corporate-data/159816/
- https://www.darkreading.com/vulnerabilities---threats/meet-egregor-a-new-ransomware-family-to-watch/d/d-id/1339091

For questions and to report incidents, email analyst@waterisac.org.

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