Annual Review of the Public Water Supply Supervision Program for the State of Maryland

January 1, 2020 – December 31, 2020

Report date: July 2021

ACRONYMS

CDP	Capacity Development Program
CWS	Community Water System
CY	Calendar Year
DHMH	Department of Health and Mental Hygiene
DWSRF	Drinking Water State Revolving Fund
DWRLF	Maryland Drinking Water Revolving Loan Fund
EPA	The United States Environmental Protection Agency
ESRL	Eastern Shore Regional Laboratory
ETT	Enforcement Targeting Tool
FFR	Federal Financial Report
FFY	Federal Fiscal Year (October 1st to September 30th)
FTE	Full Time Equivalents
GPRA	Government Performance Results Act
HBV	Health-Based Violations
LCR	Lead and Copper Rule
NDWC	National Drinking Water Clearinghouse
NPDWR	National Primary Drinking Water Regulations
NTNCWS	Non-Transient Non-Community Water System
PWS	Public Water System
PWSS	Public Water System Supervision
RTCR	Revised Total Coliform Rule
SDWIS	Safe Drinking Water Information System
SFY	State Fiscal Year (July 1st to June 30th)
TNCWS	Transient Non-Community Water System
MD	Maryland
MD AWWA	MD American Water Works Association
MDE	MD Department of the Environment
MD PSC	MD Public Service Commission
MD RCAP	MD Rural Community Assistance Program
MRWA	MD Rural Water Associations
NTNCWS	Non-Transient Non-Community Water System
PPG	Performance Partnership Grant
WMRL	Western Maryland Regional Laboratory

TABLES/CHARTS/ATTACHMENTS

Overview

Pursuant to 40 CFR 142.17, the U.S. Environmental Protection Agency Region III (EPA) has conducted its annual primacy review of the Maryland Public Water System Supervision (PWSS) program, administered by the Maryland Department of the Environment (MDE). The drinking water system supervision program data is not static. Over the course of a year, the water system inventory, the compliance status of individual systems and drinking water program resources may change.

EPA conducted a comprehensive evaluation of the PWSS program in 2018 and identified a number of significant issues, many of which were driven by the lack of sufficient resources. In response to this evaluation, MDE and EPA developed an Action Plan which can be found in Attachment 1. This year's review for calendar year 2020 has found that MDE continues to implement the agreed upon Action Plan and is implementing an acceptable PWSS program despite significant resource challenges. These resource challenges may adversely affect future performance. In addition to the pre-existing issues, the report does identify a few additional issues that MDE should address.

During 2020, MDE regulated 3,292 public water systems serving 5,921,832 citizens. These water systems were divided into 465 community water systems (CWS), 556 non-transient non-community water systems (NTNCWS) and 2,271 transient non-community water systems (TNCWS). These inventory numbers are based on the "fixed" universe from the first quarter of the fiscal year (i.e., the baseline of inventory data for a given fiscal or calendar period).

Table 1 System Summary

System Type	# of Systems	System Population
CWS	465	5,371,633
NTNCWS	556	207,185
TNCWS	2,271	343,014
Total	3,292	5,921,832

SDWA Data Warehouse Fourth Quarter 2020 Queried by Jackie Pine 02/09/2021

State Resources

Funding

MDE currently implements the PWSS program using several resources including the EPA PWSS grant and the required state match. The PWSS grant is part of the MD performance partnership grant (PPG). The current PPG has a four-year cycle and runs from October 1, 2019 through September 30, 2023. The previous PPG had a three-year project period from October 1, 2016 through September 30, 2019. The project period addressed by FFY 2020 funding was October 1, 2019 through September 30, 2020. During fiscal year 2020 EPA provided MDE $1,439,000 in base PWSS funding and $103,000 in PWSS emerging contaminants funding.

As of April 1, 2021, EPA has provided MDE more than $1 million in PWSS funding. The final allotment for 2021 is $1,557,000, including $155,000 specifically earmarked for activities related to addressing emerging contaminants. By October 1, 2021, (i.e., the beginning of FY 2022)

MDE will have received all of its 2021 allotted funding including its emerging contaminantes funding.

Table 2 PWSS Funding

	Awarded ($)
2021 PWSS Grant Amount	1,712,000
2020 PWSS Grant Amount	1,542,000
2019 PWSS Grant Amount	1,426,000
2018 PWSS Grant Amount	1,451,000
2017 PWSS Grant Amount	1,527,000

The PWSS grant provides funding for staff salaries, staff fringe benefits, supplies, travel, contractual services, and other indirect costs.

MD also uses the Drinking Water State Revolving Fund (DWSRF) set-aside funds to support its drinking water program. MDE requested, and received, the 2% Small System Technical Assistance set-aside, the 10% State Program Management set-aside and the 15% Local Assistance set-aside (for Wellhead Protection and Capacity Development). The Water Supply Program of MDE, which oversees the PWSS program in Maryland, has not traditionally received the 4% set-aside. The 4% set-aside which is used primarily for the administration of the DWSRF Program has traditionally been managed by the SRF program office in MDE. The following chart contains the balances of the 2%, 10% and 15% set-asides for 2017, 2018, 2019 and 2020 as of May1, 2021. The MD 2021 DWSRF award has not been issued as of May 1, 2021 and will not likely be issued before August 2021.

Table 3 DWSRF Set-aside Funding

Set-Aside	Awarded Amount ($)	Remaining Balances ($)
2% set-aside 2017	$279,740	$0
10% set-aside 2017	$1,398,700	$0
15% set-aside 2017	$2,066,625	$0
2% set-aside 2018	$406,960	$49,494
10% set-aside 2018	$2,034,800	$426,129
15% set-aside 2018	$3,052,200	$66,671
2% set-aside 2019	$403,160	$403,160
10% set-aside 2019	$2,015,800	$2,015,800
15% set-aside 2019	$3,023,700	$3,023,700
2% set-aside 2020	$403,400	$403,400
10% set-aside 2020	$2,017,000	$2,017,000
15% set-aside 2020	$3,025,500	$3,025,500

Compass Data Warehouse updated data as of May 21, 2021

MDE is meeting the goals of EPA's DWSRF Unliquidated Obligations Strategy dated April 14, 2014. The strategy has two key objectives: 1) liquidation of past years' grant legacy funds (i.e., DW SRF set-aside funds issued before 2016) and 2) maintenance of lower levels of unliquidated obligations (ULOs) in future years. These objectives are framed within the expectations that

states will work towards operating their DWSRFs to have ULOs at the lowest practical level while recognizing the varying institutional and financial circumstances of each state.

While the DWSRF ULO Strategy states a goal to have a complete draw down of funds from future years' grants within two years from the date of grant award, it also includes a notation:

Some states, particularly with respect to set-aside funds, may face challenges that could contain their efforts. In such instances, states in collaboration with Regions should carefully consider, wherever possible, alternative approaches to using the funds in the timeliest manner possible to achieve their intended public health protection purposes. Addition time to use the set aside funds is envisioned not to extend beyond twelve months.

The 2019 DWSRF award was made in September 2019 and the 2020 DWSRF award was made in September 2020. The actual award dates are September 17, 2019 and September 10, 2020, respectively. It should be noted that Maryland has a unique situation related to the SRF. Based on state law, Maryland's SRF match is not available until after the SRF allotment is awarded.

In addition to the previous discussion regarding the DW ULO Strategy, it should also be noted that the project periods and budget periods of the 2017, 2018, 2019 and the 2020 SRF grants are each seven (7) year periods. Recent SRF awards have project and budget periods of seven years.

MDE has experienced some incidents of late reporting for the PWSS grants and the DW SRF set-asides. Late reporting of grant progress reports has been mentioned in past discussions between MDE and EPA. In the 2018 Annual Review, EPA recommended that MDE dedicate additional resources to the grant coordination function, specifically for the PWSS grant and the DWSRF set-asides. In response, MDE committed in its Action Plan to provide additional resources to that function by December 2021.

Recommendation: MDE should continue implementation of the Action Plan.

Staffing

Historically, the WSP staffing dedicated to PWSS Program implementation has been between 46 and 50 FTE. However, from 2016 to 2020 staffing fell from 47 FTE to 34 FTE. At the same time, state staff have had to adopt additional responsibilities related to implementation of the 2017 Maryland law Chapter 386 requiring the testing of all occupied public and non-public schools serving children in pre-kindergarten to grade 12 that receive drinking water from a public utility to test for the presence of lead in all drinking water outlets. Additionally, MDE staff have had to assume responsibilities for the conduct of sanitary surveys of transient water systems from the County governments and local health department which returned the drinking program back to MDE between 2018 and 2020. This has added almost an additional 800 sanitary surveys to the already significant workload of MDE staff. In 2020, MDE experienced the challenge of addressing COVID 19 programmatic challenges with the additional need to go to remote operations. Additionally, MDE workload has increased by approximately 300 NCWS with the addition of hospitals that have installed treatment to address Legionella concerns.

As a result of the previous staffing reductions and additional workload, MDE has had to make significant reductions in the following programs: Source Water Protection, Capacity Development, Water Conservation, Security/Emergency Response, and Data Management. The lack of funding in these areas coupled with limited resources may adversely impact the state's ability to proactive or adequately react to emerging drinking water and emergency response issues; implement new regulations such as the proposed revisions to the Lead and Copper Rule; and maintain the levels of compliance currently demonstrated.

In previous annual reviews, EPA recommended that MDE conduct a resource needs analysis to determine whether the program is adequately staffed to meet current and anticipated resource needs. This resource analysis was conducted from October 2020 through April 2021. Resource gaps exist. Region III requests that MDE develop a resource investment plan to address identified gaps and improve the level of staffing.

Previously, in response to other reviews MDE agreed to pursue the following actions:

- Prioritize recruitment and hiring for new and vacant positions with an expectation that five vacant positions will be filled by July 2021.
- Complete reorganization of the program to provide more resources to primacy functions.
- Request 11 additional federally funded positions for the program by April 15, 2022.
- Establish a resource investment plan to address identified resource gaps. Provide the resource gap analysis and any resource investment plan for EPA review and approval by October 2021. This should include establishing a lower public water system to field staff ratio. The national average is approximately 67 systems / sanitary survey staff person.
- Until the goals of the resource analysis have been achieved, provide a semi-annual report on the number and type of positions in the following categories: positions filled, total number of vacancies, positions newly vacant.

Recommendations: MDE should continue to implement its Action Plan; MDE should develop a resources investment strategy.

Status of Rule Adoption

Maryland has regulatory authority for all federal rules promulgated to date.

Recommendation: None

Sanitary Surveys

The sanitary survey measure for community water systems (nontribal) is SDW-1a. SDW-1a is defined as "Percent of CWSs in states 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)."

For the sanitary survey monitoring period ending December 31, 2020, MD completed sanitary surveys at 97.6% of the systems required to have a sanitary survey. According to the data in OBI/SDWIS as of June 11, 2021, MDE did not complete (11) sanitary surveys out of a required 457 surveys due during the sanitary survey period that ended December 31, 2020. For the past three years, Maryland's inventory has not stayed constant. The SDW-1 figure is based on the number of sanitary surveys required in a three-year cycle which does not equal the current annual inventory number of community water systems.

Under the 2018 – 2022 EPA Strategic Plan, SDW-1 is no longer a strategic plan measure. However, EPA still monitors sanitary survey coverage. In compliance with several NPDWRs, drinking water systems are required to have a sanitary survey at either a once per three years or once per five years frequency for systems meeting the state definition of outstanding performer.

Based upon discussions with MDE, the MDE personnel responsible for conducting sanitary surveys each have a workload of approximately 240 public water systems. According to the Association of State Drinking Water Administrators, the national average of public water systems per sanitarian inspector was 67. The MDE workload per sanitary inspector is significantly greater than national average which could result in a loss of sanitary survey quality. The workload demand is further complicated by the fact that the same staff are also responsible for addressing security concerns, managing emergencies, overseeing capacity development, and system optimization efforts. MD has experienced declines in the number of annual sanitary surveys conducted. While the decline from 2019 into 2020 may be exacerbated by COVID 19 impacts on state travel and inspections, there is still a downward decline in the number of sanitary survey inspections conducted.

Table 4 Sanitary Surveys Conducted Annually

	FY 2017	**FY 2018**	**FY 2019**	**FY2020**
Sanitary Surveys Conducted of CWS and NTNCWS	484	359	231	178
Sanitary Surveys Conducted of TNC Systems (by local gov't and MDE)	433	403	408	187
Totals	917	762	639	356

From Capacity Development Reports

Sanitary Surveys were identified as an issue during the previous annual reviews. EPA recommended that MDE:

- Evaluate whether sanitary surveys currently conducted meet sanitary survey requirements.
- Evaluate whether the current level of engineering staff is sufficient to sufficiently fulfill their full range of responsibilities.
- If resource gaps exist, develop and implement a strategy to address them.

In response, MDE agreed in its Action Plan to take action to address its staffing issues discussed in the *Staffing* section of this report. The Cadmus report on staffing notes MDE personnel shortages.
MDE uses an electronic sheet to document sanitary surveys; it runs on Microsoft Excel. The electronic sanitary survey sheet may be integrated with SDWIS State when all the components the SDWIS State data system are fully implemented. MDE has initiated the pursuit of SWIFT software which would facilitate MDE's integration of sanitary survey information with the SDWIS STATE data system.

Recommendation: MDE should continue to implement its Action Plan.

Health Based Violations Discussion

The chart below displays health-based violation trends for community water systems by rule. The rules with the greatest number of health-based violations for CWSs are Stage 2 DBP (MCL violations) and LCR (TT violations).

Maryland Health-Based Violations

Chart 1A 2021Q1 CWS

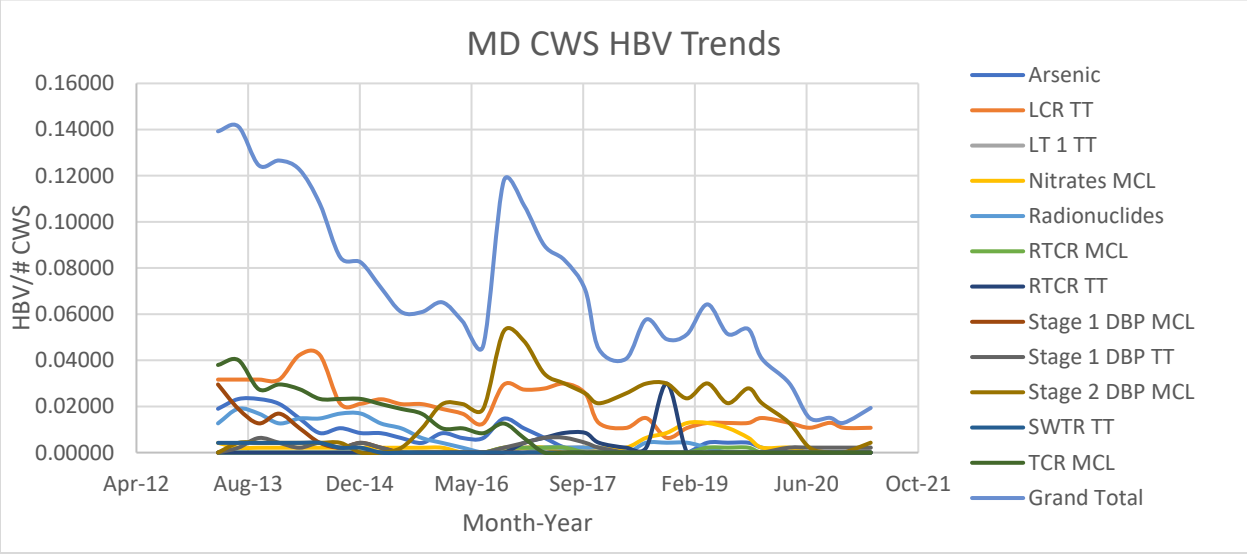
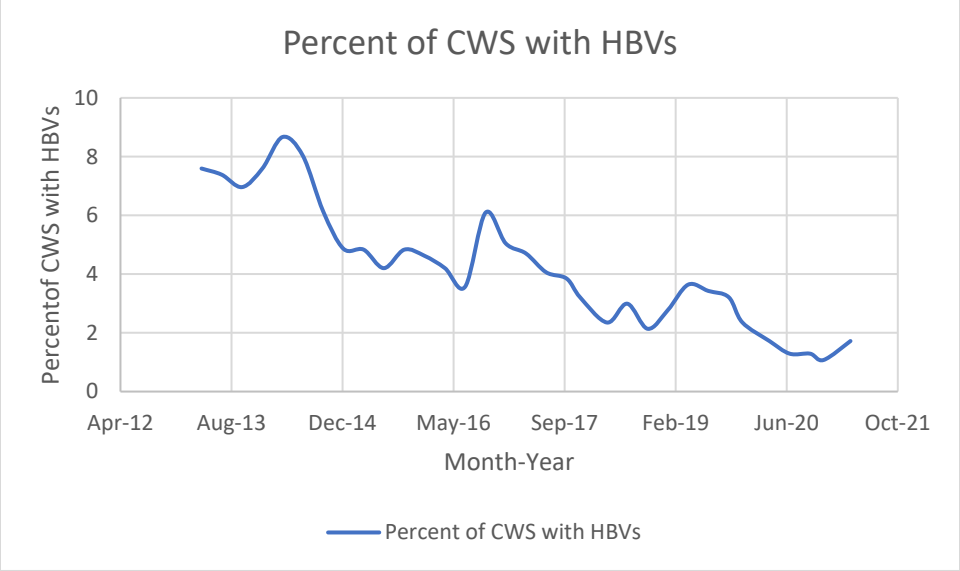


Chart 1B



The chart below displays health-based violation trends for non-transient non-community water systems by rule. The rules with the greatest number of health-based violations for NTNCWSs are Nitrates (MCL violations) and LCR (TT violations). The number of LCR TT violations consistently exceeds the number of Nitrate MCL violations. For the past year, the number of Nitrate MCL violations has been greater than the number of LT1 TT violations.

Chart 2A 2021Q1 NTNCWS HBVs

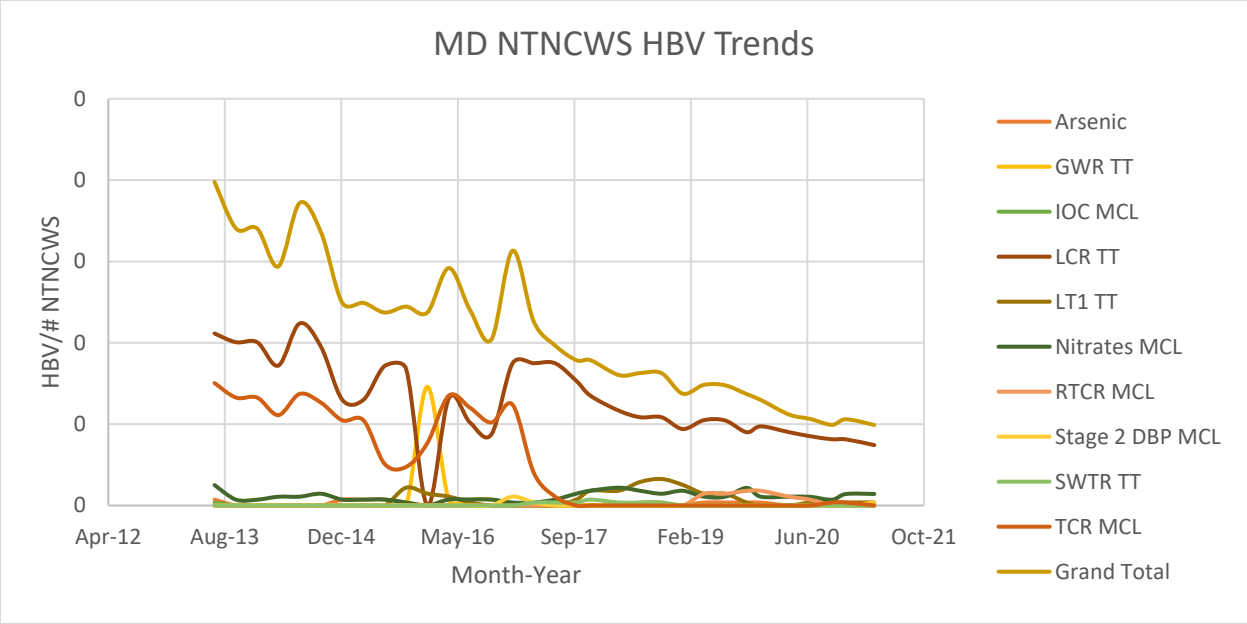
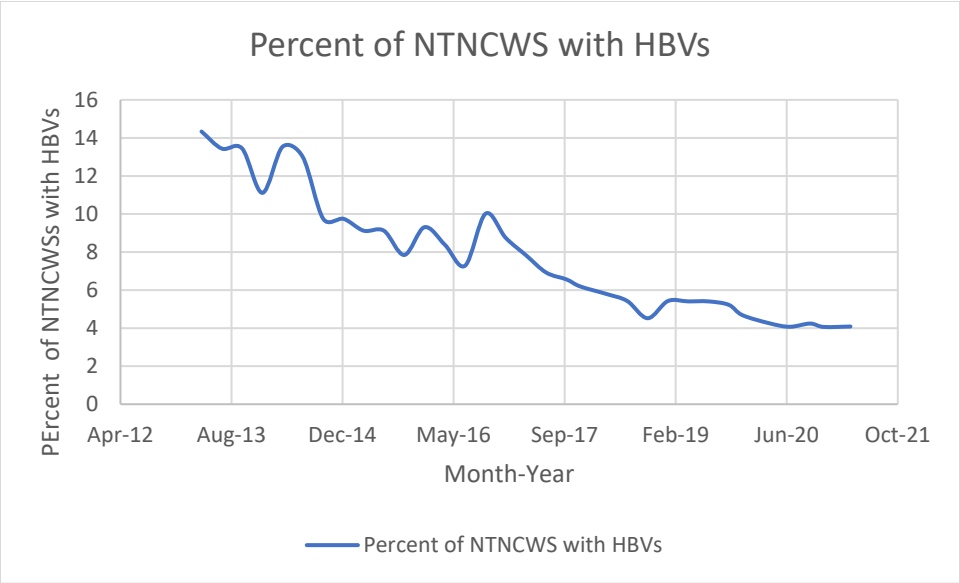


Chart 2B



Compliance / ETT / Compliance Assistance

During FFY 2020 MDE's WSP staff reviewed approximately 48,000 water quality reports. MDE has a process for addressing water system violations through notification, compliance assistance and ultimately enforcement.

MDE continues to work towards returning systems to compliance by addressing health-based violations and priority systems with violations on the Enforcement Targeting Tool (ETT) list. The ETT list focuses enforcement attention on the drinking water systems with the most serious or repeated violations, bringing those systems to the top of the list for state enforcement action so they can be returned to compliance as quickly as possible. Federal priority status for systems on the ETT list is systems with a score greater than 11. EPA and MDE staff participate in quarterly calls to discuss the compliance status of facilities on the ETT list.

Below is a chart of ETT systems over time by quarter over the past ten quarters.

Table 5 Systems in Priority Status (ETT) by Quarter

	Jan-21	**Oct-20**	**Jul-20**	**Apr-20**	**Jan-20**	**Oct-19**	**Jul-19**	**Apr-19**	**Jan-19**	**Oct-18**
# PWSs in Priority Status (ETT>11)	39	40	46	28	25	24	21	5	10	14
# Schools/Childcares on Priority List	6	6	7	4	0	0	2	1	3	5

MDE uses the ETT as a tool to address compliance. EPA and MDE compliance and enforcement staff have discussed plans to target systems with an ETT score of >8 to begin measures to remedy violations before the system reaches the ETT score of 11. MDE has followed through with a discussion of facilities with ETT score >8.

MDE submitted a response to the April ETT list on June 8, 2021 *(the list came out on April 27, MD responded on June 8)*. Of the 27 facilities on the list, 12 have not returned to compliance. Of those 12 all are not on the path to compliance. MDE and EPA enforcement staff have developed a plan to address the 12 facilities which are not on the path to compliance.

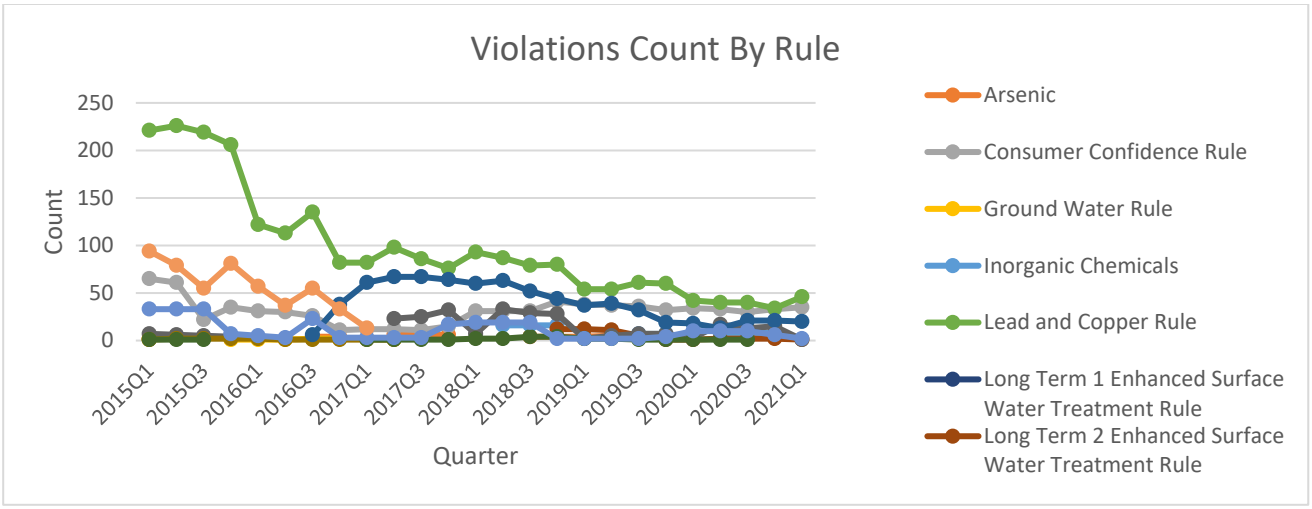
MDE has been responsive to requests for follow-up to citizen complaints and inquires. MDE has assisted EPA personnel in addressing complaints received by Region 3.

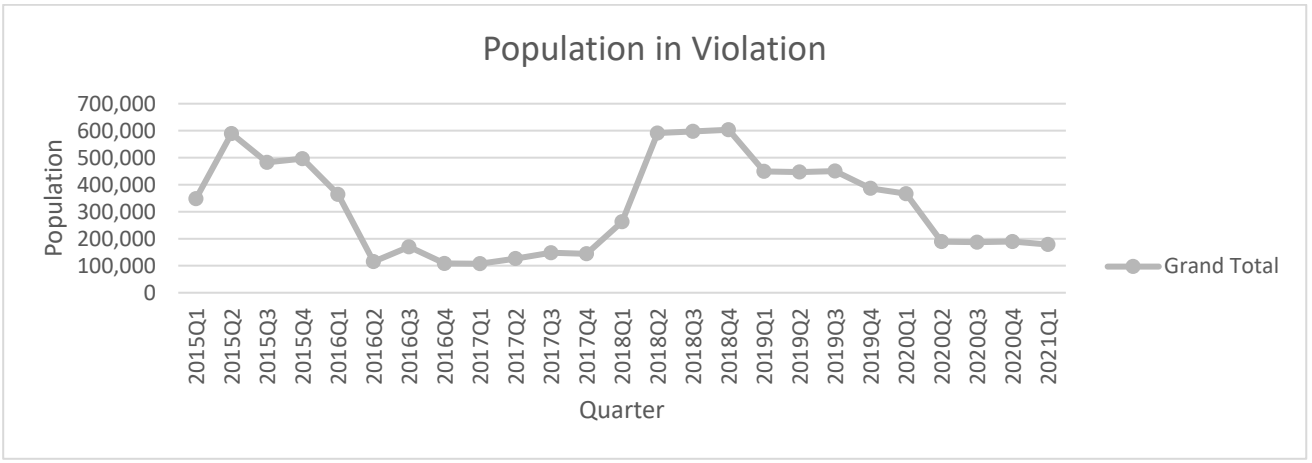
MD had a generally declining rate of systems with monitoring and reporting (M&R) violations over the past five years. With the adoption of the RTCR rule there was an uptick in M&R violations as there was a corresponding increase in the monitoring and reporting requirements. The following two charts illustrates the level of systems with monitoring violations and the character of the monitoring violations over the past five years.

In the following two charts MON refers to specifically two RTCR monitoring violations. RPT refers specifically to RTCR reporting violations. These violation types are tracked separately from other monitoring and reporting violations of other NPDWRs within SDWIS/FED.

Below is a series of charts that address monitoring and reporting (M&R) violations. Under the Safe Drinking Water Act (SDWA) National Primary Drinking Water Rules (NPDWRs) there are several different types of monitoring and reporting violations. There are sampling frequency violations, sample locations violations, report submittal violations, repeat sampling requirement violations, time of reporting violations, analytical violations, timeliness of notice violations, failure to take a sample or take enough samples violations, etc.

In Maryland the number of M&R violations and the number of systems with M&R violations have declined since 2015. Some rules have had some uptick in violations. For example, Region III notes an increase of Consumer Confidence Rule violations over the past two years. This increase coincides with a decrease in MDE Water Supply Program staffing. It is also possible that some of these CCR violations may have occurred due to changes in ownership at several small systems with the new owners not being aware of the CCR requirement.


Violations Count By Rule
Count
250
200
150
100
50
0
2015Q1
2015Q3
2016Q1
2016Q3
2017Q1
2017Q3
2018Q1
2018Q3
2019Q1
2019Q3
2020Q1
2020Q3
2021Q1
Quarter
Arsenic
Consumer Confidence Rule
Ground Water Rule
Inorganic Chemicals
Lead and Copper Rule
Long Term 1 Enhanced Surface Water Treatment Rule
Long Term 2 Enhanced Surface Water Treatment Rule


Population in Violation
Population
700,000
600,000
500,000
400,000
300,000
200,000
100,000
0
2015Q1
2015Q2
2015Q3
2015Q4
2016Q1
2016Q2
2016Q3
2016Q4
2017Q1
2017Q2
2017Q3
2017Q4
2018Q1
2018Q2
2018Q3
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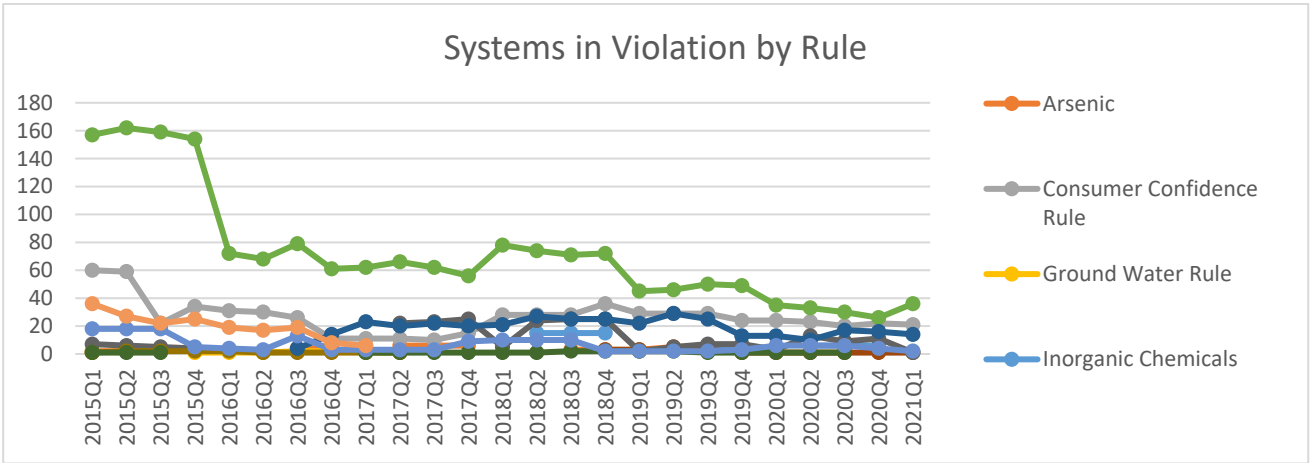
2020Q3
2020Q4
2021Q1
Quarter
Grand Total


Systems in Violation by Rule
180
160
140
120
100
80
60
40
20
0
2015Q1
2015Q2
2015Q3
2015Q4
2016Q1
2016Q2
2016Q3
2016Q4
2017Q1
2017Q2
2017Q3
2017Q4
2018Q1
2018Q2
2018Q3
2018Q4
2019Q1
2019Q2
2019Q3
2019Q4
2020Q1
2020Q2
2020Q3
2020Q4
2021Q1
Arsenic
Consumer Confidence Rule
Ground Water Rule
Inorganic Chemicals

Recommendations: None

DWSRF Program Integration: Capacity Development and Small System Support

In November 2020, MDE submitted its most recent Annual Capacity Development Implementation Report.

Authority

The submitted capacity development report notes that no changes were made to the State's legal authority nor have there been any changes in the State's control points.

New System

Thirty-six (36) systems started operation since October 1, 2017. None of the new systems which came on-line in the past three years had an ETT score of 11 or more.

DWSRF Recipients

The Maryland Drinking Water Revolving Loan Fund (DWRLF) provides financial assistance through loans. The purpose of the DWRLF is to make low-interest-rate loans to both community water systems and non-profit non-community systems for drinking water infrastructure projects. Systems applying for DWRLF loans must develop a plan for future financial stability and must meet technical, managerial, and financial capacity requirements. During FFY 2020, the DWRLF provided $16.1 million in financing to seven projects.

Existing System Strategy

MDE provides funding to support the Maryland Rural Water Association (MRWA) who provides on-site training and technical assistance to operators and managers of small systems where the need for special attention has been identified. MRWA provides assistance to small systems in completing and submitting monthly operating reports to MDE.

MD has experienced a reduction in the overall number of sanitary survey inspections for CWSs and NTNCWSs. There has been more than 50% reduction in the number of sanitary surveys conducted of CWS and NTNCWS since 2017. Instead of facilities being visited several times a year or in the three-year sanitary survey period, MD has had to reduce repeat visits due to resources. 484 sanitary surveys at CWS and NTNCWs were conducted in FY2017, 359 in FY2018, 231 in FY 2019 and 178 in FY2020.

Table 6 Measuring Improvement: Capacity Development Strategy

Data Source	Measure of Capacity		2001	2007	2014	2017	2018	2019	2020
	Technical:								
ETT list[1]	Number of ETT systems (CWS & NTNC)		51	37	23	9	14	7	4
Compliance Data[2]	Percent of systems with Lead and Copper violations (CWS & NTNC)		13%	<13%	<13%	12%	15%	9%	7%
Sanitary Survey[3]	Percentage of systems with certified operators	Community systems	80%	86%	91%	91%	90%	87%	90%
		Non-transient non-community systems	40%	74%	75%	76%	74%	74%	67%
Self-Assessment Survey[4]	Systems that can meet future 10-year demand with current sources and treatment		72%	58%	69%	N/A	N/A	N/A	92%
Sanitary Survey[2]	Percentage of significant deficiencies resolved		67%	90%	83%	97%	94%	94%	77%
	Financial:								
Self-Assessment Survey[4]	The last time water rates were changed (CWS)		Average Years: 4	Average Years: 1	Average Years: 1	N/A	N/A	N/A	Average Years 3
Self-Assessment Survey[4]	Systems that have financial records reviewed at least annually by an independent financial auditor		53%	78%	90%	N/A	N/A	N/A	75%
	Managerial:								

Data Source	Measure of Capacity		2001	2007	2014	2017	2018	2019	2020
Self-Assessment Survey[4]	CWS respondents aware of whether additional treatment or equipment will be required because of SDWA regulations that will come into effect within the next few years (groundwater rule, LT2ESWTR, DBP2)		30%	45%	55%	N/A	N/A	N/A	24%
Self-Assessment Survey[4]	Percentage of systems with service connections metered	Residential	25%	60%	74%	N/A	N/A	N/A	64%
		Commercial	4%	50%	71%	N/A	N/A	N/A	71%
Self-Assessment Survey [4]	Systems that can meet average daily demand with largest source out of service		52%	64%	69%	N/A	N/A	N/A	83%
Sanitary Survey[2]	Percentage of CWS systems with emergency plan of operation.		43%	75%	83%	83%	83%	N/A	83%

[1] EPA now is using the Enforcement Tracking Tool (ETT).

[2] Data from MDE's Public Drinking Water Information System database.

[3] MDE staff conduct sanitary surveys of public water systems on a regular basis. Frequency ranges from more than once a year to once every three to five years. Current federal requirement is a minimum of one sanitary survey per system every three years for community systems and once every five years for non-community water systems. MDE tends to meet the once every three years frequency for community water systems; MDE targets non-community water systems for a once every five years frequency.

[4] Self-assessment surveys were conducted in 2001, 2007, and 2014.

In the aforementioned chart the "N/A" reflects information which was not available from the most recent triennial Governor's Capacity Development report. The next triennial Governors report is due September 30, 2024.

On April 9, 2020, EPA Region 3 issued a letter to MDE acknowledging the continued implementation of MDE's capacity development program (CDP). The MDE evaluates the

technical, managerial and financial capacity of systems in accordance with Maryland state strategy.

In the 2018 Annual Review, EPA recommended that MDE reinvest in conduct Comprehensive Performance Evaluations which had been an important element in its previous implementation of the program. The performance issue identified could be attributed to staffing limitations. In response, Maryland committed in the Action Plan to the staffing investments discussed in the *Staffing* section of this report and the following activities:

- Complete one CPE by December 2021.
- Establish criteria for the selection of systems to receive CPEs and establish an annual target for the number of CPEs. Submit the results of this analysis for EPA review and approval by December 2021.
- Report semi-annually the number of CPEs conducted.

Recommendation: MDE should continue to implement its Action Plan. Additionally, as required by AWIA, EPA recommends that Maryland revise its Capacity Development Strategy to incorporate asset management plan development. Maryland must submit its revised strategy to EPA for review and approval by December 31, 2021.

DWSRF Program Integration: Operator Certification Program

The EPA approved Maryland's Operator Certification Program (OCP) on July 13, 2001. Maryland regulation requires all community water systems and non-transient community water systems to have certified operators.

The MDE OCP requires all public water system operators to complete education, training and certification requirements covering basic knowledge of water treatment concepts and regulations. Maryland classifies water systems, and all operator certifications, according to treatment technology to ensure individuals possess the knowledge required for specific processes.

The following table identifies MD public water systems and corresponding operator coverage. TNCWS are not included in the table since those systems are not covered by the operator certification program requirements. Year 2001 is included in the chart to note the baseline from when the program was initiated (i.e., initially certified). The following graph is a chart of the number of systems with a certified operator and percentage of systems with a certified operator. The 2020 data for operator certification will not be available until after June 30, 2021.

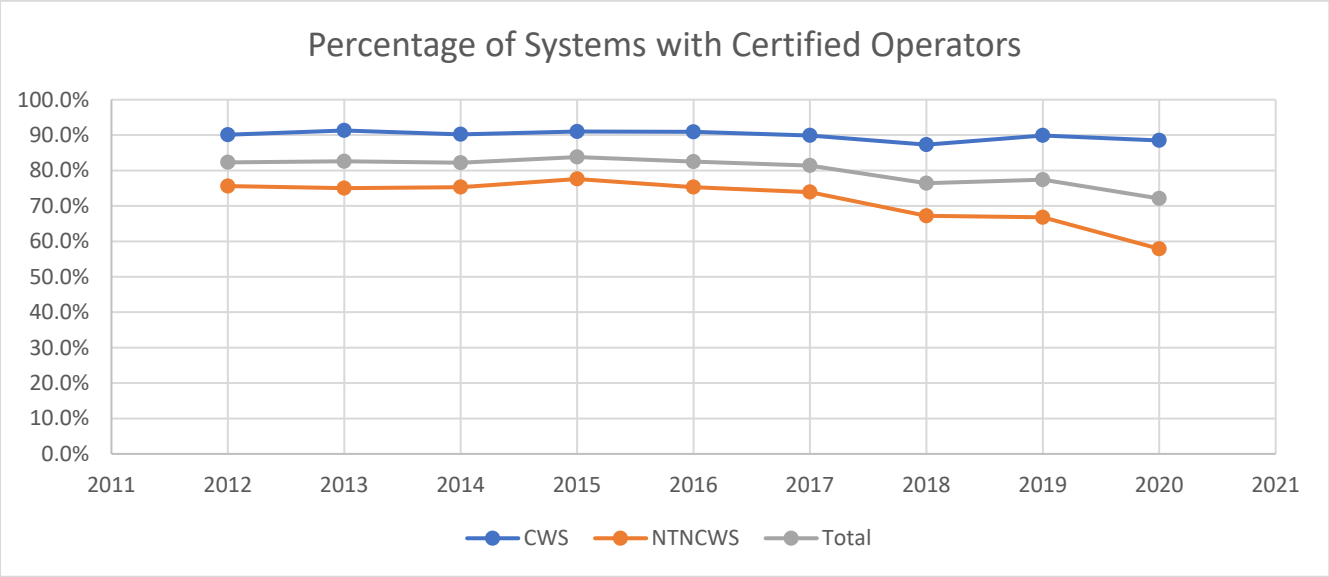
Table 7 Systems and Operators

Maryland	**Number of systems**			**Number of Systems with a Certified Operator**			**Percentage of systems with a Certified Operator**		
Year	CWS	NTNCWS	Total	CWS	NTNCWS	Total	CWS	NTNCWS	Total
2001	503	568	1,071	402	225	627	79.9%	39.6%	58.5%
2012	475	549	1,024	428	415	843	90.1%	75.6%	82.3%

Maryland	Number of systems			Number of Systems with a Certified Operator			Percentage of systems with a Certified Operator		
2013	473	540	1,013	432	405	837	91.3%	75.0%	82.6%
2014	469	538	1,007	423	405	828	90.2%	75.3%	82.2%
2015	469	539	1,008	427	418	845	91.0%	77.6%	83.8%
2016	464	538	1,002	422	405	827	90.9%	75.3%	82.5%
2017	466	537	1,003	419	397	816	89.9%	73.9%	81.4%
2018	464	546	1,010	405	367	772	87.3%	67.2%	76.4%
2019	464	543	1,007	417	363	780	89.9%	66.8%	77.4%
2020	461	534	995	408	309	717	88.5%	57.9%	72.1

2021 Data is not available until after June 30, 2022

Chart 5



The graphical display of the operator certification data indicates a decline in the number of systems with a certified operator since 2015. A more significant drop in the number of systems with a certified operator occurred from 2017 to 2020. The drop in systems with a certified operator was larger for non-transient non-community water systems; it was approximately a 15%-point decline. The 2021 data on the number of systems with a certified operator will not be available until after June 30, 2022.

In discussions with MDE, the following have been identified as some of the potential factors in the decrease of the number of systems that have required certified operators:

- There has been a significant increase in the retirement of certified operators and systems have had difficulty in finding certified operators to replace them.
- Many applicants have had difficulty passing the certification exam. MDE had assisted applicants that lacked certain skills through the Employment Advancement Right Now (EARN) program. This program was considered to be successful by MDE, it but was

discontinued in 2018 due to resource restrictions. The program which is administered by the Maryland Center for Environmental Training (MCET) was reconstituted in CY2020. It has grown to include 25 partner employers including multiple county utilities.
- Sanitary Survey frequency has declined from a 12 to 18-month frequency to three years. This does not allow early identification and correction of non-compliant systems.
- During 2020, in-person operator certification exams were halted due to COVID 19 concerns. MDE's certification board worked with stakeholders in CY 2020 to promote electronic testing which proved valuable for meeting operator certification needs while addressing COVID 19 pandemic related challenges.

Under federal regulations, there are requirements that public water systems be operated by an operator that meets the qualifications established by the state. Maryland has established regulatory requirements that community water systems and non-transient non-community water systems (referred here collectively as PWSs) be operated by certified operators. PWSs that do not have a certified operator are operating in violation of state and federal requirements.

The Engineering & Technical Assistance Division (ETAD) of MDE's WSP issues significant deficiency for non-compliance with operator certification requirements, especially if a risk to public health is present. In 2020 one significant deficiency was issued to a water system for operator certification. The Board did not take undertake any enforcement actions against any operators and no licenses were revoked or suspended in CY 2020.

Operator certification challenges are greatest at very small systems. All systems with service population greater than 10,000 persons had a certified operator. For CWSs with service population between 3,301 and 10,000 persons, 95% of the systems had a certified operator. For CWS with service population between 501 and 3,300 persons, 97% of the systems had a certified operator. NTNCWSs had lower rates of having a certified operator than community water systems.

MDE committed in the existing Action Plan to the following activities:

- Conduct an analysis to identify the causes for reduced numbers of systems with certified operators. Identify specific activities, including an enforcement component, designed to address the root causes. Provide the results of this analysis and the projected activities by December 2021.
- Provide to EPA a semi-annual report including systems without a certified operator and the status of activities to address the issue.

Recommendation:

- MDE should continue to implement its Action Plan.
- MDE should address how to improve the rate of certified operators at NTNCWSs.

Rule Implementation

Maryland has primary enforcement responsibility for all national primary drinking water regulations (NPDWRs). While EPA has tracked rule implementation with all rules, during the past two years there has been an increased focus on the Lead and Copper Rule (LCR).

Lead and Copper Rule

The MDE regulation with the largest concentration of health-based violations is the Lead and Copper Rule. The LCR is designed to protect public health by minimizing lead and copper levels in drinking water. During 2020, Maryland and EPA continued to exchange information on system compliance with the LCR.

MDE has increased its focus on lead and copper issues over the past few years. During the compliance period that ended December 30, 2020, there were 22 action level exceedances in SDWIS/FED. This number represents a decline in the number of action level exceedances. In FFY 2017, MDE reported 225 LCR violations at 156 systems.

Although not required by the LCR, MDE in conjunction with the Maryland Department of Education has embarked on a program of lead testing in schools. The program applies to all public and non-public schools serving children in pre-k to grade 12 which receive drinking water from a public utility. Testing is phased in based on the date of school building construction and student age. The LCR continues to apply to schools which have their own wells and are, therefore, public water systems.

Maryland has a tab on its Water Supply website related specifically to lead and copper in drinking water. The page links to monitoring guidance and to numerous forms useful to CWSs and NTNCWSs to assist them in complying with the Lead and Copper Rule.

Stage 2 Disinfection Byproducts

After the Lead and Copper Rule, the MDE regulation with the next largest concentration of health-based violations is the Stage 2 Disinfection and Disinfectants By-Products (Stage 2 DBP) Rule. More than 25% of the health-based violations reported by drinking water systems in Maryland were violations of the Stage 2 DBP Rule. With the publication of the Disinfectants and Disinfection Byproducts Rule (DBPR) In-Depth Analysis Report, EPA will continue discussions with MDE on DBPR compliance.

Recommendation: None

Public Notification Rule

Maryland allows systems to use the consumer confidence reports (CCRs) for Tier 3 PN notification as long as the notice is distributed no later than one year after the earliest of the included violations. Maryland, however, does not check and verify that each CCR contains the all the required PN elements. MDE staff does review information provided by the system on the CCR certification form to ensure that the CCR is distributed in accordance with the PN

distribution requirements. MDE does not typically issue notice of violations for Tier 3 PN violations.

MDE responds immediately after receiving a Tier 1 notice from a public water system. MDE staff will contact system via telephone after learning of the Tier 1 situation. MDE expects the system to contact MDE and Provide a Tier 1 public notice as soon as practical but not later than 24 hours after learning of the violation; it is the system's responsibility to know its compliance status.

To track certifications of compliance with the PN Rule, MDE adds and SIF enforcement action in SDWIS that is associated with the violation. MDE reviews each certification. MDE rarely provides notice on behalf of public water systems for PN requirements. If MDE provides notice, it does so via contact with the local media.

MDE uses US Census data for systems represented in the Census to meet the minimum multilingual requirements of the PN rule under 40 CFR §141.205(c)(2). Maryland does not track how often a PN notice required translation. MDE would provide a full translation of the public notice if requested.

MDE uses SDWIS State to track PN violations. Due to staffing resources and current database limitations, MDE does not link the PN violations to the underlying violations. The PN violation is considered resolved when the public notice is issued by the system and proof of the notice is received by MDE. MDE does not provide a notice of violation for failure to provide a certification. The MDE CCR Certification form includes a checkbox so that systems can indicate if they are using the CCR to convey Tier 3 public notices.

MDE has a public notification compliance assistance program. Notices of violation letters include information on PN requirements, instructions for posting PNs, pre-filled PN templates, and pre-filled PN certification forms. All PNs received are reviewed.

Recommendation: None

Data Management and Reliability

MDE uses the Safe Drinking Water Information System (SDWIS) State version 3.3 and FedRep version 3.51 for reporting data to EPA. MDE has utilized contractor support via in-kind funding to adopt and implement solutions to transition to SDWIS Prime; this work was on-going in 2020 and has continued into 2021. MDE is submitting quarterly data submittals in a timely manner.

The EPA SDWIS coordinator has sent MDE copies of the SDWIS/ODS error reports, a separate set of error reports from the federal system, which MDE used to continue MDE's work on correcting the SDWIS data transmission errors. Concentrating on facility data, especially treatment data, has improved MDE's inventory error counts. However, there are issues related to the reporting and entry of significant deficiencies. During sanitary survey inspections, deficiencies that do not constitute regulatory violations but may nevertheless have a significant public health impact are often identified.

Maryland has reported that seventy-seven percent (77%) of all significant deficiencies have been resolved as of the end of FFY 2020. However, SDWIS/FED does not list any violation type 45 entries for Maryland. EPA Region III and MDE have confirmed a data transmission problem related to the transmittal of unresolved significant deficiency data from SDWIS/State to SDWIS/FED. MDE is working with Region III and contractor assistance to resolve the data transmission issue.

Recommendation: MDE needs to resolve the sanitary survey significant deficiencies discrepancy (i.e., type 45 violation reporting) and should revise the Action Plan to identify actions it is taking to report and address them.

Lab Certification

In accordance with 40 C.F.R Section 142.10(b)(4), Maryland has laboratories capable of performing analytical measurements of drinking water parameters. In November 2020 EPA Region III's staff from the Laboratory & Technical Service Branch of the Laboratory Services and Applied Science Division (LSASD) conducted an evaluation of Maryland's laboratory certification program. The review team had no findings.

Maryland Department of Health and Mental Hygiene (DHMH) operates laboratories which conduct drinking water analyses. In 2020 EPA certified the MDE DHMH laboratory in Baltimore, Maryland. EPA has also certified the Eastern Shore Regional Laboratory (ESRL) and the Western Maryland Regional Laboratory (WMRL) facilities

Historically, Maryland has maintained its laboratory certification status. Maryland's labs are certified for inorganic contaminants, disinfection byproducts, haloacetic acids, trihalomethanes, and synthetic organic contaminants. Maryland has state-wide waivers for some organic contaminants. Those contaminants are glyphosate, endothall, diquat, dioxin, and bromate. Limited testing is required for PCBs, cyanide, and asbestos based on the vulnerability of a new source.

The state laboratory maintained its certification status throughout 2020. According to documentation from December 2020 the Maryland lab program is certified for 2021.

Recommendation: None

2020 Maryland Source Water Protection (SWP)

The Maryland Department of Environmental (MDE) Water Supply Program (WSP) has the primary responsibility for SWP in Maryland.

Successful collaborations in SWPAs with USDA NRCS:
In 2020, MDE successfully collaborated with NRCS to prioritize several source water protection

areas (SWPAs) at Liberty Reservoir and Northeast, MD. This is also the second year in the readiness/planning phase of the Double Pipe Creek National Water Quality Initiative (NWQI) which includes 3 continuous HUC-12s across Carroll County, MD. The Double Pipe Creek watersheds drain to Frederick County, the City of Frederick, and eventually enter the Potomac River.

Harmful algal blooms (HABs):
Three systems with reservoir impoundments were identified with a HABs issue: (1) Blue Ridge, (2) Cunningham State Park and (3) Westminster. At Cunningham State Park, the bloom was not near an intake and as of October 2020, began work on a contingency plan. At Westminster, the impoundment went offline then was pumped and treated with copper sulfate ($CuSO_4$). As a result of issues with HABs at reservoir impoundments, MDE SWP strengthened their relationship with HABs staff.

Water reuse exploration at two water systems:
As of October 2020, two water systems are considering water reuse: (1) Anne Arundel County and (2) City of Westminster (Carroll County). Anne Arundel County was exploring long-term sustainability of a water reuse system.

Active participation in local and regional partnerships:
MDE remains an active member of the Potomac Drinking Water Partnership Program (Potomac DWSPP) which is coordinated by the Interstate Commission for the Potomac River Basin (ICPRB). MDE is actively engaged with the Susquehanna River Basin Commission. MDE also holds active membership with the Baltimore City Reservoir Technical Group which, as of October 2020, was working on an action plan and exploring rezoning options in the surrounding counties.

Aligning with national and regional priorities of climate change and environmental justice:
MDE Office of Planning recently completed their drinking water impact report. The outcome was a decision to enforce each new permitting activity to address climate change impacts and to incorporate local community impacts and address public concerns.

Challenges of the COVID-19 pandemic:
The COVID-19 pandemic forced cancellation of the annual Groundwater Symposium in 2020, however this event may be held virtually in 2021. In December 2020, long-time manager of the MDE WSP, John Grace, retired. Several leadership changes have taken place since that time. It is currently unclear whether the MDE SWP will remain staffed at 2-3 personnel. MDE is currently hiring to fill several vacancies due to delayed hiring caused by the COVID-19 pandemic. They recently received funding to fill a position to inspect wells in wellhead protection areas.

Recommendation: None

Source Water Protection PFAS Work

In September 2020, MDE initiated Phase I of its PFAS study to evaluate the occurrence of PFAS in public water systems. During this phase, 132 Community Water System Water Treatment Plants (CWS-WTPs) were sampled and tested for all eighteen (18) PFAS analytes listed under EPA Method 537.1. Collectively these tested systems provide drinking water to an estimated 4.3 million people.

The test sites were identified by MDE using readily available information as having the highest relative risk for PFAS contamination. Relative risk is defined as a combination of the estimated degree of threat (i.e., potential PFAS source type, number of potential sources, and proximity to drinking water sources), vulnerability (i.e., source waters from surface water or groundwater in unconfined or semi-confined aquifers) and the frequency a system's customers receive their drinking water (i.e., customers receiving water from the same CWS every day).

Samples from two water systems showed levels greater than the U.S. Environmental Protection Agency's health advisory level for those compounds. The report describes actions taken in response by MDE and others to protect public health. MD has published a report of its findings.

The MDE sampling showed quantifiable levels of PFOA and PFOS, the two most studied PFAS compounds, in 98 samples. Two samples measured PFOA and PFOS greater than the EPA health advisory level of 70 ppt. Two others measured the compounds between 35 ppt and 70 ppt and 23 samples had PFOA and PFOS levels between 10 ppt and 35 ppt.

Currently, there are no federal regulatory drinking water standards for PFAS. However, the Environmental Protection Agency (EPA) has issued a health advisory level of 70 parts per trillion (ppt) for the sum of the concentrations of PFOA and PFOS in drinking water. EPA has stated that its health advisory level for PFOA and PFOS offers a margin of protection for all Americans throughout their life from adverse health effects resulting from exposure to PFOA and PFOS in drinking water.

Given that 75% of the samples tested under Phase 1 detected quantifiable levels of PFAS, MDE is continuing monitoring efforts of PFAS in public drinking water treatment systems and has moved on to sample an additional 62 systems in phase II of this effort. MDE has committed to reducing the risks of PFAS chemicals in Maryland and to continuing close coordination with scientific, local, other state agency and federal partners.

Recommendation: None

Best Practices

In conducting the annual primacy review, EPA has noted a number of best practices being employed by MDE.

Maryland has a focus on health-based violations. More than 90% of Maryland's health-based violations were returned to compliance within 6 months of occurrence.

MDE has implemented a program to address lead in schools, including schools which are not public water systems. Working with the MD Department of Education, testing of schools serving children in pre-k to grade 12 is underway. The testing is being phased in based on the date of school building construction and student age. Follow-up actions are required for sample results greater than 20 ppb; samples are required to be analyzed by a certified laboratory.

MDE is taking an active role even with limited resources to address unregulated contaminants that pose a potential risk to drinking water resources. MDE's work with PFAS sampling is an example of this effort.

Summary

As of the date of this report, Maryland is implementing its PWSS program. MDE meets many program measures despite significant resource challenges that may adversely affect future program performance. MDE has been implementing an Action Plan to address previously identified programmatic challenges. MDE needs to provide a staffing and resource plan to address the challenges identified in the CADMUS report on Maryland drinking water program resources. While there are issues that need to be addressed, the Drinking Water Section of EPA Region III finds that Maryland should retain primacy enforcement responsibility for the implementation of approved NPDWRs.

To address the major issues identified in this report, EPA recommends that:

- MDE's WSP fill the vacant budget position and the grants management position which address the PWSS grant and DWSRF set-asides.
- MDE submit a staffing and resources plan to address previously identified staffing and resource concerns.
- MDE continue to implement its Action Plan to address programmatic needs.
- MDE address data entry issues to resolve the sanitary survey significant deficiencies discrepancy (i.e., type 45 violation reporting) in information flow from SDWIS/State to SDWIS/FED.
- MDE continue to implement its Action Plan addressing capacity development program concerns.
- MDE continue its efforts to improve SDWIS data quality.

EPA offers its assistance to MDE in carrying out these recommendations and requests quarterly updates on MDE progress in addressing these recommendations.

Follow Up Actions

EPA requests that within 60 days, the MDE submit a response to the findings and recommendations outlined in this report. The response should outline any actions that have been or will be taken to address identified deficiencies and areas in which EPA could provide additional support to MDE. These activities will be incorporated into the existing EPA/MDE action plan.