

Commonwealth of Kentucky

2020 TRIENNIAL REPORT TO THE GOVERNOR

October 1, 2017 – September 30, 2020

**Capacity Development Program
for Kentucky Public Drinking Water Systems**



**Department for Environmental Protection
Division of Water
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Executive Summary

The 2020 Triennial Report to the Governor on Kentucky's Public Drinking Water System Capacity Development Program summarizes activities conducted by the Division of Water (the Division) concerning the assessment, prioritization, and assistance provided to Public Water Systems (PWS) to improve their technical, managerial, and financial capacity to comply with the Safe Drinking Water Act (SDWA). This report fulfills Kentucky's obligation under the SDWA to report the status of the program to the Governor every three years by September 30th.

The SDWA regulates the nation's public drinking water systems. The 1996 amendments included additional requirements for source water protection, operator training, specific contaminants, and public information. It also established the Drinking Water State Revolving Fund (DWSRF) and guidelines for small water systems to develop their technical, managerial, and financial abilities.

The Division implements the Capacity Development Program (CD) by conducting assessments of PWS in Kentucky to determine the technical, managerial, and financial (TMF) capacity of each system to produce safe drinking water. The drinking water sanitary survey process provides an evaluation of the system's TMF capabilities based on criteria developed by the Division in conjunction with a drinking water stakeholder group. Capacity development and technical assistance staff provide support and guidance as needed when indicated by this evaluation.

Although significant progress has been made to reduce PWS health-based, monitoring, and reporting violations, the majority of PWS still require managerial and financial assistance to ensure future sustainability and resiliency. The Division and its stakeholders continue to provide technical assistance in key areas of treatment, distribution, and management, and utilize the DWSRF to affordably assist small PWS to rehabilitate, replace, or construct new infrastructure.

For several years Kentucky has encouraged PWS that lack TMF capacity to pool resources and merge with other local PWS to improve service. Through regionalization, the number of PWS in Kentucky has decreased from 698 in 1999 to 433 in 2020, and resulted in nearly the entire Commonwealth having access to public water. Regionalization has been the catalyst for improving PWS sustainability.

The Division continues its successful management of the CD program and work with its stakeholders to improve PWS compliance and ensure all Kentuckians receive safe drinking water. The Division's top priority is the reduction of health-based violations through education, training, and on-site technical assistance at PWS. The Division is also modernizing the CD program to improve efficiency and enhance PWS ability to maintain compliance with the SDWA.

List of Acronyms

ADD – Area Development District
ARM – Advantage Regulatory Management
ASCE – American Society of Civil Engineers
ASDWA – Association of State Drinking Water Administrators
AWIA – America’s Water Infrastructure Act
AWOP – Area-Wide Optimization Program
CD – Capacity Development
CPE – Comprehensive Performance Evaluation
CWS – Community Water System
DBP – Disinfection By-Product
DCA – Division of Compliance Assistance
DOW – Division of Water
DWAC – Drinking Water Advisory Council
DWSRF – Drinking Water State Revolving Fund
EEC – Energy and Environment Cabinet
ERP – Enforcement Response Policy
ETT – Enforcement Targeting Tool
FFY – Federal Fiscal Year
GIS – Geographical Information System
HAA – Haloacetic Acid
HAB – Harmful Algal Bloom
KAR – Kentucky Administrative Regulation
KMUA – Kentucky Municipal Utilities Association
KIA – Kentucky Infrastructure Authority
KRS – Kentucky Revised Statute
KRWA – Kentucky Rural Water Association
KWWOA – Kentucky Water and Wastewater Operators Association
MCL – Maximum Contaminant Level
MGD – Millions of Gallons per Day
NC – Non-Community Water System
NOV – Notice of Violation
PFAS - Per- and poly-fluoroalkyl substances
PWS – Public Water System
RTCR – Revised Total Coliform Rule
SDWA – Safe Drinking Water Act
SFY – State Fiscal Year
Stage 2 DBPR – Stage 2 Disinfection By-Product Rule
SWP – Source Water Protection
SWPAP – Source Water Protection Assistance Program
TMF – Technical, Managerial, & Financial
TTHM –Total Trihalomethane
USEPA – United States Environmental Protection Agency
USGS – United States Geological Survey
WRIS – Water Resource Information System

2020 Triennial Report to the Governor Kentucky's Public Drinking Water System Capacity Development Program

I. Capacity Development Program Overview

The 1996 amendments to the SDWA established the Drinking Water State Revolving Fund (DWSRF) to finance construction and improvements to new and existing PWS. To receive the full allocation of DWSRF funds, the SDWA required states to develop and implement a capacity development (CD) program to ensure that all PWS have the technical, managerial, and financial capacity necessary to meet regulatory requirements and consistently provide safe drinking water to customers.

America's Water Infrastructure Act (AWIA) of 2018 enhanced the SDWA by extending infrastructure loan terms, providing additional subsidization for disadvantaged communities through the DWSRF loan program, and requiring community water systems with populations greater than 3,300 people to develop or update water system risk assessments and emergency response plans. The amendments also provided funds to assist small and disadvantaged communities with reducing lead in drinking water systems, and required states to amend their CD strategies to include a description of how the state will encourage the development of asset management plans that include best practices, training, technical assistance to help PWS with implementation of those plans. A committee of Kentucky drinking water stakeholders and regulators are currently developing a strategy to assist PWS with asset management planning. The plan and baseline data will be included in the 2023 Triennial Report to the Governor.

The SDWA requires each state to possess the legal authority to implement a CD program, develop a strategy to assist PWS in improving and maintaining TMF capacity, and submit a triennial report to the Governor detailing the effectiveness and progress made by the program. In response to the 1996 SDWA amendments, the Kentucky General Assembly enacted KRS 151.630 – 151.636, which directed the Energy and Environment Cabinet (the Cabinet) to develop and implement a CD program consistent with federal regulations. The CD strategy is required to address six elements:

- The method or criteria the Cabinet will use to identify and prioritize the PWS most in need of improving TMF capacity;
- A description of the institutional, regulatory, financial, tax, or legal factors at the federal, state, or local level that encourage or impair CD;
- A description of how the Cabinet will use the authority and resources of the SDWA to assist PWS in complying with drinking water regulations, encourage development of partnerships between PWS to enhance TMF capacity, and assist in the training and certification of operators;
- A description of how the Cabinet will establish a baseline and measure capacity improvements to comply with drinking water law and regulations;
- Identify key stakeholders that have an interest and are involved in development and implementation of the CD strategy; and
- A description of how the State will encourage development of PWS asset management plans that include best practices for asset management, and assist PWS in training operators or other relevant and appropriate persons in implementing asset management plans.

After working with its stakeholders and the public, the Division submitted its initial CD criteria and strategy to the USEPA in September of 2000. In 2008 revisions to the CD strategy established additional criteria to identify PWS in need of improving capacity. The Cabinet and its stakeholders are currently updating the CD strategy to incorporate America's Water Infrastructure Act of 2018 requirements, and to improve efficiency in identifying and assisting PWS to provide safe drinking water. The primary goal of the CD program is to ensure that all PWS in Kentucky maintain the TMF ability to provide safe drinking water and to remain compliant with the SDWA.

II. Capacity Development Program Implementation

Capacity Assessment

The Division retains primacy to regulate community and non-community PWS in Kentucky (Table 1). Currently 78% of the 433 regulated PWS serve populations of less than 10,000 people (Table 2). Although these PWS serve a small portion of Kentucky’s overall population, historically they have been in the greatest need of assistance.

Table 1: The number of regulated water systems in Kentucky by system type.

	Water System Type	Number
Regulated PWS	Community	380
	Non-Community	53
State Regulated Water Systems	Semi-Public	55
	Bottled Water	6
TOTAL		494

Table 2: The number and percentage of Kentucky PWS in each size category and the total population served by each system size.

System Size by Population Served	Number of Water Systems	Percentage (%) of Total Water Systems	Population Served
< 10,000	338	78	1,084,166
≥ 10,000	96	22	3,424,637

The drinking water sanitary survey is an in-depth, on-site evaluation of PWS source water, treatment processes, infrastructure, management, and finances. The Division conducts sanitary surveys, which were developed with stakeholders, once every three years at Community Water Systems (CWS) and once every five years at Non-Community Water Systems (NCWS), to obtain critical TMF information in accordance with the CD strategy. A PWS is deemed to lack capacity if any critical question is answered unfavorably. Data gathered from the sanitary survey provides the clearest measure of system capacity and is used in conjunction with compliance data and the Enforcement Response Policy to track, prioritize, and provide assistance to PWS. In order to assess changes in PWS capacity, current data from the sanitary survey is evaluated against initial baseline data and data from subsequent sanitary survey cycles (Figure 1).

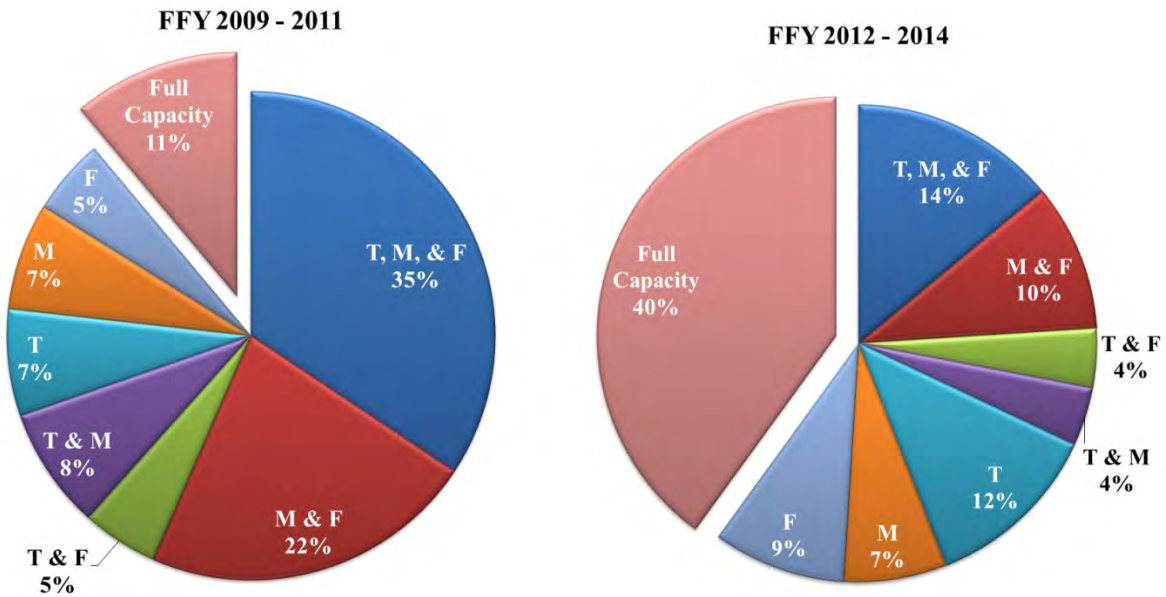
Initial, baseline sanitary surveys with the capacity assessment were conducted at PWS beginning in federal fiscal year (FFY) 2009 and ending in FFY 2011. The initial assessment indicated that 89% of PWS lacked some form of capacity and of these, 35% were deficient in TMF capacity, which jeopardized their ability to remain compliant with the SDWA.

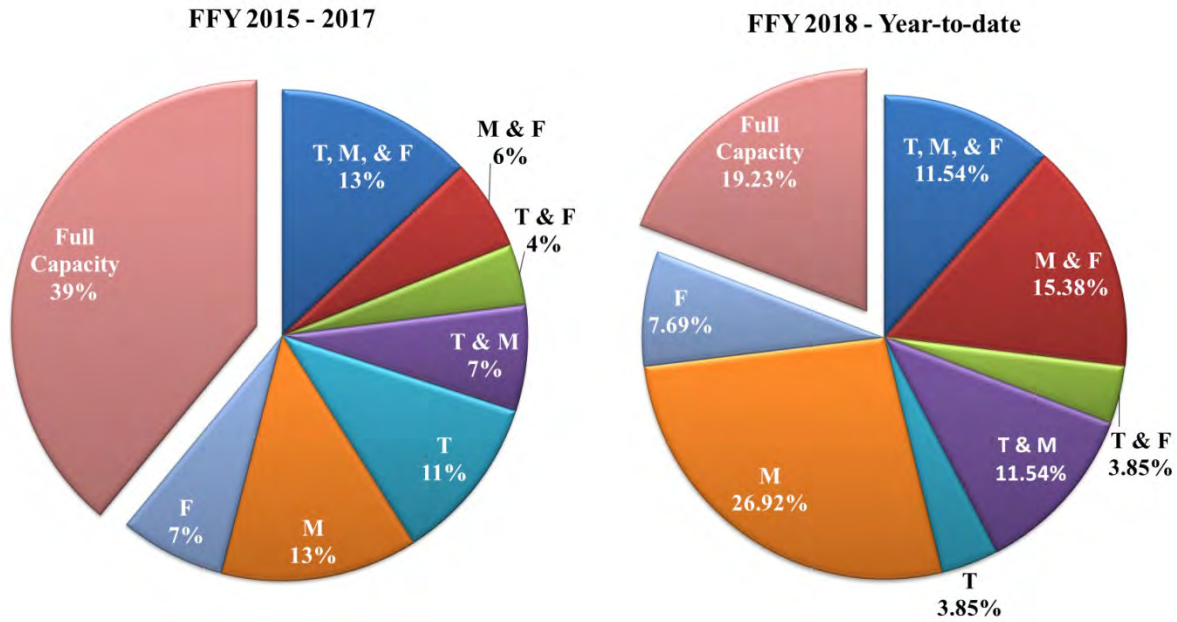
Subsequent sanitary surveys conducted from FFY 2012 through FFY 2014 indicated a dramatic 29% increase in the number of systems with full capacity compared to baseline. Water systems with insufficient TMF capacity dropped from 35% to 14% in the same timeframe, further indicating increased ability to maintain SDWA compliance. This data may indicate that Kentucky’s overall CD strategy is helping to improve PWS capacity. However, the number of PWS deficient in individual areas of financial and technical capacity increased slightly, which indicates the continued need for PWS assistance from the Division.

Data collected from FFY 2015 through FFY 2017 (Figure 3) indicates that the number of PWS with full capacity, and those lacking TMF capacity, remained comparatively unchanged since the previous assessment period. Although PWS have made great progress towards improving safe drinking water production capacity, the majority of PWS still lack the financial and managerial capacity to maintain long-term compliance with the SDWA.

It is important to note that the coronavirus pandemic disrupted the completion of sanitary surveys in 2020 because inspections and sanitary surveys were suspended from mid-March through August; therefore, capacity data for this cycle is not yet complete. Nearly 90 PWS have not yet received a sanitary survey evaluation for these reasons, however evaluations will resume in late-August. According to year-to-date data, the majority of PWS still lack the managerial capacity to produce safe drinking water (Figure 4). This could be due to a lack of PWS communication, planning, or both. The effects the pandemic may be having on PWS cannot yet be determined because the majority of data from the current cycle was collected in FFY 2018 and FFY 2019. However, this data highlights the continued need for technical, managerial, and financial assistance to improve PWS ability to produce safe drinking water.

Figure 1: Comparison of 3-year sanitary survey cycle PWS Technical (T), Managerial (M), and Financial (F) capacity data.

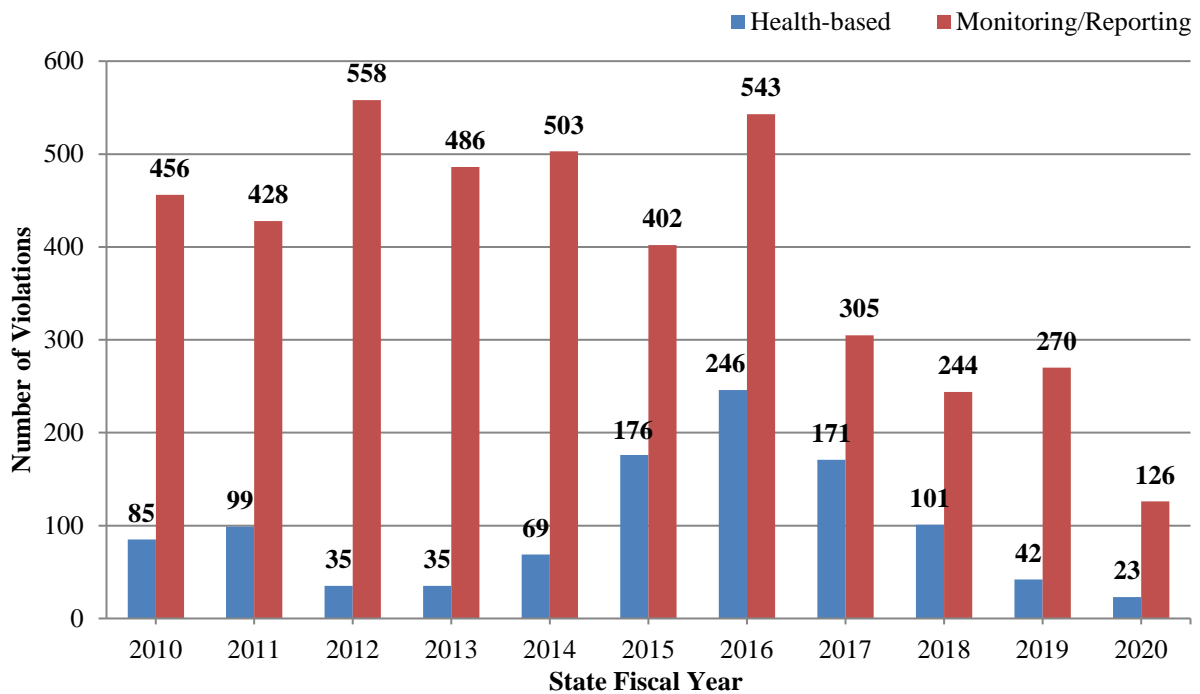




Drinking Water Violation Trends

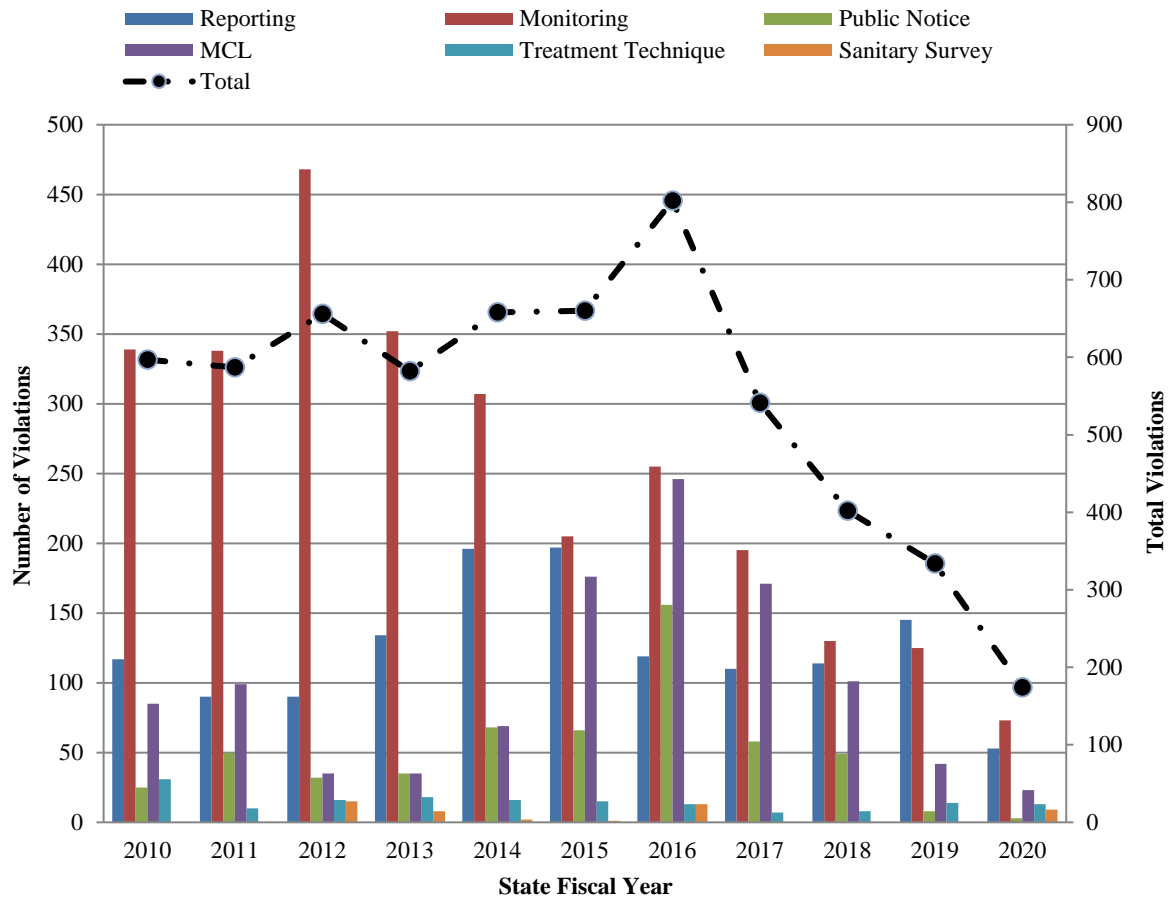
The SDWA requires PWS to monitor treated water for contaminants and report results to the Division at regular intervals during the year. A Notice of Violation (NOV) is issued when contaminant levels exceed specific limits, or when monitoring or reporting is not properly conducted. Historically, the greatest numbers of PWS violations are administrative in nature (Figure 2) though maximum contaminant level (MCL) health-based violations reached record numbers in SFY 2014 and SFY 2015 due to the implementation of the Stage 2 Disinfection By-Product Rule (DBPR).

Figure 2: Health-based and monitoring and reporting violation trends.



The Stage 2 DBPR required PWS to monitor levels of potentially carcinogenic compounds in treated drinking water. DBP Maximum Contaminant Level violations constitute the majority of health-based violations and remain a technical challenge for many Kentucky PWS (Figure 3). Since 2014, the Division and its stakeholders have focused significant training and on-site technical assistance resources to assist PWS in reducing DBP violations from 246 in SFY 2015, to only 23 in SFY 2020.

Figure 3: PWS violations of the Safe Drinking Water Act



Enforcement Activities

In October 2010, USEPA implemented changes to its Enforcement Response Policy to better identify PWS exhibiting significant health-based violations or violations across multiple rules. The Enforcement Targeting Tool (ETT) prioritizes and directs enforcement responses to those PWS with the most systemic non-compliance (i.e., “priority” systems), and focuses on returning the system to compliance rather than simply addressing the violation. The ETT assigns points to specific violations in the following tiers:

- Acute health-based violations 10 points
- Chronic health-based violations 5 points
- Monitoring and reporting violations 1 point

Any PWS that accumulates an ETT score of 11 points or more must return to compliance or be placed under formal enforcement within six months. Currently six PWS are working towards compliance through this process.

III. Drinking Water State Revolving Fund

The USEPA provides the states with Drinking Water State Revolving Funds (DWSRF) to advance the goals of the CD program. States with authority may disburse and set-aside funds from the DWSRF to assist with administrative and environmental initiatives. Kentucky continues to dedicate these funds to support technical assistance, CD activities, source water protection, drinking water contaminant testing, and building stakeholder partnerships to support TMF assistance to small water systems. Administrative costs fund Division personnel who track DWSRF loan projects from initiation to completion. The Public Water System Supervision (PWSS) grant funds Division personnel, drinking water laboratory certification auditors, and source water testing for contaminants such as harmful algal blooms. State and Local Assistance funds support contracts for United States Geological Survey stream flow gaging data collection and technical assistance with the Kentucky Rural Water Association as shown in Table 3.

Table 3: Administration of the DWSRF 2017 – 2020.

		2017 Federal Funds	2017 State Funds	2018 Federal Funds	2018 State Funds	2019 Federal Funds	2019 State Funds	Estimated 2020 Funds
Program Administration (DSR00)	Federal Allocation	\$ 384,900.00		\$ 549,090.00		\$ 543,960.00		\$ 544,320.00
	Personnel spending	\$ 384,900.00	\$ -	\$ 549,900.00	\$ 7,445.00	\$ 543,960.00	\$ 575,869.00	\$ 544,320.00
Public Water System Supervision (DSR01)	Federal Allocation	\$ 1,283,000.00		\$ 1,830,300.00		\$ 1,813,200.00		\$ 1,814,400.00
	Personnel spending	\$ 1,149,958.00	\$ 735,334.74	\$ 1,621,671.00	\$ 1,552,089.00	\$ 1,604,571.00	\$ 1,548,244.00	\$ 1,814,400.00
	Contractual spending	\$ 133,042.00	\$ 43,189.42	\$ 201,588.00	\$ -	\$ -	\$ -	\$ -
State & Local Assistance (DSR03, DSR04, DSR07, DSRA7)	Federal Allocation	\$ 1,924,500.00		\$ 2,745,450.00		\$ 2,719,800.00		\$ 2,719,800.00
	Personnel spending	\$ 1,191,900.00	\$ 14,588.64	\$ 2,133,091.00	\$ -	\$ 1,191,971.00	\$ 88,778.00	\$ 1,191,971.00
	Travel spending	\$ 30,000.00	\$ -	\$ 30,000.00	\$ -	\$ 4,370.00	\$ -	\$ 10,000.00
	Contractual spending	\$ 702,600.00	\$ -	\$ 582,359.00	\$ -	\$ -	\$ -	
Small System Technical Assistance (DSR05)	Federal Allocation	\$ 256,600.00		\$ 366,060.00		\$ 362,640.00		\$ 362,640.00
	Personnel spending	\$ 256,600.00	\$ 69,814.63	\$ 366,060.00	\$ -	\$ 362,640.00	\$ 345,072.00	\$ 362,640.00

Small Systems Technical Assistance

The Division uses a portion of set-aside funds for dedicated staff that provide assistance to small PWS in need of technical capacity improvement, and on-site technical assistance without risk of enforcement action, which gives PWS the opportunity to proactively correct issues. A successful component of technical assistance is the Area-Wide Optimization Program (AWOP) which was developed by USEPA to provide tools and approaches for PWS to meet water quality goals that are more stringent than SDWA regulations on a long-term basis. Kentucky participates in and incorporates the AWOP into its technical assistance activities by teaching operators problem-solving skills to improve operations. There were 36 PWS serving over 1.4 million Kentuckians that met microbial AWOP goals in 2020. PWS that actively participate in and meet AWOP goals are recognized with certificates of achievement and awards. Since 2017, Division staff have:

- Conducted 389 system contacts and provided comprehensive technical assistance focused on DBP compliance, removal of microbial contaminants during water treatment, and addressing technical capacity deficiencies identified in the sanitary survey.
- Provided or Participated in Trainings and Conferences:
 - Multi-state Comprehensive Performance Evaluation in Concord, NC
 - Kentucky Water & Wastewater Operators Association (KWWOA) Conference, Northern KY Conference Center, 401 KAR Chapter 8 update & DBP Update
 - Small System Operator Training: Achieve & Maintain Compliance with the SDWA, Disinfection Overview
 - Water Quality Intro & Compliance Workshop, Big Sandy Area Development District- Prestonsburg,
 - Division of Compliance Assistance Water Regulations and Compliance Workshop, EEC Conf Rm TR-A

- Modular Distribution System Optimization Training; Campbellsville
- Modular Distribution System Optimization Training; Frankfort
- Distribution System Optimization Presentation at DCA Training; Rough River State Park
- Corrosion Control Training Kentucky Rural Water Association (KRWA), Kentucky American Water, Lexington
- Corrosion Control Training KRWA, Prestonsburg Utilities
- Corrosion Control Training KRWA, Calvert City
- KWWOA Conference, Northern Kentucky Convention Center, DBP updates and M&R violation reduction training
- Corrosion, Quality & Compliance from Treatment to Tap, Bowling Green KRWA
- Multi-State CPE, Ashland Water Works
- Presented Kentucky case studies during National Association of State Drinking Water Administrators /USEPA DBP Webinar Series
- Modular Distribution System Optimization Training; Somerset
- AWOP Presentation at KWWOA Western Chapter Conference
- KY/TN Disinfectants & Disinfection Byproducts Performance Based Training Session 1—Somerset
- Kentucky Municipal Utilities Association Summer Meeting, Center for Rural Development, Somerset, KY,- Utility Safety
- Multi-State Comprehensive Performance Evaluation, Mountain Water District
- KY/TN Disinfectants & Disinfection Byproducts Performance Based Training Session 2—Stanford
- KY/TN Disinfectants & Disinfection Byproducts Performance Based Training Session 3—Somerset
- Per- and poly-fluoroalkyl substances (PFAS) state-wide drinking water sampling project SFY20
- Attended following AWOP events:
 - 2017 National AWOP Conference
 - Multi-State Comprehensive Performance Evaluation, North Carolina
 - USEPA Region 4 AWOP Meeting, Frankfort, KY
 - USEPA Region 4 Annual AWOP Meeting, Alabama
 - USEPA Region 4 AWOP Meeting, Cincinnati, OH
 - USEPA Region 4 AWOP Meeting, Florida
 - USEPA Region 4 Annual AWOP Meeting, North Carolina
 - 2019 National AWOP Conference
 - USEPA Region 4 AWOP Meeting, South Carolina
 - USEPA Region 4 Annual AWOP Meeting, North Carolina

State Revolving Fund Grant and Projects

Drinking Water SRF provides low interest loans to communities for drinking water infrastructure projects, and is administered jointly by the Division and the Kentucky Infrastructure Authority. Since State Fiscal Year (SFY) 2018, 31 communities received nearly \$77 million dollars to improve drinking water infrastructure. Projects that received funding represent investments in regionalization, rehabilitating, or constructing new water treatment facilities, replacing inadequate and aging water lines and tanks, and extending service to residents. Such projects improve the quality and availability of drinking water and strengthen local economies.

Water Supply

The Division is charged with administering sections of KRS Chapter 151, and state regulations 401 KAR 4:010 and 4:220 which pertain to water resource management, including local and regional water supply planning, water withdrawal permitting and reporting, source water and wellhead protection, and drought monitoring and response. These programs serve to manage the beneficial use of Kentucky's waters and provide assistance and support for water resource management and development.

Water Supply Planning

Based on KRS Chapter 151 and Chapter 224A, the Division and Kentucky Infrastructure Authority developed regulations with the goal to provide water service to every Kentuckian by the year 2020, while encouraging regionalization, consolidation, and the merger of water systems. These initiatives also required the statewide Area Development Districts to coordinate 2020 water management planning councils, and to employ water service coordinators to facilitate and implement the water supply planning process.

By 2001, each 2020 water management planning council had developed a long range water supply plan for each county that was consistent with the water supply planning requirements. The plans included a water needs forecast for each county for 5, 10, 15, and 20 years after the year 2000, a strategy for delivering potable water to unserved and underserved areas of the county, and encouraged merger and consolidation of water systems. These plans were last updated in 2003-2004. In 1999, nearly 3.3 million Kentuckians, almost 85% of the of the state's population, received water from 678 public water systems (Water-Resource Development: A Strategic Plan, 1999). In the year 2020, more than 4 million Kentuckians, almost 95% of the state's population, receive water from 494 public water systems. There are 213 water treatment plants serving the Commonwealth through nearly 64,000 miles of water distribution lines. The American Society of Civil Engineers 2019 Infrastructure Report Card gave Kentucky a Grade of C+ for drinking water infrastructure.

To ensure continued growth of sustainable infrastructure throughout the Commonwealth, the Division needs to focus on the significant challenges and resource management decisions involved in ensuring safe, clean, and reliable public water beyond 2020. Through strategic, sustained investment, bold leadership, thoughtful planning, and careful preparation for the needs of the future, we can promote sustainable planning and infrastructure funding for our communities. The Division has determined that significant changes to KRS Chapter 151 will be necessary before it can revise its related water planning regulation contained at 401 KAR 4:220 to facilitate these goals.

Water Withdrawal

Since 1996, the Division has regulated water withdrawals through a water withdrawal permitting and reporting program. Permits or authorizations are required for water withdrawals of 10,000 gallons per day or more of public waters of the Commonwealth, with exemptions for:

- Use of water for agricultural and domestic purposes including irrigation
- Production of steam generating plants of companies whose retail rates are regulated by the Kentucky Public Service Commission
- Water injected underground in conjunction with operations oil and gas production

In accordance with KRS Chapter 151 and 401 KAR 4:010, permits are specific in terms of quantity, time, place, and rate of diversion, transfer, or withdrawal. The Division is actively developing programmatic integration, and streamlining and modernizing the water withdrawal application, recording, and reporting requirements, as well as guidance. Standard Operating Procedures, compliance schedules, and process permits and authorizations are maintained in the Department's CGI Advantage Regulatory Management (ARM) system. In a continued effort to develop, manage, and maintain correct and accurate data and information, the Division has conducted numerous system inspections, and provided regular updates to

ArcMap data layer files. Table 4 below summarizes active permitted withdrawals measured in millions of gallons per day.

Table 4: Number of permitted water withdrawals and daily averages.

Use Category	Number of Permitted Withdrawals			Daily Average (MGD)		
	Year					
	2018	2019	2020	2018	2019	2020 (Jan-July)
Water Supplier	263	257	254	534.79	540.77	542.78
Industrial	136	136	136	192.79	195.66	207.61
Mining (Coal)	129	112	111	10.61	8.72	8.20
Mining (Non-coal)	40	42	45	10.43	10.21	8.56
Commercial	115	106	101	11.17	9.75	4.63
Aquaculture	5	5	5	29.72	29.80	29.80
Other	10	10	10	0.62	0.52	0.51
Totals	698	668	662	790.13	795.43	784.08

The Division works with the USGS to collect water-use information that is compiled into a national water-use data system and published every five years. Kentucky has one of the most comprehensive and long-term water withdrawal data programs in the eastern U.S.

Source Water Protection

Source water is raw, untreated water used for current or future drinking water. Source water protection is a proactive, front-line defense to safeguard, maintain, or improve the quality of drinking water sources, as well as a planning process conducted by local water systems, regional, state, and federal government agencies, to protect drinking water sources from overuse and contamination. Kentucky’s source water assessment and protection efforts have been very successful during this three-year reporting period. Original surface intake delineations for 187 public water systems were reviewed and modifications including archiving inactive systems, re-delineating protection areas to reflect changes, and delineating new systems were made. The Division has approved approximately 60 source water and wellhead protection plans over the last three years.

Division staff continue providing assistance to public water systems and other agencies on source water and wellhead protection plan development and implementation, education and outreach, and public meeting facilitation. Programmatic integration and streamlining, and modernizing plan guidance, forms, brochures, checklists, and databases is ongoing.

The Division developed a training module and hosted training sessions, in coordination with Kentucky Division of Compliance Assistance and the Kentucky Rural Water Association, for certified water and wastewater operators regarding the background, core elements, and requirements of the source water and wellhead protection programs. The Division also conducted a study to determine the presence of per- and poly-fluoroalkyl substances (PFAS) in Kentucky’s public drinking water. The initiative required Standard Operating Procedure (SOP) and Project Management Plan development, sample collection across the state, transport and delivery of all samples for analyses, data review and analysis, and compilation of a final report.

The Division also compiled and published an interactive Source Water Protection Viewer to view assessments and plans and an Environmental Systems Research Institute (ESRI) Story Map application that showcases Source Water Protection in Kentucky. Division staff assisted with sampling and analyses required for the Kentucky Groundwater Monitoring Network, compliance reviews associated with Consumer

Confidence Reports, and updated the guidance for Groundwater Under the Direct Influence. The Division continues working with the U.S. Department of Agriculture and Natural Resources Conservation Service State Technical Committee to identify local priorities for effective implementation of the 2018 Farm Bill, which requires that 10 percent (~\$4 billion) of funds for conservation programs be used to protect sources of drinking water.

Division staff attended and/or provided presentations at numerous trainings and meetings, including the Area Development District Water Management Councils, Wastewater & Drinking Water Advisory Council, Source Water Protection Committees and Source Water and Wellhead Protection Plan Public Meetings, U.S. Department of Agriculture, National Resource Conservation State Technical Committee, Kentucky Interagency Groundwater Monitoring Network, Kentucky Water Resources Research Institute, Kentucky Geological Survey, Kentucky Rural Water Association, U.S. Geological Survey Indiana-Kentucky Water Science Center, 319(h) program education and outreach events, Kentucky Division of Compliance Assistance, U.S. Environmental Protection Agency Region 4, Groundwater Protection Council, and Kentucky Agriculture Science and Monitoring.

Drought Monitoring

The Division continuously monitors hydrologic conditions to detect emerging drought conditions, identify the locations and severity of drought, and provide timely and appropriate information to the public. The Division also works with the Kentucky Drought Mitigation Team to issue drought and water shortage watches and warnings in compliance with the Kentucky Drought Mitigation and Response Plan. These efforts are coordinated with the U.S. Drought Monitor, National Integrated Drought Information System, Midwest Drought Early Warning System, and Kentucky Climate Center.

Division staff regularly attend climate and drought conferences and submit recommendations for the North Central U.S. Climate and Drought Summary and Outlook and Kentucky Monthly Climate Perspective on Drought and Hydrologic Conditions webinars, and co-authored a chapter in the National Soil Moisture Network Implementation. The Division compiled and published a Drought Viewer and a Drought Impact Reporter as on-line interactive tools to report declared droughts, drought-related conditions and impacts, and water shortage watches and warnings.

Water Shortage Response Planning

The Division is streamlining and modernizing the Water Shortage Response Program that originated in response to the 1988 drought in Kentucky. The program is designed to provide a framework that assists public water systems in making key water supply management decisions and develop plans to minimize the impacts of water shortages. The plans typically include stages of response related to droughts or other supply shortages, conserving available water supplies, and demand reduction and supply augmentation options. The program objectives address the need to preserve essential public services while minimizing adverse effects on public health and safety, community and utility economic activity, environmental resources, and quality of life.

Bathymetry and Pool Level Monitoring

The Division began a new program that collects bathymetry (underwater depth and topography) data to produce robust models of water quantity and availability, and installed sensors to monitor pool levels in public drinking water supply reservoirs. Having the ability to monitor lakes across the state remotely from a

centralized location will greatly improve both flood and drought monitoring. Some of these efforts utilized manned watercraft and a remote control drone to collect data and aerial imagery. To date, 39 sensors have been installed at 33 different lakes. Multiple agencies partnered to conduct assessments and share valuable data, including the federal Department of Surface Mining Reclamation and Enforcement, Department of Natural Resources Abandoned Mine Lands, Kentucky Department of Transportation, and Kentucky Department of Fish and Wildlife.

Operator Certification

The Division of Compliance Assistance implements Kentucky’s Operator Certification program which is pivotal in building TMF capacity. The program issues certification and provides training to ensure that individuals who operate drinking water systems are qualified and capable of performing their duties. Training focuses primarily on the technical knowledge required to treat water and maintain compliance with the SDWA. The following is a synopsis of drinking water operator certification activities for SFY 2018 to 2020 (Table 5).

Table 5: Drinking water operator certification activities SFY 2018 through SFY 2020.

	2018	2019	2020
Active Certifications	2,924	3,243	2,804
Training Hours Conducted	270	192	150
Individuals Trained	695	431	460
Exams Administered	480	451	375

State and Local Assistance

The Division continues to utilize State and Local Assistance set-aside funds from the DWSRF to contract with the Kentucky Rural Water Association to provide technical, managerial, and financial assistance to small, rural PWS. In FFY 2015 the contract was updated with an emphasis on providing technical assistance to priority PWS that are out of compliance with the Stage 2 Disinfection By-Products Rule (DBPR). Additional assistance is provided in the areas of operations, maintenance, training, and planning. Assistance provided to PWS since FFY 2018:

- Reduced the number of PWS in persistence non-compliance with the Stage 2 DBPR from 24 at the start of the triennium to five
- Returned 272 PWS to compliance. This also reduced the number of PWS on the ETT list from 152 to 66.
- Assisted 28 PWS in updating their Operations and Maintenance Manuals
- Assisted 31 PWS in reviewing their rates, charges, and debt consolidation, with sixteen PWS receiving additional assistance in filing for rate increases. The revenue recovered through rate adjustments totaled over \$1.1M. With interest rates being lower in FY2020, one PWS was able to refinance \$1,590,000 in long-term debt and realized a net savings of \$389,092.
- Assisted 212 PWS in the preparation and reporting of compliance data, public notifications, Consumer Confidence Reports, Operational Level Evaluation Reports, Level 1 Assessments and reviewing Sample Site Plans. The PWS savings for Consumer Confidence Reports alone totaled \$242,800.
- Conducted 121 on-site technical assistance visits PWS to reduce DBP formation during water treatment and distribution. Staff evaluated precursory organics removal, chemical treatment, water distribution, and water tank operations, to reduce DBP formation.
- Conducted 13 training sessions with 5 sessions being web based due to COVID-19. There were a total of 93 continuing education hours available to the 816 attendees representing 270 PWS. The topics

presented covered Corrosion Control, Safe Drinking Water Act Compliance, DBP Mitigation, Asset Management, Emergency Response Planning and Electronic Reporting of Drinking Water Compliance.

IV. Stakeholder Involvement

The Drinking Water Advisory Council (DWAC) is a stakeholder panel convened by the Division several years ago to address issues affecting consumers and the regulated community, and meets publicly on a quarterly or as-needed basis. It is comprised of:

- Kentucky Division of Water
- Kentucky Association of Counties
- Kentucky Council of Area Development Districts
- Division of Compliance Assistance
- Division of Plumbing
- Department for Public Health
- American Council of Engineering Companies of Kentucky
- Kentucky Infrastructure Authority
- Kentucky League of Cities
- Kentucky Municipal Utilities Association
- Public Service Commission
- Rural Community Assistance Partnership
- Kentucky-Tennessee American Water Works Association
- Kentucky Water & Wastewater Operators Association
- Kentucky Rural Water Association
- Louisville Water Company, representing large water systems
- Bowling Green Municipal Utilities, representing medium water systems
- Warren County Water District, representing medium water systems
- VACANT, representing small water systems
- Kentucky American Water Company, representing privately-owned water systems

V. Current and Future Activities

The DOW continues to conduct actions to ensure that it maintains primary regulatory responsibility over PWS pursuant to 40 C.F.R. 142, dp that compliance can be tailored to Kentucky's unique needs and challenges. The DOW regularly engages drinking water stakeholders through the Drinking Water Advisory Council (DWAC) to facilitate discussions regarding future regulations, education, workforce development, new technology, and best practices, to promote the value of and enhance water resources in the state. The DWAC also helps promote and support funding of applied research and development in water technology, sustainability, security, water quality, and infrastructure resiliency. The DOW and Kentucky Infrastructure Authority, which jointly administer the DWSRF, continue to advocate funding to address aging infrastructure through the SRF loan program.

In 2019, the Kentucky General Assembly established the Public Water and Wastewater System Infrastructure Task Force, consisting of legislators, state agency representatives, and citizens, to evaluate and develop a legislative strategy and policy options regarding:

- 1) Creating an evaluation process that can identify community water systems (CWS) and wastewater systems that lack TMF capacity and may be at risk of failure;
- 2) Identifying and assessing the current regulatory and enforcement authority of the oversight agencies, and policy and regulatory options, to improve the sustainability and TMF capacity of CWS and wastewater systems;

- 3) Identifying statutes that need to be amended to implement policy options, and any legal impediments to implementing specific policy options;
- 4) Developing a strategy regarding the authority, procedures, and resources necessary to intervene and prevent TMF failure of CWS and wastewater systems; and
- 5) Identifying options for generating state and local revenue to directly fund water infrastructure projects and leverage other public and private funds.

The Task Force voted on several recommendations, which included:

- 1) Reauthorizing the task force to meet during the 2020 interim so that it may continue its work;
- 2) Establishing a new, or recapitalizing an existing, water and wastewater infrastructure fund to leverage federal grants and loans, assist challenged utilities with infrastructure planning and asset management, and make direct loans and grants to water and wastewater utilities;
- 3) Conditioning any state loans or grants to public water or wastewater utilities on certain TMF performance benchmarks as established by the appropriate state entity;
- 4) Requiring the development of best management practices for PWSs that could be used as standards for the operation and maintenance of those systems;
- 5) Requiring the appropriate state entity to establish a uniform evaluation process to identify challenged public water and wastewater utilities that lack TMF capacity;
- 6) Establishing initial and continuing training requirements for all water and wastewater board members, commissioners, and decision makers to be administered and enforced by the appropriate state or state-authorized entity;
- 7) Requiring annual financial audits and reporting, regular rate reviews, and establishing regular rate adjustment criteria for all public water and wastewater utilities;
- 8) Studying the adoption of a model that would authorize a new or existing state entity or entities to have jurisdiction over all of Kentucky's water and wastewater utilities to ensure their financial and operational capacities, and establishing parameters for accountability, including oversight of annual utility financial, operations and water loss audits; and
- 9) Studying the regionalized pooling of resources and professional services, and hiring and qualification criteria for those services, for challenged water and wastewater utilities to more efficiently manage their facilities and meet auditing and reporting standards.

The Division has suggested that the Cabinet convene a workgroup to address and facilitate the Public Water and Wastewater System Infrastructure Task Force recommendations and related issues.

Infrastructure

Kentucky has made significant improvements in water and wastewater infrastructure over the past 20 years. Regional Water Management Councils coordinated planning and investment in water resources throughout Kentucky. Compliance with EPA environmental regulations has steadily improved. The number of failing systems has decreased, and consolidation in the industry has reduced the number of systems and improved water quality. Between general and SRF funding, over \$1.3 billion has been invested in Kentucky water systems which has resulted in public drinking water availability to 97% of Commonwealth citizens.

To continue providing water service and creating opportunities for economic development, Kentucky needs to properly maintain its water infrastructure. Water infrastructure can provide useful service for 20 to 100 years, but with reduced water consumption and a flat customer base, the cost of maintaining aging water infrastructure will continue to increase. A system to foster investment, maintenance, and capitol planning must be implemented to manage costs and stabilize customer rates. In order to do so, the DOW is developing asset management guidance as required by the 2018 America's Water Infrastructure Act. The goal is to incorporate asset management as a requirement to receive SRF funding, and to work collaboratively with other funding agencies to adopt asset management strategies for borrower eligibility.

The DOW will develop guidance that encourages regular rate reviews, promotes rate indexing, and improves regulatory accountability and follow-up on PWS financial audits.

Workforce Development

The availability of skilled labor is at an all-time low. Electricians, mechanics, plumbers, heavy equipment operators, and water and wastewater operators are currently in short supply as the economy expands. The median age of Kentucky's water utility workforce is 55. Many of those operators returned to the water industry after retirement because younger people are not entering the industry. Therefore, the DOW is exploring regulatory flexibility to improve PWS compliance with staffing plans and operator certification, utilizing SRF set-aside funds to support recruitment and training of new drinking water operators, and promoting technology in operations to support PWS personnel decision making.

On November 1, 2019, revised regulations governing drinking water and wastewater operator certification became effective and are jointly implemented by the DOW and DCA. While the framework formerly in place worked for many years, the challenges facing the industry made it necessary for the DOW and the DCA to review and analyze regulations to determine needed changes. The regulatory package was developed with input from stakeholders, and helps address operator shortages while maintaining high standards for operators in Kentucky. Changes made to 401 KAR Chapters 5, 8 and 11 include:

- Expansion of education and experience substitutions to include a wider variety of applicable education and skills
- Acceptance of state-approved apprenticeship programs towards operator certification
- Expansion of Operator-In-Training to help with alternate staffing plans
- Revisions to Class IV Wastewater Operator qualifications to maintain a solid experience base without requiring experience in excess of what is needed to successfully operate a facility.
- Continuing education requirements for drinking water and wastewater operators can be accrued in the same system to help operators manage licenses.
- Expanding options for reciprocity to out-of-state operators by taking into account qualifications and experience in the field, rather than focusing only on initial licensing credentials.

While these changes will aid in the recruitment and development of operators, the cabinet remains committed to working with partner organizations, facilities, and other government agencies to help address operator shortages.

Technical Assistance

In 1999, there were 698 PWS in Kentucky. Through regionalization efforts, there are now 436 PWS serving more than 95% of the Commonwealth. While merging assets and resources has enhanced the ability of many PWS to maintain compliance with the SDWA, regionalization has also created new challenges in maintaining compliance, particularly with the Stage 2 Disinfection Byproducts Rule (DBPR). Improper treatment, aging and/or inadequate infrastructure, and increased water age during transmission to customer taps can produce harmful contaminants in drinking water. Consecutive systems that lack infrastructure to treat water purchased from another system have particularly struggled to maintain compliance with Stage 2 DBPR. Moving forward, the DOW and its stakeholders will continue efforts to reduce DBPR non-compliance through targeted technical assistance, and anticipate seeing better results in the coming years.

Capacity Development Strategy

The 2018 amendments to the SDWA prompted the DOW to initiate a workgroup under the Drinking Water Advisory Council (DWAC) to determine criteria for PWS asset management plans, and develop a

strategy to assist PWS implementation of asset management planning. After review by the DWAC, and DOW and cabinet leadership, the criteria and strategy will be sent to the EPA for approval by December 2021. Upon approval, the DOW will incorporate asset management planning into its training and technical assistance activities in FFY 2022.

The DOW is also updating its drinking water and capacity development data management systems to allow faster detection of, and response to, health-based violations, which will improve PWS compliance. Additionally, the DOW is pursuing implementation of electronic data collection and submittal systems for PWS compliance.

Lead and Copper Rule Revision

The EPA published proposed changes to the Lead and Copper rule on November 13, 2019. The Lead in Drinking Water Workgroup was reconvened shortly thereafter, and met through January 2020, to and provide input for the cabinet's comments regarding the proposed rule. The cabinet's comments to the EPA can be found on the cabinet's website at:

<https://eec.ky.gov/Pages/Agency404.aspx?oldUrl=https%3a%2f%2feec.ky.gov%2fEnvironmental-Protection%2fWater%2fDrinking%2fDWAdvisoryCouncil%2fLead+Documents%2fKY+Lead+Workgroup+Recommendations+2-10-20+Final+Draft.pdf>.

Martin County Water District

A historical review of SDWA violations at the Martin County Water District (MCWD) revealed multiple violations of federal drinking water maximum contaminant levels, and in particular, disinfection byproducts (DBP).

The DOW dedicated personnel and funding for the Kentucky Rural Water Association (KRWA) to work on-site locating and repairing leaks, and providing technical assistance to MCWD's operators, to optimize treatment and distribution system performance. The prioritization of training and technical assistance provided to MCWD helped the system return to compliance with the Stage 2 DBPR.

The DOW collaborated with the Kentucky Division of Abandoned Mine Lands (AML) to secure an AML Pilot grant that will provide improvements to MCWD's drinking water intake and treatment facility, and distribution system. The Kentucky Appalachian Regional Commission also invested funds to help repair leaking lines. A capital improvement project to build water pump stations and install approximately 1,000 feet of water line also received funding.

Due to ongoing TMF challenges identified at MCWD over the last several years, the cabinet Secretary established an internal workgroup of state agencies to ensure that the district receives necessary assistance and resources, encourage open communication between Martin County and the cabinet, and to establish a collaborative environment dedicated to supporting the residents of Martin County. A technical subcommittee was formed to study issues such as water loss, future capital improvements, investments of the district, and to develop recommendations to ensure MCWD has the TMF capability to produce safe drinking water.

The DOW continues conducting comprehensive inspections, water sampling, providing technical assistance and optimization training, and performing its regulatory functions at MCWD. KRWA has helped with on-site assistance in Martin County by advising the water district on operations and maintenance, locating and repairing leaks, and collecting data for GIS mapping and water samples. These ongoing efforts will continue improving the district's capacity to deliver safe and reliable drinking water to Martin County residents and businesses.

Recommendations

To continue progress in water system capacity development, resiliency, and sustainability, the DOW recommends:

- Developing asset management planning guidance as required by the 2018 America's Water Infrastructure Act
- Incorporating asset management planning as a requirement for SRF and other funding eligibility
- Implementing capacity development guidance to encourage regular rate reviews and promote rate indexing
- Utilize SRF funds to support recruitment and training of new drinking water operators
- Promote technology to support PWS decision-making in operations
- Update drinking water and capacity development data management, including implementing an electronic data collection and submittal system for PWS compliance
- Increase collaboration with Area Development Districts and KIA to expand the Water Resource Information System maintained by KIA to enhance PWS infrastructure and financial planning
- Revising state regulations to improve TMF capacity at PWS
- Continuing collaborative working relationships with all stakeholders and other agencies to enhance regulatory programs and guidance; provide resources for best practices, workforce development, education, process improvement, and new technology; continue advocacy and funding for renewing aging water infrastructure through the SRF loan program; support funding of applied research and development in water technology, sustainability, security, quality, and infrastructure resiliency, and promote and protect water resources.

Report Availability

The 2020 Triennial Report to the Governor on Kentucky's Capacity Development Program for October 1, 2017 through September 30, 2020 is a requirement of the USEPA for primacy States and must be made public. The DOW makes this report available to the citizens of Kentucky by:

- Posting the report online at <http://water.ky.gov/DrinkingWater/Pages/CapDev.aspx>

Any comments, concerns or questions regarding this report may be directed to Russell Neal at 502-782-7026, or russell.neal@ky.gov.

Appendix A – Definitions

Capacity Development – A State effort to help drinking water systems improve their finances, management, infrastructure, and operations so they can provide safe drinking water consistently, reliably, and cost-effectively.

Community Water System – A Public Water System which serves at least 15 service connections used by year-round residents or regularly serves at least 25 year-round residents.

Financial Capacity – The ability of a Public Water System to acquire and manage sufficient financial resources to achieve and maintain compliance with the Safe Drinking Water Act.

Managerial Capacity – The ability of a Public Water System to conduct its affairs in a manner enabling the system to achieve and maintain compliance with the Safe Drinking Water Act.

Non-Community Water System – A Public Water System that is not a community water system. A non-community water system is either a “transient non-community water system” or a “non-transient non-community water system.”

Non-Transient Non-Community Water System – A Public Water System that is not a community water system and that regularly serves at least 25 of the same persons over 6 months per year.

Public Water System – A system for the provision to the public of water for human consumption through pipes or, after August 5, 1998, other constructed conveyances, if such system has at least fifteen service connections or regularly serves an average of at least twenty-five individuals daily at least 60 days out of the year. Such term includes: any collection, treatment, storage, and distribution facilities under control of the operator of such system and used primarily in connection with such system; and any collection or pretreatment storage facilities not under such control which are used primarily in connection with such system. Such term does not include any “special irrigation district.” A Public Water System is either a “community water system” or a “non-community water system.”

Sanitary Survey – An onsite review of the water source, facilities, equipment, operation and maintenance of a Public Water System for the purpose of evaluating the adequacy of such source, facilities, equipment, operation and maintenance for producing and distributing safe drinking water.

Small Water System – A Public Water Systems serving fewer than 10,000 people.

Technical Capacity – The physical and operational ability of a water system to meet Safe Drinking Water Act requirements.

Transient Non-Community Water System – A non-community water system that does not regularly serve at least 25 of the same persons over six months per year.