
Oklahoma Department of Environmental Quality

Capacity Development Program
Annual Progress Report to EPA
State Fiscal Year 2022



OKLAHOMA
Environmental
Quality

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1. Introduction

With the Safe Drinking Water Act (SDWA) Amendments of 1996, Congress put in place a variety of initiatives designed to assist public water systems in providing safe drinking water and complying with the terms of the Act. One of these was the capacity development (CD) initiative, established with the intent of focusing on those systems most in need of assistance, primarily small systems serving populations of 3,300 or less. CD is the process by which the State of Oklahoma assures that drinking water systems acquire and maintain the *technical, managerial, and financial* (TMF) capabilities to successfully operate.

All states are currently implementing state-specific CD programs tailored to meet water system needs. As required in Section 1420 of the Safe Drinking Water Act Amendments of 1996, the Oklahoma Department of Environmental Quality (DEQ) must submit an annual report of CD activities to the United States Environmental Protection Agency (EPA). This report reflects the efficacy of the State's CD Strategy by detailing improvements in the TMF capabilities of the State's public water systems. The annual CD progress report is available on DEQ's website, at <https://www.deq.ok.gov/water-quality-division/public-water-supply/capacity-development/>.

A *public water system* (PWS) is defined by the SDWA as a system that provides water via piping or other constructed conveyances for human consumption to at least 15 service connections or serves an average of at least 25 people for at least 60 days each year.

There are three types of PWSs:

1. Community Water Supplies (CWS) such as towns and rural water districts;
2. Non-transient non-community (NTNC) systems such as schools or factories; and
3. Non-community (NC) systems such as rest stops or parks.

The 1,334 PWSs in Oklahoma are characterized as follows:

Classification

- 900 community water systems;
- 77 non-transient non-community water systems;
- 357 non-community water systems;

Types of Primary Source

- 178 surface water;
- 719 groundwater;
- 7 groundwater under the direct influence of surface water;
- 346 purchase from surface water;
- 76 purchase from groundwater systems; and
- 8 purchase from groundwater under the direct influence of surface water systems.

DEQ has the statutory authority to ensure that all water supply systems will have adequate TMF capabilities prior to their construction in Oklahoma. For new systems, these capabilities are assessed via two DEQ regulatory directives. The first directive derives from Oklahoma Administrative Code (OAC) 252-626: Public Water Supply Construction Standards [<https://www.deq.ok.gov/asd/rules-and-regulations/attachment/626/>], which states that a PWS must receive a "Permit-to-Construct" from DEQ prior to initiating construction. The other directive requires all operators of a PWS to be licensed by DEQ, according to OAC 252:710: Waterworks and Wastewater Works Operator Certification Regulations [<https://www.deq.ok.gov/asd/rules-and-regulations/attachment/710/>].

2. Enforcement and Compliance Mechanisms

DEQ's CD program relies on the success of its enforcement and compliance programs. These two programs are partially funded through the Drinking Water State Revolving Fund (DWSRF) 10% State Program Management Set-Aside and 15% Local Assistance and Other State Programs Set-Aside. Funding information is detailed in DEQ's *Final Intended Use Plan, Drinking Water State Revolving Fund, State Fiscal Year 2022*. Note that Oklahoma's state fiscal year is from July 1 to June 30.

DEQ maintains a strong enforcement program. Systems with violations of SDWA requirements or with state PWS rule violations are referred to DEQ enforcement staff for analysis of the causes behind the violations and for correction. When it is determined that enforcement is needed, there are three main legal tools available to the agency to bring about compliance: Notices of Violation, Consent Orders, and Administrative Compliance Orders. Boil Orders, while not official enforcement actions, also play a role in protecting public health.

A **Notice of Violation** (NOV) is the first formal enforcement document issued to facilities upon failure to comply with SDWA or state PWS rules or regulations. NOVs address matters such as maximum contaminant level (MCL) violations, monitoring failures, improper operating procedures, or construction deficiencies. NOVs have short deadlines for compliance, typically between fourteen (14) and thirty (30) days from the date the water system receives the document.

If it is determined that a system is not likely to regain compliance by a NOV's deadline, the DEQ PWS District Engineer (DE) prepares a **Consent Order** (CO). A CO is a mutual agreement between DEQ and the affected system that cites the system's responsibilities, establishes a longer deadline for returning to compliance (with milestones and deadlines for major steps towards compliance), and specifies fines that may be levied against the system as a result of non-compliance.

An **Administrative Compliance Order** (ACO) is issued when time is limited and there is a significant health hazard, or when a water system refuses to agree to the terms of a CO. In an ACO, DEQ determines what tasks need to be completed and sets deadlines for the completion of these tasks. Both the CO and the ACO include stipulated penalties for failing to meet the required deadlines.

Boil Orders, while not enforcement actions themselves, are an additional tool used by DEQ to protect public health. These orders are issued to systems that have acute health risks or *E. coli* bacteriological violations. Boil Orders require immediate notification be made to all consumers informing them of how to protect themselves.

In calendar year 2021, DEQ issued 2,948 enforcement actions, which consisted of:

- 2,704 informal enforcement letters;
- 240 NOVs and COs;
- 0 Administrative Compliance Orders; and
- 4 Boil Orders.

A total of 1,318 systems were returned to compliance during calendar year 2021 (some systems returned to compliance more than once).

3. Capacity Development Program Section

The Capacity Development Section (CDS) implements the CD strategy in Oklahoma. The CDS is responsible for fostering the relationship among the various DEQ drinking water programs and between DEQ and other state agencies and organizations that are involved with supporting and assisting public water supplies. The CDS coordinates with the Oklahoma Water Resources Board (OWRB), Oklahoma Rural Water Association (ORWA), Communities Unlimited (CU), Southwest Environmental Finance Center (SWEFC), Oklahoma Municipal League (OML) and other agencies and organizations that provide TMF training and assistance to water systems. This ensures that open lines of communication exist between the entities and promotes cooperative and complementary efforts towards achieving water system sustainability. The overall goal is maintaining coordinated efforts towards increasing PWS TMF capabilities.

Table 1 lists the tools currently in use in Oklahoma to assess and enhance TMF capabilities.

Table 1: Oklahoma’s Capacity Development Tools.

Tool	<i>Technical</i>	<i>Managerial</i>	<i>Financial</i>
Construction Permitting	X		
PWS Enforcement	X	X	
Operator Certification	X	X	
SWAP	X	X	
AWOP	X	X	X
DWSRF	X	X	X
CD TMF Assessments	X	X	X
Sanitary Surveys	X		
Asset Management Training	X	X	X
Regionalization	X	X	X
FACT		X	X
Rate Studies			X
Water Loss Auditing	X	X	X

4. Water Quality Efforts and Participation

Regionalization and Consolidation

DEQ continued efforts to identify new and existing water systems that may benefit from **regionalization and/or consolidation** into larger water systems in SFY 2022. Systems were considered for regionalization/consolidation that:

- Have source water capacity limitations (drought),
- Are undergoing DEQ enforcement proceedings,
- Are considering giving away, selling, or abandoning the system, or
- Have expressed interest in regionalization or consolidation.

Creating combined distribution systems can enhance public health by providing all systems in the combined system with water that is more thoroughly tested and often more plentiful and reliable than they were able to produce on their own. While there were no regionalization or consolidation of PWSs in SFY 2022, DEQ continues to seek out small water supplies that are struggling with compliance and help them consider regionalization and/or consolidation, if appropriate for their situations.

Funding Agency Coordinating Team

The ***Funding Agency Coordinating Team (FACT)***, hosted by ORWA, is comprised of the following state and federal agencies and organizations:

- DEQ;
- Oklahoma Department of Commerce;
- OWRB;
- Indian Health Service;
- U.S. Department of Agriculture – Rural Development;
- Oklahoma Association of Regional Councils;
- CU;
- EPA;
- Bureau of Reclamation;
- Cherokee Nation; and
- Chickasaw Nation.

FACT meets quarterly to discuss the status of Oklahoma community water supplies identified in DEQ's enforcement list and to coordinate water and wastewater project funding. Before each meeting, invitations are extended to a few water and/or wastewater systems from across the state that are contending with severe problems and have the greatest *financial* need. Guests are invited for the purpose of helping them identify the best source of project funding as efficiently and effectively as possible.

With every public financing agency present at FACT, communication barriers are reduced and application processes are streamlined, resulting in rapid assistance. FACT provides a single uniform method for requesting funding and regulatory approvals, and it offers guides, checklists, and forms that are accepted by all FACT-participating agencies. DEQ has been a member of FACT since its inception in the early 1990s and has been instrumental in crafting an organization that helps to correct some of Oklahoma's most difficult to solve public water supply issues. The CDS is an important member of FACT and serves by offering TMF assistance to invited systems.

The assistance provided by FACT has been universally praised by invited water systems, which provide feedback by voluntarily completing a brief survey immediately following the FACT meeting and a follow-up survey a few months later. Survey responses are used to fine-tune the assistance provided by FACT and help plan the direction of subsequent FACT meetings.

5. Water Quality Programs

The ***Construction Permitting Program*** assures technical adequacy by reviewing water system engineering reports as well as construction plans and specifications. This technical review helps determine the sufficiency of the sourcewater and the water system infrastructure.

The ***PWS Enforcement Program*** also helps assure the technical capabilities of water systems by providing technical assistance and training to water systems on operations, maintenance, regulations, security, and more. Managerial capabilities are also addressed by providing training to water system managers.

The ***Operator Certification Program*** is charged with training and licensing persons working in water and wastewater facilities in the State. Programmatic oversight helps to ensure that operators have adequate *technical* training to properly treat and monitor drinking water supplied to the public. Also, with oversight from the DEQ Operator Certification section, ORWA provides study material and training for operators for all classifications of water facilities as well as *managerial* training for system managers and board members. The examinations for operators are administered by the ORWA by means of a DEQ contract, and during SFY 2022, 957 individual water operator exams and 171 water laboratory operator exams were given. Also, during SFY 2022, four public water supply systems were issued NOV's for not having an appropriately licensed operator. If operator license issues arise, DEQ makes these systems aware of training and testing opportunities that are available to them at little or no charge so that the water system is easily able to quickly rectify the issue.

In addition to the training offered by ORWA, training is available in classroom settings (taught by DEQ and other certified instructors/agencies) and via the internet several times during the year. Online classes and exams for operators and other environmental professionals are available at any place with an internet connection, which has included presentations over Asset Management presented by one of the members of the CD Staff.

The ***Source Water Assessment Program (SWAP)*** was designed in accordance with the SDWA Amendments which require development and implementation of a SWAP to analyze existing and potential threats facing the public drinking water sources throughout the state. DEQ developed this program utilizing EPA's Source Water Assessment and Protection Programs Guidance.

SWAP includes the following:

- Delineation of the Source Water Protection Area,
- Inventory of the Potential Sources of Contamination,
- Determination of susceptibility of the water to contamination from the inventoried sources, and
- Release of the results of the assessment to the public.

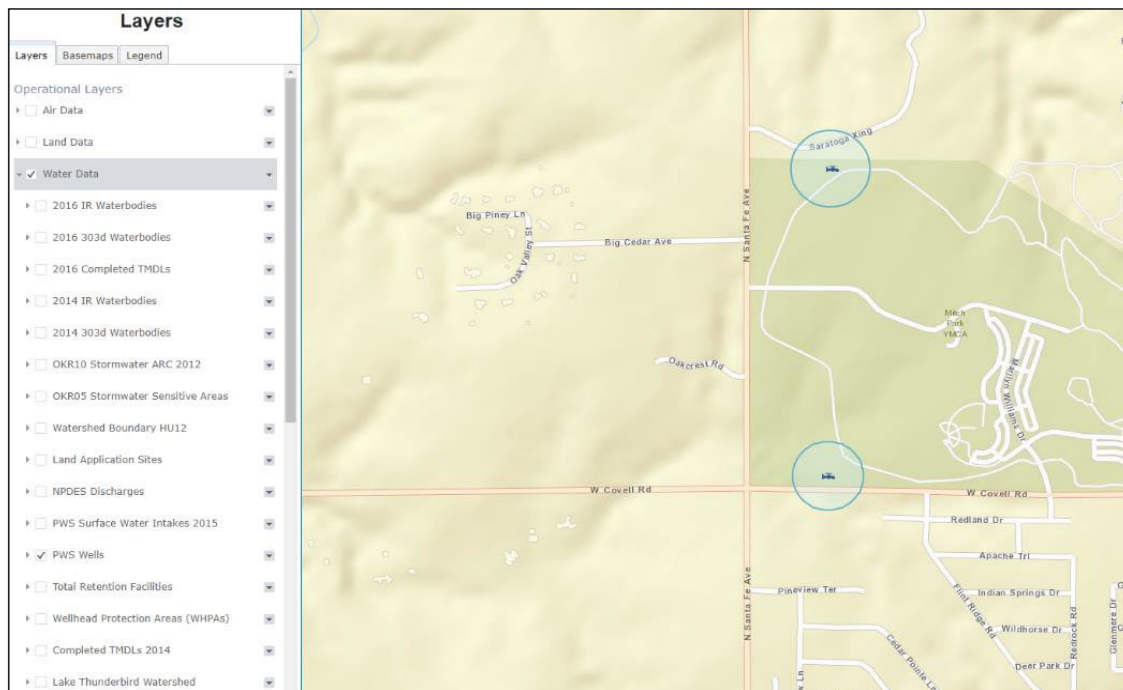
The data collected from a SWAP report is summarized in the water system's annual Consumer Confidence Report, which identifies the system's vulnerability and susceptibility score. This report is available for public review.

The SWAP program is currently under redevelopment in which a large focus has been on collaboration with other departments and organizations to ensure the accuracy of the inventoried sources of contamination. DEQ is looking to expand the data gathered to comprise a larger database of all potential sources of contamination as well as staying up to date on all issues that may arise regarding threats to the quality of our state's source water, including information on reported fish kills, superfund and Department of Defense (DoD) clean-up efforts, and other issues that may arise.

Also in development is a way to communicate recommended preventative measures to water systems tailored to the inventory of sources from the SWAP report and aid systems in locating funding sources for source water protection (SWP) projects. DEQ will educate water systems on the application processes for the Clean Water State Revolving Fund (CWSRF) program with OWRB, the DWSRF program through DEQ, and help systems to be aware of any grant programs or other sources of funding that may be beneficial for their project.

Visual tools are also integral in communication of SWP. Once data collection is complete, it will be used to create a map showing SWP zones around public water supply sources. Figure 1 below is an example of a map produced with various input layers indicating SWP zones around wells.

Figure 1: Sample map indicating location of well and wellhead protection areas.



Currently, the DEQ website has an interactive GIS map that utilizes some of the SWP data. DEQ regulated discharges, wells, surface intakes, and other planning information can be found using this map. In development is a localized GIS map that will contain all the potential contamination sources as well as all relevant watershed data made available to DEQ. This should allow DEQ to better monitor the source water in the state, prioritize watersheds based on data, and provide easy access to water systems to see what sources of contamination are near their source water. This map will also be made available to the public once it is completed.

The *Area-Wide Optimization Program (AWOP)* was piloted in April of 1999 in Oklahoma by EPA Region 6. This program started as a multi-state effort to optimize particle removal and disinfection capabilities of filtration at conventional water treatment plants. The goal of AWOP is to maximize public health protection from disease-causing microbial contaminants by identifying performance problems in the water treatment and distribution system. Water systems having the most trouble with their filtration treatment are identified and prioritized in terms of their need for assistance. Following the AWOP model is one of the most cost-effective and economical ways a PWS can improve their ability to produce safe drinking water.

EPA Region 6 and Process Applications, Inc. in Fort Collins, CO, have assisted in the development of AWOP. The states of Arkansas, Louisiana, New Mexico, Oklahoma, and Texas are participants in the EPA Region 6 AWOP group, and a larger AWOP “super” group has been created with states from Region 7 (Missouri, Iowa, and Kansas). DEQ continues its involvement in AWOP by attending quarterly regional and biennial national meetings and by participating in and hosting multi-state comprehensive performance evaluations (CPE) and training workshops.

From 1997 through the end of SFY 2022, DEQ has conducted 25 optimization and six mandatory CPEs of water systems in the state. The original scope of the CPE effort was and continues to be to assist the community and to train operators and engineers in understanding the intricacies of optimizing water treatment. A CPE provides analysis of the facility’s design capabilities and a system’s administrative, operational, and maintenance practices, leading to a report that addresses the TMF aspects of the water system. Following the CPE, the participating water system receives a report within 60 days from DEQ that outlines factors that may influence the optimization of its treatment operations.

While traditional CPEs focused on turbidity and disinfection at conventional surface water treatment plants, AWOP has expanded CPEs to assist in addressing issues like disinfection byproducts, harmful algal blooms, groundwater issues, and more. Oklahoma DEQ representatives from the Capacity Development, Engineering and Enforcement, and Compliance sections are attending a multi-state distribution CPE in Louisiana in October 2022. Oklahoma has not performed a distribution CPE but hopes through the collective efforts of those in attendance, one can be performed in SFY 2023.

Oklahoma has been finding ways to further the incorporation of TMF concepts in the CPE process, with a focus on bolstering the administrative review with elements from the capacity development program, including TMF assessments, water loss audits, and future plans to include asset management and emergency response plans.

Oklahoma also has an AWOP Awards Program, which water systems sign up to participate. This program encourages water systems to go above and beyond regulations to meet optimized goals set by the state. The water systems are recognized for their efforts with plaques, trophies, flags, signs, and more. The image below includes a summary of the program.

Image 1: AWOP Awards Poster



The *Drinking Water State Revolving Fund Loan Program* was established by the 1996 SDWA Amendments, which allowed EPA to make a capitalization grant to Oklahoma to fund the DWSRF loan program. This program, co-managed by DEQ and OWRB, is dedicated to providing low-interest loans to upgrade public water system infrastructure. It is designed to help those in greatest need based on a priority system that places a primary emphasis on drinking water quality. DWSRF Project Engineers assure the *technical* capabilities of water systems by reviewing engineering reports on proposed construction projects. Borrowers also receive *technical*, *managerial*, and *financial* assistance from the CDS, who conducts a capacity development assessment and water loss audit on each borrower as well as reviews emergency response plans and asset management plans, providing assistance and guidance to correct any found deficiencies.

Currently, 95 water systems are on the DWSRF PPL for a total of over \$1,240,522,668 in projects to be funded within the next few years. DWSRF applicants are assisted throughout the planning, design, bidding, contracting and construction phases of the project by DEQ engineers, environmental specialists, and the CDS. Applications for the DWSRF program are accepted anytime throughout the year.

From 1998 to the present, the program has entered into binding commitments totaling over \$1,980,767,537 to fund a total of 248 water system upgrades. In addition to funding infrastructure improvements, the program funds the CD Baseline Assessment Project, lab equipment in the State Environmental Lab, Small System Technical Assistance, SWAP, water loss auditing and leak detection programs, and the PWS Program (partial funding).

In SFY 2022, the DWSRF provided subsidies in the form of principal forgiveness to public water supplies with health-based violations or that serve disadvantaged communities. The total amount of subsidies given for health-based violations was determined by the FY 2021 Capitalization Grant. For SFY 2022, the DWSRF committed \$1,726,561.43 in health-based subsidy to eight systems, and \$593,398 in disadvantaged subsidy to seven systems.

During SFY 2022, DEQ revised the Intended Use Plan to further promote awarding the remaining subsidy funds to projects that were ready to proceed during the fiscal year. In addition to the amounts above, DWSRF provided \$6,709,222.07 in regular subsidy funds to ten systems, and an additional \$715,250 in disadvantaged subsidy funds to eight systems.

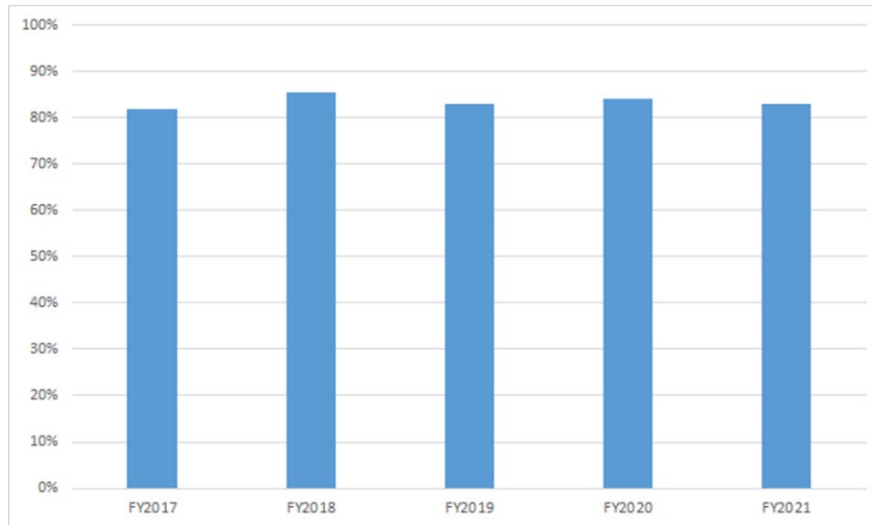
The PWS *Sanitary Survey Program* is implemented by DEQ, in cooperation with EPA Region 6, and in the course of conducting inspections, field staff from the Environmental Complaints and Local Services (ECLS) Division of DEQ and the WQD of DEQ provide technical assistance to PWS system personnel in resolving compliance issues. Across the state, ECLS staff members inspect all water systems annually. In SFY 2022, 221 sanitary surveys were conducted by ECLS and WQD staff, and 952 primacy site inspections were completed by ECLS.

6. Challenges to Oklahoma's Capacity Development Strategy

Mile for mile, Oklahoma offers the nation's most diverse terrain. It is one of only four states with more than ten ecoregions and has by far the most changes in ecoregions per mile in America. Oklahoma's ecoregions, terrains, and sub-climates include everything from Rocky Mountain foothills to cypress swamps, from tallgrass prairies to hardwood forests, and pine-covered mountains. Each is graced with wide blue lakes, tumbling freshwater rivers, and peaceful country streams. Additionally, there is one man-made type of terrain: urban turf. This variety of ecoregions creates source waters with a correspondingly wide range of quality and conditions. This variability in source water quality creates a correspondingly variety of treatment challenges for public water supplies.

EPA sets national limits on contaminant levels in drinking water to ensure that the water is safe for human consumption; these limits are known as maximum contaminant levels (MCL). For some regulations, EPA establishes treatment techniques (TT) in lieu of a MCL to control unacceptable levels of contaminants. Figure 2 shows the yearly trend in the percentage of systems in Oklahoma reporting no MCL or TT violations.

Figure 2: Percent of Systems Reporting No Violations



The State of Oklahoma’s PWS Program currently oversees 1,334 active entities that meet the federal definition of a PWS. Of these, 1,146, or approximately 86% of PWSs, reported no MCL or TT violations. Table 2 shows breakdown of the 14% of PWSs with violations for CY 2021.

Table 2: CY 2021 Violation Breakdown

Contaminant	MCL, TT, or Monitoring	Number of violating PWSs	Number of Violations
Arsenic	MCL	3	13
Arsenic	Monitoring	3	3
Inorganic Chemical	MCL	3	13
Inorganic Chemical	Monitoring	7	10
Nitrate	MCL	22	47
Nitrate	Monitoring	87	118
Synthetic Organic Chemical	MCL	0	0
Synthetic Organic Chemical	Monitoring	35	738
Volatile Organic Chemical	MCL	0	0
Volatile Organic Chemical	Monitoring	14	800
Radionuclides	MCL	4	5
Radionuclides	Monitoring	14	160
Disinfection Byproducts	MCL	155	819
Disinfection Byproducts	TT	17	36
Disinfection Byproducts	Monitoring	188	465
Revised Total Coliform Rule	Acute MCL	1	2
Revised Total Coliform Rule	Monitoring	298	634
Surface Water Treatment	TT	13	60
Surface Water Treatment	Monitoring	24	92
Lead and Copper	TT	0	0
Lead and Copper	Monitoring	38	53
Groundwater Rule	TT	0	0
Groundwater Rule	Monitoring	27	42
Public Notice, failure to perform		18	176
Consumer Confidence Report, failure to distribute		87	97

Per Section I of The State of Oklahoma Capacity Development Strategy, DEQ ensures that new systems have TMF capabilities to provide safe and affordable drinking water. All new systems are referred to the CDS, who then assesses the system's TMF capabilities. The CDS then ensures that the system has an appropriately certified operator, notes the dates of sanitary surveys/inspections, determines if plans and specifications were submitted to and approved by DEQ, and makes TA referrals as indicated. A total of six (6) new or newly discovered water systems were identified by DEQ in SFY 2022, two (2) community one (1) NTNC, and three (3) NC. The Capacity Development Section is working to provide TMF assistance to all of these new PWSs.

7. ETT Implementation

At the direction of EPA, DEQ has implemented an Enforcement Response Policy and Enforcement Targeting Tool (ETT) aimed to identify PWS systems with health-based violations as opposed to the previous approach, where all the significant non-compliance (SNC) systems were treated equally regardless of the severity of the violation.

This approach utilizes the ETT formula as a basis for determining a PWS's enforcement priority points. It will also be used to help identify and prioritize systems for enforcement response. In the formula, violations that pose a greater risk to public health are given greater importance. The formula calculates a score for each system based on open-ended violations and violations that have occurred over the past five years but does not include violations that have returned to compliance or are on the "path to compliance" through a specified enforcement action.

Under this policy, violation types are "weighted" with points being assigned for each violation type based on its threat to public health. Points for each "unaddressed" violation are added together to provide total score for each water system. Water systems whose scores exceed "11" are considered priority systems for enforcement unless the violations can be returned to compliance within six months.

The Capacity Development Section and the PWS Compliance Section track new community, NTNC, and NC systems that appear on the ETT list during their first three years of operation, providing them with technical assistance aimed at getting them back into compliance.

ETT scores for PWS systems are available at <https://echo.epa.gov/>.

8. Program Initiatives

Water Loss Auditing and Control

Since 2015, DEQ has worked to standardize and promote water loss auditing across the state by the use of the M36 Water Loss Audit Method developed by the American Water Works Association (AWWA). The program has had continuous success tracking and identifying sources of loss and non-revenue water across the state using this scientifically sound, repeatable, and comparable method.

An M36 method water loss audit quantifies volumes and values of real and apparent water losses from a distribution system. Real loss is defined as water that escapes the water distribution system through leakage, breaks, hydrants, and storage overflows. This loss is water that is considered as finished water

but is never delivered to customers and results in increased operational costs and stress on source water supplies. Apparent loss is revenue lost due to customer meter inaccuracies, billing system data errors, and/or unauthorized consumption. It is water that *could* have been sold, resulting in lost revenue for the system and distorted production and consumption data.

An M36 method water loss audit also determines the volumes and values of revenue and nonrevenue water that a PWS is producing. Revenue water is the water that a system sells to customers. The amount of revenue water a system can deliver has a direct impact on its ability to pay for operations, make debt obligations, and provide for capital improvement and emergency response funding. In contrast, nonrevenue water is the sum of the real and apparent losses occurring at a system as well as all unbilled authorized usage, such as water used for municipal buildings, parks, swimming pools, irrigation, firefighting, and system flushing. Unbilled authorized usage is a necessity; however, these amounts can become excessive if not tracked. A water loss audit is often the first time many PWS systems become aware of the impact of unbilled authorized usage and can begin controlling it.

Figure 3 below summarizes the volumes and percentages of water use and loss from the 261 systems across the state that have participated in the water loss auditing and control program.

Figure 3: Summary Water Balance (gallons per year identified)
(±15,000 gallons)

Volume from Own Sources: 265,251,003,000	Water Sold as Exports: 7,134,024,000	Authorized Consumption: 49,034,065,000	Billed Authorized Consumption: 46,172,732,000	Billed Metered Consumption: 46,235,515,000	Revenue Water: 46,296,766,000
	Water Supplied: 265,825,092,000			Billed Unmetered Consumption: 43,347,000	
		Water Losses: 13,505,872,000	Unbilled Authorized Consumption: 2,846,459,000	Unbilled Metered Consumption: 1,447,259,000	Non-Revenue Water: 16,326,958,000
			Apparent Losses: 1,440,110,000		
Real Losses: 12,189,832,000	Customer Metering Inaccuracies: 1,167,952,000	Unauthorized Consumption: 156,374,000			
		Systematic Data Handling Errors: 124,848,000			
Water purchased as Imports: 6,904,071,000			Water Main Leaks, Storage Overflows, Customer Service Line Leaks: 12,189,832,000		

Apparent Losses

As defined earlier, apparent loss is water lost due to customer meter inaccuracies, billing system data errors, and/or unauthorized consumption. It is water that could have been sold and contributes to revenue loss, distorted production, and consumption data. Annually, apparent losses account for a smaller percentage of total water loss than real losses (see Table 3); however, apparent losses still represent a significant loss of revenue to most systems participating in the audit, costing on average \$35,675.00 per year per audited system and \$8.99 million for the group. Apparent loss figures are summarized in Table 3, below:

Table 3: Apparent Losses

	Minimum	Maximum	Average	Total
Annual Apparent Loss:	0.019 MG/Yr	98.44 MG/Yr	5.56 MG/Yr	1,440.110 MG/Yr
Annual Cost of Apparent Loss:	\$149.00	\$683,393.00	\$35,675.00	\$8,990,182.00
Unauthorized Consumption	0 MG/Yr	10.233 MG/Yr	0.60 MG/Yr	156.374 MG/Yr
Customer Metering Inaccuracies	0 MG/Yr	78.98 MG/Yr	4.49 MG/Yr	1,167.952 MG/Yr
Systematic Data Handling Errors	0 MG/Yr	12.592 MG/Yr	0.48 MG/Yr	124.848 MG/Yr

Real Losses

Real loss is defined as water that escapes the water distribution system through leakage, breaks, hydrants, and storage overflows. This loss is water that is treated but is never delivered to customers and results in increased operational costs and stress on source water supplies. Overall, real water loss is the largest category of water loss observed from the audited systems, costing on average \$69,161.19 per year per audited system. This totals over 12 million gallons per year in identified loss. Real water loss is composed of three types of loss: water main leaks, storage area overflows, and leaks on customer service lines (portions that are the responsibility of the system). The AWWA software is not detailed enough to break down real water loss into these three categories and simply reports the amount as a total of all three.

The AWWA software did, however, provide several performance indicators that detailed the volume, cost, and relative magnitude of real water loss. These are summarized in Table 4, below:

Table 4: Real Losses

	Minimum	Maximum	Average	Total
Current Annual Real Losses	0.138 MG/Yr	954.377 MG/Yr	47.22 MG/Yr	12,189.832 MG/Yr
Annual Cost of Real Loss (Valued at Variable Production Cost)	\$19.00	\$3,190,026.02	\$69,161.19	\$16,391,201.59

Leak Detection, Meter Analysis, and Loss Correction

Conducting water loss auditing with the AWWA M36 method has improved understanding of real and apparent losses at participating systems; however, this is only the first step towards the ultimate goals of reducing water loss and retaining system revenue. The next step, intervention, takes the results gained from the water loss audit and uses it to guide efforts to find the specific sources of water loss and to implement solutions. This section summarizes the efforts of the technical assistance program performed by DEQ and ORWA which focused on conducting leak detection and meter analysis at PWS systems where an AWWA M36 water loss audit has indicated that significant problems with real and/or apparent loss may exist.

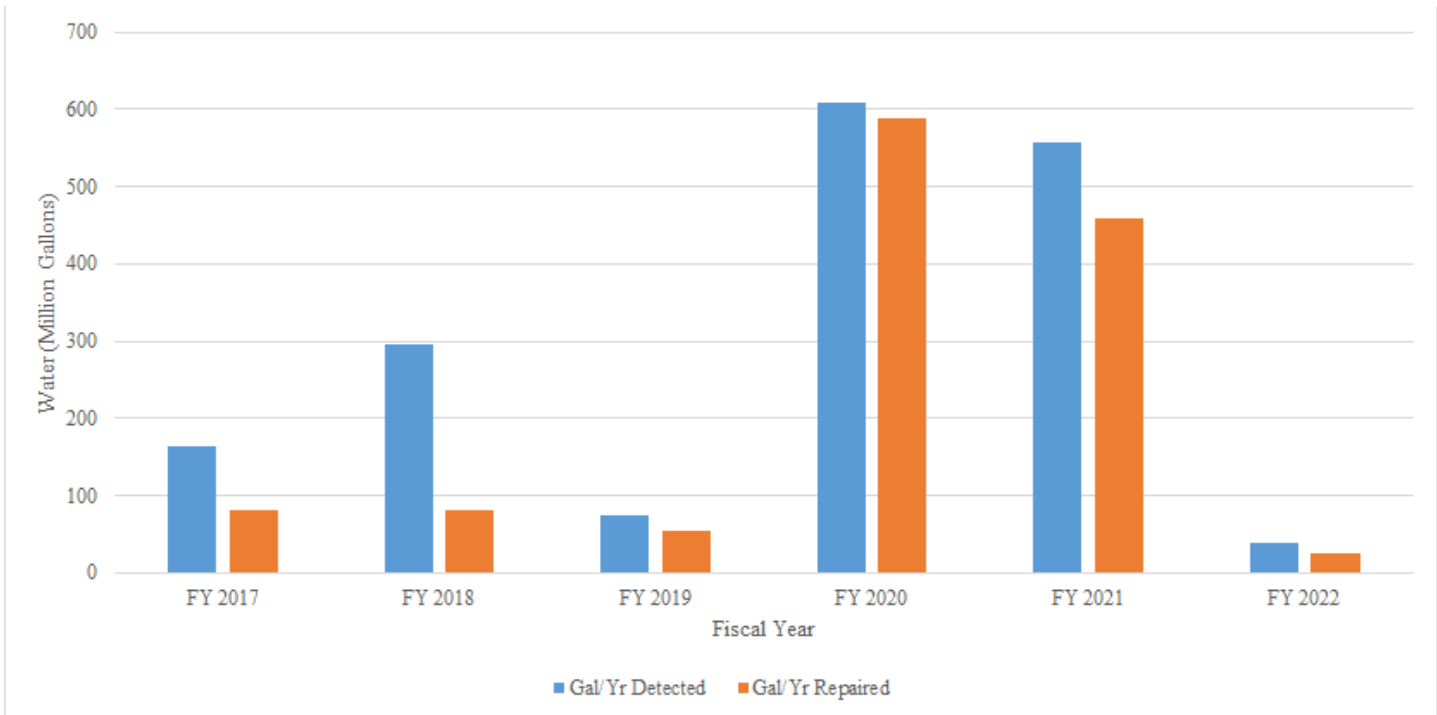
PWS systems that participated in the water loss auditing pilot project and met the criteria of either nonrevenue water (as % of supply) greater than 20% or having apparent loss of greater than 10 gallons per connection per day (or both) qualified for leak detection and/or meter analysis technical assistance from ORWA. Participation in the technical assistance project was driven by the level of interest of the PWS in receiving the help (meaning that the system would benefit from the technical assistance in proportion to the level of effort and interest that the system contributed to the program).

For systems that chose to participate, ORWA met with system personnel, reviewed the results of the water loss audit, and then coordinated an in-depth schedule of leak detection and meter analysis help. The typical technical assistance event took place over 2-3 weeks and involved locating leaks, analyzing meters and training PWS staff how to conduct their own leak detection and meter analysis. Following the completion of this technical assistance effort, participating systems receive a detailed report indicating the location, volume, and value of all identified leaks. Systems are encouraged to act on the information provided and make repairs where possible. Table 5 shows six-year summary of PWSs receiving technical assistance following a water loss audit, and Figure 4 depicts gallons per year of leaks detected and repaired.

Table 5: Leak Detection six-year summary

	FY2017	FY2018	FY2019	FY2020	FY2021	FY2022	Total
Systems receiving leak detection help	7	12	5	5	9	6	44
Systems receiving customer meter analysis help	6	2	4	0	0	0	12
Total # leaks detected	36	52	28	52	103	19	290
Gal/yr leaks detected	163,510,176	296,427,081	73,592,064	607,588,637	557,503,689	38,131,056	1,736,752,703
Value/Yr of detected leaks	\$460,188	\$574,155	\$235,508	\$822,056	\$1,649,730	\$108,393.40	\$3,850,030.40
Total # leaks repaired	18	12	25	43	71	10	179
Gal/yr leaks repaired	81,755,087	82,490,000	54,662,400	589,350,024	458,467,200	25,497,360	1,292,222,071
Value/Yr of leaks repaired	\$230,094	\$176,316	\$165,575	\$779,745	\$1,457,581	\$71,215.80	\$2,880,526.80

Figure 4: Gallons per year of Leaks Detected and Repaired



In total, 44 systems have received leak detection help from the ORWA, where, together, they have identified 290 leaks estimated at 1,736,752,703 gallons/year. Of the 290 leaks identified by ORWA, 179 of them have been repaired by the systems. These repairs have recovered an estimated 1,292,222,071 gallons of water per year valued at an estimated \$2,880,526.80 per year.

The amount of saved revenue has shown real, immediate, and positive impact, even saving at least one system from the brink of bankruptcy. Additional benefits seen by systems that have participated in the program are increased financial capacity, continued loss reduction, and better operational knowledge and decision making.

Also, DEQ will continue to build on the success of the water loss auditing and control program by performing additional water loss audits at PWS systems that request the help and by continuing funding for ORWA’s work conducting leak detection and meter analysis technical assistance. In contrast to other states where water loss auditing and control is involuntary, these methods can obtain significant cooperation and meaningful results via voluntary participation and free technical assistance, which can be seen in the results.

Capacity Development Baseline Assessment

In 2017, DEQ began work on a project to assess the TMF capacity of small municipal PWSs and rural water districts in Oklahoma. Named the Capacity Development Baseline Assessment, the project was designed to develop a clear concept of state-wide TMF needs, to determine which systems are most in need of help, and to delineate the unique set of needs faced by each system. The project functions by conducting capacity development assessments at all municipal PWS systems and rural water districts in Oklahoma serving 10,000 or fewer people. By using the capacity development assessment tools developed

by DEQ and used originally for assessing DWSRF borrowers and newly created systems, a clearer picture of the TMF sustainability needs across the state was gained.

The baseline capacity development assessment project was implemented as a cooperative venture between the WQD and the Environmental Complaints and Local Services (ECLS) Division at DEQ. To complete the large number of assessments required in this project, a group of local ECLS inspectors were called up to conduct the assessments with PWS system personnel. Given that ECLS inspectors are the DEQ personnel that PWS systems see most frequently, relationships and trust were already established and a framework for efficient completion of the project already existed. This project capitalized on this framework to conduct the assessments.

The results of this project allowed DEQ staff to identify trends and correlations within the data including the state-wide average assessment score and the greatest issues affecting a significant proportion of Oklahoma water systems. As of June 30, 2022, there have been 1,066 Capacity Development Assessments completed. Additional details about the participating PWSs are in following tables and figures.

Table 6: Summary Characteristics of Audited Community Water Systems

Total Number of CDAs Completed (as of 6/30/2022):	1,066
Average Score:	78.19%

Results of the 1,066 completed assessments indicate that, on average, water systems have 78.19% of the necessary TMF capacity to achieve sustainability. This means that assessed systems are missing approximately one quarter (21.81%) of the items, procedures, policies, and resources needed to achieve maximum ‘sustainability’ based on the assessment. The range of assessed values are shown in Figure 5.

Figure 5: Score Range of Assessed Systems

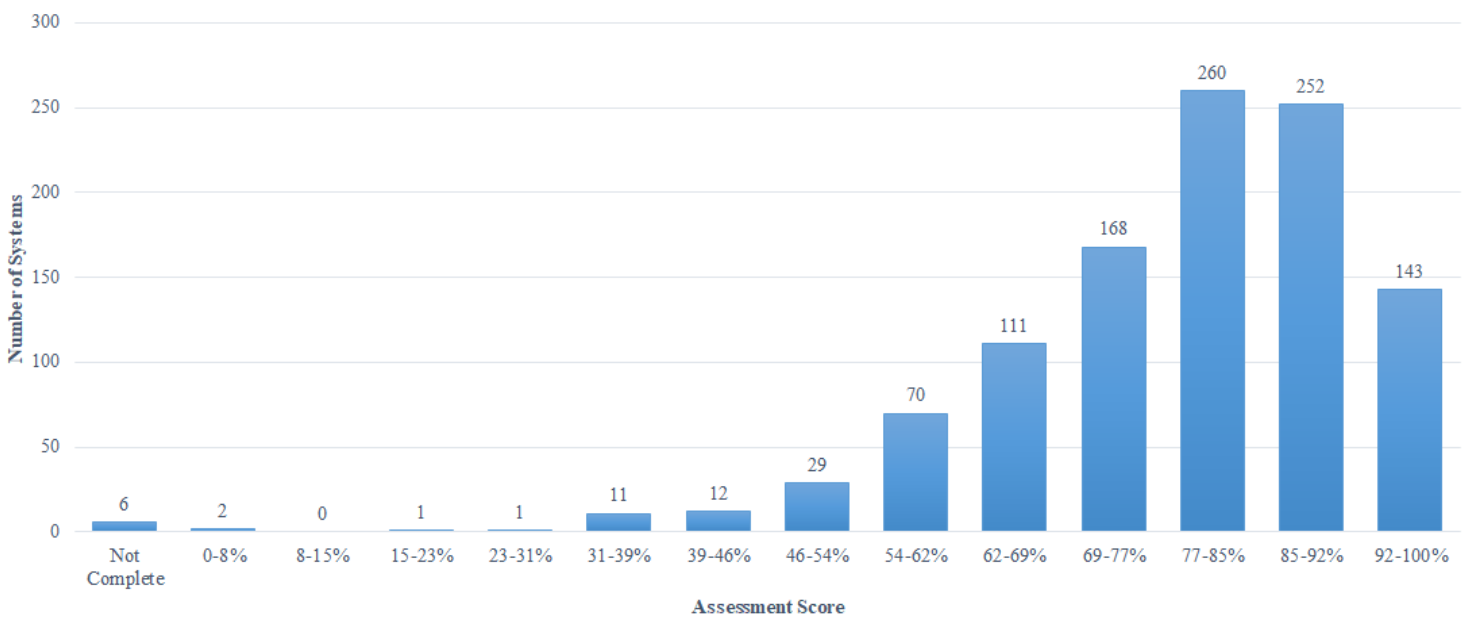
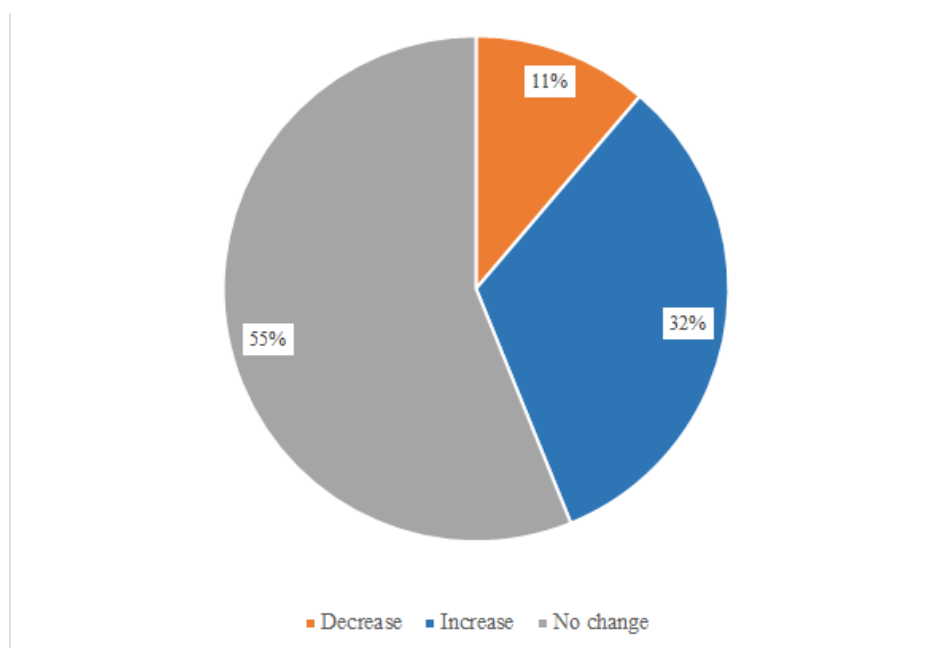


Table 7: Ten Most Common TMF Issues

Percentage of systems without	TMF Capacity Issue
77.59%	Without SoonerWarn (Mutual Aid).
67.03%	Do not conduct an energy audit on regular basis.
59.16%	Have no written plan to eliminate dead ends in distribution system when feasible.
57.87%	System has no written plan to acquire additional water rights to meet future increases in demand.
54.09%	System has not conducted a risk assessment (EPA VSAT or other method) or an emergency response plan (ERP) and has not certified with EPA that both steps have been completed. ERP must be reviewed and practiced annually.
52.80%	System has no written plan to respond to and address deficiencies noted on sanitary surveys or other inspections.
51.19%	Operations & Maintenance plan is not regularly reviewed by board.
50.11%	Does not track water loss yearly with AWWA M36 Method.
45.47%	No Operation and Maintenance Plan available and regularly updated, detailing all aspects of operating the water system.
44.72%	No written plan to regularly test backflow preventers.

Since the completion of the Baseline Assessment Projects, DEQ and ECLS staff have made an effort to follow up with systems who completed their initial capacity development assessment in order to evaluate the effectiveness of the assessment and the technical assistance provided to the systems who have requested help. So far, 423 follow-up capacity development assessments have been conducted. The follow-ups have yielded the follow results listed in Figure 6:

Figure 6: Follow Up Changes in Capacity Development Assessment Scores



An overview of the baseline capacity development assessments yielded the following three conclusions:

1. Of the TMF issues surveyed, the top ten issues are technical issues.

All of the top ten issues were found to be in the technical section of TMF capacity. Specifically, two out of the top ten were issues related to Operation & Maintenance (O&M). The two O&M aspects that systems tend to lack most include: lack of a plan that is regularly updated and plans that are not reviewed on a regular basis by the board. A complete and up-to-date O&M plan is critical to PWS system sustainability and should cover all aspects of system operations, including being both thorough and straight-forward enough so that an operator who is not familiar with a PWS system could operate it and produce safe water in an emergency. O&M plans are also excellent tools to train new staff and to document and preserve institutional knowledge concerning system operations. PWS governing boards are encouraged to review O&M plans at least annually to become familiar with system operational challenges and to develop a knowledge base for making accurate strategic and financial decisions.

2. Capacity development assessment score relates to system population.

Assessment score and water system population showed a slight positive correlation suggesting that higher scores correspond to higher populations. Systems with higher populations have access to more funding and other resources allowing for higher levels of sustainability. Systems serving smaller populations may have lower assessment scores due to issues such as having a volunteer staff, a smaller revenue base, or less ability to access needed professional services. This finding reinforces that TMF sustainability assistance should be primarily directed towards PWS systems serving smaller populations in rural areas.

3. Operators leaving or retiring has a major impact on the over sustainability of a system.

There are multiple factors that contribute to the small percentage of systems whose capacity development assessment score has decreased over time. One of the biggest influences on decreasing scores has been identified as employee turnover within the systems. Many of the small systems that are assessed by DEQ have one operator who has run the system for many years, often taking on many different responsibilities within their community. As those employees retire or leave their systems the institutional knowledge carried by that employee is lost, making written plans and policies even more valuable.

Asset Management

Asset management is the practice of operating a PWS so that the cost of owning and operating infrastructure capital assets is minimized while delivering the service level that satisfies customers. Termed “applied common sense” by the water industry, it is a means of operating a system that maximizes efficiencies and maintains sustainability, allowing a system to provide safe water at an affordable cost indefinitely.

An asset management plan is built around 5 core components:

- Building an asset inventory,
- Determining a target level of service,
- Determining criticality of assets,
- Calculating life cycle costing, and
- Developing a long-term funding plan.

Building an asset management plan that follows these core components guides systems toward obtaining the longest and most efficient use of infrastructure possible while ensuring customers receive the quality of service they expect from the system.

America’s Water Infrastructure Act (AWIA) of 2018 requires that states amend their capacity development strategies to include a description of how the state will encourage the development of asset management plans at PWS systems. The Capacity Development Section has completed a revision of the state’s strategy, which now includes the promotion of asset management best practices and details the training and technical assistance that the agency will provide. The strategy revisions focus on providing training seminars, one-on-one assistance, and providing for 3rd party asset management plan development via the ORWA technical assistance contract.

Also, because no low-cost/free option existed, the Capacity Development Section developed an asset management tool that is available to any Oklahoma PWS system, free of charge. The Microsoft Excel-based tool assists systems in cataloging assets, determining the likelihood and consequence of failure, and exploring timeframes and funding options for asset replacement. In SFY 2022, DEQ Capacity Development staff assisted with the completion of 13 Asset Management Plans for systems using the free tool created by the section. Improvements continue to be made to DEQs Asset Management Tool. Figures 7, 8, and 9 show examples of some of the improvements made to the asset management tool.

Figure 7: Asset Management Plan Data Collection Page

ID. Number	Category	Type	Size	Description	Location	Installation Date	Installation Estimated?	Current Condition	Repair and Maintenance History	Estimated Year of Failure	Life Expectancy
MeFl-2020-2	Meter	Flow	6"	Mag meter	at WTP	2020	<input type="checkbox"/>	Good		2032	10.00
MeFl-2017-1	Meter	Flow	6"	Turbine	at WTP	2017	<input type="checkbox"/>	Good		2029	7.00
TrCh-2018-1	Treatment	Chlorination	200 gal	Tank	at WTP	2018	<input type="checkbox"/>	Good		2034	12.00
TrCh-2018-2	Treatment	Chlorination	200 gal	Tank	at WTP	2018	<input checked="" type="checkbox"/>	Good		2034±5	12.00

Figure 8: Current Predicted Cost Data Calculation in the Asset Management Plan

The value of a dollar (in comparison to 1913) is found for the year of purchase and the current year (2022).	The difference in the dollar values between 2022 and the year of purchase is found, then divided by the dollar value for the year of purchase. This calculates the inflation rate between the years.	The inflation rate is then multiplied by the initial price. This gives the amount of dollars added over the years.	The extra dollars are then added to the initial price to find the cost to purchase in 2022.	Find the complete calculation below:
1913: \$1 = \$1 2022: \$1 = \$29.40 Year of purchase: \$1 = x	$\frac{\$29.40 - x}{x} = r$	$r \times \text{initial price} = \$ \text{ added}$	$\$ \text{ added} + \text{initial price} = \text{Cost to purchase in 2022.}$	$\left(\frac{\$29.40 - x}{x} \times \text{initial price}\right) + \text{initial price} = \text{Cost in 2022}$

Figure 9: Future Predicted Cost Data Calculation in the Asset Management Plan

The inflation rate for 2022 is found using the most recent data from the U.S. Congress Joint Economic Committee.	The difference in years between 2022 and the estimated year of failure is found.	The inflation rate is multiplied by the difference in years, as well as the cost to purchase in 2022. This gives us the amount of dollars added past 2022.	The dollars past 2022 are then added to the cost of purchase in 2022 to find the estimated price in the year of failure.	Find the complete calculation below:
"Core" CPI Inflation for 2022 = 4.9%	$2022 - \text{Year of Failure} = Y$	$0.049 \times Y \times \text{Cost in 2022} = p$	$p + \text{Cost in 2022} = \text{Price in Year of Failure}$	$(4.9\% \times \text{Year of Failure} \times \text{Cost in 2022}) + \text{Cost in 2022} = \text{Price in Year of Failure}$

Figure 10: Consequence of Failure Calculation in the Asset Management Plan

For each question within this section, a score is assigned depending on the answer. This score is a sum of the individual question scores					
Consequence of Failure (CoF) Score	Yes back-ups = +0 No back-ups = +1	<u>Loss of water</u> 0-25% = +0.5 26-50% = +1 51-75% = +1.5 76-100% = +2	Yes compliance violations = +1 No compliance violations = +0	Yes health/environmental concerns = +1 No health/environmental concerns = +0	Sum of questions = Consequence of Failure Score
For each question within this section, a score is assigned depending on the answer. This score is a sum of the individual question scores					
Probability of Failure (PoF) Score	Yes in last 1/3 of life = +1 Not in last 1/3 of life = +0	Above capacity = +2 At capacity = +1 Below capacity = +0	Yes additional maintenance = +1 No additional maintenance = +0	Yes increased maintenance = +1 No increased maintenance = +0	Sum of questions = Probability of Failure Score
Criticality Score	Consequence of Failure Score x Probability of Failure Score = Criticality Score. Max = 20				

In response to the amendments to Section 1420 of SDWA brought about by Section 2012 of the America’s Water Infrastructure Act (AWIA), DEQ’s CD section will increase efforts toward promoting and supporting the implementation of Asset Management (AM) at the state’s PWS systems. To further support AM training, DEQ intends to explore additional training and technical assistance avenues in the state for water systems. Additionally, DEQ will be developing a process to measure the success of the implementation of these plans and revise accordingly to achieve successful results.

Lead Testing in School and Child Care Program Drinking Water Grant Program

Starting in early 2020, the Capacity Development Section began implementation of a program aimed at reducing or eliminating lead from the drinking water in public schools and public or private childcare centers. Using funding appropriated by the Water Infrastructure Improvements for the Nation (WIIN) Act Section 2107, the Lead Testing in Schools and Child Care Program (or LWSC for short) offers free and voluntary lead testing of drinking water outlets to any Oklahoma public school or public/private childcare center that requests to participate, along with direction on how to address high lead levels based on EPA’s “3Ts” guidance.

In the past, lead was a common component of faucets and water supply plumbing. If the water transported and delivered by such plumbing is corrosive, lead can leach out from the lines and fixtures and enter the water exposing anyone using the water to lead. Lead is a toxic metal that is harmful to all humans, and no level of lead in the body is considered safe. Children are at particular risk of adverse health effects from lead, including nervous system damage, learning impairment, bone development problems, hearing damage, and anemia. The LWSC program aims to protect the health of children by reducing or eliminating children’s exposure to lead in the water they drink at school or childcare centers.

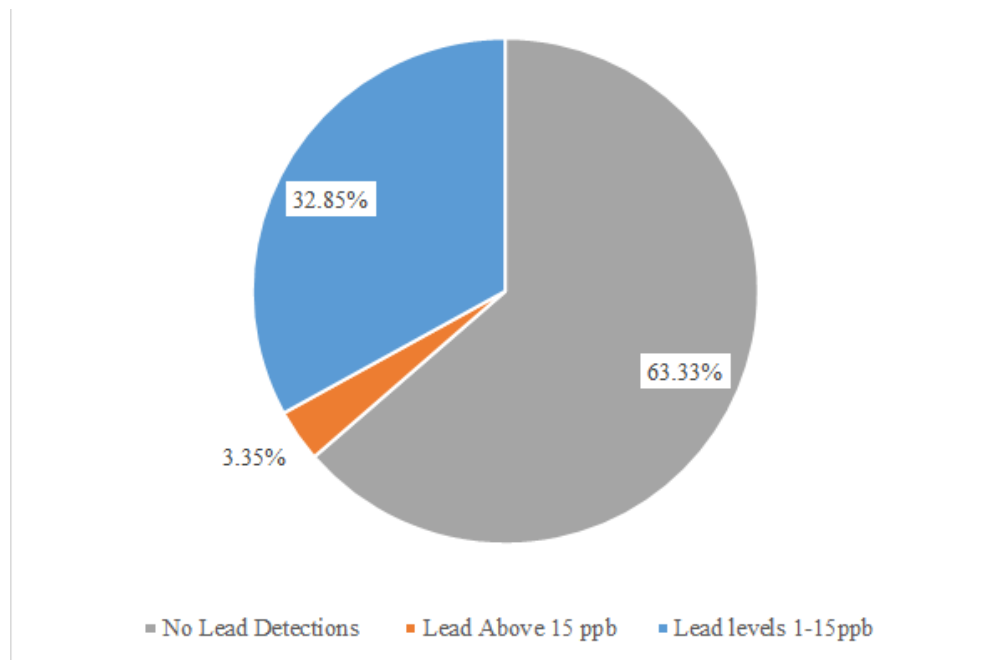
The program is guided by a coalition of agencies and organizations (the Secretary of Energy and Environment’s Office (OSEE), DEQ, the Departments of Education (OSDE), Health (OSDH), Human Services (ODHS), and the Oklahoma Parent Teachers Association (OPTA) and seeks to prioritize facilities that serve younger children (ages 6 and under), facilities serving or located in disadvantaged communities, and facilities that are older and are more likely to contain lead plumbing.

Along with no-cost testing, program participants implement EPA’s 3Ts guidance to:

- **Communicate**, throughout the implementation of the program, the results and important lead information to the public, parents, teachers, and larger community,
- **Train** on the risks of lead in drinking water and of the importance of testing for lead, as well as developing key partnerships to support the program,
- **Test** using appropriate testing protocols and a certified laboratory, and
- **Take Action**, including the development of a plan for helping schools and childcare facilities in their response to test results and in addressing potential elevated lead where necessary.

The lead testing in schools program has had a very successful second year. As of June 30, 2022, forty-six (46) public schools, two (2) childcare facilities and one (1) youth facility have signed up to participate in the program. Currently, there are 3,326 eligible public schools and daycares in Oklahoma. Of the forty-eight (48) schools signed up to participate, twenty-six (26) schools have been sampled. The results of the twenty-six (26) sampling events are listed in Figure 10.

Figure 11: Percentages of Samples with Lead Detects



The twenty-six (26) schools who have had detections over 15 parts per billion are all currently undergoing remediation efforts or have completed remediation. To address these issues as soon as possible, the CDS partners with DEQ’s Land Protection Division to offer remediation funding through the Site Cleanup Assistance Program (SCAP). So far, \$26,071 of SCAP funding has been requested from schools and childcare facilities participating in the program. This SCAP funding used for remediation efforts will directly impact 4,765 students and staff in all schools and daycares tested so far.

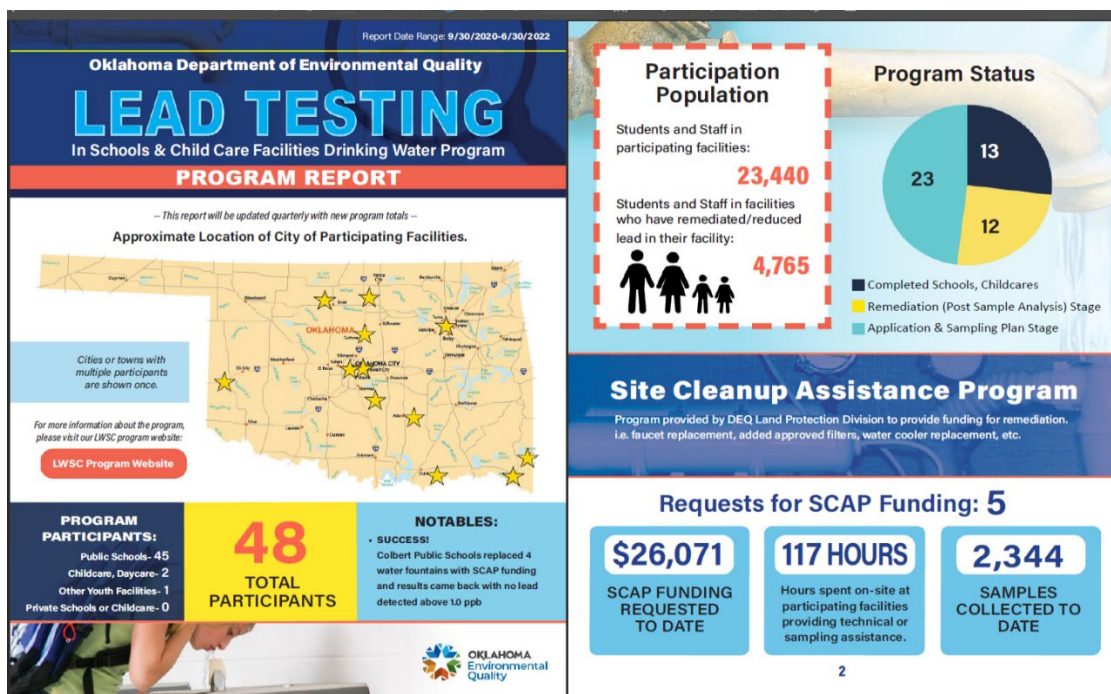
Expected outcomes for this project are:

1. Reduction of children’s exposure to lead in drinking water.
2. Training schools or childcare programs to begin implementing a testing program and mitigating lead exposure by utilizing the 3Ts toolkit in determining the best action to take for remediation.
3. Improvement of staff and community knowledge on lead in drinking water and other environmental harms.
4. Water quality improvement and lead exposure reduction in drinking water.
5. Establishment of routine practices such as those outlined in the 3Ts guidance.
6. Fostering sustainable partnerships at the state and local level to allow for a more efficient use of resources and the exchange of information among experts in various areas of school, childcare, utility, and health sectors.
7. Expanding the level of trust between the community, parents, and teachers.

The program has developed a webpage that provides flyers, fact sheet, and guidance videos on the importance of eliminating lead from school and childcare center drinking water, along with information on how to participate in the program (located at <https://www.deq.ok.gov/state-environmental-laboratory-services/environmental-public-health-information/lwsc/>). The coalition is currently working to complete testing on all schools that are signed up for the program and is planning on conducting additional outreach to gain more participation.

The program has developed a Report that includes participant information, sample results, program status, remediations completed, SCAP funding information, and other program highlights. This Report is updated and published every quarter on the DEQ Lead Testing in Drinking Water in Schools and Child Care Webpage (located at the website in the above paragraph) as well DEQ social media platforms. This has been a great way to showcase the program’s hard work and accomplishments.

Figure 12: DEQ Lead Testing in Drinking Water in Schools and Child Care Program Report



Beginning July 1, 2022, DEQ began developing a student pilot program where high school students can participate in the LWSC Program and gain experience and knowledge about the water industry outside of the classroom. The program will allow students to assist in developing inventory and assist in sampling for the LWSC Program. In addition, students will have the opportunity to tour the State Environmental Laboratory to learn the process of analyzing for lead in drinking water. Implementation of the student pilot program is planned for Fall 2022.

PWS Sustainability

Adequate TMF capacity is a critical component of PWS sustainability and is required for a system to consistently provide safe drinking water to the public. Acquiring and maintaining this TMF capacity can be challenging for any water system. A failure to maintain TMF capacity can lead to unsustainable, inefficient operation and frequent or continuous violations of health-based, primary drinking water standards.

If a water system requests technical assistance, the CDS schedules a visit with the PWS to help with various TMF policies and plans to improve the sustainability of the water system. To maximize assistance throughout the state, Oklahoma DEQ has contracted with ORWA to provide TMF assistance with rate analyses, financial management planning, SWP planning, and much more. In SFY 2022, technical assistance was provided to 45 unique systems across Oklahoma, each of them receiving customized assistance based on their needs. The specific assistance that was provided in SFY 2022 to these systems is detailed in Table 8.

Table 8: Type and Number of TMF Assistance Provided for PWS Sustainability 7/1/2021-6/30/2022

TMF Assistance Type	# of Systems Receiving Assistance
Emergency Response Planning and Procedures	7
Operations and Maintenance Plans	1
Rate Analysis	14
Source Water Protection Planning	2
Financial Management Policies	3
Standard Operating Procedures	1
Asset Management Plans	13
Water Loss Auditing/Leak Detection Assistance	26

To maximize effectiveness, each participating PWS received a package of technical assistance activities focused on their individual needs. There is no maximum amount of time or effort that may be expended on an individual system; as much assistance and guidance as needed will be provided to the participating system. Participation is voluntary and is driven by the level of interest of the participating system.

Of the 45 systems that participated in this program within the specified time frame, 21 systems increased their Capacity Development score while the score of the remaining 24 remained the same, likely due to the *improvement* of existing policies and procedures rather than the introduction and creation of these plans. Overall, the percent change in Capacity Development scores increased by 4.2% implying that the systems who received assistance and increased their score have effectively increased their TMF capacity. These systems with increased TMF capacity are better able to respond to emergency situations, operate effectively, and plan for the future.

Small, Underserved, and Disadvantaged Communities

Adequate TMF capacity is especially critical, but often difficult, for the success and sustainability for small (less than 10,000 in population), underserved (by having been in violation of a health-based primary drinking water standard at some point over the past five years), and disadvantaged (communities where the median household income is at 85% or less than the national median household income according to the United States Census Bureau / American Community Survey) communities. Inability to possess adequate TMF capacity can lead to health-based enforcement actions, unpreparedness during emergencies, financial issues, and more.

Over the past six years, the DEQ has been surveying the TMF needs of rural and small municipal PWS systems via the Capacity Development Baseline Assessment Project. Each system was assessed on 109 different aspects of operational sustainability. Preliminary results of the survey found that, on average, the assessed systems possessed 78.19% of needed TMF capacity, and that both decreasing TMF score, and population correlated with an increasing likelihood and frequency of primary drinking water standards violations.

In SFY 2020, DEQ and ORWA, as members of the Oklahoma Strategic Alliance, joined forces and developed a program aimed at improving and enhancing PWS sustainability at small, underserved, and disadvantaged communities. Named the Long-Range System Sustainability (LRSS) Program, the program leads PWS systems through a series of programs and trainings that once complete, provide a significant boost to TMF capacity and system sustainability. The LRSS program focuses on many of the issues examined by the Baseline Assessment, and systems that complete the program demonstrate an improved TMF score, as well as improved efficiency, operations, and fiscal condition.

In addition to the LRSS Program, Oklahoma DEQ has applied for and been awarded grant funds through the Water Infrastructure Improvements Act (WIIN), Section 2104, Funding for FFY19 and FFY21. Funding received for FFY19 has been used to contract with ORWA during SFYs 2021-2023 to provide one on one TMF technical assistance for small, underserved, and disadvantaged communities. These grant funds have provided TMF assistance with a focus on actions that lead to resolution of violations of health-based primary drinking water standards and that significantly improve PWS system efficiency, operation, and fiscal health.

During SFY 2022, 62 water systems benefited from the WIIN 2104 FFY19 grant funds. Technical assistance provided by ORWA included compliance assistance with nitrate, DBPs, lead and copper as well as help with rate analyses, source water plans, emergency response plans, policy development, asset management plans, board member training, and much more.

While Oklahoma DEQ continues to utilize WIIN 2104 FFY19 grant funds, an application has been submitted with award funds pending for the WIIN 2104 FFY21 grant funds. Funding received for FFY21 is planning to be used differently. Oklahoma DEQ will use this grant for infrastructure projects to achieve compliance at small, underserved, and disadvantaged communities and enable them to provide water meeting state and federal regulations. Oklahoma DEQ will combine these grant funds with Drinking Water State Revolving Fund (DWSRF) principal forgiveness funding, which will allow additional oversight in the planning, design, bidding, and construction phases of the projects.

Using guidance from the Baseline Assessment, tools developed in the LRSS program, and technical assistance by ORWA through the WIIN 2104 grant, significant positive changes have been achieved at Oklahoma's small, underserved, and disadvantaged systems. This approach has several advantages:

- **Targeted TMF Assistance:** Via the recently completed Baseline Assessment, the PWS systems most in need of TMF help are known. Furthermore, the assessment specifies precisely what type of assistance is needed. Using WIIN 2104 funds, DEQ is able to target technical assistance on missing or malfunctioning PWS processes for maximum positive effect.
- **Rapid Deployment:** The LRSS program is completely developed and functional, having been in service for several years. By using the structure and services of the LRSS program, DEQ will be able to immediately begin work at targeted PWS systems, generating positive results quickly.
- **Proven Results:** The LRSS program is a significant part of the technical assistance provided to small Oklahoma PWS systems by the Oklahoma Strategic Alliance. In FY2022, the work of alliance partners has saved over 12 million gallons per year of water via water loss reduction, improved small Oklahoma PWS financial operating ratios by 0.22, added over \$3.8 Million in revenue to PWS budgets (via rate adjustments and efficiency improvements), and helped systems implement numerous policy and procedure improvements.

By using the Baseline Assessment as a roadmap, WIIN 2104 funds for targeted TMF assistance and the LRSS program as tools to arrive at a safe water destination, DEQ has initiated rapid and significant positive changes in the PWS systems that are included in this program. DEQ CDS effectively tailor the provided TMF assistance to focus on resolution of health-based drinking water standards violations that *can* be corrected via improved operations and system optimization, as well as on improving all aspects of the system's TMF capacity. CDS measure and report on success in terms of system compliance, capacity development assessment scores, and improvements in PWS system financial conditions (as indicated by fiscal indicators and metrics).

9. Summary and Future Plans

Enhancing the *technical*, *managerial*, and *financial* capacities of Oklahoma's public water supplies is a group effort. The continued success of the DEQ CD program is dependent on the efforts of the DWSRF Section, PWS Engineering and Enforcement Section, PWS Compliance Section, Operator Certification Section, State Environmental Lab, and the various agencies that represent the FACT and OSA. This cooperative effort is very effective at promoting CD enhancement, but it can possibly be made more effective when efforts are targeted to where they are needed most. To this end, DEQ CD are looking forward to continuing to update the SWP program, enhance AWOP Awards, complete water loss audits and assist in solutions to reduce loss, utilize the results of the state-wide CD baseline assessment to target areas of assistance needed, implement and build the asset management tool, sample for lead at enrolled schools and daycares, and guide the Disadvantaged Communities Program, targeting systems that need the most assistance through on-site help as well as infrastructure funding.

Long-Term expected outcomes for the Capacity Development program include:

1. A trend showing an overall reduction in the number of PWS systems out of compliance with health-based standards.
2. Improved understanding of current and emerging threats to water quality, safe drinking water, public health, and environmental health.
3. Reduced number of accidents, injuries, and safety-related incidents at PWS systems.
4. Completion of a revamped SWP program, including accurate, updated, and easily accessible data, outreach emphasizing the benefits of implementation, information on funding projects to protect source water with a trending increase in SWP plans completed and implemented.
5. Promotion of the AWOP Awards Program to increase awareness and implementation of optimization concepts.
6. Reduction in real and apparent water loss at PWS systems as well as an increased understanding of types of loss and importance of data integrity.
7. A trend showing continued improvement in TMF assessment scores, especially in small, underserved, and disadvantaged communities leading to an improvement in the overall state TMF assessment score.
8. Increased use of asset management planning to improve understanding of asset criticality and enhance sustainability of PWS systems.
9. Continue to promote the lead testing in drinking water in schools and daycare facilities program across the state with an expectation of increased enrollment into the program.
10. Continue to reduce lead exposure from drinking water at schools and daycare facilities by assisting with remediation actions to reduce or eliminate lead.
11. Implement student program to assist with inventory and lead sampling at schools.
12. Improved performance of drinking water systems in small, underserved, and disadvantaged communities.

References

Oklahoma Capacity Development Strategy

Document SFY22 DWSRF Intended Use Plan

2021 State of Oklahoma Public Water Supply Program Annual Compliance Report