State of Oklahoma

Capacity Development Program Report to the Governor

State Fiscal Years 2020-2023

Oklahoma Department of Environmental Quality

Water Quality Division

Capacity Development Section

September 2023

OKLAHOMA Environmental Quality

Reporting Requirements

In Oklahoma, the federal Safe Drinking Water Act (SDWA) and the Drinking Water State Revolving Fund (DWSRF) are administered by the Department of Environmental Quality (DEQ), with the DWSRF being co-administered by the Oklahoma Water Resources Board (OWRB). Closely tied with the management of the DWSRF, the DEQ also administers the state's capacity development program which provides technical, managerial, and financial (TMF) capability assistance to the state's public water supplies (PWSs).

Section 1420(c)(3) of the 1996 Amendments to the SDWA requires that the DEQ must report to the governor every three years regarding the effectiveness of the state's capacity development program; **the purpose of this report is to satisfy that requirement by providing an assessment of the capacity development program in Oklahoma and the statewide strategy for assisting water systems in need**. Submittal of this report also assures that Oklahoma will not be subject to a 20 percent withholding of subsequent fiscal year federal grant funds from the DWSRF program.

The Report will be made publicly available online on the DEQ Capacity Development main page, under Reports: https://www.deq.ok.gov/water-quality-division/public-water-supply/capacity-development/

Report due: September 30, 2023
Date ranges covered: July 1, 2020- June 30, 2023

The Department of Environmental Quality's own 'Spirit of the Buffalo' statue stands tall in the native pollinator garden located at DEQ's central offices.

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The street façade of DEQ's central offices, located at 707 N. Robinson Ave, Oklahoma City.

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Introduction to Capacity Development

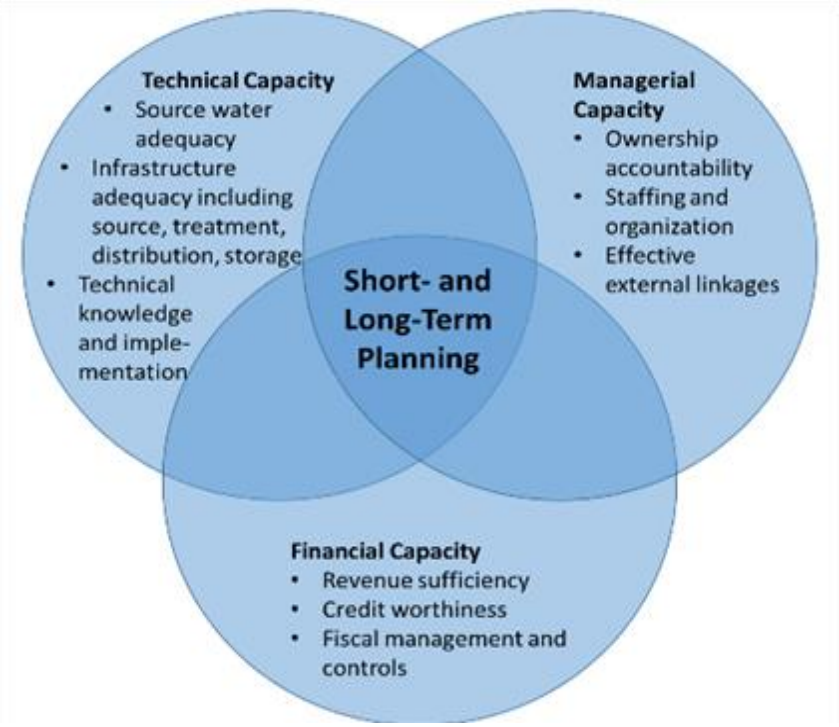
Capacity refers to the Technical, Managerial, and Financial (TMF) capabilities that a water system needs to sustainably achieve and maintain compliance with the Safe Drinking Water Act (SDWA). With the 1996 Amendments to SDWA, Congress formally recognized that to be sustainable a public water supply must possess adequate TMF capacity.

Mastering these factors is critical for a water system's ability to plan for, achieve, and maintain the production of safe drinking water that complies with all applicable drinking water standards. The three areas of TMF capacity are:

- *Technical Capacity:* a water system's ability to operate and maintain its infrastructure, including source water adequacy, infrastructure adequacy, and technical knowledge and implementation.
- *Managerial Capacity:* the ability of water system personnel to effectively administer system operations, including management/ownership accountability, adequate staffing and organization, and effective external communication, partnerships, and linkages.
- *Financial Capacity:* the financial resources and fiscal management needed to support the operation of a water system, including revenue sufficiency, credit worthiness, and fiscal management and control

TMF capacity is necessary to achieve and maintain long-term sustainability and compliance with national safe drinking water regulations; furthermore, it is crucial to supporting positive health and economic outcomes for water system customers.

The image below is a visualization to help understand the three areas of TMF capacity.



The Oklahoma DEQ Capacity Development Section

DEQ's Capacity Development Section operates within the Public Water Supply Group, which is in the agency's Water Quality Division. The section is responsible for implementing the state's capacity development strategy with the primary mission of ensuring that all DWSRF applicants and newly formed PWS systems have adequate TMF capacities. This is accomplished by both the direct provision of assistance via the section's staff members and by coordination with third-party technical assistance providers.

The assistance provided by the Capacity Development Section is purely 'non-enforcement' based and is conducted with PWS systems on a voluntary basis. The section helps systems develop the skills and utilize the resources necessary to return to compliance, maintain existing infrastructure, organize staff, and reliably provide safe drinking water to their customers.

The needs of Oklahoma's water systems vary widely; issues seem most often include crumbling infrastructure, a lack of financial control policies, inadequate staffing, insufficient water rates, and a lack of written policies. When assisting a PWS system, the section first conducts a comprehensive 'capacity development assessment' that examines a system's needs and provides a comprehensive roadmap to sustainability. The goal of the section is to provide the tools, resources, and relationships needed for the system to reach sustainability; however, it is ultimately up to the systems themselves to make the necessary changes.

Prior to SFY 2020, all capacity development work was completed by a single capacity development coordinator within the DWSRF section. However, with the increasing TMF needs of PWS systems across the state and promising results achieved with early capacity development work, a Capacity Development Section was created. The section is now staffed by three coordinators and a section manager with plans in place to hire two more coordinators.

The Department of Environmental Quality's Capacity Development team (from left to right): Tara Bussing, Katelynn McLaughlin, Lisa Stewart, and Jamie Henson.

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Technical, Managerial, and Financial (TMF) Sustainability

The primary duty of the Capacity Development Section is the support of TMF sustainability for newly formed PWS systems or for systems that apply for funding through the DWSRF. The SDWA requires that systems meeting either of these qualifications possess the necessary characteristics to be sustainable. The section staff and manager work with the operators, staff, and administrators of these systems to ensure that they can sustainably produce water that is in compliance with all health-based requirements at a reasonable cost.

DEQ believes that TMF sustainability is a critical concern for all water systems across Oklahoma and has expanded the scope of the Capacity Development Section to provide TMF assistance to all water systems across the state. Any Oklahoma PWS system qualifies for assistance from the section in the following areas:

Technical Capacity

- Operation and Maintenance Plans
  - System Optimization
  - Routine / Preventative Maintenance Plans
  - Work Order System Development
  - Critical Inventory Development
  - Leak Log Record Keeping
  - Valve Location and Exercising Plans
  - Dead-end Line Elimination
  - Energy Audits
- Training and Continuing Education
  - Training Plans for Operators, Office Staff, and Board Members
  - Cross-Training Plans
- Communication
  - Communication Policy Development
  - 24-hour Emergency Response System Development
  - Customer Notification Plan Development
- Strategic Plan Development
- Water Rights Planning
- Mapping
- Emergency Response Planning
  - Risk Assessment and Vulnerability Planning
  - Emergency / Stand-by Source of Water Planning
  - Critical Customer Planning
  - Mutual Aid Planning
- Source and Production Planning
  - Hydraulic Modeling
  - Maximum Demand / Rated Design Modeling
  - Water Loss Auditing and Control
- Water Meter Accuracy Testing
- PWS System Security

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Technical, Managerial, and Financial (TMF) Sustainability (cont.)

- Contamination Prevention
  - Monitoring and Testing Procedures
  - Wellhead and Source Water Protection Plans
  - Backflow Prevention Planning

Managerial Capacity

- PWS Governance and Management
  - Open Meeting and Open Records Act Training
  - Bylaws Development and Updating
  - Board Member Training and Continuing Education
- Organization and Personnel
  - Organizational Chart Development
  - Personnel Policy / SOP Development
  - Office Support Staff Training

Financial Capacity

- Budgeting
  - Budget Preparation and Use
  - Financial / Budget Reporting
- Financial Position
  - Financial Indicator Training
  - Enterprise Accounting Training
- Accounts Receivable / Accounts Payable Training
  - Fund Management Procedures
  - Financial Controls
  - Separation of Financial Duties Policies
- Rate Studies and New Rate Implementation
- Reserve Account Policies
- Insurance and Bonding
- Asset Management Plans

The Capacity Development Section provides direct assistance in most of the above TMF areas; additionally, the section maintains technical assistance contracts with the Oklahoma Rural Water Association (ORWA) and referral relationships with other third-party technical assistance providers (Communities Unlimited, Environmental Finance Center, and Oklahoma Municipal League) to ensure that PWS systems receive help in areas where the section has a wait list or lacks the expertise.

The Capacity Development Section also promotes TMF sustainability as part of the Oklahoma Strategic Alliance (Alliance), a coalition of organizations committed to promoting PWS sustainability in Oklahoma. Ratified by Governor Stitt on September 3, 2019, the Alliance is comprised of the Office of the Secretary of Energy and Environment, DEQ, Oklahoma Water Resources Board (OWRB), and ORWA. Each organization is committed to working together and combining resources to help rural and small community PWS systems better maintain and update infrastructure.

Capacity Development Baseline Assessment

Introduction

In 2017, DEQ began work on a project to assess the Technical, Managerial, and Financial (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, determine which systems are most in need of help, and delineate the unique set of needs faced by each system. The project functions by conducting capacity development assessments at all municipal PWSs and rural water districts in Oklahoma serving 10,000 or fewer individuals. By using the comprehensive 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 Water Quality Division (WQD) and the Environmental Complaints and Local Services (ECLS) division at DEQ. To complete the large number of assessments required of this project, a cadre of local ECLS inspectors were called up to conduct the assessments with PWS system personnel. ECLS inspectors are DEQ personnel that PWS systems see most frequently; therefore, 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.

Results

The results of this project allowed DEQ 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. A total of 1,213 Capacity Development Assessments have been completed as of June 30, 2023. Preliminary results of the 1,213 completed assessments indicate that, on average, water systems have 78.47% of the necessary TMF capacity to achieve sustainability. This means that, on average, assessed systems are missing (21.53%) almost one quarter of the items, procedures, policies, and resources needed to become sustainable. **The table below** details the Capacity Development Assessment data.

Capacity Development Assessments (CDAs) completed by Date	Number of Assessments	Average Score
CDAs completed between 2020-2023	729	79.41%
Total Number of CDAs Completed	1,213	**78.47%**

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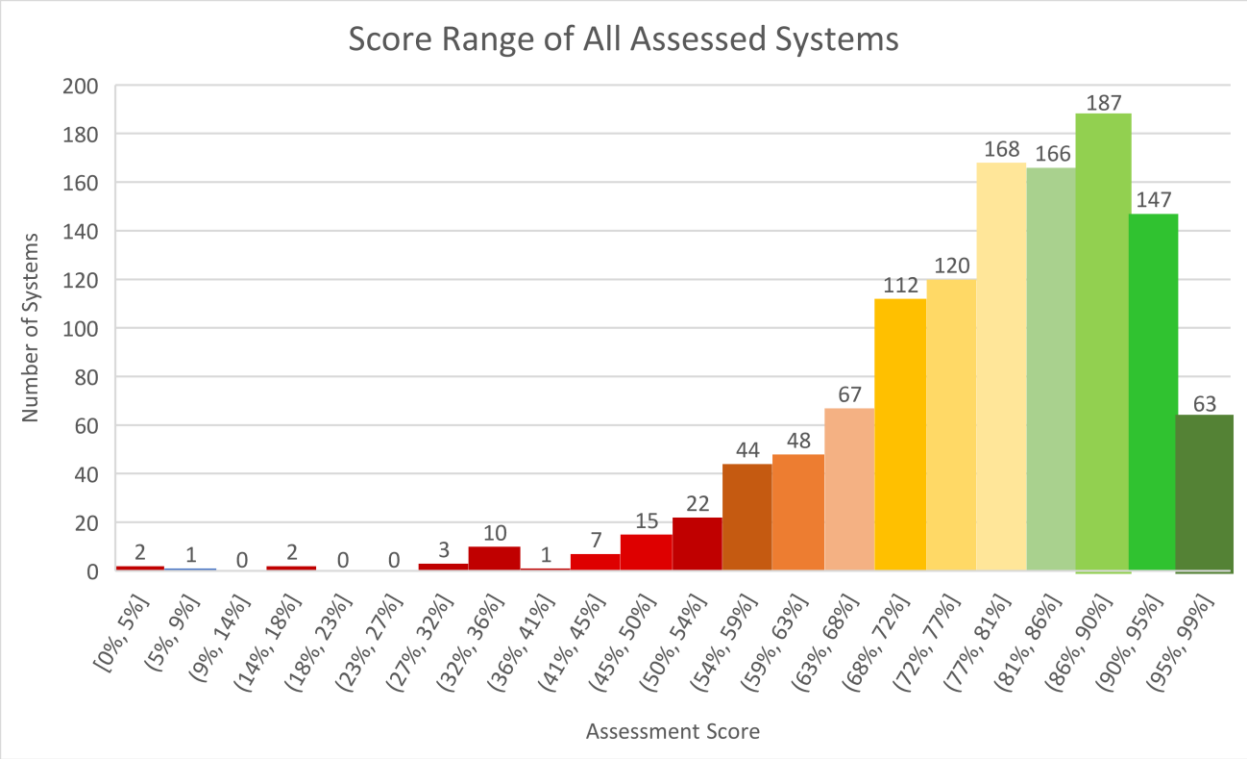
Results (Cont.)



The above graphic illustrates the score range of all systems assessed under the capacity development baseline assessment. This data was collected over seven years and represents the technical, managerial, and financial capacity of over one-thousand Oklahoma water systems.

Facility Name: Example Water System

DWSRF Project Number: Triennial Governors Report

Completion Date: 9/28/2023

Prepared By / Title: ODEQ Capacity Development

CAP DEV SCORE: **81.7%**

Instructions: Capacity development refers to the financial, managerial, and technical conditions that lead to the succesful and sustainable operation of a water system. The purpose of this checklist is to help pinpoint areas in the operation of your water system that might significantly impact your ability to produce safe water now and in the foreseeable future. The form should be completed by a managing operator or other official that is familiar with the day-to-day operations of the system. None of the information placed on this form is intended for use in enforcement actions. If you are interested in assistance and/or resources on any specific topic, please make a note in the comments section and DEQ will contact you.

Please note: items in bold are *required* for DWSRF loan applicants.

If you have any questions, please contact the Capacity Development Section at (405) 702-8100.

echnical Capacity

	Operation and Maintenance Plan	Yes	No	Comments
1	Operation and Maintenance plan available and regularly updated, detailing all aspects of operating the water system.	◉ Yes	○ No	
2	Operation and Maintenance plan addresses leak detection/repair, flushing, meter calibration, elimination of cross connections, regular valve exercising, and testing/exercising of emergency/backup equipment.	◉ Yes	○ No	

The snapshot above is the top portion of an example Capacity Development Assessment.

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TMF Capacity Deficiencies for PWS

TMF Capacity Deficiency	Percentage of systems without
Without SoonerWARN (**Mutual Aid**).	75%
Does not conduct **energy audits** on a regular basis.	65%
Have no written plan to **eliminate dead ends** in distribution system when feasible.	59%
System has no **water rights** management plan or is unaware of the water rights they do possess.	57%
System has not conducted a **risk assessment** (EPA VSAT or other method) and an **emergency response plan (ERP)** and has not certified with EPA that both steps have been completed. ERP must be reviewed and practiced annually.	53%
System has no written plan to **respond to and address deficiencies noted on sanitary surveys** or other inspections.	52%
Operations & Maintenance plan is not regularly reviewed by board.	51%
Does not track **water loss** annually with AWWA M36 Method.	49%
Has no **Operations and Maintenance plan** available and/or regularly updated, detailing all aspects of the water system.	44%
No written plan to regularly **test backflow preventers**.	44%

The table above identifies the top ten issues among Oklahoma water systems as reported by the Capacity Development Baseline Assessment. According to the data, most common deficiency for water systems is “not a member of SoonerWARN” or any mutual aid group. SoonerWARN is Oklahoma’s Water/Wastewater Agency Response Network. It is the formalized system of “utilities helping utilities” with mutual aid during emergency situations. The lack of systems involved in SoonerWARN may because of little promotion or marketing. The importance of having mutual aid is highly recommended to water systems.

TMF Capacity Deficiencies for PWS (Cont.)

An overview of the baseline capacity development assessments over a three-year period yielded the following three conclusions:

1. Of all the Technical, Managerial, and Financial (TMF) issues surveyed, the top ten (10) limitations of Oklahoma systems are 'technical.'

The top ten limitations of Oklahoma water systems were found to be in the technical section of the TMF assessment. Two out of the ten most common issues were related to Operation & Maintenance (O&M) plans. Based on the assessment data, systems tend to lack regularly updated board approved O&M plans. A complete and up-to-date O&M plan is crucial for PWS system sustainability. This plan should cover all aspects of system operations to ensure continuous water system operation in the event of an emergency.

O&M plans are also excellent tools to train new staff, 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 informed decisions.

2. Of all the deficiencies surveyed, seven (7) out of ten (10) included a lack of 'written policy or plan'.

According to the table above, it is common for systems to lack any written plan, policy, or procedure. Most systems say they have a plan yet after more investigating, it usually is not actually written down. The importance of having every plan, procedure and audit written down is highly recommended. Without these plans written down for all system staff to view, the possibility for chaos and disorganization is inevitable. One of the main objectives for capacity development is to assist these systems with developing or implementing a written plan, policy, or procedure.

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

There are multiple factors that contribute to a system's capacity development score decreasing over time. One of the biggest influences is high employee turnover. Many of the small systems 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 difficult to create.

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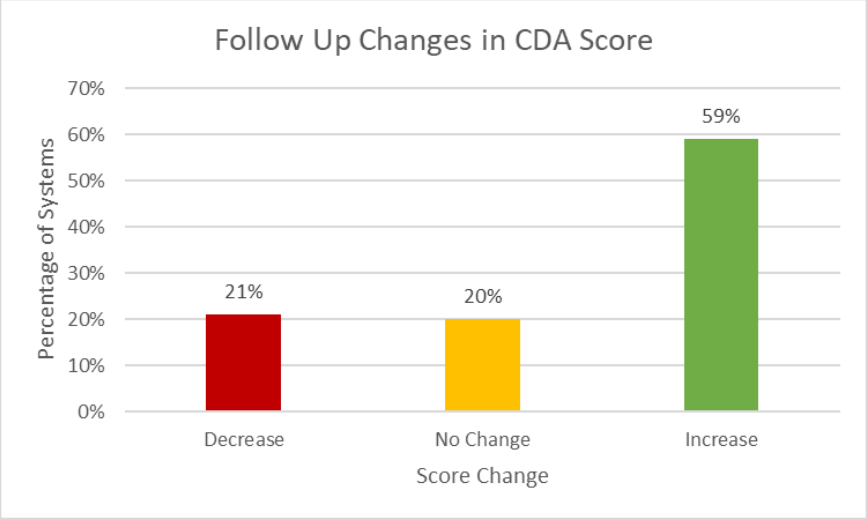
Follow Up Results

Since the completion of the Baseline Assessment Project, DEQ and ECLS have conducted follow up with systems who completed their initial capacity development assessment to evaluate the effectiveness of the assessment and subsequent technical assistance. So far, **546** follow-up capacity development assessments have been conducted during 2021-2023. These follow-up assessments make up 45% of the total capacity development assessments completed during the project's duration.

Based on the initial assessments, completed between 2018 and 2020, and the follow up assessments, completed between 2021 and 2023- show that **59% of systems assessed have increased their score** over the three-year period (**in the table below**). This is just one of the ways that Capacity Development measures the success of technical assistance. According to the table below, about 20% of systems showed no change in score after the follow up assessment. This reason could be because the system did not request any assistance and was not part of a DWSRF project. Also in the table below, 21% of the systems scores decreased after the follow up assessment. The most common reason for this is because of water system staff turnover which leads to a lack of communication and transfer of knowledge.



Capacity Development Assessment Goals

The current assessment has a total of 107 'yes or no' TMF questions. The Capacity Development Section is in the process of updating the assessment by reducing the number of questions, making the assessment easier to understand, and providing easier access to technical assistance after completing the assessment. The updated assessment will also allow systems to provide a larger range of responses; in addition to being able to answer 'yes or no' to an assessment question they can also answer "Yes, needs verification' or "N/A" if the question does not apply to their system.

Capacity Development staff hopes to complete the updated assessment by fall of 2023. After completion, training sessions will be held to inform ECLS staff of changes and a pilot year for the assessment will begin.

After the assessment is completed, capacity development staff will review the responses and provide technical assistance as requested by the system. Currently, templates for emergency response plans, communications policies, operations and maintenance plans, and asset management planning exist.

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Water Loss Auditing and Control

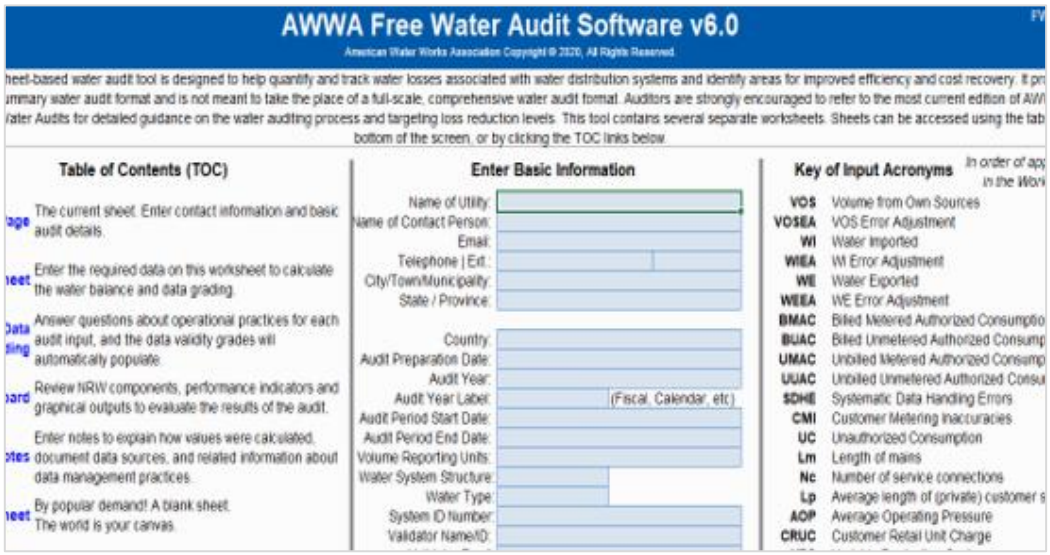
Since 2015, DEQ has worked to standardize and promote water loss auditing across the state using the M36 Water Loss Audit Method developed by the American Water Works Association (AWWA). The program has had continuous success tracking and identifying sources of loss and non-revenue water across the state 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, 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. *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 and siphons revenue from the system and distorts data on production and consumption.

An M36 method water loss audit also determines the volumes and values of nonrevenue water that a PWS is producing. 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.



The photo above is a screen shot of the first page of the Water Loss Audit Software used to conduct water loss audits.

Program Statistics

292

Total Water Loss Audits completed under this program since 2015

92

Audits completed (July 1, 2020- June 30, 2023)

15.632 BG

(billion gallons)

Of total water loss identified for Oklahoma systems

$10,635,542

Cost of apparent loss per year identified under the Water Loss Auditing program

$18,276,867

Cost of real loss per year identified under the Water Loss Auditing program

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Water Loss Auditing and Control (cont.)

Apparent Losses

'Apparent loss' is water lost due to customer meter inaccuracies, billing system data errors, and/or unauthorized consumption. It is water that is still consumed by the distribution system's customers but is not properly paid for. This type of water loss contributes greatly to system revenue loss and distorts production and consumption data. Annually, apparent losses have accounted for a smaller percentage of total water loss than real losses (only 10.99% of total water loss detected between 2020-2023). However, apparent losses still represent a significant loss of revenue to most systems participating in the audit, costing on average $37,715 per audited system and over $10.6 million for the group.

Annual Apparent Losses (MG/yr.)	Average apparent loss per system (MG/yr.)	Total apparent loss identified (MG/yr.)	Average cost of apparent loss per system per year (USD)	Total cost of apparent loss per year identified (USD)
Total Detected in water loss audits completed (July 1, 2020- June 30, 2023)	7.62 MG	677.88 MG	$52,034.66	$4,630,996.02
Total Detected in all water loss audits completed since 2015	5.80 MG	1,676.18 MG	$37,715.69	$10,635,542.02

The above table represents annual apparent loss experienced by Oklahoma water systems.

Real Losses

'Real loss' is water that escapes the water distribution system through leakage, breaks, and storage overflows. This treated water is never delivered to customers and results in increased operational costs and stress on source water supplies. Real water losses are the largest category of water loss observed from the audited systems with an average real loss of 64.15 million gallons per system and 14,079 million gallons for the group.

Annual Real Losses (MG/yr.)	Average real loss per system (MG/yr.)	Total real loss identified (MG/yr.)	Average cost of real loss per system per year (USD)	Total cost of real loss per year identified (USD)
Total Detected in water loss audits completed (July 1, 2020- June 30, 2023)	64.15 MG	5,708.97 MG	$91,829.81	$8,172,763.74
Total Detected in all water loss audits completed since 2015	48.72 MG	14,079.43 MG	$68,452.69	$18,276,867.84

The above table represents annual real loss experienced by Oklahoma water systems.

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Water Loss Auditing and Control (cont.)

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. PWS systems that have completed a water loss audit and had results which indicate nonrevenue water (as % of supply) greater than 20% or apparent loss of greater than 10 gallons per connection per day qualified for leak detection and/or meter analysis assistance from ORWA.

Participating systems meet with ORWA, review audit results, and coordinate an in-depth leak detection schedule. The typical technical assistance event takes place over 2-3 weeks' time and involves locating leaks, analyzing meters and training PWS staff. 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.

In total, **53 systems** have received leak detection help from the ORWA, where, together, they have identified 351 leaks estimated at 1.899 billion gallons/year. Of the 351 leaks identified by ORWA, 215 of them have been repaired by the systems. These repairs have recovered an estimated 1.407 billion gallons of water per year valued at an estimated $3,479,615.48 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 greater operational knowledge and decision making.

ORWA Leak Detection Assistance Program	FY2023	FY2022	FY2021	FY2020	FY2020-FY2023 Totals	Total Overall (FY2017-FY2023)
Systems receiving Leak Detection assistance	9	6	9	5	29	53
Number of Leaks Detected	61	19	103	52	235	351
MG/Yr. of detected leaks	163.200 MG	38.131 MG	557.504 MG	607.589 MG	1.366 BG	1.899 BG
Value/Yr. of Detected Leaks	$888,881	$108,393	$1,649,730	$822,056	$3,469,061.70	$4,738,914.95
Total Number of Leaks Repaired	36	10	71	43	160	215
Gallons/Yr. of Leaks Repaired	115.100 MG	25.497 MG	458.467 MG	589.350 MG	1.188 BG	1.407 BG
Value/Yr. of Leaks Repaired	$601,087	$71,215	$1,457,581	$779,745	$2,909,629.40	$3,479,615.48

The table above summarizes leak detection work done by ORWA. This summary includes the total number of systems receiving assistance as well as how many leaks were detected and repaired during their program participation.

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Asset Management Program

Definition

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 water 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.

The Capacity Development Asset Management Tool

The Capacity Development Section has developed an asset management plan tool that is available to any Oklahoma PWS system, free of charge. The Microsoft Excel-based tool assists systems in cataloging their assets, determining the likelihood and consequence of failure, and exploring timeframes and funding options for asset replacement.

Plans are in place to further improve upon the tool. The Capacity Development Section is utilizing the contract with ORWA to provide cost estimates for a wide array of assets commonly seen in the water industry. The cost estimates will be updated annually at minimum by ORWA and will be built into the asset management plan spreadsheet. This data set will be extremely useful when coordinators are in the field providing technical assistance. Often, PWSs may not have records for the cost of items purchased decades ago. The expense of asset replacement is valuable information for future financial planning.

Asset management plans are vital for making informed decisions on infrastructure acquisition, construction, operation, maintenance, renewal, replacement, expansion, and disposal. Having a plan in place that is regularly updated will minimize risk, help manage costs, and ensure the continuous delivery of safe drinking water to customers.

Program Statistics

(July 1, 2020-June 30, 2023)

44

Unique Asset Management Plans have been created for Oklahoma water systems

312,766

Total customers are served by water systems with a DEQ Asset Management Plan

2,128

Total assets logged for Oklahoma systems

48

Average number of assets logged per water system

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Asset Management Tool Improvements

The Capacity Development Section assisted with the completion of 44 Asset Management Plans. Improvements continue to be made to DEQs Asset Management Tool. The figures below show examples of some of the improvements made to the asset management tool since its implementation in 2021.

The snapshot below shows the data collection page from the Asset Management Tool, detailing all specifics of each asset. The life expectancy is now color coded to help visualize which assets will expire first.

I.D. 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	☐	Good		2032	10.00
MeFl-2017-1	Meter	Flow	6"	Turbine	at WTP	2017	☐	Good		2029	7.00
TrCh-2018-1	Treatment	Chlorination	200 gal	Tank	at WTP	2018	☐	Good		2034	12.00
TrCh-2018-2	Treatment	Chlorination	200 gal	Tank	at WTP	2018	☑	Good		2034±5	12.00

The snapshot below shows the current predicted cost data calculation in the Asset Management Tool. These equations can be found in the tool under Calculations Tab.

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 x initial price = $ added	$ added + initial price = Cost to purchase in 2022.	$(\frac{\$29.40 - x}{x}$ x initial price) + initial price = Cost ir

The snapshot below shows the future predicted cost data calculation in the Asset Management Tool. These equations can be found in the tool under Calculations Tab.

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 - Year of Failure = Y	0.049 x Y x Cost in 2022 = p	p + Cost in 2022 = Price in Year of Failure	(4.9% x Year of Failure x Cost in 2022)+ Cost in 2022 = F in Year of Failure

The snapshot below shows the Consequence of Failure Calculation in the Asset Management Tool. These equations can be found in the tool under Calculations Tab.

Consequence of Failure (CoF) 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				
	Yes back-ups = +0 No back-ups = +1	Loss of water 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 Scor
Probability of Failure (PoF) 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				
	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				

OKLAHOMA Environmental Quality

Asset Management Tool Improvements (Cont.)

The Capacity Development Section has added a summary page tab to the Asset Management Tool. This page automatically populates assets by criticality. The reason for the addition of this page is to have one main page that gives a quick summary that is easy to understand. A screenshot of this addition is in the **image below**.

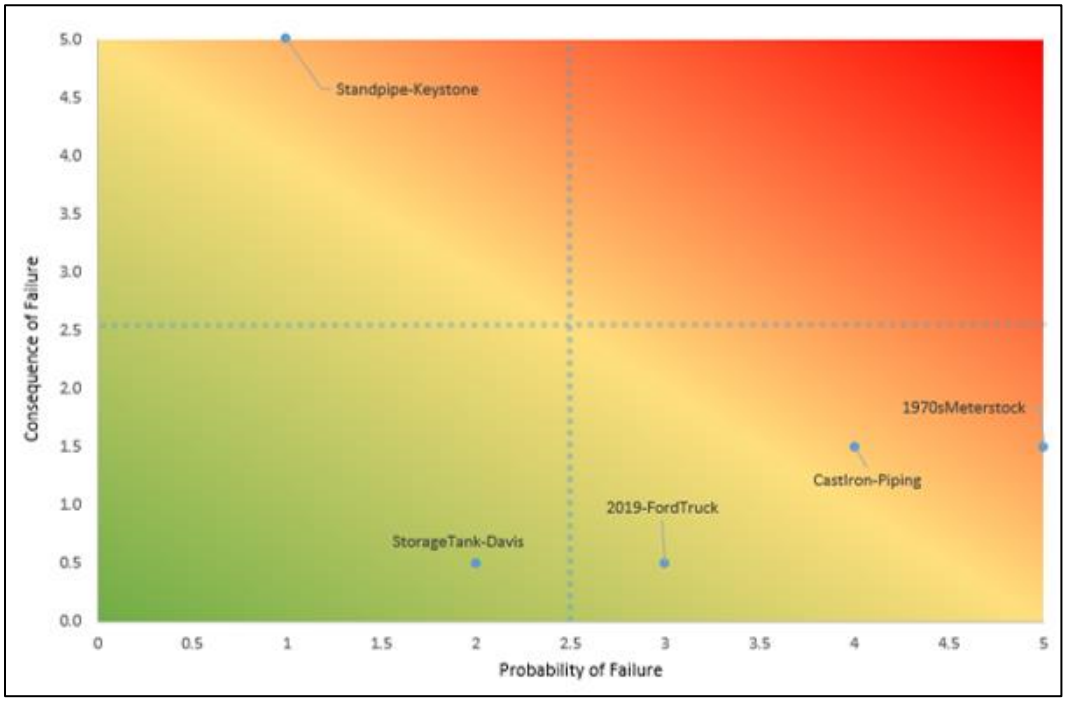
OKLAHOMA Environmental Quality

Recommendations:	# of Assets
Immediate Work	20
Schedule for Rehab/Replace	
Aggressive Monitoring	
Sample Monitoring	46

Summary (by most critical)

	ID Number	Category	Type	Size	Description	Criticality Score	Estimated Year of Failure	Projected Cost of Replacement	Long-Term Funding Source	Estimated Calculation Disclaimers
1	SoWe-1990-1	Source	Well		well 2 north	2.00	2022±5	$1,740,163.99	Annual Budget	The YEAR OF FAILURE and PROJECTED COST were calculated using estimated installation date.
2	PuMe-2013-1	Pump	Metering		well 2 north	2.00	2022±5	$31,205.95	Annual Budget	The YEAR OF FAILURE and PROJECTED COST were calculated using estimated installation date.
3	BuWe-1990-1	Building	Well house		well 2 north	1.50	2040±5	$61,406.04	Annual Budget	The YEAR OF FAILURE and PROJECTED COST were calculated using estimated installation date.
4	TaSt-1980-1	Tank	Standpipe	120 ft	standpipe tower	1.50	2022	$1,178,156.39	Annual Budget	The PROJECTED COST was calculated using an estimated intial pri
5	SoWe-1980-1	Source	Well		Well 1 east by tower	1.00	2022	$336,616.11	Annual Budget	The PROJECTED COST was calculated using an estimated intial pri

The Capacity Development Section also created a graphic results page. Assets are automatically graphed based on the probability of failure and the consequence of failure. Assets that are more likely to fail *and* cause regulatory or health violations upon failure will be graphed in the 'red' section of the graph. Assets that are less likely to fail and/or will *not* cause violations upon failure- will be graphed in the 'green' section of the graph. A snapshot of this new graphic results page **is below:**



OKLAHOMA Environmental Quality

Asset Management Program (cont.)

Asset Management Outreach

America's Water Infrastructure Act of 2018 (AWIA) required 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 third-party asset management plan development via the ORWA technical assistance contract.

The section has conducted at least eight (8) trainings/presentations on asset management to other agencies and states in the last three years. The asset management tool has been showcased nationally during ASDWA meetings and webinars. Other states and agencies from across the United States have requested copies of DEQ's Asset Management Plan, and some have used the tool as a base to create their own.

A list of trainings and presentations given:

- Asset Management Tool Training to ORWA
- Asset Management Tool Presentation to the Oklahoma Strategic Alliance
- Asset Management Presentation to EPA coordinator
- Asset Management Tool Presentation at ORWA Conferences
- Asset Management for Small Systems ASDWA/OK Presentation
- Asset Management Tool Presentation for ASDWA EBTB National Meeting

There is also an asset management training presentation on the DEQ website that is available to view and obtain operator certification hours. The website link to the online training is here: https://www.deq.ok.gov/water-quality-division/operator-certification/online-training-catalog/

Asset management plans are a requirement for any PWS undergoing a project with DEQ's DWSRF section. Once completed, regular updates to the plan are strongly encouraged.

DEQ offers free technical assistance for asset management creation for PWSs. DEQ also sends a copy of the completed asset management plan to the water system to continuously update the data. DEQ's partner, ORWA conducts asset management plans using DEQ's tool as well. They have been fully trained and complete them with systems upon request.

Most Critical Assets

After Asset Management plan creation, assets are ranked by criticality. Assets with a higher 'criticality score' tend to both be more likely to fail and have a sizable impact on system operations upon failure.

Oklahoma water Systems' top three most critical assets- as reported in the asset management program- are as follows:

20%

of systems report 'pipe infrastructure' as their most critical asset

17%

of systems report 'water treatment infrastructure' as their most critical asset.

16%

Of systems report items relating to their water treatment buildings, offices, storage facilities, etc. are their most critical assets.

OKLAHOMA Environmental Quality

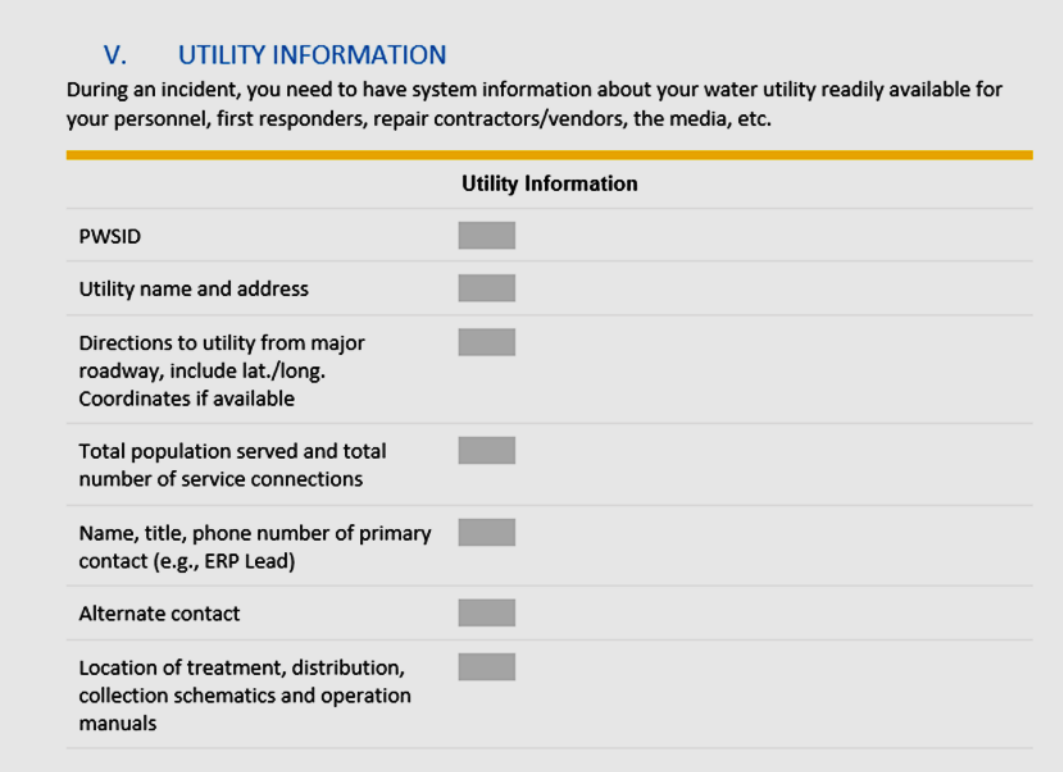
Emergency Response Plan

Emergency response planning is a process that helps water system managers and staff explore vulnerabilities, make improvements, and establish procedures to follow during an emergency. Preparing and practicing a response plan can save lives, prevent illness, enhance system security, minimize property damage, and lessen liability.

America's Water Infrastructure Act (AWIA) requires that community (drinking) water systems serving a population of 3,300 or greater will need to develop, submit, and update an emergency response plan (ERP) for their system; additionally, water systems will need to complete or show proof of a written ERP prior to being approved for DWSRF funding. The Capacity Development Section has created an ERP template for Oklahoma water systems to fulfill these requirements.

The DEQ emergency response plan provides water systems with a place to 'house' all the relevant contact information, infrastructure information, and response resources that might become important in the instance of an emergency. System staff are prompted to discuss alternative routes into their community, assembly areas that could be utilized in the event of water outages, physical security, cybersecurity, power outages, and emergency drinking water suppliers.

Emergency preparedness and security are vital for the reliable delivery of safe drinking water, the protection of public health, and the safety of staff.



V. UTILITY INFORMATION

During an incident, you need to have system information about your water utility readily available for your personnel, first responders, repair contractors/vendors, the media, etc.

	Utility Information
PWSID	
Utility name and address	
Directions to utility from major roadway, include lat./long. Coordinates if available	
Total population served and total number of service connections	
Name, title, phone number of primary contact (e.g., ERP Lead)	
Alternate contact	
Location of treatment, distribution, collection schematics and operation manuals	

The above DEQ emergency response plan template has helped many systems within Oklahoma become more prepared for emergencies and more resilient in the face of hazardous conditions.

Program Statistics

(July 1, 2020-June 30, 2023)

34

Unique Emergency Response Plans created for Oklahoma water systems

113,709

Total customers served by water systems with a DEQ Emergency Response Plan

44,228

Total service connections served by water systems with a DEQ Emergency Response Plan

The template is consistent with AWIA guidelines as it provides strategies and resources to improve the resiliency of the system, plans and procedures that can be implemented in hazardous situations, and strategies that can be used to aid in the detection of emergency events.

Area-Wide Optimization Program (AWOP)

AWOP Background

The Area-Wide Optimization Program first piloted in early April 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. AWOP is now a voluntary approach to improve drinking water quality beyond compliance levels to enhance public health protection, and it is no longer limited to only conventional water treatment plants. 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, as it is focused on enhancing process monitoring and control using the existing staff and facilities.

EPA Region 6 and Process Applications, Inc. in Fort Collins, Colorado, assisted in the development of AWOP. The Region 6 states: Oklahoma, Arkansas, Louisiana, New Mexico, and Texas, along with Region 7 states: Missouri, Iowa, and Kansas, have combined to make a large AWOP group that meets quarterly. Oklahoma continues its involvement by attending these quarterly regional meetings, as well as the biennial national meetings. The next quarterly meeting, in October of 2023, is currently scheduled to be hosted by Oklahoma DEQ. Oklahoma also participates in and hosts multi-state comprehensive performance evaluations (CPEs) and training workshops.

DEQ AWOP Status

From 1997 through the end of SFY22, DEQ has conducted 25 optimization and seven mandatory CPEs of water systems within the state. The original scope of the CPE effort was, and continues to be, to assist the community and train the 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. Within 60 days following the CPE, systems receive a report from DEQ that outlines factors that may influence the optimization of their treatment operations.

AWOP Multi-State Distribution CPE-Louisiana

While traditional CPEs focused on turbidity and disinfection at conventional surface water treatment plants, AWOP has expanded to address issues like disinfection byproducts, harmful algal blooms, groundwater issues, and more. To learn more about the various types of CPEs, Oklahoma DEQ representatives from Capacity Development, Engineering and Enforcement, and Compliance attended a multi-state distribution CPE in Louisiana in October 2022.

During the multi-state distribution CPE, DEQ staff was split amongst the administration, storage tank, treatment, and distribution system teams. Each team had their own responsibilities, such as assessing the TMF capabilities in administration, evaluating the build and mechanics of the storage tanks and distribution system, and running tests to learn more about optimizing the chlorination treatment. This distribution CPE offered hands-on experience in treating nitrification, iron, and manganese issues, and optimizing chlorination without a full treatment plant. After the week-long process of running tests, interviewing the water operations staff, and evaluating all the historical data of the system, the staff assisted in developing the performance limiting factor sheet as well as the final report that was given to the system. Once the staff returned to Oklahoma, they presented their newly gained knowledge to the rest of the Public Water System group so that others could learn from their experience as well.

Area-Wide Optimization Program (AWOP) (cont.)

AWOP Awards

Oklahoma DEQ also has an AWOP Awards Program, in 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. Below is a flyer for the AWOP Awards program that offers information about the program, who can participate, and how public water systems can sign up to participate**.**

This AWOP awards flyer **(left)** demonstrates the basic principles of AWOP and outlines 'next steps' for participation. All public water supply systems can participate- interested systems can email the AWOP awards committee to get more information, ask questions, and sign up for the program.

AWOP Goals

Oklahoma has not performed a distribution CPE but hopes through the collective efforts of those who attended, one can be performed soon. Oklahoma also plans to perform a conventional surface water treatment CPE in the spring of SFY24.

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. These elements include the capacity development assessments and water loss audits, with plans to incorporate asset management and source water protection.

OKLAHOMA Environmental Quality

Disadvantaged Communities

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, but systems located in small and disadvantaged communities can find it particularly difficult. A failure to maintain TMF capacity can lead to unsustainable, inefficient operation and frequent or continuous violations of health-based, primary drinking water standards.

Capacity Development Baseline Assessment Project and Long Range Sustainability Program

Over the past six years, 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 107 different aspects of operational sustainability. Preliminary results of the survey found that, on average, the assessed systems possessed 78.47% 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 state fiscal year 2020, DEQ and ORWA, as members of the Oklahoma Strategic Alliance, joined forces and developed a program aimed at improving and enhancing PWS sustainability. 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.

With the Assistance for Small and Disadvantaged Communities Drinking Water Grant Program, DEQ will begin using the guidance from the Baseline Assessment and the tools developed in the LRSS program to bring about significant positive changes at Oklahoma's underserved, small, 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. Once work via this grant begins, DEQ will be 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 since 2020. 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 FY2023, the work of alliance partners has saved over 115.1 million gallons per year of water via water loss reduction, improved small Oklahoma PWS financial operating ratios by 20%, added over $2.971 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 and the LRSS program as the tool, DEQ will affect rapid and significant positive change at the PWS systems that are the focus of this program. Intentions are to 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. Intentions also include to measure and report on the sections success in terms of system compliance, capacity development assessment scores, and improvements in PWS system financial conditions (as indicated by fiscal indicators and metrics).

OKLAHOMA Environmental Quality

Disadvantaged Communities (cont.)

The Assistance for Small and Disadvantaged Communities Drinking Water Grant Program will provide TMF assistance to Oklahoma PWS systems that are both underserved (facing health-based drinking water violations), small (serving 10,000 or fewer people) and economically disadvantaged 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. To implement this program, some or all the following technical assistance activities will be conducted with participating systems:

- Asset Management Planning.
- Business and Financial Policy Planning and Development.
- Capital Improvement Planning.
- Distribution System Mapping and Line Inventory.
- Employee Succession Planning and Guidance.
- Governing Authority / Board Training and Guidance.
- Mutual Aid Planning and Development.
- Office and Support Personnel Training.
- Operations and Maintenance Plan Development and Implementation.
- Operator Skillset Development and Continuing Education.
- Optimization of Water Treatment and Disinfection Systems.
- Rate Analysis and Implementation.
- Risk / Vulnerability Assessment and Emergency Response Planning.
- Safety Training and Safety Plan Development / Implementation.
- Source Water Protection Plan Development and Implementation.
- Water Loss Auditing, Leak Detection, and Meter Analysis.

Each participating PWS will receive a package of technical assistance activities focused on their individual needs and tailored to maximize effectiveness. Also, 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.

Due to changes in the cost share element of the 2104 WIIN grant, this program will partner with DWSRF to fund water system construction projects in the coming years. It is projected that the first project to receive funding in this manner will be in SFY2024.

OKLAHOMA Environmental Quality

Lead Testing in Public Schools & Childcare Facilities

Background

Starting in early CY2020, the Capacity Development Section began implementation of a new 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 Act- Section 2107 (WIIN 2107), the Lead Testing in School and Child Care Program Drinking Water Grant Program (or LWSC for short) offers free and voluntary testing of lead in drinking water outlets to any Oklahoma public school or public/private childcare center that requests to participate. In addition to free lead sampling in drinking water- schools will receive direction on how to address high lead levels based on EPA's "3Ts" guidance and follow up sampling if necessary.

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 lines and fixtures and enter the water- exposing anyone using the water to lead. Lead is a highly 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.

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.

Lead Testing in Public Schools & Childcare Facilities (cont.)

Program Partners

The program is guided by a coalition of agencies and organizations, including: the Secretary of Energy and Environment's Office (OSEE), the Oklahoma Parent Teachers Association (OPTA), and the Departments of Education (OSDE), Environment (DEQ), Health (OSDH), and Human Services (ODHS). This partnership 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.

The program also works with groups internal to DEQ, including State Environmental Laboratory Services (SELS), Environmental Complaints and Local Services (ECLS), the Engineering and Enforcement section, and the Land Protection Division.

The SELS division has played an integral role to the success of the program. SELS developed the application forms, plumbing profile questionnaire and outlet inventory form for the program. The SELS division also plays a large role in the program by creating sample kits for each sampling event and performing laboratory analysis on the samples. Communication with the SELS division regarding sampling schedules, and results notification is imperative. **The image to the right** features a DEQ SELS staff member testing for lead after a sampling event.

The Lead Testing in Schools Program also works together with the Engineering and Enforcement Section within DEQ for some schools that are also their own water supplies. This past year the program reached out to two public schools that have groundwater wells as the primary water source for their school. One school had a lead exceedance and the other had a copper violation. The Lead Testing in Schools Program and Engineering Section is currently working with both schools to come up with a viable solution.

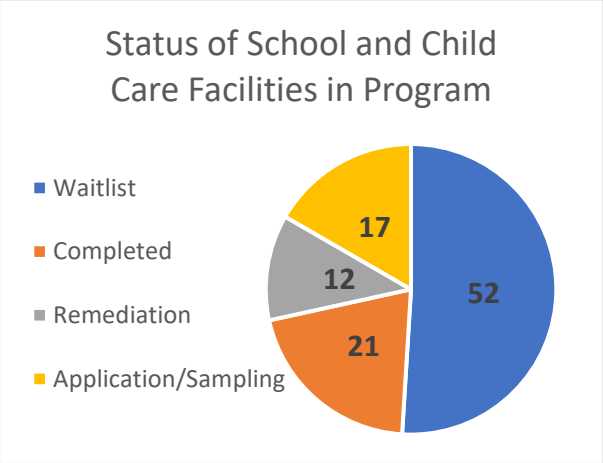
The Land Protection Division of DEQ has also contributed greatly to the success of Oklahoma's LWSC program. Their partnership, specifically their choice to offer remediation funding through the Site Cleanup Assistance Program (SCAP), has encouraged many schools to sign up and continue with the program after sampling. So far, seven schools have been reimbursed for fixture remediation and replacement of high lead detections (over 15ppb). A total of $38,458 in SCAP funding has been reimbursed to schools for fixture replacement after high lead detections (over 15ppb). This SCAP funding used for remediation efforts has directly impact 9,089 students and staff- all of whom will no longer be exposed to lead in their drinking water at their place of work and education.

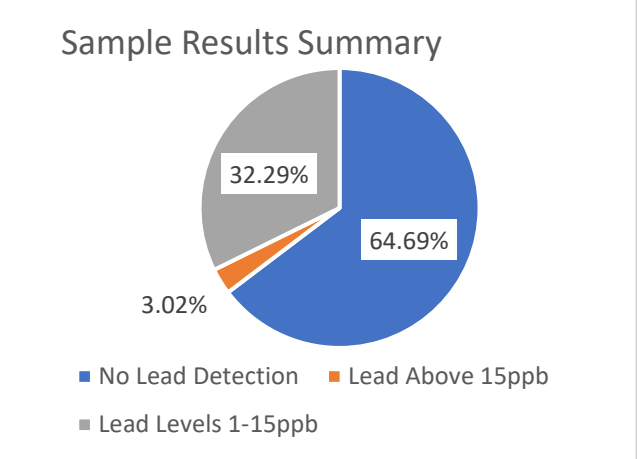
Beginning in FY2024, the ECLS division will help the Capacity Development Section with sampling efforts throughout the state. Sampling requirements necessitate that water samples must be collected before a facility opens and before any water is used. This has presented a challenge to central-Oklahoma based staff- as program enrollment is available to schools and childcare facilities across the state- regardless of distance from the central offices. The ECLS division's involvement in the program will allow for sampling to continue at a consistent pace while balancing internal staffing constraints and limitations.

Lead Testing in Public Schools & Childcare Facilities (cont.)

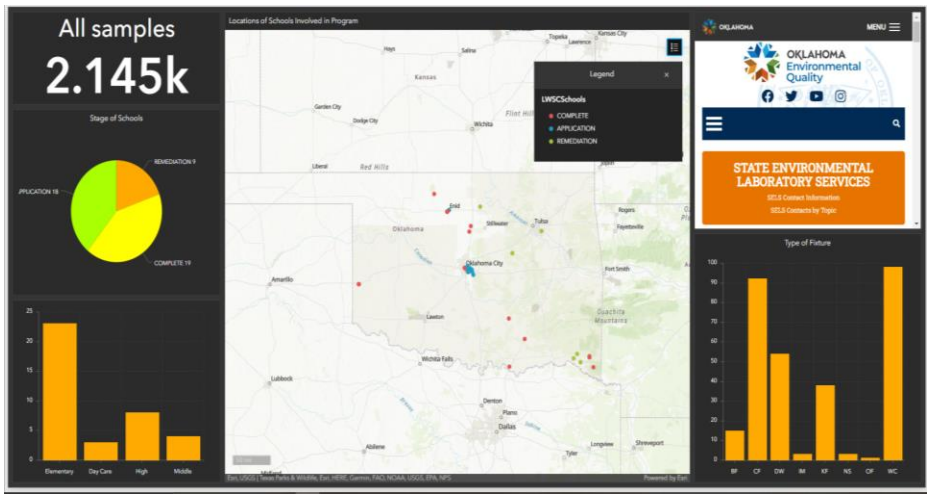
Program Updates

There have been many improvements since the start of the program in early CY2020. As of June 30, 2023- one-hundred and two (102) facilities are involved in the program; sixty-six (66) public schools, thirty-five (35) childcare facilities and one (1) youth facility. Currently, there are 3,326 eligible public schools and daycares in Oklahoma. Of the one-hundred and two (102) schools signed up to participate, thirty-three (33) schools have been sampled. **The image below** details that status of each participating schools and childcare centers within the program. A total of twenty-one (21) schools/childcare centers have completed the program.





The pie chart above on the right shows the results of the thirty-three (33) sampling events completed by the program. More than half of samples taken (64.69%) had no lead detections, 32.29% of samples had lead levels between 1-15ppb, and 3.02% of samples were above the 15ppb maximum contaminant level (MCL) for lead.



The program has also created a GIS (Geographic Information Systems) dashboard that showcases all samples data and a map to view information on each school tested. This dashboard is public and viewable at the link below: https://deq.maps.arcgis.com/apps/dashboards/0ced35b721704791b02eae1210606a8a

OKLAHOMA Environmental Quality

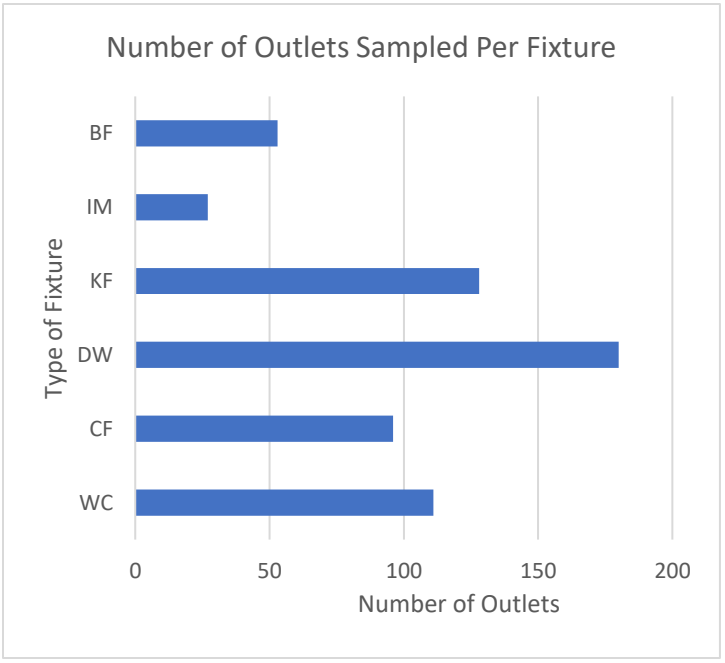
Lead Testing in Public Schools & Childcare Facilities (cont.)

Data Analysis

DEQ has performed data analysis on all samples taken from the start of the program. Most samples taken were from drinking water fountains, kitchen faucets, water coolers with chiller units and drinking water fountains. There were minimal ice machines and bathrooms faucets for drinking at schools. The abbreviations for each type of fixture are listed below:

- WC: Water Cooler with Chiller Unit
- CF: Classroom Faucet
- DW: Drinking Water Fountain
- KF: Kitchen Faucet
- IM: Ice Machine
- BF: Bathroom Faucet

The chart identifies the number of outlets sampled per fixture. Drinking Water Fountains (DW) is machine that is connected to the buildings water supply for a continuous supply of water was sampled the most. Kitchen Faucets (KF), Water Coolers (WC) and Classroom Faucets (CF) were sampled a good amount while Ice Machines (IM) and Bathroom Faucets (BF) were less often sampled.



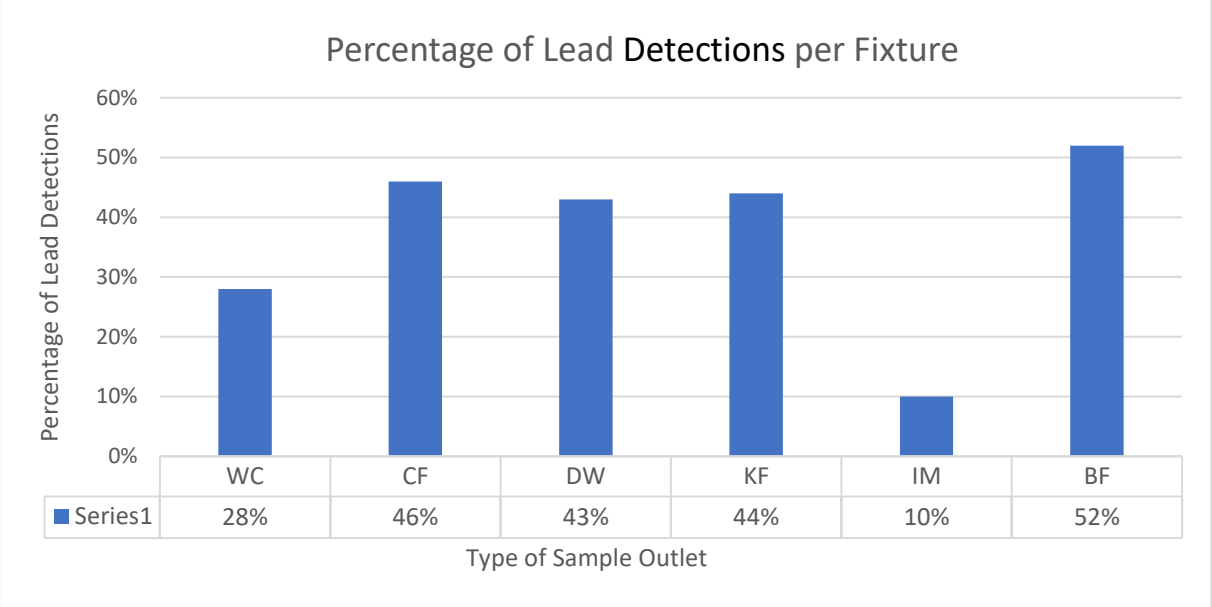
The image above is of a Classroom Faucet (CF) and Drinking Water Fountain (DW) that were sampled at a school. There were multiple schools with two (2) fixtures on each sink. These are often found in schools built prior to 1980.

The image above is of a Kitchen Faucet (KF) that was sampled from a school in the program. There was an average of zero to three (0-3) Kitchen Faucets sampled per school.

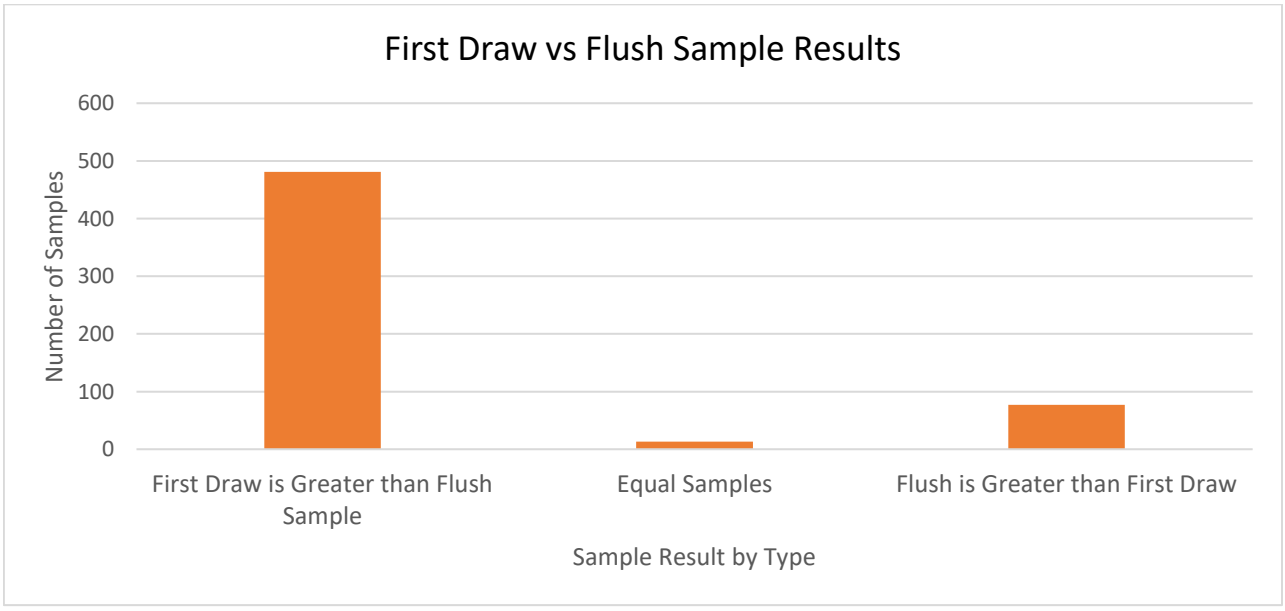
OKLAHOMA Environmental Quality

Lead Testing in Public Schools & Childcare Facilities (cont.)

Data Analysis (Cont.)



DEQ also performed a data analysis based on the sample results of each of those fixtures. **The chart above** shows the percentages of lead detections per fixture. Bathroom Faucets (BF), Kitchen Faucets (KF), Drinking Fountains (DW) and Classroom Faucets (CF) all had more than 40% of their samples contain lead. Ice Machines (IM) and Water Coolers (WC) had minimal lead detections due to the default installation of filters.



DEQ also performed data analysis for all samples in determining if more lead was detected in the first draw or the flush sample. **The chart above** depicts that most samples resulted in higher lead results in the first draw and decreased in the flush sample. This gives reason to believe that the lead source for most of the samples are coming from the fixture not in the plumbing lines.

OKLAHOMA Environmental Quality

Lead Testing in Public Schools & Childcare Facilities (cont.)

Program Improvements

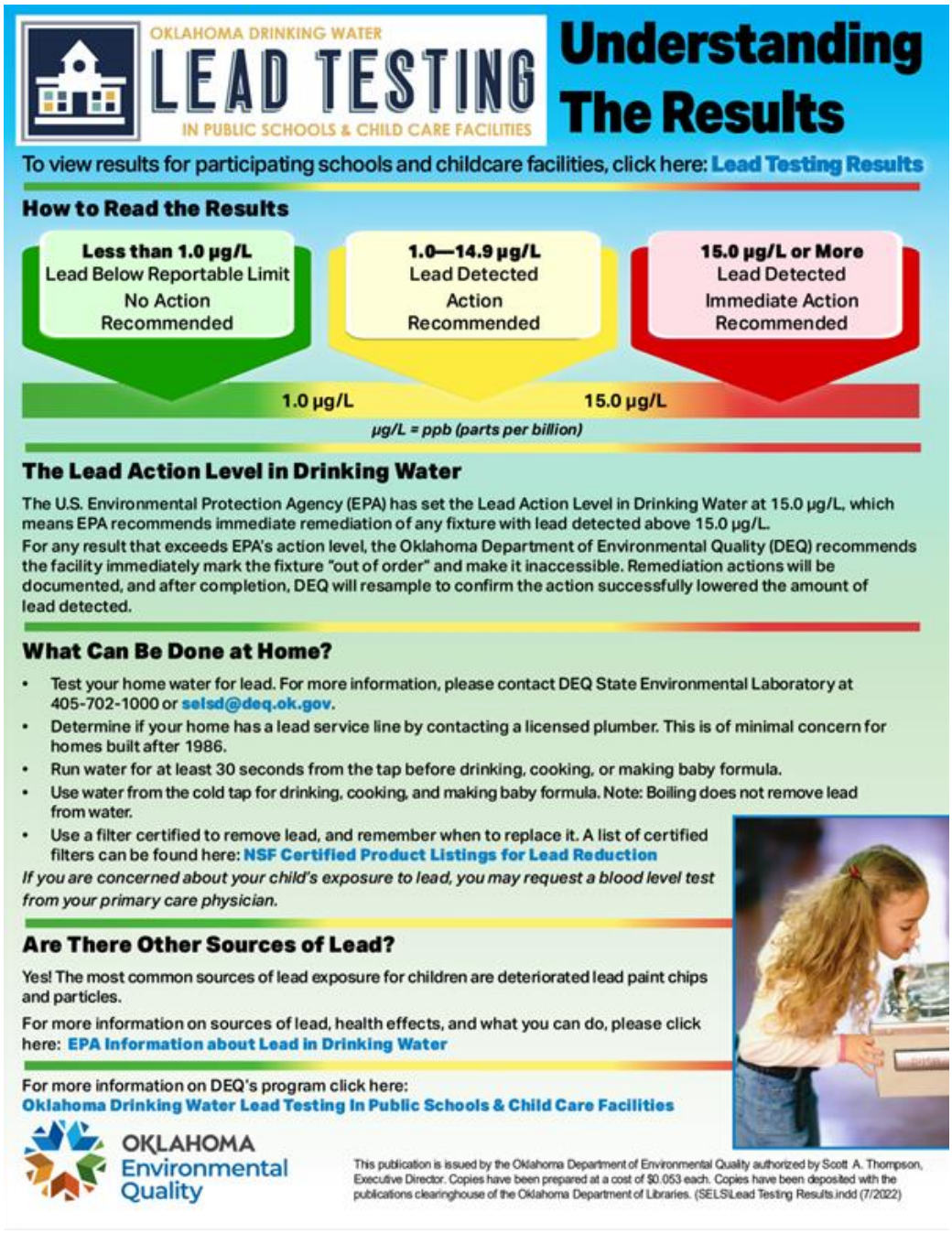
The program has developed a Report that includes participant information, sample results, program status, remediations completed, SCAP funding information, and other program highlights. This Report is updated and published every quarter on the DEQ Lead Testing in Drinking Water in Schools and Child Care Webpage as well as DEQ social media platforms. This has been a great way to showcase the program's hard work and accomplishments. The first two pages of the program's most recent report **are above.**

The Capacity Development Section has also created signs for schools to put above drinking water fixtures that have had lead detects **(image on the left**). This would be recommended for use if school officials decide to permanently convert a fixture to a 'hand-wash only sink' or as temporary solution. This sign is sent as a Portable Document Format (PDF) to schools with their respective results.

OKLAHOMA Environmental Quality

Lead Testing in Public Schools & Childcare Facilities (cont.)

Program Improvements (Cont.)



OKLAHOMA DRINKING WATER
LEAD TESTING
IN PUBLIC SCHOOLS & CHILD CARE FACILITIES

Understanding The Results

To view results for participating schools and childcare facilities, click here: **Lead Testing Results**

How to Read the Results

Less than 1.0 µg/L	1.0—14.9 µg/L	15.0 µg/L or More
Lead Below Reportable Limit	Lead Detected	Lead Detected
No Action Recommended	Action Recommended	Immediate Action Recommended

1.0 µg/L — 15.0 µg/L

µg/L = ppb (parts per billion)

The Lead Action Level in Drinking Water

The U.S. Environmental Protection Agency (EPA) has set the Lead Action Level in Drinking Water at 15.0 µg/L, which means EPA recommends immediate remediation of any fixture with lead detected above 15.0 µg/L.

For any result that exceeds EPA's action level, the Oklahoma Department of Environmental Quality (DEQ) recommends the facility immediately mark the fixture "out of order" and make it inaccessible. Remediation actions will be documented, and after completion, DEQ will resample to confirm the action successfully lowered the amount of lead detected.

What Can Be Done at Home?

- Test your home water for lead. For more information, please contact DEQ State Environmental Laboratory at 405-702-1000 or **selsd@deq.ok.gov**.
- Determine if your home has a lead service line by contacting a licensed plumber. This is of minimal concern for homes built after 1986.
- Run water for at least 30 seconds from the tap before drinking, cooking, or making baby formula.
- Use water from the cold tap for drinking, cooking, and making baby formula. Note: Boiling does not remove lead from water.
- Use a filter certified to remove lead, and remember when to replace it. A list of certified filters can be found here: **NSF Certified Product Listings for Lead Reduction**

If you are concerned about your child's exposure to lead, you may request a blood level test from your primary care physician.

Are There Other Sources of Lead?

Yes! The most common sources of lead exposure for children are deteriorated lead paint chips and particles.

For more information on sources of lead, health effects, and what you can do, please click here: **EPA Information about Lead in Drinking Water**

For more information on DEQ's program click here:
Oklahoma Drinking Water Lead Testing In Public Schools & Child Care Facilities

OKLAHOMA Environmental Quality

This publication is issued by the Oklahoma Department of Environmental Quality authorized by Scott A. Thompson, Executive Director. Copies have been prepared at a cost of $0.053 each. Copies have been deposited with the publications clearinghouse of the Oklahoma Department of Libraries. (SELS\Lead Testing Results.indd (7/2022)

The program has created a Lead Results Interpretation sheet to help school staff and parents understand the lead detection results. Most of the public does not know what the EPA Action Level is or what amount of lead requires immediate action. This document is intended to mitigate miscommunication with the public. The document above is on the webpage and sent to schools with their respective results. **See image above.**

Lead Testing in Public Schools & Childcare Facilities (cont.)

Stories

A portion of the success of the program is due to water systems contacting their respective schools to sign up for the program. In early 2020 there was hesitation from schools to participate in the program. Without that push from the water systems, the program would not be where it is today. There was a total of 15 schools that either signed up for the program because of promotion from their water system or they worked together with their water system. The list of the schools includes:

- Broken Bow Water System
  - Broken Bow High School
  - Rector Johnson Middle School
  - Dierks Elementary
  - Bennett Elementary
  - Haworth Public Schools
  - Valliant Public Schools
  - Forest Grove Public School
  - Wright City Public School
- Town of Jet
  - Timberlake Public Schools
- City of Enid
  - Hayes Elementary
  - Hoover Elementary
  - Taft Elementary
  - Coolidge Elementary
  - Longfellow Middle School
- Colbert PUA
  - Colbert Public Schools

PARTICIPANT TESTIMONIAL

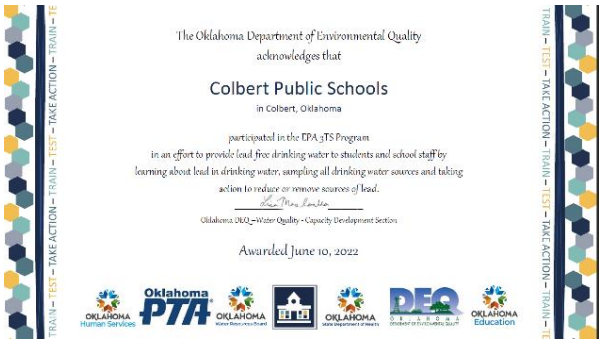
"I would like to express my appreciation for Oklahoma DEQ in providing the Lead Testing in Drinking Water Program. This program will be essential in helping our water system, schools and daycares navigate through the new Revised Lead/Copper Rule. With Oklahoma DEQ's guidance our system will be able to provide the best quality water for our customers. Once again, thank you for your help."

-Jennie Woods

Broken Bow Water Treatment Supervisor

One water system in particular, Broken Bow Water System provided tremendous initiative and promotion for the program. Not only did they get eight (8) schools in their surrounding area to sign up but worked with the school and DEQ every step of the way. The staff of the water system helped DEQ by helping collect samples, escorting DEQ around the buildings, scheduling, communication and repairing fixtures. A quote from the Water Treatment Supervisor of Broken Bow is in the **text box above.**

Another success story includes Colbert Public Schools. This school signed up for the program in 2021 and was sampled for lead in drinking water. After the initial sample, there were four (4) water fountains with high lead detections (over 15ppb). The school requested $6,295 of SCAP funding for the water fountains to be replaced with new fixtures. The SCAP funding was granted, and the school completed replacement of the fixtures. The fixtures were re-sampled in 2022 and there were no lead detections. The school received the **certificate to the right**, in honor of their completion of the program.


The Oklahoma Department of Environmental Quality
acknowledges that

Colbert Public Schools
in Colbert, Oklahoma

participated in the EPA 3Ts Program
in an effort to provide lead free drinking water to students and school staff by
learning about lead in drinking water, sampling all drinking water sources and taking
action to reduce or remove sources of lead.

Oklahoma DEQ – Water Quality - Capacity Development Section

Awarded June 10, 2022

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Lead Testing in Public Schools & Childcare Facilities (cont.)

Program Student Involvement

Beginning July 1, 2022, DEQ began developing a student pilot program where high school or college 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. The program officially launched in Spring 2023. The link to sign up is on DEQ's website.

(above) Student Volunteer Program sign up page from the DEQ website.

Expected Outcomes

Expected outcomes for the 'Lead Testing in Public Schools & Childcare Facilities' project are:

- The reduction of children's exposure to lead in drinking water.
- 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.
- Improvement of school staff and community knowledge on lead in drinking water and other environmental harms.
- Water quality improvement and lead exposure reduction in drinking water.
- Establishment of routine practices such as those outlined in the 3Ts guidance.
- 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.

Program Outreach Efforts

The Capacity Development Section participates in outreach and marketing efforts throughout the year to inform Oklahoma water systems of the services the section provides, connect with organizations who share similar goals, and share the success of the programs.

The section historically attends at least seven conferences every year. Responsibilities vary but the section is often responsible for presenting and/or tending to a booth setup.

Conferences attended include:

- The Governors Water Conference
- Oklahoma Rural Water Association Conference (triennial)
- Water Appreciation Day at the Oklahoma State Capitol
- ASCOG (Association of South-Central Oklahoma Governments) REAP (Rural Economic Action Plan) Seminar (semiannual)

Two members of the Capacity Development Section, Katelynn McLaughlin (left) and Lisa Stewart (right) pose in front of their booth at Water Appreciation Day at the Oklahoma State Capitol (2022).

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Program Outreach Efforts (cont.)

Capacity Development staff member, Lisa Stewart, giving a presentation at the Oklahoma Rural Water Association Conference (2023) **(above).**

Capacity Development Staff at an Oklahoma Rural Water Association Expo featuring a trained "leak detection" dog **(left).**

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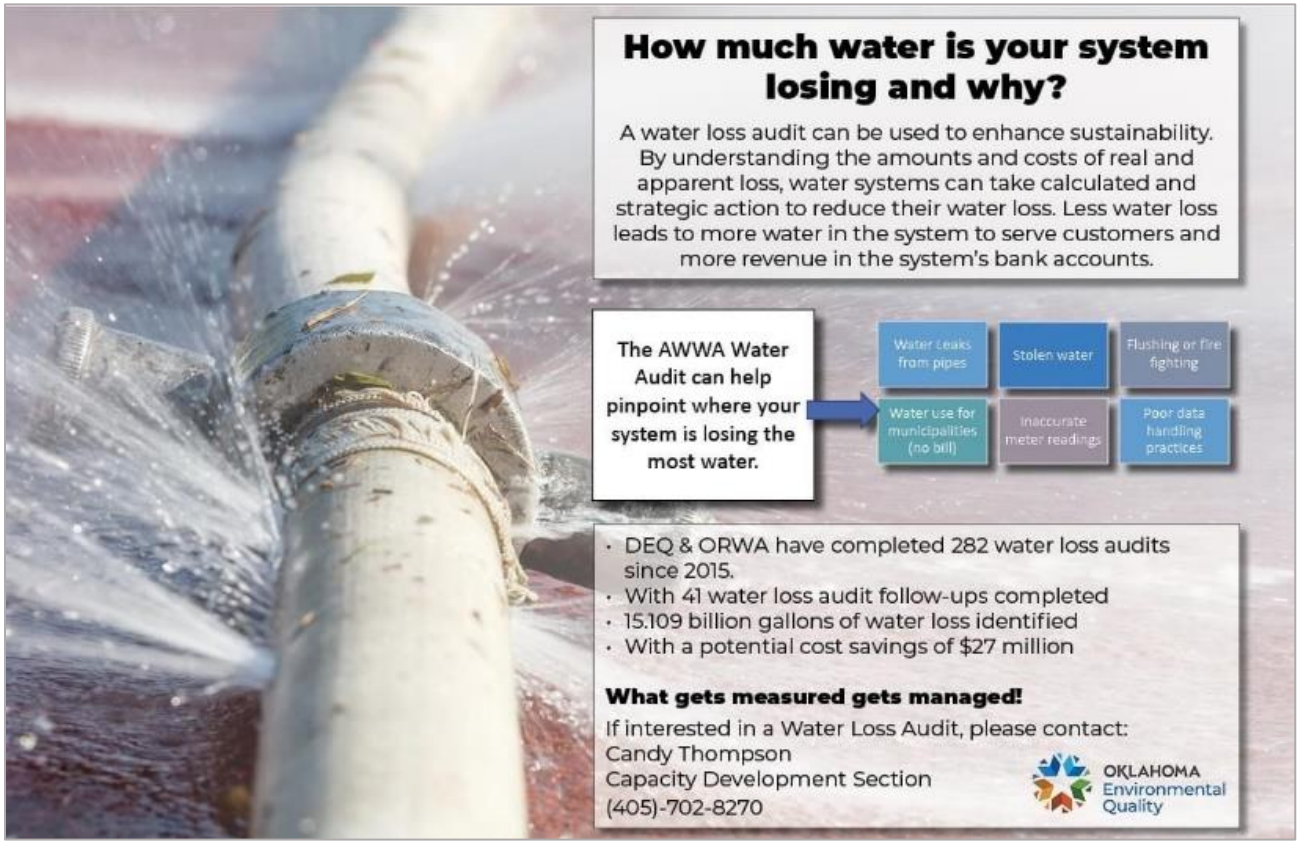
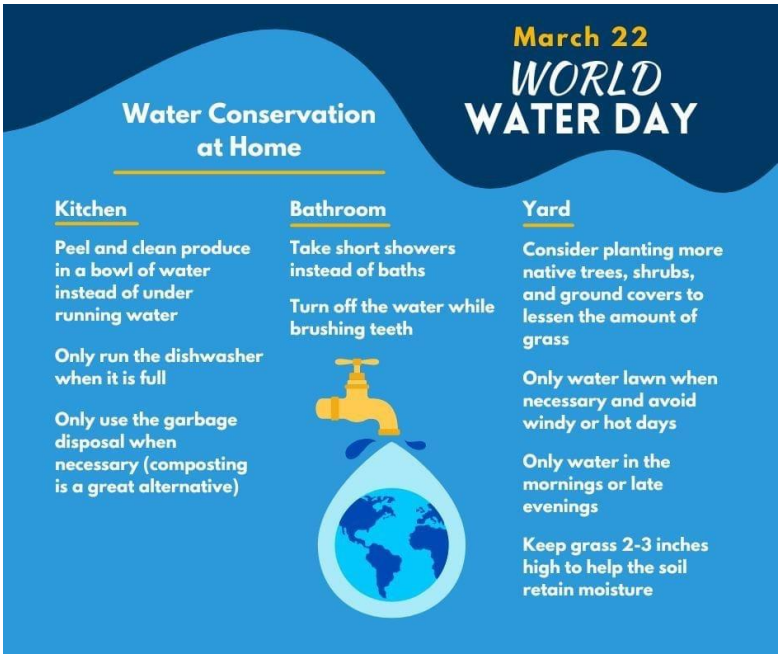
Program Outreach Efforts (cont.)

The Capacity Development Section also performed marketing efforts in 2022-2023 for water conservation. The section created a different conservation post with tips on how to save water for each month of the year. The posts were posted to DEQ's social media pages. **Below** are a few examples of the conservation posts the section has created:





Two examples of 'conservation posts,' one informs upon DEQ's water loss auditing program **(above)** and the second gives tips on domestic water conservation in celebration of World Water Day **(left).**

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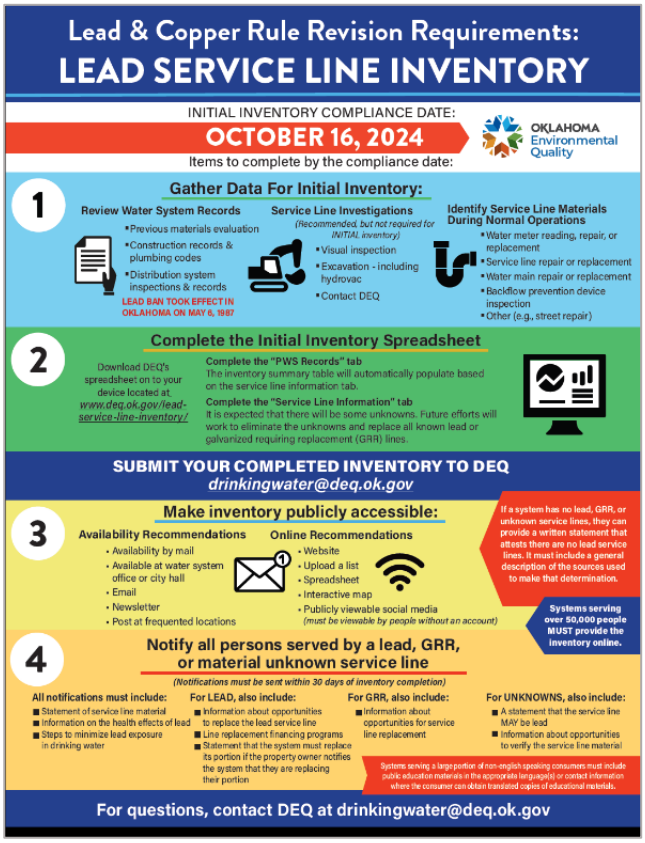
Program Outreach Efforts (cont.)

The Capacity Development Section also performed marketing and outreach efforts by making new posters and infographics. A few examples of new posters created were for the Lead Service Line Inventory and the importance of removing lead from our water sources. The posters were printed and used for showcasing at conferences and made as flyers for distribution to water industry professionals. The Capacity Development Section expects to continue its program outreach goals in the future by continuing to attend relevant conferences, provide trainings, update infographics and posters, and brainstorm ways to reach not only water system staff, but the general public.



The Capacity Development Section was heavily involved in the Lead & Copper Rule Revision (LSLI) outreach events and trainings which took place across Oklahoma in the spring of 2023. This graphic was created to showcase information about the initial inventory, due October 2024 **(left).**

There is no safe level of lead in drinking water- especially for vulnerable populations. Becoming aware of the potential sources of lead in one's home is one step closer to eliminating that exposure **(right).**

New Initiatives- Source Water Protection Program

Background

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 assessments include 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
- 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.

DEQ's SWPP

DEQ began re-developing the program in 2022, focusing largely on collaboration with other departments and organizations to ensure the accuracy of the inventoried sources of contamination. This is in hopes to expand the data gathered and 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 the state's source water, including information on reported fish kills, superfund and 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 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 used to create a map showing source water protection zones around public water supply sources.

Below is an example of a map produced with various input layers indication source water protection zones around wells.

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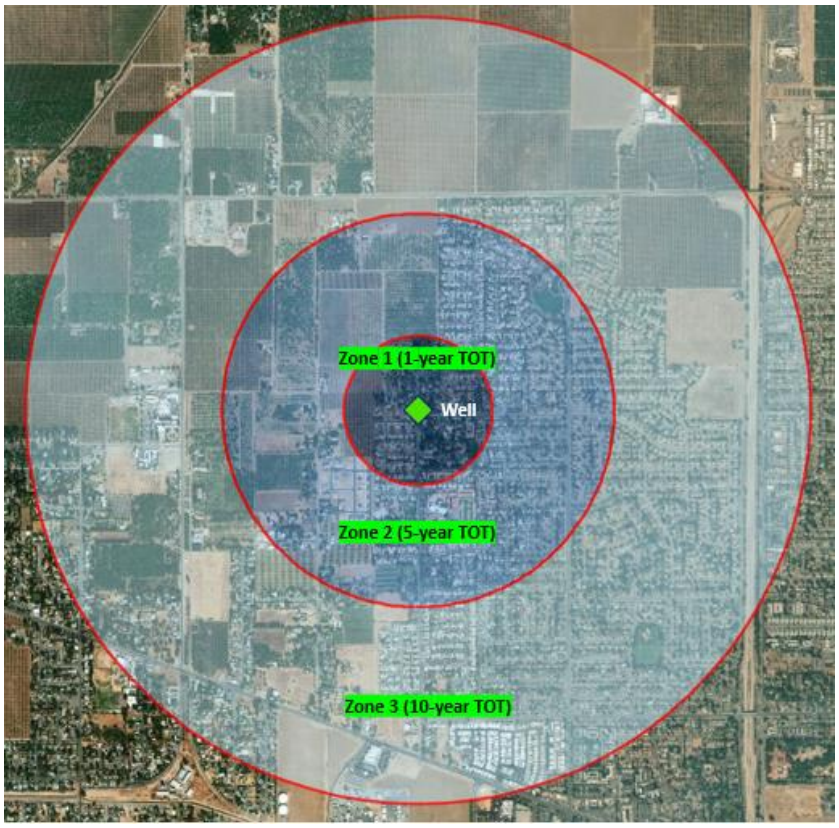
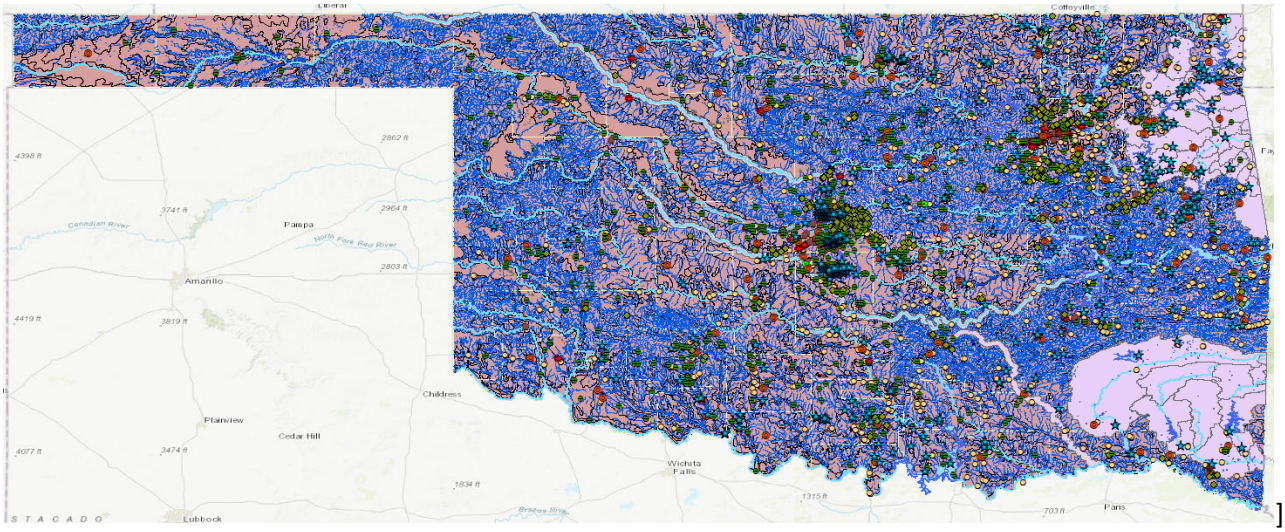
New Initiatives- Source Water Protection Program (cont.)



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 below image is an example of what this map currently looks like while in development.



In addition to the internal source water efforts, DEQ is also a member of the Oklahoma Source Water Collaborative with OWRB, OCC (Oklahoma Conservation Commission), ORWA, ODAFF (Oklahoma Department of Agriculture and Forestry), SWAWWA (Southwest Section of AWWA), USDA NRCS (United States Department of Agriculture Natural Resources Conservation Service), and the GWPC (Ground Water Protection Council). This group meets regularly to identify the source water protection needs of surface and ground water systems across the state, as well as to facilitate collaboration across the agencies involved.

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Lessons Learned

In the past three years the Oklahoma DEQ Capacity Development Section has undergone many improvements. With high employee turnover, the section was required to be in a constant state of adjustment and flexibility; nevertheless, due to existing staff perseverance and dedication- work was completed on time and forward progress was made.

This section began many projects that will continue in the coming years. Notably, the 'Capacity Development Assessment' revamp project in which the current assessment (created in 2014) is undergoing drastic changes. The goal is to reduce the number of questions, provide more detailed explanations, and create assistance items related to each question asked. Overall, this update will provide more comprehensive and customized assistance to each water system assessed.

The assistance items provided by the section pre-2020 were also overhauled. This includes a re-vamped Emergency Response Plan template (based on AWWIA guidance). This new template structure and language is catered to Oklahoma systems- creating more space for systems to prepare for tornados, severe weather, flooding, heatwaves, ice storms and other Oklahoma-specific emergency events. Systems are also encouraged to work with their internet provider to create a comprehensive cybersecurity plan.

There have also been many improvements and updates to the Asset Management Plan. An improved instructions page and revised formulas to calculate 'criticality score' for each asset was included. Additionally, DEQ has partnered with ORWA to create a cost data summary sheet. This sheet will include cost data for assets that are most often added to asset management plans (pumps, master meters, fire hydrants, etc.). It will be a useful tool for completing plans for systems that do not have access to purchasing or financial information on system assets.

The section has also improved site visit efficiency by developing 'Pre-Visit check sheets' for each of the most requested assistance items. These check sheets are sent out to water systems prior to a water loss audit, emergency response plan and/or asset management plan creation. These documents outline the data required to complete each of these assistance items. This data can include water usage totals, personnel contact information, location information for assets within the system, etc. After implementing this change, water systems were more prepared for the site visit than before. The documents will be modified as needed.

These past few years the Capacity Development Section has leaned into change. The section has revised or made plans to revise all the pre-2020 assistance items, created new templates, partnered with internal and external entities, and developed many programs from the ground up. The Lead Testing in Schools, asset management, and Source Water Protection Programs were only in the initial phases in 2020- now they take their place amongst the diversity of assistance offered by the section to the water systems of Oklahoma. Capacity Development will continue changing and learning to respond to the diverse needs of water systems in the state.

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Future Direction

The Capacity Development Section will continue modifying the technical assistance offered to respond to the ever-changing needs of Oklahoma water systems. Expectations are to continue work in the Water Loss Auditing, Emergency Response, Lead Testing in Schools, and AWOP programs over the next few years with little changes. These programs have had an incredible impact across the state, and the hope is to extend assistance from these programs to as many systems as possible in the coming years. To assist in that goal the section is gaining one new employee position- raising the total number of individuals in the section to six.

Several of the programs are undergoing massive changes including the Capacity Development Assessment, Asset Management, Disadvantaged Communities, and Source Water Protection Program. The goals reflect these major changes and the future direction of the section.

Internal Goals:

1. Finish updating the Capacity Development Assessment by the end of the calendar year 2023 and launch its subsequent pilot project in Spring of 2024.
2. Promote the 'Student Volunteer Program' associated with The Lead Testing in Schools initiative.
3. Complete the auto-calculated 'cost data tab' within the asset management plan by 2024. This tab will allow systems a greater understanding of asset cost over time.
4. Complete work on the revamped Source Water Protection (SWP) Program and launch a pilot project in 2024.
5. Promote the AWOP Awards Program to increase awareness and implementation of optimization concepts.
6. Continue to promote and provide trainings and presentations on DEQ's Asset Management Plan Tool for the next year.
7. Create additional templates and modify assistance available based on water system needs; additionally, to upload these templates and assistance items on the official DEQ website for increased accessibility.

Project outcomes:

1. Reduce 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. Decrease real and apparent water loss at PWS systems and increase understanding of types of loss and the importance of data integrity.
4. Improve TMF assessment scores across the state- especially in small, underserved, and disadvantaged communities- leading to an improvement in the overall state TMF score.
5. Reduce lead exposure from drinking water at schools and childcare facilities across the state.
6. Increase awareness of Asset Management Plan Tool and its benefits to water systems in Oklahoma.
7. Improve the performance of drinking water systems in small, underserved, and disadvantaged communities.