

CONNECTICUT DEPARTMENT *of* PUBLIC HEALTH  
DRINKING WATER SECTION

# Small CWS Fiscal and Asset Management Plan Training

CT Dept of Public Health – Drinking Water Section

June 2, 2020

2:30pm - 4:00pm EST



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## Meet the Presenters

Mandy Smith, Capacity Development Unit

Vicky Carrier, Technical Review and Field Assessment Unit

Sara Ramsbottom, Drinking Water State Revolving Fund Unit

Steven Wallett, Capacity Development Unit

Submit questions using the chat box – Answer questions at end



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# Today's Agenda

- DWS Capacity Development/Review of New Statute
- Section 1: PWS General Information
- Section 2: Asset Management
- Section 3: Financial Management & DWS Funding Opportunities
- Section 4: Unaccounted For Water
- Section 5: Annual Update Record



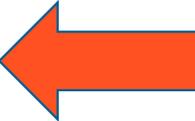
# CT DPH Drinking Water Section (DWS) Responsibilities

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- Regulate over 2,550 Public Water Systems with over 4,000 sources
- CT DPH: Primacy over SDWA and State Public Health Laws that protect/provide for Public Drinking Water
  - 17 different Federal Rules
  - 13 distinct State PWS planning/permitting/ protection laws – High Quality Sources
- 2.9 million CT residents served
- 90 CWS serve over 1,000 people
- 460 CWS serve under 1,000 people 
- 2,000 non-community PWS





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# Introduction

What is Capacity Development?

What is the new Statutory Requirement for Small CWS?

Format to Meet the New Requirements



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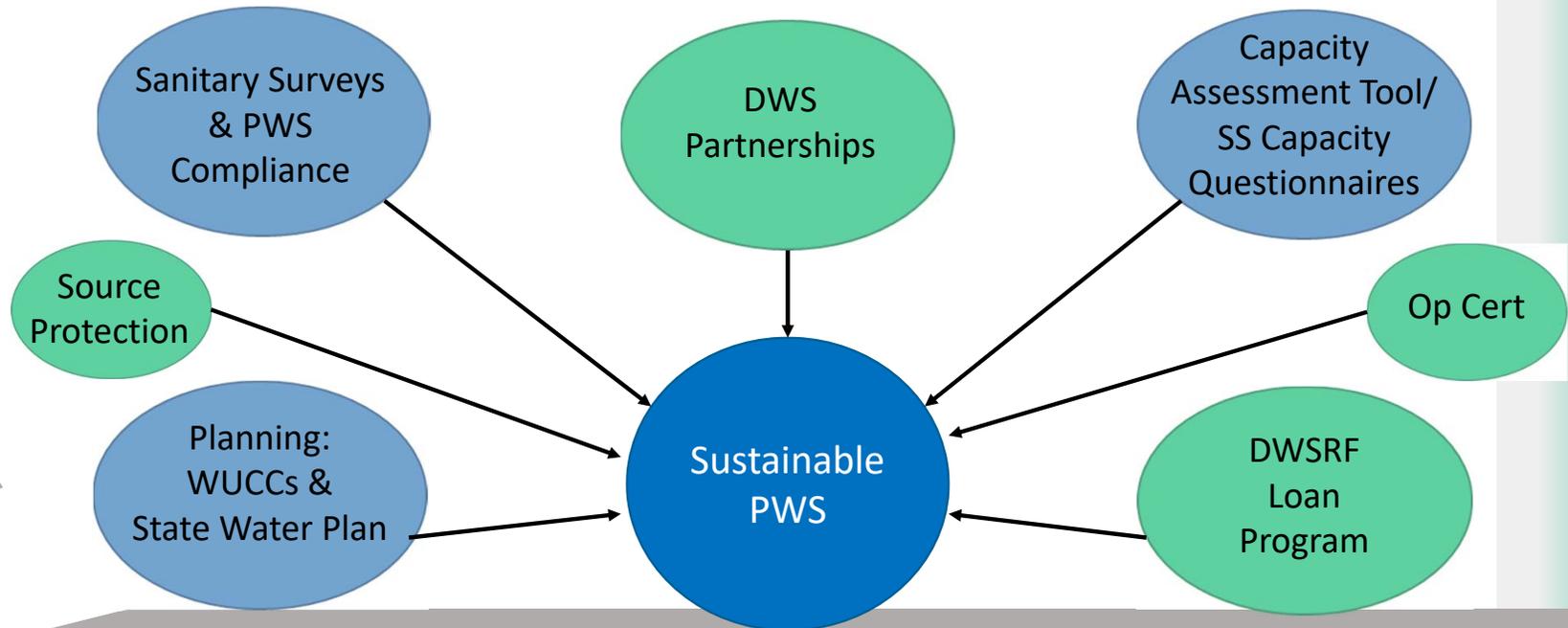
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# CT DPH DWS Capacity Development

Cap Dev Strategy that addresses PWS Technical, Managerial and Financial needs to maintain viable systems per the SDWA 1996 Amendments for **New** and **Existing** PWS – Integrated with all we do





# Why Care about Capacity & Aging Infrastructure?

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3 Storms  
Aug. 2011 – Irene  
Oct. 2011 – Alfred  
Oct. 2012 – Sandy



**Small Systems:**  
Boil Water Advisories,  
No Resources,  
Restricted Access



**Large Systems:**  
Extended Period on  
Generators,  
Limited Access,  
Communication Issues





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# Why Care about Capacity & Aging Infrastructure?



2015 Hydro-pneumatic Tank  
Explosion In Southeastern CT





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# Connecticut General Statutes-CGS §19a-37e

- Applicable to Small CWS serving <1,000 & not required to prepare Water Supply Plans or regulated by PURA (Approx 300 CWS in CT)
- Requires Fiscal and Asset Management Plan by **1/1/2021**
  - Includes: Asset Management Inventory and Capital Improvement Plan, Fiscal Review and Unaccounted for Water Loss
  - Prioritized Hydropneumatic Storage Tank Assessment 5/2/19
- Plan shall be updated Annually
- Plan shall be made available to the Department upon request





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# Format to meet New Requirements

## Use DWS Fiscal & Asset Management Plan Template

- DWS template incorporates all mandatory requirements
- Instructions, guidance document and filled out example
- Template announced in DWS Circular Letter 2020-006
- Above available on DWS Small System Capacity webpage with other useful web links to resources
- Spring in-person trainings had to be canceled due to COVID-19



# DWS Capacity Development WebPage

## Small Community Fiscal and Asset Management Plan Requirements – NEW!

Pursuant to the new Connecticut General Statutes (CGS) §19a-37e, all small community public water systems serving < 1,000 year-round residents shall complete a fiscal and asset management plan for all capital assets by no later than **January 1, 2021**. To aid small CWS in the development of the initial fiscal and asset management plan, a Fiscal & Asset Management Plan Template, Instructions and Guidance Document have been prepared and are available at the links below.

- [Fiscal and Asset Management Plan Template for Small Community Public Water Systems \(PWS\)](#)
- [Fiscal and Asset Management Plan Template Instructions](#)
- [Fiscal and Asset Management Plan Appendix A: For Community PWS applying for DWSRF loans](#)
- [Fiscal and Asset Management Plan Guidance Document](#)
- [Example of Completed Fiscal and Asset Management Plan Template](#)

The template has been designed so that a PWS owner working with their certified operator should be able to complete the plan based on their water system records. This asset and fiscal plan is due by 1/1/2021, must be updated annually and also must be made available to the department upon request. DPH staff will request to see a copy of the completed Fiscal & Asset Management Plan for Small Community PWS at the time of the PWS's next sanitary survey after the 1/1/21 due date. A list of the small PWS required to complete a plan is available at the link below.

- [Small Community PWS Serving <1,000 Year Round Residents Required to Complete F&AM Plan](#)

- Template
- Instructions
- DWSRF Appendix
- Guidance Doc
- Completed Example Plan
- List of PWS Required to Prepare Plan





# DWS Capacity Development WebPage

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The plans and assessments above are an important step for small community PWS to prepare for long term success. Additional capacity development information and resources are available below.

- [DPH/EFCN Small Community Capacity Webinar Series for CT PWS](#)
- [Drinking Water State Revolving Fund \(DWSRF\) Generator and Small System Loan Program](#)
- [Capacity Assessment Tool \(CAT\)](#)
- [Water Utility Coordinating Committees \(WUCCs\)](#)
- [Community PWS Generator and Emergency Contingency and Response Plan Requirement](#)

## Helpful Resources to Build PWS Capacity

- [EPA STEP Guide Series](#) Step by Step guides for Building the Capacity of Drinking Water Systems
- [EPA Drinking Water Capacity Website](#) many resources available for systems of all types
- [RCAP](#) - Resources for Communities and People - EPA Technical Assistance Contractor that can provide technical assistance to public water systems for compliance and financial and managerial capacity topics
- [EFCN](#) - Environmental Finance Center Network - EPA Technical Assistance Contractor that can provide financial and managerial assistance to public water systems

- Scroll Down for Other Resources
- DPH/EFCN Webinar Series
- DWSRF Small System Info
- Links to External Partners like EPA, EFCN, ASRWVA and RCAP

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# Section 1: PWS General Information

PWS System Characteristics General Info

Who Should be Part of Your Asset Management Team?

Water System Schematic & Distribution Map

What is your Level of Service?



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## Section 1: PWS General Information

This Plan is developed **BY you and FOR you and your customers** – **be honest** and use this exercise as a self-check up on your PWS to provide highest level of service to customers at lowest life cycle costs

This F&AM Plan can be used as training manual or a knowledge transfer for new board members, owners and/or operators.

It is a central place where all aspects of the water system are addressed including system and individual component history, operations/maintenance, budgeting, future planning and conservation



# Section 1: PWS General Information – ABC123

## Basic Info about the size and structure of your PWS

### SECTION 1: PWS GENERAL INFORMATION

Public Water System Name: ABC123 Homeowners Association PWSID: CT0169041 Town Served: Bridgewater

Type of Ownership: (check appropriate box)

Private Owner
  Homeowners Association / Condominium Association
  Municipality / Water Authority
  Incorporated, Investor-Owned

Other (specify): \_\_\_\_\_

### Public Water System Description

Source Type: (Check all that apply)

Ground Water
  Surface Water
  Surface Water (Purchased)
  Ground Water (Purchased)

Number of Service Connections:	17 single family homes	Total Population Served:	68 people
Number of Metered Service Connections:	0	Interconnections (list, if applicable):	N/A
Number of Lead Service Lines:	0		





# Section 1: PWS Contacts and F&AM Team

Who is Part of your Team?  
How will you Work Together?

Updated Contact Info  
and Clear  
Responsibilities are Key!

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### Contact Information

Contact Type	Name	Phone	Email	Current Address
Owner	Stan Roper, Assoc. Pres.	111-555-1234	<a href="mailto:stanleyroper@fakemail.com">stanleyroper@fakemail.com</a>	10 Water Street, Bridgewater, CT
Manager	N/A			
Financial Contact	Valerie Westin, Treasurer	111-555-1874	<a href="mailto:treasurerval@fakemail.com">treasurerval@fakemail.com</a>	15 Water Street, Bridgewater, CT
Chief Certified Operator	Paul Troeg, GoodH <sub>2</sub> O, Inc.	111-555-1212	<a href="mailto:PaulT@fakemail.com">PaulT@fakemail.com</a>	1453 Town Road, Danbury, CT
Sampler	Environment Laboratory	111-555-6210	<a href="mailto:LisaSmalls@fakemail.com">LisaSmalls@fakemail.com</a>	25 Summer Street, Danbury, CT
Head Maintenance Personnel	Stan Roper	111-555-1234	<a href="mailto:stanleyroper@fakemail.com">stanleyroper@fakemail.com</a>	10 Water Street, Bridgewater, CT

### Fiscal and Asset Management Team

Name	Responsibility
Stan Roper	ABC123 Association President, Oversee PWS operations, Customer Complaints, Communication with Association Board Members of needs of PWS
Valerie Westin	ABC123 Association Treasurer; Annual Budget Preparation, Rate Setting Plan, Rate Collection and Paying PWS Bills
AI Boardman	ABC123 Association Vice President; Association Communication/Outreach, issues with customer non-payment
Paul Troeg	Certified Operator; Day to Day Operations of PWS, Communicate with Association Board about PWS needs and issues



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# Section 1: PWS Schematic & Dist. Map

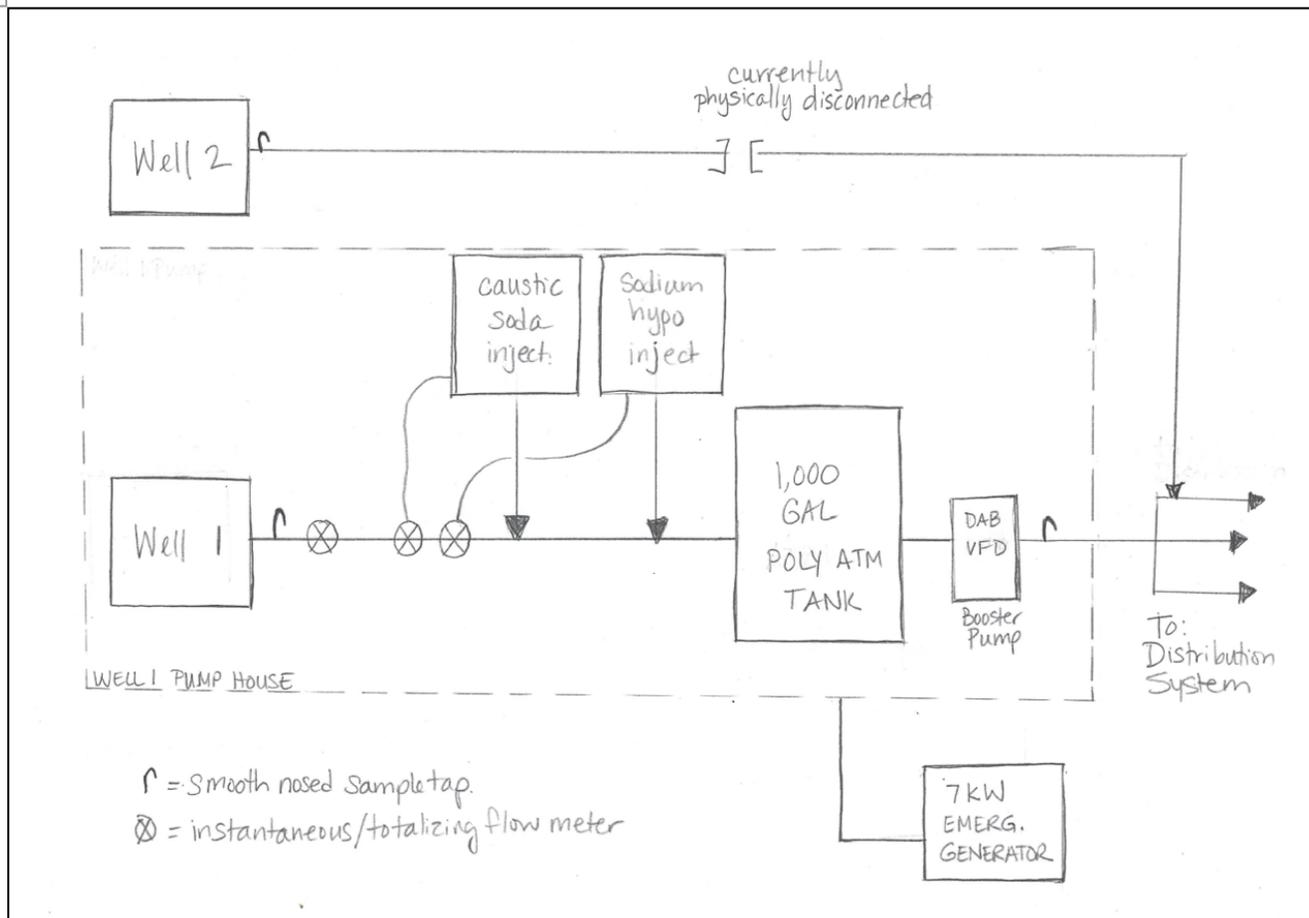
## Water System Schematic & Distribution System Map

Wells  
Storage Tanks  
Treatment Systems  
Sample Taps  
Meters  
Pumps  
Interconnections

Water Mains  
Service Lines  
Curb Stops  
Hydrants/Blow-offs  
Interconnections



# Section 1: PWS Schematic & Dist. Map

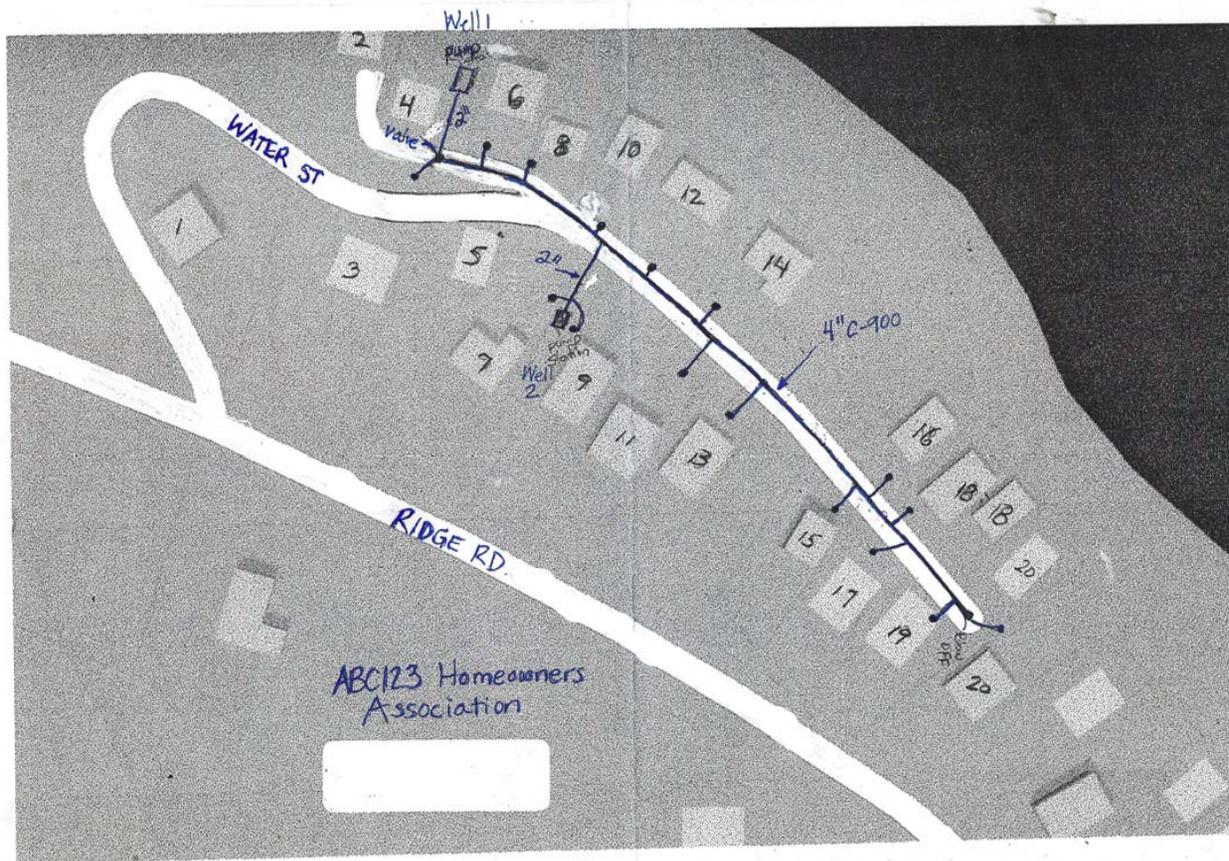


Identify Main System Components and how they are plumbed together



# Section 1: PWS Schematic & Dist. Map

ABC123 Homeowners Association Distribution System Map



Identify where water main and service connections are and valves, blow-offs or hydrants



## Section 1: Level of Service (LoS)

### What is Level of Service?

Characteristics or attributes of a service (your PWS) that describe its required level of performance. LoS is driven by customer/user demand, but also must take into account the state and federal regulatory requirements.

Goals Have been divided into 4 main categories: Public Health & Safety, Customer Service, Response Time and PWS Management

Have to know baseline conditions before you can accurately assess



# Level of Service (LoS) Goals Table

1. **Level of Service Goal** column: Fill in blanks for goals (as applicable).

2. **Current State** column: Identify if the PWS is meeting that specific goal or not and why.

3. **Plan to Maintain or Improve PWS** column: Identify your plan for maintaining or getting an acceptable LoS

Category	Level of Service (LoS) Goal	Current State	Plan to Maintain or Improve PWS
Public Health & Safety	Meet all federal and state Drinking Water Standards.	Yes No; Explain: All WQ test results within levels <b>2</b>	Maintain sources & water sys infrastructure in good repair.
	Maintain high level of confidence in water quality by completing all regulatory monitoring and reporting requirements and reporting results to customers annually in the consumer confidence report. <b>1</b>	Yes No; Explain: no recent M&R violations, complete CCR annually and distribute to residents	Continue to communicate water sys results to residents annually in consumer confidence report and conduct monitoring on time. <b>3</b>
Customer Service	Provide average water pressure of <u>75</u> PSI and minimum water pressure of <u>50</u> PSI throughout the distribution system.	Yes No; Explain: Constant Pressure set point 75 psi	Consider investing in redundant booster pump with VFD
	Fewer than <u>1</u> complaints received regarding color, taste and/or odor per month.	Yes No; Explain:	Maintain current treatment system to maintain good water quality
	Customers will receive _____ hour(s) notice for planned outages. Planned outages will last no longer than 8 hours per event.	Yes No; Explain: No standard for planned outages	Set goal to give customers <u>24 hours notice</u> for any planned outages
Response Time	Respond to water quality complaints by the next business day.	Yes No; Explain:	Assn President responds in a timely manner to any WQ complaints
	Main line breaks will be fixed within <u>12</u> hours of discovery. Service line breaks will be fixed within <u>36</u> hours of discovery.	Yes No; Explain:	Need to create a break response plan with list of contractors available to conduct work in a timely manner
PWS Management	The PWS employs an appropriately classified certified water operator that has direct responsible charge of the water system 100% of the time, and there is open communication between operator and the PWS owners/administrators.	Yes No; Explain: Current Operator Paul Troeg; conducts weekly site visits	Add in CO contract to provide a quarterly written water system update and maintenance report
	The PWS will implement this Fiscal and Asset Management Plan to maintain defined levels of service at the lowest life cycle costs.	Yes No; Explain: This is the first time this PWS has a	Will implement plan moving forward and take an active role in ownership



# Section 2: Asset Management



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What is Asset Management (AM)?

Asset Inventory Worksheet – List, Assess Condition & Risk

Operations & Maintenance Plan

Capital Improvements Table

The logo for the Connecticut Department of Public Health (DPH), featuring the letters 'DPH' in a stylized font with a blue and green circular graphic.

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Public Health Accreditation Board



# What is Asset Management?

Asset management is the practice of managing infrastructure capital assets to minimize the total cost of owning and operating them, while delivering the service level customers desire.

This management framework has been widely adopted by the water sector as a means to pursue and achieve sustainable infrastructure.

(EPA website)





## Why is Asset Management Important (Benefits)?

- Prolonging asset life and improving decisions about asset rehabilitation, repair, and replacement
- Meeting consumer demands with a focus on system sustainability
- Setting rates based on sound operational and financial planning
- Budgeting focused on critical activities for sustained performance
- Meeting service expectations and regulatory requirements
- Improving responses to emergencies
- Improving the security and safety of assets
- Reducing overall costs for both operations and capital expenditures



## What are Core Concepts (Elements) of Asset Management?

- What is the current state of my assets?
- What is my required "sustainable" level of service?
- Which assets are critical to sustained performance?
- What are my minimum life-cycle costs?
- What is my best long-term funding strategy?



# Asset Management Tools and Resources

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- The form we are presenting on today of course!
- Other Tools and Resources:

**1. RELIABILITY**  
PROPER MANAGEMENT

**2. COST EFFICIENCY**  
REDUCED COSTS

**3. WATER SYSTEM PARTNERSHIPS**

**4. WATER AND ENERGY EFFICIENCY**

**5. COMMUNICATIONS**  
CUSTOMER

**Reference Guide for Asset Management Tools**

Asset Management Plan Components and Implementation Tools for Small and Medium Sized Drinking Water and Wastewater Systems

**Asset Management: A Best Practices Guide**

Introduction

The guide will help you understand:

- What asset management means
- The benefits of asset management
- Dependence on asset management
- How to implement an asset management program

Target Audience

The guide is intended for owners, managers, and operators of water systems, local officials, technical assistance providers, and other personnel.

Asset Management

Asset management is a systematic process for identifying, assessing, and managing the physical assets of an organization in order to maximize their value, reduce risk, and improve performance.

Challenges faced by Water Systems	Benefits of Asset Management
<ul style="list-style-type: none"> <li>• Developing the best use of assets to meet the needs of the community</li> <li>• Identifying the best use of assets to meet the needs of the community</li> <li>• Identifying the best use of assets to meet the needs of the community</li> </ul>	<ul style="list-style-type: none"> <li>• Reducing water loss and saving on chemicals</li> <li>• Reducing energy consumption</li> <li>• Reducing the risk of system failure</li> <li>• Reducing the risk of system failure</li> <li>• Reducing the risk of system failure</li> </ul>

**Asset Management Switchboard**

The Southwest Environmental Finance Center has partnered with EPA to create a repository of documentation and tools related to Asset Management.

Whether you are **new to the Asset Management process** or just need a refresher on a specific topic, the resource you are looking for is probably here. If you're unable to find what you're looking for, reach out and tell us about it.

If you would like to contribute by having a resource added to the repository, please email the Southwest Environmental Finance Center (by clicking on the link below) and tell us about it. We welcome your feedback and strive to serve your utility and water systems at large.

[Email DW ETC](#)

[Phone \(800\) 577-6644](#)



**Taking Stock of Your Water System**  
A Simple Asset Inventory for Very Small Drinking Water Systems

**Asset Management: A Handbook for Small Water Systems**

One of the Simple Tools for Effective Performance (STEP) Guide Series

**Water System Owner Roles and Responsibilities: A Best Practices Guide**

Introduction

This Guide will help you understand:

- Your roles and responsibilities in delivering safe drinking water to your community's customers
- Additional responsibilities, which may vary depending on your system size, characteristics (e.g., complexity of treatment, managerial structure, and regulatory requirements)

All system owners share several key responsibilities that are critical to meeting your ultimate goal: providing an adequate and safe supply of drinking water.

Target Audience

This Guide is intended for owners and operators of all public water systems serving fewer than 10,000 persons.

System Operation

Work to ensure that the system is shown in a condition that is properly, efficiently, and in a financially responsible way.

General Responsibilities

- Annually assess your system's technical, managerial, and financial capacity
- Ensure that your system's infrastructure (pipes, pumps, tanks, etc.) is in good working order
- Determine whether staffing levels are adequate
- Work with the system operator to ensure that all staff having access are well
- Review your system's budget regularly to ensure whether your system is collecting enough revenue each year to cover costs of operating and maintaining the system
- Determine and plan future infrastructure maintenance and replacement needs with the system operator
- Develop and maintain an asset management plan to inventory assets of the system
- Develop and maintain a Cross Connection Control and Backflow Prevention Program
- Develop treatment optimization with the system operator and develop an optimization plan that includes goals for the water system to meet
- Identify available sources of local, state, and federal funding with help from regulatory, planning departments, and technical assistance providers

For additional information:

Call the Small Community Water Program at 1-800-452-4774, visit the EPA Web site at [www.epa.gov/owow](http://www.epa.gov/owow), or contact your state drinking water representative.

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# Section 2 : Asset Management Form Instructions

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## Section 1. Public Water System (PWS) General Information

**Section 1. Public Water System (PWS) General Information**

**Public Water System (PWS) Name:** Name of water system (as registered with DPH)

**PWSID:** PWSID Identification Number (as registered with DPH)

**Town:** Municipality in which customer is served.

**Type of Ownership:** Please check one option from the provided (S) (S) Solely owned by the PWS (M) Municipally owned (P) Privately owned (J) Jointly owned (O) Other

**Contact Information:** **Owner:** Property owner or person legally responsible for the system (may be the same contact as the Financial Contact). **Manager:** Person responsible for overseeing water system (may be the same contact as the Financial Contact). **Chief Certified Operator:** Person designated to maintain the water system components. **Inspector:** Individual or certified laboratory personnel (may be the same contact as the Chief Maintenance Personnel). **Additional person the public water system may be the same contact as the Chief Maintenance Personnel:** Additional person the public water system may be the same contact as the Chief Maintenance Personnel.

## Section 2. Asset Management Information

**Section 2. Asset Management Information**

The Asset Inventory Worksheet is a tool designed to maintain records of the current status of assets, their remaining lifespan and their criticality to the functional operation of a system. These records should be updated annually as a minimum, and revised with any equipment or engineering modification of the system being maintained with this tool. See the column instructions immediately below for guidance on completing the Asset Inventory Worksheet.

<b>Asset Component:</b>	Name of equipment being inventoried. This column is pre-populated with the most common PWS assets found at small community systems.
<b>Asset ID:</b>	Assign each asset a unique distribution ID in order to maintain continuity and track similar assets throughout the inventory process. Assets may be used again for future future equipment additions.
<b>Specifications on size, length, and diameter/capacity:</b>	This information should be extracted directly from manufacturer literature and should be precise but should not include part of the system an asset is located.
<b>Year Constructed or Installed:</b>	Identify the year in which the asset was constructed or installed.
<b>Estimated Life Expectancy:</b>	Estimate how long the asset should last and adjust this to specific conditions and exposures of your system. The end of an asset's useful life should be determined by the manufacturer.
<b>Condition:</b>	Enter the number as identified in the condition rating table below of the Asset Inventory Worksheet that best describes the condition of the asset taking into consideration age and use.
<b>Remaining/Adjusted Service Life:</b>	Calculate the remaining useful service life (in years) remaining before an asset must be replaced or significantly rehabilitated. If an asset will be replaced by a more quality equivalent number of years the asset lasted in the past, the asset's current condition. The adjusted service life of an asset will be the estimated life expectancy. The adjusted service life may be used to determine the asset's life.
<b>Probability of Failure:</b>	How likely is the asset to fail during its service life? Use the description below rating table as a guide on how to assign a probability of failure.
<b>System Impact:</b>	Determine the importance of the asset to the operation of the distribution system. Consider the potential consequences of the asset's failure to the system's ability to provide service to customers. Use the description below rating table as a guide on how to assign a system impact.
<b>Risk Score:</b>	The risk score is determined utilizing the following equation: Risk Score = Condition Rating x System Impact.

**Notes:** Asset Component Categories not applicable to a system may be left blank. For clarity include "condition," "probability of failure," and "system impact" rating table below in the footnotes at the bottom of the Asset Inventory Worksheet for clarification purposes that best represents the asset's condition, probability of failure and system impact based on current provided descriptions.

**Notes:** Asset Component Categories not applicable to a system may be left blank. For clarity include "condition," "probability of failure," and "system impact" rating table below in the footnotes at the bottom of the Asset Inventory Worksheet for clarification purposes that best represents the asset's condition, probability of failure and system impact based on current provided descriptions.

**Notes:** Asset Component Categories not applicable to a system may be left blank. For clarity include "condition," "probability of failure," and "system impact" rating table below in the footnotes at the bottom of the Asset Inventory Worksheet for clarification purposes that best represents the asset's condition, probability of failure and system impact based on current provided descriptions.

**The Water System Operation and Maintenance (O&M) Plan** is written procedures explaining how a public water system is to be operated on a day-to-day basis to ensure public health, safety and compliance with applicable regulations. It also describes maintenance practices and frequency to check the physical components of the water system, and maintained in such a way to maximize the useful life of the assets. Use the prompts inside the boxes to be operational and/or maintenance procedures for each category pertaining to water systems. This operation and maintenance plan should be reviewed annually to check for consistency and/or modify the plan to suit the needs of a PWS as its demands change. Once it is completed, this plan can also be used to train new water system personnel and/or certified water operators.

**The Capital Improvements Table** uses data from the Asset Inventory Worksheet based on the 10 Determine the top assets with the highest risk score from the Asset Inventory Worksheet. See the 10 immediately below for guidance on completing the Capital Improvements Table.

**Risk Score:** Equal to top ten (or more, if necessary) highest Risk Score Inventory Worksheet starting with the highest score first.

**Asset ID:** List the corresponding asset ID from the Asset Inventory Worksheet inventory of assets.

**Description of Action Required to Improve Asset:** Describe what type of improvement project is required for the rehabilitation, etc.) and brief description.

**Years Until Action Required:** Identify the number of years left until the project is required, be a negative number if the asset is already beyond its useful life.

**Total Cost of Required Action (Rehabilitation, Rehabilitation, Repair):** Estimate the cost of the improvement or rehabilitation project or associated with the project. Such as engineering costs, etc. installation, utility testing, labor charges, disposal of the replaced items.

**Reserves Required Each Year:** How likely is the asset to fail during its service life? Use the description below rating table as a guide on how to assign a probability of failure.

**Capital Improvement Funding:** Answer the following five questions about how the PWS plans an improvement project.

**How are Capital Improvement funding needs budgeted for?** The top ranking asset projects as identified in this PWS Management Plan should make up the Capital Improvement fund budgeting for projects.

**How is the reserve fund managed?** The PWS should have a money set aside to "reserve" for projects. Include information on how the reserve fund will be set up and how often needs to be added to this account in order to appropriate amount of services and fund necessary projects.

**Notes:** Asset Component Categories not applicable to a system may be left blank. For clarity include "condition," "probability of failure," and "system impact" rating table below in the footnotes at the bottom of the Asset Inventory Worksheet for clarification purposes that best represents the asset's condition, probability of failure and system impact based on current provided descriptions.

## Section 3. Fiscal Management Information

**Section 3. Fiscal Management Information**

The purpose of entering Fiscal Management Information is to ensure systems have the financial resources to maintain day-to-day operations as well as the ability to handle future improvements and unforeseen expenses. The fiscal questions in the template are designed as a tool for the approach to ensure that systems are successful with these essential objectives. The financial tables in the template provide a convenient way to report an accurate accounting of system finances and may encourage additional work that needs to be done to take into consideration when gathering revenue and setting utility rates.

**Water rates:** Check which, if any, apply and provide the corresponding information for each billing category. If there are multiple rates of the same type, each should be listed. Show the average annual water bill. If the system has commercial customer's, separately. A water bill may be combined with other utility bills, such as an homeowner association fee.

**Average Annual Bill:** Show the average annual water bill. If the system has commercial customer's, separately. A water bill may be combined with other utility bills, such as an homeowner association fee.

**Change to water rates:** Water rates should be reviewed on a regular basis to ensure that the rates are sufficient to meet expenses.

**Types of Accounts Subsidized for Water System:** Water rates should be reviewed on a regular basis to ensure that the rates are sufficient to meet expenses.

**Water System:** Operating expenses for routine revenues and expenses. Expenses may include but are not limited to: certified operator, water quality testing, water treatment plant, etc.

**Revenue sources:** Revenue sources for this type of account are normally held in "reserve" planned capital improvement projects. Funds placed in this account can be used to finance water treatment or special investments for specific projects.

**Revenue account:** Revenue account funds in this account are held to be used in the event of unforeseen emergencies, or as a tool to defray the operating or other accounts. If this account can be used to finance water treatment or special investments for specific projects.

**PWS Revenues:** List the revenue sources for the water system. System may not have any revenue in certain categories.

**PWS Operating Expenses:** List the operating expenses for the water system. System may not have any revenue in certain categories.

**Overall Account Balances:** List the overall account balances for the water system. System may not have any revenue in certain categories.

**Fiscal Management Review:** Answer the following four questions about the fiscal management of the water system (determine if appropriate resources are in place).

**Review of Revenues and Expenses:** Explain how often water system revenues and expenses are reviewed. This table is provided as a guide for the system to explain all of the water system revenues and expenses that are reported in the budget process. Water system revenues and expenses must be reviewed regularly to ensure the accuracy of the current financial data and to adjust for regular increases and expenses are not adjusted. Include details including: Regular financial reviews take the system to ascertain if there is sufficient revenue to cover the cost of the water system and to ensure that the system is able to pay for its water system. Regular financial reviews take the system to ascertain if there is sufficient revenue to cover the cost of the water system and to ensure that the system is able to pay for its water system.

**Are revenues sufficient to meet expenses:** Regular financial reviews take the system to ascertain if there is sufficient revenue to cover the cost of the water system and to ensure that the system is able to pay for its water system.

**Fiscal Controls:** Controls should be in place that monitor and collect and report appropriate data to the water system. Regular financial reviews take the system to ascertain if there is sufficient revenue to cover the cost of the water system and to ensure that the system is able to pay for its water system.

## Section 4. Annual Update Record

**Section 4. Annual Update Record**

The Fiscal and Asset Management Plan will be updated annually. Space is provided for up to a annual entry should include a summary of any changes made at the time of the annual update. After the PWS is a new sheet.

## Section 4. Unaccounted For Water Loss Estimation

**Section 4. Unaccounted For Water Loss Estimation**

Unaccounted for water system losses are the difference between the water supplied to the distribution system, but never reaches to customers. Types of unaccounted for water loss can be leaks, main breaks, flushing, tank overflow, etc. Having PWS water system has some amount of unaccounted for water loss. It should be noted that unaccounted for water for the purpose of this section encompasses both Raw Water Loss such as leaks, main breaks, etc. and PWS generated, but Unaccounted Water Loss such as water main flushing, treatment backflow or make up water. Manufacturing

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## Appendix A. Drinking Water State Revolving Fund - Additional PWS Financial Information

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The Drinking Water State Revolving Fund (DWSRF) Program provides long-term low-cost loans to community and non-community public water systems (PWS) to finance infrastructure improvement projects. Available funds include drinking water treatment plants, and water mains. Projects may also qualify for partial subsidization if available. A small PWS must have an annual management plan in order to be eligible for funding. After January 1, 2015, the requirement will be the Asset and Fiscal Management Plan.

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# Section 2: Asset Inventory Worksheet

Estimated Life Expectancy will vary – pick a reasonable estimate.

Remaining service life can be negative!

Asset Inventory Worksheet

Asset Component	Asset ID	Size, Length, Diameter and / or Capacity, and Location (Where necessary, list each individual component separately)	Year Constructed or Installed	Estimated Life Expectancy (Yrs)	Condition (1-5) <sup>1</sup>	Estimated Remaining / Adjusted Service Life <sup>2</sup> (Yrs)	Probability of Failure (1-5) <sup>3</sup>	System Impact (1-5) <sup>4</sup>	Risk Score (1-25) <sup>5</sup>
Well	Well-1	Lower Well, 600' deep, 6" drilled well	1950	50	4	-20	4	5	20
	Well-2	Upper Well (not currently active or tied in)	1952	50	4	-18	4	1	4
Well Pump	WPump-1	Gould 7GS10 submersible pump, 1 HP set at 560'	2017	10	2	7	3	5	15
	WPump-2	Unknown	unk						
Source Meter	WMeter-1	5/8" Badger meter, instantaneous and totalizing	2017	20	2	17	2	1	2
	WMeter-2	5/8" Badger meter, instantaneous and totalizing (not connected)	unk	20					
Well/Pump House	W1PH	Lower Pumphouse, Masonry Block Construction	1950	30	3	-40	4	3	12
	W2PH	Upper Pumphouse, Concrete Below Grade Vault (roof caving in)	1952	30	5	-38			
Atmospheric Tank	ATMTank-1	1,000 Gallon Polyethylene Storage tank	2017	30	1	27	1	5	5





# Section 2: Asset Inventory Worksheet

DRINKING WATER SECTION

Webinar

F&AM Plan Training

June 2, 2020

Asset Component	Asset ID	Size, Length, Diameter and / or Capacity, and Location (Where necessary, list each individual component separately)	Year Constructed or Installed	Estimated Life Expectancy (Yrs)	Condition (1-5) <sup>1</sup>	Estimated Remaining / Adjusted Service Life <sup>2</sup> (Yrs)	Probability of Failure (1-5) <sup>3</sup>	System Impact (1-5) <sup>4</sup>	Risk Score (1-25) <sup>5</sup>
Booster Pumps	BPump-1	DAB E-Sybox	2017	10	1	7	3	5	15
Bladder Tank	BLTank-1	(built-in DAB E-sybox)	2017	10	1	7	3	5	15
Hydropneumatic Tank <sup>6</sup>		Not applicable							
Distribution Pipe and all in-line valves and boxes	Djst Main	1,700 linear feet of 4" blue polyethylene distribution piping	2000	35-50	2	30	2	5	10
Treatment System	Cl2 Feed	55 Gal day tank, LMI feed pump, paced proportional to flow	2017	5	2	2	3	5	15
	KOH Feed	55 Gal day tank, LMI feed pump, paced proportional to flow	2017	5	2	2	3	4	12

Estimated Life Expectancy is a Range and will vary among sources of information

For this example, the outer range of Life Expectancy was selected and calculation on remaining life was done accordingly.





# Section 2: Asset Inventory Worksheet

Use the tables at the bottom of the worksheet to rate all assets

Score	Condition	Description
1	Excellent	New or relatively new condition. Asset has required little to no preventative or corrective maintenance.
2	Good	Acceptable condition. It still functions and requires minor preventative or corrective maintenance.
3	Fair	Deterioration of the asset can be seen. It needs preventative or corrective maintenance frequently to be able to perform.
4	Poor	Failure of the asset is likely and will need to be replaced in the next few years.
5	Very Poor	Failure has occurred or is going to occur. Major maintenance is required, or replacement needs to occur.

Score	Probability of Failure
1	Highly Unlikely
2	Unlikely
3	Likely
4	Very Likely
5	Imminent

Score	System Impact	Description
1	Insignificant	Can continue normal operations of the water system without this asset
2	Minor	Redundant systems in place; loss of the asset has a minor impact on the ability of the system to operate.
3	Moderate	Some redundancy in place; loss of the asset has a moderate impact on the ability of the system to operate
4	Major	Greatly reduced capacity (major impact) to operate water system without this asset
5	Catastrophic	Cannot operate water system without this asset

**Risk Score is an important concept-  
 it is probability of failure X system impact: A high score is bad!  
 It means asset is likely to fail and that impact will be significant!**





# Section 2: Operations & Maintenance Plan

DRINKING WATER SECTION

Webinar

F&AM Plan Training

June 2, 2020

## Day-to-Day Operations

Task	Frequency	Description
Record instantaneous and totalizing meter readings for all source of supply	weekly	Contract operator performs task as part of weekly visits
Check and record water levels in storage tanks	weekly	Contract operator performs task as part of weekly visits
Inspect pumps, motors and controls	monthly	Contract operator performs task as part of weekly visits, second booster pump recommended for redundancy as part of 4-log approval in 2017
Check chemical solution tanks and record amounts used, replenish tanks	weekly	Contract operator performs task as part of weekly visits
Conduct field operating tests for treatment parameters (pH, Cl <sub>2</sub> and PO <sub>4</sub> residual)	weekly	Contract operator performs task as part of weekly visits; Volunteer resident takes daily chlorine residuals and pH readings under operator supervision
Check instrumentation for proper signal input/output	monthly	Contract operator performs task as part of weekly visits – no telemetry or online analyzers
Complete security check of pumphouse	daily	Volunteer resident asked to report any security incidents as part of daily visits for daily chlorine residual and pH monitoring
Inspect heater operation during winter	daily	Volunteer resident asked to report heat failures in winter

Volunteers are an important part of running a Homeowner's Association as there is typically no paid staff.

You may want to think about succession planning.





# Section 2: Operations & Maintenance Plan

When you add an asset you are also adding potential maintenance items even if minor

Spare parts are required for 4-log chlorination but a permanently installed back up chlorine pump is preferred

Routine Maintenance		
Task	Frequency	Description
Exercise Valves	none	Cited as Minor Deficiency as part of 2017 sanitary survey; need to implement
Implement flushing program	none	Cited as Minor Deficiency as part of 2017 sanitary survey; need to implement
Insect tank hatches, vents, pipes	none	Need to implement on as at least bi-yearly basis now that system added atmospheric storage tank (main purpose was contact time for required 4-log)
Inspect and lubricate pumps	N/A	
Calibrate chemical feed pumps and/or treatment instrumentation	weekly	Contract operator performs task as part of weekly visits; spare parts available; second permanently installed chemical feed pump recommended as part of 2017 sanitary survey report.
Inspect and conduct repairs to water system facilities – wellheads, pump house, etc., as needed	monthly	Contract operator performs task as part of weekly visits
Inspect and clean chemical feed lines and solution tanks	weekly	Contract operator performs task as part of weekly visits





# Section 2: Capital Improvement Table

DRINKING WATER SECTION

Webinar

F&AM Planning Training

June 2, 20

Risk Score	Asset ID	Asset	Description of Action Required to Improve Asset	Years Until Action Required	Approx. Total Cost of Required Action: Replacement, Rehabilitation, Repair	Reserves Required Each Year (Total Cost ÷ # of Years)
20	Well1	Lower Well, 600' deep, 6" drilled well	Replace, re-drill or re-case well	0	\$20,000	\$20,000
20	Electrical-1	W1PH: dedicated 60 AMP service	Replaced dedicated electrical service in pumphouse for active well	0	\$3,000	\$3,000
15	WPump-1	Gould 7GS10 submersible pump, 1 HP set at 560	Replace well pump when it fails	7	\$3,500	\$500
15	BPump-1	DAB E-Sybox	Replace booster pump when it fails (second booster pump has been recommended for redundancy)	7	\$2,100	\$300
15	Cl2 Feed	55 Gal day tank, LMI feed pump, paced proportional to flow	Replace chlorine feed system when necessary (4-log chlorination system is mandatory and was installed as a result of an acute E. Coli event; analyzer and chart recorder has been recommended)	2	\$3,000	\$1,500
12	W1PH	Lower Pumphouse, Masonry Block Construction	Re-build pumphouse when needed (cost is low because pumphouse is likely to be rebuilt using volunteer labor from residents)	0	\$5,000	\$5,000

Approximate Cost is an educated guess for budgeting purposes to plan capital improvements

If remaining service life is zero or negative, it means you should have the money in your reserve account to replace now

Estimate for re-building pumphouse is relatively low since last pumphouse upgrade was done with the assistance of volunteers





# Section 2: Capital Improvement Table

DRINKING WATER SECTION

Webinar

F&AM Plan Training

June 2, 2020

Risk Score	Asset ID	Asset	Description of Action Required to Improve Asset	Years Until Action Required	Approx. Total Cost of Required Action: Replacement, Rehabilitation, Repair	Reserves Required Each Year (Total Cost ÷ # of Years)
12	KOH Feed	55 Gal day tank, LMI feed pump, paced proportional to flow	Replace pH chemical feed system when necessary (soda ash feed system is proactive and replaced calcite filters; analyzer and recorder has been recommended)	2	\$3,000	\$1,500
10	Dist Main	1,700 linear feet of 4" blue polyethylene distribution piping	Distribution main was replaced in 2000 and is in good condition with low amount of breaks/leaks.	30	\$170,000	\$5,666
8	Gen-01	Honda 7 kW gen. with pigtail connection located at Well 1	When generator is replaced, it should be replaced with a propane powered one	0	\$15,000	\$15,000
5 and less	Miscellaneous	Miscellaneous items with low risk score	Budget \$1500 per year for miscellaneous low risk items (items with relatively low risk scores/low costs are lumped together as one yearly contingency item to simplify the form)	n/a		\$1,500
<b>Totals:</b>						<b>\$53,966</b>

Distribution piping is believed to be in good condition so the choice of a relatively high expectancy resulted in a long remaining life (30 years)

Miscellaneous for items with low risk scores just emphasizes that it's Ok to budget a lump sum for items that are lower impact/lower risk of failure- you don't need to list everything separately





# Capital Improvement Funding Questions

## Capital Improvement Funding:

For the actions you've listed on the table above, where is the funding for these projects included in your budget? Is the money included in the capital reserve? Is it included in your Operation & Maintenance budget? Please explain.

Currently, ABC123 Homeowners Association does not have enough money to fund the projects listed above. We maintain a maintenance budget for emergency repairs, which is only about 15% of the annual budget. We need to start working toward building the reserves of **\$54,000** that we should already have since many of our assets are past their useful service lives. To improve our current financial backlog, the association may consider an annual assessment of all water system users to build up its reserve funds. Currently our water system lacks redundancy- for example with only one well and one booster pump, a failure in either would cause the neighborhood to be out of water almost immediately. This means that our small water system should also work toward building additional reserves for a second source of supply (\$20,000+) and a second booster pump (approx. \$2100). Also with an additional source of supply (whether it is rehabilitating our old well which has not been used in years or drilling a new one), consideration should be given to configure the water system so that it consists of a single entry point to minimize testing and treatment costs (currently the inactive well is configured as a separate point-of-entry pumping directly into distribution).

Explain how the system is or will be developing/managing a reserve fund for water system capital improvements. Be sure to include how the reserve fund will be generated and used and how often funds are/will be added to the account.

At the next Board meeting, the Association's Board will review this plan and determine an appropriate amount of money to be dedicated to a reserve fund in order to proactively pay for infrastructure repairs/upgrades. The amount determined will be voted on upon the membership but will plan on a rate increase on the quarterly Association water bill and a special assessment. Possible amount is shown in the projected year budget.

Rounding reserve number illustrates that it is a good faith estimate





## Section 2: Asset Management Observations

- Many small systems are not quantifying true cost of maintaining service
- Many assets are beyond estimated useful life (remaining useful service life is negative, translation- system has been lucky)
- Reserve accounts are likely insufficient or nonexistent
- Difficult to overcome the "dis-economy of scale" for small systems
- Homeowner associations, condominium management or apartment owners often lack general understanding of water systems



## Section 2: Asset Management Observations

- Small systems often lack redundancy (single points of failure like one well or one booster pump)
- Water systems need to budget for necessary "goal" items like a second well, dual booster pump, generator and analyzers/chart recorders that are not necessarily quantified as part of current assets.
- Common Recommendations:
  - Consolidate water systems (Improves redundancy, reduces testing)
  - Consolidate entry points (Reduces testing and no need to treat separately)
  - Improve redundancy
  - Consider an interconnection (if feasible)

# Section 3: Fiscal Management

What is Fiscal Management (FM)?

PWS Rate Structure

Annual Budget - Revenues & Expenses

Fiscal Control Questions



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## Section 3: Fiscal Management

### What is Fiscal Management (FM)?

- The financial resources to maintain day to day operations as well as the ability to handle future improvements and unforeseen expenses
- Budget to ensure sufficient revenues and justify water rates to customers (your neighbors)
- Controls and oversight in place to ensure monies are collected and spent appropriately



## Section 3: Fiscal Management

### Why is FM Important?

- Clearly and accurately track expenses and revenues
- Plan for funding necessary water system work
  - Regular Operation & Maintenance
  - Water Quality Monitoring
  - Planned and Future Capital Improvements
  - Emergency Repairs
- Planning in advance and charging sufficiently for all water expenses allows for more consistent water rates and can minimize high, unexpected charges when upgrades are needed



# Section 3: Fiscal Management - Rates

- Flat Fee – one charge, the same for all customers
- Metered Usage – based upon the amount of water used by each customer; may include a flat “customer charge” in addition to usage
- Other – charges that are not flat fee or based on usage
- Rates may differ based on meter size, customer type (i.e. residential vs commercial), home size, home features (i.e. pool, hot tub, etc.)

Water Rates: (complete all rows that apply)

Flat Fee	<input checked="" type="radio"/> Y / <input type="radio"/> N	Current Rate	\$192.50 /quarter	Frequency of Billing:	Monthly		Quarterly	<input checked="" type="radio"/> X	Other (Specify):	
Metered Usage	Y / N	Current Rate	_____ Base Rate	Frequency of Billing:	Monthly		Quarterly		Other (Specify):	
			_____ Volume Charge							
Other	Y / N	Current Rate		Frequency of Billing:	Monthly		Quarterly		Other (Specify):	

Average Residential Annual Water Bill \$770

Average Commercial Annual Water Bill N/A

Are water rates combined with any other rates/fees? (If yes, list) No





# Section 3: Fiscal Management - Accounts

Types of Water System accounts – organize funds

- **Operating** – funds needed for routine operations
- **Reserve** – funds to be used for future, planned capital improvement projects
- **Emergency** – funds to be used in the event of an emergency, such as water main break or well pump failure, when the work needs to be completed immediately
- **Other** – you may have another type of account, such as for debt payments, etc.

Types of Accounts Maintained by the Water System (check all that apply):

Operating Account  Reserve Account  Emergency Account  Other (list) \_\_\_\_\_





# Section 3: Fiscal Management – Budget

## Revenues

- Are your current rates sufficient? Is the budget balanced? Is revenue enough for future needs?

PWS Revenue (complete or attach PWS budget)		Actual Last Year	Budget Current Year	Projected Next Year	Comments
Total Water Usage Revenue		\$12,705	\$13,090	\$13,600	Plan rate increase to \$200/gal
Other Fees and Service Charges (late fees, new connection fee, etc.):		--	--	--	
Special Assessments:		--	--	\$4,250	\$250 x17
Secured Funding (e.g. loan):		--	--	--	
Interest:		\$7.87	\$7.95	\$7.99	
Amount transferred from Reserve Fund:		--	--	--	
Amount transferred from Emergency Fund:		\$865.00	--	--	to meet 3 months cash on hand
Other:		--	--	--	
		--	--	--	
<b>TOTAL REVENUE:</b>		<b>\$13,577.87</b>	<b>\$13,097.95</b>	<b>\$17,857.99</b>	





# Section 3: Fiscal Management – Budget

## Expenses

- Include as many or few as you need
- Are you planning future needed projects?

PWS Operating Expenses	Actual Last Year	Budget Current Year	Projected Next Year	Comments
<b>Expenses</b>				
Maintenance:	--	--	--	Covered by Cert. Op/residents
Certified Operator:	\$4,300.00	\$4,400.00	\$4,500.00	
Utilities (power, telephone, internet, etc.):	\$1,015.20	\$1,020.00	\$1,030.00	
Salaries and Benefits:	N/A	N/A	N/A	
Equipment Cost:	--	--	\$1,000.00	Analyzer & chart recorder
Water Quality Sampling & Testing:	\$3,308.76	\$3,400.00	\$3,500.00	
Water Treatment (Chemicals, etc.):	\$1,608.43	\$1,700.00	\$1,800.00	
Capital Improvement Project:	--	--	\$3,000.00	Electrical Improvements Well 1
Rent or Mortgage:	N/A	N/A	N/A	





# Section 3: Fiscal Management – Budget

## Expenses, cont.

Insurance:		\$600.00	\$625.00	\$650.00	
Professional Services (property management, legal, accounting, engineering, etc.):		N/A	N/A	N/A	
Training Costs:		N/A	N/A	N/A	
Billing costs:		N/A	N/A	N/A	
Fees (state PWS fee, Annual Secretary of State Filing):		\$175	\$175	\$175	DPH \$125; Sec. filing \$50
Security:		--	--		
Debt payments:		\$1,000.00	\$1,000.00	\$1,000.00	
Taxes:		\$47	\$50	\$55	
Amount transferred to Reserve Fund:		--	--	\$1,250.00	New fund; from special assmt.
Amount transferred to Emergency Fund:		--	--	--	
Other:	ASRWWA Dues	\$165	\$165	\$165	
		--	--	--	
<b>TOTAL EXPENSES:</b>		\$12,219.39	\$12,535.00	\$18,125.00	
<b>Net Income/Loss:</b>					
Total Revenue:		\$13,577.87	\$13,097.95	\$17,857.99	
Total Expenses:		\$12,219.39	\$12,535.00	\$18,125.00	
Net Income/loss:		\$ 1,358.48	\$ 562.95	(\$267.01)	



## Section 3: Fiscal Management – Budget

- Recommend to develop annually
- Review the prior year's actual costs to develop the current year's budget and projection for the following year
- Look out further as needed for capital improvement needs
- Showing expenses will help to justify the water rates
- How many months' worth of operating funds do you have on-hand? How many do you need?



# Section 3: Fiscal Management – Balances

Overall Account Balances	Actual Last Year	Budget Current Year	Projected Next Year	Comments
<b>Operating Account Balance (cash on hand, etc.)</b>				
Opening balance:	\$1,691.52	\$3,050.00	\$3,612.95	
Annual income/loss:	\$1,358.48	\$ 562.95	(\$267.01)	
Ending balance:	\$3,050.00	\$3,612.95	\$3,345.94	
Approx. number of months of operating monies on-hand:	3	3	3	Need at least 3 months
<b>Emergency Fund Account Balance</b>				
Opening balance:	\$2,208.84	\$1,343.84	\$1,343.84	
Annual inflow/outflow:	(\$865.00)			
Ending balance:	\$1,343.84	\$1,343.84	\$1,343.84	
<b>Reserve Fund Account Balance</b>				
Opening balance:	--	--	--	
Annual inflow/outflow:	--	--	\$1,250.00	From special assessment
Ending balance:	--	--	\$1,250.00	
<b>Required Reserves</b>				
Total Annual Required Reserves:	Unknown	\$54,000.00	\$51,000.00	Reduced for elec. imp. project
Opening Reserve Fund Balance:	--	--	--	
Annual inflow/outflow:	--	--	\$ 1,250.00	
Required Reserves Ending Balance:	--	--	\$ 1,250.00	
Additional Reserves Needed:	Unknown	\$54,000.00	\$49,750.00	
<b>Debt Balance(s)</b>				
Opening Balance:	\$3,500.00	\$2,500.00	\$1,500.00	
Annual Outflow (Payments):	\$1,000.00	\$1,000.00	\$1,000.00	
Ending Balance:	\$2,500.00	\$1,500.00	\$ 500.00	



## Section 3: Fiscal Management – Controls

### Fiscal Controls

- Rates – How often do you review these rates?
  - Recommend to do annually, or each time a new budget is prepared
  - When were they last changed?
    - Smaller, regular increases can be more manageable than large, sudden increases or special assessments
    - Planned rate increases can also result in lower overall bills over the long-term than sporadic increases
- Who reviews the rates and makes the decisions for future charges?
  - Recommend that formal approval be done by the governing board or subset but not by a single person



## Section 3: Fiscal Management – Controls

### Fiscal Controls, cont.

- If revenues were insufficient to meet expenses, what are you doing to fix this situation?
  - Do you have emergency or other funds to use for immediate expenses?
  - However, we do not recommend using these funds on a regular basis to makeup for shortfalls
  - Have you ever charged a special assessment?



## Section 3: Fiscal Management – Controls

### Fiscal Controls, cont.

- Is there a governing body or similar to review the water system budget?
- Is there an approval process for spending money?
- Is there an approval process for executing contracts for capital improvement projects or other repairs?
- Who is responsible for collection of bills and enforcement of non-payment or delinquent accounts?
- Do you have a third-party handle any of these? (e.g. property management company)



# Funding Opportunities with DWSRF

- DWSRF Low-Interest Loan Program
  - Available to CWS and Non-Profit Non-Community PWS
  - PWS must have acceptable TMF Capacity - Fiscal & Asset Mgmt Plan
  - Appendix A to F& AM Plan Template identifies additional financial info required of SRF loan applicants
  - Subsidy is limited – first come first served, with max amount
    - Up to 25% of fixed project cost
    - If qualify under Disadvantaged Community Assistance Program - Up to additional 25% of fixed project cost

[www.ct.gov/dph/dwsrf](http://www.ct.gov/dph/dwsrf)

[DPH.CTDWSRF@ct.gov](mailto:DPH.CTDWSRF@ct.gov)



## DWSRF Funding

- Provides long-term below market rate loans to PWS for infrastructure improvements
  - E.g. Well, buried storage tank, water main
  - Can include planning, design, & construction – must follow procurement procedure requirements
  - Streamlined procurement for non-construction projects, e.g. generators, treatment components (under \$100k)
- Can include development of FM/AM plan as condition of loan





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## Section 4: Unaccounted For Water Loss

What is Unaccounted For Water Loss?  
(Industry vs. Statute Definition)

Trending Data Being Collected

Causes of Unaccounted for Water Loss

Measures Taken to Reduce



# Section 4: Unaccounted For Water Loss

## What is Unaccounted For Water Loss?

### SECTION 4. UNACCOUNTED FOR WATER LOSS INFORMATION

“Unaccounted for Water Loss” means water that the small community water system supplies to its distribution system, but never reaches its consumers. Types of unaccounted for water loss can be leaks, main breaks, flushing, tank cleaning, etc. The vast majority of water systems have unaccounted for water loss. It should be noted that unaccounted for water for the purpose of this exercise encompasses both Real Water Loss such as leaks, main breaks, etc. and PWS approved, but Unbilled Water Loss such as water main flushing, treatment backwashing or make up water, firefighting, etc.

#### Determination of PWS Unaccounted for Water Loss (UWL)

Do you have Unaccounted for Water Loss? YES  NO  (zero water loss is rare to non-existent)

If No, How do you know? We typically repair 1-2 water main breaks annually. Bulk deliveries of approximately 2-5,000 gallons per incident

If yes, <u>What</u> is the total <u>annual</u> amount of unaccounted for water loss for your PWS? (use either Option A or Option B below to determine this amount)	29,000 gallons / year
--	-----------------------

**\*\*Note: In this Example Plan, Both Sections A and B were completed as reference, but for your specific PWS, only Option A OR Option B would need to be completed.**





## Section 4: Unaccounted For Water Loss

### Water Loss

**Water Entering the System** – **Water Reaching the Customers** = **Water Loss**

Many factors are considered when determining Water Loss.

- Leaks within the distribution system piping
- Leaks from buried storage tanks (Atmospheric or Hydropneumatic)
- Water lost during flushing
- Water theft
- Inaccurate metering



## Section 4: Unaccounted For Water Loss

### Why should systems have a plan to reduce water loss?

- Cost Savings
- Conservation
- Drought Mitigation
- Public Health and Safety





## Section 4: Unaccounted For Water Loss

**Cost** – Considerable costs are incurred when pumping, treating, storing, and pressurizing drinking water. The cost of “Lost Water” is compounded when factoring in cost of electricity, well pump replacement, chemical treatment costs (including labor), distribution costs (booster pump operation and maintenance). All the expense of delivering water to your customers without the benefits.

**Conservation** – EPA has guidance on conservation including low-flow fixtures. As customers increase conservation measures, unchecked water losses become a larger percentage of total water production. Small systems can benefit greatly by reducing water loss.



## Section 4: Unaccounted For Water Loss

**Drought Mitigation** – Water conservation during droughts is critical to maintaining sufficient water supply to meet demand. Large amounts of lost water contribute to supply failures during droughts increasing costs due to well pump failures and bulk water deliveries.

**Public Health and Safety** – Safe reliable water is essential for public health. Water loss contributes to inadequate supply and may affect water quality. Water outages result in potential health emergencies and require costly emergency response actions.



# Section 4: Unaccounted For Water Loss

## Option A – Direct measures

**Option A:** PWS that meters both supply production and distribution consumption

Use the table below to organize your meter reading data and complete the calculation to determine the amount of unaccounted for water loss.

Month	Total Production (Gallons)	Total Distribution (Gallons)	Unaccounted for Water Loss (Real Water Loss & Unbilled Water Loss) (Gallons)
January	19800	17920	1880
February	18100	16680	1420
March	16400	15505	895
April	20300	19070	1230
May	22600	20430	2170
June	40300	38170	2130
July	41700	37430	4270
August	38300	33570	4730
September	33600	31140	2460
October	34100	31490	2610
November	27100	24290	2810
December	26800	24120	2680
<b>Annual Totals</b>	339100	309815	29285
<b>Calculation</b>	Total Production (minus) -	Total Distribution (equals) =	Unaccounted For Water Loss





# Section 4: Unaccounted For Water Loss

## Option B

Start by collecting meaningful data

Plot data to help increase your understanding of how much water you send into your system

Overlay multiple years data to tell a better story

**Option B:** PWS that do not include distribution meters must estimate the total amount of unaccounted for water loss

Unaccounted for water loss can be estimated by calculating the total amount of water produced (and/or purchased) and examining and applying established estimates on the amount of water used. This option is only for systems that do not utilize distribution meters. 19-13-B102(n) public water systems are required to conduct weekly meter readings for each source of supply. Weekly water production is tabulated from the meter readings and compiled in order to determine long-term trends. According to record retention requirements, maintain these records for ten years.

Populate the total amount of water produced (as calculated by adding up all of your source meters weekly readings) for each week of the year in the table below

Weekly Readings <u>Week Number</u>	Year: 2018		Year: 2019		Year: 2020	
	Meter Readings (Gallons)	Est. Daily Production (Gal Produced/Week ÷ 7 = Gallons/Day)	Meter Readings (Gallons)	Est. Daily Production (Gal Produced/Week ÷ 7 = Gallons/Day)	Meter Readings (Gallons)	Est. Daily Production (Gal Produced/Week ÷ 7 = Gallons/Day)
1	207400	400	599100	657		
2	212200	686	603700	629		
3	218300	871	608100	660		
4	223900	800	614700	625		
5	229700	829	617200	586		
6	234900	743	621300	557		
7	245200	1471	625200	620		
8	257000	1686	631400	550		
9	264800	1114	633600	629		



# Section 4: Unaccounted For Water Loss

### Production Meter Readings and Usage Data 2018

Date	Week	Instantaneous Flow (gpm)	Meter readings	Weekly Usage (gallons/week)	Gallons/day (average)
1/2/2018	1	9	199000	4260	609
1/8/2018	2	9	203300	4300	614
1/12/2018	3	9	207400	4100	586
1/18/2018	4	9	212200	4800	686
1/26/2018	5	9	218300	6100	871
2/2/2018	6	9	223900	5600	800
2/9/2018	7	9	229700	5800	829
2/16/2018	8	9	234900	5200	743
2/23/2018	9	9	245200	10300	1471
3/2/2018	10	9	257000	11800	1686
3/9/2018	11	9	264800	7800	1114
3/16/2018	12	9	269100	4300	614

### Production Meter Readings and Usage Data 2019

Date	Week	Instantaneous Flow (gpm)	Meter readings	Weekly Usage (gallons/week)	Gallons/day (average)
1/4/2019	1	9	585900	6600	943
1/11/2019	2	9	590300	4400	629
1/18/2019	3	9	594600	4300	614
1/25/2019	4	9	599100	4500	643
2/1/2019	5	9	603700	4600	657
2/8/2019	6	9	608100	4400	629
2/18/2019	7	9	614700	6600	660
2/22/2019	8	9	617200	2500	625
3/1/2019	9	9	621300	4100	586
3/8/2019	10	9	625200	3900	557
3/18/2019	11	9	631400	6200	620
3/22/2019	12	9	633600	2200	550
3/29/2019	13	9	638000	4400	629
4/5/2019	14	9	643200	5200	743
4/12/2019	15	9	649000	5800	829
4/19/2019	16	9	653900	4900	700
4/26/2019	17	9	659000	5100	729
5/3/2019	18	9	665000	6000	857
5/8/2019	19	9	668800	3800	760
5/17/2019	20	9	676500	7700	856
5/24/2019	21	9	683900	7400	1057
6/7/2019	23	9	702500	18600	1329





# Section 4: Unaccounted For Water Loss

Consider modifying the data table to best fit your needs.

This is a separate Excel file with all the data and graphs.

We can share this with CWS.

Date	Week	Days since last reading	Instantaneous Flow (gpm)	Meter readings	Weekly Usage (gallons/week)	Gallons/day (average)
1/4/2019	1	7	9	585900	6600	943
1/11/2019	2	7	9	590300	4400	629
1/18/2019	3	7	9	594600	4300	614
1/25/2019	4	7	9	599100	4500	643
2/1/2019	5	7	9	603700	4600	657
2/8/2019	6	7	9	608100	4400	629
2/18/2019	7	10	9	614700	6600	660
2/22/2019	8	4	9	617200	2500	625
3/1/2019	9	7	9	621300	4100	586
3/8/2019	10	7	9	625200	3900	557
3/18/2019	11	10	9	631400	6200	620
3/22/2019	12	4	9	633600	2200	550
3/29/2019	13	7	9	638000	4400	629
4/5/2019	14	7	9	643200	5200	743
4/12/2019	15	7	9	649000	5800	829

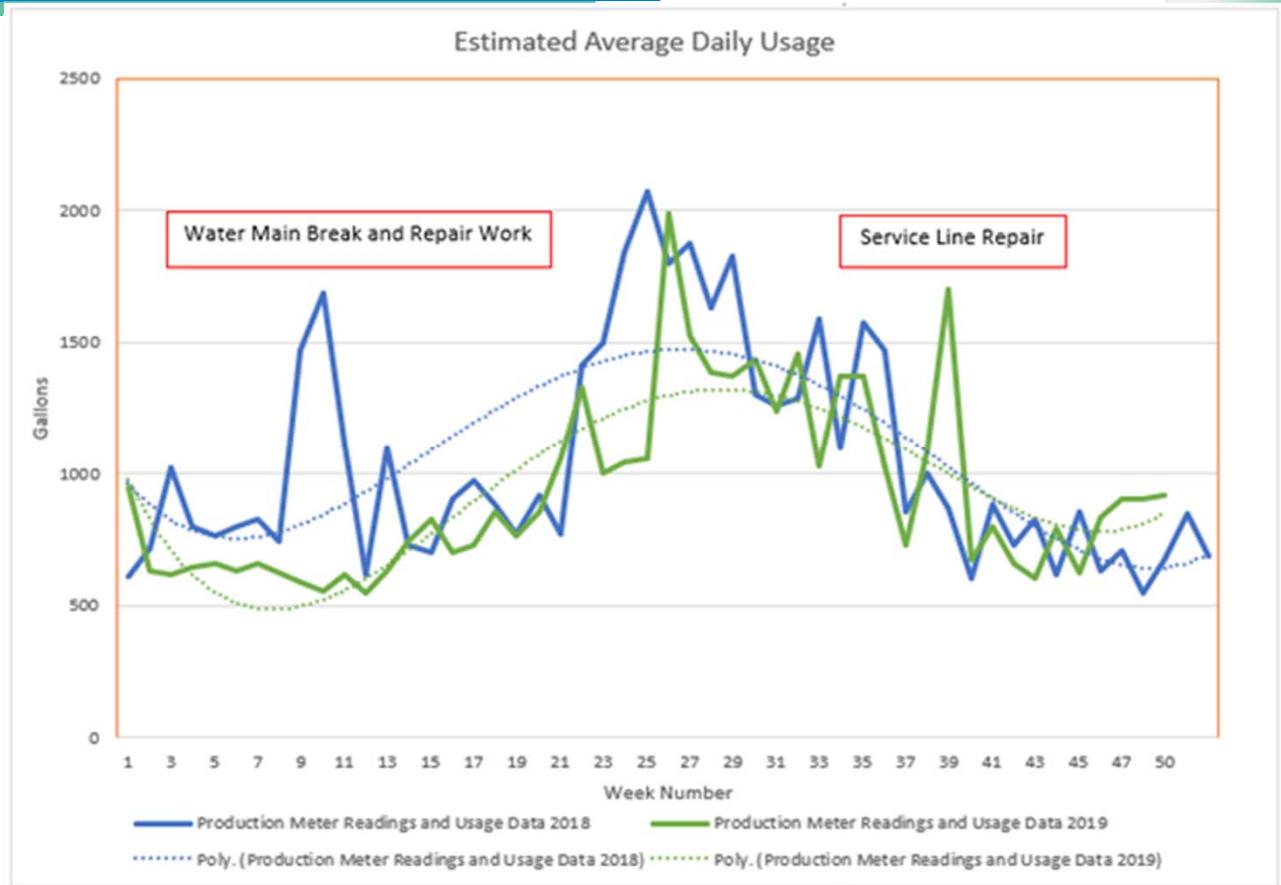




# Section 4: Unaccounted For Water Loss

The graphs can be used to help understand trends and possible problems.

The example system has a partly “seasonal population”. Usage increases due to higher population.





# Section 4: Causes for Unaccounted For Water Loss

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## Causes for Unaccounted for Water Loss

Check "Yes" or "No" for each category and provide an adequate description for each item checked "Yes"

Yes	No	Category	Description (Size and Number of Occurrences per Year)	Estimated/Actual Volume
X		Water main breaks (Real)	2-3 breaks/year resulting in bulk deliveries	15,000 gallons/yr. approx
X		Distribution system leaks (Real)	Unknown but assumed we have a few	unknown
X		Water main flushing (Unbilled)	1/yr.	5,000 gallons/yr. approx
	X	Treatment system backwash/process (Unbilled)		
	X	Fire Protection (Unbilled)		
	X	Distribution Bleeder (Unbilled)		
		Other:		
<b>Total Estimated Unaccounted for Water Loss Volume (gallons):</b>				<b>~29,000 estimated</b>
<b>Volume Water Produced in Year (gallons):</b>				<b>387,200 gallons</b>
<b>Estimated Percentage of UWL = UWL ÷ Total Volume Produced in Year:</b>				<b>13.35% UWL</b>





# Section 4: Reducing Unaccounted For Water Loss

## Measures Being Taken to Reduce the Amount of Unaccounted for Water Loss

Check "Yes" or "No" for each category and provide an adequate description for each item checked "Yes"

Yes	No	Category	How Often	Description
	X	Conduct Leak Detection Survey		
X		Water Main Replacement Program	As needed	We replace approximately 150 ft per year based on age and history.
	X	Conduct Routine Water Audits		
	X	Meter Replacement/ Calibration Program		
X		Trend Meter Reading Data	Annually	Record data in spreadsheet and review graphs
	X	Midnight - 4 am Meter Read		
		Other:		





## Section 4: Unaccounted For Water Loss

**METERS** are a critical tool for calculating water loss. Supply meters, entry point metering and customer metering all help to refine the estimated amount of water loss. All CWS should incorporate adequate metering into long-term capital improvement plans.

Systems without adequate metering can still benefit from a comprehensive water loss plan. **"Zone metering"** can be a good compromise for systems without customer meters.

**"Smart Meters" are very useful for leak monitoring and detection.**



## Section 4: Unaccounted For Water Loss

### METERS

- Proactive distribution system maintenance and routine leak detection surveys can be performed with or without customer meters.
- Non-peak water readings from source meters or entry point meters will help estimate excessive water use during off-hours (11PM-5AM). During this time period most residents are sleeping and very little water should be entering the distribution system.



## Section 4: Unaccounted For Water Loss

### Water Loss Prevention Tips -

- There is no such thing as too much data. Plot graphs for daily use, weekly use, monthly use, quarterly use to identify trends
- Recruit volunteers – Retirees and students can help with a lot of the information gathering and data analysis
- Every little bit helps (a.k.a. “you've got to start somewhere”)
- Document all your activities (give yourself some credit)



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## Section 5: Annual Update Record

Put Plan into Action!

Annual Update Required

Make Changes in Plan – Summarize in Section 5



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# Section 5: Annual Update Record

(c) Each small community water system shall complete the fiscal and asset management plan for all of its capital assets not later than January 1, 2021. Following the completion of the initial fiscal and asset management plan, each small community water system shall update such fiscal and asset management plan annually and make such fiscal and asset management plan available to the department upon request.

**SECTION 5. Annual Update Record-** to be completed yearly beginning one year after the completion of the plan. Any changes made to the plan each year during the update should be summarized below for historical records purposes. – Example below

Date of update:	March 2021	Signature of PWS Owner/Legal Contact	<i>Al Boardman</i>
Brief description of update (items considered, changes made, etc.): Team has been updated as Stan Roper has stepped down as Association President and Al Boardman is the new President. Level of Service has been updated based on new tracking initiatives. Asset Management Inventory and Capital Improvement Table updated based on emergency maintenance and upgrade projects conducted during previous calendar year. Current rates and budget updated. Current Unaccounted for Water Loss totals have been entered and additional steps being taken to prevent unaccounted for water loss added to the plan.			
Date of update:		Signature of PWS Owner/Legal Contact	
Brief description of update (items considered, changes made, etc.):			





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# Additional On-line Resources

*Attend Webinars to increase your understanding of key principles and concepts*

Webinar 1 for Small Systems in Connecticut:  
**Asset Management for Small Systems: Improving Your System While Meeting Regulations**  
 Presented By: Heather Himmelberger  
[www.southwestefc.unm.edu](http://www.southwestefc.unm.edu)  
[www.efcnetwork.org](http://www.efcnetwork.org)

EFcN environmental finance center network  
 NADO  
 Government Finance Officers Association

This program is made possible under a cooperative agreement with the U.S. EPA.



# Additional On-line Resources



DRINKING WATER  
SECTION

Webinar

F&AM Plan  
Training

June 2, 2020

Many are free!

Browse through  
older  
presentations  
on-line!





DRINKING WATER  
SECTION

*Webinar*

F&AM Plan  
Training

June 2, 2020

# Question & Answer Session

DPH

Connecticut Department  
of Public Health



DRINKING WATER  
SECTION

Webinar

F&AM Plan  
Training

June 2, 2020

# Thank You!

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