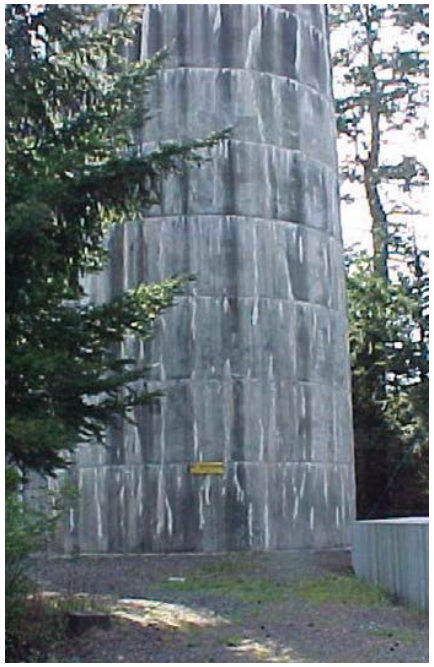
Asset Management:

A Handbook for Small Water Systems

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



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Contents

Is This Guide for Me?

This guide is designed for owners and operators of small community water systems (CWSs). CWSs include all water systems (both publicly and privately owned) with at least 25 year-round residential customers or 15 year-round service connections. Typical water systems that may find this guide useful include:

- Small towns
- Tribal systems
- Rural water districts

This guide presents basic concepts of asset management and provides the tools to develop an asset management plan. Very small CWSs may have some difficulty in completing some of the worksheets included in this booklet, while medium CWSs may find the worksheets too simple for their needs. Due to each water system's particular circumstances, the time and effort needed to develop the plan will vary. Building a team, made up of your operator, board members, owners, assistance providers, and state drinking water staff, will help you develop an effective and complete plan.

Capacity Development Program Coordinators are available to help you understand the concepts covered in this guide and complete the accompanying worksheets. They can also provide additional asset management tools and offer resources to help implement an asset management plan. Reach out to your Capacity Development Program for more information. State and territorial contacts can be found on EPA's website here. EPA's Regional Tribal Drinking Water Coordinators can be found on EPA's website here.

Step Guides for Homeowners' Associations & Manufactured Home Communities

EPA has developed a simpler asset management booklet for homeowners' associations and manufactured home communities called *Taking Stock of Your Water System*. You can download it from EPA's STEP Guide Series Website.

What Will I Learn?

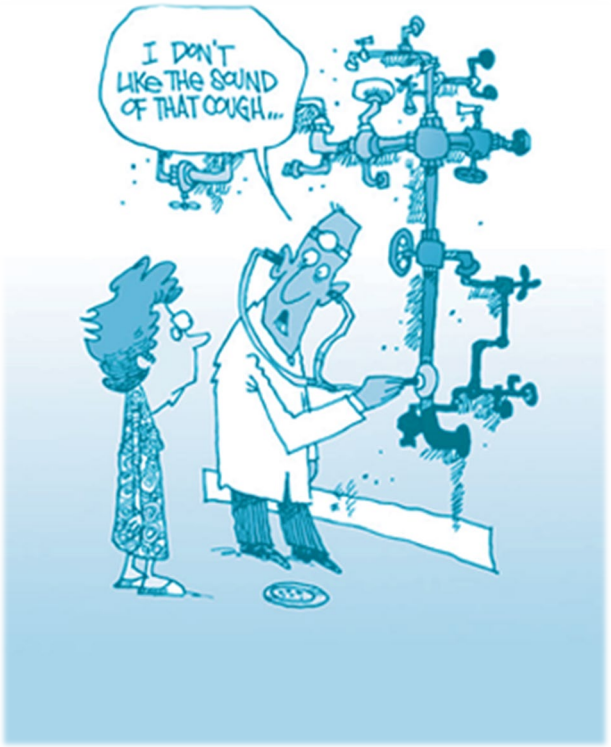
As a drinking water system owner or operator your most important job is delivering safe and secure drinking water to your customers. Part of providing safe and secure drinking water is taking care of your system's facilities and equipment, as well as planning for any needed rehabilitations and replacements. An asset management plan will help you meet these goals in an efficient and cost-effective manner.

This guide will help you by providing information about:

- How asset management can help improve your system's financial health and ability to provide safe drinking water.
- How asset management fits into the development of an overall plan for your system's future (i.e., strategic planning).
- How to complete a six-step asset management process including:
  - **Determining** a level of service.
  - **Conducting** a thorough asset inventory
  - **Prioritizing** the rehabilitation and replacement of your assets.
  - **Developing** an annual estimate of needed reserves and an annual budget.
  - **Implementing** the asset management plan.
  - **Reviewing and Revising** the asset management plan.

A water tower that has exceeded its useful life.

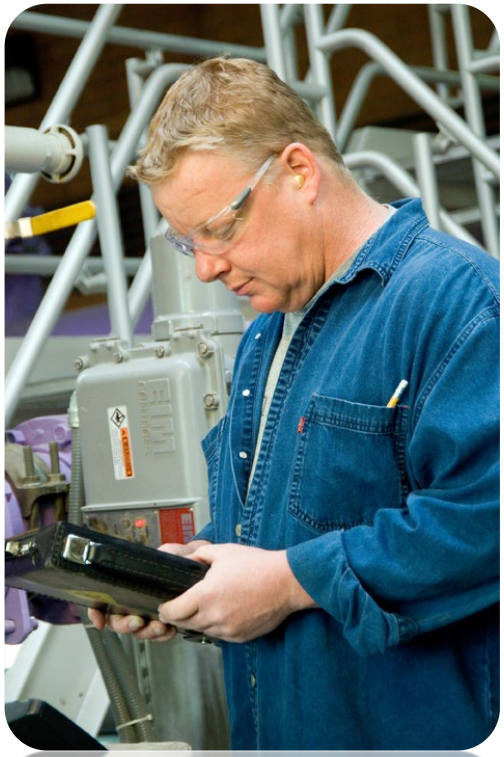
How Can Asset Management Help Me?



Applying the practices recommended in this guide will help you improve the management of your system by:

- **Building Capacity and Resiliency.** Increased knowledge of your system will allow you to be better prepared and positioned to respond to new regulations and sudden or unexpected problems with the system's operation or the quality of water it provides. Those that implement asset management plans are more likely to improve and maintain compliance and have an improved overall approach to taking exams.
- **Improving Operations and Maintenance (O&M) Strategies.** Due to disorganized maintenance, many water systems unintentionally allow their assets to run to failure. Asset management can help transition to a more proactive maintenance strategy. Since asset management sets you up to plan for the replacement and rehabilitation of your assets, the number or emergency repairs are reduced.
- **Calculate Current and Future Financial Projections.** Implementing an asset management plan can provide financial projections and allow the system to see if rates and other revenues are enough for safely providing clean water to customers. A commitment of time and money spent in the short term to make cost-effective decisions will lead to a system saving money over the long term.
- **Encourage Knowledge Sharing.** Asset management can be an empowering tool for water system operators and owners to communicate on day-to-day operations and system needs with board members, elected officials, and customers. Being transparent with your community can show that you are using their money effectively and efficiently, which may make them more likely to increase investment or tolerate rate increases.
- **Giving Greater Access to Financial Assistance.** Documented actual needs of a system and knowledge of current and future financial standings can lead to a stronger justification when applying for financial assistance. Some funding sources give applicants extra credit (higher priority ratings) for having an asset management plan or a capital improvement plan.

What Is Asset Management?



In this guide, an **asset** is any building, tool, piece of equipment, pipe or machinery used in your operation that deliver safe and clean water. They are often large, expensive, long-lived, and often buried underground. **Asset management** is a planning process that ensures that you get the most value from each of your assets and have the financial resources to rehabilitate and replace them when necessary. Asset management maintains a desired level of service for what you want your assets to provide at the lowest life cycle cost. Successfully implementing an asset management plan depends on knowing about your system's assets and regularly communicating with management and customers about your system's future needs.

Starting small and growing from what you learn along the way may be the best strategy, especially for smaller systems. You should thoroughly review your asset management plan at least once a year, noting any relevant changes such as new acquired assets. Throughout the year, you should keep a running list of items to consider or include in the annual update.

What Is the Governmental Accounting Standards Board's Statement #34 (GASB 34)?

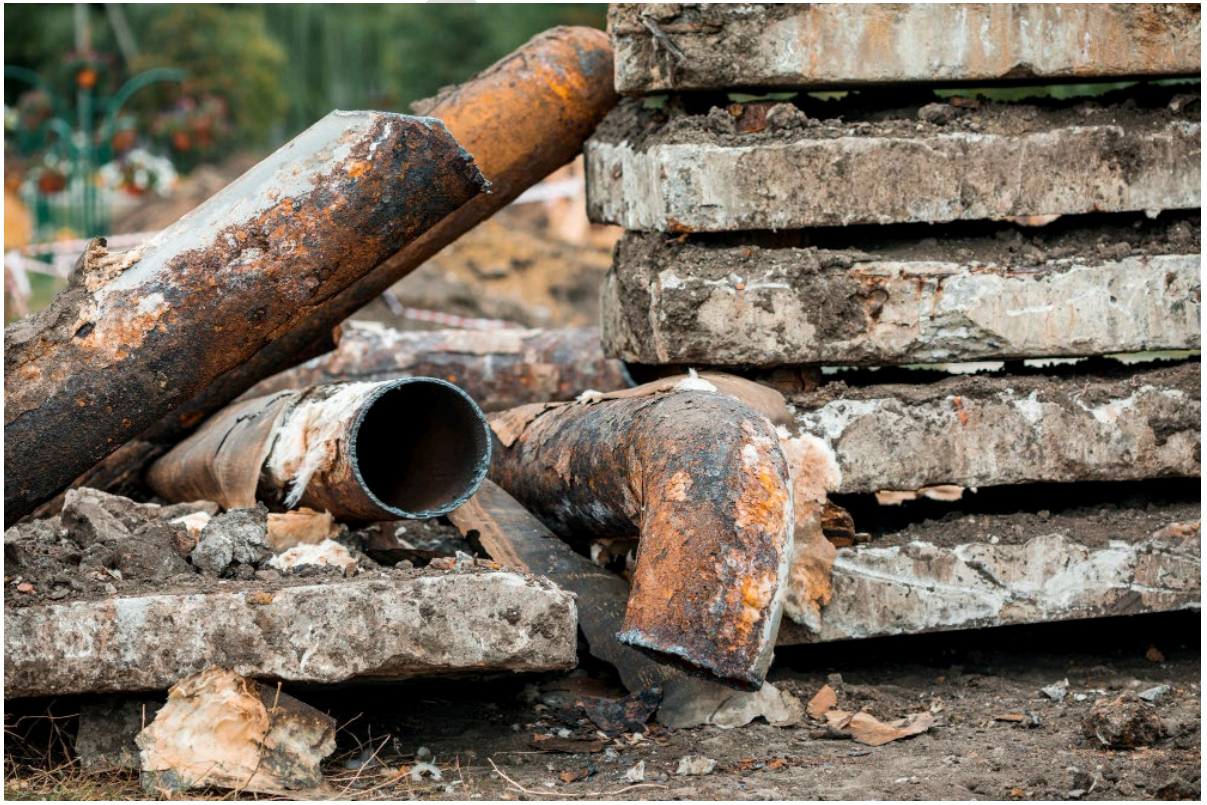
If your system is part of a municipal government, its accounting standards are likely established by GASB. GASB 34 is "Statement Number 34, Basic Financial Statements and Management's Discussion and Analysis for State and Local Governments" although some states may mandate a different accounting standard or excuse small governments from GASB. Following GASB 34 standards will require publicly-owned water systems to report the value of infrastructure assets and the cost of deferred maintenance. An accurate and up-to-date asset management plan will help you comply with this requirement. See Appendix C for more information on GASB 34.

Note: If you operate a privately owned water system, you do not need to comply with GASB 34. However, complying with generally accepted accounting principles (GAAP) makes sense for any system. Visit the Financial Accounting Standards Board (FASB) at www.fasb.org for more information on GAAP for private entities.

How Does Asset Management Relate to Strategic Planning?

The U.S. drinking water industry faces many key challenges in the 21st century, such as replacing aging infrastructure, addressing security concerns, and complying with new regulations. Depending on the circumstances of your system, you may need to make changes to the operation of your system.

Strategic planning is a management concept that helps you address and prepare for both anticipated and unexpected problems. Strategic planning utilizes asset management to evaluate your system's current physical condition, and it also evaluates your water system's financial and managerial situation. It requires you to make fundamental decisions about your water system's purpose, structure, and functions.



Most water systems have implemented some parts of asset management. The best place to start is to determine what is already in place and what needs to be added or establishing your baseline. The worksheets and other information in this guide will also help you begin to develop an overall strategy for your water system. Using this guide along with EPA's Strategic Planning: A Handbook for Small Water Systems will help you develop, implement, and receive optimal benefit from an asset management plan that fits in with your water system's overall strategy.

What Is the Asset Management Process?

Asset management consists of the following six steps:

1. **Determine Level of Service.** Describing the water system's short- and long-term performance goals, as well as the customer's expectations, is key to communicate with customers and stakeholders to provide transparency and accountability. This step is critical for an asset management plan to address gaps with the current level of service delivered.

2. **Taking an inventory.** Before you can manage your assets, you need to know what the current state of your assets are and what condition they are in. This information will help you schedule rehabilitations and replacements of your assets.

3. **Prioritizing your assets.** Your water system probably has a limited budget. Prioritizing your assets will ensure that you allocate funds to the rehabilitation or replacement of your most important assets.

4. **Developing an asset management plan.** Planning for the rehabilitation and replacement of your assets includes estimating how much money you will need each year to maintain the operation of your system each year. This includes developing a budget and calculating your required reserves.

5. **Implementing your asset management plan.** Once you have determined how much money you will have to set aside each year and how much additional funding (if any) you will need to match that amount, you need to work with your management and customers and with regulators to carry out your plan and ensure that you have the technical and financial means to deliver safe water to your customers.

6. **Reviewing and revising your asset management plan.** Once you have developed an asset management plan, do not stick it in a drawer and forget about it! Your asset management plan should be used to help you shape your operations. It is a flexible document that should evolve as you gain more information and as priorities shift.

This guidebook provides information and worksheets that will help you complete all six steps. As you work your way through this guidebook, you should remember that the suggestions provided and the results you develop based on the worksheets are not set in stone. **You should adjust your plan based on your own experience and the particular characteristics of your system and reevaluate your plan every year.**

Step #1 – What Is My Required Level of Service?

Level of service (LOS) goals are defined by the value and expectations of customers and employees. Communicating with customers and stakeholders about the services the system is providing, as well as the cost associated with that service, can help you prioritize and make decisions.

It's important to engage with customers and stakeholders when establishing your LOS goals. Goals can be external, which will impact the customer, or can be internal. Internal goals are those related to a water system's operations, or in other words, what the assets need to do in order to achieve the delivery of services to the customer.

As you move forward with developing and implementing an asset management plan, LOS goals can be used to track performance over time. This can help determine asset capacity and reliability, provide transparency to customers and stakeholders, optimize efficiency, and ensure long-term sustainability in services. Goals can be changed or adjusted over time, as well as be added or removed from the list.

When defining your goals, remember to think S.M.A.R.T.!

Specific – Be clear and specific about what you want to accomplish and the actions to take. Think of popular "W" questions: who, what, when, where, and why? Use action verbs such as "Implement", "Update", "Maintain", "Support", "Provide", etc.

Measurable – It's important to have measurable goals in order to track performance and stay motivated. If there is a long-term goal that may seem daunting, then set milestones of smaller tasks to accomplish which will add up to the completion of the main goal. Measurement methods can be both quantitative (audits or benchmark analysis) or qualitative (customer surveys).

Achievable – Goals should inspire motivation, not discouragement. Think about how important the goal is and what you can do to make sure it is attainable. This may require developing new skills or a change in workplace culture.

Relevant – Relevance is to put the focus back on the expectations and values of your customers and stakeholders. Sometimes goals are not realistic for the time being due to other priorities and needs, or you simply don't have the capacity to reach this goal. Feel free to set it aside for now and reconsider in the future.

Time Bound – When applicable, it's good to set a deadline to focus on and work toward. Some goals may be ongoing or long-term, so you may want to set milestones (i.e., half-way or every quarter) and define what could be achieved during that time.

Introduction to the Level of Service Worksheet

The following Level of Service Worksheet will help you:

- Identify all of your water system's level of service goals;
- Describe how you will measure identified goals;
- And determine if your water system is meeting identified goals

Two copies of the worksheet are provided. The first copy is followed by instructions that will help you understand how to complete it. The second worksheet is an example. Appendix A has blank worksheets that you can use.

In this guide, LOS is split into two groups: Customer LOS Values and Technical LOS Categories. **Customer LOS Values** are referred to your customer's expectations of service. Values are measured through tangible attributes such reliability and quality, but also in satisfaction of customer services and public engagement. **Technical LOS Categories** refer to the system's internal goals of operational performance. Identifying what the system and their assets need to do in order to achieve the delivery of services to the customer will help determine gaps and benchmark performance.

The following list is composed of common values and categories that you may wish to consider and find applicable when developing your LOS goals. There are certainly other categories and values that can be included but try not to overcomplicate things. At the end of the day, these goals should be meaningful to your customers and employees.

Customer LOS Values	***Technical LOS Categories***
> Accessibility	> Operations
> Reliability	> Maintenance
> Quality	> Asset Replacements, Rehabilitation, or Repair
> Efficiency and Capacity	> Utility Management
> Customer Service	> Hazard and Risk Management
> Public Health and Safety	> Response
> Legislative	> Water Loss Control
> Sustainability	> Drought and/or Demand
> Affordability	> Water System Partnerships
> Environmental Impacts	> Staff and Workforce
> Stakeholder and Public Engagement	> Efficiency and Capacity
	> Other Internal Goals

Level of Service (LOS) Worksheet

Date Worksheet Completed/Updated: 1					
Customer LOS					
Value 2	**I.D.** 3	**LOS Measure** 4	**Goals** 5	**Measurement of Data** 6	**Status or Grade** (Very Good, Good, Fair, Poor, Very Poor) 7
Technical LOS					
Category	**I.D.**	**LOS Measure**	**Goals**	**Measurement of Data**	**Status or Grade** (Very Good, Good, Fair, Poor, Very Poor)

Using the Level of Service Worksheet

This section presents instructions for completing the Level of Service Worksheet. Each step presented here corresponds to a numbered section of the sample worksheet on page 11.

Step #1

Enter the date.
Circle whether you are completing or updating the worksheet and fill in the date. You should update this worksheet at least every year. You can either make minor adjustments to the worksheet as your priorities change or short-term goals have been met and do not need to continue.

Step #2

Identify the value or category.
List out comprehensive values or categories in this column that are meaningful to your system, customers, and stakeholders. Refer to table in the introduction section for examples of values and categories.

Step #3

Label your value or category with an ID Code.
Sometimes you may have multiple goals in one value or category, so it's important to distinguish and organize your LOS measures with an ID Code.

Step #4

Describe the level of service measure.
Briefly describe the LOS measure you want to achieve. These measures should be aligned with the values and categories listed in Step #2, but more specific and goal oriented. Remember to think S.M.A.R.T.!

Step #5

Identify the goal.
You've defined what you want to achieve, so now set a target or goal that is measurable and achievable. Don't forget to include a unit of measurement (i.e., percentages, time, number of people) If it's a reoccurring measure, describe how often you need to measure (i.e., per year, every quarter).

Step #6

Describe the process to collect data to measure your goal.
Briefly describe how you will collect and monitor data to determine if you are meeting your goal. Sources of data could include compliance data, surveys, internal records, benchmark analysis, and more.

Step #7

Evaluate or grade the status of your goal.
After collecting your data, evaluate to see if you are meeting your goal or target. If you are not meeting your goal, or believe the system can improve, describe what steps need to be taken to help improve this measure. List out any additional activities that may also impact the LOS measure. If you believe that the set target or goal too unrealistic or unachievable, you may need to re-evaluate the measure.

Level of Service (LOS) Worksheet: Example

Date Worksheet Completed/Updated: ***8/14/21***					
Customer LOS					
Value	**I.D.**	**LOS Measure**	**Goals**	**Measurement of Data**	**Status or Grade** (Very Good, Good, Fair, Poor, Very Poor)
Reliability	R.1.	Average response time to emergencies issues during business hours	< 60 min.	Response records, average response, repair time (Review per year)	Not meeting goal – Average response time recorded was 89 minutes; May need to re-evaluate target next review
	R.2.	Average response time to emergencies issues after business hours	<90 min.	Response records, average response, repair time (Review per year)	Not meeting goal – Average response time recorded was 113 minutes; May need to re-evaluate target next review
	R.3.	Provide water continually to all customers	95% of time	Outage Records (Review per month)	Very Good – 100%; no outages last month (July)
Customer Service	CS.1.	Automated alerts and notification to customers Boil advisories Expected shutoffs for maintenance	100% customers receive alerts	Notice records, Number of customers signed up for alert system (Review per year)	Fair – Approx. 70% of customers receive alerts through email and/or text messages
	CS.2.	Number of non-H&S complaints per month Poor or no water pressure Leaks and/or flooding Property Damage	<5 per month	Compliant records and responses	Poor – Approximately 20 complaints regarding inadequate and/or no water pressure last month (July); no additional complaints

Value	I.D.	LOS Measure	Goals	Measurement of Data	Status or Grade (Very Good, Good, Fair, Poor, Very Poor)
	CS.3.	Response to customers within 8 hours of message received during normal business operations	<8 hours	Response records via customer service email, walk-ins, and hotline number (Review per year)	Very Good
Public Health and Safety	PHS. 1.	Meet Federal Safe Drinking Water Act Primary Drinking Water Standards	100%	SDWA Regulations, Test Results	Meeting Goal – no violations
	PHS. 2.	Meet state and local health-based drinking water regulations	100%	SDWA Regulations, Test Results	Meeting Goal – no violations
	PHS. 3.	Number of H&S issues or complaints per month Taste and/or Odor Color and/or Appearance Illness	<2 per month	Compliant records and responses	Very Good – 0 complaints last month (July)
Value	**I.D.**	**LOS Measure**	**Goals**	**Measurement of Data**	**Status or Grade (Very Good, Good, Fair, Poor, Very Poor)**
Utility Management	U.1.	Number of safety-related training hours per employee per year	15 hours per year	Training Records	Meeting goal
	U.2.	Number of years since the water master plan was reviewed and last updated	<5 years	Water Master Plan Evaluation, Stakeholder meeting records	Very Good – Plans for review next year

Value	I.D.	LOS Measure	Goals	Measurement of Data	Status or Grade (Very Good, Good, Fair, Poor, Very Poor)
	U.3.	Implement an energy management plan to reduce energy use 10% in 5 years	10% in 5 years	Energy Bills (review per year)	Energy efficiency program to be implemented in October.
	U.3.	Number of years since the capital improvement plan was last reviewed and updated	<3 years	Date of review and updates	Meeting Goal – Reviewed and updated last year
Operations and Maintenance	OM. 1.	Ratio of planned maintenance (PM) to corrective maintenance (CM)	70:30	% PM= planned maintenance hours / total maintenance hours % CM= corrective maintenance hours / total maintenance hours (Review per year)	Not meeting goal – Current ratio is approx. 60:40
	OM. 2.	Percent (%) of planned maintenance activities completed per year	>95%	% = hours of completed planned maintenance activities / total hours estimated	Not meeting goal – approximately 80% activities completed
	OM. 3.	Average age of distribution pipes in the water network	<30	Asset Inventory	Not meeting goal – Average age of distribution pipes is 35
	OM. 4	Number of main breaks per 100 customers	<5 breaks annually per 100 customers	Response records	Not meeting goal- may need to revise until a water main inspection program is implemented

Step #2 – How Do I Inventory My Assets?

Before you can manage your assets, you need to know what you have, what condition it is in, and how much longer you expect it to last. To complete an inventory, list all your assets and collect the following information for each:

- **Condition**
- **Age**
- **Service history**
- **Useful life**

The worksheets on the following pages will help you develop an asset inventory and keep track of important information. Detailed instructions are provided.

Later on, you may want to keep track of your assets on a computer spreadsheet or use custom software program for easier use and accessibility.

Taking inventory your assets can be an intensive job. Get the best information that you can, but don't get bogged down in this step and use estimates where needed. As crews respond to work orders, they can build the asset inventory by collecting information such as age, condition, location, and other valuable information. As you are acquiring new assets, immediately add it to your inventory. This can be done in the handover process from the engineers to the organization. If you keep up with an asset management program, your inventory will only improve!

Remember!

The worksheets in this guide could contain sensitive information about your water system. Make sure you store these worksheets, as well as all other asset information about your water system, in a secure location.

Introduction to the System Inventory Worksheet

The following System Inventory Worksheet will help you:

- Identify all of your water system's assets;
- Record the condition of your assets;
- Record the service history of your assets;
- Determine your assets' adjusted useful lives;
- Record your assets' ages; and,
- Estimate the remaining useful life of each of your assets.

Usually, there are two steps to estimating useful life:

1. Determine the expected useful life by using the manufacturer's recommendations or the estimates provided in the box to the right. Adjust these numbers based on the specific conditions and experiences of your water system.
2. Calculate an adjusted useful life by taking into account the service history and current condition of your asset.

Two copies of the worksheet are provided. The first copy is followed by instructions that will help you understand how to complete it. The second worksheet is an example. Appendix A has blank worksheets that you can use.

Estimated Useful Lives	
Asset	Expected Useful Life (in years)
Intake Structures	35-45
Wells and Springs	25-35
Galleries and Tunnels	30-40
Chlorination Equipment	10-15
Other Treatment Equipment	10-15
Storage Tanks	30-60
Pumps	10-15
Buildings	30-60
Electrical Systems	7-10
Transmission Mains	35-40
Distribution Pipes	35-40
Valves	35-40
Blow-off Valves	35-40
Backflow Prevention	35-40
Meters	10-15
Service Lines	30-50
Hydrants	40-60
Lab/Monitoring Equipment	5-7
Tools and Shop Equipment	10-15
Landscaping/Grading	40-60
Office Furniture/Supplies	10
Computers	5
Transportation Equipment	10
Note: These numbers are ranges of expected useful lives drawn from a variety of sources. The ranges assume that assets have been properly maintained.	

System Inventory Worksheet

Date Worksheet Completed/Updated: 1						
Asset	**Expected Useful Life**	**Condition**	**Service History**	**Adjusted Useful Life**	**Age**	**Remaining Useful Life**
2	3	4	5	6	7	8

Using the System Inventory Worksheet

This section presents instructions for completing the System Inventory Worksheet. Each step presented here corresponds to a numbered section of the sample worksheet on page 18.

Step #1

Enter the date.

Circle whether you are completing or updating the worksheet and fill in the date. You should update this worksheet at least once a year. You can either make minor adjustments to the worksheet as the condition of your assets change or start a new worksheet each year.

Step #2

Identify your assets.

Write in each of your system's assets. Be as specific as possible by providing location, manufacturer, or some other identifier for each asset. List separately assets made of different materials or installed at different times. For example, you might list a section of your distribution system as "10-inch PVC on Main St." You can make a copy of this worksheet if you need more room to list assets.

Step #3

Fill in expected useful life.

Use the manufacturer's recommendation or the list provided in the box on page 17 to enter the expected useful life for each asset.

Step #4

Describe assets' condition.

Briefly describe the condition of each asset. Focus especially on conditions that may influence the useful life.

Step #5

Describe service history.

Briefly describe the service history of each asset. Include routine maintenance activities as well as any repairs and rehabilitations. List how often you have made repairs and rehabilitations.

Step #6

Estimate the adjusted useful life for each asset.

Using the Expected Useful Life (step 3) as a guide, estimate the adjusted useful life for each of your assets by considering its current condition (step 4) and its service history (step 5).

If your asset is in poor condition, has not been properly maintained, or faces other challenges (poor water or soil quality, excessive use, etc.), then the adjusted useful life is likely to be less than the lower end of the expected useful life range.

If your asset is in good condition, has been properly maintained, and faces average water quality, then you can use the average useful life value. However, you may want to use the lower end of the range to be more conservative and help ensure that you are prepared to replace the asset.

Step #7

Record age.

For each asset, fill in how long the asset has been in use. If the asset has been previously used by another system, you should list the total age, not just the length of time your system has used it.

Step #8

Calculate the remaining useful life.

For each asset, calculate the remaining useful life by subtracting its age (step 7) from its adjusted useful life (step 6).

System Inventory Worksheet: Example

Date Worksheet Completed/Updated: 8/14/21

Asset	Expected Useful Life	Condition	Service History	Adjusted Useful Life	Age	Remaining Useful Life
Well 1 (2012)	30	Good		30	9	21
Well 1 pump	10	Good	Rehab (2015)	10	9	1
Well 2 (2012)	30	Good		30	9	21
Well 2 pump	10	Good	Rehab (2017)	10	9	1
Pumphouse (2012)	30	Good		30	9	21
Electrical components	10	Some corrosion	Rehab (2013)	10	9	1
Chlorinator (2012)	10	Good	Rehab (2017)	5	3	2
Storage tank 1 (2012)	40	Good	Rehab (2019) - $17,000	40	9	31
Storage tank 2 (2012)	40	Good	Rehab (2019) - $17,000	40	9	31
Storage tank 3 (2019)	40	Almost new		40	2	38
Distribution System:						
Hydrants (15)	40	Unknown				
Valves (45)	40	Unknown	6 valves don't work	40	9	31
6-inch (PVC)	60	Unknown		40	9	31
4-inch (PVC)	60	Unknown		60	9	51
2-inch (PVC)	60	Unknown	Repair breaks (2/year)	60	9	51

Explanation of Example System Inventory Worksheet

A small, municipally-owned water system serving 750 service connections has decided to develop an asset management plan. A neighboring water system recently negotiated very good interest rates on a loan to fund distribution pipe replacement due in part to their asset management plan. This inspired the managers of this water system to develop their own asset management plan.

In addition, the municipality plans to begin significant road work sometime in the next five years. The water system managers have been asked to determine whether any of the pipes under the roads scheduled to be repaired will need to be replaced in that time frame.

As a first step, the water system operator develops a list of the water system's assets and evaluates the condition of each asset. To differentiate the assets, the operator includes the year that some of the assets were installed. Although the operator does not have comprehensive information about every asset on the list, there is enough information to begin assessing the overall health of the water system.

Note that although the estimated useful life for a chlorinator is 10 years (see the box on page 17), the operator of this water system knows that they had to replace their previous chlorinator after only 5 years. The operator adjusts the useful life for the chlorinator from the estimated 10 years to a more conservative 5 years. The operator uses the manufacturers' recommendations as the useful life for the hydrants, valves, and PVC pipes.

Upon completing the System Inventory Worksheet, the water system managers notice that they will have to replace a significant number of their assets starting next year and then about 2, 21, and 31 years from now. They begin to consider whether spacing the projects out over two or three years is possible, or if they will need to replace these assets in the same year.

In addition to the System Inventory Worksheet, the other worksheets in this guide will help the water system managers prioritize the assets and determine how much money they will need to set aside each year to meet the financial demands of replacing them when necessary.

Step #3 – How Do I Prioritize My Assets?

Once you have inventoried your assets, your next step will be to prioritize your assets based on their importance to your water system. Prioritization means ranking your water system's assets to help you decide how to allocate resources. Factors involved in prioritization include:

- How soon will you have to replace an asset (its remaining useful life).
- How important the asset is to the provision of safe drinking water (its impact on public health).
- How important the asset is to the operation of the water system (can other assets do the same job?).

A water system is often one of many responsibilities of a community or municipality. Other factors can influence which water system projects are funded and when they are completed. For example, in many small communities, distribution system rehabilitation and replacement are tied to the road repair schedule and budgeting. Developing an asset management plan and prioritizing your assets will help you determine when you should replace your assets so as to not jeopardize water delivery, but you may have to work with your community or municipality to develop a replacement schedule that works for all parties.

Ideally, an asset management plan will help you forecast your financial needs well into the future and develop a rehabilitation and replacement schedule appropriate for your system's priorities.

An Example Prioritization Scheme

There is no one correct way to prioritize your assets. Most often, assets are prioritized basedon their remaining useful life. However, this is not the only way to prioritize your assets and may not be the best way for your system.

One possible prioritization scheme, in order from most critical assets to the least critical:

1. Existing threat to public health, safety, orenvironment;
2. Potential public health, safety, or environmental concern;
3. Internal safety concern or public nuisance;
4. Improved system operations & maintenance (O&M) efficiency; and
5. It would be nice to have...

Introduction to the Prioritization Worksheet

The following Prioritization Worksheet will help you:

- Consider the redundancy and importance of each of your water system's assets; and,
- Prioritize your assets based on their remaining useful life, redundancy, and importance.

Two copies of the worksheet are provided. The first copy is followed by instructions that will help you understand how to complete it. The second worksheet is an example. Appendix A has blank worksheets that you can use.

Things to Keep in Mind!

Assets with a shorter remaining useful life should have ahigher priority, as you will have to replace these assets sooner.

Assets that are more important to your ability to deliver safe water should have a higher priority because your water system relies on these assets to deliver safe water.

Assets for which there is less redundancy, or not have duplication of components or a backup, should have a higher priority because your water system will have trouble continuing to operate without them.

The "big picture," or how your community is planning development, is important to your operating plans and your prioritization decisions. For example, if the replacement of distribution system pipes is tied to road repairs, and the road repairs are delayed, water system improvements will also be delayed.

Any engineering master plans, failure or risk analysis, capital improvement plans (CIPs), or comprehensive performance evaluations (CPEs) done for your water system can be used to determine priorities.

Prioritization Worksheet

Date Worksheet Completed/Updated: 1				
Asset	**Remaining Useful Life**	**Importance**	**Redundancy**	**Priority (1 is high)**
2	3	4	5	6

Using the Prioritization Worksheet

This section presents instructions for completing the Prioritization Worksheet. Each step presented here corresponds to a numbered section of the sample worksheet on page 24.

Step #1

Enter the date.
Circle whether you are completing or updating the worksheet and fill in the date. You should update this worksheet at least every year. You can either make minor adjustments to the worksheet as your priorities change or problems are addressed or start a new worksheet each year.

Step #2

List your assets.
Copy your list of assets from step 2 of the System Inventory Worksheet.

Step #3

Enter assets' remaining useful life.
For each of your assets, copy the remaining useful life from step 8 of the System Inventory Worksheet.

Step #4

Describe assets' importance.
Briefly describe the importance of each of the assets to the operation of your water system and the protection of public health. Assets that are required in order to keep the system running are usually more important than those that just make operation more efficient.

Step #5

Describe assets' redundancy.
Briefly describe the redundancy of each of the assets. Are there assets that can do the same job, even if they cannot do it as well? Does the asset have a back-up or fail-safe measures to ensure reliability?

Step #6

Evaluate assets' priority.
Considering remaining useful life, importance, redundancy, and any other important factors, rank your assets in terms of how important it is to reserve money for them. Write "1" next to the asset with the highest priority, "2" next to the asset with the next highest priority, and so on. You may find that you have more than one asset with the same level of priority. You can assign the same ranking to all assets with the same priority.

Assets with a shorter **remaining useful life** should have a higher priority (lower number) because you will need to rehabilitate or replace them relatively soon.

Assets that are more **important** to your ability to deliver safe water should have a high priority (lower number), because of public health protection goals.

Assets for which there is less **redundancy** should have a high priority (lower number), because your system will have trouble continuing to operate without them.

Prioritization Worksheet: Example

Date Worksheet Completed/Updated: **8/14/21**				
Asset	**Remaining Useful Life**	**Importance**	**Redundancy**	**Priority (1 is high)**
Well 1 (2012)	21	Needed for service	Other well, but need backup	6
Well 1 pump	1	Needed for service	Other well, but need backup	3
Well 2 (2012)	21	Needed for service	Other well, but need backup	6
Well 2 pump	1	Needed for service	Other well, but need backup	3
Pumphouse (2012)	21	Needed for service	Other well, but need backup	6
Electrical components	1	Needed for control	No redundancy - corrosion	2
Chlorinator (2012)	2	Mandatory	No redundancy - need backup	1
Storage tank 1 (2012)	31	Need for fire flow and demand	Other tanks	6
Storage tank 2 (2012)	31	Need for fire flow and demand	Other tanks	6
Storage tank 3 (2019)	38	Need for fire flow and demand	Other tanks	6
Distribution System:				
Hydrants (15)	31	Needed for public safety	Other hydrants	5
Valves (45)	31	Needed for isolation	Other valves, but some are out of service	4
6-inch (PVC)	51	Needed for delivery	No redundancy	6
4-inch (PVC)	51	Needed for delivery	No redundancy	6
2-inch (PVC)	51	Needed for delivery	No redundancy	6

Explanation of Example Prioritization Worksheet

Once the System Inventory Worksheet (see page 18) is completed, the operator begins to work with the water system managers to prioritize the assets. A number of assets will require attention within the next five years. These assets are given the highest priority.

Even though the chlorinator has a longer remaining useful life than both well pumps and the electrical components, the water system managers have assigned the chlorinator the highest priority. The delivery of safe drinking water and the water system's compliance with drinking water regulations depends on the chlorinator. The managers have also assigned a high priority to both well pumps and the electrical components of the pumphouse since consistent and adequate water delivery will be in jeopardy if these items are not replaced.

Deciding whether to assign the chlorinator, the pumps, or the electrical components a higher priority was a difficult decision, as all are integral to the operation of the water system. The managers know they will have to replace all of these assets if they expect to continue to provide their customers with safe drinking water. By completing the prioritization worksheet, however, the managers gave themselves some time to properly evaluate the situation, collect the necessary resources, and replace all critical assets according to a schedule that will work for the water system.

The Prioritization Worksheet also helps the managers forecast future needs and allocate resources. The managers are able to inform the municipality that the distribution pipes will not require replacement for another 50 years. By not replacing the pipes before the end of their useful lives, the funds that might have been allotted to the pipe-replacing project can now be assigned to more critical projects, such as replacing the chlorinator.

The managers will need to decide how to fund the necessary rehabilitations or replacements. Based on the System Inventory Worksheet, many of the assets will require major rehabilitation or replacement every 10 years. The remaining worksheets in this guide will help the water system managers determine how much money they will need to reserve each year and whether current revenues can cover the costs of on-going operation and rehabilitation and replacement of all of these assets. If current revenues are insufficient, they will need to seek additional sources of funding.

Alternative Exercise: Priority Ranking Matrix

What happens if you determine that many of your assets are a high priority, but can't determine which should be addressed first? A priority ranking matrix may be the answer. This matrix is designed to facilitate discussion of assets' priority and rank the needs of a water system.

After the assets and needs are listed out, each participant is given two or three votes to place those assets deemed most critical to them. A tally of votes generates the ranking. Ask participants to reach a consensus regarding the comparison of each pair of assets they have identified. In seeking consensus on each pair comparison, watch for the variability of opinion as it will be important information as you continue to develop and implement your asset management plan. During this exercise, it's important for those participating to contribute their ideas and opinions. If there is concern about voting being influenced by certain persons, people can vote anonymously by writing on paper and dropping it in a box. You may choose to do it as a whole organization or split into smaller groups to develop their own ranking and convene to question each other, discuss the ideas as they are presented, and then vote on a final ranking. If you have a large list of assets, narrow down to the top 8 or fewer items and then conduct the ranking.

Below is an example of a priority ranking matrix conducted by 20 operators and staff given three votes each. Although the valves and well pump had the same number of votes, the participants agreed that the well pump was deemed a higher priority in comparison to the valves due to higher consequences of failure.

EXAMPLE Priority Ranking Matrix

	Replace Chlorinator	Upgrade and Repair Electrical Components	Evaluate and Repair Out of Service Valves	Replace Well Pump 2	Rank
Chlorinator		Chlorinator	Chlorinator	Chlorinator	1
Electrical Components			Electrical Components	Electrical Components	2
Valve				Well Pump 2	4
Well Pump 2					3
# of Tallies	30	16	7	7	

Step #4 – How Do I Plan for the Future?

Now that you have prioritized your assets, you will have to determine how much it will cost to rehabilitate and replace them as they deteriorate. To properly protect public health and deliver safe water, you need to rehabilitate and replace your assets in addition to operating your water system. Many systems will need considerable lead-time to budget and gather the necessary funds. By developing an asset management plan, you will be able to allocate your resources in the most efficient way.

The Required Reserve Worksheet on the next few pages will lead you through the steps necessary to determine how much money you need to put in reserve each year (for the next five years) to fund your highest priority activities. This reserve should be protected from other use.

The worksheet will give you an idea of how much money you should set aside to fund your reserve account this year. Changes in your water system's finances and costs of new assets can change from year to year. It is important that you update this worksheet every year. This will ensure that you have enough reserves to cover necessary rehabilitations and improvements. This worksheet only helps account for additional funds you will need to rehabilitate or replace your assets. Standard O&M costs (e.g., chemicals for disinfection) are not included in the calculations on this worksheet.

Remember that while the total reserves needed each year may at first seem overwhelming, it is easier to put aside $500 a year to repair or replace a storage tank rather than to pay $20,000 to replace it when it fails. Step #4 will discuss some of your water system's options for raising revenues to carry out your asset management plan. Refer to Appendix B for funding assistance available to public water system.

Remember!

A preventive maintenance program will allow you to maximize the useful lives of your assets and can help you avoid problems and cut down or delayreplacement costs. Contact your Capacity Development Coordinator for more information on developing and implementing a preventive maintenance program. . State and territorial contacts can be found on EPA's website here. EPA's Regional Tribal Drinking Water Coordinators can be found on EPA's website here.

Introduction to the Required Reserve Worksheet

The following Required Reserve Worksheet will help you calculate the amount of money that you will need to set aside every year (your annual reserve) to pay for the rehabilitation and replacement of your assets. Standard O&M costs are not included.

The worksheet asks for the estimated cost of rehabilitation and replacement activities associated with your highest-priority assets. Remember to gather information on all of the costs associated with rehabilitation and replacement such as equipment purchase, installation, pilot tests, labor charges, clean up, and disposal of the replaced asset. To determine your estimated costs, you can:

- Ask local contractors and businesses for estimated costs.
- Contact equipment manufacturers.
- Talk to neighboring systems about the cost of their rehabilitations or replacements.
- Discuss this with your state, tribal, or local technical assistance organization.

This worksheet can be used to estimate your annual reserves for the next five years. The worksheet uses a five-year forecast to help you think about and begin financial planning for your short-term future needs. Although several of your assets will have remaining useful lives considerably longer than five years, it is unlikely that you will be able to forecast your water system's situation much farther into the future. You should update the worksheet at least once a year because your system is likely to experience changes in costs, budgeting, and funding.

Two copies of the worksheet are provided. The first copy is followed by instructions that will help you understand how to complete it. The second worksheet is an example. Appendix A has blank worksheets that you can use.

Required Reserve Worksheet[1]

Date Worksheet Completed/Updated: 1

Asset (list from highest to lowest priority)	Activity	Years until action needed	Cost ($)	Reserve required current year
2	3	4	5	6
			Total reserve in the current year	7

[1] Note: The Required Reserve Worksheet only helps you account for the additional funds you will require to rehabilitate or replace your asset. Standard O&M costs are not included in this calculation.

Using the Required Reserve Worksheet

This section presents instructions for completing the Required Reserve Worksheet. Each step presented here corresponds to a numbered section of the sample worksheet on page 31.

Step #1

Enter the date.
Circle whether you are completing or updating the worksheet and fill in the date. You should update this worksheet at least once a year. You can either make minor adjustments to the worksheet or start a new worksheet each year.

Step #2

List your prioritized assets.
List the assets from the Prioritization Worksheet. List the assets in order, with the highest priority assets (lowest number) first.

Step #3

List activities.
For each asset, list the rehabilitation and replacement activities that you expect to perform over the next five years. Provide enough detail for each activity so that you can determine the cost of the activity.

Step #4

Estimate years until action needed.
For each activity, fill in the number of years before you will need to do that task.

For annual activities, enter "1."

For replacement activities, enter the remaining useful life you estimated in step 8 of the System Inventory Worksheet.

Step #5

Estimate cost.
Fill in the expected cost for each activity. Make sure to include the complete cost, including preparation, clean-up, removal, and disposal of any waste.

If you expect to sell an asset at the end of its useful life, subtract the estimated sale price from the cost of a new item and enter the difference.

Step #6

Calculate the reserve required per year.
For each asset, calculate the reserve required by dividing the cost by the years until the action is needed. This is the estimated amount of money that your system needs to set aside per year for that asset.

Step #7

Calculate the total reserve required in the current year.
Add the reserve required per year for each item to calculate the total reserve required in the current year. This is the estimated amount of money that your system needs to set aside, starting this current year, if you want to pay for all of these rehabilitation and replacement activities.

Required Reserve Worksheet[1]: Example

Date Worksheet Completed/Updated: **8/14/21**				
Asset (list from highest to lowest priority)	**Activity**	**Years until action needed**	**Cost ($)**	**Reserve required current year**
1. Chlorinator	Replace	2	$2,000	$1,000
	Purchase redundant unit	1	$2,000	$2,000
2. Pumphouse-Electrical	Replace with controller	1	$2,000	$2,000
3. Well Pumps	Replace Well 1 pump	1	$5,000	$5,000
	Replace Well 2 pump	1	$5,000	$5,000
	Next Replacements (2 well pumps at $5000 each)	10	$10,000	$1,000
4. Valves	Replacement	31	$22,500	$726
	(45 valves at $500 each)			
5. Hydrants	Replacement	31	$60,000	$1,935
	(30 hydrants at $2,000 each)			
6. Pipe	6-inch (3600 ft. at $20/ft.)	51	$302,000	$5,922
	4-inch (9500 ft. at $20/ft. - replace 4-inch with 6 inch)			
	2-inch (2000 ft. at $20/ft. - replace 2-inch with 6 inch)			
	(Total is 15,100 ft. at $20/ft.)			
7. Storage	Rehabilitate 3 tanks	5	$50,000	$10,000
	(1 every 8 years, 2015 and 2023 tanks)			
	Replace - 2 tanks (2015 tanks)	31	$40,000	$1,290
	1 tank (2015 tank)	38	$20,000	$526
			Total reserve in the current year	$36,399

[1] Note: The Required Reserve Worksheet only helps you account for the additional funds you will require to rehabilitate or replace your asset. Standard O&M costs are not included in this calculation.

Explanation of Example Required Reserve Worksheet

In order to calculate the funds the water system will have to set aside each year to pay for the upkeep of its assets, the managers complete the Required Reserve Worksheet. By inventorying and determining the condition of the system's assets, and evaluating when they will need to be replaced, the managers realize:

- That while none of the items that require replacement within the next 1-2 years (the chlorinator, the pumps, and the electrical system for the pumphouse) is very expensive, they will have to set aside approximately $16,000 in the next two years to cover the cost of replacing these assets.
- The replacement of pipes in this system's distribution system is by far the most costly activity for the system. It will cost an estimated $302,000 to replace pipes, but since this cost can be spread out over 50 years, they only need to put aside an additional $6,000 a year (every year) to fund this activity.
- The total reserve required to successfully implement this asset management plan is around $36,500 per year.

Before beginning the asset management plan process, the managers were planning on replacing the chlorinator next year but did not plan on replacing either of the well pumps until they broke. Now, they plan on using some of the system's current reserve fund to purchase a redundant unit and to begin saving for the replacement of one of the well pumps. They also decide to meet with town officials to discuss system priorities, costs, and funding options.

Step #5 – How Do I Carry Out This Plan?

In the previous section, you may have discovered that you should be reserving additional money every year to cover the cost of rehabilitating and replacing your assets. Preparing a financial forecast (by estimating how much revenue you expect for the next five years) will help you determine if you will need to supplement your revenues to carry out your asset management plan.

If you don't already have a five-year forecast, the Budgeting Worksheet on page 37 will help you complete this task. In addition, to increase or more efficiently use your revenues to operate and maintain your water system and carry out your asset management plan you can:

- **Create additional reserve accounts.** Reserve all or some of the money you will need in a protected capital improvement reserve account and create an emergency account to fund unexpected repairs and replacements. A good rule of thumb is to set aside enough to cover the cost of operations for 45 days or more. Check with your state or tribal coordinator for more information on reserves and any restrictions within your state. Contact information is provided in Appendix E.
- **Form partnerships.** Working with other water systems may allow you to lower costs, simplify management, and continue to provide your customers with safe drinking water. Some water system partnerships can be as simple as having an informal cooperation to share equipment, or as complex as transferring ownership to become a larger, centralized system. Check out EPA's Water System Partnerships Website to learn more.
- **Consider increasing rates.** Having an appropriate rate structure will ensure you not only have enough to cover operation costs, but to establish and build financial reserves to meet established goals and be prepared for the unexpected. Reviewing your budget can help determine whether or not the current rate structure is adequate to provide service now and into the future. Check out EPA's Setting Small Drinking Water Rates for a Sustainable Future for more information.
- **Apply for financial assistance.** Banks and government agencies can provide funds for infrastructure projects such as treatment facilities, distribution lines, and water source development. If you do not have enough funds to pay for needed capital improvements, you can apply for loans and grants. Although you will pay interest on loans which will, over the long term, increase your costs, loans will allow you to address needed system improvements without dramatically increasing rates or assessing fees to cover the costs. Seek financial advice from your city clerk, a certified accountant, or contact your State or Regional Tribal Capacity Development Coordinator if you are considering a loan to fund capital improvement projects. The table in Appendix B provides information on some programs that may provide financial assistance to help you fund major infrastructure improvements and replacement projects.

Introduction to the Budgeting Worksheet

The following simple five-year Budgeting Worksheet will help you quickly determine:

- Your water system's annual revenues from fees, loans and grants, interest from any accounts, and other sources of income.
- Your annual expenditures on maintenance, utilities, salaries and benefits, office supplies, professional services, taxes, and loan payments.
- Your net income.
- How much additional funding you will need to continue to operate and maintain your water system and replace and repair your assets.[2]

You should complete the Budgeting Worksheet every year. It will allow you to assess your financial situation and properly plan for future needs. Two copies of the worksheet are provided. The first copy is followed by instructions that will help you understand how to complete it. The second worksheet is an example. Appendix A has blank worksheets that you can use.

Remember!

The budgeting worksheet is intended to help you understand the financial position of your system and forecast any potential shortfalls you may face.It will help you determine whether or not you are adequately funding your reserve account(s) and whether or not you should begin searching for additional funding sources. It *is not* meant to serve as an accounting tool, nor is it intended to replace your current accounting practices.

[2] The Budgeting Worksheet does not take into account current reserves or your annual contributions to other reserve accounts. If you already have reserve accounts, you can use them to supplement your asset management plan. It is important, however, to continue contributing to these reserve accounts so that you don't experience a shortfall if you use these funds for repair and replacement of assets

Budgeting Worksheet

Date Worksheet Completed/Updated: 1

Revenues		Expenses		Net Income	
Service Fees:		Maintenance:		Total Revenue:	
Fees and Service (late fee, connection fee, fire fee, etc.):		Utilities (power, telephone):		Total Expenses:	
Impact Fees (demand fee, system development fee, etc.):		Salaries and Benefits:			
Secured Funding:	2	Equipment Cost:		Net Income: (Revenue - Expenses)	6
Interest:		Chemicals:			
Other:		Monitoring and Testing:			
		Rent or Mortgage:			
		Insurance:		**Additional Reserves Needed**	7
		Professional Services (legal, accounting, engineering, etc.):	4	Total Required Reserves:	
		Training Costs			
		Billing Costs:		Net Income:	8
		Fees (state PWS fee, franchise fee, conservation fee, etc.):			
		Security:			
		Other (debt payments, taxes, miscellaneous, etc.):		Additional Reserves Needed: (Income - Required Reserves)	9
Total Revenues:	3	**Total Expenses:**	5		

Using the Budgeting Worksheet

This section presents instructions for completing the Budgeting Worksheet. Each step presented here corresponds to a numbered section of the sample worksheet on page 37.

Step #1

Enter the date.
Circle whether you are completing or updating the worksheet and fill in the date. You should update this worksheet once a year. You can either make minor adjustments to the worksheet or start a new worksheet each year.

Step #2

List your revenues.
Fill in your revenues in the lines provided. If your system has other sources of income not listed on the worksheet, enter them in the "Other" lines provided.

Step #3

Calculate total annual revenues.
Calculate your total revenues by adding all the revenues you listed in the previous step. Enter this number in the box marked "Total Revenues." Do not include funding you expect but have not secured.

Step #4

List your expenses.
Fill in your expenses in the lines provided. If your system has other expenses not listed on the worksheet, enter them in the "Other" lines provided.

Step #5

Calculate total expenses.
Calculate your total expenses by adding all the expenses you listed in the previous step. Enter this number in the box marked "Total Expenses.

Step #6

Calculate net income.
Enter the result of step 3 on the "Total Revenues" line and the result of step 5 on the "Total Expenses" line. Calculate your net income by subtracting your expenses from your revenues. Enter this number on the "Net Income" line.

Step #7

Enter your total required reserves.
Enter your total required reserves from the Required Reserves Worksheet.

Step #8

Enter your net income.
Enter the result of step 6 on the "Net Income" line.

Step #9

Calculate additional reserves needed.
Subtract your total required reserves (from step 7) from your net income (from step 8). Enter this number in the box marked "Additional Reserves Needed."

If the result is a positive number (i.e., your resources are larger than your required reserves), you will not have to plan for ways to make up for the shortfall and can set aside the required funds in a reserve account.

If the result is a negative number (i.e., your resources are less than the required reserves), you should start planning for ways to make up for the shortfall.

Budgeting Worksheet: Example

Date Worksheet Completed/Updated: ***8/14/21***

Revenues		Expenses		Net Income	
Service Fees:	$249,971	Maintenance:	$54,320	Total Revenue:	$253,430
Fees and Service (late fee, connection fee, fire fee, etc.):	$5,284	Utilities (power, telephone):	$3,992	Total Expenses:	$245,072
Impact Fees (demand fee, system development fee, etc.):	$175	Salaries and Benefits:	$76,689	Net Income: (Revenue - Expenses)	$10,358
Secured Funding:		Equipment Cost:	$1,371		
Interest:		Chemicals:	$40,512		
Other:		Monitoring and Testing:	$8,096		
		Rent or Mortgage:			
		Insurance:	$1,453	**Additional Reserves Needed**	
		Professional Services (legal, accounting, engineering, etc.):	$400	Total Required Reserves:	$34,625
		Training Costs	$1,000		
		Billing Costs:	$2,500		
		Fees (state PWS fee, franchise fee, conservation fee, etc.):	$500	Net Income:	$10,358
		Security:	$609		
		Other (debt payments, taxes, miscellaneous, etc.):	$53,630	Additional Reserves Needed: (Income - Required Reserves)	-$24,267
Total Revenues:	$255,430	**Total Expenses:**	$245,072		

Explanation of Example Budgeting Worksheet

In order to better understand their financial position, the managers for the water system must complete the budgeting worksheet. Note that almost all of their revenues come from service fees ($249,971 of $255,430 in total revenues). Most of their expenditures go to pay for maintenance, salaries and benefits, and chemicals.

On the surface, it would seem that the water system is in a fairly good financial situation. After expenses, the water system has a net income of $10,358 a year. However, the water system cannot afford the annual $34,625 contribution to its reserve account with its current income. If the water system does not raise revenues or secure outside funding, it will not have the income necessary to pay for rehabilitation and replacement of its assets in the future. The water system managers will have to start thinking about how to raise the additional revenue necessary to make up for the shortfall.

Step #6 – What Should I Do Next?

Once you have inventoried and prioritized your assets, determined how much money you will need to set aside each year to fund the rehabilitation and replacement of your assets, and explored funding options for your water system, you can use your asset management plan to help plan your water system's future. You will have a good picture of when you will need to replace your assets and how much money you will need to fund those replacements and continue to deliver safe and secure drinking water to your customers.

Remember that the worksheets should be reviewed, revised, and updated on an annual basis. Your asset management plan should help you shape your system's operations and should change as your priorities change. Current information in the worksheets provides a better picture of your system's position, and better prepares you to meet your water system's future needs.

Taken in tandem with the strategic planning tools available in EPA's Strategic Planning STEP Guide Series, the worksheets will give you a good idea of the challenges your water system may face in the future and help you think about the most cost-effective and efficient way to address those challenges. Consulting with your State or Regional Tribal Capacity Development Coordinators and developing a plan of action with their assistance will ensure that you can continue to deliver safe and secure drinking water well into the future.

Appendix A: Worksheets

Level of Service Worksheet

Date Worksheet Completed/Updated:					
Customer LOS					
Value	**I.D.**	**LOS Measure**	**Goals**	**Measurement of Data**	**Status or Grade** (Very Good, Good, Fair, Poor, Very Poor)
Technical LOS					
Category	**I.D.**	**LOS Measure**	**Goals**	**Measurement of Data**	**Status or Grade** (Very Good, Good, Fair, Poor, Very Poor)

System Inventory Worksheet

Date Worksheet Completed/Updated:						
Asset	**Expected Useful Life**	**Condition**	**Service History**	**Adjusted Useful Life**	**Age**	**Remaining Useful Life**

Prioritization Worksheet

Date Worksheet Completed/Updated:				
Asset	**Remaining Useful Life**	**Importance**	**Redundancy**	**Priority (1 is high)**

Required Reserve Worksheet[1]

Date Worksheet Completed/Updated:				
Asset (list from highest to lowest priority)	**Activity**	**Years until action needed**	**Cost ($)**	**Reserve required current year**
			Total reserve in the current year	

[1] Note: The Required Reserve Worksheet only helps you account for the additional funds you will require to rehabilitate or replace your asset. Standard O&M costs are not included in this calculation.

Budgeting Worksheet

Date Worksheet Completed/Updated:					
Revenues		**Expenses**		**Net Income**	
Service Fees:		Maintenance:		Total Revenue:	
Fees and Service (late fee, connection fee, fire fee, etc.):		Utilities (power, telephone):		Total Expenses:	
Impact Fees (demand fee, system development fee, etc.):		Salaries and Benefits:			
Secured Funding:		Equipment Cost:		Net Income: (Revenue - Expenses)	
Interest:		Chemicals:			
Other:		Monitoring and Testing:			
		Rent or Mortgage:			
		Insurance:		**Additional Reserves Needed**	
		Professional Services (legal, accounting, engineering, etc.):		Total Required Reserves:	
		Training Costs			
		Billing Costs:			
		Fees (state PWS fee, franchise fee, conservation fee, etc.):		Net Income:	
		Security:			
		Other (debt payments, taxes, miscellaneous, etc.):		Additional Reserves Needed: (Income - Required Reserves)	
Total Revenues:		**Total Expenses:**			

Appendix B: Sources of Financial Assistance to Drinking Water Systems

System improvements can be funded by raising rates and obtaining loans or grants. The programs presented below may provide financial assistance to help you maintain assets in good condition, replace deteriorated assets that have outlived their useful lives, and continue to provide safe and secure drinking water to your customers. Consult your State or Regional Tribal Drinking Water Primacy Agency for additional information. State and territorial contacts can be found on EPA's website here. EPA's Regional Tribal Drinking Water Coordinators can be found on EPA's website here. To view the Simple Tools for Effective Performance (STEP) Guide Series visit EPA's website.

Before you apply for funding, find out what each source will pay for and what information it will need to consider in your application. Ask about local matching fund requirements, application procedures, what makes a project "fundable," and special program requirements and restrictions. Ask to see applications from previously funded projects. Get an idea of what information is required for an application; most lending and granting agencies will want to see financial statements such as budgets, income statements, and cash flow documents.

Major Providers of Financial Assistance to Drinking Water Systems

Program	Description	Contact Information
Water Finance Clearing House	Water Finance Clearinghouse is a database of financial assistance sources available to fund a variety of watershed protection projects.	https://www.epa.gov/waterdata/water-finance-clearinghouse
Drinking Water State Revolving Fund (DWSRF)	These state-administered loan programs enable water systems to finance infrastructure improvements, provide training, and fund source water protection activities	https://www.epa.gov/dwsrf/state-dwsrf-website-and-contacts
Rural Utilities Service (RUS) Water and Wastewater Loan and Grant Program	This program offers loans and grants to develop water and waste-disposal systems in rural areas.	https://www.rd.usda.gov/programs-services/water-environmental-programs
Manufactured Housing Institute	The Manufactured Housing Institute provides information on loan programs for manufactured homes to its members. It also offers forums to interact with financial services companies that cater to the manufactured homes market.	www.manufacturedhousing.org
Small Business Administration (SBA)	SBA helps small businesses get low-interest loans.	www.sba.gov
Rural Community Assistance Corporation (RCAC)	RCAC provides loans to rural utilities in 11 western states to help meet the financing needs of rural communities and disadvantaged populations.	https://www.rcac.org/programs-services/#section-0

Appendix C: Introduction to GASB 34

The Governmental Accounting Standards Board (GASB) is a private, nonprofit organization that is responsible for establishing and improving governmental accounting and financial reporting standards. GASB also establishes generally accepted accounting principles (GAAP) for state and local governmental entities, including publicly-owned water systems.[2]The standards and principles developed by GASB are strictly voluntary. However, some states may incorporate them into their laws and regulations and therefore make them mandatory for local governments and the water systems they operate.

In June 1999, GASB approved "Statement Number 34, Basic Financial Statements and Management's Discussion and Analysis for State and Local Governments."[3] Statement Number 34 revised several accounting practices and established new standards for the annual financial reports required of state and local governments. The revisions were intended to make annual financial reports easier to understand and make the financial data more useful to decision makers.

GAAP and GASB 34 make good sense for publicly-owned water systems as these principals are often the best way to keep track of finances. Following them will help you form a better picture of your system's financial health, forecast future shortfalls, and continue to deliver safe drinking water to your customers. In addition, following GASB standards is a must for obtaining a "clean opinion" (i.e., a good credit rating) from an auditor. Clean opinions are often necessary for loans, negotiating favorable interest rates, or issuing bonds.

GASB 34 requires:

1. An accounting of revenues and expenditures in the period in which they are earned or incurred. This is called accrual-based accounting. For example, if the water system provides water in December 2003 and receives payment in February 2004, the water system would report that the money was earned in 2003. This change will allow the system and its investors to understand the direct financial results of its investments.

2. A reporting of the value of infrastructure assets and the cost of deferred maintenance. These measures allow the public to evaluate how well the system is managing its assets. A current asset management plan is a valuable tool to help you meet this requirement if you are complying with Statement 34. In addition, reporting the true cost of deferred maintenance (i.e., unmade repairs that result in equipment or facility deterioration) may allow systems to raise money more easily for maintenance activities necessary to use facilities and equipment for their full expected lives.

[2] The Financial Accounting Standards Board (FASB) establishes and improves standards of financial accounting and reporting in the private sector. If your system is privately owned, visit www.fasb.org for more information on private accounting standards.

[3] The new standards took effect for small governments (including water systems) with annual revenues of less than $10 million on June 15, 2003

3. Contributed capital (for example, federal grants) to be considered a form of income. This change will increase a system's reported income. While reporting all forms of income is a necessary accounting principal, this method of reporting (which includes contributed capital) may make it more difficult to justify rate increases.

For more information, talk to your city clerk, ask a certified public accountant, or contact your Capacity Development Coordinator. State and territorial contacts can be found on EPA's website here. EPA's Regional Tribal Drinking Water Coordinators can be found on EPA's website here. GASB's website offers more information on Statement 34, as well as guidance documents, case studies of entities that have implemented Statement 34, and trainings. Visit www.gasb.org for more information.

Appendix D: Sources for More Information on Asset Management

EPA's Environmental Finance Program provides financial and technical assistance to water systems and other regulated entities. Visit Water Finance Clearinghouse (https://ofmpub.epa.gov/apex/wfc/f?p=WFC:12) for more information about the program, for access to the program's publications, and to reach the network.

About Asset Management: https://www.epa.gov/dwcapacity/about-asset-management

- EFC AM Switchboard: https://swefcamswitchboard.unm.edu/
- Building an Asset Management Team: https://nepis.epa.gov/Exe/ZyPdf.cgi?Dockey=P1000LTZ.txt
- Talking to Your Decision Makers: A Best Practices Guide: https://www.epa.gov/dwcapacity/interactive-tools-owners-and-operators
- Electronic Preventive Maintenance Logs: https://www.epa.gov/dwcapacity/electronic-preventive-maintenance-logs
- Knowledge Retention Tool Spreadsheet (Excel): https://www.epa.gov/dwcapacity/interactive-tools-owners-and-operators
- Reference Guide for Asset Management Tools (pdf): https://www.epa.gov/dwcapacity/reference-guide-asset-management-tools

EPA's Simple Tools for Effective Performance (STEP) Guide Series: https://www.epa.gov/dwcapacity/simple-tools-effective-performance-step-guide-series

State and territorial contacts: https://www.epa.gov/dwcapacity/find-epa-capacity-development-contact

EPA's Regional Tribal Drinking Water Coordinators: https://www.epa.gov/tribaldrinkingwater/regional-tribal-drinking-water-coordinators

EPA's Strategic Planning: A Handbook for Small Water Systems: https://www.epa.gov/dwcapacity/strategic-planning-step-guide-2021-update

Water System Partnerships Website: https://www.epa.gov/dwcapacity/about-water-system-partnerships

EPA's Setting Small Drinking Water Rates for a Sustainable Future: https://www.epa.gov/dwcapacity/simple-tools-effective-performance-step-guide-series

Additional Organizations

American Water Works Association: www.awwa.org
Association of Metropolitan Water Agencies: www.amwa.net
Association of State Drinking Water Administrators: www.asdwa.org
Government Finance Officers Association: www.gfoa.org
National Association of Regulatory Utility Commissioners: www.naruc.org
National Association of Water Companies: www.nawc.org
National Rural Water Association: www.nrwa.org
Rural Community Assistance Program: www.rcap.org
Rural Utilities Service: www.usda.gov/rus