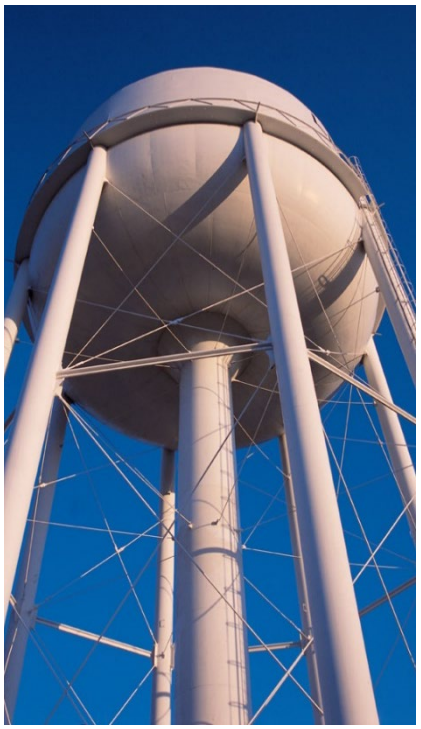
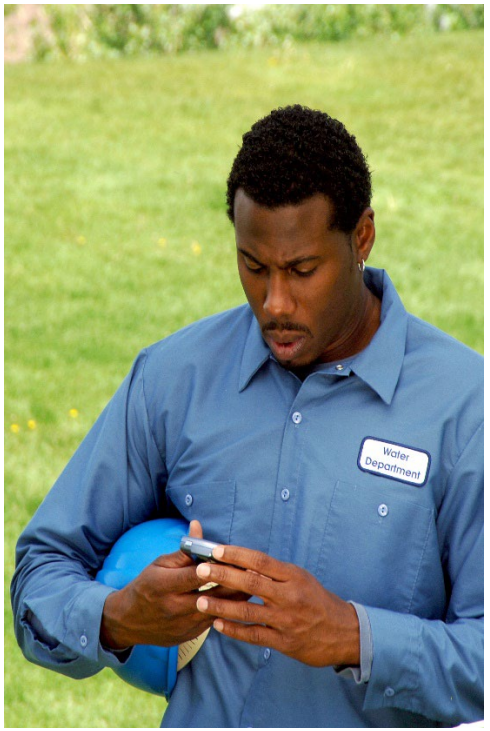
United States Environmental Protection Agency

Setting Small Drinking Water System Rates for a Sustainable Future

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





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Contents

Key Terms

Asset Management	The practice of identifying and managing the infrastructure capital assets of a system to minimize the cost of owning and operating those assets.
Capacity Development	The process for water systems to acquire and maintain adequate technical, managerial and financial (TMF) capacity. TMF capacity enables water systems to have the capability to consistently provide safe drinking water to the public.
Capital Expenditure	The amount your system spends to acquire or upgrade your system's long-term assets.
Capital Improvement Plan (CIP)	A budgeting and financial tool that a system can use to establish asset rehabilitation, maintenance, and replacement priorities and to establish a project schedule, cost, and funding sources.
Community Water System (CWS)	A public water system that serves at least 15 service connections used by year-round residents or regularly serves at least 25 year-round residents.
Debt Service	Principal and interest payments on an outstanding debt (e.g., a capital lease, mortgage, loan, or bond).
Decreasing Block Rate	A rate structure under which the price of water per unit (block) decreases as the amount used increases. Blocks are set according to consumption (e.g., up to 2,000 gallons used, 2,000 to 6,000 gallons, etc.).
Depreciation	The reduction in the value of an asset over time. Also, the allocation of the cost of an asset over time, usually the estimated useful life, for accounting and tax purposes—an annual depreciation charge in accounts represents the amount of capital assets expensed in the accounting period.
Fixed Costs	Costs that remain the same regardless of variations in how much water your system treats and sells.
Flat Rate/Fixed Fee	Rate structure under which all customers pay a set fee (monthly, quarterly, etc.) for water service that is not tied to the amount of water used.
Increasing Block Rate	Rate structure under which the price of water per unit (block) increases as the amount used increases. Blocks are set according to consumption (e.g., up to 2,000 gallons used, 2,000 to 6,000 gallons, etc.). This type of rate structure has the potential to encourage water conservation.

Net Revenue	The difference between total revenue and costs.
Public Water System (PWS)	A system that provides water for human consumption to the public through pipes or other constructed conveyances. These systems have at least 15 service connections or regularly serve an average of at least 25 individuals daily at least 60 days out of the year (Community Water Systems are a type of PWS).
Rate	The charge a system assesses its customers for use of the system's services.
Rate Structure	A set of fees and rates that a water system uses to charge its customers for water. The rate structure will also define elements related to fees and rates such as billing frequency, customer classes and penalties.
Reserve Account	An account used to hold funds set aside to finance future system expenses or obligations such as infrastructure rehabilitation or replacement, major capital improvements, emergency repairs, revenue shortfalls or accessing additional capital.
Revenue	Funds earned by the system through the sale of water or by other means.
Seasonal Rate	A rate that varies depending on the time of the year. Seasonal rates can be used in conjunction with any rate structure, including flat rates and uniform, decreasing, or increasing block rates.
Strategic Planning	A process through which an organization defines what it does and why. A strategic plan defines an organization's long-term goals and objectives and provides a framework through which to meet these goals. Strategic plans should be flexible to make them adaptable in response to unexpected changes.
Transfer Payment	Payment made between the governmental fund and enterprise fund as a gift or aid, not as payment for any good or service nor as an obligation.
Uniform Block Rate	A rate structure under which customers pay a single charge per unit of water. For example, customers may pay $2 per thousand gallons. The cost per thousand gallons remains constant even if usage changes. A uniform rate may be combined with a fixed fee so customers would pay a fixed monthly fee plus a charge per unit of water purchased.
Variable Costs	The costs of operating your system that change as the amount of water that you treat and sell increases or decreases.

Equity and Affordability Considerations

Equity and affordability with drinking water accessibility are priorities for EPA to ensure all of the public has access to clean and safe drinking water. If your system's pricing objectives include affordability, it's important to think through the short and long-term impacts to system costs and revenues as well as potential impacts from changes in environmental conditions or customer base.

Affordability. When setting rates, systems must consider questions of customer equity. If a uniform rate is used within a customer class, low-income residents will spend a larger proportion of their household income on their water bill than high-income households using the same amount of water. Non-residential customers that are low or no-profit entities like schools are usually included in the same customer class as for-profit businesses and may have difficulty affording higher water rates.

Many systems and states/territories/tribes consider a certain amount of water consumption "non-discretionary" meaning it is required to meet basic health and sanitary needs. Systems may choose to create a program where qualified low-income households or businesses are charged a lower rate on water consumption considered non-discretionary. Some states, territories and tribes also have grant programs that low-income customer can use to get assistance in paying their water bill. The unique characteristics of each water system mean that there is no single or simple solution to water affordability; however, it's an important issue that not only can lead to improved service to your community, but also reduce delinquent payment rates, the number of accounts going to collections and the amount of customer shut-offs which result in additional costs for both utilities and customers.

Is This Guide for Me?

As a water system decision maker, operator, or manager, one of your most important jobs is making sure that your system brings in enough money to cover the full costs of doing business now and in the future. This guide is designed to help decision makers, operators, and managers of community water systems (CWSs) serving 3,300 or fewer persons understand the full costs of providing a safe and adequate supply of drinking water to their customers and how to set water rates that reflect those costs. According to federal regulations, CWSs include all water systems (both publicly and privately owned) with at least 25 year-round residential

customers or at least 15 year-round service connections. Systems that will find this guide useful are small publicly or privately-owned entities that charge users directly for water service. These include, but are not limited to:

- Small municipalities
- Manufactured housing communities
- Rural water districts
- Homeowner's associations
- Tribal water systems

This document is one in a series of Simple Tools for Effective Performance (STEP) documents for small drinking water systems. Additional STEP documents are available on EPA's website.

State, Territorial, and Tribal Requirements

Many states and territories have rate setting requirements and restrictions which are usually administered by a public utilities commission, also known as public service commissions. These requirements can vary significantly among states/territories, including the types of systems that are regulated, the requirements related to customer rates, and the cash reserves a system must hold. Tribal systems may also have tribe-specific laws and regulations. Before starting the process to set water rates for your system you should determine whether your state, territory or tribe has specific requirements that would affect how you set rates. You may want to start researching these requirements by contacting your county, tribal or municipal authorities, reaching out to other water systems, or contacting your system's legal counsel. State and territorial contacts can be found on EPA's website here.[1] EPA's Regional Tribal Drinking Water Coordinators can be found on EPA's website here. In this guide, rate review is further described in Step 7.

[1] See Appendix C for a list of the full URLs used in this document.

Why is the Rate Setting Process Important?

Water rates are an important component of the revenue you will need to operate your system. This guide will help you determine how much money you need to collect annually from customers through rates to fully cover your expenses and help determine an appropriate rate structure. You will need to take a detailed look at your current and future costs and expenses, your water system assets, your rate structure options, and the amount of water your customers use. Although the rate setting process takes time, the benefits are significant—you will gain the tools you need to:

- Maintain your system's financial stability by ensuring a sufficient and steady revenue stream.
- Identify system assets and life cycle costs associated with rehabilitating, repairing and replacing assets.
- Calculate the funds needed to cover the costs of future asset rehabilitation and repair projects, employee retention and training, security and technology upgrades, and compliance with future regulations, among other things.
- Plan ahead for reasonable, gradual rate increases when necessary.
- Deliver high-quality drinking water to your customers now and in the future.

What Will I Learn?

As the decision maker, manager, or operator of a drinking water system, your most important job is delivering safe drinking water to your customers. If your system does not have the resources to cover the full cost of producing and delivering water, your job will be all the more difficult. Full cost pricing is an approach for setting water rates that ensures your rate structure will cover current and future operational, maintenance, capital costs, and debt service costs (full cost pricing is described in detail in the next section). This may include the costs associated with production, treatment, storage, distribution, principal and interest payments on debt, capital expenditures, regulatory compliance, and other operation and maintenance costs.

The information and worksheets in this guide will help you understand the importance of recovering the full cost of running your system through customer charges and how to structure your rates to achieve full recovery. Structuring your rates in this way will ensure you have the financial resources to operate effectively and efficiently now and in the future. This process has seven steps:

Step 1: **Determine** the full cost of doing business.

Step 2: **Determine** your current revenues.

Step 3: **Consider** your reserve requirements to ensure you have enough funds to cover your asset rehabilitation and repair costs as well as unexpected costs during the next five years.

Step 4: **Calculate** how much money you need to collect from customer charges to cover your costs and fully fund your reserve account.

Step 5: **Evaluate** appropriate rate structures and determine appropriate rates

Step 6: **Implement** the rates.

Step 7: **Review** your rates and make changes when appropriate.

This guide is designed to help you plan financially for the next five years. Once you have a better understanding of your system's finances and future needs, it will be to your advantage to plan even further ahead—at least 20 years in advance, if possible. Asset management and financial planning are critical to avoid unexpected future cost increases and ensure that customer rates can be increased in a gradual and sustainable manner. EPA's *Strategic Planning: A Handbook for Small Water Systems* (EPA 816-R-03-015) will give you the information and tools you need to develop long-term plans for managing and operating your system.

What is Full Cost Pricing?

Charging customers for the actual cost of water service will guarantee the revenue you need to operate and maintain system infrastructure, pay and retain trained and qualified employees, plan for future expenses such as infrastructure repairs and replacement, and providing funds for future investments. This concept of recovering the costs of running your system through user charges is called "full cost pricing" and is discussed throughout this guide.

Ideally, full cost pricing:

- Ensures rates are a sufficient and stable source of funds. Charging for the full cost of delivering water will ensure your system's financial health, enabling you to provide safe water now and in the future.
- Provides information on costs to customers. How much you ask your customers to pay sends a signal to them about the value of the service you are providing. Charging for the full cost of the water service can help customers recognize the value of safe drinking water and be more mindful of their water use.
- Supports provision of safe drinking water in manner that also meets the environmental and affordability objectives of your system.

While full cost pricing has many advantages, it may not be feasible or desirable for all water systems. Even if you do not set water rates to fully cover all costs, calculating that number can help you determine what additional revenue or budget cuts may be needed to sustainably operate your water system while keeping rates low.

Planning for the Future

EPA encourages water systems to plan for the future. **Strategic planning** helps you address and prepare for anticipated and unexpected problems by evaluating your system's current technical, managerial, and financial capacity. It also requires you to make important decisions about your water system's purpose, structure, and function.

What are the Benefits of Recovering Your Costs Through Revenues?

Evaluating your costs annually and adjusting customer charges to cover your costs takes time and may result in a rate increase for your customers. There are also benefits to your system and your customers. The most important benefit will be financial stability and security, which will ensure that your system can provide customers safe drinking water, with service that is sustainable in the long-term.

The ability of your system to provide safe drinking water depends on your technical, managerial, and financial capacity, often referred to as TMF. The capacity development process ensures that your water system has the ability to provide safe drinking water in a sustainable manner. Recovering costs through water rates can improve your technical, managerial, as well as financial capacity.

Technical capacity is the physical and operational ability of a PWS to meet the Safe Drinking Water Act (SDWA) requirements, including the adequacy of physical infrastructure and the technical knowledge and capability of personnel. Maintaining high quality source water, replacing outdated infrastructure, and ensuring operators are trained and certified are all examples of technical capacity.

Managerial capacity is the ability of a PWS to conduct its affairs in a manner enabling the system to achieve and maintain compliance with SDWA requirements, including institutional and administrative capabilities. Identifying system ownership, staffing the appropriate personnel, and communicating regularly with customers are all examples of managerial capacity.

Financial capacity is the ability of a water system to acquire and manage sufficient financial resources to allow the system to achieve and maintain compliance with SDWA requirements. Ensuring revenues exceed costs, maintaining financial records, and establishing good credit are all examples of financial capacity. Some loan and grant programs, including the Drinking Water State Revolving Fund (DWSRF), assess capacity during the loan application process. You might not qualify for a loan if you do not have adequate capacity.

Beginning on page 9, this guide describes the seven steps to setting water rates so you recover the full cost of providing safe drinking water to your customers and ensuring that your system has the capacity to operate effectively and efficiently now and in the future.

Asset Management

Asset management is a practice of identifying and managing the infrastructure capital assets of a system to minimize the cost of owning and operating those assets. The asset management process builds financial capacity and serves as a critical foundation for calculating rates that reflect the true cost of providing safe drinking water to your customers. Additionally, many state, territorial, and federal financing opportunities now require systems to demonstrate asset management as part of the loan application process, therefore adopting asset management can further improve financial capacity by resulting in expanded access to capital.

The asset management process has five components:

1. Taking an inventory
2. Prioritizing your assets
3. Development an asset management plan
4. Implementing your asset management plan
5. Reviewing and revising your asset management plan

The benefits of applying these five components within each step of the rate setting process are discussed in more detail throughout this Step Guide.

Developing an asset management plan is a valuable tool for small systems which requires creating an asset inventory, detailing operation and maintenance tasks, and identifying infrastructure capital projects that will be needed in the long term. EPA has a number of tools that can help systems develop an inventory and asset management plan including *Asset Management: A Handbook for Small Water Systems* which includes worksheets and guidance for each step of the asset management process. Additional resources can be found on EPA's website.

Step 1 – Determining Your Costs

The first step in setting rates that reflect the true cost of delivering safe drinking water is determining the routine costs of operating your system every year (your annual costs).

In determining your annual operating costs, you need to consider all aspects of your system, such as the operation and maintenance of physical infrastructure, employee salaries and benefits, employee certification and training, debt service payments, and mortgage payments. Knowing your annual costs and understanding how they have changed in the past and can change in the future is key to understanding how much money you will need to collect from your customers every year.

Annual Costs Worksheet

The Annual Costs Worksheet helps you determine the annual costs of running your water system. To make sure that you collect enough revenue to cover the full cost of delivering water to your customers, you need to know your full annual operating costs. Annual operating costs include the costs to operate your system during a typical year, including reoccurring operation and maintenance of infrastructure; chemicals for treatment; sampling to meet regulatory requirements; and overhead costs related to administration, utilities, vehicles, staffing, insurance, and financial obligations. Capital improvement costs that do not occur annually are addressed in Step 3 “Setting Aside a Reserve” and should be identified through the development of an asset management plan.

There are many ways to account for your system’s costs. You should pick one that works with your current accounting system and that supports the rates you plan to use. Any approach you use must fully account for your costs. To estimate these costs, review records of last year’s expenditures and take into account any costs that might change over the next five years (e.g., increased energy costs). The information in this STEP Guide is intended to help systems determine sustainable rates for drinking water service. While many systems provide both drinking water and wastewater service, these services should be considered as separate enterprise funds that are each self-sustaining and evaluated independently when developing rate structures.

Generally, you should use the most recent year of cost data available for your Annual Costs Worksheet; however, if the most recent year of data doesn’t represent a “typical” year it may be better to use a prior year for purposes of determining annual costs. If the

annual costs for your system tend to fluctuate substantially between years you might consider averaging several years of cost data together to create a “typical” year. Whenever you work with cost data from prior years, or when calculating future costs, it is important to consider adjusting for inflation to either bring past costs into current dollars or account for future increases in costs. You should update the Annual Costs Worksheet every year to make sure to account for any changes in your system operation, debt service, or inventory.

Two copies of the worksheet are provided. The first worksheet is a completed example. These examples are based on real water systems but have been revised to ensure they illustrate the purpose of the example. The examples do not represent a single water system or continuous scenario. The second copy includes instructions on how to complete the worksheet.

Explanation of Example Annual Costs Worksheet

To better understand this system's financial condition, the water system's manager has completed an annual cost worksheet that estimates costs for the upcoming year. To develop the estimates, the manager reviewed records of the system's costs from the past year. In doing so, the manager included:

- personnel costs such as salaries, wages, and benefits;
- non-personnel costs for things like equipment, supplies, utilities, the purchase of water, waste disposal, laboratory costs and taxes and franchise fees; and
- costs for debt service and other interest owed by the water system.

Note that this worksheet contains simplified categories and you may need to complete additional calculations before arriving at the values entered into this worksheet. For example, you may need to add up each employee's salary individually on a separate worksheet or spreadsheet in order to enter the total salary costs under "Payroll". Keep a record of any additional calculations made in the same place as you keep these worksheets.

Example **Annual Costs Worksheet**		
Date Worksheet Completed/Updated: *6/19/2021*		**A**
Personnel Costs		
Payroll (hourly and salaried wages)	*$90,400*	
Health/Life Insurance	*$13,150*	
Retirement/Pension Benefits	*$10,216*	
Worker's Compensation	*$3,123*	
Long-Term Disability	*$1,892*	
Payroll Taxes	*$7,846*	
Personnel Costs Subtotal	*$126,627*	**B**
Operating Costs		
Operating Supplies (chemicals, PPE, sampling equipment, etc.)	*$12,650*	
Maintenance and Repair Costs	*$16,875*	
Contracted Services (accounting, legal, engineering, etc.)	*$4,625*	
Water Purchases	*$1,250*	
Office Supplies	*$2,360*	
Electricity	*$12,701*	
Laboratory and Testing Fees	*$9,752*	
Training and Professional License Fees	*$3,203*	
Vehicles (purchases, insurance, fuel, maintenance, registration, etc.)	*$16,002*	
Building Operations (phone, internet, insurance, etc.)	*$4,137*	
Additional Small Equipment	*$1,302*	
Operating Costs Subtotal (excluding debt service)	*$84,857*	**C**
Debt Service		
Principal Payments	*$15650*	
Loan Interest	*$7,920*	
Debt Service Subtotal	*$23,570*	**D**
Total Costs	*$235,054*	**E**

Using the Annual Costs Worksheet

This section presents instructions for completing the Annual Costs Worksheet. Each step presented here corresponds to a numbered section of the sample worksheet on page 15.

Step 1: **Date (Line A).** 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: **Annual Costs**. Fill in your costs on the lines provided. Examples of common annual line item costs are included in each of the three major cost categories, these should be modified as needed to capture specific line item costs at your system. If your system does not track line-item costs in detail you can simply use the subtotal line in each of the three categories to estimate your annual costs. If your system has other annual costs not listed on the worksheet, enter them on the blank lines provided.

Personnel Costs (Line B). List costs such as salaries and wages for administrative employees and functions, for operations and maintenance employees and functions including labor costs for treatment, monitoring, maintenance, and testing; and benefits paid on their behalf, including medical insurance, retirement, vacation, workers' compensation, etc. Public systems may include payments made in lieu of taxes not including indirect taxes like sales taxes charged by the utility, amounts withheld from employees for federal, state, or territorial income tax liability, or amounts withheld from employees for their social insurance contributions. Also include billing operations, including meter reading, mailing of bills, and processing of returns. Note that costs for billing operations, meter reading, and processing of returns can be contracted to a third party. If your system contracts these services, include the costs as non-personnel costs.

Operating Costs (Line C). List costs of operating the office, including rent and utilities; property, general, and liability insurance, insurance on vehicles; accounting, legal, engineering, and other professional services; office supplies, computer software, etc.; utilities for the operation of the system, including electricity and telephone

charges; supplies used in the day-to-day operations of the system and maintenance of the system (not including major capital purchases); purchase of treated and untreated water that is resold to customers; chemicals; annual expenses on equipment leased to operate the system; cost of regular maintenance and repair of equipment (not including major repairs); cars, trucks, etc. used in daily operations; certification and training of operations employees; removal or disposal of waste residuals from water treatment; testing associated with water quality monitoring; equipment used for security, like locks and surveillance equipment; other miscellaneous costs, taxes paid on annual profits, and franchise fees.

Debt Service (Line D). List cost of annual principal and interest payments on debt of the system incurred to finance investment, other than mortgages. Also, include any other interest owed by the system.

Step 3: **Total Annual Costs (Line E)**. Calculate your total costs by adding the annual costs you listed in Step 2. Enter this number in the box marked "Total Costs."

Annual Costs Worksheet		
Date Worksheet Completed/Updated:		**A**
Personnel Costs		
Payroll (hourly and salaried wages)		
Health/Life Insurance		
Retirement/Pension Benefits		
Worker's Compensation		
Long-Term Disability		
Payroll Taxes		
Personnel Costs Subtotal		**B**
Operating Costs		
Operating Supplies (chemicals, PPE, sampling equipment, etc.)		
Maintenance and Repair Costs		
Contracted Services (accounting, legal, engineering, etc.)		
Water Purchases		
Office Supplies		
Electricity		
Laboratory and Testing Fees		
Training and Professional License Fees		
Vehicles (purchases, insurance, fuel, maintenance, registration, etc.)		
Building Operations (phone, internet, insurance, etc.)		
Additional Small Equipment		
Operating Costs Subtotal (excluding debt service)		**C**
Debt Service		
Principal Payments		
Loan Interest		
Debt Service Subtotal		**D**
Total Costs		**E**

Step 2 – Determining Your Current Revenue

After determining your costs, you need to calculate how much money you collect every year (your annual revenue).

Annual Revenue Worksheet

The Annual Revenue Worksheet includes examples of common water system revenue sources, these should be modified as needed to capture specific sources of revenue at your system. If your system does not track revenue sources in detail you can simply use the subtotal line in each of the two categories to estimate your annual revenues. The Annual Revenue Worksheet will help account for your annual revenue and includes detailed instructions for determining:

1. Your system's annual revenue **generated by water rates.**
2. Revenue generated from **interest earned**, **connection fees, water testing fees, late payment penalties, property leases, services to other utilities,** and **any other sources of revenue** related to system holdings or operations.
3. Any **additional revenue** related to **subsidy** and **transfer payments**.

Two copies of the worksheet are provided. The first worksheet is a completed example. The second copy includes instructions on how to complete the worksheet.

Note that this worksheet contains simplified categories and you may need to complete additional calculations before arriving at the values entered into this worksheet. For example, you may need to add up each individual customer payment on a separate worksheet or spreadsheet in order to enter the total amount under "Water Sales". Keep a record of any additional calculations made in the same place as you keep these worksheets

Explanation of Example Annual Revenue Worksheet

After completing the **Annual Costs Worksheet**, the water system manager completes the **Annual Revenue Worksheet** to get an accurate picture of the money the system will likely spend in the upcoming year versus the amount of money it will take in. When accounting for annual revenue, the manager includes the additional revenue, including revenue from a grant and transfer payment the system expects to receive to complete a capital improvement project. Note that in the example worksheet almost all revenue (97 percent) comes from water sales.

Looking at the total costs identified in the **Annual Costs Worksheet** ($235,054) and the subtotal of operating revenue and interest listed in the **Annual Revenue Worksheet** ($228,024), it appears that this water system's costs and revenues are fairly even (taking into account the total additional revenues). However, this worksheet does not account for the money that the system will need to set aside every year to maintain an adequate emergency fund or to obtain financing for major capital improvements that are part of the system's long-term asset management plan. By calculating how much money the system should contribute annually to a reserve fund in Step 3, the system manager will have a much better picture of the system's financial situation.

Example **Annual Revenue Worksheet**		
Date Worksheet Completed/Updated: *6/19/2021*		**A**
Operating Revenue and Interest		
Water Sales	*$221,465*	
Connection Charges	*$2,140*	
Water Testing Services	*$1,368*	
Penalty Fees (late payment, reconnection, etc.)	*$873*	
Account Interest	*$967*	
Property Leases	*$500*	
Other	*$711*	
Operating Revenue and Interest Subtotal	*$228,024*	**B**
Additional Revenue (Subsidies)		
Grants	*$1,824*	
Transfer Payments	*$4,000*	
Other	*$432*	
Subtotal Additional Revenue (Subsidies)	*$6,256*	**C**
Total Annual Revenue	*$234,280*	**D**

Using the Annual Revenue Worksheet

This section presents instructions for completing the Annual Revenue Worksheet. Each step presented here corresponds to a numbered section of the sample worksheet on page 20.

Step 1: **Date (Line A)**. Circle whether you are completing or updating the worksheet and fill in the date. You should update this worksheet annually.

Step 2: **Operating Revenue and Interest.** Fill in your revenue in the lines provided. If your system has other sources of revenue not listed on the worksheet, enter them on the blank lines provided. Do not include funding you expect but have not yet secured.

Step 3: **Subtotal Operating Revenue and Interest (Line B).** Calculate your total operating revenue and interest by adding all the operating revenue and interest you listed in the previous step. Enter this number in the box marked "Subtotal Operating Revenue and Interest."

Step 4: **Additional Revenue (Subsidies).** Fill in additional revenues on the lines provided. This category should include subsidies such as any grants to support day-to-day operation of the system, transfer payments, or other subsidies you receive that are used to support day-to-day operation of the system.

Step 5: **Subtotal of Additional Revenue (Subsidies) (Line C)**. Calculate your total additional revenue by adding all the additional revenue (subsidies) you listed in the previous step. Enter this number in the box marked "Subtotal Additional Revenue (Subsidies)."

Step 6: **Total Annual Revenue (Line D).** Calculate your total annual revenue by adding the operating revenue and interest you listed on **Line B** to the additional revenue (subsidies) you listed on **Line C**. Enter this number in the box marked "Total Annual Revenue."

Annual Revenue Worksheet		
Date Worksheet Completed/Updated:		**A**
Operating Revenue and Interest		
Water Sales		
Connection Charges		
Water Testing Services		
Penalty Fees (late payment, reconnection, etc.)		
Account Interest		
Property Leases		
Operating Revenue and Interest Subtotal		**B**
Additional Revenue (Subsidies)		
Grants		
Transfer Payments		
Subtotal Additional Revenue (Subsidies)		**C**
Total Annual Revenue		**D**

Step 3 – Setting Aside a Reserve

Having enough revenue to cover your operational and personnel costs is the first step in ensuring that you can consistently provide high-quality drinking water. Three more critical components to providing safe drinking water are taking care of your facilities and equipment, having financial resources to continue providing services when emergency repairs are needed or an unexpected revenue shortfall occurs, and planning for any major capital improvements identified in your asset management plan.

You should set aside money every year above and beyond what is needed to cover your system's typical day-to-day costs. This should include:

- Money set aside in an emergency fund that could cover unexpected revenue shortfalls or emergency repairs.
- An account based on your system's asset management plan that can be used to either pay for major infrastructure improvements (outside of annual repair and replacement) or to obtain financing for such improvements. Keep in mind that funding set aside in your reserve for infrastructure improvements will be in addition to any asset depreciation you've already accounted for as part of your operating costs.

Asset Depreciation

The loss in value of infrastructure assets over time is called depreciation. Some water systems include depreciation in their budget as a cost of operation. Depreciation can be a useful budgeting tool when determining the annual contribution to your reserve fund. Additional information on calculating depreciation is available in Appendix B.

The amount that you need to save must be factored into your system's rates because these expenses are part of the overall cost of providing service. If you do not already have a reserve account, consider establishing one as soon as possible; having a reserve account is critical to developing financial capacity.

To establish and properly fund a reserve account you will need to establish your asset rehabilitation and maintenance priorities and determine the funding required for these improvements. Asset management will be an important tool to help you do this. Asset management can be a lengthy process, but as a result of working through the components of the asset management process you

will identify and record important information that will help you determine how much you should set aside in a reserve fund each year:

1. **Develop an inventory** of all of your assets by listing them and collecting information on the condition, age, service history, and useful life of each one. Capital assets are the physical components of a water system such as pipes, valves, tanks, pumps, wells, hydrants, meters, vehicles, buildings, and treatment facilities. When developing an asset inventory, it's important to consider both the system's "visible" assets that are above ground as well as the "invisible" or "buried" assets that are located below ground.
2. **Prioritize your assets** to help you decide how best to allocate your limited resources. Priority should be based on the asset's importance to the operation of your system and the protection of public health. Other factors to consider include how soon you will have to replace the asset (its remaining useful life) and whether other pieces of equipment can do the same job (its redundancy).
3. Determine the costs of asset rehabilitation and replacement.
4. Decide what **percentage** of these costs you will cover with cash (i.e., money you set aside in the reserve account). You may want to start by applying for grant funds and then determining what percentage of your costs can be covered by cash versus debt. In some cases, it may make more financial sense to borrow money to cover the cost of the project. If you decide to take out a loan, you will need to consider how much cash you will need to put down to secure the capital and what the future increase to your debt service will be.
5. **Review and revise your plan.** Your asset management plan should be used to help you shape your system's operations, investments and long-term capital improvement projects. It should evolve to capture updated information about your system, your customer base, and your system priorities.

This process will help you determine how much money you need to implement your asset management plan and to maintain your system's emergency fund as well as communicate to your customers what your reserve fund will be used for. This is a very brief description of the process, and additional resources are available to help you create and implement an asset management plan and

determine how much you need to save in your reserve fund every year. If you do not already have a reserve account in place, creating one is a good first step towards helping your system cover the costs of expensive capital improvement projects, pay for any additional debt service the system may incur, and to be prepared for emergency repairs or unexpected shortfalls in revenue.

There are other resources available to help you develop an asset management plan. EPA's *Asset Management: A Handbook for Small Water Systems* will guide you through inventorying and prioritizing your assets using a series of worksheets and examples. For more information on long-term planning, you also can consult EPA's *Strategic Planning: A Handbook for Small Water Systems*.

Determining Your Required Reserve: An Example

A water system manager completes an asset management plan, using *Asset Management: A Handbook for Small Water Systems*. The water system manager prioritizes the system's assets and determines what rehabilitation and replacement projects will be necessary during the next five years. The manager also determines what large longer-term capital improvement projects the system needs to start saving for now. Using engineering reports and historical cost data, the manager estimates the total cost of the capital improvements required. The manager then determines how much cash the water system will use to make these improvements and the amount the water system will need to borrow. For this example, the manager determines the water system must contribute $87,400 to a reserve fund in the first year to implement its plan. The water system manager completes their asset management plan each additional year and adjusts the annual reserve contribution to account for changing priorities and water system needs. The system manager will use the first year’s reserve contribution in the calculation of the annual revenue that must be recovered from customers in Step 4: Determining Actual Revenue Required from Your Customers.

Step 4 – Determining Revenue Required from Your Customers

Now that you have a better sense of what your costs and revenues will be, including how much money you will need to put in your reserve account over the next few years, you are ready to determine the total revenue that you will need to collect from customers each year. To cover the full cost of doing business (i.e., to meet the goals of full-cost pricing), the amount of revenue that you receive from your customers should equal your total annual costs including your annual reserve contribution minus any subsidies or transfer payments you receive.

You will need to calculate your required revenue annually, taking into account your budget for the upcoming year. In addition, you will need to think beyond your needs for the next year.

Variable costs, changes in subsidies, debt service costs, and other factors can affect your required revenue from year to year. Estimating costs for the next several years based on your fixed costs, operating expenses, asset rehabilitation and repair needs, and existing grants or loans can help avoid a significant gap between revenue and costs. Cost estimates for future years should also consider inflation and increases in costs to do business over time that may exceed the rate of inflation, such as increasing wages, increasing cost of insurance, and increasing cost of construction materials, treatment chemicals and replacement components. The Department of Labor's Consumer Price Index for all urban consumers (CPI-U) or the Department of Commerce's Gross Domestic Product Price Index (GDP Price Index) are both good measures of general inflation. Once you have a better idea of actual costs for future years, you can revise your estimates accordingly.

The next worksheet will help you with short-term planning. Use the worksheet to calculate your revenue requirements for the upcoming year and to estimate how much revenue you need to generate over the next five years.

Short-term Revenue Required from Your Customers Worksheet

The Short-term Revenue Required from Your Customers Worksheet will help you calculate how much revenue you need to generate every year from customer charges. This activity will take into account the annual costs and revenues that you calculated in the Annual Costs Worksheet and the Annual Revenue Worksheet and the amount you need to reserve every year in an emergency fund or to pay for or obtain financing for major capital improvement projects as determined in Step 3.

Financial planning is an important step in avoiding large revenue shortfalls. Knowing what your costs and revenues will be over the next several years will help you decide now whether you will be able to recover your costs through customer charges, whether rate increases will be necessary to cover costs over the next few years, how your surplus or deficit will change over time, and whether you will need to consider restructuring your system, as described later in this guide.

The Short–term Revenue Required from Your Customers Worksheet will help you develop a detailed estimate of your costs and revenue for the next five years. This, in turn, will help you understand the need for, and effect of rate increases over the next few years as you work towards recovering costs through water rates. This worksheet displays information for the current year and can be used to develop long-term estimates as well.

Long-term planning is another important step to ensuring the financial health of your system. Estimating your costs for the next 15 to 20 years will help you identify future large capital improvement projects that you should start saving for now. You may want to use a worksheet similar to the Short–term Revenue Required from Your Customers Worksheet to evaluate your long-term revenue needs. You can estimate your operating costs, reserve contribution requirements, revenue needs, and surplus or shortfall for five-year increments rather than each year.

EPA's *Strategic Planning: A Handbook for Small Water Systems* (EPA 816-R-03-015) is a good source of information that will guide you through the long-term planning process using worksheets and examples.

Two copies of the worksheet are provided. The first worksheet is a completed example. The second copy includes instructions on how to complete the worksheet.

Explanation of Example Short-term Revenue Required from Your Customers Worksheet

After factoring in the amount, the system needs to put into its reserve account in the first year ($87,400), the system manager determines that the system's actual revenue will not be enough to cover its costs. The manager has to decide how the system will begin to cover those costs. The manager also needs to estimate costs and revenue for the upcoming years to determine whether this problem will continue and to determine whether it is possible to increase customer charges at a reasonable rate to eliminate this shortfall. To do this the system manager:

- Inputs the **system's annual cost (Line C)** ($235,054) as determined on **Page 12 (Line E)**.
- Inputs the **annual costs to the system's reserve fund contribution (Line D)** ($87,400) as stated in the example on Page 23.
- Sums the **total annual cost of business (Line E)** using **Line C** and **Line D**.
- Inputs **additional revenue (subsidies) (Line F)** ($6,256) as calculated on **Page 18 (Line C)**.
- Calculates the **total annual revenue needed (Line G)** by subtracting **additional revenue (subsidies) (Line F)** from **total annual cost of business (Line E).** This is to estimate the amount of money the system needs to cover its costs in the first year is ($316,198). The manager will use this amount to determine its rates.

Looking out a few years the manager realizes that despite a fairly small deficit in the first year, the system's failure to recover costs could become a much bigger problem as early as five years from now. Using information from the system's asset management plan and information the system has collected regarding water use and customer base, the system's operating costs are expected to increase every year, and the amount the system needs to contribute to the reserve fund will increase. The manager realizes that, to minimize the growing deficit while avoiding customer rate shock, the system must evaluate ways to maximize efficiency and reduce operating costs, consider implementing annual rate reviews to assess rate increases and consider changing the way customers are charged.

Example **Short-term Revenue Required from Your Customers Worksheet**						
Date Worksheet Completed/Updated: *6/29/2020*						**A**
	Year: *2020*	**Year:** *2021*	**Year:** *2022*	**Year:** *2023*	**Year:** *2024*	**B**
Annual Costs:	*$235,054*	*$258,555*	*$284,250*	*$312,000*	*$342,850*	**C**
Annual Reserve Fund Contribution:	*$87,400*	*$89,350*	*$83,300*	*$85,670*	*$82,670*	**D**
Total Annual Cost of Business:	*$322,454*	*$347,905*	*$367,550*	*$397,670*	*$425,520*	**E**
Additional Revenue (Subsidies):	*$6,256*	*$8,100*	*$7,900*	*$8,000*	*$8,600*	**F**
Total Annual Revenue Needed: Total Annual Cost of Business – Total Additional Revenue	*$316,198*	*$339,805*	*$359,650*	*$389,670*	*$416,920*	**G**
Projected Revenue:	*$228,024*	*$230,500*	*$235,820*	*$239,600*	*$245,200*	**H**
Revenue Surplus or (Deficit):	*($88,174)*	*($109,305)*	*($123,830)*	*($150,070)*	*($171,720)*	**I**
% Revenue Surplus or (Deficit): (as a % of current annual revenues)	*(39%)*	*(47%)*	*(53%)*	*(63%)*	*(70%)*	**J**
Cumulative Surplus/(Deficit):	*($88,174)*	*($197,479)*	*($321,309)*	*($471,379)*	*($643,099)*	**K**

Using the Short-term Revenue Required from Your Customers Worksheet

This section presents instructions for completing the Revenue Required from Your Customers Worksheet. Each step presented here corresponds to a numbered section of the sample worksheet on Page 29.

Step 1: **Date (Line A).** Circle whether you are completing or updating the worksheet and fill in the date. You should update this worksheet annually.

Step 2: **Year(s) (Line B).** Enter the year(s) for which you are calculating your estimates.

Step 3: **Total Annual Costs (Line C).** Enter your estimated total costs per year for the first five years starting with the total costs you determined in the **Annual Costs Worksheet**. For the next four years consider total annual costs from previous years and adjust them, taking into account any information you have on debt payments as well as inflation and additional increases to the cost of doing business over time.

Step 4: **Total Annual Reserve Fund Contribution (Line D).** Enter the total annual required reserve amount. Use the Asset Management Step Guide to calculate your reserve fund needs.

Step 5: **Annual Costs and Reserve Fund Contribution (Line E).** Add the amount entered on **Line C** (total annual costs) to the amount entered on **Line D** (required annual reserves) and enter the total.

Step 6: **Total Additional Revenue (subsidies) (Line F).** Enter the total additional revenue (subsidies) amount calculated on **Line C** of the **Annual Revenue Worksheet** (grants plus transfer payments).

Step 7: **Total Revenue Needed (Line G).** Subtract the total additional revenue entered on **Line F** from the sum of your costs and reserve fund contribution calculated on **Line E**. This is the estimated amount of money that your system must generate to cover its costs for each year.

Step 8: **Projected Revenue (Line H).** Enter the amount you anticipate your system will take in from customer charges each year based on the operating and interest subtotal amount calculated on **Line B** of the **Annual Revenue Worksheet**.

Step 9: **Funding Deficit or Surplus (Line I).** Subtract the number on **Line G** from the number on **Line H** and enter the result. If the result is zero or greater, you are taking in enough money to fully recover your costs (and possibly more). If the result is a negative number, you will not recover all your costs and should re-evaluate your rates based on this. Note that in an accounting ledger a deficit or negative value is signified by parentheses around the number.

Step 10: **% Revenue Surplus or Deficit (Line J).** Divide the revenue or surplus on **Line I** by the projected annual revenue on **Line H**.

Step 11: **Cumulative Surplus/Deficit (Line K).** Sum the surplus or deficit from each of the previous years.

Short-term Revenue Required from Your Customers Worksheet						
Date Worksheet Completed/Updated:						**A**
	Year:	**Year:**	**Year:**	**Year:**	**Year:**	**B**
Annual Costs:						**C**
Annual Reserve Fund Contribution:						**D**
Total Annual Cost of Business:						**E**
Additional Revenue (Subsidies):						**F**
Total Annual Revenue Needed: Total Annual Cost of Business – Total Additional Revenue						**G**
Projected Revenue:						**H**
Revenue Surplus or (Deficit):						**I**
% Revenue Surplus or (Deficit): (as a % of current annual revenues)	0%	0%	0%	0%	0%	**J**
Cumulative Surplus/(Deficit):						**K**

What if My System's Costs Exceed Its Revenue?

After determining whether you have a deficit or a surplus, you may need to re-evaluate how your system is operated and how you are generating revenue. If the actual revenue exceeds the amount needed to cover all costs, you are in good financial shape. This surplus may be due to fluctuations in demand and may disappear in future years; however, if you have a substantial surplus that continues to grow over time, you may want to review the amount you are setting aside in your reserve fund for future capital projects and the depreciation calculations you are using. While your system may face a shortfall or surplus in any given year, your revenue requirement should be met over the longer-term. If your actual revenue is consistently below the amount required to cover all costs, you may need to consider options for reducing the gap between actual and required revenue.

Some options are:

- Reducing operating costs.
- Increasing customer's water rates.
- Refinancing debt to reduce debt service payments.
- Finding additional sources of revenue such as grants or implementing fees for system services.
- Establishing a water system partnership with one or more systems to increase purchasing power and to share knowledge and technical expertise.
- Restructuring, which includes such options as purchasing water from another system rather than pumping and treating from your own source, consolidating your operations with a nearby water system, or contracting the operation and maintenance of your water system to another party in order to obtain increased operational efficiency and possibly reduce costs.

If the Total Annual Cost you calculate is twice or more your current Annual Revenue, you should contact your state, territory or tribal coordinator to discuss your restructuring options; it is unlikely that you could eliminate the deficit through customer charges alone.

Accounting for Subsidies

Many systems receive subsidies that lower the costs faced by their customers. For example, your system may receive an explicit transfer from your local municipality or a grant from the federal, state, territorial, tribal, or local government to help finance your operations. Or, your system may not pay the full cost of some of the goods and services it uses or may pay interest rates on loans that are less than the rates charged in private markets. These subsidies will reduce the amount of revenue you must generate through rates and fees. Subsidies received as transfers or grants should be included as a line item in your Annual Revenue Worksheet. Subsidies in the form of reduced costs should accounted for in your Annual Costs Worksheet. (Be sure subsidies are included only on one worksheet to avoid double counting.)

Your annual deficit would be larger (or your annual surplus would be smaller) if you did not receive these subsidies. However, these subsidies should be used as a way to achieve financial stability, not as a permanent solution for revenue short-falls.

Step 5 - Designing a Rate to Cover Your Costs

Now that you know your costs and the amount of money you need to collect from your customers to fully cover those costs, Steps 5 through 7 will help you start thinking about *how* you're going to collect this money. One way is through water rates.

Considerations for Choosing a Rate Structure

Water rates can be structured in several different ways and there are a number of things to consider, in addition to recovering costs, when selecting the best rate structure for your system and your customers.

To determine which structure is best for your water system, you should evaluate the characteristics of your system, its customer base, and your options for maintaining the predictability of rates and any rate increases. In addition to recovering all your costs, you should consider:

- **Rate Stability.** The total annual cost of business is always increasing. In order to maintain full cost pricing, rates will have to increase as well. Customers may be more likely to accept and pay rate increases if the increase is introduced gradually. Maintaining the same rate for many years, then suddenly increasing it by 10 percent or more, can lead to affordability issues, "rate shock," and opposition to the increase. In terms of customer perception and response, it is often far better to increase rates by 2 percent per year for 5 years than 10 percent once every 5 years.
- **Revenue Predictability.** As the manager of a small water system, you need to know how much revenue you expect to take in next year and in the years to come. However, predicting revenue can be difficult, as water use can vary from year to year. Water use can change significantly due to weather patterns, economic conditions or abrupt changes in customer base. It is important to generate and keep sufficient reserves in the event that your system experiences a short-term decrease in revenue.
- **Customer Classes.** Some systems may serve only residential customers while others also serve industrial, commercial, or agricultural customers. Residential, industrial, commercial, and agricultural customers may have very different patterns of water use. The cost of servicing these customers may be different as well. You will likely want to use different rates and rate

structures for different classes of customers in order to meet their specific needs and your goals, such as meeting revenue requirements, encouraging water conservation or ensuring affordability. In lieu of customer classes, some systems will charge different base rates and/or volumetric rates based on the meter size.

- **Billing Period.** Systems have discretion in deciding how often to bill your customers—monthly, bi-monthly, quarterly, or less frequently. Monthly billing provides the advantage of a steady stream of revenue for the system. Customers are generally better able to pay smaller and more frequent bills, and monthly billing allows customers to adapt more quickly to changes in water usage or to identify unexpected charges which could be due to a water leak or billing issue. However, monthly billing is more expensive than less frequent billing—more meter reads, more bills to mail, and more payments to process. Some systems that bill less frequently than monthly will divide their customers into groups, so a portion of the bill payments are still received each month.

Additional Pricing Objectives

Affordability and conservation don't always fit neatly into full cost pricing calculations, but they are often priorities for water systems and primacy agencies. The effect of affordability and conservation measures on system's rate structures can vary greatly among systems. If your system's pricing objectives include affordability and/or conservation it's important to think through the short and long-term impacts to system costs and revenues as well as potential impacts from changes in environmental conditions or customer base.

- **Affordability.** When setting rates, systems must also consider questions of customer equity. If a uniform rate is used within a customer class, low-income residents will spend a larger proportion of their household income on their water bill than high-income households using the same amount of water. Non-residential customers that are low or no-profit entities like schools are usually included in the same customer class as for-profit businesses and may have difficulty affording higher water rates.

  Many systems and states/territories/tribes consider a certain amount of water consumption "non-discretionary" meaning it is required to meet basic health and sanitary needs. Systems may choose to create a program where qualified low-income households or businesses are charged a lower rate on water consumption considered non-discretionary. Some states,

territories and tribes also have grant programs that low-income customers can use to get assistance in paying their water bill. The unique characteristics of each water system mean that there is no single or simple solution to water affordability; however, it's an important issue that not only can lead to improved service to your community, but also reduce delinquent payment rates, the number of accounts going to collections and the amount of customer shut-offs which result in additional costs for both utilities and customers.

- **Conservation.** For some water systems, water is a scarce commodity. Depending on the water resources of your system and on the capacity of your system, you may want to structure rates so that they send a "price signal" to customers that encourages efficient use of water. Examine your customers' water use habits during peak and off-peak seasons and time of day to determine which rate structure might best address your conservation objectives. It's important to consider that if you promote water use efficiency, you will likely see a reduction in water use. This reduction may lead to a shortfall in revenue, requiring a rate increase. This lack of predictability should not discourage you from experimenting with rate structures that promote a valuable public program (like conservation). Instead, you should incorporate rate stability into your pricing structure, which may include setting a base rate, developing long term demand projections and continually reviewing and updating your rate planning documents and calculations.

Common Rate Structures

Five of the most common types of rate structures are described in detail below: **flat rate or fixed fee, uniform block rate, decreasing block rate, increasing block rate and seasonal rate**[2] Hybrid rates that incorporate both a base rate and a volumetric rate are also possible. For example, a system can have a monthly fixed fee per household, plus a uniform block rate that varies by season. Under each of these rate structures, systems have the flexibility to set different rates for different categories of customers (for example, different rates for residential users and agricultural users) while ensuring the required level of revenue is collected for the system to provide safe drinking water.

Flat Rate/Fixed Fee Rate Structure

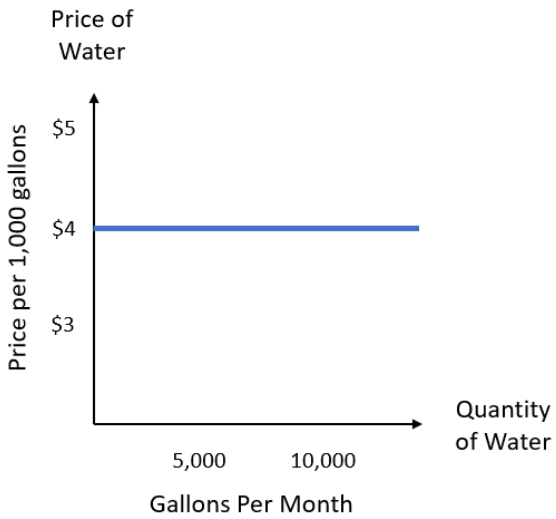
Under this rate structure, your customers pay the same amount regardless of how much water they use. A flat rate/fixed fee structure may make sense for very small water systems whose customers all use about the same amount of water. The simplicity of this rate structure may save your system the time and money required to conduct routine meter readings and calculate consumption-based bills for each of your customers.

However, in times where water use is higher than average, your system will not be generating the additional revenue needed to keep up with higher demand (e.g., additional treatment costs). In addition, this rate structure offers no incentive for customers to conserve water. Also, keep in mind that frequently monitoring water usage is an important aspect of system capacity and often increases system efficiency through leak detection.

[2] Information provided on the rate structures below draws from: Janice A. Beecher, Ph.D. and Patrick C. Mann, Ph.D., with John D. Stanford, J.D., *Meeting Water Utility Revenue Requirements: Financing and Ratemaking Alternatives*, The National Regulatory Research Institute, Columbus, OH, November 1993.

Uniform Block Rate Structure

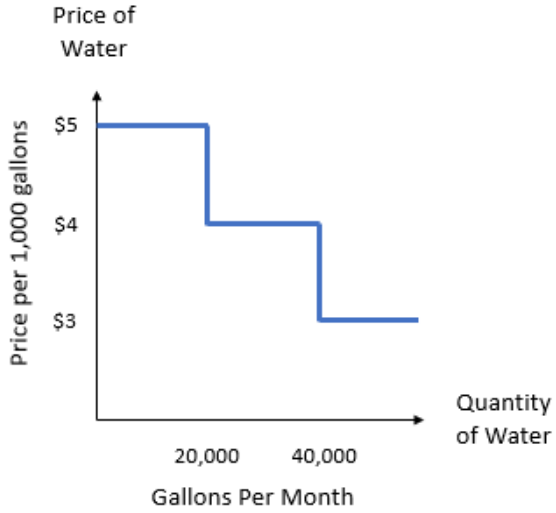
The uniform block rate structure is based on customers' water consumption and requires meters. Under this structure, customers are charged a uniform rate per unit of water (e.g., gallon, hundred cubic feet) regardless of the amount of water used. This rate structure often includes a fixed service charge or "base rate" that represents the minimum amount the system needs to recoup to cover the cost of providing service. Setting the base rate ensures revenue stability for your system in times of reduced water usage. Uniform block rate structures are most appropriate for systems whose customers have similar water use patterns.



If priced appropriately, this rate structure can guarantee a stable revenue stream for your system and can help encourage conservation because the average cost of water does not decline as use increases as it does with fixed fees or decreasing block rates, discussed below. It is fairly easy to implement in comparison to other rate structures and is easy for customers to understand.

Decreasing Block Rate Structure

Under this rate structure, customers are charged lower rates per unit of water for successive blocks (fixed quantities). As with uniform rates, systems may charge a fixed fee in addition to the decreasing block rates. A decreasing block rate structure may function similarly to a fixed fee rate structure for most residential customers if the first block is set high enough that few residential customers reach that level of water consumption.



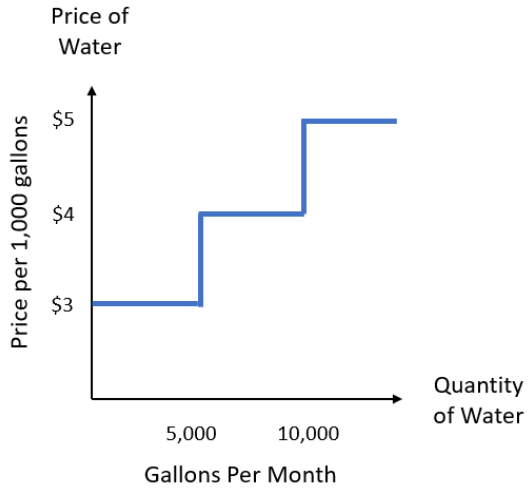
This rate structure provides discounts to industrial or commercial customers who use large amounts of water. However, this rate structure can be difficult to implement and offers little incentive for customers to conserve water. In addition, it may result in insufficient revenue

for the system if demand is unexpectedly high or an unanticipated future need arises. A system must also have meters in place in order to implement this rate structure.

Increasing Block Rate Structure

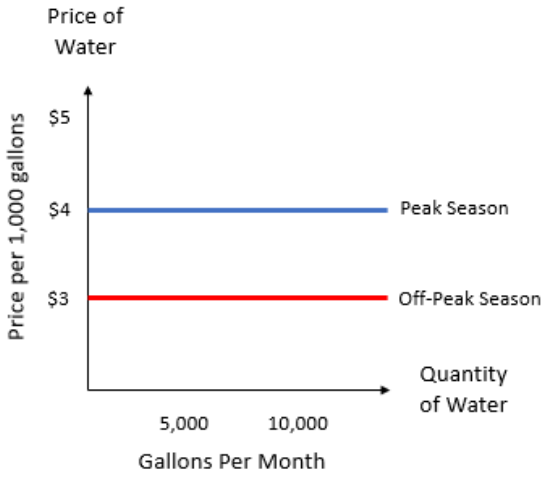
Under this rate structure, customers are charged higher rates per unit of water for successive blocks (fixed quantities). Systems may charge a fixed fee in addition to the increasing block rates or set the first block high enough that it results in a predictable level of revenue for your system that is not sensitive to moderate changes in water usage.

If priced appropriately, this rate structure can send a strong signal to customers about the value of the service you are providing and offers incentive for customers to conserve water. The reduction in water use that conservation brings can ease strains on system infrastructure, potentially postponing or eliminating the need for expensive upgrades or new equipment. This rate structure's emphasis on conservation is also beneficial for systems with a limited water source, limited water rights, or high treatment costs. The increasing block rate structure does require meters that must be read promptly each billing period. It is also important to consider that large or multi-generational families living in a single household may be harmed by increasing block rates: while their per-capita water consumption may be no more than most other customers, the total number of people in the household may push their usage into higher and more expensive blocks. Water systems could consider using budget-based increasing block rates. Under this approach, each household receives a tailored rate structure, where the price for each block is the same as it is for other customers, but the number of gallons included in each block is based on the number of people in each household.



Seasonal Rate Structure

Changes in water use patterns from season to season due to changes in weather occur at most systems and some systems see extreme fluctuations of usage if they serve a significant number of seasonal customers. These systems may want to consider implementing a seasonal rate structure. Under this rate structure, you would charge higher rates to customers during peak season. A seasonal rate structure is vulnerable to changes in utility revenue due to environmental conditions. If implementing a seasonal rate structure your system may want to consider a base charge that remains constant throughout the year to ensure revenues don't drop below the threshold critical to maintain system operations and level of service.



A seasonal rate structure is not appropriate for all systems that experience seasonal fluctuations in water use. Consider this rate structure if: increases in usage occur over the same time period every year, the variation in usage between seasons is significant, and your system's capacity is determined by demand during peak season.

Systems can apply one of two forms of seasonal rate structure. The first option is to set one rate for the off-peak season and one for the peak season (these rates can be uniform or increasing or decreasing block rates). The second option is to set one rate (uniform or increasing block rate) and apply excess usage charges (i.e., charge for water use in excess of that used on average during off-peak times) during peak season. In this second option, customers' rates increase in the peak season only if their use is higher than during the off-peak season.

Seasonal rates can encourage conservation, reducing peak use and therefore limiting the need to expand system capacity (as maximum capacity is determined by peak use rates). In addition, for systems in areas with a significant seasonal population, customers using water during off-peak months would not be required to shoulder the full burden of recovering system costs incurred primarily during peak season.

Setting seasonal rates may require you to increase the frequency with which meters are read, as you will need to assess average usage at the beginning and end of peak and off-peak periods and intermittently throughout each period to fairly distribute costs among peak and off-peak season customers.

Estimating the Amount of Water Used by Customers

Now that you have reviewed some of the other rate considerations and common rate structures, you need one final piece of information to set your rates. Most water rates include a charge per unit of water (except a flat rate/fixed fee). Therefore, unless you use a flat rate or fixed fee, information on water usage is necessary to set rates.

This information will also help you allocate costs, which will be important if you plan to use a different set of rates for each customer class. For example, if residential customers use three-quarters of the water sold by your system, you may want to collect three-quarters of your revenue from residential customers. Or if you have seasonal variation in use, you may want to allocate costs between peak and off-peak seasons.

All of the water your system draws from its sources may not be delivered to paying customers. For example, your system may not charge customers for all of the water it delivers. A common example of uncompensated usage is water provided to municipalities for firefighting. Your system also may consume some of its water during treatment. A system that filters its water, for example, may use some water to backwash its filters. Finally, your system may have water losses – real losses, due to leaks in the distribution network or elsewhere, and apparent losses due to faulty customer meters. Water meters that monitor withdrawals from the source and meters that monitor water delivered to the customer can help you identify and address that water loss. Remember that rates are calculated using the full cost of producing, treating, storing and delivering water. Therefore, it is important to have good estimates of the amount of water used by your customers in order to ensure that all of these costs are divided fairly among customers.

The best source of information to determine the amount of water used by your customers is your billing data. Most water systems measure the amount of water used each month. If your system does not have meters in place, you may need to estimate the amount of water used by your customers. If you have more than one class of customer, you should determine the amount of water

used by each class. (If the volume of water used by customers in each customer class is similar, you may want to determine the total water use for all customers.)

In addition, you may choose to divide your customer classes into categories based on the amount of water they use. For example, you may want to determine the number of customers and volume of water delivered to residential customers using up to 1,000 gallons each month, 1,001–2,000 gallons, 2,001–3,000 gallons, and so on. But if you find that average usage does not vary across customers, you may not need to make these distinctions.

Average Monthly Usage Worksheet

The Average Monthly Usage Worksheet will help you summarize water usage. You first determine the number of service connections served by your system in each customer class and then determine the total amount of water used by these connections in a typical month. If you have seasonal variation in usage, you may want to divide use into peak and off-peak seasons. You can fill out a separate worksheet for each customer class if use varies by class. If usage is similar across customer classes, you can fill out one worksheet for all your customers.

The worksheet lets you divide your customers into categories based on the amount of water they use. The number of categories you use and the cut-offs for each category is up to you and will depend on the type of rate structure you wish to implement and the objectives you hope to achieve with your rates. If you choose to divide your customer classes into more than one category, use billing records or meter books to determine the number of customer service connections that fall into each category and the total volume used by customers in each category. If you do not have exact information on water usage, use estimates. In addition to summarizing water usage, dividing your customers into categories can serve as the basis of your increasing or decreasing block rate structure, if you choose to implement those rate types.

Explanation of Example Average Monthly Usage Worksheet

To better understand a system's customer base, the water system's manager uses information from billing records covering the past two years and categorizes residential customers according to their average usage habits. The manager divides the system's residential customers into usage categories. The manager considers implementing an increasing block rate with two blocks. The manager sets the first block of usage between 0 and 9,000 gallons per month, and the second block at more than 9,000 gallons per month. The manager determines the total number of residential customer service connections that use no more than 9,000 gallons of water each month and the total amount of water used by these customers. The manager then determines the number of customer service connections that use more than 9,000 gallons per month and the total amount of water used by these customers. There is space for 4 different blocks provided on the worksheet, although only two are used in the example. If the manager wants to use more than 4 blocks, additional rows can be added to the worksheet. The manager fills out a similar worksheet for the system's non-residential customers.

Example **Average Monthly Usage Worksheet**	
Date Worksheet Completed/Updated:	*6/17/2021*
Customer Class:	*Single Family Residential*
Unit of measure of monthly usage:	*Gallon*

Water Usage per Month per Customer	Number of Service Connections	Subtotal Usage per Month
0-9,000	*905*	*6,516,000*
>9,000	*225*	*2,475,000*
Total	*1,130*	*8,991,000*

Using the Average Monthly Usage Worksheet

This section presents instructions for completing the Average Monthly Usage Worksheet. Each step presented here corresponds to a numbered section of the sample worksheet on page 44.

Step 1: **Date (Line A).** Circle whether you are completing or updating the worksheet and fill in the date. You should update this worksheet annually.

Step 2: **Customer Class (Line B).** If you have a single customer class, enter the customer class on the line. If you have more than one customer class, you may want to complete one worksheet for each customer class. If you plan to charge all customers the same rate, you can enter the total number of customers and their water usage in one table.

Step 3: **Monthly Usage (Line C).** Enter the units in which you measure water volume (e.g., gallons, cubic feet, acre feet).

Step 4: **Water Usage Block (Lines D, E, F, first column).** Divide the number of customers and the amount of water used into blocks as discussed on page 39. If you plan to use a uniform rate, you can use only one block (i.e., put the total number of customer connections and the total amount of water used by these customers on a single line). If you plan to use an increasing or decreasing block rate, you will need several blocks. Enter the cut-offs for the blocks on the lines provided. You should add rows to the table if you want to use more than four blocks.

Step 5: **Service Connections (Lines D, E, F, second column).** Enter the total number of service connections that your water system serves for each block of water.

Step 6: **Total Volume of Water Used (Line D, E, F, third column).** Using billing records, meter records, or your estimates, enter the total usage for each block. If you plan to use seasonal rates, you should distinguish between peak and off-peak usage.

Step 7: **Total Number of Service Connections (Line G).** Add the total number of service connections for each block of customers you listed in Step 5. Enter the total on this line.

Step 8: **Total Amount of Water Used (Line G, third column)**. Add the total amount of water used for each block of customers you listed in Step 6. Enter the total on this line.

Average Monthly Usage Worksheet			
Date Worksheet Completed/Updated:			**A**
Customer Class:			**B**
Unit of measure of monthly usage:			**C**
Water Usage per Month per Customer	**Number of Service Connections**	**Subtotal Usage per Month**	
			D
			E
			F
Total			**G**

Base and Volumetric Rates

Just as your water system has fixed and variable costs, you can set fixed or “base” and variable or “volumetric” rates. A base rate is an amount that your system charges each customer every billing period, regardless of how much water the customer uses. Base rates guarantee stable, predictable revenue and can be used to cover your system’s fixed costs and is similar to a flat fee rate structure. A volumetric rate is based on customer usage, which is determined by routine meter readings. As discussed previously, volumetric rates such as increasing or decreasing block rates can be a good way to encourage water conservation or provide favorable pricing for industrial or commercial customers.

If your revenue becomes too unpredictable, one could place somewhat more reliance on base rates. You would still be sending a price signal to customers through variable rates, but base rates could help preserve some predictability in revenue from year to year.

Investing in collecting and analyzing your meter data will give you a much more accurate picture of how usage varies among customers, how usage varies seasonally, and whether your efforts to encourage conservation have been successful. Meter data can also help you identify any structural problems within the system. This information can help you more accurately predict future costs and, therefore, set rates that are designed to recover your costs.

Rate structures that put more emphasis on the base charge and less on the volumetric charge are more stable but may reduce affordability and water efficiency. Conversely, rate structures that put more emphasis on the volumetric charge and less on the base charge give customers more control over their bills and may encourage conservation, but revenues will be more volatile for the system.

Setting Your Rate

Now that you have organized your usage data, you can use the data to set rates. There are many ways to set rates; the option you choose should reflect the considerations discussed at the beginning of this step. The basic steps are the same for each approach: the revenue requirement is allocated to customers and then divided by the volume of water used by those customers. In practice, the calculations can involve many steps and can be complex. Fortunately, there are many resources available to help systems calculate rates for many different rate designs. **(Appendix A** provides information about some of these resources.)

The following examples demonstrates two possible approaches for setting water rates. They both use data from the previous example worksheets and assume that the system serves only residential customers.

- Using data from the **Average Monthly Usage Example** worksheet (page 42), we see the system serves 1,130 single-family residential customer connections.
- The **Average Monthly Usage Example** worksheet (page 42) shows that total consumption is 8,991,000 gallons per month. **Yearly Consumption** is calculated as: 8,991,000 gallons per month x 12 months = 107,892,000 gallons per year.
- In the **Short-term Revenue Required from Your Customers Example** worksheet (page 27), we see the annual revenue the system must recover from customers is $316,198 in 2020.
- The water rate will be set per thousand gallons of water used. Water usage is reported in gallons and must therefore be divided by 1,000 to convert from gallons to thousands of gallons.

Example 1

In Example 1, the system chooses to recover costs through a uniform block rate because a substantial majority of the system's residential customers use <9,000 gallons of water per month and the uniform block rate structure will simplify the billing process.

To meet the annual revenue requirement with a uniform block rate, the system can use the most basic approach to determining rates by dividing the revenue it will need annually by the volume of water it will sell during the year. Therefore, the uniform rate per thousand gallons that meets the system's revenue requirement is:

$$\text{Uniform Rate} = \frac{\$316{,}198}{107{,}892 \text{ (thousands of gallons)}} = \$2.93 \text{ per thousand gallons}$$

Using a uniform block rate each customer would be charged $2.93 per thousand gallons of water delivered.

Example 2

In Example 2, the system chooses to recover costs through an increasing block rate to encourage water efficiency for water usage over 9,000 gallons per month.

To meet the annual revenue requirement with an increasing block rate, use customer water use data to calculate rates for the first and second blocks. The system can choose what the price increase will be between the first and second blocks. In this example the system decides to set the rate for the first block to keep the household cost for low water users as low as possible, picking $2.75 per thousand gallons. It makes up the rest of the funds needed to meet its revenue requirement by charging a higher rate for the second block. There are many different combinations of price levels for blocks that will generate the annual revenue requirement. Systems may wish to try different combinations of prices to see which combination best supports system goals. Because an increasing block rate will require assessing customer usage on a monthly basis, the revenue requirement in this example is also provided as a monthly requirement: $316,198 annual revenue requirement /12 months = $26,350/month. Therefore, the increasing block rate

that meets the system's monthly revenue requirement is $2.75 for water use in Block 1 (up to 9,000 gallons) and $6.36 for every thousand gallons used after. For the 225 customers who use more than 9,000 gallons per month, the amount of water to charge at the Block 1 rate is simply 9,000 gallons x 225 customers = 2,025,000 gallons. The rest of the water used by that group of customers can be calculated by subtracting this value from the total water used by those customers: 2,475,000 gallons – 2,025,000 gallons = 450,000 gallons to charge at the Block 2 rate.

Category	Customers	Total	Block 1 Water Use ≤9,000 gallons/month	Block 2 Water Use >9,000 gallons/month	Monthly Revenue
≤9,000 gal	905	6,516,000	6,516,000	0	$17,919
>9,000 gal	225	2,475,000	2,025,000	450,000	$8,431
Total	**1,130**	**8,991,000**	**8,541,000**	**450,000**	**$26,350**
Rate per 1,000 gallons			**$2.75**	**$6.36**	

Once you've determined which rate structure to use and the rate has been calculated, it's time to consider how to implement the rate; Step 6 will help you with this process. For further details on calculating more complex rate structures, **Appendix A** includes additional sources of information on rate setting, including electronic rate-setting tools.

Step 6 – Implementing the Rate

Once you have decided on a rate structure and appropriate rates, it is important to consider a number of other factors before charging your customers. Your rates may need to be adjusted because of the particular circumstances of your system. Factors to consider include:

- **Public Perception.** Customers should know what the rates are and should understand that they will be paying a fair and equitable share of the cost of providing safe drinking water. If, after calculating the amount you need to receive from customers every year, you determine that a substantial rate increase is necessary, consider preparing outreach materials (e.g., mailings, announcements in local newspapers, fliers) to explain the reason for the rate increase. Make sure your customers understand that your ability to provide safe drinking water depends greatly on having sufficient revenue, most of which comes from customer charges. Keep your customers informed throughout the rate setting process; informed customers are more likely to understand and tolerate rate increases. You might also consider increasing your rates over a number of years or when water use is low to make the rate increase easier on your customers.
- **Regulatory Requirements.** Ensuring your water system has the resources to meet all applicable state, territorial, tribal and federal drinking water regulatory requirements is an important consideration when setting rates.
- **Public Service Agency Requirements.** The state, territory or tribe may require formal approval to institute a rate or to change rates or rate structures.
- **Administration.** The rate structure should be feasible to administer given your system's staffing and capacity. Overly complex structures may increase administrative costs and confuse customers.

Step 7 – Reviewing the Rate

Ideally, you should review your rates, rate structure, and rate setting procedures at least once every year. Annual reviews ensure that your rate is appropriate even if circumstances have changed (e.g., new regulatory requirements, changing customer base), evaluate whether your rate is keeping pace with inflation and increased costs to do business and that you will continue to generate sufficient revenue to cover costs. States, territories, and tribes may require systems to receive formal approval to change rates or rate structures. See the box on the right for more information.

Even if it's not required, you might find it beneficial to submit your rate structure for an independent review. Your state, territory, tribal coordinator or a technical assistance provider might offer programs to help you evaluate your rate structure and set rates. Consider assembling a special review committee, since a review performed by an external party can be more transparent and impartial. Determining who should review the rate is an important part of the process. Persons with management and budget experience are good candidates for the review committee.

Public Service Agencies

Every state has a Public Service Agency (e.g., a Public Utility or Public Service Commission). In some states and territories, these agencies evaluate water system proposals for rate increases. During this process, the agencies can also evaluate the system's financial capacity.

Agencies primarily regulate privately owned systems (particularly investor owned systems). But some states and territories also regulate publicly owned small systems.

If you are regulated by a Public Service Agency, you may receive special assistance during the rate increase evaluation process. Some agencies have established expedited rate review procedures for small systems and understand that you may not have the resources to prepare the type of proposal required of large systems. During the expedited process, agency employees often meet with the system before a formal hearing to discuss the proposal. Some agencies also have simplified forms that can be used by small systems.

To find out if you are regulated by a Public Service Agency or if there are expedited procedures for rate increase approvals, check with your state or territory.

Depending on your system, a review committee could include:

1. Your water system's operator
2. The town clerk
3. A professional from the community (e.g., accountant, lawyer, water system engineer)
4. A member of the council or board
5. Customers
6. The manager of a neighboring system

You Are on Your Way to a Financially Sound Future!

As you have learned, setting sustainable rates is an important part of ensuring your system's financial health. Accounting for all of your system's costs including reserve contributions, and revenues (including grants and subsidies) will help you establish a full-cost pricing structure so you can recover the funds necessary to provide safe drinking water now and in the future. This guide has helped you:

- Determine the full cost of doing business.
- Determine your current **revenues**.
- Consider your **reserve requirements** to ensure you have enough funds to cover costs during the next five years.
- Calculate how much money you need to cover your costs and fully fund your reserve account using **customer charges**.
- Evaluate your options and determine an appropriate rate.
- **Implement** the rate.
- **Review** your rate and make changes when necessary.

Ideally, you should review your system's rates each year. Although it takes time, the process should be less burdensome each year as you become more familiar with the steps outlined in this guide. An annual rate review will ensure that you are maintaining a balance between your costs and revenues; maintaining adequate technical, managerial and financial capacity; and, most important, continuing to deliver high-quality drinking water to your customers. In addition, communicating effectively with your customers about the full cost of doing business will strengthen your relationship with your customers and can help alleviate rate shock when a rate adjustment is necessary.

Appendix A – Sources for More Information on Rate Setting

Electronic Programs

1. **The EPA's Water Finance Clearinghouse** is an easily navigable web-based portal to help communities locate information and resources that will assist them in making informed decisions for their drinking water, wastewater, and stormwater infrastructure needs. The Water Finance Clearinghouse includes two searchable databases: one contains available funding sources for water infrastructure and the second contains resources, such as reports, weblinks, webinars etc. on financing mechanisms and approaches that can help communities access capital to meet their water infrastructure needs. **Find this tool online here.**
2. **The Environmental Finance Center (EFC) Rates Dashboard:** Based on annually-collected rates data from many states, EFC has designed several free interactive Rates Dashboards to compare water and wastewater rates across various system characteristics, such as utility finances, system characteristics, customer base socioeconomic conditions, geography, and history. Rate data and analyses are also provided free of charge on the EFC's website. **Find this tool online here.**
3. **EFC Water and Wastewater Rates Analysis Model**: Use this tool annually to help set water and/or wastewater rates for the next year by projecting a system's expenses, revenues from rates, and fund balance for the next few years. It is designed specifically for small water/wastewater systems and should be used annually. Systems can test up to 12 rate structures with minimal data inputs to determine whether they should adjust rates in order to achieve financial sufficiency. The tool is free to download and use. **Find this tool online here.**
4. **The Environmental Finance Center's Online Water Rate Checkup Tool:** Another free tool from the EFC, the Online Water Rate Checkup Tool analyzes data from a system's annual financial statement to calculate various financial metrics (the ability to pay debt service, availability of cash to pay for operations and maintenance, the sufficiency of revenues generated, etc.), explain these metrics in lay terms, and set goals to measure performance. The tool tracks data from up to five years back to evaluate a system's long-term financial health. **Find this tool online here.**

Technical Assistance

1. **The EPA's Water Infrastructure and Resiliency Finance Center** (WIRFC) collaborates with various stakeholders that work with water systems to provide on-the-ground financial technical assistance.

   - **Capacity Development Program.** The EPA's capacity development program helps small system owners and operators, state and tribal agencies, technical assistance providers, and consumers help small water systems provide safe drinking water and protect public health. Every state has a capacity development program to help small systems improve their finances, management, infrastructure, and operations.
   - **Environmental Finance Center (EFC) Network.** EFCs receive grant funding from EPA and partner with, states, tribes, local governments, and the private sector to deliver targeted technical assistance to the water sector. EFCs and their partners provide innovative solutions to help manage the costs of environmental financing and program management.
   - **U.S. Department of Agriculture Rural Development**. USDA RD offers loans, grants, loan guarantees and technical assistance to support essential services in rural areas including water, electric, and communications infrastructure.
   - **National Rural Water Association.** NRWA is a national network of non-profit organizations that: trains, supports, and promotes the water and wastewater professionals that serve rural and small communities across the U.S. and provides training and technical assistance through 49 affiliated State Rural Water Associations on operating, managing, and financing water and wastewater utilities.

     Rural Community Assistance Partnership. RCAP is a national network of non-profit organizations that: helps rural and small communities throughout the U.S. access safe drinking water and sanitary wastewater disposal and provides training and technical assistance through six regional organizations on financing, managing, and operating water and wastewater systems.

2. EPA developed a Compendium of Drinking Water and Wastewater Customer Assistance Programs that describes the benefits, implementation, and examples of customer assistance programs (CAPs) throughout the country. These examples show the short-term or long-term reductions through a Bill Discount, Flexible Terms, Lifeline Rate, Temporary Assistance, and Water Efficiency advantages.

Appendix B – Depreciation Accounting

If your water system has financial statements (revenue statements and balance sheets) that are prepared in a manner consistent with generally accepted accounting principles (GAAP), you will use the concept of "depreciation." Depreciation ensures that the asset values in your balance sheet are not overestimated. Since an asset is unlikely to be as valuable in year 2 as it was in year 1, depreciation provides a method for proper estimation. Accounting for depreciation on your revenue statement is another way of estimating your reserve fund requirements. If your accounts currently show depreciation, you may be able to skip the exercise in Step 3, where you learned how to calculate annual reserve fund requirements.

From an (over-simplified) accounting perspective, the amount of each year's addition to "accumulated depreciation" on the balance sheet should create an expense (of the same amount) on the revenue statement. Note, however, that unlike many costs, this does not involve the outlay of cash.

Depreciation as an Expense

Depreciation is an accounting process that shows the amount of value an asset has lost over time. For example, accountants will calculate that a pump you purchased for $1,000 and has an expected useful life of 10 years will "lose" $100 of value every year. Depreciation is not tied to resale price or replacement value of assets. But by including this difference in value (the depreciation) as an expense that needs to be paid into your reserve account each year, it helps to ensure that when assets need to be rehabilitated or replaced there are sufficient funds available.

What, therefore, should one do with the revenue associated with this expense? It is recommended that the expense be moved into a reserve account where it can accumulate and be available for the rehabilitation and replacement of assets.

If you fail to contribute to a reserve fund, you will not create a reserve fund large enough for your future capital needs.

Depreciation and GASB 34

You may have heard discussions of the term "GASB 34." GASB stands for the Government Accounting Standards Board, an organization that establishes accounting and financial reporting standards for government organizations. If your system is part of a

municipal government, its accounting standards are likely established by GASB.[3] 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.

The most important change by GASB 34 is the requirement that state and local governments report all current and long-term assets and liabilities on the balance sheet of the government-wide financial statement. Government agencies can comply:

- By depreciating those assets.
- By using a "modified approach," which allows state and local government agencies to report the current costs of preserving infrastructure to be reported, in lieu of depreciation.[4]

Therefore, an organization may comply with GASB 34 by adopting depreciation in balance sheets and revenue statements, but that is not the only way to comply. In fact, organizations that are concerned about public works[5] are concerned that the mere addition of depreciation to financial statements might be an inadequate approach to accumulating sufficient funds to adequately preserve vital infrastructure. An agency that uses the "modified approach" to comply with GASB 34 would need to report how much it spent on maintenance and replacement and then it would need to show whether it had spent enough. An agency that simply reports depreciation but does not set that revenue aside in a reserve account does not improve its long-term financial ability to pay for the preservation of asset value. It creates an increase in revenue that is rolled over to the following year, creating no long-term reserves.

Conclusion: Build a Reserve Fund

The lesson from this discussion of GASB 34 is that full accounting for the cost of doing business must include an annual contribution to a reserve fund. Whether the amount of that contribution is determined by a worksheet (as shown in Step 3) or by a depreciation expense on a revenue statement, it still must go into the reserve fund. Failure to contribute to that reserve fund each year is a failure to properly calculate the cost of doing business.

[3] If you are a privately-owned system, your accounting standards are established by a similar organization for the private sector, the Financial Accounting Standards Board.
[4] See GASB 34, para. 20.
[5] See, e.g., the position statement of the American Public Works Association, 2003

Appendix C – Complete List of Links

Below is a comprehensive list of the links referenced throughout the Rate Setting Step Guide.

Additional STEP documents available on EPA's website
https://www.epa.gov/dwcapacity/simple-tools-effective-performance-step-guide-series

State and Territorial Contacts
https://www.epa.gov/dwcapacity/epa-regional-contacts

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

Asset Management: A Handbook for Small Water Systems
https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=2000261D.txt

Additional asset management resources
https://www.epa.gov/dwcapacity/asset-management-resources-states-and-small-drinking-water-systems

EPA's Water Finance Clearinghouse
https://ofmpub.epa.gov/apex/wfc/f?p=165:1:9788184655297

EFC Water and Wastewater Rates Analysis Model
https://efc.sog.unc.edu/resource/water-and-wastewater-rates-analysis-model

The Environmental Finance Center (EFC) Rates Dashboard
https://efc.sog.unc.edu/utility-financial-sustainability-and-rates-dashboards

The Environmental Finance Center's Online Water Rate Checkup Tool
https://efc.sog.unc.edu/resource/financial-health-checkup-water-utilities

EPA's Water Infrastructure and Resiliency Finance Center
https://www.epa.gov/waterfinancecenter/financial-technical-assistance-and-tools-water-infrastructure#partners

EPA's Compendium of Drinking Water and Wastewater Customer Assistance Programs
https://www.epa.gov/waterfinancecenter/compendium-drinking-water-and-wastewater-customer-assistance-programs

EPA's Effective Utility Management
https://www.epa.gov/sustainable-water-infrastructure/effective-water-utility-management-practices