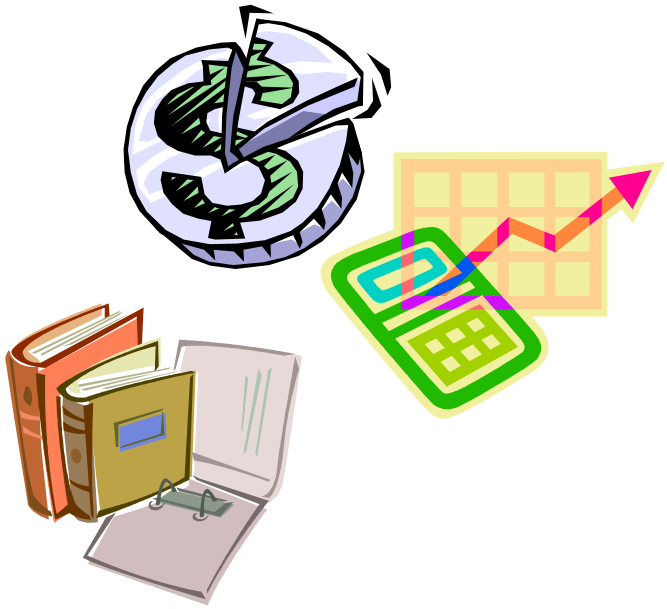
Module 3
The Safe Drinking Water Act

Instructor Guide



Financial/Managerial Series

This course includes content developed by the Pennsylvania Department of Environmental Protection in cooperation with the following grantees:

RCAP Solutions, Inc.
Penn State Harrisburg Environmental Training Center

Training Module 3
Instructor Guide
The Safe Drinking Water Act

Objectives:

By the end of the course, the learner should be able to:

- Understand the four areas of responsibility of public water systems under the SDWA: environmental compliance, monitoring and reporting, record keeping, and public notification.
- Recognize the contaminant groupings their utility must test for, and know what an MCL is.
- Identify whether or not their utility is meeting record keeping and Consumer Confidence Reporting (CCR) requirements.
- Know the public notification requirements and the difference between Tier 1, 2 and 3 Violations, and understand what actions can be taken to enforce regulations, and by whom.
- Understand that there are different requirements between treating and protecting ground water sources and surface water sources.
- Know it is important to stay on top of the ever-changing rules and compliance deadlines set forth by the U.S. Environmental Protection Agency (EPA) and the Pennsylvania Department of Environmental Protection (DEP).
- Understand that a water system's financial, managerial and technical capacity directly impacts its current and future environmental compliance and that it must operate as a business and be managed appropriately.

Key Points:

- Public water systems are charged with providing safe drinking water to their customers in compliance with the Safe Drinking Water Act, and requirements set forth by the EPA and DEP.
- Public water systems have specific monitoring and reporting, record keeping, and public notification requirements.
- There are over 100 substances regulated under SDWA, and more are added each year.
- Water system board members are accountable for their system's compliance.
- Consumer Confidence Reports (CCR) must be sent to all customers annually. Free software is available from the EPA to prepare them.
- Sanitarian field orders, DEP consent orders, civil lawsuits and criminal prosecutions are all means of enforcing SDWA regulations.
- Systems that use ground water as their source must establish a wellhead protection program. Those that use surface water as their source have more stringent monitoring, filtration and disinfection requirements.
- Additional information can be obtained from EPA and DEP.
- Systems that do not stay on top of maintenance and fiscal obligations will find themselves at greater risk of being out of environmental compliance. A well managed, fiscally sound organization will have much greater capacity to meet compliance needs.

Methods: Lecture **Time:** 60 minutes

Materials:

- *PowerPoint presentation*
- *Laptop*
- *Projector*
- *Training Module 3 Workbooks*
- *As an option, instructor can provide an electronic copy of the EPA's CCR preparation software, or a hard copy example from a community*
- *Flipchart and markers*
- *Walkerton Timeline handout*
- *Classification of Water Systems handout*

***Instructor preparation note**: It is recommended that you review the PowerPoint slides and talking points provided with this instructor guide in order to tailor the content and style of delivery to your particular setting, audience, and time constraints. The talking points are instructor comments designed to accompany the slides or materials handed out and are not intended as handouts themselves.*

Organize workbooks so that they can be passed out to learners prior to the start of the training. To save time and keep your audience focused, try to plan for and minimize any possible disruptions and transitions between activities.

After opening the PowerPoint file, the slide show can be viewed by selecting the "View Show" command under the "Slide Show" menu button. The slide show can be ended with "Esc". Slides can be advanced with "Enter", "PgDn", the down arrow or the right arrow. You can go back to the previous slides with "Backspace", the up arrow or the left arrow.

Any websites referenced in the training module should be checked by the instructor prior to the training session since these may change over time. The same applies to contact information.

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- Know it is important to stay on top of the ever-changing rules and compliance deadlines set forth by the U.S. Environmental Protection Agency (EPA) and the Pennsylvania Department of Environmental Protection (DEP).

- Understand that a water system’s financial, managerial and technical capacity directly impacts its current and future environmental compliance and that it must operate as a business and be managed appropriately.

Introduction

Instructor Note: *Display Slide # 0. Welcome learners to the training. Introduce yourself and ask learners to introduce themselves including job title and system name if desired.*

Instructor Note: *Display Slide #1. Remind learners that this is only an overview intended to make them aware of their general liabilities under the Safe Drinking Water Act. We will not specify in detail the 100+ drinking water standards they must comply with, though learners will learn where to find them.*

This module is intended as a basic introduction to the responsibilities of water systems under the Safe Drinking Water Act.

The goals of the module are:

- You need to understand the four areas of responsibility of public water systems under the SDWA: environmental compliance, monitoring and reporting, record keeping, and public notification.
- You will be able to recognize the contaminant groupings your utility must test for, and know what an MCL is.
- You will be able to identify whether or not your utility is meeting record keeping and Consumer Confidence Reporting (CCR) requirements.
- You will know the difference between Tier 1, 2, and 3 Violations, understand what actions can be taken to enforce regulations, and by whom.

- You will understand that there are different requirements between treating and protecting ground water sources and surface water sources.

- You will know it is important to stay on top of the ever-changing rules and compliance deadlines set forth by the EPA.

- You will understand that a water system's financial, managerial and technical capacity directly impacts its current and future environmental compliance and that it must operate as a business, and be managed appropriately.

Instructor Note: *Display Slide #2.*

The law is based on a history of improving public health over the years. For the amateur historians in our audience, a brief history of public health leading up to the 1996 Amendments to the Safe Drinking Water Act follows:

- 4000 year old Sanskrit Records demonstrate boiling water directives (little was known about disease)
- 1799 - Philadelphia used wooden pipes to move drinking water (connections of water quality and health)
- 1893 - The US Interstate Quarantine Act empowered the US Public Health Service to control waterborne communicable disease (early scientific understanding and protective legislation)
- 1942 - "Manual of Water Works Practice" was established
- 1962 - Requirement that qualified personnel supervise and operate water systems
- 1974 - Safe Drinking Water Act (first comprehensive drinking water regulation, advanced scientific understanding and protective legislation)
- 1986 - SDWA Amendments (set very high standards – caused backlash to unfunded mandates)
- 1996 - SDWA Amendments (maintained tough standards but provided regulatory relief)

Water System and Regulator Responsibilities

Instructor Note: *Display Slide #3. Depending on time constraints, you may review the Walkerton Timeline with the learners or allow them to review it on their own after the module.*

An important point all water system board members must understand is that, in addition to many other legal and financial issues, their governing body will be held liable for environmental compliance. They are responsible for providing safe drinking water to their customers. The accountability does not rest just on the shoulders of the operators, who are responsible for correctly reporting what is happening. Board members can be held individually accountable in extreme cases where they have acted criminally, such as falsifying documents.

An example of this occurred in Walkerton, Ontario. See the Walkerton Timeline handout for details.

Instructor Note: *Display Slide #4.*

The Environmental Protection Agency (EPA) delegates the authority to enforce SDWA regulations to state regulatory agencies. This is called primacy. In Pennsylvania, the primacy agency is the DEP. Pennsylvania has its own Safe Drinking Water Act, administered by DEP, which closely parallels and references the U.S. Safe Drinking Water Act. However, there are parts of the PA SDWA that are more detailed or stringent.

The EPA also provides an annual revolving fund to make funds available at the local level to pay for new water systems, or improvements to existing systems. In Pennsylvania, the primacy agency administering the State Revolving Fund is the Pennsylvania Infrastructure Investment Authority, also known as PENNVEST.

Instructor Note: *Display Slide #5. Depending on time constraints, you may review the Classification of Water Systems with the learners or allow them to review it on their own after the module.*

How are public water systems (PWS) defined? A PWS is any system serving 15 or more connections or an average of 25 or more people per day for at least 60 days per year. PWS can be categorized into one of the following groups. Each has its own requirements.

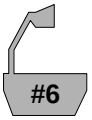
- Community Water System (CWS) is a PWS that supplies water to the same residential population year-round. The smallest example of a community system might be a village or manufactured housing community.

- Non-Transient Non-Community Water System (NTNCWS) is a PWS that regularly supplies water to at least 25 of the same people at least 6 months per year, but not to their residences. These include schools, factories and hospitals that have their own water supplies.

- Transient Non-Community Water System (TNCWS) is a PWS that provides water in a place where people do not remain for long periods of time. Examples include restaurants, rest stops, and campgrounds that have their own water supply.

Any system that serves fewer than 15 connections, or 25 people, is not regulated under the SDWA. This includes individual wells serving single residences.

Refer to the Classification of Water Systems handout for additional information.



Instructor Note: *Display Slide #6.*

Nationally, 85% of all U.S. households are served by public water systems. Currently, there are over 172,000 public water systems in our country, and nearly 11,000 in PA, including 2300 community water systems. 66% of them serve populations less than 500 people.

Do you fall into that category?

Nevertheless, these systems must comply with nearly the same regulatory challenges as very large systems.

Making Sure Drinking Water is Safe

Instructor Note: *Display Slide #7.*

With regard to environmental regulatory compliance, community water systems are charged with four responsibilities:

- Meeting safe drinking water standards set by the EPA and DEP
- Monitoring and reporting
- Record keeping
- Public notification

Instructor Note: *Display Slide #8.*

The EPA regulates more than 100 biological and chemical substances, and more are being added each year. Maximum Contaminant Levels (MCL) are set for each substance. These are established by the EPA based on human health and other scientific studies and are the maximum allowable amount of the substance in the drinking water.

The EPA is continuously revising standards. Local systems should review 40 CFR parts 136 to 149 of the Safe Drinking Water Act for the most current regulations.

MCL Tip

- How can I find specific Maximum Contaminant Levels for regulated substances?
- A list of these can be easily accessed on the EPA's website by going to www.epa.gov/safewater/mcl.html#mcls or at DEP's website, www.dep.state.pa.us, subject "Drinking Water." The site includes a list of secondary standards for substances that have recommended, though not required, MCLs. These generally affect the aesthetic quality (color, taste, odor) of water.

Instructor Note: *Display Slide #9.*

The types of contaminants regulated by the EPA include:

- Microbial contaminants (including Turbidity)
- Chemical & Radiological contaminants

In addition, there are treatment technique requirements that apply in lieu of MCLs. We'll cover both of these briefly in the next couple slides. More information is available from EPA or DEP.

Instructor Note: *Display Slide #10.*

Microbial contaminant indicators may include:

- Total Coliform bacteria
    - Indicator of potentially harmful organisms

- Fecal Coliform *(E. coli)*
    - Bacteria naturally present in intestines of warm-blooded animals
    - Indicator of contamination by human or animal waste

- Viruses
    - Can cause diarrhea, nausea, and/or stomach cramps

- Protozoa
    - Disease-causing organisms originating in the intestines of warm-blooded animals
    - Includes *Giardia lamblia* and *Cryptosporidium parvum*

- Bacterial Pathogens
    - Such as *Legionella* can cause Legionnaire's Disease

Instructor Note: *Display Slide #11.*

Chemical & Radiological contaminants include:

- Inorganic Chemicals (IOCs)
    - IOCs are mineral-based compounds that can occur naturally in water or can enter through farming, industrial processes, and other human activities
    - Regulated IOCs include arsenic, asbestos, copper, cyanide, lead, mercury, nitrates, and certain radionuclides, including radium 226 and 228, uranium, and gross alpha particle radioactivity.

- Volatile Organic Chemicals (VOCs)
    - Sources of VOCs include discharge from factories, leakage from gas storage tanks, and leaching from landfills.

- VOCs include industrial and chemical solvents, such as benzene, toluene, and MTBE.

- Synthetic Organic Chemicals (SOCs)
  - SOCs are man-made, carbon-based compounds that can enter water through runoff from cropland or discharge from factories.
  - SOCs include pesticides and herbicides such as atrazine, alachlor, endrin, and lindane.

- Disinfectants and Disinfection Byproducts
  - Chemicals such as chlorine, chloramines, and chlorine dioxide are disinfectants that have maximum residual disinfectant levels (MRDL).
  - Disinfection Byproducts (DBPs) form when disinfectants added to drinking water react with naturally occurring organic and inorganic matter in water.
  - Regulated DBPs include total trihalomethanes (TTHM), haloacetic acids (HAA5), bromate, and chlorite.

Instructor Note: *Display Slide #12.*

Treatment techniques include:

- Turbidity
  - Cloudiness, measured by the amount of light transmission
  - Indicator for water quality and effectiveness of treatment

- Filtration and Disinfection
  - Surface waters – continuous filtration and disinfection
  - Groundwater – continuous disinfection only

- Lead and Copper
  - Achieve Optimal Corrosion Control treatment, which minimizes lead and copper concentrations at the user's tap

Instructor Note: *Display Slide #13.*

Community water treatment plants must be run by certified operators. While other employees may assist in the operations, unless certified they must be supervised by an individual certified by the state. The operator is responsible for devising a sample siting plan and getting it approved by the primacy agency in Pennsylvania, the DEP. This plan spells out where and when water samples will be collected and sent to a certified testing lab. The operator must maintain records of sample test results and show them on demand if a surprise inspection is conducted.

Instructor Note: *Display Slide #14.*

Records must be kept available for review for a specific length of time. These include:

- Copies of lab results (with name of person that collected the sample)
- Dates and locations of sampling points
- Past and current violations, and steps taken to correct them
- Sanitary survey reports
- Annual water supply report
- All other water quality information

Instructor Note: *Display Slide #15.*

Record retention requirements vary with the type of reports:

Bacteriological analysis	5 years
Chemical analysis	10 years
Written reports (e.g. engineering, sanitary surveys)	10 years after completion

Variance and exceptions	5 years after expiration
Violation corrective actions	3 years

Instructor Note: *Display Slide #16.*

Consumer Confidence Reports (CCR) are annual water quality reports that a system must generate and provide to its customers. A CCR identifies where the water comes from, what is in the water, and what the customer can do to help protect their water. It also lists any violations in the past year and health risks. It explains how violations were corrected, and outlines any projects being planned to improve the water system. These must be sent to customers by July 1 of each year.

CCR Tip

- Where can I find help in preparing a Consumer Confidence Report?
- Actually, the EPA offers free software that can be ordered or downloaded from their website, www.epa.gov.

Instructor Note: *Display Slide #17. Allow the learners 5 minutes to complete the exercise below. Review the answers to the exercise with the learners then allow them a short break.*

Let's take the time to complete a short exercise to see what you've learned.

SDWA Exercise 1

1. SDWA stands for Safe Drinking Water Act.

2. 85% of all U.S. households are served by public water systems.
3. MCL stands for Maximum Contaminant Level.
4. Ensuring compliance with the SDWA is the responsibility of the water system board members.
5. The primacy agency that enforces SDWA regulations in PA is the Department of Environmental Protection.
6. The primacy agency that administers the State Revolving Fund is PENNVEST.
7. Community water treatment plants must be run by a certified operator.
8. A CCR is a Consumer Confidence Report.
9. A Public Water System is regulated under the SDWA if it serves 15 or more connections or an average of 25 or more people for at least 60 days per year.
10. A restaurant with its own water supply would likely be considered a TNCWS.

Regulatory Compliance

Instructor Note: *Display Slide #18.*

Engineering and treatment techniques must be approved by the primacy agency (in Pennsylvania, the DEP). The DEP may set stricter standards than the EPA, but cannot adopt or enforce less stringent requirements.

If a system exceeds the Maximum Contaminant Level for any regulated substance, it must report the violation immediately to the DEP. In some urban counties water systems should report violations to their county health department or county emergency management agency. In either case, the regulatory agency will give directions to correct violations, and will require notices (public notification) to be sent out to customers.

Instructor Note: *Display Slide #19.*

The Public Notification (PN) Rule ensures that all people who drink a system's water are informed about any violations that have occurred and their possible health consequences. The PN Rule groups the public notification requirements in 3 tiers, depending on the seriousness of the violation or situation.

Violations fall into three categories:

- Tier 1 Violations pose an immediate threat to human health. The public should be advised within hours via broadcast media and newspapers (24 hours max).

- Tier 2 Violations do not pose an immediate threat, but customers must be notified within a specific number of days to be determined by the regulatory agency (30 days max).

- Tier 3 Violations do not pose a direct impact to human health, and notification may not be required for months. Follow the directions of the regulatory agency (1 year max).

Instructor Note: *Display Slide #20.*

Regulatory enforcement steps, from the discovery of a violation, usually start with a Field Order by your local DEP sanitarian. If the violation is not corrected, a Consent Order will be issued by the DEP. Depending on the urgency, they will require a Corrective Action Plan to be submitted within a specific timeframe. If a system still does not take action, Civil Actions can be filed against the governing body for noncompliance. Criminal Actions may be filed for falsification of information. Violations rarely escalate into court proceedings.

Help Is Available!

- The DEP and a number of agencies offer free technical assistance to help small community water systems find solutions to operational and compliance problems. Tapping into these resources demonstrates a system's concern and commitment to achieving compliance. See the Resources and References slide for more information.

Instructor Note: *Display Slide #21.*

Independent of any regulatory actions, a citizen may take civil action against a system for noncompliance after a 60 day notification of their intent to file the civil action. Even if regulators are not pressing to solve a violation, the threat of such action should spur systems to resolve problems quickly.

Instructor Note: *Display Slide #22.*

The federal government may step in during an emergency, or if state and local authorities do not take appropriate action. The EPA can fine local water systems up to $25,000 per day if they ignore emergency orders.

Other Provisions of the Safe Drinking Water Act

Instructor Note: *Display Slide #23.*

In addition to MCLs and treatment standards, there are other monitoring rules in place. Some of these are specific to the water system's population served, type of raw water source, treatment process, or previous monitoring results.

Instructor Note: *Display Slide #24.*

Systems that use groundwater as their source must establish a Well Head Protection Program. Underground pollution plumes can travel long distances over time. This requires a system to assess the hydrology of the well head zone and perform a risk assessment of past and future activities.

Examples of potential threats to well water are:

- Underground Storage Tanks (UST)
- Urban and agricultural runoff
- Accidental truck and rail car spills
- Karst Topography (limestone, sinkholes)
- Inadequate water supplies and slow recharge rates

Groundwater systems are not required to provide filtration unless they are influence by surface water, determined through a Surface Water Identification Protocol (SWIP); however all regulated systems must disinfect the water.

Instructor Note: *Display Slide #25.*

Systems that draw surface water have even more rules to contend with since surface water is more susceptible to pollution and contamination. Special monitoring, filtration and disinfection treatments will be required. These are specifically established for each system.

Instructor Note: *Display Slide #26.*

One requirement worth noting is the Lead and Copper Rule, which requires systems to evaluate whether or not their water is corrosive enough to potentially release these metals into their treated water. Many homes have copper pipes and solder with lead content. Special treatment to increase the pH may be required if tap water at the user end is ever found to have elevated lead or copper.

Instructor Note: *Display Slide #27.*

Governing bodies of water systems should be aware that there are many new or updated rules and compliance deadlines their systems may need to prepare for. Without going into the specific requirements of each, some of the rules to be concerned about include:

Radon	Deadline in 2005
Filter Back Wash Rule	Deadline in 2005
LT1ESWTR	Deadline in 2006
Radionuclides	Deadline in 2005
Arsenic	Deadline in 2006
Ground Water Rule	Deadline in 2006
LT2ESWTR	Deadline in 2007
Stage 2 DBPR	Deadline in 2007

The acronyms above stand for: Long-Term 1 Enhanced Surface Water Treatment Rule, Long-Term 2 Enhanced Surface Water Treatment Rule, and the Disinfection Byproducts Rule. More information on these can be found in the EPA literature.

Instructor Note: *Display Slide #28.*

Since many small water systems have found it difficult to operate as a viable business, the most recent update to the Safe Drinking Water Act requires new systems to be built in compliance with all existing *and future* rules. Existing older systems must continuously improve their management and financial capability to assure their future ability to meet all regulatory rules, which the DEP has labeled "Capability Enhancement." Strategic planning is an integral component of the system's management. This changes the responsibility focus from the operator to the manager and governing body.

Instructor Note: *Display Slide #29.*

Federal funds administered by DEP provide for outreach and technical assistance providers to work with system governing boards and system managers, in addition to operator certification training.

Instructor Note: *Display Slide #30.*

If you have any doubt about your responsibilities under the SDWA, do not hesitate to contact EPA or DEP. They have staff that can help you better understand your responsibilities. DO NOT wait until you have a violation to start asking questions.

Instructor Note: *Display Slide #31. Allow the learners 5 minutes to complete the exercise below. Review the answers to the exercise with the learners.*

Let's take the time to complete a short exercise to see what you've learned.

SDWA Exercise 2

1. A Tier 1 Violation poses an immediate threat to human health. The public should be advised within hours via broadcast media and newspapers.
2. A Tier 3 Violation does not pose a direct impact to human health, and notification may not be required for months. Follow the directions of the regulatory agency.
3. A Tier 2 Violation does not pose an immediate threat, but customers must be notified within a specific number of days to be determined by the regulatory agency.
4. Independent of any regulatory actions, a citizen may take civil action against a system for noncompliance after a 60 day notification of their intent to file the civil action.
5. Systems that use groundwater as their source must establish a Well Head Protection Program.
6. The EPA can fine local water systems up to $25,000 per day if they ignore emergency orders.
7. Engineering and treatment techniques must be approved by the primacy agency. In Pennsylvania this is the DEP.
8. Improving a system's management and financial capability to assure the future ability to meet all regulatory rules is known as Capability Enhancement.

Summary

Instructor Note: *Display Slide #32.*

The key points of this module are:

- Public water systems are charged with providing safe drinking water to their customers in compliance with the Safe Drinking Water Act, and requirements set forth by the EPA and DEP.

- Public water systems have specific monitoring and reporting, record keeping, and public notification requirements.

- There are over 100 substances regulated under SDWA, and more are added each year.

- Water system board members are accountable for their system's compliance.

- Consumer Confidence Reports (CCR) must be sent to all customers annually. Free software is available from the EPA to prepare them.

- Sanitarian field orders, DEP consent orders, civil lawsuits and criminal prosecutions are all means of enforcing SDWA regulations.

- Systems that use groundwater as their source must establish a wellhead protection program. Those that use surface water as their source have more stringent monitoring, filtration and disinfection requirements.

- Additional information can be obtained from EPA and DEP.

- Systems that do not stay on top of maintenance and fiscal obligations will find themselves at greater risk of being out of environmental compliance. A well managed, fiscally sound

organization will have much greater capability to meet compliance requirements.

Resources and References

Instructor Note: *Display Slide #33.*

The following are references and resources you can use when you have questions:

The U.S. EPA's website www.epa.gov. Go to topics related to drinking water.

The PA DEP's website www.dep.state.pa.us, keyword "Drinking Water."

EPA guide, "Small Systems Guide to Safe Drinking Water Act Regulations"

Penn State Harrisburg Environmental Training Center, (717) 948-6388.

Sanitarians from your regional DEP office.

DEP Capability Enhancement Facilitators, contact Dennis Lee at the state DEP headquarters by calling (717) 772-4058.

RCAP Solutions, Don Schwartz, PA/NJ Program Manager, (814)861-6093.

National Environmental Training Center for Small Communities, located in Morgantown, WV. Phone (800)624-8301. www.netc.wvu.edu.

NETCSC's "Managing a Small Drinking Water System: A Short Course for Local Officials"

The complete list of training modules includes:

- Module 1, Water Supply System Basic Operations
- Module 2, Responsibilities of Governing Boards
- Module 3, The Safe Drinking Water Act
- Module 4, Dealing with Consultants, Technical Assistance Providers, Regulators, and Funding Agencies
- Module 5, The Basics of Accounting and Finance for Small Water Systems
- Module 6, Business Planning for Small Water Systems
- Module 7, Budgeting and Capital Improvements Planning Overview for Small Water Systems
- Module 8, Rate Design Overview for Small Water Systems
- Module 9, Bidding, Purchasing, and Leasing
- Module 10, Project Management Overview for Small Water Systems