Small Water Systems Video Information Series
Office of Water Programs
California State University, Sacramento
(3.0 Continuing Education Units)

COURSE DESCRIPTION

Small systems need to deliver safe drinking water to their consumers and to do it in a cost-effective manner. The objective of this video series is to provide operators and managers with the knowledge, skills, abilities, and judgment essential to safely operate and maintain their facilities as well as manage their facilities using appropriate financial strategies.

This video series provides needed training for various operators and managers of small public water systems. Operators have the responsibility of ensuring that safe and pleasant drinking water is delivered to everyone's tap. The information provided in these videos will help operators do their jobs with greater knowledge and efficiency. Managers will help see that maintenance, recordkeeping, reporting, public complaints, and budgeting are properly handled. The information provided in these videos will increase background knowledge regarding the system and provide specific training regarding administrative tasks. Owners and governing bodies must understand the needs and provide operators and managers with the resources to perform their jobs.

COURSE OUTLINE

The course uses *Small Water Systems Video Information Series* training videos and Learning Book.

CHAPTER (VIDEO) 1. ROLES AND RESPONSIBILITIES OF OPERATORS, MANAGERS, OWNERS, AND ELECTED BOARD MEMBERS
OBJECTIVES
Following completion of Video 1 and Chapter 1, students should be able to:
1. Explain the responsibilities of small water system operators.
2. Describe the importance of hiring and retaining qualified operators for small water systems.
3. Explain the importance of operator certification.
4. Obtain support from decision makers.
5. Justify reasons for providing adequate resources.
6. Describe the importance of understanding and complying with regulations.
7. Participate in a public relations program.
8. Find sources of further information on how to do the jobs performed by small water system operators.

CHAPTER (VIDEO) 2. SURFACE WATER TREATMENT, PART 1
OBJECTIVES
Following completion of Video 2 and Chapter 2, students should be able to:
1. Identify safety hazards encountered by the operators of small water systems.
2. Safely perform the tasks essential for the operation and maintenance of small surface water treatment facilities.

3. Describe those aspects of Worker Right-To-Know laws that apply to small water system O&M.
4. Recognize threats of contamination to water supply sources.
5. Outline the procedures of a sanitary survey.
6. Explain why operators must take necessary precautions to produce water free from disease-producing organisms.
7. Describe why turbidity is measured and monitored.
8. Perform a jar test and apply the results.
9. Operate, maintain, and troubleshoot surface water treatment processes for:
a. Coagulation
b. Flocculation
c. Sedimentation (settling)
d. Filtration (including slow sand filtration)
NOTE: Chapter (Video) 3 will cover material on how to safely operate, maintain, and troubleshoot surface water treatment processes for corrosion control, disinfection, and also taste and odor control. Chapter 3 also will explain how to operate all of these processes in conventional water treatment plants, package plants, and slow sand filter plants. Material will be provided on how to develop and implement a preventive maintenance program for small water systems.

CHAPTER (VIDEO) 3. SURFACE WATER TREATMENT, PART 2
OBJECTIVES
Following completion of Video 3 and Chapter 3, students should be able to:
1. Safely perform the tasks essential for the operation and maintenance of small surface water treatment facilities.
2. Operate, maintain, and troubleshoot surface water treatment processes for:
a. Corrosion control
b. Disinfection
c. Package plants
d. Slow sand filters
3. Troubleshoot and solve taste and odor problems.
4. Develop, implement, and administer a preventive maintenance program.

CHAPTER (VIDEO) 4. GROUNDWATER TREATMENT, PART 1
OBJECTIVES
Following completion of Video 4 and Chapter 4, students should be able to:
1. Identify groundwater sources.
2. Conduct a sanitary survey.
3. Develop a groundwater source protection program.
4. Protect a well from contamination.
5. Identify the parts of a well and pump system.
6. Operate and maintain a well pump and hydropneumatic pressure tank.
7. Inspect a well and pumping system.
8. Disinfect wells and pumps.
9. Keep accurate records of a well and pumping system.
10. Remove sand from water mains.
11. Troubleshoot a well and pumping system.
NOTE: Chapter (Video) 5 covers information on how to treat groundwater, including how to control iron and manganese, treat hardness, prevent and control tastes and odors,

and add fluoride to water. Chapter (Video) 5 also presents information on corrosion control and compliance with the Lead and Copper Rule.

CHAPTER (VIDEO) 5. GROUNDWATER TREATMENT, PART 2

OBJECTIVES

Following completion of Video 5 and Chapter 5, students should be able to:

1. Explain and implement the Lead and Copper Rule.
2. Determine if corrosion problems exist in their system.
3. Select the proper chemical and dose to control corrosion.
4. Comply with sampling and monitoring requirements for the Lead and Copper Rule.
5. Safely operate and maintain iron and manganese control processes.
6. Safely operate and maintain water softening processes.
7. Safely operate and maintain fluoridation processes.
8. Identify causes of tastes and odors.
9. Locate sources of tastes and odors.
10. Safely operate and maintain adsorption processes to control tastes and odors.

CHAPTER (VIDEO) 6. STORAGE AND DISTRIBUTION

OBJECTIVES

Following completion of Video 6 and Chapter 6, students should be able to:

1. Identify various types of water storage facilities.
2. Inspect storage facilities.
3. Safely operate and maintain a storage facility.
4. Collect samples from a storage facility.
5. Troubleshoot storage facility problems.
6. Protect a storage facility from corrosion.
7. Disinfect a storage facility.
8. Develop a storage and distribution system recordkeeping system and keep accurate records.
9. Explain the purpose of a water distribution system.
10. Identify, read, and test various types of meters.
11. Determine the need for and install backflow prevention devices.
12. Identify types of contaminants that could get into water distribution systems.
13. Identify and correct sources of contaminants in distribution systems.
14. Identify and correct causes of water quality degradation in distribution systems.
15. Develop and conduct a water distribution system surveillance program.
16. Develop and conduct a water quality monitoring program for a water distribution system.
17. Develop and conduct a cross-connection control program.
18. Locate buried pipes and leaks.
19. Repair leaks.
20. Flush pipes.
21. Disinfect mains.
22. Safely operate and maintain a water distribution system.

CHAPTER (VIDEO) 7. MONITORING

OBJECTIVES

Following completion of Video 7 and Chapter 7, students should be able to:

1. Collect representative samples.

2. Describe the various types of samples.
3. Obtain samples from surface waters and groundwaters.
4. Determine sample locations and frequency of collecting samples.
5. Use proper sample containers.
6. Properly label sample containers.
7. Transport and deliver samples to laboratories.
8. Collect a sample and measure chlorine residual.
9. Explain and implement the Lead and Copper Rule.
10. Comply with the Lead and Copper Rule.

CHAPTER (VIDEO) 8. MANAGERIAL RESPONSIBILITIES
OBJECTIVES
Following completion of Video 8 and Chapter 8, students should be able to:
1. Explain the purpose of operation and maintenance (O&M) programs.
2. Describe the rules and regulations applicable to their small water system.
3. Develop and implement a staffing program, including hiring and training.
4. Politely and effectively handle customer inquiries (complaints).
5. Develop and implement a public relations program.
6. Describe the proper relationships between employees and their employer.
7. Develop and implement a safety program for their small water utility.
8. Explain the importance of a water conservation program.
9. Describe the role of the benchmarking process in improving system performance.

CHAPTER (VIDEO) 9. FINANCIAL CONSIDERATIONS
OBJECTIVES
Following completion of Video 9 and Chapter 9, students should be able to:
1. Determine and improve the financial stability of their small water system.
2. Administer water rates and charges.
3. Establish a revenue base.
4. Allocate costs of O&M.
5. Determine and present rates to rate payers.
6. Develop funding for replacement and capital improvements.
7. Locate and apply for financial assistance.

CHAPTER (VIDEO) 10. EMERGENCY PREPAREDNESS
OBJECTIVES
Following completion of Video 10 and Chapter 10, students should be able to:
1. Plan and prepare for responding to emergencies.
2. Determine what types of equipment will be needed in most major emergencies.
3. Organize their small water system to respond to emergencies.
4. Identify which areas of their small water system may be vulnerable during an emergency.
5. Respond to emergencies.

TIME ASSIGNMENT

Video: The course uses training video, organized into seven separate topic areas. Each video topic is complemented by a chapter in the Learning Book *Small Water Systems Video Information Series*. There is a total of 1,796 minutes of video.

Text Pages: The course uses the Learning Book *Small Water Systems Video Information Series* (260 pages). The average word count on a page from the training manual is 950 words. Some pages contain tables, graphs, or illustrations to enhance the presentation of information. It is assumed that readers spend equal time studying tables, graphs, and illustrations as they would spend reading the equivalent amount of text. Therefore, each page is assumed to contain the equivalent of 950 words. Accepted average adult reading speed is 200 – 250 words per minute. Therefore, each page is projected to require four minutes of student time for each reading.

Objective test questions: The course contains 377 objective test questions. Projected average response time is one minute per question.

Component	Minutes per Component Unit	Number of Component Units	Time to Complete Units
Video	1	1,796	1,796
Text pages	4	260	1,040
Objective test questions	1	377	377
Total (minutes)			**3,213**
Total (hours)			**54**