



NEED-TO-KNOW CRITERIA

Very Small Water System Operator

A Need-to-Know Guide when preparing for the:

ABC Very Small Water System Operator Certification Exam



The Associated Boards
of Certification

Superior Water Starts Here™

Before You Dive In...

What is the Need-to-Know Criteria?

This **ABC Very Small Water System Operator** Need-to-Know Criteria was developed to assist operators in understanding the content that will be covered in the ABC Very Small Water System Operator Certification exam. A methodical and comprehensive international investigation was conducted to determine the most significant job tasks performed by operators. The content covered in the exam represents the job tasks identified through this research as essential operator competencies and is not limited to the practices of your site. The following pages organize these job tasks into Core Competency Job Areas and identify the amount of the test devoted to each area.

Is this Need-to-Know Criteria relevant to MY exam?

WPI offers a variety of standardized and customized exam services. This document is reflective only of the ABC Very Small Water Operator Certification exam; older editions of the standardized exam and various customized exams are also administered by various certification programs. Please contact your certifying authority to determine whether they have implemented this exam for your program.

Exam Preparation Resources

Visit gowpi.org to access the formula/conversion table administered with this exam, a list of approved references, information on purchasing study guides available from partner organizations, and more.

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ABC Very Small Water System Operator

ABC Very Small Water System Operator Certification Exam

As part of the development of the ABC Very Small Water System Operator Certification exam, Water Professionals International (WPI) conducted a job analysis of very small water system operators. The purpose of the job analysis was to identify the essential job tasks performed by these operators and the capabilities required to competently perform these job tasks. The results of this job analysis provided WPI with the foundation for the development of a new Very Small Water System Operator Certification exam.

CORE COMPETENCY JOB AREAS

The criticality ratings and percentage of operators reporting that they performed the tasks were used to determine what is covered on the very small water system exam. The essential tasks and capabilities that were identified through this process are called the core competencies. The following pages list the core competencies for very small water system operators. The core competencies are clustered into the following job duties:



Operate System



Water Quality Parameters and Sampling



Operate Equipment



Install, Maintain, and Evaluate Equipment



Perform Safety Duties



Perform Administrative and Compliance Duties

ABC Very Small Water System Operator

ABC Very Small Water System Operator Certification Exam

The ABC Very Small Water System Operator Certification exam evaluates an operator's knowledge of tasks related to the operation of small water systems. The content of the exam was determined from the results of the job analysis. To successfully take an ABC exam, an operator must demonstrate knowledge of the core competencies listed in this document.

The ABC Very Small Water System Operator Certification Exam consists of 50 multiple-choice questions. The specifications for the exams are based on a weighting of the job analysis results so that they reflect the criticality of tasks performed on the job. The specifications list the percentage of questions on the exam that fall under each job duty. For a list of tasks and capabilities associated with each job duty, please refer to the list of core competencies on the following pages.

EXAM SPECIFICATIONS

CORE COMPETENCY JOB AREA		
	OPERATE SYSTEM	22%
	WATER QUALITY PARAMETERS AND SAMPLING	20%
	OPERATE EQUIPMENT	10%
	INSTALL, MAINTAIN, AND EVALUATE EQUIPMENT	16%
	PERFORM SAFETY DUTIES	14%
	PERFORM ADMINISTRATIVE AND COMPLIANCE DUTIES	18%



Operate System

Core Competencies:

System Design	System Inspection
Assess system demand	Conduct cross-connection surveys/control
Flushing program	Sample site plan
System layout	Sanitary surveys
System map	Well inspection
Perform pressure readings	Chlorine Disinfection
Read blueprints, readings, and maps	Monitor disinfection process
Select materials	Evaluate disinfection process
Select type of pipes	Adjust disinfection process
Size mains	

REQUIRED CAPABILITIES:

Ability to adjust flow patterns and system units

Ability to communicate verbally and in writing

Ability to diagnose/troubleshoot system units

Ability to discriminate between normal and abnormal conditions

Ability to evaluate system units

Ability to inspect pumps

Ability to maintain system in normal operating condition

Ability to monitor and adjust equipment

Ability to perform basic math

Knowledge of blueprint readings

Knowledge of cathodic protection

Knowledge of different types of joints, restraints, and thrust blocks

Knowledge of disinfection concepts and design parameters

Knowledge of disinfection process

Knowledge of fire flow requirements

Knowledge of general chemistry, biology, and physical science

Knowledge of general electrical and hydraulic principles

Knowledge of hydrology

Knowledge of measuring instruments

Knowledge of monitoring requirements

Knowledge of piping material, type, and size

Knowledge of principles of measurement

Knowledge of regulations

Knowledge of sampling procedures and requirements

Knowledge of sanitary survey process

Knowledge of standards

Knowledge of start-up and shut-down procedures

Knowledge of testing instruments

Knowledge of well-drilling principles

Knowledge of well-head protection



Water Quality Parameters and Sampling

Core Competencies:

Chlorine demand/residual/dosage

Coliforms

pH

Temperature

Turbidity

REQUIRED CAPABILITIES:

Ability to calibrate instruments

Ability to follow written procedures

Ability to interpret Safety Data Sheets

Ability to perform basic math

Ability to recognize normal and abnormal analytical results

Knowledge of basic laboratory equipment

Knowledge of chemical handling and storage

Knowledge of general biology, chemistry, and physical science

Knowledge of normal characteristics of water

Knowledge of principles of measurement

Knowledge of public notification requirements

Knowledge of quality control/quality assurance practices

Knowledge of regulations

Knowledge of reporting requirements

Knowledge of safety procedures

Knowledge of sampling procedures



Operate Equipment

Core Competencies:

Blowers and compressors

Centrifugal pumps

Chemical feeders

Chlorinators

Hydrants

Hydraulic equipment

Instrumentation

Leak detectors

Positive-displacement pumps

Valves

REQUIRED CAPABILITIES:

Ability to monitor, evaluate, and adjust equipment

Knowledge of drinking water concepts

Knowledge of function of tools

Knowledge of general electrical and mechanical principles

Knowledge of hydraulic and pneumatic principles

Knowledge of regulations

Knowledge of safety procedures

Knowledge of start-up and shut-down procedures

Knowledge of system operation and maintenance



Install, Maintain, and Evaluate Equipment

Core Competencies:

Install and Maintain Equipment	Evaluate Operation of Equipment
Backflow prevention devices	Inspect equipment for abnormal conditions
Chemical feeders	Read charts
Chlorinators	Read meters
Corrosion control	Read pressure gauges
Electric motors	Troubleshoot electrical equipment
Hydrants	
Meters	
Pipe repair	
Pumps	
Service connection	
Storage tanks	
Taps	
Valves	
Water mains	

REQUIRED CAPABILITIES:

Ability to calibrate equipment

Ability to diagnose/troubleshoot equipment

Ability to differentiate between preventive and corrective maintenance

Ability to discriminate between normal and abnormal conditions

Ability to evaluate and adjust equipment

Ability to follow written procedures

Ability to order necessary spare parts

Ability to perform general maintenance

Ability to record information

Knowledge of corrosion control processes

Knowledge of dechlorination and disinfection processes

Knowledge of different types of cross-connections and approved backflow methods and devices

Knowledge of general electrical, mechanical, hydraulic, and pneumatic principles

Knowledge of lubricant and fluid characteristics

Knowledge of pipe fittings and joining methods

Knowledge of piping material, type, and size

Knowledge of regulations

Knowledge of start-up and shut-down procedures

Knowledge of system operation and maintenance



Perform Safety Duties

Core Competencies:

Chemical handling

Confined space entry

Electrical hazards

Fire safety

Lock-out/tag-out

Personal Protective Equipment

Traffic/work zone

REQUIRED CAPABILITIES:

Ability to communicate verbally and in writing

Ability to interpret Safety Data Sheets

Ability to recognize unsafe work conditions/
safety hazards

Ability to select and operate safety equipment

Knowledge of emergency plans

Knowledge of potential causes and impact
of system disasters

Knowledge of risk management

Knowledge of safety procedures



Perform Administrative and Compliance Duties

Core Competencies:

Administration and Security	Comply with Drinking Water Regulations
Administer compliance, emergency preparedness, and safety programs	United States Exams
Develop budget	Code of Federal Regulations, Title 40, Part 141— National Primary Drinking Water Regulations:
Develop operation and maintenance plan	Subpart A—General definitions
Plan and organize work activities	Subpart B—Maximum contaminant levels
Record and evaluate data	Subpart C—Monitoring and analytical requirements
Respond and evaluate data	Subpart D—Reporting and recordkeeping
Respond to complaints	Subpart I—Control of lead and copper
Write regulatory authority reports	Subpart Q—Public notification of drinking water violations
	Canadian Exams
	Provincial and territorial regulations

REQUIRED CAPABILITIES:

Ability to assess likelihood of disaster occurring
 Ability to communicate verbally and in writing
 Ability to coordinate emergency response with other organizations
 Ability to generate written policies and procedures
 Ability to interpret and transcribe data
 Ability to organize information and review reports
 Ability to perform basic math
 Ability to perform impact assessments
 Ability to translate technical language into common terminology
 Knowledge of emergency plans
 Knowledge of local codes and ordinances

Knowledge of monitoring and reporting requirements
 Knowledge of potential causes and impact of system disasters
 Knowledge of principles of finance
 Knowledge of principles of management
 Knowledge of principles of public relations
 Knowledge of public notification requirements
 Knowledge of public participation process
 Knowledge of recordkeeping function and policies
 Knowledge of regulations
 Knowledge of risk management
 Knowledge of system operation and maintenance

References

The following are approved as reference sources for the ABC Very Small Water System Operator Certification Exam. Operators should use the latest edition of these reference sources to prepare for the exam.

American Water Works Association (AWWA)

- **WSO: Water Distribution Series (Grades 1 & 2, Grades 3 & 4)*
- ***Water Quality & Treatment*
- *Water Distribution Operator Training Handbook*
- *Basic Science Concepts and Applications*
- *Water System Security, A Field Guide*
- *M68 Water Quality in Distribution Systems*

*These WSO texts replace the previous AWWA title, *Water Transmission and Distribution*

**This WSO text replaces previous AWWA title, *Water Quality, 3rd Edition*

To order, contact: **American Water Works Association**

6666 West Quincy Ave.

Denver, CO 80235

Website: www.awwa.org

Phone: (800) 926-7337

Fax: (303) 347-0804

E-mail: custsvc@awwa.org

California State University, Sacramento (CSUS) Foundation, Office of Water Programs

- *Water Distribution System Operation and Maintenance*
- *Small Water System Operation and Maintenance*
- *Utility Management*
- *Manage for Success*

To order, contact: **Office of Water Programs**

California State University, Sacramento

6000 J Street

Sacramento, CA 95819-6025

Website: www.owp.csus.edu

Phone: (916) 278-6142

Fax: (916) 278-5959

E-mail: wateroffice@csus.edu

References

Regulations for United States exams:

- *Code of Federal Regulations, Title 40, Part 141*
- State regulations (contact information for state certification programs is available on the [OpCert Program Contacts](#) page of WPI's website, www.gowpi.org)

Regulations for Canadian exams:

- *Guidelines for Canadian Drinking Water Quality*. Federal-Provincial-Territorial Subcommittee on Drinking Water. Ottawa, ON: Health Canada
- Provincial and territorial regulations (contact information for provincial/territorial certification programs is available on the [OpCert Program Contacts](#) page of WPI's website, www.gowpi.org)



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