



# How to Become a Certified Operator

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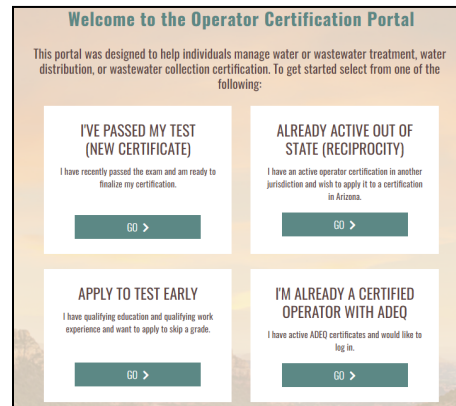
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## How to Register for the Exam

Visit ADEQ’s [Operator Certification homepage](#) for information on Program services, Portal access and use, exam registration, upcoming workshops and trainings, and additional operator resources. For current Op Cert Program certification and application fees, please visit the [Certified Operator fee](#) page.

[GateWay Community College](#) and [the City of Phoenix \(COP\)](#) are the ADEQ approved exam proctors for operator examination. While both Gateway and COP offer the same computerized exam and adhere to ADEQ’s Rule for Operator Certification, each proctor sets their own dates, times, and location of examination. Follow their examination policy for scheduling/rescheduling, testing, and canceling.

After you complete the exam, an Individual Mastery Report (IMR) will be sent to the email received by your testing location. A score of 70 percent or higher is required to pass your exam. Use the IMR to certify your exam score(s) through the [Operator Certification Portal](#). If you are already certified with ADEQ, register your exam through your personal Portal account. If you are an approved early exam applicant, return to your Early Exam Approval email to *Get Your Certificate*. To maintain your certificate and renew successfully, you must complete a minimum of 30 Professional Development Hours (PDHs) every three years or between your certification’s effective and expiration date. Operators are responsible for keeping a complete record of PDHs, and must provide copies to ADEQ’s Operator Certification Portal before certificate renewals. **Certification upgrades do not require PDHs.** To start the operator certification process with ADEQ:



**Step 1:** Decide which certification Grade you will test for – Grade 1 exams require a high school diploma or GED. Contact ADEQ’s Operator Certification Program for approval to skip one grade if you have less than one year with a previous grade.

**Step 2:** Decide which classification you are going to test for: [Water Distribution](#), [Water Treatment](#), [Wastewater Collections](#), or [Wastewater Treatment](#).

**Step 3:** Visit [ADEQ Operator Certification](#) and select GateWay’s or COP to register for an exam. Each location will have different rules and policies for examination. Please check the site description upon registration.

**Step 4:** After passing your exam, certify your results with ADEQ through the [Operator Certification Portal](#).

**Step 5:** If you did not pass the exam, utilize the IMR to focus on areas with low scores. Reschedule for your exam when you are ready. Study to understand, not just to pass.

# Information You Need to Know About the Exam

The exam creators are [Association of Board of Certification \(ABC\)](#) and [Water Professionals International \(WPI\)](#) and ADEQ currently utilizes the computerized **2017 ABC exam**. ABC/WPI offer 16 Need-to-Know Criteria documents, one for each classification/grade level of exam certifiable in the state of Arizona. The Need-to-Know Criteria describe the core competencies covered on the standardized exams. The Criteria also lists exam specifications and reference material that should be used to prepare for the ABC exam.

The Op Cert Program highly recommends starting with the WPI Need-to-Know Criteria. To supplement your studies, please utilize the resources listed within this document. Visit [WPI's Examination Resources](#) for updated study material or click the classification/grade level below to view and print the **2017 Need-to-Know Criteria**.

## Test Preparation Materials

### Practice Exams

Once you have studied thoroughly and want to test the waters before you pay for an actual exam, set up an appointment to take a practice exam. ADEQ keeps older editions of the certification exams, which can be used for practice. The practice exams are not a photocopy of the actual ABC exams but the relevancy of topics and materials will help test your knowledge prior to the official exam.

To set up an appointment and take the practice exam, email [azopcert@azdeq.gov](mailto:azopcert@azdeq.gov) with your *name*, *the grade* and *class* of the test you want to take, and *the date and time* you want to take the practice exam. Practice exam office hours are Monday-Friday 8:30am-4pm, except holidays, at the ADEQ Phoenix and Tucson office. Practice exams can take up to 3 hours to complete. Once the Op Cert team has received your inquiry, we will set up an appointment through Google Calendar with information on the practice exam process.

### Op Cert Recommended Study/Reference Books

If you wanted to purchase a book, the following is a list of many different study/reference books. The ones from the University of California Sacramento are probably the most popular. The Water Distribution O&M is the one for the distribution exams.

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

Please visit [Operator Training](#) for all available CSUS courses. If you have further questions about their curriculum, please contact CSUS by phone or online inquiry: 916-278-6142/[Online Inquiry Form](#).

#### **Water Distribution System Operation and Maintenance**

Designed to train operators in the safe and effective operation and maintenance of water distribution systems, this manual describes the responsibilities of being an operator for water storage and distribution systems. Material in this manual will provide an understanding of the basic operational

and maintenance concepts of water distribution systems and will help operators develop the ability to analyze and solve problems when they occur.

#### **Operation of Water Treatment Plants Vol. 1**

Designed to train operators in the safe and effective operation and maintenance of water treatment plants, Volume I emphasizes the knowledge and skills needed by an operator working in a conventional water treatment plant used for treating surface waters.

#### **Operation of Water Treatment Plants Vol. 2**

Designed to train operators in the practical aspects of operating and maintaining water treatment plants, emphasizing safe practices and procedures. Information is presented on drinking water regulations (including the Safe Drinking Water Act), iron and manganese control, fluoridation, softening, trihalomethanes, demineralization, handling and disposal of process wastes, maintenance, instrumentation, and advanced laboratory procedures. Administrative procedures for dealing with budgeting, setting rates, recordkeeping, personnel administration, public relations, and emergency planning.

#### **Operation and Maintenance of Wastewater Collection Systems Vol. 1**

Designed to train operators in the practical aspects of operating and maintaining wastewater collection systems, emphasizing safe practices and procedures. Information is presented on the importance and responsibilities of a collection system operator, the need for collection system O&M, and the components and typical layouts of collection systems. Operators learn safety procedures for construction, inspection and testing of sewers, inspection of manholes, and underground construction and repair. Detailed instructions are included for using closed-circuit television, clearing stoppages, cleaning sewers, and controlling roots, grease, odors, and corrosion in collection systems. Focuses on the knowledge and skills operators need to identify actual collection system problems and select appropriate methods to solve them. Operators also learn to solve arithmetic problems relating to the operation and maintenance of wastewater collection systems.

#### **Operation and Maintenance of Wastewater Collection Systems Vol. 2**

Focuses on three areas: (1) lift stations, (2) sewer rehabilitation, and (3) administration of a collection system agency. Detailed information is provided on the components and practical operation of lift stations. Operators learn to operate and maintain a variety of types of motors, supervisory controls, pumps, valves, and other equipment. They will also learn to examine the condition of a sewer system, set up a sewer rehabilitation program, and safely use various methods to replace or repair damaged sewers. Covers critical aspects of effectively administering a wastewater collection agency or department. Administrative topics include overall organization of the agency as well as employment, training and compensation of personnel, selection and acquisition of equipment and facilities, system mapping, management information systems, report writing, and public relations. Operators learn to organize and administer all facets of a collection system agency.

#### **Operation of Wastewater Treatment Plants Vol. 1**

This widely used professional program trains operators in the safe and effective operation and maintenance of city wastewater treatment plants. Volume I emphasizes the knowledge and skills

needed to operate plants efficiently. Operators will gain an understanding of the basic operational aspects of their plant and learn how to analyze and solve problems.

### **Operation of Wastewater Treatment Plants Vol. 2**

This widely used professional program trains operators in the safe and effective operation and maintenance of city wastewater treatment plants. Volume II shifts the focus toward larger conventional treatment plants and teaches operators in supervisory and management positions how to use best practices, including following regular maintenance programs, accurate recordkeeping, maximizing information technology, and preparing and writing meaningful reports.

### **Advanced Waste Treatment**

This text provides advanced training for operators of wastewater treatment plants. From California State University, Sacramento, the program covers biological treatment processes and physical–chemical treatment processes.

### **Manual of Cross-Connection Control Tenth Edition, Textbook**

The Manual of Cross-Connection Control, Ninth Edition contains field test procedures for backflow prevention assemblies (with illustrations for each step), specifications for backflow prevention assemblies, sample forms for a cross-connection control program, a model ordinance for a cross-connection control program and much more information. ISBN 978-0-9638912-6-6

### **Manage for Success**

This training manual stresses problem identification and solutions, working together as a team, communication, motivation, and evaluating and improving solutions to problems. Managers completing the training program will be confident that they have the tools and the ability to apply them to be successful managers. Utilities can help ensure that they have the needed management capacity by having their management personnel complete this training program.

## **American Water Works Association (AWWA)**

Please visit [AWWA's Technical & Operator Courses](#) for all online and in-person courses. If you have further questions about their curriculum, please contact CSUS by phone or online inquiry: 800-926-7337/[Contact Us Form](#).

### **Water Supply Operations I: Water Sources, Textbook**

Water operator training text teaches fundamentals of water sources for drinking water. Edition: 2003, Hardback, 212 pp. ISBN 1-58321-229-9; Catalog Number 1955.

### **Water Supply Operations II: Water Treatment, Textbook**

Water operator training text teaches fundamentals of common water treatment processes and techniques. Edition: 2003, Hardback, 552 pp. ISBN 1-58321-230-2; Catalog Number 1956.

### **Water Supply Operations III: Water Transmission and Distribution, Textbook**

Basic principles of design, construction, operation, and maintenance of water transmission and distribution systems. Edition: 2003, Hardback, 553 pp. ISBN 1-58321-231-0; Catalog Number 1957.

### **Water Supply Operations IV: Water Quality, Textbook**

Water operator training text teaches fundamentals of water quality analysis and drinking water regulations. Edition: 2003, Hardback, 214 pp. ISBN -58321-232-9; Catalog Number 1958.

### **Water Supply Operations V: Basic Science Concepts and Applications**

Water operator training text teaches fundamental mathematics, hydraulics, chemistry, and electricity as they apply to municipal water supply. Edition: 2003, Hardback, 645 pp. ISBN 1-58321-233-7; Catalog Number 1959.

### **Math Problems for Water Distribution Operators: A Guide to Preparing for Distribution System Operator Certification Exam**

Math study text is designed to help water distribution operators improve their math skills, pass certification exams, perform their jobs better, and advance their careers. This book is an ideal study guide for the mathematics portion of certification examinations. Each book is organized into four parts consisting of material associated with the first four grade levels. Edition: 2007, Softbound, 250 pp. ISBN 1583214550; Catalog Number 20628.

### **Math for Water Treatment Operators: A Guide to Preparing for Water Treatment Operator Certification Exams**

This book is an ideal study guide for the mathematics portion of certification examinations. Each book is organized into four parts consisting of material associated with the first four grade levels. John Giorgi. Math study text is designed to help water treatment operators improve their math skills, pass certification exams, perform their jobs better, and advance their careers. Edition: 2007, Softbound, 250 pp. ISBN 1583214542; Catalog Number 20618

### **Water Operator Certification Study Guide, Sixth Edition**

This study guide is specially designed to give water operators and students practice in answering questions that are similar in format and content to the questions that appear on state certification exams. ISBN 9781583218525 - 20517-6E

### **Wastewater Operator Certification Study Guide**

Sample questions are provided for Classes I, II, III, and IV wastewater operator certification exams, so you can study the questions that are specific to your grade level. Answers and references are included for questions. Math questions include the method to solve. ISBN 978-1-58321-728-3 - 20683

### **WSO Water Treatment, Grade 1**

Organized into 21 chapters addressing core test content on certification exams. Chapters discuss regulations, operator math and chemistry, and specific treatment processes in detail. Other chapters cover water quality testing, electrical and monitoring systems, treatment plant safety, and monitoring and recording requirements. Everything you need to know to pass your Grade 1 exam is included in this book. ISBN: 9781625761231

### **Water Treatment, Grade 2**

Organized into 22 chapters addressing core test content on certification exams. Chapters discuss regulations, operator math and chemistry, and specific treatment processes in detail. Other chapters cover water quality testing, electrical and monitoring systems, treatment plant safety, and monitoring

and recording requirements. Everything you need to know to pass your Grade 2 exam is included in this book. ISBN: 9781625761248

#### **Water Treatment, Grades 3 and 4**

Organized into 15 chapters addressing core test content on certification exams. Chapters discuss regulations, operator math and chemistry, and specific treatment processes in detail. Other chapters cover water quality testing, electrical and monitoring systems, treatment plant safety, and monitoring and recording requirements. Everything you need to know to pass your Grade 3 & 4 exam is included in this book. ISBN: 9781625761255

#### **WSO Water Distribution, Grades 1 & 2**

Organized into 22 chapters addressing core test content on certification exams. Chapters discuss regulations, operator math and chemistry, and specific distribution processes in detail. Other chapters cover water use and system design, water mains, hydrants and valves, water system supply security and public relations. Everything you need to know to pass your Grade 1 or 2 exam is included in this book. ISBN: 9781625761262

#### **WSO Water Distribution, Grades 3 & 4**

Organized into 13 chapters addressing core test content on certification exams. Chapters discuss regulations, operator math and chemistry, and specific distribution processes in detail. Other chapters cover water use and system design, water mains, hydrants and valves, water system supply security and public relations. Everything you need to know to pass your Grade 3 or 4 exam is included in this book. ISBN: 9781625761279

#### **Field Guide to SDWA Regulations**

This operations-oriented book explains all the regulations and how they fit together. The book provides regulatory guidance and advisories related to USEPA regulations in a single, easy-to-follow guide. It compiles information from USEPA, AWWA, and others and presents it in an understandable format. Useful to water utility managers, treatment and distribution operators, and environmental engineers. ISBN: 978-1-58321-385-8 - 20599

### **Water Environmental Federation Publications**

#### **The Wastewater Operator's Guide to Preparing for the Certification Examination**

The Wastewater Operator's Guide to Preparing for the Certification Examination was prepared jointly by the Water Environment Federation, the Association of Boards of Certification (ABC), and the Certification Commission for Environmental Professionals (C2EP). It outlines what you can expect from the exam, provides key formulas, and lets you test your skills with sample questions. Use the book to study on the go, and then when you get home, take an online practice quiz (complete with a timer). Explore the interactive quizzes, which offer immediate feedback after each answer is chosen.

#### **Operation of Water Resource Recovery Facilities Study Guide**

This study guide is a companion to the seventh edition of Operation of Water Resource Recovery Facilities, MOP 11. The manual and study guide can be used for training classes, studying for certification exams, and improving the quality of operations within the facility or firm. As with the latest edition of MOP 11, this study guide reflects the state of the art coverage in water resource

recovery facility management and operation. The questions emphasize principles of treatment, facility management, troubleshooting, and preventive maintenance.

### ACR Publications

Please visit [ACR Publications](#) for all books and online courses. If you have further questions about their curriculum, please contact CSUS by phone or online inquiry: 800-433-8150/info@acrp.com.

#### FlashCerts!™

FlashCerts!™ are flash cards sold by ACR Publications that enable users to recall facts and numbers with ease. FlashCerts!™ improves memory retention and instills confidence. FlashCerts!™ are ideal for certification levels I through III. FlashCerts!™ are available for Wastewater, Water Treatment, and Water Distribution.

#### Simplified Math for Waterworks/Wastewater Operators

These workbooks guide users through math applications commonly used in the waterworks industry. It separates formulas, conversion tables, glossaries, and friction loss tables into easy-to-use sections. While most math books are divided into math concepts, this text is divided into application topics such as volume, flow, etc. so you can easily use the material for real-world applications.

### Additional Helpful Websites for Study Information

#### Free Resources

**Sewer Geek:** Wastewater Collection Book on Op Cert Sharefile, PDF. [Sewer Geek's Wastewater Collection 2010 Review](#)

**The Water Sifu:** Podcasts on water distribution and water treatment. [thewatersifu.com](http://thewatersifu.com)

**Indigo Water Group:** Resource for math used by both water and wastewater operations. Indigo Water Group has an excellent math book called Sidney's Big Book of Math. Go to downloads then math workbook. [indigowatergroup.com/math-workbooks/](http://indigowatergroup.com/math-workbooks/)

**The Kentucky Department of Environmental Protection:** They have test prep materials and great information. Disregard anything Kentucky specific but the rest of the information is very useful. [eec.ky.gov/Environmental-Protection/Compliance-Assistance/operator-certification-program/Pages/test-preparation-materials.aspx](http://eec.ky.gov/Environmental-Protection/Compliance-Assistance/operator-certification-program/Pages/test-preparation-materials.aspx)

**Quizlet:** Flashcards for operator exams. [quizlet.com](http://quizlet.com)

**New Mexico Environment Department:** New Mexico Study Manual for Water (Ragsdale). [env.nm.gov/wp-content/uploads/sites/5/2016/07/NMWaterSysOperStudyMan.-Update-11-2016.pdf](http://env.nm.gov/wp-content/uploads/sites/5/2016/07/NMWaterSysOperStudyMan.-Update-11-2016.pdf)

**American Water College Math Links-Water and Wastewater:** Free [Sample Water Treatment and Distribution](#) lessons as well as Keys to Passing Your Exam. [americanwatercollege.org/exam-prep](http://americanwatercollege.org/exam-prep)



## Paid Resources

**Rural Water Association of Arizona (RWAA):** Provides training and test prep. [rwaaz.org](http://rwaaz.org)

**American Water College:** An online resource that guarantees a passing score on your operator certification exam. [americanwatercollege.org](http://americanwatercollege.org)

**CEU Plan:** Provides affordable state approved online training solutions for the purpose of water, wastewater, environmental health, and engineering professional license renewal/recertification throughout the United States. [ceuplan.com](http://ceuplan.com)

**Small Water Supply:** Offers many different types of assistance. They have a wealth of web links to online tutorials. Several helpful math videos on Youtube.com. Use their search function to find links to helpful resources and videos. [smallwatersupply.org/Home](http://smallwatersupply.org/Home)

**Technical Learning College (TLC):** Offers distance based or independent study courses that are approved nationwide for operator renewal. They also provide free online practice exams. [abctlc.com](http://abctlc.com)

**National Environmental Services Center:** Montana training CDs. [nesc.wvu.edu/home](http://nesc.wvu.edu/home)

**BC Water Jobs:** Water jobs across the USA. [bcwaterjobs.com](http://bcwaterjobs.com)

**Zarathom:** An online-based training company designed to provide professional water operators a 'classroom environment' to improve their general knowledge of water industry standards, and at the same time satisfy the continuing education and contact hour requirements associated with the certified water operator license renewal. [zarathom.com](http://zarathom.com)

**SafePersonnel:** Suite of safety and compliance programs that includes staff training, safety incident reporting and tracking and SDS management. Municipalities, hospitals, businesses, and other non-education related organizations to increase safety and compliance can use customizable programs. [safepersonnel.com](http://safepersonnel.com)