



ABC Certification Exam Passing Score Study

Volunteer Opportunity

The Association of Boards of Certification (ABC) is seeking volunteers to participate in passing score studies that will determine the passing scores of its newly developed standardized Water Treatment, Collection, and Distribution certification exams. The input of certified operators working in these fields is needed to ensure that ABC certification exams administered across North America appropriately distinguish between certification candidates who are minimally competent and those who are not.

Qualifications

ABC is looking to identify volunteers who represent the diversity of geography as well as facility and system types and sizes of the industry. To qualify for participation, a volunteer must:

- Be a certified Water Treatment, Collection, or Distribution Operator at a level equivalent to ABC's Class I, II, III, or IV certification.
- Sign a non-disclosure agreement.
- Have access to the necessary materials.
- Be able to commit to participation in each of the passing score study activities, including the scheduled webinars.

The final panel of volunteers for this project will be selected from volunteer applicants to best represent the diversity of the industry.

Necessary Materials

Computer with Internet Access

Participants must have access to a computer in order to participate in the passing score activities. The computer must have a reliable Internet connection, and we recommend that you be able to utilize the latest version of Microsoft Internet Explorer. Your browser must have the 'cookies enabled' feature set. Participants will link to webinars hosted through Microsoft LiveMeeting and to an online test in order to complete the passing score study activities. There is no cost to volunteers to participate in any of the passing score activities. To determine whether your system is ready to use Microsoft LiveMeeting, [check your system](#).

Phone

Participants must have access to a phone and be able to call into a toll-free conference line in order to participate in the audio portion of the webinars.

Activities and Time Commitment

Volunteers will participate in a series of activities to describe the minimum competency of certified operators of each class, I-IV, estimate the percentage of minimally competent operators who would correctly answer each certification test item, and set the passing standard for each ABC Certification exam. The total time commitment for this project will be approximately 6-9 hours.

Describe the Minimally Competent Operator

In order to help define the minimally competent operator, each participant will be asked to generate the following lists based on their own experiences:

- Examples of things minimally competent operators at each level of certification, I-IV, can do.
- Examples of things that might indicate a higher level of expertise than minimal competency at each level of certification, I-IV.
- Examples of mistakes that would indicate that a person is not yet competent enough to earn certification at each level, I-IV.

All participants will return their lists to ABC for compilation. The compiled lists will be discussed during the training webinar.

Training Webinar, 1.5-2 Hours

Participants will convene via webinar to discuss the compiled lists and come to agreement on the minimum level of competence expected of operators certified at each class, I-IV. Participants will then be instructed in rating the test items that will appear on the certification exams. **Volunteers must be able to participate in the scheduled Training Webinar.**

Training Webinar Schedule

Webinar Dates:

Water Treatment
Thursday, March 29, 2012

Collection
Tuesday, March 27, 2012

Distribution
Wednesday, March 28, 2012

Webinar Times:

All Training Webinars will be held at the following time:

2PM-4PM Atlantic Time
1PM-3PM Eastern Time
12PM-2PM Central Time
11AM-1PM Mountain Time
10AM-12PM Pacific Time
9AM-11AM Alaska Time

Rate the Test Items, 3-4 Hours

Each participant will independently rate each test item that will appear on a certification exam for a particular class. To do this, participants will answer 150 class I, II, III, or IV test items on their computers. Individual participants' responses will not be shared or utilized to evaluate the participant in any way. After answering each item, participants will be asked to estimate the percentage of minimally competent operators who would correctly answer the test item. Participants will be allotted at least one week to complete this activity at their own pace and convenience.

Standard-Setting Webinar Schedule

Webinar Dates:

Water Treatment
Thursday, April 12, 2012

Collection
Tuesday, April 10, 2012

Distribution
Wednesday, April 11, 2012

Webinar Times:

All Standard-Setting Webinars will be held at the following time:

2PM-4PM Atlantic Time
1PM-3PM Eastern Time
12PM-2PM Central Time
11AM-1PM Mountain Time
10AM-12PM Pacific Time
9AM-11AM Alaska Time

Standard-Setting Webinar, 1-2 Hours

Approximately one to two weeks after participants' ratings are due, participants will reconvene via webinar to debrief and discuss the passing standard estimated by psychometricians based on participants' ratings. **Volunteers must be able to participate in the scheduled Standard-Setting Webinar.**

Benefits

Networking

Participants will join ABC's active network of volunteer subject matter experts anchored by our Validation & Examination (V&E) Committees who provide technical support for all aspects of exam development and validation. Over 70 industry professionals serve as technical subject matter experts on ABC V&E Committees to lend their knowledge and ensure our exams maintain the highest industry standards.

ABC Certification Continuing Education Credit

Volunteers will earn eight (8) hours of continuing education approved for renewal of their ABC certification. **ABC cannot guarantee that any other certifying or licensing authority will accept this continuing education credit.**

Gift Cards

Volunteers completing all panel activities will earn a \$75 gift card.

Industry Leadership

Your participation in ABC exam development activities helps ensure that ABC certification exams administered across North America appropriately distinguish between candidates who are minimally competent and those who are not, protecting the public health and environment.

How to Participate

Certified operators interested in participating should complete and return the attached application to ABC. Applications must be received no later than March 11, 2012. Contact Lorrie Banks, Office & Volunteer Coordinator, at certification@abccert.org or (515) 232-3623 with any questions or for more information.



ABC Certification Exam Passing Score Study

Volunteer Application

The Association of Boards of Certification (ABC) is seeking volunteers to participate in studies that will determine the passing scores of its newly developed standardized Water Treatment, Collection, and Distribution certification exams. If you are a certified operator working in one of these fields and interested in participating in a study, please complete and return the following application and the appropriate plant point rating system worksheet (Water Treatment Operators only) to ABC by email, fax, or mail. **Completed applications must be received by ABC no later than March 11, 2012.**

Attn: Lorrie Banks
 Phone: (515) 232-3623
 Email: certification@abccert.org
 Fax: (515) 965-6827
 Mail: 2805 SW Snyder Blvd., Suite 535
 Ankeny, IA 50023

ABC exam development activities are carried out in accordance with industry best practices including ANSI/ISO/IEC General Requirements for Bodies Operating Certification of Persons in order to ensure that ABC certification exams are valid, reliable, fair, and legally defensible. In order to meet these standards, ABC needs the assistance of volunteers who represent the depth, breadth, and scope of the industry and must document volunteers' qualifications and backgrounds. For this reason, you will be asked to provide information on your current certification(s), education, work experience, and other industry activities below. Volunteers must sign the included non-disclosure agreement prior to participating in any activities.

For additional information regarding this volunteer opportunity, including time commitment and benefits of participation, please refer to the *Volunteer Opportunity* handout included in this package.

Contact Information

Name	<i>First</i>	<i>Last</i>	
Address	<i>Street</i>		
	<i>City</i>	<i>State</i>	<i>Zip</i>
Home Phone	()		
Cell Phone	()		
Work Phone	()		
E-Mail Address			

Which passing score studies would you like to participate in? (Check all that apply)

You must participate in both the Training Webinar and Standard-Setting Webinar for the category (Water Treatment, Collection, or Distribution) of passing score study in which you are participating. Please determine your availability for the scheduled webinar dates and times below prior to completing and returning your application. **Checking a box below indicates that you are able and willing to participate in the scheduled webinars for the specified category.**

	ABC Class I (Lowest)	ABC Class II	ABC Class III	ABC Class IV (Highest)
Water Treatment				
Water Treatment Training Webinar: Thursday, March 29, 2012 12PM-2PM Central Standard Time	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Water Treatment Standard-Setting Webinar: Thursday, April 12, 2012 12PM-2PM Central Standard Time	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Collection				
Collection Training Webinar: Tuesday, March 27, 2012 12PM-2PM Central Standard Time	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Collection Standard-Setting Webinar: Tuesday, April 10, 2012 12PM-2PM Central Standard Time	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Distribution				
Distribution Training Webinar: Wednesday, March 28, 2012 12PM-2PM Central Standard Time	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Distribution Standard-Setting Webinar: Wednesday, April 11, 2012 12PM-2PM Central Standard Time	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Education

High School	<input type="checkbox"/> High School Diploma	<input type="checkbox"/> GED	Year Conferred: _____
	Name of High School: _____		
College	<input type="checkbox"/> No College	<input type="checkbox"/> Some College	<input type="checkbox"/> Associate Degree
	<input type="checkbox"/> B.A.	<input type="checkbox"/> B.S.	<input type="checkbox"/> Masters Degree
	Major: _____	Year Conferred: _____	
	Name of College: _____		

Work Experience

Total Work Experience

Total Years of Water Treatment Operator Experience	Years	Total Years of Direct Responsible Charge (DRC) ¹	Years
Total Years of Collection Operator Experience	Years	Total Years of Direct Responsible Charge (DRC) ¹	Years
Total Years of Distribution Operator Experience	Years	Total Years of Direct Responsible Charge (DRC) ¹	Years

Present Employment

Title/Position			
Employer			
Employer Address	<i>Street</i>		
	<i>City</i>	<i>State</i>	<i>Zip</i>
Employer Phone	()		
Employed Since	<i>Year you were hired by this employer:</i>		
Facility/System	<u>Collection or Distribution System:</u> What is the population served by your system? _____		
	<u>Water Treatment Facility:</u> Please complete and attach the appropriate plant point rating system worksheet from the following pages to your application.		
Please list your job responsibilities:			
Give the percent of your time spent in operations: _____ %			
Do you currently supervise operators/ analysts? (Briefly explain)			
Do you have contact with entry-level operators/ analysts? (Briefly explain)			

¹DRC experience is defined as active day-to-day technical direction and supervision or active day-to-day accountability and/or authority for process control decisions of a facility, or a major segment of a facility, that directly impacts public health and/or the environment.

Current Certification(s)

Please provide information on your current certification(s). You may provide information for up to three relevant certifications below.

Certification #1

Valid Certification Number			
Issuing Agency			
Title/Category of Certification	<input type="checkbox"/> Water Treatment <input type="checkbox"/> Distribution <input type="checkbox"/> Collection		<input type="checkbox"/> Other: _____
Class/Grade/Level of Certification	<input type="checkbox"/> I <input type="checkbox"/> A	<input type="checkbox"/> II <input type="checkbox"/> B	<input type="checkbox"/> III <input type="checkbox"/> C <input type="checkbox"/> IV <input type="checkbox"/> D <input type="checkbox"/> Other: _____ <i>What is the highest level offered by your agency?</i> _____
Expiration Date of Certification	Month	Year	Initial Date of Certification Year

Certification #2

Valid Certification Number			
Issuing Agency			
Title/Category of Certification	<input type="checkbox"/> Water Treatment <input type="checkbox"/> Distribution <input type="checkbox"/> Collection		<input type="checkbox"/> Other: _____
Class/Grade/Level of Certification	<input type="checkbox"/> I <input type="checkbox"/> A	<input type="checkbox"/> II <input type="checkbox"/> B	<input type="checkbox"/> III <input type="checkbox"/> C <input type="checkbox"/> IV <input type="checkbox"/> D <input type="checkbox"/> Other: _____ <i>What is the highest level offered by your agency?</i> _____
Expiration Date of Certification	Month	Year	Initial Date of Certification Year

Certification #3

Valid Certification Number			
Issuing Agency			
Title/Category of Certification	<input type="checkbox"/> Water Treatment <input type="checkbox"/> Distribution <input type="checkbox"/> Collection		<input type="checkbox"/> Other: _____
Class/Grade/Level of Certification	<input type="checkbox"/> I <input type="checkbox"/> A	<input type="checkbox"/> II <input type="checkbox"/> B	<input type="checkbox"/> III <input type="checkbox"/> C <input type="checkbox"/> IV <input type="checkbox"/> D <input type="checkbox"/> Other: _____ <i>What is the highest level offered by your agency?</i> _____
Expiration Date of Certification	Month	Year	Initial Date of Certification Year

Other Industry Activities

Please list any industry activities such as operator training programs and committees in which you participate.

Organization

Activity/Committee

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Validation & Examination Committee Information and Opportunities

ABC has established a Validation & Examination (V&E) committee for each of our exam disciplines. These committees provide technical support for all aspects of exam development and validation and lend their knowledge to ensure our exams maintain the highest industry standards. Training in exam development is provided and travel and expenses for attendance at examination development workshops are funded by ABC.

Please check here if you would like to learn more about the role of ABC's V&E Committees and to be considered for Validation & Examination Committee Membership should a vacancy arise.

Agreement and Signature

By submitting this application, I affirm that the facts set forth in it are true and complete. I understand that if I am accepted as a panel member, any false statements, omissions or other misrepresentations made by me on this application may result in my immediate dismissal.

Signature

Date



ABC Certification Exam Passing Score Study

Non-Disclosure Agreement

I, _____ understand that I will be afforded access to proprietary information, (name – please print) confidential documents, examination items and generally related test development items, and hereby agree that I will hold safe and will not disclose or reveal, intentionally or unintentionally, to any person, individual or entity any information to which I have been made privy. I will not divulge the text, working notes, draft copies, general reference materials or any indicators as to my involvement in any Association of Boards of Certification (ABC) assigned projects to any person, individual, or entity, unless so released and authorized by ABC.

I agree that all proprietary information, confidential documents, examination items and generally related test development items that I am granted access to will remain the property of ABC. In addition, all items prepared by me, whether final or draft versions, shall become the property of ABC. Upon completion of each assignment, I agree to return all materials to ABC.

I agree that I will not sit for certification examinations in any area to which I have been exposed for a period of two (2) years. I further agree that I will not use examination items or proprietary information that I have been exposed to during my involvement with ABC in any exam preparation course or other Non-ABC examination committee.

In the event that a member of my immediate family plans to sit for an examination that I have been asked to work on, I will notify ABC prior to beginning the work. I understand that this situation presents a conflict of interest and that I may be asked not to participate as a Subject Matter Expert of the examination in question.

I further agree that I will not advertise my participation as a Subject Matter Expert (SME) and will not suggest in any way that ABC or any agency or organization affiliated with ABC endorses me because of my participation in the examination program.

Breach of this agreement, intentional or unintentional, shall be grounds for civil proceedings should ABC so pursue legal remedies to said breach.

Applicant Signature

Date

Witness Signature

Date



ABC Certification Exam Passing Score Study

Water Treatment

Plant Point Rating System

For purposes of ABC Certification Exams, a water system with a groundwater supply and only (non-gaseous) chlorination is considered a distribution system, not a water treatment facility. A water system with the addition of any chemical to a public water supply other than for chlorination shall be considered a treatment facility and should use this rating worksheet to determine the classification of the facility. Each unit process should have points assigned only once.

Facility Information	
Facility	<i>Plant Name</i>
Is this treatment facility in Indian country? <input type="checkbox"/> Yes <input type="checkbox"/> No	

Item	Points Possible	Your Plant
Size (1 point minimum to 20 point maximum)		
Design flow average day, or peak month's average day, whichever is larger (1 point per 0.5 MGD. Round up.) Design flow: Consider this to be the design capacity of the plant. Examples: 9.2 MGD = 19 points 4.7 MGD = 10 points	1 - 20	
Water Supply Sources (Rating based on public health significance)		
Seawater/saltwater	0	
Groundwater	0	
Groundwater under direct influence of surface water (GWI)	8	
Surface water	10	
Average Raw Water Quality Variation (0 to 10 point maximum). Applies to all sources (surface and groundwater). Key is the effect on treatment process changes that would be necessary to achieve optimized performance. <ul style="list-style-type: none"> • Little or no variation - no treatment provided except disinfection (0 points) • Minor variation - e.g. "high quality" surface source appropriate for slow sand filtration (1 point) • Moderate variation in chemical feed, dosage changes made: monthly (2 points), weekly (3 points), or daily (4 points) • Variation significant enough to require pronounced and/or very frequent changes (5 points) • Severe variation - source subject to non-point discharges, agricultural/urban storm runoff, flooding (7 points) • Raw water quality subject to agricultural or municipal waste point source discharges (8 points) • Raw water quality subject to industrial waste pollution (10 points) 	0 - 10	
Raw water quality is subject to:		
• Taste and/or odor for which treatment process adjustments are routinely made ¹	2	
• Color > 15 CU (not due to precipitated metals) - see exceptions in Note 1 at end of table	3	
• Iron or/and manganese > MCL: Fe (2 points), Mn (3 points) (3 points maximum allowed) - see exceptions in Note 1 at end of table ¹	2 - 3	
• Algal growths for which treatment process adjustments are routinely made ¹	3	

Item	Points Possible	Your Plant
Chemical Treatment/Addition Processes		
Fluoridation	4	
<u>Disinfection/Oxidation</u> (Points are additive to a maximum of 15 points allowed for this category.) CHECK <input checked="" type="checkbox"/> ALL THAT APPLY: <ul style="list-style-type: none"> • Chlorination: <ul style="list-style-type: none"> ○ Hypochlorites..... <input type="checkbox"/> (5 points) <ul style="list-style-type: none"> ▪ If generated on site..... <input type="checkbox"/> (1 point) ○ Chlorine gas..... <input type="checkbox"/> (8 points) ○ Chloramination..... <input type="checkbox"/> (10 points) ○ Chlorine dioxide..... <input type="checkbox"/> (10 points) • Ozonation..... <input type="checkbox"/> (10 points) • UV Irradiation..... <input type="checkbox"/> (2 points) • Iodine, Peroxide, or similar..... <input type="checkbox"/> (5 points) • Potassium permanganate (without greensand filtration)..... <input type="checkbox"/> (4 points) 	0 - 15	
pH adjustment for process control (e.g. pH adjustment aids coagulation)	4	
Stability or Corrosion Control (If the same chemical is used for both Corrosion Control and pH adjustment, count points only once)	4	
Coagulation/Flocculation & Filter Aid		
Primary coagulant addition	6	
Coagulant aid / Flocculant chemical addition (in addition to primary coagulant use)	2	
Flocculation	2	
Filter aid addition (Non-ionic/anionic polymers)	2	
Clarification/Sedimentation		
Sedimentation (plain, tube, plate)	4	
Contact adsorption	6	
Other clarification processes (air flotation, ballasted clarification, etc.)	6	
Upflow clarification ("sludge blanket clarifier") ²	8	
Filtration		
Granular media filtration (Surface water/GWI) ≤ 3 gpm/sq ft	10	
Granular media filtration (Surface water/GWI) > 3 gpm/sq ft	20	
Groundwater filtration	6	
Membrane filtration <ul style="list-style-type: none"> • For compliance with a primary regulation (10 points) • For compliance with a secondary regulation (6 points) 	6-10	
Diatomaceous earth (pre-coat filtration)	10	
Cartridge/bag	5	
Pre-filtration (staged cartridges, pressure sand w/o coagulation, etc.): add one point per stage to maximum of 3 points	1 - 3	
Slow sand	5	
Other Treatment Processes		
Aeration	3	
Air stripping (including diffused air, packed tower aeration)	5	
Ion-exchange/softening	5	
Greensand filtration	10	

Item	Points Possible	Your Plant
Other Treatment Processes (<i>continued</i>)		
Lime-soda ash softening (includes: chemical addition, mixing/flocculation/clarification/filtration - do not add points for these processes separately)	20	
Granular activated carbon filter (do not assign points when included as a bed layer in another filter)	5	
Powdered activated carbon	2	
Blending sources with significantly different water quality <ul style="list-style-type: none"> To achieve MCL compliance (4 points) For aesthetic reasons (2 points) 	2-4	
Reservoir management employing chemical addition	2	
Electrodialysis	15	
Residuals Disposal		
<ul style="list-style-type: none"> Discharge to surface, sewer, or equivalent (0 points) On-site disposal, land application (1 point) Discharge to lagoon/drying bed, with no recovery/recycling – e.g. downstream outfall (1 point) Backwash recovery/recycling: discharge to basin or lagoon and then to source (2 points) Backwash recovery/recycling: discharge to basin or lagoon and then to plant intake (3 points) 	0 - 3	
Facility Characteristics		
Instrumentation - Use of SCADA or similar instrumentation systems to provide data, with: <ul style="list-style-type: none"> Monitoring/alarm only, no process operation - plant has no automated shutdown capability (0 points) Limited process operation - e.g. remote shutdown capability (1 point) Moderate process operation - alarms and shutdown, plus <u>partial</u> remote operation of plant (2 points) Extensive or total process operation - alarms and shutdown, full remote operation of plant possible (4 points) 	0 - 4	
		Total Points

Notes

¹ Raw water quality is subject to:

- Taste and/or odor for which treatment process adjustments are routinely made (2 points): 1) T&O issue has been identified in a pre-design report, etc., 2) a process has been installed to address, and 3) operational control adjustments are made at least seasonally. Do not give points for T&O when there is no specific additional impact on operation. E.g. if a system is already pre-chlorinating for disinfection, give no points for T&O.
- Color > 15 CU (not due to precipitated metals) (3 points) **with following exceptions**. Color will be considered elevated and points assigned when levels exceed 75 Color Units (CU) for conventional filtration, 40 CU for direct filtration, or 15 CU for all other technologies, except reverse osmosis (no points given for color for reverse osmosis).
- Iron and/or manganese > MCL: Fe (2 points), Mn (3 points) (3 points maximum allowed) **with following exceptions**. Iron and manganese levels will be considered elevated and points assigned if they are greater than the MCL, except for applications of manganese greensand filters. For applications of manganese greensand filters, iron and manganese levels will be considered elevated when their combined level exceeds 1.0 mg/L (3 points allowed).
- Algal growths for which treatment process adjustments are routinely made (3 points): Raw water will be considered subject to algae growths when treatment processes are specifically adjusted due to the presence of high levels of algae on at least a weekly basis for at least two months each year.

- ² **Upflow clarification** ("sludge blanket clarifier") – 8 points – Also known as sludge blanket clarification. Includes such proprietary units as Super-Pulsator. These units include processes for flocculation and sedimentation. Important note: these are not the same as adsorption clarifiers.

Water Treatment Definitions

Definitions reprinted from "Master Glossary of Water and Wastewater Terms,"

[<http://www.owp.csus.edu/glossary/glossary.php>], with permission from Office of Water Programs, California State University, Sacramento.

Adsorption

The gathering of a gas, liquid, or dissolved substance on the surface or interface zone of another material.

Aeration

The process of adding air to water. Air can be added to water by passing air through water or passing water through air.

Air stripping

A treatment process used to remove dissolved gases and volatile substances from water. Large volumes of air are bubbled through the water being treated to remove (strip out) the dissolved gases and volatile substances.

Chloramination

The application of chlorine and ammonia to water to form chloramines for the purpose of disinfection.

Diatomaceous earth

A fine, siliceous (made of silica) "earth" composed mainly of the skeletal remains of diatoms.

Direct filtration

A method of treating water which consists of the addition of coagulant chemicals, flash mixing, coagulation, minimal flocculation, and filtration. The flocculation facilities may be omitted, but the physical-chemical reactions will occur to some extent. The sedimentation process is omitted.

Electrodialysis

The selective separation of dissolved solids on the basis of electrical charge, by diffusion through a semipermeable membrane across which an electrical potential is imposed.

Reverse osmosis

The application of pressure to a concentrated solution which causes the passage of a liquid from the concentrated solution to a weaker solution across a semipermeable membrane. The membrane allows the passage of the water (solvent) but not the dissolved solids (solutes).

SCADA system

The Supervisory Control And Data Acquisition system is a computer-monitored alarm, response, control and data acquisition system used by drinking water facilities to monitor their operations.

Stabilization

Processes that convert organic materials to a form that resists change. Organic material is stabilized by bacteria which convert the material to gases and other relatively inert substances. Stabilized organic material generally will not give off obnoxious odors.