A Need-to-Know Guide when preparing for the ABC Wastewater Collection Certification Examination.
Acknowledgement
The Association would like to thank the members of the 2010-2011 Wastewater Collection Validation and Examination Committee for their effort in conducting the job analysis and developing the ABC Need-to-Know Criteria for Wastewater Collection Operators. Committee members included:

- Lonn Rasmussen, Utah (Chair)
- Mike Bell, Ontario
- Steve Desmond, Oregon
- Bradley Fix, Indiana
- Dwight Lancaster, North Carolina
- Darryl Macy, Georgia
- Coby Shurtleff, Colorado
- Bill Weitkemper, Missouri

Introduction
As part of the development of its certification exams, the Association of Boards of Certification (ABC) conducted a job analysis of collection operators in 2010. As part of this process, ABC conducted a national survey of collection operators. This Need-to-Know Criteria was developed from the results of ABC’s 2010 collection operator job analysis.

How the Need-to-Know Criteria Was Developed

Review of Task Survey
The results of the 2010 task analysis survey were provided to the ABC Collection V&E Committee. In the task analysis survey, operators rated job tasks and capabilities for frequency of performance and seriousness of inadequate or incorrect performance. These two rating scales were used because they provide useful information (i.e., how critical each task is and how frequently each task is performed) pertaining to certification. Of the 214 individuals in the collection industry who completed the survey, 31 were class I operators, 46 were class II operators, 34 were class III operators, and 48 were class IV operators.

Analysis of Ratings
The composite criticality ratings and percentage of operators reporting that they performed the tasks were presented to the Collection V&E Committee in January 2011 to begin development of the new Need-to-Know Criteria. V&E committee members were given the opportunity to retain tasks which did not meet decision criteria (a criticality value of at least 10.5, and a percent performing value of at least 50%) if a significant rationale could be provided for their importance on the examination. The V&E committee members were also given the opportunity to remove any tasks which met criteria on the survey but were deemed untestable or inappropriate for the collection certification examination. Final examination blueprint weights were calculated by summing the criticality values of all remaining tasks, and dividing the criticality value of each task by the grand total criticality value. Weights of individual tasks were summed for each core competency area to determine the proportion of the collection certification examination devoted to each core competency.
Core Competencies

The essential tasks and capabilities that were identified through this process are called the core competencies. The following pages list the core competencies for collection operators. The core competencies are clustered into the following job duties:

- Operate Equipment
- Evaluate and Maintain Equipment
- Maintain and Restore Collection System
- Maintain Lift Stations
- Monitor, Evaluate, & Adjust Collection System
- Perform Security, Safety, & Administrative Procedures

The level of knowledge (i.e., comprehension, application, analysis) required for each task is also identified in the following pages.

- **Comprehension** is the most basic level of understanding and remembering. Items written at the comprehension level require examinees to recognize, remember, or identify important ideas.
- Items written at the **application** level require examinees to interpret, calculate, predict, use or apply information and solve problems.
- Items written at the **analysis** level require examinees to compare, contrast, diagnose, examine, analyze, and relate important concepts.

The level of knowledge is a hierarchy from basic comprehension to analysis. The level of knowledge tested is cumulative. Therefore, tasks identified as application may include questions written at both the application and comprehension levels. Tasks identified as analysis may include questions written at the comprehension, application, and analysis levels.

About the Association of Boards of Certification

Established in 1972, the Association of Boards of Certification (ABC) is a non-profit member-driven organization dedicated to protecting public health and the environment by advancing the quality and integrity of environmental certification programs. ABC membership includes almost 100 certifying authorities, representing more than 40 states, nine Canadian provinces as well as several international programs. Existing solely for its members, ABC is the voice for the profession and serves as the conduit for information in an ever-changing industry.

Over 70 certification programs currently test approximately 35,000 operators and laboratory analysts annually through ABC’s industry-leading Certification & Testing Services. Over 400,000 water and wastewater operators, laboratory analysts, and backflow prevention assembly testers have taken an ABC exam since the testing program began in 1982.

**ABC Vision**
Promote integrity in environmental certification throughout the world.

**ABC Mission**
ABC is dedicated to advancing the quality and integrity of environmental certification programs.

**ABC Objectives**
- Promote certification as a means of protecting public health, the infrastructure, and the environment.
- Promote uniformity of standards and best practices in certification.
- Serve as the technical resource for certification entities.
- Facilitate the transfer of certification between certifying authorities.
- Serve the needs of our members.
The ABC collection certification exams evaluate an operator’s knowledge of tasks related to the operation of collection systems. The ABC Collection V&E Committee determined the content of each exam based on the results of the national task analysis survey. To successfully take an ABC exam, an operator must demonstrate knowledge of the core competencies in this document.

Four levels of certification exams are offered by ABC, with class I being the lowest level and class IV the highest level. 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 example, 21% of the questions on the ABC class I collection exam relate to the job duty “Operate Equipment.” For a list of tasks and capabilities associated with each job duty, please refer to the list of core competencies on the following pages.

### ABC Collection Exam Specifications

<table>
<thead>
<tr>
<th>Blueprint Area</th>
<th>Class I</th>
<th>Class II</th>
<th>Class III</th>
<th>Class IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operate Equipment</td>
<td>21%</td>
<td>20%</td>
<td>19%</td>
<td>20%</td>
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<tr>
<td>Evaluate and Maintain Equipment</td>
<td>25%</td>
<td>25%</td>
<td>25%</td>
<td>24%</td>
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<tr>
<td>Maintain and Restore Collection System</td>
<td>10%</td>
<td>10%</td>
<td>10%</td>
<td>11%</td>
</tr>
<tr>
<td>Maintain Lift Stations</td>
<td>14%</td>
<td>14%</td>
<td>14%</td>
<td>13%</td>
</tr>
<tr>
<td>Monitor, Evaluate, &amp; Adjust Collection System</td>
<td>9%</td>
<td>10%</td>
<td>11%</td>
<td>10%</td>
</tr>
<tr>
<td>Perform Security, Safety, &amp; Administrative Procedures</td>
<td>21%</td>
<td>21%</td>
<td>21%</td>
<td>22%</td>
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</table>

### Operate Equipment Specifications

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<thead>
<tr>
<th>Equipment</th>
<th>Class I</th>
<th>Class II</th>
<th>Class III</th>
<th>Class IV</th>
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</thead>
<tbody>
<tr>
<td>Blowers and compressors</td>
<td>Comprehension</td>
<td>Comprehension</td>
<td>Application</td>
<td>Application</td>
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<tr>
<td>Boring equipment</td>
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<td>N/A</td>
<td>Comprehension</td>
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<td>Cathodic protection devices</td>
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<td>Chemical feeders</td>
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<td>Comprehension</td>
<td>Comprehension</td>
<td>Application</td>
</tr>
<tr>
<td>Cleaning equipment</td>
<td>Comprehension</td>
<td>Application</td>
<td>Analysis</td>
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</tr>
<tr>
<td>Computers</td>
<td>Comprehension</td>
<td>Comprehension</td>
<td>Application</td>
<td>Analysis</td>
</tr>
<tr>
<td>Electrical controls</td>
<td>Application</td>
<td>Application</td>
<td>Application</td>
<td>Application</td>
</tr>
<tr>
<td>Engines</td>
<td>Application</td>
<td>Application</td>
<td>Application</td>
<td>Application</td>
</tr>
<tr>
<td>Excavating equipment</td>
<td>Application</td>
<td>Application</td>
<td>Application</td>
<td>Application</td>
</tr>
<tr>
<td>Flow monitoring equipment</td>
<td>Comprehension</td>
<td>Comprehension</td>
<td>Application</td>
<td>Application</td>
</tr>
<tr>
<td>Generators</td>
<td>Application</td>
<td>Application</td>
<td>Application</td>
<td>Application</td>
</tr>
<tr>
<td>Hand tools</td>
<td>Application</td>
<td>Application</td>
<td>Application</td>
<td>Application</td>
</tr>
<tr>
<td>Heavy vehicles</td>
<td>Application</td>
<td>Application</td>
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### Operate Equipment Continued

<table>
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<tr>
<td>High velocity cleaners</td>
<td>Application</td>
<td>Application</td>
<td>Analysis</td>
<td>Analysis</td>
</tr>
<tr>
<td>Inspection equipment (vacuum testing, pressure testing)</td>
<td>Comprehension</td>
<td>Application</td>
<td>Application</td>
<td>Application</td>
</tr>
<tr>
<td>Motors</td>
<td>Application</td>
<td>Application</td>
<td>Application</td>
<td>Application</td>
</tr>
<tr>
<td>Power tools</td>
<td>Application</td>
<td>Application</td>
<td>Application</td>
<td>Application</td>
</tr>
<tr>
<td>Pumps</td>
<td>Application</td>
<td>Application</td>
<td>Application</td>
<td>Application</td>
</tr>
<tr>
<td>Rodding equipment</td>
<td>Application</td>
<td>Application</td>
<td>Application</td>
<td>Application</td>
</tr>
<tr>
<td>Safety equipment</td>
<td>Application</td>
<td>Application</td>
<td>Application</td>
<td>Application</td>
</tr>
<tr>
<td>Tapping equipment</td>
<td>Application</td>
<td>Application</td>
<td>Application</td>
<td>Application</td>
</tr>
<tr>
<td>Valves</td>
<td>Application</td>
<td>Application</td>
<td>Application</td>
<td>Application</td>
</tr>
<tr>
<td>Variable speed drives</td>
<td>Application</td>
<td>Application</td>
<td>Application</td>
<td>Application</td>
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</tbody>
</table>

### Required Capabilities

**Knowledge of:**
- Function of tools
- General chemistry
- General electrical principles
- General mechanical principles
- Hydraulic equipment
- Instrumentation
- Internal combustion engines
- Lubricants and fluids
- Operation and maintenance practices
- Physical science
- Pipe fittings and joining methods
- Pipeline construction principles
- Piping material type and size
- Pneumatics
- Potential causes of disasters in system
- Potential impact of disasters on system
- Regulations
- Safety regulations
- Start-up and shut-down procedures
- System operation and maintenance
- Types of lift stations
- Types of pumps
- Wastewater collection system operation and maintenance
- Wastewater treatment concepts

**Ability to:**
- Adjust equipment
- Calibrate equipment
- Discriminate between normal and abnormal conditions
- Evaluate cause of damage
- Evaluate operation of equipment
- Follow written procedures
- Identify cause of damage
- Identify potential safety hazards
- Interpret data
- Interpret Material Safety Data Sheets
- Locate cause of flow problems
- Maintain system in normal operating condition
- Monitor electrical equipment
- Monitor mechanical equipment
- Monitor mechanical equipment
- Operate safety equipment
- Perform impact assessments
- Perform mathematical calculations
- Perform physical measurements
- Read plans and profiles
- Recognize unsafe work conditions
- Record information
<table>
<thead>
<tr>
<th>Evaluate and Maintain Equipment</th>
<th>Class I</th>
<th>Class II</th>
<th>Class III</th>
<th>Class IV</th>
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<tbody>
<tr>
<td><strong>Perform Maintenance on Equipment</strong></td>
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<tr>
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<td>Cleaning equipment</td>
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<td>Comprehension</td>
<td>Comprehension</td>
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<tr>
<td>Electrical controls</td>
<td>Comprehension</td>
<td>Comprehension</td>
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<tr>
<td>Engines</td>
<td>Comprehension</td>
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<td>Excavating equipment</td>
<td>Comprehension</td>
<td>Comprehension</td>
<td>Comprehension</td>
<td>Comprehension</td>
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<tr>
<td>Flow monitoring equipment</td>
<td>Comprehension</td>
<td>Comprehension</td>
<td>Analysis</td>
<td>Analysis</td>
</tr>
<tr>
<td>Generators</td>
<td>Comprehension</td>
<td>Application</td>
<td>Application</td>
<td>Application</td>
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<tr>
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<td>Application</td>
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<td>Application</td>
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<tr>
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<td>Comprehension</td>
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<td>Comprehension</td>
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<td>Comprehension</td>
<td>Analysis</td>
<td>Analysis</td>
</tr>
<tr>
<td>Inspection equipment (tv vacuum testing, pressure testing)</td>
<td>Comprehension</td>
<td>Application</td>
<td>Analysis</td>
<td>Analysis</td>
</tr>
<tr>
<td>Motors</td>
<td>Application</td>
<td>Application</td>
<td>Application</td>
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<tr>
<td>Power tools</td>
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<tr>
<td>Pumps</td>
<td>Application</td>
<td>Application</td>
<td>Analysis</td>
<td>Analysis</td>
</tr>
<tr>
<td>Rodding equipment</td>
<td>Application</td>
<td>Application</td>
<td>Analysis</td>
<td>Analysis</td>
</tr>
<tr>
<td>Safety equipment</td>
<td>Application</td>
<td>Application</td>
<td>Application</td>
<td>Application</td>
</tr>
<tr>
<td>Tapping equipment</td>
<td>N/A</td>
<td>N/A</td>
<td>Application</td>
<td>Application</td>
</tr>
<tr>
<td>Valves</td>
<td>Comprehension</td>
<td>Comprehension</td>
<td>Comprehension</td>
<td>Comprehension</td>
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<tr>
<td>Variable speed drives</td>
<td>Comprehension</td>
<td>Comprehension</td>
<td>Analysis</td>
<td>Analysis</td>
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<tr>
<td><strong>Evaluate Operation of Equipment</strong></td>
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<tr>
<td>Inspect equipment for abnormal conditions</td>
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<td>Measure temperature of equipment</td>
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<tr>
<td>Read charts</td>
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<tr>
<td>Read gauges</td>
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<td>Analysis</td>
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<td>Read meters</td>
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<td>Troubleshoot electrical equipment</td>
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</table>
## Required Capabilities

### Knowledge of:
- Function of tools
- General electrical principles
- Instrumentation
- Internal combustion engines
- Lubricants and fluids
- Operation and maintenance practices
- Physical science
- Pneumatics
- Start-up and shut-down procedures
- System operation and maintenance
- Types of lift stations
- Types of pumps
- Wastewater collection system operation and maintenance

### Ability to:
- Adjust equipment
- Calibrate equipment
- Diagnose/troubleshoot
- Differentiate between preventative and corrective maintenance
- Discriminate between normal and abnormal conditions
- Evaluate cause of damage
- Evaluate operation of equipment
- Evaluate system performance
- Follow written procedures
- Identify cause of damage
- Identify potential safety hazards
- Interpret data
- Maintain system in normal operating condition
- Monitor mechanical equipment
- Perform general maintenance
- Perform impact assessments
- Perform physical measurements
- Recognize unsafe work conditions
- Record information

### Maintain and Restore Collection System

<table>
<thead>
<tr>
<th>Clean System</th>
<th>Class I</th>
<th>Class II</th>
<th>Class III</th>
<th>Class IV</th>
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</thead>
<tbody>
<tr>
<td>Hydraulic cleaning (balling, flushing, poly pig)</td>
<td>Application</td>
<td>Application</td>
<td>Application</td>
<td>Analysis</td>
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<td>Jet rodding</td>
<td>Application</td>
<td>Application</td>
<td>Application</td>
<td>Analysis</td>
</tr>
<tr>
<td>Remove stoppage</td>
<td>Application</td>
<td>Application</td>
<td>Analysis</td>
<td>Analysis</td>
</tr>
<tr>
<td>Rodding</td>
<td>Application</td>
<td>Application</td>
<td>Application</td>
<td>Analysis</td>
</tr>
<tr>
<td>Root control</td>
<td>Application</td>
<td>Application</td>
<td>Analysis</td>
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<table>
<thead>
<tr>
<th>Inspect System</th>
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<td>Physical inspection</td>
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<td>Application</td>
<td>Application</td>
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<tr>
<td>Televising</td>
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<table>
<thead>
<tr>
<th>Rehabilitate and Repair Collection System</th>
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</thead>
<tbody>
<tr>
<td>Lift station fitting and piping</td>
<td>Application</td>
<td>Application</td>
<td>Analysis</td>
<td>Analysis</td>
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<tr>
<td>Manholes</td>
<td>Application</td>
<td>Application</td>
<td>Analysis</td>
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### Maintain and Restore Collection System Continued

<table>
<thead>
<tr>
<th>Class</th>
<th>Class I</th>
<th>Class II</th>
<th>Class III</th>
<th>Class IV</th>
</tr>
</thead>
</table>

### Rehabilitate and Repair Collection System Continued

| Sewer lines | Application | Application | Analysis | Analysis |
| Taps | Application | Application | Analysis | Analysis |

### Required Capabilities

#### Knowledge of:
- Function of tools
- General hydraulic principles
- Instrumentation
- Operation and maintenance practices
- Physical science
- Pipe fittings and joining methods
- Pipeline construction principles
- Piping material type and size
- Potential causes of disasters in system
- Potential impact of disasters on system
- Regulations
- Risk management
- Start-up and shut-down procedures
- System operation and maintenance
- Types of lift stations
- Types of pumps
- Wastewater collection design parameters
- Wastewater collection system concepts
- Wastewater collection system operation and maintenance
- Wastewater treatment concepts

#### Ability to:
- Adjust equipment
- Diagnose/troubleshoot
- Differentiate between preventative and corrective maintenance
- Discriminate between normal and abnormal conditions
- Evaluate cause of damage
- Evaluate data from inspections
- Evaluate system performance
- Follow written procedures
- Identify cause of damage
- Identify potential safety hazards
- Interpret data
- Interpret Material Safety Data Sheets
- Locate cause of flow problems
- Maintain system in normal operating condition
- Monitor mechanical equipment
- Perform general maintenance
- Perform impact assessments
- Perform physical measurements
- Read plans and profiles
- Recognize unsafe work conditions
- Record information

### Maintain Lift Stations

<table>
<thead>
<tr>
<th>Electrical</th>
<th>Class I</th>
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<th>Class IV</th>
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<tbody>
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<td>Fuses</td>
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<td>Analysis</td>
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<tr>
<td>Motors</td>
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<td>Application</td>
<td>Analysis</td>
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<td>Relays</td>
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<th>Class III</th>
<th>Class IV</th>
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<td>Controllers</td>
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### Maintain Lift Stations

**Continued**

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<td>Level detection system</td>
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<td>Analysis</td>
<td>Analysis</td>
</tr>
<tr>
<td>RTU (remote transmitting units)</td>
<td>Application</td>
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<td>Analysis</td>
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</table>

<table>
<thead>
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</thead>
<tbody>
<tr>
<td>Piping</td>
<td>Application</td>
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<td>Analysis</td>
<td>Analysis</td>
</tr>
<tr>
<td>Pressure relief valves</td>
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<td>Analysis</td>
<td>Analysis</td>
</tr>
<tr>
<td>Pre-treatment</td>
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<td>N/A</td>
<td>Analysis</td>
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</tr>
<tr>
<td>Pumps</td>
<td>Application</td>
<td>Application</td>
<td>Analysis</td>
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<tr>
<td>Valves</td>
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<td>Application</td>
<td>Analysis</td>
<td>Analysis</td>
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<tr>
<td>Wet wells</td>
<td>Application</td>
<td>Application</td>
<td>Analysis</td>
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</tr>
</tbody>
</table>

### Required Capabilities

**Knowledge of:**
- Computer operations
- Function of tools
- General electrical principles
- Hazardous situations
- Instrumentation
- Internal combustion engines
- Lubricants and fluids
- Physical science
- Pipe fittings and joining methods
- Pipeline construction principles
- Piping material type and size
- Pneumatics
- Potential causes of disasters in system
- Potential impact of disasters on system
- Start-up and shut-down procedures
- System operation and maintenance
- Types of lift stations
- Types of pumps
- Wastewater collection system operation and maintenance

**Ability to:**
- Adjust equipment
- Calibrate equipment
- Diagnose/troubleshoot
- Differentiate between preventative and corrective maintenance
- Discriminate between normal and abnormal conditions
- Evaluate cause of damage
- Evaluate operation of equipment
- Evaluate system performance
- Follow written procedures
- Identify cause of damage
- Identify potential safety hazards
- Interpret data
- Locate cause of flow problems
- Maintain system in normal operating condition
- Monitor electrical equipment
- Monitor mechanical equipment
- Operate safety equipment
- Perform general maintenance
- Perform physical measurements
- Read plans and profiles
- Recognize unsafe work conditions
- Record information
<table>
<thead>
<tr>
<th>Monitor, Evaluate, &amp; Adjust Collection System</th>
<th>Class I</th>
<th>Class II</th>
<th>Class III</th>
<th>Class IV</th>
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</thead>
<tbody>
<tr>
<td>Aeration for hydrogen sulfide control</td>
<td>Comprehension</td>
<td>Comprehension</td>
<td>Application</td>
<td>Application</td>
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<td>Biological filters for odor control</td>
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<td>Chemical addition for hydrogen sulfide control</td>
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<td>Application</td>
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<td>Cross connections</td>
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<td>Comprehension</td>
<td>Comprehension</td>
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<td>Flow monitoring</td>
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<td>Analysis</td>
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<td>Force mains</td>
<td>Analysis</td>
<td>Analysis</td>
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<td>Analysis</td>
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<tr>
<td>Gravity sewers</td>
<td>Analysis</td>
<td>Analysis</td>
<td>Analysis</td>
<td>Analysis</td>
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<tr>
<td>Infiltration (inflow, exfiltration)</td>
<td>Application</td>
<td>Application</td>
<td>Analysis</td>
<td>Analysis</td>
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<tr>
<td>Lift stations</td>
<td>Analysis</td>
<td>Analysis</td>
<td>Analysis</td>
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<tr>
<td>Manholes</td>
<td>Analysis</td>
<td>Analysis</td>
<td>Analysis</td>
<td>Analysis</td>
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<tr>
<td>Measuring and control systems</td>
<td>Analysis</td>
<td>Analysis</td>
<td>Analysis</td>
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<tr>
<td>Pressure sewers (S.T.E.P.)</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>Analysis</td>
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<td>Vacuum sewers</td>
<td>N/A</td>
<td>Analysis</td>
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</tbody>
</table>

Required Capabilities

Knowledge of:
- Adjust equipment
- Assess likelihood of disaster occurring
- Calibrate equipment
- Communicate in writing
- Communicate verbally
- Conduct meetings
- Conduct training programs
- Coordinate emergency response with other organizations
- Demonstrate safe work habits
- Diagnose/troubleshoot
- Differentiate between preventative and corrective maintenance
- Discriminate between normal and abnormal conditions
- Evaluate data from inspections
- Evaluate operation of equipment
- Evaluate proposals
- Evaluate system performance

Ability to:
- Adjust equipment
- Calibrate equipment
- Diagnose/troubleshoot
- Differentiate between preventative and corrective maintenance
- Discriminate between normal and abnormal conditions
- Evaluate cause of damage
- Evaluate data from inspections
- Evaluate operation of equipment
- Evaluate system performance
- Follow written procedures
- Identify cause of damage
- Identify potential safety hazards
- Interpret data
- Interpret Material Safety Data Sheets
- Locate cause of flow problems
- Maintain system in normal operating condition
- Monitor electrical equipment
- Monitor mechanical equipment
Required Capabilities Continued

Knowledge of:
• Follow written procedures
• Generate written safety procedures
• Identify cause of damage
• Identify potential safety hazards
• Interpret data
• Interpret Material Safety Data Sheets
• Locate cause of flow problems
• Maintain system in normal operating condition
• Monitor mechanical equipment
• Negotiate contracts
• Operate safety equipment
• Order necessary spare parts
• Perform general maintenance
• Perform impact assessments

Ability to:
• Operate safety equipment
• Perform general maintenance
• Perform impact assessments
• Perform mathematical calculations
• Perform physical measurements
• Read plans and profiles
• Recognize unsafe work conditions
• Recognize unsafe work conditions
• Record information

<table>
<thead>
<tr>
<th>Perform Security, Safety, &amp; Administrative Procedures</th>
<th>Class I</th>
<th>Class II</th>
<th>Class III</th>
<th>Class IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administer System</td>
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<tr>
<td>Administer safety compliance program</td>
<td>Application</td>
<td>Application</td>
<td>Analysis</td>
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<tr>
<td>Develop budget</td>
<td>N/A</td>
<td>N/A</td>
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<td>Develop capital improvement plan</td>
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<td>Develop operation and maintenance plan</td>
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<td>Analysis</td>
<td>Analysis</td>
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<tr>
<td>Evaluate employee performance</td>
<td>Application</td>
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<td>Application</td>
<td>Analysis</td>
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<tr>
<td>Hire employees</td>
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<td>Application</td>
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<tr>
<td>Maintain records</td>
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<td>Application</td>
<td>Analysis</td>
<td>Analysis</td>
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<tr>
<td>Perform workplace safety evaluations</td>
<td>Application</td>
<td>Application</td>
<td>Analysis</td>
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<tr>
<td>Plan and organize work activities</td>
<td>Application</td>
<td>Application</td>
<td>Analysis</td>
<td>Analysis</td>
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<tr>
<td>Record and evaluate data</td>
<td>Application</td>
<td>Application</td>
<td>Analysis</td>
<td>Analysis</td>
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<td>Respond to public complaints</td>
<td>Application</td>
<td>Application</td>
<td>Analysis</td>
<td>Analysis</td>
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<tr>
<td>Supervise employee work activities</td>
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<td>Application</td>
<td>Application</td>
<td>Analysis</td>
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<tr>
<td>Write reports (federal, internal, state)</td>
<td>Application</td>
<td>Application</td>
<td>Analysis</td>
<td>Analysis</td>
</tr>
<tr>
<td>Safety Procedures</td>
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<td>Class II</td>
<td>Class III</td>
<td>Class IV</td>
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<tr>
<td>Calibration of atmospheric testing devices</td>
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<td>Chemical spill</td>
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<td>Confined space entry</td>
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<td>Electrical hazards</td>
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<td>Fires</td>
<td>Analysis</td>
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<td>First aid</td>
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<td>Hazardous material</td>
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<td>Infectious disease</td>
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<td>Lifting</td>
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<td>Lockout/tagout</td>
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<td>Analysis</td>
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<td>Personal protection equipment</td>
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<td>Respiratory protection</td>
<td>Analysis</td>
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<td>Shoring</td>
<td>Analysis</td>
<td>Analysis</td>
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<td>Traffic control</td>
<td>Analysis</td>
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<td>Trenching and excavation</td>
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<td>Emergency Plans</td>
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<tr>
<td>Combined sewer overflows</td>
<td>Application</td>
<td>Application</td>
<td>Analysis</td>
<td>Analysis</td>
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<tr>
<td>Disasters</td>
<td>Application</td>
<td>Application</td>
<td>Analysis</td>
<td>Analysis</td>
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<tr>
<td>Manhole hazards</td>
<td>Application</td>
<td>Application</td>
<td>Analysis</td>
<td>Analysis</td>
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<tr>
<td>Sanitary sewer overflow</td>
<td>Application</td>
<td>Application</td>
<td>Analysis</td>
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<tr>
<td>System failure</td>
<td>Application</td>
<td>Application</td>
<td>Analysis</td>
<td>Analysis</td>
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</tbody>
</table>
**Required Capabilities**

**Knowledge of:**
- Emergency plans
- Function of recordkeeping system
- General electrical principles
- General hydraulic principles
- Hazardous situations
- Hydrogen sulfide generation
- Methane generation
- Monitoring and reporting requirements
- Pipe fittings and joining methods
- Pipeline construction principles
- Piping material type and size
- Pneumatics
- Potential causes of disasters in system
- Potential impact of disasters on system
- Regulations
- Risk management
- Safety regulations
- Start-up and shut-down procedures
- System operation and maintenance
- Types of lift stations
- Types of pumps
- Wastewater collection design parameters
- Wastewater collection system concepts
- Wastewater collection system operation and maintenance
- Wastewater treatment concepts

**Ability to:**
- Adjust equipment
- Assess likelihood of disaster occurring
- Calibrate equipment
- Communicate in writing
- Communicate verbally
- Conduct meetings
- Conduct training programs
- Coordinate emergency response with other organizations
- Demonstrate safe work habits
- Diagnose/troubleshoot
- Differentiate between preventative and corrective maintenance
- Discriminate between normal and abnormal conditions
- Evaluate cause of damage
- Evaluate data from inspections
- Evaluate operation of equipment
- Evaluate proposals
- Evaluate system performance
- Follow written procedures
- Generate written safety procedures
- Identify cause of damage
- Identify potential safety hazards
- Interpret data
- Interpret Material Safety Data Sheets
- Locate cause of flow problems
- Maintain system in normal operating condition
- Monitor mechanical equipment
- Negotiate contracts
- Operate safety equipment
- Order necessary spare parts
- Perform general maintenance
- Perform impact assessments
- Perform mathematical calculations
- Perform physical measurements
- Prepare proposals
- Read plans and profiles
- Recognize unsafe work conditions
- Record information
- Review reports
- Select safety equipment
- Transcribe data
- Translate technical language into common terminology
- Write policies and procedures
References

The following are approved as reference sources for the ABC collection examinations. Operators should use the latest edition of these reference sources to prepare for the exam.

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

- *Operation of Wastewater Treatment Plants, Volume I and II*
- *Operation and Maintenance of Wastewater Collection Systems, Volume I and II*
- *Manage for Success*

To order, contact:
Office of Water Programs
California State University, Sacramento
6000 J Street
Sacramento, CA 95819-6025
Web site: www.owp.csus.edu
Phone: (916) 278-6142
Fax: (916) 278-5959
E-mail: wateroffice@owp.csus.edu

Water Environment Federation

- *Operation of Municipal Wastewater Treatment Plants - Manual of Practice No. 11*
- *Existing Sewer Evaluation and Rehabilitation - Manual of Practice FD-6*
- *Wastewater Collection Systems Management - Manual of Practice No. 7*

To order, contact:
Water Environment Federation
601 Wythe Street
Alexandria, VA 22314-1994
Web site: www.wef.org
Phone: (800) 666-0206
Fax: (703) 684-2492
E-mail: pubs@wef.org