

# Environmental Compliance Inspector Candidate Handbook

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## ECI CERTIFICATION



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Congratulations on pursuing certification. Certification is a great way to demonstrate competency, show commitment to the profession, and help with job advancement.

This handbook contains information about California Water Environment Association's Technical Certification Program for certification candidates. Please read this entire handbook to become familiar with CWEA's certification policies and procedures. Certification candidates are responsible for knowing the contents of this handbook. Please contact the CWEA office at (510) 382-7800 with any questions.

All policies are subject to change. The most recent edition of this handbook can be downloaded for free on [Cert.CWEA.org](http://Cert.CWEA.org). Candidates should ensure that they have the most current version as indicated by the date in the title above.

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## INTRODUCTION TO THE TECHNICAL CERTIFICATION PROGRAM

**CWEA's** Technical Certification Program (TCP) develops and administers competency-based certification exams for wastewater professionals in a number of different vocations. The certification program was founded in 1937. The first certification offered was the Wastewater Treatment Plant Operator certification, which was later adopted by the State Water Board. The exams are developed and revised by CWEA Subject Matter Experts under the guidance of exam development professionals. The certifications continue to grow and be refined in accordance with water sector and certification professional practices. Exams are offered throughout the year and are experience based, ranging from entry level to upper management.

CWEA currently certifies over 7,000 individuals. Certification is a great way to demonstrate competency, show commitment to the water profession, and help with job advancement.

### TECHNICAL CERTIFICATION PROGRAM Executive Committee

The Technical Certification Program Executive Committee is the governing body of CWEA's certification program. It was created to develop and implement a multilevel technical certification program for individuals employed in the wastewater field. They are responsible for the development and administration of the Technical Certification Program, including the application, examination development, examination administration, and certification renewal process. They develop the guidelines, criteria, and testing procedures that are responsive to the needs of the water quality industry and allow participants to demonstrate technical competence. They are also responsible for maintaining the quality of the examinations through continuous upgrading and review.

For current Committee members, contact the CWEA office.

## Overview of the Certification Process

To become certified all applicants must complete the following requirements:

1. Submit an application
2. Pay the application fee
3. Meet the minimum qualifications regarding professional experience
4. Pass the exam

Once an applicant successfully completes the requirements, they will be mailed their certificate. In order to maintain the certification once earned, certified individuals must continue to meet the following recertification requirements:

1. Submit 12 contact hours of continuing education every two years
2. Pay the annual renewal fee

## Certifications Offered by CWEA

- Collection Systems Maintenance, Grades 1-4
- Mechanical Technologist, Grades 1-4
- Electrical & Instrumentation, Grades 1-4
- Laboratory Analyst, Grades 1-4
- Environmental Compliance Inspector, Grades 1-4
- Advanced Water Treatment Operator, Grades 3-5
  - Offered in partnership with California-Nevada Section of the American Water Works Association. For more information visit [www.AWTOperator.org](http://www.AWTOperator.org).

Please note that the **Wastewater Treatment Plant Operator Certification** and **Drinking Water Treatment Plant Operator Certification** are administered by the State of California. To work on a drinking water treatment system, distribution system or in a wastewater treatment plant, an individual must have a valid operator certificate or an operator-in-training certificate from the State Water Board. For information about these programs, please contact the [State Water Board Office of Operator Certification](#).



## APPLICATION PROCESS

### Submitting an Application

Candidates must submit an application and be approved before they can schedule an exam. Applications can be faxed, emailed or mailed to the CWEA office at any time throughout the year. Applications are reviewed by CWEA TCP Staff and/or Subject Matter Experts. Once the application is processed, candidates are notified of their approval status via email. Please follow all instructions on the application carefully. Incomplete applications may delay approval. The application is available on the [Cert.CWEA.org](http://Cert.CWEA.org) website.

### Application Deadlines and Exam Windows

The year is divided into four exam windows, each with an application deadline. Applications are valid for one year from the first date of the applicant’s original exam window. Applicants may transfer exam windows throughout the year, for details see *Transferring Exam Windows* (p. 14).

Exam Windows	Exam Dates	Application Deadlines
FALL	October 1 <sup>st</sup> – December 31 <sup>st</sup>	August 31 <sup>st</sup>
WINTER	January 1 <sup>st</sup> – March 31 <sup>st</sup>	November 30 <sup>th</sup>
SPRING	April 1 <sup>st</sup> – June 30 <sup>th</sup>	February 28 <sup>th</sup>
SUMMER	July 1 <sup>st</sup> – September 30 <sup>th</sup>	May 31 <sup>st</sup>

### CWEA Application Fees

Current fees are listed on the application. Valid CWEA members qualify for a discounted member rate. The non-member rate includes a one-year CWEA membership. If an applicant does not wish to take advantage of the membership, they must note it on the application.



## Minimum Qualifications: Qualifying Education and Experience

Applicants must meet the minimum qualifications for the exam at the time the application is submitted. The table below gives the combinations of education and/or experience that will satisfy the requirements. There is no education or experience requirement to take any Grade 1 exam, however, the Grade 1 exams test at the level of one year of experience in the field. Education and experience should be relevant to the vocation and reflect the job knowledge for that grade level. Relevancy is at the sole discretion of CWEA. Applicant’s experience must be indicated on the application under “Job Duties”. Applicants should provide sufficient detail to demonstrate they possess the relevant experience. The best way to provide this information is to include the official job description for the position. Applicants consent to a thorough investigation of employment records and other qualifications in related activities for the purpose of verification of qualifications. CWEA may verify job history by contacting employers.

### ECI Certification Minimum Qualifications Chart

GRADE 1	
EDUCATION/CERTIFICATIONS	EXPERIENCE
None required to take test	None required to take test
GRADE 2	
EDUCATION/CERTIFICATIONS	EXPERIENCE
None	4 full-time years in vocation
Hold Grade 1 certificate in vocation for year	2 full-time years in vocation
Associate’s, or higher degree in related field	2 full-time years in vocation
Bachelor’s, or higher degree in related field	1 full-time years in vocation
GRADE 3	
EDUCATION/CERTIFICATIONS	EXPERIENCE
None	6 full-time years in vocation
Hold Grade 2 certificate in vocation for 2 years	4 full-time years in vocation
Associate’s, or higher degree in related field	4 full-time years in vocation
Bachelor’s, or higher degree in related field	3 full-time years in vocation

GRADE 4	
EDUCATION/CERTIFICATIONS	EXPERIENCE
None	8 full-time years in vocation with 1 year supervising others
Hold Grade 3 certificate in vocation for 2 years	6 full-time years in vocation with 1 year supervising others
Associate's, or higher degree in related field	6 full-time years in vocation with 1 year supervising others
Bachelor's, or higher degree in related field	5 full-time years in vocation with 1 year supervising others

## Application Approval

Once an application has been approved, the applicant will receive a Certification Application Approval Notification via email. It is very important that applicants use a current email address when filling out the application. CWEA will only contact applicants in regard to their application status via email. The Certification Application Approval Notification will contain the certification exam the applicant has been approved for, the exam window and CWEA ID number. This ID number is needed when contacting Pearson VUE to schedule an exam appointment.

## Rejected Application

Applications will be rejected if applicants do not meet all requirements at the time they apply. CWEA will refund the application fee minus a \$50 admin fee. Refunds are automatically issued within two weeks of rejection to the original form of payment. Candidates may request that their rejected application be reviewed by the Technical Certification Program Executive Committee by submitting a request in writing to [tcpcommittee@cwea.org](mailto:tcpcommittee@cwea.org).

## Code of Ethics

All CWEA certification holders and applicants are expected to meet the following standards of professional conduct and ethics:

1. To protect public health, themselves, their co-workers, property, and the environment by performing the essential duties of the CWEA certified vocation safely and effectively, and complying with all applicable federal, state and local regulations.
2. To represent themselves truthfully and honestly throughout the entire certification process.
3. To adhere to all test site rules and make no attempt to complete the test dishonestly or to assist any other person in doing so.
4. To refrain from activities that may jeopardize the integrity of the Technical Certification Program.

The CWEA Code of Ethics establishes basic values and standards of conduct for certification applicants and certification holders. Any action of a certification holder or applicant that compromises the reliability of the certification process may be subject to the process described by the Ethics Procedures.

The Ethics Procedures provide a fair process for dealing with ethics complaints. The procedures define the participants in an ethics case and how each case will be handled. Individuals going through the process will be given opportunities to defend themselves and appeal any decisions made. The Ethics Officer handles all official ethics complaints and determines if there is enough merit in each case to follow through with the procedures. If appropriate, the Ethics Officer may suggest mediation to resolve ethics disputes without the formality of going through the entire procedural process. This information is paraphrased for clarity from the 05-01 CWEA Code of Ethics and Ethics Procedures.

A full copy of the policy can be requested by contacting the TCP department.

Some examples of violations would be:

- Providing false work history on an application
- Using prohibited reference materials during a test
- Taking test materials from a test site
- Falsifying documentation of continuing education contact hours

Any action that might undermine CWEA's process of certifying basic minimal competency will be investigated.

## Non-Discrimination Policy

CWEA does not discriminate among applicants on the basis of age, gender, race, religion, national origin, disability, sexual orientation or marital status.

## Accommodations

In compliance with the Americans with Disabilities Act, reasonable accommodations will be provided for those individuals who provide CWEA with a physician's certificate, or its equivalent, documenting a physical or psychological disability that may affect the individual's ability to successfully complete the certification examination. Written requests for reasonable accommodations must be submitted with the application.

Language barriers and lack of familiarity with computers are not covered under ADA laws.

## Privacy

CWEA is committed to protecting privacy. Exam results and any other information regarding an application are confidential and will only be released to the applicant. Basic certification information is available on our [Certification Registry](#). Employers can use the registry to verify an individual's certification status.

## Out-of-State Programs

Anyone anywhere in the United States can apply for CWEA certification. Our certifications are specific to the state of California.

CWEA partners with the following water environment associations to administer certification exams for their members:

- Hawaii Water Environment Association
- Michigan Water Environment Association

Candidates wishing to earn certification through one of those associations should be sure to use the correct application that is specific to that association.

## Reciprocity

CWEA does not grant certification by reciprocity. For other certification programs that do offer reciprocity, CWEA will provide any information necessary for verification upon request.

## SCHEDULING AN EXAM

### Scheduling an Exam Appointment

Once an applicant receives the approval notification email, they will be eligible to schedule an exam appointment. Applicants can schedule an exam appointment through [Pearson VUE's website](#) by creating an account or by logging into an existing account. The applicant's CWEA ID number is needed when creating an account. The CWEA ID number can be found in the approval notification email. To schedule an appointment over the phone, call Pearson VUE at 888-749-3881. Test centers are conveniently located throughout the U.S. Locations can be found on [Pearson VUE's Test Center Search](#).

### Online Proctored Exams

Online proctoring is available for CWEA exams. If available, candidates will be notified in their approval email of the option to schedule their exam online versus at an in-person test center. Candidates should examine both options before making the choice that is best for them. Candidates will make their selection at the time when they schedule their exam.

Online proctored exams are a convenient way to take an exam at home or at work. Candidates will complete a check in process and are monitored online by a live proctor. **An onscreen calculator and white board are provided, no physical calculators or scratch paper are allowed.**

For more information about the online proctored experience, please see: <https://home.pearsonvue.com/cwea/onvue>. Please review the system requirements and Pearson Vue policies and procedures for online proctored exams before you schedule your appointment. You will be required to accept and comply with these policies.

To take an online proctored exam, candidates must meet the system requirements. If a candidate is testing at work, they should check with their Network Administrator or IT Professional that their system meets the requirements.

**It is the candidate's responsibility to ensure they meet the system requirements prior to their appointment time.** If a candidate does not meet the system requirements, they will not be able to complete their exam and will need to reschedule.

## Canceling an Existing Appointment

To cancel an appointment, applicants must notify Pearson VUE 24 hours before their scheduled appointment time. Failure to notify Pearson VUE at least 24 hours before the existing appointment will result in an \$85 No Show fee. Pearson VUE will send applicants a Cancellation Confirmation to the email on file in their Pearson VUE account.

The following are considered No Shows and will result in an \$85 No Show fee:

- Failing to appear at a scheduled test appointment
- Failing to check-in for an online appointment
- Arriving at the test center without a current, government-issued photo ID
- Arriving at the test center 15 minutes or later to a scheduled test appointment

Applicants must pay the No Show fee to schedule a new test appointment. Applicants should contact the CWEA office to reschedule.

## Rescheduling an Exam Appointment

To reschedule an existing appointment within the same exam window, applicants must call Pearson VUE directly at least 24 hours before their existing exam appointment, for details see *Canceling an Existing Appointment* (p. 14).

Applicants must contact the CWEA office to reschedule (transfer) an existing exam appointment to a different exam window. Before contacting CWEA, the applicant must cancel their existing appointment.

## Transferring Exam Windows

Applications are valid for one year from the first date of the applicant's original test window. Applicants may transfer exam windows throughout the year. The first transfer is complimentary, subsequent transfers are \$50.

Applicants can request a transfer at any time. If an applicant does not test by the last date of their original exam window, CWEA will automatically initiate a transfer and the applicant will be notified via email.

## PREPARING FOR THE EXAM

### Environmental Compliance Inspector Certification Scope

Specifications	Grade 1	Grade 2	Grade 3	Grade 4
Brief description of the Grade Level in relation to the job family.	Entry and basic working level.	Skilled or journey level.	Lead/advanced technical level.	Program manager level.
Level of knowledge, skill and ability within the job family, in relation to job tasks, including the taxonomic level of knowledge applied on the job.	Basic knowledge and ability, as needed to safely and effectively perform basic tasks. This includes: recall and recognition, comprehension, and application.	Knowledge and ability to safely and effectively accomplish most technical tasks in the job family.  This includes: comprehension, application, and analysis.	Knowledge, skill and ability to safely and effectively accomplish and coordinate complex tasks.  This includes: application, analysis and synthesis.	Knowledge, skill and ability to administer, coordinate and manage complex programs across vocations.  This includes: analysis, synthesis, and evaluation.
Level of supervision received.	Receives direct supervision.	Receives limited supervision.	Receives general direction.	May receive broad direction.
Level of supervision exercised.	None.	May provide technical direction over other staff.	Will oversee and direct complex tasks performed by others.	Will coordinate program activities within or across vocations.
Level of training provided to other personnel.	None.	May train lower level personnel.	May oversee a training program.	Designs and administers training programs within the job family.
Use of tools.	Will recognize the basic tools of the job family.	Will be able to apply most of the tools used by those in the job family.	Will select tools for individuals and teams in relation to specific problems.	Manages and evaluates systems and facilities.



Specifications	Grade 1	Grade 2	Grade 3	Grade 4
Problem solving and troubleshooting responsibilities.	Follows directions.	Troubleshoots and solves common problems.	Troubleshoots and solves complex problems.	Evaluates program effectiveness and takes corrective actions as needed.
Actions in relation to safety problems.	Recognizes unsafe conditions.	Recognizes and corrects unsafe conditions.	Anticipates and prevents unsafe conditions.	Designs and administers safety programs.
Actions in relation to standard operating procedures (S.O.P.s), laws and regulations.	Has the ability to follow S.O.P.s.	Has the ability to understand and apply S.O.P.s, laws and regulations.	Formulates new S.O.P.s, in compliance with laws and regulations.	Assures program compliance with laws and regulations.
Actions in relation to documentation of work activities.	Completes minimal work process documentation.	Completes routine work process documentation.	Responsible for detailed technical report writing and review.	Responsible for quality assurance of program documentation.

## Exam Content

CWEA's Technical Certification Program Environmental Compliance Inspector exams are based on exam blueprints that outline the exam content and are periodically reviewed by CWEA Subject Matter Experts. An exam blueprint is based on a job task analysis that includes research of the essential duties of an Environmental Compliance Inspector worker at a representative cross-section of systems and facilities in California. The Environmental Compliance Inspector Certifications were last reviewed by Subject Matter Experts in 2016.

The exam content outlines that follows presents content covered on the Environmental Compliance Inspector exams and shows the amount of the exam devoted to each KSA in the column labeled % on the exam.

## ECI GRADE 1 EXAM CONTENT OUTLINE

KSA	Exam Content Outline	% on exam
101	<p>Use, as directed, appropriate sampling locations, equipment and procedures; collect representative samples in accordance with the District's quality assurance program of wastewater and water from industrial, commercial, residential, and institutional sources, various clarifiers or sumps, storm sewers, grease traps/interceptors and sample receiving waters affected by contaminants.</p> <ul style="list-style-type: none"> <li>▪ Understand best practices in approved sampling techniques and preservatives when sampling.</li> <li>▪ Understand how to balance chemical equations, identify acids and bases, and perform basic dilutions and neutralization calculations.</li> <li>▪ Recall how to calculate pH of an aqueous solution.</li> <li>▪ Complete understanding of the following terms: pH, turbidity, grab sample, field blanks, specific conductance, correlation between BOD and COD.</li> <li>▪ Understand the requirements for the use of field blanks and grab samples.</li> <li>▪ Demonstrate how to balance chemical equations, identify acids and bases, and perform basic dilutions and neutralization calculations.</li> </ul>	7%
102	<p>Complete appropriate documentation, including inspection reports and chain of custody documentation.</p> <ul style="list-style-type: none"> <li>▪ Recognize importance of proper Chain of Custody procedures, and consequences of breaking such procedures.</li> <li>▪ Select what information should be included on an inspection report.</li> <li>▪ Explain proper sampling techniques, including the necessary containers, required preservatives, and essential information needed to complete a Chain of Custody.</li> </ul>	5%
103	<p>Perform field and laboratory tests and/or coordinates laboratory testing with appropriate lab personnel.</p> <ul style="list-style-type: none"> <li>▪ Demonstrate awareness of the gases and chemical compounds a field test will identify.</li> <li>▪ Explain how to satisfy the requirements of regulatory compliance sampling, ability to accurately identify Total Toxic Organics.</li> <li>▪ Operate essential field equipment with complete understanding of their specific uses, the limitations the equipment may have, and necessary preparation for a field test and their limitations.</li> </ul>	4%

KSA	Exam Content Outline	% on exam
104	<p>Inspect industrial and commercial pretreatment facilities for compliance with local wastewater discharge ordinances and permits, federal regulations and state regulations.</p> <ul style="list-style-type: none"> <li>▪ Understand how to respond to facility violations during the inspection process and explain reverse osmosis and its use in Industrial processes.</li> <li>▪ Understand Federal Water Pollution Control Act of 1972 requirements for industrial wastewater dischargers.</li> <li>▪ Understand common pollutants and wastewater contaminants in oil refinery facilities and circuit board industries.</li> <li>▪ Identify who is responsible for enforcing pretreatment requirements as stated in the Clean Water Act.</li> <li>▪ Understand specific statements of the 1977 Clean Water Act regarding structure for regulating discharges of pollutants into the waters of the United States.</li> <li>▪ Understand categorical industrial processes as defined by the US EPA.</li> <li>▪ Compare and contrast concurrent rinse tanks and counter current tanks.</li> <li>▪ Describe photo, x-ray, and silver removal processes from waste streams.</li> <li>▪ Understand Significant Non-Compliance.</li> <li>▪ Demonstrate full understanding of an Inspector's right to enter an Industrial User facility, and conduct an unannounced or unscheduled inspection.</li> </ul>	9%
105	<p>Inspect industrial and commercial businesses for compliance with federal, state and local regulations related to pollution prevention and storm water requirements.</p> <ul style="list-style-type: none"> <li>▪ Understand terms and definitions regarding: storm water, pollution prevention hierarchy and goals, and abbreviations commonly associated with water pollution control.</li> <li>▪ Understand hierarchy levels of Environmental Management methods as outlined by Congress in 1990.</li> <li>▪ Recognize non-compatible pollutants, and explain the chemistry that occurs in the Sewer Sanitary lines.</li> <li>▪ Understand rules for applying Categorical Pretreatment Standards for an Industrial User's wastewater regarding dilution.</li> </ul>	9%

KSA	Exam Content Outline	% on exam
	<ul style="list-style-type: none"> <li>▪ Understand proper spill response procedures and identify the primary goal when responding to a spill.</li> </ul>	
106	<p>Inspect pretreatment devices such as grease traps, interceptors, clarifiers, and silver recovery units (SRUs) for proper operation and maintenance.</p> <ul style="list-style-type: none"> <li>▪ Calculate detention time, and minimum size of an interceptor using a set of given parameters. Knowledge of a clarifier capacity, operating with proper levels.</li> <li>▪ Identify which gases can be generated in grease interceptors.</li> <li>▪ Understand processes involved in removal of Heavy Metals in waste streams.</li> <li>▪ Explain ORP meters and its uses in Industrial Processes.</li> <li>▪ Describe how Silver Recovery Units (SRUs) are used.</li> </ul>	6%
107	<p>Clean, inspect, and maintain sampling equipment, meters and related test apparatus.</p> <ul style="list-style-type: none"> <li>▪ Calibrate sampling equipment and gas detectors.</li> <li>▪ Understand proper use of sampling equipment, field blanks, and the importance of Quality Assurance when sampling.</li> <li>▪ Describe proper preservation methods according to 40 CFR 136.</li> </ul>	4%
108	<p>Use sampling equipment, meters, related test apparatus, and other tools as instructed.</p> <ul style="list-style-type: none"> <li>▪ Explain the effect high alkalinity has on a collections system.</li> <li>▪ Choose the proper sampling pump in a given situation.</li> <li>▪ Recall different types of sampling: composite, grab, flow-proportional, and discrete.</li> <li>▪ Understand pH meter calibration methods.</li> </ul>	5%
109	<p>Assist in call-outs and investigate and trace the sources of illegal or nuisance waste discharges entering the control authority's stormwater or wastewater collection systems.</p> <ul style="list-style-type: none"> <li>▪ Understand how to activate emergency response procedures as an inspector.</li> <li>▪ Understand industrial spill procedures.</li> <li>▪ Understand 40 CFR 403.5. National Pretreatment Standards: Prohibited Discharges.</li> </ul>	3%
110	<p>Support customer service activities by responding to inquiries and/or referring them to the appropriate level; interacting cooperatively with</p>	4%

KSA	Exam Content Outline	% on exam
	internal and external customers; and, providing feedback to appropriate staff. <ul style="list-style-type: none"> <li>▪ Understand inspection procedures and effective/appropriate communication with Industrial Users.</li> <li>▪ Determine who or what has legal authority of a POTW and the authority granted to a POTW by federal guidelines.</li> </ul>	
111	<b>Observe proper safety procedures, rules, regulations, and practices, including use of personal protective equipment (PPE).</b> <ul style="list-style-type: none"> <li>▪ Identify maximum safe sound levels in the workplace.</li> <li>▪ Recognize exposure limits of pollutants in the workplace.</li> <li>▪ Recall what a confined space is, its dangers and the different permits associated with them.</li> <li>▪ Identify common gases encountered in a sewer system and recognize gas detector alarm set points.</li> <li>▪ Identify best practices when undergoing fit tests for respirators.</li> </ul>	8%
112	<b>Record data and observations relating to commercial, industrial, and residential inspections.</b> <ul style="list-style-type: none"> <li>▪ Calculate the density of liquids and which values to report, gallons that are discharged per day, and flow rate.</li> <li>▪ Understand how to convert liquid measurements.</li> <li>▪ Indicate what needs to be including in an inspector's field notebook.</li> <li>▪ Describe procedures an inspector should take when observing an irregular discharge during an inspection.</li> </ul>	6%
113	<b>Maintain equipment, materials, and worksites in an orderly and safe fashion, in accordance with policies and procedures.</b> <ul style="list-style-type: none"> <li>▪ Select the types of confined spaces as described by OSHA.</li> <li>▪ Identify concentrations of flammable gases that will cause combustion.</li> <li>▪ Explain what pathogens are, and how they thrive in an environment.</li> <li>▪ Know how to monitor gases in a space using a gas detector.</li> <li>▪ Understand procedures to take when observing unsafe conditions at facility inspections.</li> </ul>	6%
114	<b>Keep current on pertinent information and developments in environmental compliance functional areas.</b>	3%

KSA	Exam Content Outline	% on exam
	<ul style="list-style-type: none"> <li>▪ Identify the best sources in order to stay current on pretreatment regulations.</li> <li>▪ Recall temperatures that must be maintained for organic substances, according to 40 CFR 136.</li> <li>▪ Understand sources of information that workers in an Industrial User site must have access to.</li> </ul>	
115	<p>Assist in maintaining program compliance with federal, state and local requirements through the issuing of permits and by guiding noncompliant users back to compliance.</p> <ul style="list-style-type: none"> <li>▪ Explain the inspection frequency for all Significant Industrial Users.</li> <li>▪ Understand terms and definitions relating to indirect and permitted dischargers.</li> <li>▪ Describe the federal regulations regarding pollutants and permitted dischargers, and control dischargers.</li> <li>▪ Identify the effectiveness of wastewater permits.</li> </ul>	5%
116	<p>Observe and record field conditions such as effluent, flow meter readings, pH, ORP, selective ion, atmospheric gas monitoring levels, and other field test results during a visit to the industrial and/or commercial user.</p> <ul style="list-style-type: none"> <li>▪ Calculate volume unit conversions.</li> <li>▪ Detect hazardous levels of combustibles using a specific monitor.</li> <li>▪ Recognize flow measurement systems.</li> <li>▪ Report the parameters that must be recorded as field tests.</li> </ul>	4%
117	<p>Collect information from commercial and industrial users needed to assess sewer impact fees; perform flow and other calculations necessary to determine such fees.</p> <ul style="list-style-type: none"> <li>▪ Understand how to measure and calculate sewer use fees.</li> </ul>	2%
118	<p>Provide input and assistance in the preparation of written and oral reports; update field inspection records.</p> <ul style="list-style-type: none"> <li>▪ Determine when to calculate a facilities water usage.</li> <li>▪ Outline what inspectors should look for when recording field notes.</li> <li>▪ Understand terms and acronyms relating to hazardous materials.</li> <li>▪ Understand how to review Safety Data Sheets and identify when additional information is required.</li> </ul>	5%
119	<p>Perform sampling of sanitary sewer overflows (SSOs) where appropriate.</p>	5%

KSA	Exam Content Outline	% on exam
	<ul style="list-style-type: none"> <li>▪ Recall the different categories of sanitary sewer overflows, the required notifications, and reporting.</li> <li>▪ Identify what sampling procedures and precautions that must be taken when dealing with SSO.</li> </ul>	

## Suggested References

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This list does **not** include all the available textbooks and materials for studying for this exam. Candidates are strongly encouraged to seek additional material, training, and experience, especially in content areas for which the candidate is not adequately prepared. Candidates are encouraged to prepare for CWEA certification exams using as many different study materials as possible plus education events and on-the-job training. Candidates are encouraged to develop their own personal study plan based on individual needs and knowledge.

KSA	Suggested References <i>This list is not intended to be an endorsement of any of the publications listed.</i>
101	<ul style="list-style-type: none"> <li>▪ Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Chapter 6 (6.0-6.6), Chapter 9 (9.0-9.1)</li> <li>▪ Federal Register: Table II Required Containers, Preservation Techniques, and Holding Times</li> <li>▪ Industrial Users Inspection and Sampling Manual for POTWs, 2017</li> </ul>



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102	<ul style="list-style-type: none"> <li>▪ Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Chapter 6 (6.0-6.6), Chapter 6 Appendix F-Chain of Custody Procedures</li> <li>▪ Industrial Users Inspection and Sampling Manual for POTWs, 2017</li> </ul>
103	<ul style="list-style-type: none"> <li>▪ Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Chapter 6 (6.2-6.3)</li> <li>▪ Industrial Users Inspection and Sampling Manual for POTWs, 2017</li> </ul>
104	<ul style="list-style-type: none"> <li>▪ Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Chapter 1 (1.01-1.2), Chapter 3 (3.0-3.2), Chapter 4 (4.1-4.3), Chapter 10 (10.3)</li> <li>▪ Industrial Users Inspection and Sampling Manual for POTWs, 2017</li> </ul>
105	<ul style="list-style-type: none"> <li>▪ Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Chapter 1 (1.0-1.4), Chapter 8 (8.1-8.3), Chapter 9 (9.0-9.3)</li> </ul>
106	<ul style="list-style-type: none"> <li>▪ Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Chapter 9 (9.3), Chapter 10 (10.3)</li> </ul>
107	<ul style="list-style-type: none"> <li>▪ Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Chapter 5 (5.2-5.3), Chapter 6</li> </ul>
108	<ul style="list-style-type: none"> <li>▪ Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Chapter 6 Appendix C, Chapter 7 (7.4-7.8), Chapter 8 (8.4-8.5)</li> <li>▪ Industrial Users Inspection and Sampling Manual for POTWs, 2017</li> </ul>
109	<ul style="list-style-type: none"> <li>▪ Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Chapter 6 (6.4-6.6), Chapter 11 (11.0-11.6)</li> </ul>
110	<ul style="list-style-type: none"> <li>▪ Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Chapter 1, Chapter 4 (4.2-4.3)</li> </ul>
111	<ul style="list-style-type: none"> <li>▪ Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Chapter 5 (5.0-5.5)</li> <li>▪ Industrial Users Inspection and Sampling Manual for POTWs, 2017</li> </ul>
112	<ul style="list-style-type: none"> <li>▪ Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Appendix II- Pretreatment Arithmetic.</li> </ul>
113	<ul style="list-style-type: none"> <li>▪ Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Chapter 5 (5.1-5.2)</li> </ul>
114	<ul style="list-style-type: none"> <li>▪ Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Chapter 5 (5.0-5.1)</li> <li>▪ 40 CFR 136 Table II</li> </ul>
115	<ul style="list-style-type: none"> <li>▪ Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Chapter 3, Appendix III-Pretreatment Words</li> </ul>

KSA	Suggested References <i>This list is not intended to be an endorsement of any of the publications listed.</i>
116	<ul style="list-style-type: none"> <li>▪ Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Appendix II- Pretreatment Arithmetic</li> <li>▪ Industrial Users Inspection and Sampling Manual for POTWs, 2017</li> </ul>
117	<ul style="list-style-type: none"> <li>▪ Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Appendix II- Pretreatment Arithmetic</li> </ul>
118	<ul style="list-style-type: none"> <li>▪ Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Chapter 4 (4.4-4.6), Chapter 5 (5.0-5.2)</li> </ul>
119	<ul style="list-style-type: none"> <li>▪ Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Chapter 3 (3.4-3.6)</li> <li>▪ Industrial Users Inspection and Sampling Manual for POTWs, 2017</li> <li>▪ Enrollee’s Guide to the SSO Database: Sanitary Sewer Overflow Reduction Program, August 2013, State Water Resources Control Board</li> </ul>

## Publications in the Suggested Reference List

- 40 CFR 136 Table II
- Federal Register: Table II Required Containers, Preservation Techniques, and Holding Times
- [Industrial Users Inspection and Sampling Manual for POTWs, January 2017, U.S. Environmental Protection Agency](#)
- [Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010](#)
- [Enrollee’s Guide to the SSO Database: Sanitary Sewer Overflow Reduction Program, August 2013, State Water Resources Control Board](#)

## ECI GRADE 2 EXAM CONTENT OUTLINE

KSA	Exam Content Outline	% on exam
201	Review and evaluate non-complex permit applications, self-monitoring reports, facility modifications and pretreatment systems. <ul style="list-style-type: none"> <li>▪ Calculate size requirements of basin/containment structures.</li> <li>▪ Identify EPA requirements as it applies to a discharge permit system and discharge consent.</li> <li>▪ Understand mass limit requirements defined by National Pretreatment Standards.</li> <li>▪ Understand industrial waste plan check review and approval process.</li> </ul>	4%
202	Generates permits following established practices, policies, procedures internal guidelines and models. <ul style="list-style-type: none"> <li>▪ Understand terms and examples of Point-Source Pollution and Non-Point Source Pollution discharge.</li> <li>▪ Explain the effective control mechanism duration for a Significant Industrial User as outlined in 40 CFR 403.</li> </ul>	2%
203	Perform calculations related to industrial discharge permitting, including calculation of production-based and alternative limits. <ul style="list-style-type: none"> <li>▪ Calculate Production-Based and Mass-Based limits.</li> </ul>	2%
204	Thoroughly inspect pretreatment systems, facilities, and processes of industrial, commercial, residential, and institutional establishments for compliance with Federal, State, and local laws, rules regulations and codes that regulate wastewater pretreatment, pollution prevention and stormwater management. <ul style="list-style-type: none"> <li>▪ Describe the process of pollution prevention hierarchy assessments.</li> <li>▪ Identify pollutants of concern for a POTW that may arise with various industrial users.</li> <li>▪ Understand terms and definitions relating to organic loading, buffering capacity and infiltration.</li> <li>▪ Understand the Municipal Separate Storm Sewer System (MS4) permit and requirements.</li> <li>▪ Identify the paths in which water can infiltrate the sanitary sewer.</li> <li>▪ Identify the substances that are used in metal finishing procedures.</li> <li>▪ Understand the steps an inspector should take when responding to a suspected illicit discharge.</li> </ul>	9%

KSA	Exam Content Outline	% on exam
	<ul style="list-style-type: none"> <li>▪ Explain the effectiveness of dental amalgam regulations and requirements.</li> </ul>	
205	<p>Determine sampling locations and methods when necessary to reflect changed conditions.</p> <ul style="list-style-type: none"> <li>▪ Identify open channel flow rate measurement devices, and the specifics of Flumes and Weirs.</li> <li>▪ Choose appropriate cleaning methods for sampling equipment.</li> </ul>	2%
206	<p>Collect representative samples of water and wastewater from industrial, commercial, residential, institutional sources, and storm sewers.</p> <ul style="list-style-type: none"> <li>▪ Understand the various aspects of a sampling program.</li> <li>▪ Understand the required information that should, and should not be, included on a Chain of Custody.</li> <li>▪ Understand the limitations of split samples in the field.</li> <li>▪ Identify the proper location to take a wastewater sample in order to receive the best results.</li> </ul>	4%
207	<p>Use appropriate collection devices, containers and preservation techniques per Standard Methods.</p> <ul style="list-style-type: none"> <li>▪ Describe organic chemical analysis test methods as outlined in 40 CFR 136, Appendix A.</li> <li>▪ Understand preservation methods for samples as shown in 40 CFR Part 136.</li> </ul>	4%
208	<p>Perform basic field tests and/or coordinate with appropriate lab personnel on samples collected.</p> <ul style="list-style-type: none"> <li>▪ Understand terms and specifics relating to method blanks, turbidity, pH and temperature.</li> </ul>	4%
209	<p>Observe and record field conditions, meter readings, field test results, and other data relevant to sampling conditions and complete documentation.</p> <ul style="list-style-type: none"> <li>▪ Understand how to reduce conventional pollutants using sewage treatment methods.</li> <li>▪ Understand how to calculate flow rate, and Open Channel Flow Measurement devices.</li> <li>▪ Identify the best practices for taking grab samples.</li> </ul>	4%
210	<p>Respond to call-outs and investigate and trace the sources of illegal or nuisance waste discharges entering the control authority's stormwater or wastewater collection systems.</p>	4%

KSA	Exam Content Outline	% on exam
	<ul style="list-style-type: none"> <li>▪ Calculate and understand how to identify an illicit discharge in the sanitary sewer.</li> <li>▪ Understand time limit requirements Industrial Users must abide by when reporting self-monitoring violations.</li> <li>▪ Understand proper sampling procedures per 40 CFR 136.</li> </ul>	
211	<p>Undertake appropriate response and enforcement action after identifying noncompliance with local limits or other industrial waste discharge permit requirements; participate in enforcement hearings and monitor follow-up action.</p> <ul style="list-style-type: none"> <li>▪ Identify when assistance from local law enforcement might be needed when entering an inspection site.</li> <li>▪ Understand proper inspection protocol.</li> <li>▪ Understand and calculate Significant Non-Compliance violations such as, but not limited to: chronic effluent violations, and technical review criteria violations.</li> </ul>	4%
212	<p>Provide technical and other assistance to collections and operations personnel.</p> <ul style="list-style-type: none"> <li>▪ Identify the main functions of responding to spill incidents.</li> <li>▪ Understand all aspects of a gravity settling clarifier.</li> </ul>	2%
213	<p>Implement safety regulations and identify, correct and/or report unsafe conditions.</p> <ul style="list-style-type: none"> <li>▪ Understand proper protocol for opening a sewer manhole.</li> <li>▪ Ability to identify the different levels of personal protection for facilities and work sites.</li> <li>▪ Familiarity with Safety Data Sheets.</li> <li>▪ Identify flash point temperatures of liquids.</li> <li>▪ Recall traffic control requirements and devices.</li> </ul>	7%
214	<p>Explain environmental compliance regulations, requirements, and policies to business owners/operators, other government agencies, and the public.</p> <ul style="list-style-type: none"> <li>▪ Recognize examples of various categories of pollutants.</li> <li>▪ Understand terms and definitions relating to Significant Industrial Users, CERCLA, and RCRA.</li> <li>▪ Explain the main components of the Clean Water Act.</li> <li>▪ Identify EPA-regulated industrial categories.</li> </ul>	6%

KSA	Exam Content Outline	% on exam
	<ul style="list-style-type: none"> <li>▪ Know the limitations of a local ordinance and an inspector’s authority to inspect an Industrial User.</li> </ul>	
215	<p>Communicate professionally with customers and the public to report technical and/or specialized information clearly and concisely, and provide feedback, observations, education, and analysis related to stormwater and wastewater.</p> <ul style="list-style-type: none"> <li>▪ Familiarity with the steps that must be taken before acquiring samples between storm events as outlined in 40 CFR 122.21.</li> <li>▪ Understand terms and definitions regarding pollution prevention hierarchy, such as source reduction, refractory materials, precipitation/coagulation treatment, complex metals, and precipitation of metals.</li> <li>▪ Ability to respond to difficult situations during an inspection of a Significant Industrial User.</li> </ul>	6%
216	<p>Prepare written notices of requirements and violations of regulations.</p> <ul style="list-style-type: none"> <li>▪ Understand the procedures a POTW must adhere to when responding to noncompliance.</li> <li>▪ Understand Significant Non-Compliance Requirements and record keeping requirements.</li> <li>▪ Familiarity with an inspector’s responsibilities when conducting an investigation.</li> <li>▪ Familiarity with all aspects of a Control Authority’s Enforcement Response Plan.</li> </ul>	6%
217	<p>Plan and participate in public outreach activities, including the development of user specific best management practices, pollution prevention plans, and stormwater best management practices.</p> <ul style="list-style-type: none"> <li>▪ Understand terms and definitions relating to ion exchange tanks, water softeners, pollution prevention, waste minimization, and reverse osmosis units.</li> <li>▪ Identify benefits for industries that follow pollution prevention strategies.</li> <li>▪ Familiarity with Stormwater Construction Permit and waste minimization as outlined in 40 CFR 122.2.</li> </ul>	6%
218	<p>Research compliance history of facilities.</p> <ul style="list-style-type: none"> <li>▪ Identify Self-Monitoring Report requirements and specifics.</li> <li>▪ Recognize when a facility is in Significant Non-Compliance.</li> </ul>	2%
219	<p>Keep current on pertinent information and developments in environmental compliance.</p>	2%

KSA	Exam Content Outline	% on exam
	<ul style="list-style-type: none"> <li>▪ Ability to locate information relating to pretreatment regulations for specific industries.</li> </ul>	
220	<p>Analyze and implement federal, state, or local requirements as necessary to maintain approved pretreatment, pollution prevention, and stormwater programs.</p> <ul style="list-style-type: none"> <li>▪ Know policies and procedures for enforcement actions established by a POTW.</li> <li>▪ Familiarity with NPDES and Industrial User Permits.</li> <li>▪ Identify the Control Authorities responsibility in enforcing the Clean Water Act of 1977 and the levels of pretreatment equipment it required.</li> </ul>	4%
221	<p>Review compliance monitoring reports, such as toxic organic management plans (TOMPs), stormwater pollution prevention plans (SWPPPs), spill prevention control and countermeasure plans, slug discharge control plans, baseline and self monitoring reports, 90-day reports, periodic reports of continued compliance, and monitoring reports for compliance with federal, state, and local requirements.</p> <ul style="list-style-type: none"> <li>▪ Calculate concentrations of chemicals in illegal loads of wastewater.</li> <li>▪ Recognize noncompliance of Significant Industrial Users.</li> <li>▪ Identify required data needed for Baseline Monitoring Report, timeline reporting requirements for categorical dischargers and essentials that would constitute a SSO.</li> </ul>	6%
222	<p>Prepare written notices of requirements and violations of regulations.</p> <ul style="list-style-type: none"> <li>▪ Recall reporting requirements and the agency that should be notified in the event of a SSO.</li> <li>▪ Understand Metal Finishing and how it could affect a POTW.</li> </ul>	2%
223	<p>Research tenant occupancy use(s) and classification(s) and respond to inquiries concerning sewer impact fees.</p> <ul style="list-style-type: none"> <li>▪ Ability to calculate penalties for exceeding discharge limitations.</li> <li>▪ Determine which agency has the authority to change an IU's assigned category.</li> </ul>	2%
224	<p>Identify and verify wastewater strength, including calculating sewer impact fees.</p> <ul style="list-style-type: none"> <li>▪ Understand all aspects of a grease Interceptor, sizing requirements and clarifier calculations.</li> <li>▪ Calculate annual sewer service fees, organic loading and wastewater strength.</li> </ul>	4%



KSA	Exam Content Outline	% on exam
225	Provide management with information and recommendations. <ul style="list-style-type: none"> <li>▪ Understand policies when dealing with IU's confidential records and ability to properly identify an IU's category.</li> </ul>	2%

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201	<ul style="list-style-type: none"> <li>▪ Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Chapter 1 (1.0-1.4), Chapter 2 (2.3-2.36)</li> <li>▪ 40 CFR 403</li> </ul>
202	<ul style="list-style-type: none"> <li>▪ Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Chapter 3 (3.2-3.3), Appendix II- Pretreatment Arithmetic</li> <li>▪ 40 CFR 403</li> </ul>

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204	<ul style="list-style-type: none"> <li>▪ Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Chapter 1 (1.0-1.2), Chapter 9 Appendix - Pollution Prevention Opportunity Checklists, Chapter 10 (10.3-10.5), Appendix II- Pretreatment Arithmetic</li> <li>▪ Industrial Users Inspection and Sampling Manual for POTWs, January 2017, U.S. Environmental Protection Agency</li> <li>▪ 40 CFR 403</li> </ul>
205	<ul style="list-style-type: none"> <li>▪ Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Chapter 6, Chapter 7 (7.0-7.5)</li> </ul>
206	<ul style="list-style-type: none"> <li>▪ Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Chapter 6</li> <li>▪ Industrial Users Inspection and Sampling Manual for POTWs, January 2017, U.S. Environmental Protection Agency</li> </ul>
207	<ul style="list-style-type: none"> <li>▪ Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Chapter 6, Table 6.1</li> </ul>
208	<ul style="list-style-type: none"> <li>▪ Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Chapter 6, Table 6.1, Chapter 7 (7.0-7.2)</li> </ul>
209	<ul style="list-style-type: none"> <li>▪ Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Chapter 6, Table 6.1, Chapter 7 (7.0-7.5), Appendix II- Pretreatment Arithmetic</li> </ul>
210	<ul style="list-style-type: none"> <li>▪ Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Chapter 3 (3.0-3.4), Chapter 6, Appendix II- Pretreatment Arithmetic</li> </ul>
211	<ul style="list-style-type: none"> <li>▪ Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Chapter 3 (3.4-3.5), Chapter 4 (4.0-4.4)</li> </ul>
212	<ul style="list-style-type: none"> <li>▪ Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Chapter 1 (1.0-1.4)</li> </ul>
213	<ul style="list-style-type: none"> <li>▪ Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Chapter 4 (4.0-4.3), Chapter 5 (5.0-5.5) and Appendices A-D, Chapter 11</li> </ul>
214	<ul style="list-style-type: none"> <li>▪ Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Chapter 1 (1.0-1.13), Chapter 2 (2.5-2.8) and Appendix A, Chapter 5 (5.2-5.3)</li> <li>▪ 40 CFR 403</li> <li>▪ California Manual on Uniform Traffic Control Devices, 2014 Edition, California Department of Transportation</li> </ul>

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	<ul style="list-style-type: none"> <li>▪ Introduction to the National Pretreatment Program, June 2011, U.S. Environmental Protection Agency</li> </ul>
215	<ul style="list-style-type: none"> <li>▪ Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Chapter 1, Chapter 3 (3.4-3.5), Chapter 4 (4.0-4.4), Chapter 9 (9.3-9.4)</li> <li>▪ 40 CFR 122</li> </ul>
216	<ul style="list-style-type: none"> <li>▪ Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Chapter 3 and Appendix F</li> </ul>
217	<ul style="list-style-type: none"> <li>▪ Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Chapter 1, Chapter 9 (9.3-9.4)</li> <li>▪ Best Management Practices For Industrial Storm Water Pollution Control, Sacramento Stormwater Management Program.</li> </ul>
218	<ul style="list-style-type: none"> <li>▪ Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Chapter 3</li> <li>▪ 40 CFR 403</li> </ul>
219	<ul style="list-style-type: none"> <li>▪ Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Chapter 1</li> <li>▪ 40 CFR 403</li> <li>▪ EPA National Pollutant Discharge Elimination System (NPDES) website</li> </ul>
220	<ul style="list-style-type: none"> <li>▪ Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Chapter 1, Chapter 2 (Lessons 1-3)</li> <li>▪ EPA National Pollutant Discharge Elimination System (NPDES) website</li> </ul>
221	<ul style="list-style-type: none"> <li>▪ Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Appendix II- Pretreatment Arithmetic</li> <li>▪ 40 CFR 403</li> </ul>
222	<ul style="list-style-type: none"> <li>▪ Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Chapter 2</li> <li>▪ State Water Resources Control Board Order No. 2006-0003-DWQ</li> </ul>
223	<ul style="list-style-type: none"> <li>▪ Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Appendix II- Pretreatment Arithmetic</li> <li>▪ 40 CFR 403</li> </ul>
224	<ul style="list-style-type: none"> <li>▪ Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Chapter 2, Appendix II- Pretreatment Arithmetic</li> </ul>
225	<ul style="list-style-type: none"> <li>▪ Introduction to the National Pretreatment Program, June 2011, U.S. Environmental Protection Agency</li> <li>▪ Industrial Users Inspection and Sampling Manual for POTWs, January 2017, U.S. Environmental Protection Agency</li> </ul>

## Publications in the Suggested Reference List

- 40 CFR 403
- 40 CFR 122
- [State Water Resources Control Board Order No. 2006-0003-DWQ](#)
- [California Manual on Uniform Traffic Control Devices, 2014 Edition, California Department of Transportation](#)
- [Best Management Practices For Industrial Storm Water Pollution Control, Sacramento Stormwater Management Program](#)
- [EPA National Pollutant Discharge Elimination System \(NPDES\) website](#)
- [Introduction to the National Pretreatment Program, June 2011, U.S. Environmental Protection Agency](#)
- [Industrial Users Inspection and Sampling Manual for POTWs, January 2017, U.S. Environmental Protection Agency](#)
- [Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010](#)

## ECI GRADE 3 EXAM CONTENT OUTLINE

KSA	Exam Content Outline	% on exam
301	<p>Assist with the review and evaluation of highly complex permit applications, discharge reports, facility modifications and pretreatment systems.</p> <ul style="list-style-type: none"> <li>▪ Understand heavy metal removal processes.</li> <li>▪ Understand timelines involved with meeting schedules as outlined in Categorical Pretreatment Standards.</li> <li>▪ Understand Significant Industrial Users required reports and prohibited materials identified per 40 CFR 403.</li> </ul>	4%
302	<p>Issue permits following established practices, policies, procedures, internal guidelines and models. Establish models and procedures when appropriate.</p> <ul style="list-style-type: none"> <li>▪ Ability to identify exemptions and procedures available per 40 CFR 403.</li> <li>▪ Understand fundamental elements and requirements a control mechanism must contain.</li> <li>▪ Identify Significant Non-Compliance, and the appropriate level of enforcement that should be taken.</li> </ul>	3%
303	<p>Assess the possible effects of a proposed discharge on the treatment plant and collection system, and initiate appropriate follow-up activities.</p> <ul style="list-style-type: none"> <li>▪ Understand the removal of metal hydroxides from wastestreams.</li> <li>▪ Calculate the materials needed to neutralize acids.</li> </ul>	3%
304	<p>Inspect a variety of pretreatment systems, facilities and processes of industrial, commercial, residential, and institutional establishments for compliance with federal, state, and local regulations related to pretreatment, pollution prevention and stormwater. Report findings to the appropriate authority.</p> <ul style="list-style-type: none"> <li>▪ Understand the purpose for metals removal and different heavy metal treatments in wastestreams.</li> <li>▪ Recall the various types of cyanide removal from wastewater and commonly used sludge dewatering and disposal methods.</li> <li>▪ Familiarity with Storm Water Pollution Prevention Plans.</li> <li>▪ Calculate flow rate when using a rinse tank and determine solubility.</li> </ul>	7%
305	<p>Verify user classification, research compliance history of facility, and collect data used to evaluate compliance with applicable standards and to establish sewer service charges.</p>	4%

KSA	Exam Content Outline	% on exam
	<ul style="list-style-type: none"> <li>▪ Calculate loading of materials in user discharges.</li> <li>▪ Understand terms and definitions relating to organic analysis, and new sources as described by the Clean Water Act.</li> <li>▪ Recognize noncompliance in Significant Industrial Users.</li> </ul>	
306	<p>Assist with the development of appropriate inspection procedures, and sampling locations and methodology, for a broad variety of industrial users.</p> <ul style="list-style-type: none"> <li>▪ Understand National Pretreatment Standards.</li> <li>▪ Recognize correct safety procedures, and employees tasked with enforcing a safe workplace.</li> <li>▪ Familiarity with Significant Industrial User inspections and proper sampling procedures.</li> </ul>	3%
307	<p>Organize, plan, supervise, and review the activities, work and performance of supervised employees; use software programs to track and report performance.</p> <ul style="list-style-type: none"> <li>▪ Understand how to delegate and evaluate an employee's work performance.</li> </ul>	3%
308	<p>Assist management with employee development and training programs and division performance standards.</p> <ul style="list-style-type: none"> <li>▪ Ability to manage and create pertinent training opportunities for an employee's development as it relates to work performance.</li> </ul>	3%
309	<p>Provide initial employee counseling and refer employee relations matters to the appropriate authority.</p> <ul style="list-style-type: none"> <li>▪ Understand the effective skills a supervisor should utilize while handling employee issues.</li> </ul>	2%
310	<p>Provide instruction and training to staff in the techniques of sampling and inspection, the application of laws, codes, ordinances and procedures governing implementation and enforcement of pretreatment regulations and other activities</p> <ul style="list-style-type: none"> <li>▪ Understand the purpose for an industrial wastewater discharge permit.</li> <li>▪ Identify the pertinent elements of a pretreatment program's Enforcement Response Plan.</li> <li>▪ Ability to develop an employee's skills and job performance.</li> </ul>	3%
311	<p>Collaborate with POTW and collection systems personnel to resolve issues related to industrial discharge, sanitary sewer overflows (SSOs) and Waste Discharge Requirements (WDRs).</p>	4%

KSA	Exam Content Outline	% on exam
	<ul style="list-style-type: none"> <li>▪ Ability to identify and how to properly respond to a Sanitary Sewer Overflow.</li> <li>▪ Identify specific components of the California Integrated Water Quality System Project database.</li> </ul>	
312	<p>Provide internal and inter-agency coordination based on information from the field, and analyze and make recommendations on additional actions; share technical and/or specialized information with staff.</p> <ul style="list-style-type: none"> <li>▪ Ability to identify Certified Unified Program Agencies violations.</li> <li>▪ Ability to execute a purposeful meeting with other employees.</li> </ul>	3%
313	<p>Supervise both scheduled and immediate investigations to trace sources of illegal waste discharges entering the collection system and enforcement activities related to illicit stormwater discharges.</p> <ul style="list-style-type: none"> <li>▪ Understand the protocol that must be followed when inspecting and investigating an illicit discharge for various commercial businesses.</li> </ul>	3%
314	<p>Respond to and coordinate call-outs; initiate and develop appropriate responses and enforcement activities.</p> <ul style="list-style-type: none"> <li>▪ Understand protocol when responding to an unknown material in the sanitary sewer and how to activate emergency response personal.</li> </ul>	2%
315	<p>Represent the program and/or agency in meetings of regional task forces, committees, work groups, outside agencies and the public.</p> <ul style="list-style-type: none"> <li>▪ Effective practices of public speaking.</li> <li>▪ Knowledge of how a POTW operates.</li> </ul>	2%
316	<p>Assist in the administration of a division's safety program; perform job hazard assessments and develop appropriate standard operating procedures (SOPs); perform field inspections for compliance with SOPs.</p> <ul style="list-style-type: none"> <li>▪ Understand combustible liquids and operating meters in order to measure explosivity.</li> <li>▪ Understand how work-related accidents and fatalities can occur in confined spaces.</li> </ul>	3%
317	<p>Explain wastewater discharge permit conditions, and other environmental compliance regulations, requirements, and policies to industrial users, the general public and government agencies.</p> <ul style="list-style-type: none"> <li>▪ Determine non-compliance with Technical Review Criteria.</li> <li>▪ Understand how a POTW pretreatment program can comply with the public participation requirements per 40 CFR 403.</li> <li>▪ Understand removal credit conditions a POTW must meet.</li> </ul>	5%

KSA	Exam Content Outline	% on exam
318	<p>Initiate and respond to oral and written communications to and from system users; provide detailed information on a variety of complex topics in a clear, concise manner using the appropriate approach and response for the situation.</p> <ul style="list-style-type: none"> <li>▪ Understand the details need to create reports and the keys to giving an oral presentation.</li> <li>▪ Ability to effectively communicate with management.</li> </ul>	3%
319	<p>Work with industries to identify and resolve discharge problems or serious violations of applicable permits, ordinances, and regulations.</p> <ul style="list-style-type: none"> <li>▪ Describe the oxidation process of cyanide and the bypass requirements for an Industrial User.</li> <li>▪ Understand General Pretreatment Regulations per 40 CFR 403.</li> </ul>	5%
320	<p>Initiate appropriate enforcements after identifying noncompliance with federal, state, and local requirements; prepare and issue written notices of requirements and violations of agency regulations; facilitate and participate in enforcement hearings and monitor follow-up action.</p> <ul style="list-style-type: none"> <li>▪ Calculate toxic substance concentrations in illegal loads.</li> <li>▪ Understand 40 CFR 403 penalty fees.</li> <li>▪ Identify the key components of an effective Enforcement Response Plan.</li> </ul>	3%
321	<p>Keep current on pertinent information and developments in environmental compliance.</p> <ul style="list-style-type: none"> <li>▪ Understand the development of regulatory issues.</li> </ul>	2%
322	<p>Work with the manager to ensure approved pretreatment, pollution prevention and stormwater programs are consistent with current federal, state and local requirements, and to adapt to potential changes.</p> <ul style="list-style-type: none"> <li>▪ Understand responsibilities of the Control Authority, location of federal regulations, and levels of control with indirect dischargers.</li> </ul>	3%
323	<p>Design, implement, and document SOPs that ensure sample collection with uncontaminated equipment, correct sampling methods and correct preservation/holding methods.</p> <ul style="list-style-type: none"> <li>▪ Calculate flow and time composite sample volumes.</li> <li>▪ Describe proper preservation methods and containers according to 40 CFR 136.</li> </ul>	4%



KSA	Exam Content Outline	% on exam
324	<p>Evaluate complex compliance monitoring reports, such as toxic organic management plans (TOMPs), stormwater pollution prevention plans (SWPPPs), spill prevention control and countermeasure plans, slug discharge control plans, baseline and self monitoring reports, 90-day reports, periodic reports of continued compliance, and monitoring reports for compliance with federal, state, and local requirements.</p> <ul style="list-style-type: none"> <li>▪ Familiarity with required reports categorical users must submit.</li> <li>▪ Calculate flow when given specific parameters.</li> <li>▪ Understand the required plans, reports, and TTO and TOMP reporting exemptions an Industrial User must submit.</li> </ul>	5%
325	<p>Supervise sampling and inspection of commercial and industrial facilities to determine processes and activities generating wastewater/stormwater.</p> <ul style="list-style-type: none"> <li>▪ Understand the characteristics of a Parshall Flume and Weir.</li> </ul>	3%
326	<p>Evaluate data used in determining compliance with applicable standards and in establishing sewer service charges and capacity fees. Perform calculations required to complete the annual sewer-service charge, revenue, and compliance programs.</p> <ul style="list-style-type: none"> <li>▪ Understand how to calculate surcharge fees and standard deviation using data points.</li> </ul>	3%
327	<p>Supervise recordkeeping activities and participate in the preparation of a variety of periodic and special reports, including monthly operation reports.</p> <ul style="list-style-type: none"> <li>▪ Familiarity with an Annual POTW Pretreatment report.</li> <li>▪ Understand NPDES reporting and submission requirements.</li> </ul>	3%
328	<p>Advise management of significant data or information related to the work of the division.</p> <ul style="list-style-type: none"> <li>▪ Understand the essentials of a safety program.</li> </ul>	2%
329	<p>Perform calculations related to industrial discharge permitting, including calculation of production-based and alternative discharge limits, capacity fees and assessment of stormwater fees.</p> <ul style="list-style-type: none"> <li>▪ Calculate local limits, maximum flow rates, and waste concentration.</li> <li>▪ Understand alternative limits of Combined Wastestream Formula.</li> </ul>	5%
330	<p>Assist in development of program budgets and fiscal reports.</p> <ul style="list-style-type: none"> <li>▪ Understand the essentials in developing and managing a budget.</li> </ul>	2%

## Suggested References

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301	<ul style="list-style-type: none"> <li>▪ Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Chapter 9 (9.3-9.4)</li> <li>▪ 40 CFR 403</li> <li>▪ Treatment of Metal Wastestreams: A Field Study Training Program, 4th Edition, 2013. Lesson 2, Lesson 3</li> </ul>
302	<ul style="list-style-type: none"> <li>▪ Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Chapter 2 (2.2), Chapter 3 (3.3-3.5)</li> </ul>
303	<ul style="list-style-type: none"> <li>▪ Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Appendix II- Pretreatment Arithmetic</li> <li>▪ Treatment of Metal Wastestreams: A Field Study Training Program, 4th Edition, 2013. Lesson 2</li> </ul>

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305	<ul style="list-style-type: none"> <li>▪ Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Chapter 3 (3.0-3.5), Appendix II- Pretreatment Arithmetic</li> </ul>
306	<ul style="list-style-type: none"> <li>▪ Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Chapter 1, Chapter 2, Chapter 3</li> <li>▪ Industrial Users Inspection and Sampling Manual for POTWs, January 2017, U.S. Environmental Protection Agency</li> </ul>
307	<ul style="list-style-type: none"> <li>▪ Utility Management: A Field Study Training Program, 2nd Edition, 2004. Lesson 1</li> <li>▪ Manage For Success: Effective Utility Leadership Practices, 1st Edition, 2005. Chapter 1, Chapter 2, Chapter 14</li> </ul>
308	<ul style="list-style-type: none"> <li>▪ Utility Management: A Field Study Training Program, 2nd Edition, 2004. Lesson 1</li> <li>▪ Manage For Success: Effective Utility Leadership Practices, 1st Edition, 2005. Chapter 1, Chapter 5</li> </ul>
309	<ul style="list-style-type: none"> <li>▪ Manage For Success: Effective Utility Leadership Practices, 1st Edition, 2005. Chapter 1, Chapter 3</li> </ul>
310	<ul style="list-style-type: none"> <li>▪ Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Chapter 2 (2.0-2.5)</li> <li>▪ State Water Resources Control Board Order No. 2006-0003-DWQ</li> </ul>
311	<ul style="list-style-type: none"> <li>▪ Manage For Success: Effective Utility Leadership Practices, 1st Edition, 2005. Chapter 4, Chapter 7</li> <li>▪ State Water Resources Control Board website - CA SSO WDR</li> </ul>
312	<ul style="list-style-type: none"> <li>▪ Enrollee's Guide to the SSO Database: Sanitary Sewer Overflow Reduction Program, August 2013, State Water Resources Control Board</li> <li>▪ Violation Classification: Guidance For Unified Program Agencies, June 2006, Certified Unified Program Agencies</li> </ul>
313	<ul style="list-style-type: none"> <li>▪ Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Chapter 2 (Appendix A), Chapter 6, Chapter 10</li> </ul>
314	<ul style="list-style-type: none"> <li>▪ Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Chapter 11</li> </ul>
315	<ul style="list-style-type: none"> <li>▪ Utility Management: A Field Study Training Program, 2nd Edition, 2004. Lesson 2</li> <li>▪ Manage For Success: Effective Utility Leadership Practices, 1st Edition, 2005. Chapter 8</li> </ul>

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316	<ul style="list-style-type: none"> <li>▪ Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Chapter 5</li> </ul>
317	<ul style="list-style-type: none"> <li>▪ Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Chapter 4</li> <li>▪ 40 CFR 403</li> <li>▪ 40 CFR 122</li> </ul>
318	<ul style="list-style-type: none"> <li>▪ Utility Management: A Field Study Training Program, 2nd Edition, 2004. Lesson 2</li> <li>▪ Manage For Success: Effective Utility Leadership Practices, 1st Edition, 2005. Chapter 1, Chapter 2</li> </ul>
319	<ul style="list-style-type: none"> <li>▪ Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Chapter 4, Appendix II- Pretreatment Arithmetic</li> <li>▪ 40 CFR 403</li> </ul>
320	<ul style="list-style-type: none"> <li>▪ Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Chapter 3, Appendix II- Pretreatment Arithmetic</li> <li>▪ 40 CFR 403</li> </ul>
321	<ul style="list-style-type: none"> <li>▪ 40 CFR 403</li> <li>▪ Manage For Success: Effective Utility Leadership Practices, 1st Edition, 2005. Chapter 8</li> </ul>
322	<ul style="list-style-type: none"> <li>▪ Introduction to the National Pretreatment Program, June 2011, U.S. Environmental Protection Agency</li> <li>▪ 40 CFR 403</li> </ul>
323	<ul style="list-style-type: none"> <li>▪ Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Appendix II- Pretreatment Arithmetic</li> </ul>
	<ul style="list-style-type: none"> <li>▪ Treatment of Metal Wastestreams: A Field Study Training Program, 4th Edition, 2013. Lesson 1</li> <li>▪ Introduction to the National Pretreatment Program, June 2011, U.S. Environmental Protection Agency</li> <li>▪ Industrial Users Inspection and Sampling Manual for POTWs, January 2017, U.S. Environmental Protection Agency</li> </ul>
324	<ul style="list-style-type: none"> <li>▪ Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Appendix II- Pretreatment Arithmetic</li> <li>▪ 40 CFR 403</li> </ul>
325	<ul style="list-style-type: none"> <li>▪ Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Chapter 3 (3.1-3.3 ), Chapter 7</li> </ul>
326	<ul style="list-style-type: none"> <li>▪ Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Chapter 3, Appendix II- Pretreatment Arithmetic</li> </ul>

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327	<ul style="list-style-type: none"> <li>▪ Manage For Success: Effective Utility Leadership Practices, 1st Edition, 2005. Chapter 2</li> <li>▪ 40 CFR 403</li> <li>▪ Pretreatment Compliance Inspection and Audit Manual for Approval Authorities, July 1986, U.S. Environmental Protection Agency</li> </ul>
328	<ul style="list-style-type: none"> <li>▪ Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Appendix II- Pretreatment Arithmetic</li> <li>▪ Manage For Success: Effective Utility Leadership Practices, 1st Edition, 2005. Chapter 5, Chapter 12</li> </ul>
329	<ul style="list-style-type: none"> <li>▪ Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Chapter 2, Appendix II- Pretreatment Arithmetic</li> <li>▪ 40 CFR 403</li> <li>▪ Treatment of Metal Wastestreams: A Field Study Training Program, 4th Edition, 2013. Lesson 2, Arithmetic Problems</li> </ul>
330	<ul style="list-style-type: none"> <li>▪ Manage For Success: Effective Utility Leadership Practices, 1st Edition, 2005. Chapter 9</li> <li>▪ Utility Management: A Field Study Training Program, 2nd Edition, 2004. Lesson 2</li> </ul>

## Publications in the Suggested Reference List

- 40 CFR 403
- 40 CFR 122
- [State Water Resources Control Board Order No. 2006-0003-DWQ](#)
- [Treatment of Metal Wastestreams: A Field Study Training Program, 4th Edition, 2013](#)
- [EPA National Pollutant Discharge Elimination System \(NPDES\) website - Developing a Stormwater Pollution Prevention Plan](#)
- [Utility Management: A Field Study Training Program, 2nd Edition, 2004](#)
- [Manage For Success: Effective Utility Leadership Practices, 1st Edition, 2005](#)
- [State Water Resources Control Board website - CA SSO WDR](#)
- [Enrollee's Guide to the SSO Database: Sanitary Sewer Overflow Reduction Program, August 2013, State Water Resources Control Board](#)

- [Violation Classification: Guidance For Unified Program Agencies, June 2006, Unified Program Administration and Advisory Group](#)
- [Pretreatment Compliance Inspection and Audit Manual for Approval Authorities, July 1986, U.S. Environmental Protection Agency](#)
- [Introduction to the National Pretreatment Program, June 2011, U.S. Environmental Protection Agency](#)
- [Industrial Users Inspection and Sampling Manual for POTWs, January 2017, U.S. Environmental Protection Agency](#)
- [Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010](#)

## ECI GRADE 4 EXAM CONTENT OUTLINE

KSA	Exam Content Outline	% on exam
401	<p>Plan, organize, direct, and review the work of environmental compliance inspectors, division supervisors, technical, and office support staff.</p> <ul style="list-style-type: none"> <li>▪ Understand the importance of following inspection guidelines and procedures for POTW inspectors.</li> <li>▪ Understand compliance requirements and disclosure policies with regard to Significant Industrial Users.</li> <li>▪ Ability to properly manage and delegate tasks to employees.</li> </ul>	5%
402	<p>Provide technical services to users with non-domestic waste and groundwater discharges.</p> <ul style="list-style-type: none"> <li>▪ Understand all aspects of activated sludge and cyanide treatment.</li> <li>▪ Familiarity with groundwater treatment and discharge requirements to a POTW.</li> <li>▪ Familiarity with chemical feed systems and calculations.</li> <li>▪ Understand how a wastewater treatment plant operates and the ability to identify problems.</li> </ul>	6%
403	<p>Review and approve waste discharge plans and permits.</p> <ul style="list-style-type: none"> <li>▪ Calculate alternative concentration limits.</li> <li>▪ Familiarity with managing and writing permits.</li> <li>▪ Recognize the control mechanisms a Control Authority can utilize for Industrial Users.</li> <li>▪ Understand reporting requirements and compliance schedules for POTWs.</li> </ul>	6%
404	<p>Meet with users to inform them of any changes in Ordinance, State and Federal laws, and ensure compliance with waste discharge ordinances and state and federal requirements; manage enforcement activities.</p> <ul style="list-style-type: none"> <li>▪ Familiarity with The General Construction Storm Water Permit and POTW Pretreatment Program requirements per 40 CFR 403.</li> <li>▪ Understand the specific requirements in an Annual Report.</li> <li>▪ Ability to develop and execute an Enforcement Response Plan.</li> <li>▪ Ability to analyze sampling results and determine compliance.</li> </ul>	6%
405	<p>Execute, and prepare reports on, special studies requiring technical expertise and project management skills, such as local limits development,</p>	6%

KSA	Exam Content Outline	% on exam
	<p>industry-specific industrial waste overviews, and potential impacts of new discharges.</p> <ul style="list-style-type: none"> <li>▪ Knowledge of the agencies a POTW must submit compliance reports to.</li> <li>▪ Ability to evaluate, calculate, and develop Local Limits.</li> <li>▪ Understand the Combined Wastestream Formula.</li> <li>▪ Familiarity with inspection procedures and proper documentation.</li> </ul>	
406	<p>Manage special internal programs such as responses to program inspections and audits, inspection and monitoring program reviews, regulations reviews, and development of Best Management Practices (BMPs) and public outreach projects.</p> <ul style="list-style-type: none"> <li>▪ Understand proper hazardous waste discharge recovery and reporting requirements.</li> <li>▪ Familiarity with EPA's authority on regulating a Pretreatment Program.</li> <li>▪ Describe proper analytical methods according to 40 CFR 136.</li> <li>▪ Understand the essential components of a Slug Discharge Control Plan.</li> </ul>	7%
407	<p>Establish organizational controls to measure performance against approved objectives. Initiate improvements in work methods and procedures.</p> <ul style="list-style-type: none"> <li>▪ Ability to identify effective components necessary to manage a wastewater treatment plant.</li> </ul>	1%
408	<p>Establish and ensure proper implementation of divisional goals and objectives.</p> <ul style="list-style-type: none"> <li>▪ Develop work schedules and department goals and objectives.</li> <li>▪ Ability to calculate overtime hours.</li> </ul>	2%
409	<p>Establish program methods to monitor and control industrial and commercial wastewater sources entering the collection system.</p> <ul style="list-style-type: none"> <li>▪ Develop and manage a POTW inspection schedule.</li> <li>▪ Understand 40 CFR 136.</li> </ul>	5%
410	<p>Review the work of consultants and administer various professional contracts.</p> <ul style="list-style-type: none"> <li>▪ Understand the purpose and essential elements of an Environmental Impact Report.</li> </ul>	1%
411	<p>Disseminate management policies and division activities to staff and ensure compliance with management and administrative policies and procedures.</p> <ul style="list-style-type: none"> <li>▪ Familiarity with team workflow steps.</li> </ul>	4%



KSA	Exam Content Outline	% on exam
	<ul style="list-style-type: none"> <li>▪ Understand the best practices in approaching employees who are not performing up to standard.</li> </ul>	
412	<p>Plan, develop, and participate in a variety of ongoing division-specific training programs and ensure that employees receive all other agency mandatory training.</p> <ul style="list-style-type: none"> <li>▪ Ability to develop effective employee training.</li> <li>▪ Familiarity with OSHA training requirements for common health hazards.</li> </ul>	4%
413	<p>Direct and participate in the selection, review, and evaluation of division staff.</p> <ul style="list-style-type: none"> <li>▪ Ability to delegate and discuss work performance with an employee.</li> </ul>	3%
414	<p>Encourage professional growth, and investigate employee relations issues, implementing corrective actions or referrals as appropriate.</p> <ul style="list-style-type: none"> <li>▪ Understand how to effectively manage employees and effectively execute policies.</li> </ul>	3%
415	<p>Coordinate activities with other divisions and agencies and with outside organizations.</p> <ul style="list-style-type: none"> <li>▪ Familiarity with all aspects of a Pretreatment Program and how the program is funded.</li> <li>▪ Ability to determine the number of inspections for an Industrial User.</li> <li>▪ Understand the essential elements of a Safety Data Sheet.</li> <li>▪ Familiarity with managing an effective public relations program.</li> </ul>	6%
416	<p>Represent the program in meetings with governmental and regulatory agencies, technical committees and public and private organizations.</p> <ul style="list-style-type: none"> <li>▪ Familiarity with Categorical and Non-Categorical Industrial Users.</li> </ul>	3%
417	<p>Provide information, data and technical advice to staff, outside agencies and the public. Present data and other information related to the work of the division.</p> <ul style="list-style-type: none"> <li>▪ Ability to interpret laws, regulations, and develop legal documentation and presentations.</li> </ul>	4%
418	<p>Administer the division's safety program.</p> <ul style="list-style-type: none"> <li>▪ Ability to develop effective training.</li> <li>▪ Understand all aspects of a successful safety program.</li> </ul>	3%
419	<p>Coordinate field inspections for safety conformance and direct investigations of incidents.</p>	3%

KSA	Exam Content Outline	% on exam
	<ul style="list-style-type: none"> <li>▪ Familiarity with hazardous waste exposure requirements.</li> <li>▪ Understand OSHA terms and definitions relating to work space atmospheres.</li> </ul>	
420	<p>Manage the overall implementation of new regulated/mandated programs to protect or improve stormwater and wastewater quality. Monitor technical and regulatory developments in the field of environmental compliance.</p> <ul style="list-style-type: none"> <li>▪ Familiarity with all aspects of Clean Water Act.</li> <li>▪ Understand how to investigate unregulated pollutants in wastewater.</li> </ul>	4%
421	<p>Monitor economic, environmental, sociopolitical, and technological developments that impact programs and services.</p> <ul style="list-style-type: none"> <li>▪ Understand terms and definitions relating to storm water conveyance systems as outlined in Federal Regulations.</li> </ul>	3%
422	<p>Direct recordkeeping activities and preparation of a variety of periodic and special reports.</p> <ul style="list-style-type: none"> <li>▪ Familiarity with Waste Discharge Requirements.</li> <li>▪ Identify a SSO and its reporting requirements.</li> </ul>	6%
423	<p>Develop and administer the annual budget and routinely monitor expenditures and fiscal performance.</p> <ul style="list-style-type: none"> <li>▪ Understand terms and definitions relating to managing budgets and expenses.</li> <li>▪ Determine the appropriate budgeting for items essential to program operations.</li> </ul>	4%
424	<p>Understand the regulatory requirements and participate in the administration of the Stormwater pollution prevention management.</p> <ul style="list-style-type: none"> <li>▪ Familiarity with the NPDES permits.</li> </ul>	3%
425	<p>Participate in the plan check of new construction projects to ensure regulatory compliance with Municipal Separate Storm Sewer Systems (MS4) and pretreatment requirements.</p> <ul style="list-style-type: none"> <li>▪ Understand the Industrial General Permit.</li> <li>▪ Understand all aspects of a Storm Water Pollution Prevention Plan.</li> </ul>	3%

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402	<ul style="list-style-type: none"> <li>▪ Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Chapter 6, Chapter 8</li> </ul>
403	<ul style="list-style-type: none"> <li>▪ Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Appendix II- Pretreatment Arithmetic</li> <li>▪ 40 CFR 403</li> <li>▪ 40 CFR 469</li> <li>▪ Industrial User Permitting Guidance Manual, September 2012, U.S. Environmental Protection Agency</li> </ul>

KSA	Suggested References <i>This list is not intended to be an endorsement of any of the publications listed.</i>
404	<ul style="list-style-type: none"> <li>▪ Introduction to the National Pretreatment Program, June 2011, U.S. Environmental Protection Agency</li> <li>▪ 40 CFR 403</li> <li>▪ 40 CFR 136</li> </ul>
405	<ul style="list-style-type: none"> <li>▪ Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Appendix II- Pretreatment Arithmetic</li> <li>▪ Utility Management: A Field Study Training Program, 2nd Edition, 2004. Lesson 3</li> <li>▪ Introduction to the National Pretreatment Program, June 2011, U.S. Environmental Protection Agency</li> <li>▪ Local Limits Development Guidance, July 2004, U.S. Environmental Protection Agency</li> </ul>
406	<ul style="list-style-type: none"> <li>▪ 40 CFR 403</li> <li>▪ Introduction to the National Pretreatment Program, June 2011, U.S. Environmental Protection Agency</li> <li>▪ Pretreatment Compliance Inspection and Audit Manual for Approval Authorities, July 1986, U.S. Environmental Protection Agency</li> </ul>
407	<ul style="list-style-type: none"> <li>▪ Manage For Success: Effective Utility Leadership Practices, 1st Edition, 2005. Chapter 8</li> </ul>
408	<ul style="list-style-type: none"> <li>▪ Manage For Success: Effective Utility Leadership Practices, 1st Edition, 2005. Chapter 4</li> </ul>
409	<ul style="list-style-type: none"> <li>▪ Introduction to the National Pretreatment Program, June 2011, U.S. Environmental Protection Agency</li> <li>▪ 40 CFR 403</li> <li>▪ 40 CFR 136</li> <li>▪ Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Chapter 6</li> </ul>
410	<ul style="list-style-type: none"> <li>▪ California Department of Transportation website - Chapter 36, Environmental Impact Report (EIR)</li> </ul>
411	<ul style="list-style-type: none"> <li>▪ Manage For Success: Effective Utility Leadership Practices, 1st Edition, 2005. Chapter 1, Chapter 8</li> </ul>
412	<ul style="list-style-type: none"> <li>▪ Manage For Success: Effective Utility Leadership Practices, 1st Edition, 2005. Chapter 5</li> <li>▪ Training Requirements in OSHA Standards, Occupational Safety and Health Administration, U.S. Department of Labor</li> </ul>
413	<ul style="list-style-type: none"> <li>▪ Utility Management: A Field Study Training Program, 2nd Edition, 2004. Lesson 1</li> </ul>
414	<ul style="list-style-type: none"> <li>▪ Manage For Success: Effective Utility Leadership Practices, 1st Edition, 2005. Chapter 1, Chapter 6, Chapter 12</li> </ul>

KSA	Suggested References <i>This list is not intended to be an endorsement of any of the publications listed.</i>
415	<ul style="list-style-type: none"> <li>▪ Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Chapter 5</li> <li>▪ 40 CFR 403</li> <li>▪ Utility Management: A Field Study Training Program, 2nd Edition, 2004. Lesson 2</li> <li>▪ Manage For Success: Effective Utility Leadership Practices, 1st Edition, 2005. Chapter 11</li> </ul>
416	<ul style="list-style-type: none"> <li>▪ 40 CFR 428</li> </ul>
417	<ul style="list-style-type: none"> <li>▪ Manage For Success: Effective Utility Leadership Practices, 1st Edition, 2005. Chapter 2, Chapter 7</li> <li>▪ Industrial Users Inspection and Sampling Manual for POTWs, January 2017, U.S. Environmental Protection Agency</li> </ul>
418	<ul style="list-style-type: none"> <li>▪ Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Chapter 5</li> <li>▪ Training Requirements in OSHA Standards, Occupational Safety and Health Administration, U.S. Department of Labor</li> <li>▪ Manage For Success: Effective Utility Leadership Practices, 1st Edition, 2005. Chapter 12</li> </ul>
419	<ul style="list-style-type: none"> <li>▪ Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Chapter 5, Chapter 11</li> <li>▪ Training Requirements in OSHA Standards, Occupational Safety and Health Administration, U.S. Department of Labor</li> </ul>
420	<ul style="list-style-type: none"> <li>▪ 40 CFR 403</li> <li>▪ U.S. Environmental Protection Agency website - Summary of the Clean Water Act</li> </ul>
421	<ul style="list-style-type: none"> <li>▪ 40 CFR 403</li> <li>▪ 40 CFR 122</li> </ul>
422	<ul style="list-style-type: none"> <li>▪ Industrial Users Inspection and Sampling Manual for POTWs, January 2017, U.S. Environmental Protection Agency</li> <li>▪ 40 CFR 403</li> <li>▪ 40 CFR 122</li> <li>▪ State Water Resources Control Board Order No. 2006-0003-DWQ</li> </ul>
423	<ul style="list-style-type: none"> <li>▪ Manage For Success: Effective Utility Leadership Practices, 1st Edition, 2005. Chapter 9</li> </ul>
424	<ul style="list-style-type: none"> <li>▪ General Permit For Storm Water Discharges Associated With Industrial Activities, National Pollutant Discharge Elimination System (NPDES)</li> <li>▪ 40 CFR 122</li> </ul>

KSA	Suggested References <i>This list is not intended to be an endorsement of any of the publications listed.</i>
425	<ul style="list-style-type: none"> <li>▪ General Permit For Storm Water Discharges Associated With Industrial Activities, National Pollutant Discharge Elimination System (NPDES)</li> </ul>

## Publications in the Suggested Reference List

- 40 CFR 403
- 40 CFR 122
- 40 CFR 469
- 40 CFR 136
- 40 CFR 428
- [State Water Resources Control Board Order No. 2006-0003-DWQ](#)
- [Utility Management: A Field Study Training Program, 2nd Edition, 2004](#)
- [Manage For Success: Effective Utility Leadership Practices, 1st Edition, 2005](#)
- [Pretreatment Compliance Inspection and Audit Manual for Approval Authorities, July 1986, U.S. Environmental Protection Agency](#)
- [Local Limits Development Guidance, July 2004, U.S. Environmental Protection Agency](#)
- [California Department of Transportation website - Chapter 36, Environmental Impact Report \(EIR\)](#)
- [General Permit For Storm Water Discharges Associated With Industrial Activities, National Pollutant Discharge Elimination System \(NPDES\)](#)
- [U.S. Environmental Protection Agency website - Summary of the Clean Water Act](#)
- [Training Requirements in OSHA Standards, Occupational Safety and Health Administration, U.S. Department of Labor](#)
- [Introduction to the National Pretreatment Program, June 2011, U.S. Environmental Protection Agency](#)
- [Industrial Users Inspection and Sampling Manual for POTWs, January 2017, U.S. Environmental Protection Agency](#)

- [Industrial User Permitting Guidance Manual, September 2012, U.S. Environmental Protection Agency](#)
- [Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010](#)

## FORMULA SHEET

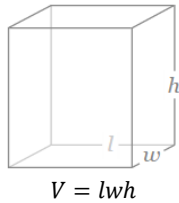
This formula sheet is available onscreen during the exam.

### Conversions

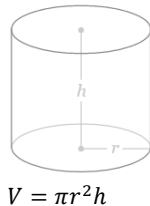
3.785 L/gal	453.6 g/lb	8.34 lb/gal	7.48 gal/ft <sup>3</sup>
28.35 g/oz	43,560 ft <sup>2</sup> /acre	$\pi = 3.14159$	

### Volumes

Rectangular Solid

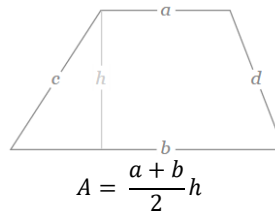


Right Cylinder

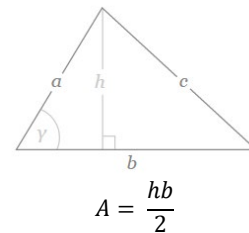


### Areas

Trapezoid



Triangle



### Formulas

Manning

$$Q = \frac{1.49 AR^{2/3} S^{1/2}}{n}$$

Q = flow rate (CFS)

A = cross-sectional area of flow (ft<sup>2</sup>)

R = hydraulic radius (ft)

S = slope of the hydraulic radius

n = Manning roughness coefficient

Counterflow Rinsing

$$R^n = \frac{C_p}{C_n}$$

R = rinse ratio (ratio of rinse water volumetric flow rate to the drag out volumetric flow rate)

C<sub>p</sub> = plating bath metal concentration

C<sub>n</sub> = metal concentration in the n<sup>th</sup> rinse tank

n = number of rinse tanks

Combined Waste Stream

$$C_T = \frac{[\sum_{i=1}^N C_i F_i][F_T - F_D]}{[\sum_{i=1}^N F_i][F_T]}$$

C<sub>T</sub> = alternative concentration limit

C<sub>i</sub> = concentration limit for stream i

F<sub>i</sub> = average daily flow of stream i

F<sub>T</sub> = F<sub>i</sub> + F<sub>D</sub>

F<sub>D</sub> = average daily flow of dilute wastestream

Periodic Properties of Elements					
Element	Symbol	Atomic Weight (grams/mole)	Element	Symbol	Atomic Weight (grams/mole)
Hydrogen	H	1.0	Potassium	K	39.1
Carbon	C	12.0	Calcium	Ca	40.1
Nitrogen	N	14.0	Chromium	Cr	52.0
Oxygen	O	16.0	Iron	Fe	55.8
Fluorine	F	19.0	Nickel	Ni	58.7
Sodium	Na	23.0	Copper	Cu	63.5
Magnesium	Mg	24.3	Zinc	Zn	65.4
Aluminum	Al	27.0	Arsenic	As	74.9
Phosphorus	P	31.0	Silver	Ag	107.9
Sulfur	S	32.1	Cadmium	Cd	112.4



## CREATING A STUDY PLAN

### Completing a Gap Analysis

CWEA certification exams are experience based. The Gap Analysis Tool is designed to help candidates identify which grade level is best suited to their current level of experience, and where they may be lacking sufficient experience.

This free self-evaluation is available on the [CWEA website](#) for all vocations.

Candidates are encouraged to develop their own personal study plan based on individual needs, experience and knowledge. Candidates should seek as many different study materials as possible as well as attend educational events and on-the-job training. This is especially important for areas in which the candidate is not adequately prepared.

CWEA's exams do not correspond directly to any specific textbook, educational course, or program. Instead, the exams are based on an analysis of the duties commonly performed in actual practice.

### CWEA Local Section Training

It is the goal of CWEA's Technical Certification Program to operate in line with established best practices for certification programs. As such, CWEA is careful to separate its education and training activities from its certification program to ensure that no conflict of interest exists. Any educational materials or trainings that are designed to prepare candidates for an exam are developed and conducted by individuals that do not have access to the exams.

CWEA Local Sections host education and training events throughout the year that focus on the job duties tested by our certifications. These trainings are limited based on demand and volunteer availability.

Local Section trainings can be found on the [CWEA Events Website](#). For questions about a Local Section training, please contact the Local Section directly. Contact information for individual Local Sections can be found in our [Directory](#).

## EXAM DAY INFORMATION

### Test Site Admission and Exam Information

Applicants are required to show at least one current, valid, government-issued photo identification, such as a state driver’s license or ID, or passport. A temporary license is acceptable if there is an expiration date, or if it is accompanied by paperwork explaining an expiration date.

Candidates have three (3) hours to complete the exam.

The formula sheet from this Handbook will be available on the exam screen.

For more information about the number of questions on each exam, see *Exam Scoring* (p. 64).

### Calculators Allowed

An onscreen calculator with basic and scientific capability is available on all CWEA exams. Applicants may bring a handheld calculator to a test center as long as it is from the CWEA approved calculator list:

<b>Casio</b>	All FX-115 models (any Casio calculator with FX-115 in its name)
<b>Texas Instruments</b>	All TI-30x and TI-36x models
<b>Sharp</b>	EL models <i>except</i> EL-W516B and EL-W535B

### Pearson VUE’s Candidate Rules Agreement

Pearson VUE maintains its own rules regarding professional examinations. All applicants are required to sign the [Candidate Rules Agreement](#) at the test center prior to sitting the exam. Applicants are responsible for knowing and complying with these rules. CWEA recommends all applicants familiarize themselves with this agreement prior to testing.

## AFTER THE EXAM

### Exam Result Notification

Applicants will see their result on the screen immediately after the exam is submitted. An Official Score Report will be printed out and given to the applicant before they leave the test center. Additional copies can be obtained by logging into the [Pearson VUE user account](#). All results are confidential and will only be released to the applicant. No results will be given over the phone, by fax or email.

### Exam Appeal Policy

All appeals must be submitted within two weeks of the exam date. Appeals will be reviewed by CWEA staff and/or Subject Matter Experts. Candidates' personal information will remain confidential and will not be accessible to Subject Matter Experts. Candidates will be updated on the status of their appeal within 4-6 weeks, and they will be notified in writing when a decision has been made. Once an appeal has been processed, candidates cannot submit a new appeal for the same exam.

Candidates cannot submit an appeal simply because they did not pass the exam.

Candidates can appeal under the following justifications:

#### Exam Delivery Appeal

Candidates may appeal testing conditions severe enough to have caused a major disruption of the examination process. CWEA staff will review the appeal and consult our exam administrator, Pearson VUE, to investigate the appeal if necessary. Please note, under Pearson VUE's candidate agreement, candidates must notify the proctor immediately during the exam of any issues to open a claim documenting the incident. If candidates did not notify the proctor during the exam, an appeal may still be submitted but may be dismissed if CWEA cannot verify the validity of the complaint.

#### Exam Question Appeal

If the candidate wishes to comment on specific exam questions, they may flag the question during the exam using the Flag to Enter a Comment function. Candidates are allowed to add comments about any question as long as there is time remaining. All comments will be

reviewed and considered by the Technical Certification Program as part of the ongoing exam review and development process. Candidates that wish to submit an appeal of their exam results, must complete the form below within two weeks of their exam date. Candidates that wish to have specific comments considered in support of their appeal should indicate so on the appeal form.

Non-substantive appeals or appeals without just cause will be automatically rejected. If candidates are not satisfied with the outcome of their appeal, they may submit a request for review by the Technical Certification Program Executive Committee at [tcpcommittee@cwea.org](mailto:tcpcommittee@cwea.org). The committee's decision will be final.

All communication related to certification decisions and appeal results with the Technical Certification Program Executive Committee must be sent in writing to [tcpcommittee@cwea.org](mailto:tcpcommittee@cwea.org). We ask that candidates do not contact committee members directly.

The appeal form can be accessed here: [CWEA Exam Appeal Form](#).

## Retest Application

If the candidate does not pass the exam the first time, they can submit a retest application along with the appropriate fees. The candidate will be required to skip at least one exam window before they are eligible to retest. If the candidate tested within the first 15 days of a window, they are not required to skip an exam window. Under no circumstances are candidates allowed to sit for the same exam twice in the same window. There are no exceptions to this policy.

To be eligible to use the retest application form, candidates must submit the application within one year of their original exam date. Candidates must meet the minimum qualifications of the exam for which they are applying. CWEA may require candidates to fill out a full application with job history to verify candidates meet the minimum requirements. Use of a retest application does not guarantee approval for any exam.

## Receiving the Certificate and Blue Card

Certificates and Blue Cards will be issued to all candidates who pass their exam. The certificate contains the certification number and expiration date. The Blue Card contains the expiration date, contact hour due date and contact hour period. These documents are mailed along with

the Score Report within 4 weeks to the address on file with CWEA. Candidates are responsible for making sure this address is current.

## MAINTAINING CERTIFICATION

### How to Renew

All certifications must be renewed annually. Certifications expire one year from the last day of the month in which the certification was earned. Renewal notices are mailed to certification holders three months before the expiration date. Certification holders can pay their renewal online by logging into their [mycwea.org](http://mycwea.org) account or by mailing their renewal notice with a check or credit card information to the CWEA office. Renewal certificates and blue cards will be mailed within 4 weeks to the address on file with CWEA.

Certification holders are required to meet Continuing Education (CE) requirements. This requirement is met by completing 12 contact hours (1.2 CEUs) of vocation-related education or training every two years. For more information about earning contact hours, for details see *Earning Contact Hours* (p. 59).

Not meeting these requirements by the expiration date will cause the certification to expire. Certifications that have been expired for more than three months are subject to a \$35 late fee. If a certification holder does not meet the renewal requirements within two years of their expiration date their certification will permanently expire. To become certified once again, the individual must re-apply for certification and pass the exam. It is the certification holder's responsibility to ensure that his or her certification remains valid. There are no exceptions to these policies.

### Renewal Fees

Current fees are listed on the [CWEA website](http://CWEA website). Valid CWEA members qualify for a discounted member rate. The non-member rate includes a one-year CWEA membership. If an applicant does not wish to take advantage of the membership, please inform CWEA.

## Continuing Education (CE) Requirement

Certification holders are required to meet Continuing Education (CE) requirements. This requirement is met by completing 12 contact hours (1.2 CEUs) of vocation-related education or training every two years. Certification holders may submit up to 50% (6 contact hours) of the required contact hours in safety related training. One contact hour is defined as 50 minutes of participation in an organized continuing education experience under responsible sponsorship, capable direction, and qualified instruction.

Contact hours must be earned within the contact hour period. Hours are earned on the date of completion of the educational or training program. The program may begin before, but must be completed during the contact hour period. If a certification holder will not earn the required hours within their contact hour period, they must notify CWEA before the period ends if they wish to remain certified, for details see *Temporary Deactivation* (p. 61).

Individuals holding more than one CWEA certification can apply the same contact hours to each certification as long as the training is relevant to each vocation. Training is acceptable as long as it is related to the vocations in which certification is held. CWEA may send contact hour certificates to Subject Matter Experts to determine relevancy.

In-house training can be used to meet this requirement as long as standard Safety Tailgate meetings do not exceed 50% (6 contact hours). In-house training includes any training that is conducted by an employer, or a trainer contracted by an employer.

## Earning Contact Hours

Contact hours may be earned by any of the following activities:

- Attendance at educational/training programs, including in-house training
- Teaching, instructing or presenting educational/training material (1 hour per 25 min)
- Developing and reviewing CWEA certification exam content as a Subject Matter Expert (1 hour per 25 minutes)
- Authorship of published books or articles (2 hours per book or article)
- Retesting and passing the relevant CWEA certification exam (12 hours)
- Membership in professional membership organizations (.5 hours per year, per membership, with a maximum of 6 hours per contact hour period)

CWEA may require and request additional documentation to assess the authenticity and/or relevance of these activities.

This information is paraphrased for clarity from the 02-03 TCP Re-Certification Policy; a full copy of the policy can be requested by contacting the TCP department.

## Contact Hour Documentation

Proof of contact hour completion for an educational/training program must meet these following guidelines:

- The name of the training organization
- The training title
- The name of the attendee who completed the program
- The number of contact hours earned
- The date of completion
- An official signature or stamp from the training organization, instructor's signature is acceptable

For other continuing education activities, CWEA may request additional information. Any documentation that does not meet these guidelines will not be accepted. It is the certification holder's responsibility to retain verification of records documenting earned contact hours and submit proof to CWEA.

## Contact Hour Audit

Audits are conducted on a regular basis by CWEA to ensure that certification holders are complying with the continuing education requirement and that the documentation meets the guidelines. Certification holders are randomly selected for an audit of contact hours. The audit reviews the relevancy of the trainings to the vocation, and the dates in which the contact hours were earned to ensure that they fall within the appropriate contact hour period.

Selected participants will be notified via email that they have either successfully passed the audit, or that CWEA requires further information.

## Temporary Deactivation

The Temporary Deactivation program is for certification holders that will not meet the continuing education requirement for recertification by their expiration date. Under this program, certification holders can request that CWEA temporarily deactivate their certification for up to two years from their expiration date. This grants the individual extra time to earn the required contact hours. During the time of temporary deactivation, the CWEA certification is invalid and may not be used. Certification holders can apply for reactivation once they fulfill all requirements. Certification must be in good standing to qualify for this program. For more information including current fees, or to request an application for temporary deactivation, contact the CWEA office.

The application must be submitted before the certification expiration date. There is no exception to this policy.

## Reinstating Certification

If a certification expires, it is invalid until all recertification requirements are met. There is a three-month grace period before a certification is considered lapsed. Once a certification becomes lapsed, the certification holder will need to pay a \$35 late fee in addition to meeting the renewal requirements. Certification will remain lapsed for up to two years from the expiration date. If a lapsed certification is not renewed within the two-year period, the certification becomes permanently expired.

## Expired Certification

Certificates expired for two years, or longer, cannot be reinstated under any circumstances. To become certified once again, the individual must re-apply for certification and pass the exam. It is the certification holder's responsibility to ensure that his or her certification remains valid. There are no exceptions to these policies.

## Retiring Certification

Certification holders can request that CWEA retire their certification at the time it expires if they no longer wish to hold it. Once a certification has been retired, the certification will no longer be valid and CWEA will cease all communications regarding the certification. A retired



certification can be reactivated only if the certification holder has met all renewal requirements within the appropriate timeframe and the certification has not permanently expired.

## EXAM DESIGN AND FORMAT

### Exam Design

All certification exams are designed to test knowledge required to perform the essential duties of a job at a given grade level with minimum acceptable competence. Exams are created by Subject Matter Experts under the guidance of exam development professionals.

Exam content is developed from a job task analysis that includes research of the essential duties at a representative cross-section of systems and facilities throughout California. All exam items are written by subject matter experts based on the content outline established by the job task analysis. These items are used to create the exam forms. The pass point for each exam is based on difficulty, using the Modified Angoff Method, for details see *Pass Point* and *How Pass Points are Set* (p. 63).

### Exam Delivery Mechanism

All exams are computer-based format and are available in the English language only. Exams are delivered at Pearson VUE testing centers or via Pearson VUE's online testing platform On Vue.

### Exam Format

All certification exams are in multiple-choice format. Multiple-choice is considered the most effective format for use in standardized tests as it allows for greater content coverage for a given amount of testing time and improves competency measurement reliability. Multiple choice questions range in complexity from simple recall of knowledge to the synthesis and evaluation of the subject matter.

## Weighting

The percentage of the exam that covers a particular content area is referred to as its weighting. Weightings are established through a Job Task Analysis and are based on the frequency and criticality of the task. A weighting is approximate and shows the relative importance of a particular area compared to the other portions of the exam. Weightings are indicated on the content outline for each exam and can be found in the preparation materials. Each weighting on the actual certification exam may vary slightly.

## Pass Points

An exam pass point is the minimum score required to pass a certification exam. The pass point is also known as a cut score or passing score. Candidates should try to score as high as possible on their exam. Pass points for CWEA certification exam vary with each exam form. The pass point for each vocation, grade level and exam form is set independently.

## How Pass Points are Set

A modified Angoff Method is used to determine the pass point for each version of each exam. The modified Angoff Method uses expert judgments to determine the difficulty level of the exam. The easier the exam, the higher the pass point. Likewise, the more difficult the exam, the lower the pass point.

The following is a basic outline of the modified Angoff Method (some details have been omitted):

1. A group of Subject Matter Experts (SMEs) independently rate each exam question within a given exam. The ratings are defined as the probability, or likelihood, that a minimally competent person with the requisite education and experience will answer the question correctly. A minimally competent person is defined as someone who adequately performs all job functions safely and requires no further training to do so.
2. The SMEs review each exam question as group. A consensus is reached for the rating of each exam question. During this time the SMEs review comments submitted in writing by exam-takers. Any exam question that is judged to be ambiguous, has more than one correct answer, or has no correct answers is eliminated from the scoring process for that exam. These exam questions are then revised for future use, re-classified, or deleted from the exam item bank.

3. After the data are refined, the final step is to calculate the mean, or average, of all the exam question ratings. This becomes the overall pass point estimation.

## Why Use Modified Angoff?

Each version of a given certification exam pulls questions from an exam item bank. Each of these questions varies in difficulty. Because a different mix of questions is used in each exam form, the overall difficulty level is not fixed. Thus, it is important to make sure that the varying difficulty level is reflected in the pass point of each exam to ensure that results are reliable. Exam reliability is concerned with the reproducibility of results for each version of a given exam. In other words, for an exam to be reliable it must yield the same result (pass or fail) for the same individual under very similar circumstances. For example, imagine a candidate takes an exam at a certain grade level and passes it. Immediately after completing the exam, the candidate takes the same grade level exam, but a different version. If the exam is reliable they will achieve the same result: pass. If they do not, it is likely that the exam is not a reliable measure of minimal competency.

By taking into consideration the difficulty level of an exam, the modified Angoff Method significantly increases the reliability of the exams. Also, since each exam is adjusted for difficulty level, each exam version has the same standard for passing. Thus, exam-takers are treated equitably and fairly, even if they take different versions of the exam.

There are other methods for setting pass points. However, for the type of exams administered by CWEA, the modified Angoff Method is the best.

## Exam Scoring

All exams are electronically scored by Pearson VUE. Most exam items are valued at one point unless otherwise stated on the exam. After exams are scored, total points are compiled, and an overall score is calculated as the sum of all points earned on the exam. If the overall score is equal to, or greater than the established pass point, the candidate has passed the exam. Each question is worth 1 point. Total points possible for each exam are as follows:

- Grade 1 - 100 points
- Grade 2 - 100 points
- Grade 3 - 100 points
- Grade 4 - 100 points

## Summary of Certification Activities

A summary of certification activities for each vocation is available upon request. The summary includes pass/fail statistics, and the number of individuals currently certified. To request this information, please visit the [CWEA website](#).