

Exam Blueprint

Environmental Compliance Inspector Certification

Exam Blueprint & Suggested References

**ECI
Grade 1**

v 10.21.19



Exam Blueprint & Suggested References

Effective October 2019

CWEA’s Technical Certification Program Environmental Compliance Inspector Grade 1 exam is based on an exam blueprint that outlines the exam content and is periodically reviewed by CWEA Subject Matter Experts. This exam blueprint is based on a job task analysis that includes research of the essential duties of an Environmental Compliance Inspector at a representative cross-section of systems and facilities in California. The Environmental Compliance Inspector Grade 1 exam was last reviewed by Subject Matter Experts in 2016.

The exam content outline that follows presents content covered on the Environmental Compliance Inspector Grade 1 exam and shows the amount of the exam devoted to each Knowledge, Skills and Abilities (KSA) area in the column labeled “% on exam.” Following the outline, you’ll find a list of suggested references and a link to a free self-evaluation you can take to help you identify your strengths and areas to work on as a candidate. You will also find an Equivalent & Formula Sheet which will be available on screen during the exam.

Please be sure to review CWEA's Technical Certification Program Handbook, which contains CWEA's certification procedures and policies. Applicants and certification holders are responsible for understanding all certification policies. The TCP Handbook can be downloaded for free in our [Online Store](#).

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"> • Understand best practices in approved sampling techniques and preservatives when sampling. • Understand how to balance chemical equations, identify acids and bases, and perform basic dilutions and neutralization calculations. 	7%



KSA	Exam Content Outline	% on exam
	<ul style="list-style-type: none"> ● Recall how to calculate pH of an aqueous solution. ● Complete understanding of the following terms: pH, turbidity, grab sample, field blanks, specific conductance, correlation between BOD and COD. ● Understand the requirements for the use of field blanks and grab samples. ● Demonstrate how to balance chemical equations, identify acids and bases, and perform basic dilutions and neutralization calculations. 	
102	<p>Complete appropriate documentation, including inspection reports and chain of custody documentation.</p> <ul style="list-style-type: none"> ● Recognize importance of proper Chain of Custody procedures, and consequences of breaking such procedures. ● Select what information should be included on an inspection report. ● Explain proper sampling techniques, including the necessary containers, required preservatives, and essential information needed to complete a Chain of Custody. 	5%
103	<p>Perform field and laboratory tests and/or coordinates laboratory testing with appropriate lab personnel.</p> <ul style="list-style-type: none"> ● Demonstrate awareness of the gases and chemical compounds a field test will identify. ● Explain how to satisfy the requirements of regulatory compliance sampling, ability to accurately identify Total Toxic Organics. ● 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. 	4%
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"> ● Understand how to respond to facility violations during the inspection process and explain reverse osmosis and its use in Industrial processes. ● Understand Federal Water Pollution Control Act of 1972 requirements for industrial wastewater dischargers. 	9%



KSA	Exam Content Outline	% on exam
	<ul style="list-style-type: none"> ● Understand common pollutants and wastewater contaminants in oil refinery facilities and circuit board industries. ● Identify who is responsible for enforcing pretreatment requirements as stated in the Clean Water Act. ● Understand specific statements of the 1977 Clean Water Act regarding structure for regulating discharges of pollutants into the waters of the United States. ● Understand categorical industrial processes as defined by the US EPA. ● Compare and contrast concurrent rinse tanks and counter current tanks. ● Describe photo, x-ray, and silver removal processes from waste streams. ● Understand Significant Non-Compliance. ● Demonstrate full understanding of an Inspector’s right to enter an Industrial User facility, and conduct an unannounced or unscheduled inspection. 	
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"> ● Understand terms and definitions regarding: storm water, pollution prevention hierarchy and goals, and abbreviations commonly associated with water pollution control. ● Understand hierarchy levels of Environmental Management methods as outlined by Congress in 1990. ● Recognize non-compatible pollutants, and explain the chemistry that occurs in the Sewer Sanitary lines. ● Understand rules for applying Categorical Pretreatment Standards for an Industrial User’s wastewater regarding dilution. ● Understand proper spill response procedures and identify the primary goal when responding to a spill. 	9%
106	<p>Inspect pretreatment devices such as grease traps, interceptors, clarifiers, and silver recovery units (SRUs) for proper operation and maintenance.</p>	6%



KSA	Exam Content Outline	% on exam
	<ul style="list-style-type: none"> ● Calculate detention time, and minimum size of an interceptor using a set of given parameters. Knowledge of a clarifier capacity, operating with proper levels. ● Identify which gases can be generated in grease interceptors. ● Understand processes involved in removal of Heavy Metals in waste streams. ● Explain ORP meters and its uses in Industrial Processes. ● Describe how Silver Recovery Units (SRUs) are used. 	
107	<p>Clean, inspect, and maintain sampling equipment, meters and related test apparatus.</p> <ul style="list-style-type: none"> ● Calibrate sampling equipment and gas detectors. ● Understand proper use of sampling equipment, field blanks, and the importance of Quality Assurance when sampling. ● Describe proper preservation methods according to 40 CFR 136. 	4%
108	<p>Use sampling equipment, meters, related test apparatus, and other tools as instructed.</p> <ul style="list-style-type: none"> ● Explain the effect high alkalinity has on a collections system. ● Choose the proper sampling pump in a given situation. ● Recall different types of sampling: composite, grab, flow-proportional, and discrete. ● Understand pH meter calibration methods. 	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"> ● Understand how to activate emergency response procedures as an inspector. ● Understand industrial spill procedures. ● Understand 40 CFR 403.5. National Pretreatment Standards: Prohibited Discharges. 	3%



KSA	Exam Content Outline	% on exam
110	<p>Support customer service activities by responding to inquiries and/or referring them to the appropriate level; interacting cooperatively with internal and external customers; and, providing feedback to appropriate staff.</p> <ul style="list-style-type: none"> • Understand inspection procedures and effective/appropriate communication with Industrial Users. • Determine who or what has legal authority of a POTW and the authority granted to a POTW by federal guidelines. 	4%
111	<p>Observe proper safety procedures, rules, regulations, and practices, including use of personal protective equipment (PPE).</p> <ul style="list-style-type: none"> • Identify maximum safe sound levels in the workplace. • Recognize exposure limits of pollutants in the workplace. • Recall what a confined space is, its dangers and the different permits associated with them. • Identify common gases encountered in a sewer system and recognize gas detector alarm set points. • Identify best practices when undergoing fit tests for respirators. 	8%
112	<p>Record data and observations relating to commercial, industrial, and residential inspections.</p> <ul style="list-style-type: none"> • Calculate the density of liquids and which values to report, gallons that are discharged per day, and flow rate. • Understand how to convert liquid measurements. • Indicate what needs to be including in an inspector’s field notebook. • Describe procedures an inspector should take when observing an irregular discharge during an inspection. 	6%
113	<p>Maintain equipment, materials, and worksites in an orderly and safe fashion, in accordance with policies and procedures.</p> <ul style="list-style-type: none"> • Select the types of confined spaces as described by OSHA. • Identify concentrations of flammable gases that will cause combustion. • Explain what pathogens are, and how they thrive in an environment. 	6%



KSA	Exam Content Outline	% on exam
	<ul style="list-style-type: none"> ● Know how to monitor gases in a space using a gas detector. ● Understand procedures to take when observing unsafe conditions at facility inspections. 	
114	<p>Keep current on pertinent information and developments in environmental compliance functional areas.</p> <ul style="list-style-type: none"> ● Identify the best sources in order to stay current on pretreatment regulations. ● Recall temperatures that must be maintained for organic substances, according to 40 CFR 136. ● Understand sources of information that workers in an Industrial User site must have access to. 	3%
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"> ● Explain the inspection frequency for all Significant Industrial Users. ● Understand terms and definitions relating to indirect and permitted dischargers. ● Describe the federal regulations regarding pollutants and permitted dischargers, and control dischargers. ● Identify the effectiveness of wastewater permits. 	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"> ● Calculate volume unit conversions. ● Detect hazardous levels of combustibles using a specific monitor. ● Recognize flow measurement systems. ● Report the parameters that must be recorded as field tests. 	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"> ● Understand how to measure and calculate sewer use fees. 	2%



KSA	Exam Content Outline	% on exam
118	Provide input and assistance in the preparation of written and oral reports; update field inspection records. <ul style="list-style-type: none">• Determine when to calculate a facilities water usage.• Outline what inspectors should look for when recording field notes.• Understand terms and acronyms relating to hazardous materials.• Understand how to review Safety Data Sheets and identify when additional information is required.	5%
119	Perform sampling of sanitary sewer overflows (SSOs) where appropriate. <ul style="list-style-type: none">• Recall the different categories of sanitary sewer overflows, the required notifications, and reporting.• Identify what sampling procedures and precautions that must be taken when dealing with SSO.	5%



Suggested References

CWEA’s exam is based on a job task analysis that includes research of the essential duties of an Environmental Compliance Inspector at a representative cross-section of systems and facilities in California. 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. In developing the exam, CWEA subject matter experts used their years of experience in the field along with the key textbooks and reference materials listed below. Candidates should understand that the references listed do not necessarily cover all exam content. Candidates who meet the minimum qualifications for this exam may find these suggested references useful when preparing for this exam; however, these suggested references are not required reading and should not be interpreted as constituting the sole source of all exam questions.

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. Taking our free self-evaluation can help identify strengths and areas to work on; the link to that self-evaluation tool follows at the end of this document.

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"> • 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) • Federal Register: Table II Required Containers, Preservation Techniques, and Holding Times • Industrial Users Inspection and Sampling Manual for POTWs, 2017
102	<ul style="list-style-type: none"> • 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 • Industrial Users Inspection and Sampling Manual for POTWs, 2017
103	<ul style="list-style-type: none"> • Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Chapter 6 (6.2-6.3) • Industrial Users Inspection and Sampling Manual for POTWs, 2017



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104	<ul style="list-style-type: none"> • 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) • Industrial Users Inspection and Sampling Manual for POTWs, 2017
105	<ul style="list-style-type: none"> • 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)
106	<ul style="list-style-type: none"> • Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Chapter 9 (9.3), Chapter 10 (10.3)
107	<ul style="list-style-type: none"> • Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Chapter 5 (5.2-5.3), Chapter 6
108	<ul style="list-style-type: none"> • 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) • Industrial Users Inspection and Sampling Manual for POTWs, 2017
109	<ul style="list-style-type: none"> • 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)
110	<ul style="list-style-type: none"> • Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Chapter 1, Chapter 4 (4.2-4.3)
111	<ul style="list-style-type: none"> • Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Chapter 5 (5.0-5.5) • Industrial Users Inspection and Sampling Manual for POTWs, 2017
112	<ul style="list-style-type: none"> • Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Appendix II- Pretreatment Arithmetic.
113	<ul style="list-style-type: none"> • Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Chapter 5 (5.1-5.2)
114	<ul style="list-style-type: none"> • Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Chapter 5 (5.0-5.1) • 40 CFR 136 Table II
115	<ul style="list-style-type: none"> • Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Chapter 3, Appendix III-Pretreatment Words



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116	<ul style="list-style-type: none"> • Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Appendix II- Pretreatment Arithmetic • Industrial Users Inspection and Sampling Manual for POTWs, 2017
117	<ul style="list-style-type: none"> • Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Appendix II- Pretreatment Arithmetic
118	<ul style="list-style-type: none"> • 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)
119	<ul style="list-style-type: none"> • Pretreatment Facility Inspection: A Field Study Training Program, 3rd Edition, 3rd Printing 2010. Chapter 3 (3.4-3.6) • Industrial Users Inspection and Sampling Manual for POTWs, 2017 • Enrollee’s Guide to the SSO Database: Sanitary Sewer Overflow Reduction Program, August 2013, State Water Resources Control Board

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](#)

Gauge your readiness with this self-evaluation Gap Analysis Tool

Help identify the knowledge, skills, and abilities you are confident in and those you might need to spend more time on by using this self-evaluation tool.

<https://www.cwea.org/tcp/pdf/ECI1-4%20KSA%20Gap%20Tool.pdf>

Equivalents & Formula Sheet

Familiarity with the following formula sheet is important. There is no need to memorize it, as it can be accessed on screen during the exam.