



**CITY OF SANTA CRUZ  
WATER QUALITY CHEMIST I/II/III**

**Reports to** Water Quality Manager  
**Supervises** Water Quality Chemist III provides lead direction to Water Quality Chemist I/II, Water Quality Microbiologist I/II, Water Quality Laboratory Technician  
**Bargaining Unit** Service

**BASIC FUNCTION**

The Water Quality Chemist series is responsible for the sampling, analysis, and reporting related to the collection, treatment, and distribution of water. The Water Quality Chemist I is the entry-level classification requiring one year of experience in an analytic laboratory related to Water Quality; this classification works under immediate supervision. The Water Quality Chemist II is the journey-level classification and works under general supervision providing some lead duties and performing increasingly complex analysis. The Water Quality Chemist III is the lead, advanced journey-level classification that works under general direction. The Water Quality Chemist III also performs the most advanced analysis and ensures that sampling and analysis are conducted in adherence to established methods and procedures and to ensure compliance with state and federal mandates.

**DISTINGUISHING CHARACTERISTICS**

The Water Quality Chemist series is alternately staffed. As experience is gained, incumbents are expected to work with greater independence of action within established methods and procedures of the laboratory and to maintain compliance with state and federal mandates. Incumbents may advance to the higher level after gaining experience and knowledge and demonstrating a level of proficiency that meets the qualifications of the next higher level classification.

The Water Quality Chemist I is distinguished from the next lower classification of Water Quality Laboratory Technician in that the latter classification is the entry level classification in the laboratory and performs general laboratory duties in support of laboratory testing and maintenance. This classification is distinguished from the next higher classification of Water Quality Chemist II in that the latter classification is the journey level and independently performs the full range of duties of the classification.

The Water Quality Chemist II is distinguished from the next higher classification of Water Quality Chemist III in that the latter classification is the advanced journey level classification that performs duties in the series as well as provides lead duties in the laboratory. In addition, this classification leads research projects and assists the Water Quality Manager in a range of duties including assisting in the maintenance of the Quality Assurance/Quality Control Program and Procedures Manual, the creation of the budget, and the preparation and submission of water quality control compliance reports.

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**Water Quality Chemist I/II/III**

This Water Quality Chemist III is distinguished from the next higher classification of Water Quality Manager in that the latter classification is responsible for managing the Water Quality Control Section and the associated programs, activities, and staff.

**TYPICAL DUTIES:** *(May include, but are not limited to, those duties listed below.)*

*The duties below are representative of what is expected from the Water Quality Chemist series. Some duties are performed at all levels of the series, with the more complex tasks performed by the Water Quality Chemist II and the most advanced tasks and analysis performed by the Water Quality Chemist III.*

- Schedules, collects, and conducts sampling, analyses, interpretation of results, and follow-up testing of physical, chemical, biological, and bacteriological tests of raw and treated drinking water related to treatment, quality, and distribution in accordance with Water Quality Laboratory processes and state and federal mandates.
- Determines probable causes of problems in results; recommends and implements corrective measures which may occur during sampling, transporting, storage, or laboratory processes; performs complex chemical and mathematical calculations and statistical analyses for test results.
- Prepares, completes, and files daily and periodic reports relevant to regulatory monitoring and process control requirements, or assists in these duties as required; maintains records of laboratory test results, laboratory operations, and quality assurance using LIMS as required by regulatory and professional standards; assists in research and monitoring projects requiring special chemical and biological analyses.
- Investigates, responds to, and resolves customer inquiries and complaints; conducts field investigations; alerts appropriate staff to irregularities in the system.
- Sets up, calibrates, operates and performs minor maintenance on a variety of laboratory equipment, including gas chromatography, ion chromatography, atomic absorption spectrophotometer, and computer controlled analyzers; assists with keeping equipment inventory current; makes recommendations regarding the purchasing of equipment and supplies and may order supplies; assists with maintaining the laboratory.
- Assists in designing evaluation methods for laboratory services, equipment, and supplies, including quality assurance and laboratory safety and sanitation programs; recommends changes to practices and procedures as appropriate.
- Attends and participates in informational seminars and webcasts related to Water Quality; stays current with federal, state and local regulatory requirements and other issues, trends, and innovations related to physical, inorganic and organic chemical, microbiological and bacteriological analyses in the field of water quality and analysis.
- Performs other related duties as assigned.

**Water Quality Chemist II**

- May train and act as a lead-worker to less experienced personnel in analytical procedures, quality assurance and quality control procedures, safe laboratory practices, routine laboratory functions, water quality concerns, and other related areas.

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**Water Quality Chemist III**

- Leads, plans, trains, coordinates, and participates in the most advanced work of staff responsible for water quality analysis, methods, procedures, and techniques.
- Ensures validity of laboratory data by reviewing and evaluating the technical work of less experienced staff and leads employees to correctly process work; provides input to Water Quality Manager on staff performance appraisals.
- Researches and monitors special projects requiring chemical and biological analyses.
- Identifies changes in regulations that may require new or revised procedures; develops, recommends, implements, and evaluates new analytical methods, practices, and procedures for water quality analysis.
- Plans, coordinates, and conducts special research and monitoring projects involving distribution system, storage reservoirs, and treatment plants.
- Participates in the hiring selection of laboratory staff.
- Estimates time, materials, and equipment required for jobs assigned; requisitions materials as required.
- Assists in establishing, maintaining, and revising the laboratory Quality Assurance/Quality Control Program and Procedures Manual; recommends operational modifications.
- Assists in implementing and updating ongoing laboratory safety program, following the city's Chemical Hygiene Plan; ensures strict adherence to safe laboratory work practices and procedures.
- Assists in the preparation and submission of water quality control compliance reports to Federal and State regulatory agencies.
- Assists in development and monitoring of the section budget; prepares cost estimates for budget recommendations.
- May act on laboratory results, in the absence of the Water Quality Manager, if action is required, by contacting staff in other Sections (e.g. to flush distribution system or notify public).
- May represent the Water Quality Manager at department meetings.

**WORKING CONDITIONS**

Position requires prolonged sitting, standing, and walking on unlevel and slippery surfaces; reaching, twisting, turning, kneeling, bending, stooping, squatting, crouching, grasping and making repetitive hand movements in the performance of daily duties. The position also requires near, far and color vision when performing tasks such as collecting and analyzing samples, in reading work related documents and using a computer. Acute hearing is required when providing phone and in-person service. The ability to lift, carry and push equipment, tools, and supplies weighing up to 40 pounds is also required. Additionally, when collecting samples and working in the laboratory, the incumbent may be exposed to biohazards and a variety of working conditions, including mechanical and electrical hazards, loud noise, wet, heat and cold. The use of cleaning and laboratory chemicals may expose the incumbent to fumes, dust and contaminants. The nature of the work also requires the incumbent to climb ladders and to operate motor-powered boats and off-road vehicles when collecting samples, go to remote and isolated areas, drive on rough and unpaved roads in varying weather conditions, to collect samples, and enter customers' homes to collect samples in the investigation of water quality complaints.

Some of these requirements may be accommodated for otherwise qualified individuals requiring and requesting such accommodations.

## **MINIMUM QUALIFICATIONS**

### **Knowledge:**

#### *Water Quality Chemist I/II/III*

- Principles, practices, standards, methods, chemicals and equipment used in physical, inorganic and organic chemical, microbiological and bacteriological sampling and analyses of raw and treated drinking water.
- Standard methods of qualitative and quantitative chemical analysis.
- Safe laboratory and sampling procedures and practices, such as the safe use of hazardous chemicals and electronic instruments.
- Methods and techniques for record keeping and report preparation and writing.
- Quality assurance and quality control procedures.
- Standard office practices, methods, and equipment.
- Chemical, physical, and bacteriological characteristics of raw and treated drinking water.
- Statistical procedures and mathematical concepts.
- Proficiency in Microsoft productivity software.

#### *Water Quality Chemist II/III*

- Design, develop, and implement sampling strategies and programs.
- Applicable federal and state laws, codes, and regulations.
- Methods and standards issued by state and federal regulatory agencies related to water sampling and analysis.
- Principles and practices of environmental health, public health, and epidemiology.
- Principles of water treatment and distribution, hydrology, and limnology.
- Proficiency in Laboratory Information Management System (LIMS).
- Processes, equipment, and instrumentation used in the examination, testing, and analysis of water samples.
- Standard operating procedures in a laboratory.

#### *Water Quality Chemist III*

- Operations, services, and activities of a water quality control/quality assurance program.
- Advanced principles of chemistry, biology, bacteriology, and related fields.

### **Abilities:**

#### *Water Quality Chemist I/II/III*

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- Plan, conduct, and interpret a variety of laboratory tests involving the physical, inorganic and organic chemical, microbiological and bacteriological analysis of water.
- Collect samples, prepare samples for testing, and preserve samples.
- Set up and verify new laboratory procedures as required.
- Operate, maintain, and calibrate laboratory instruments and sampling equipment.
- Conduct minor maintenance on laboratory equipment.
- Accurately perform mathematical calculations and statistical analysis of laboratory data.
- Maintain accurate records and prepare clear, comprehensive, and concise technical and administrative reports.
- Follow oral and written directions.
- Observe safety principles and work in a safe manner.
- Work independently.
- Learn more complex principles, practices, and techniques related to assigned duties.
- Operate a four-wheel drive vehicle and/or motor boat for the collection of samples.
- Establish and maintain effective working relationships with City staff, outside agencies, and the public.

*Water Quality Chemist II/III*

- Make independent decisions regarding test results, initiating appropriate follow-up and corrective actions.
- Conduct research, analyze data, and prepare sound recommendations for action.
- Plan, organize, and conduct complex projects related to area of assignment.
- Make effective oral presentations to City employees and to the public.

*Water Quality Chemist III*

- Develop, update and monitor quality assurance and quality control programs and resolve laboratory quality control issues.
- Maintain and conduct lead maintenance on laboratory equipment.
- Develop and successfully perform lead duties, including training.
- Lead, assign, and review the work of lower level staff.
- Perform and interpret the most advanced water analysis test results.
- Develop and perform applied research projects.
- Interpret and explain Department policies and procedures.
- Effectively ensure compliance with federal and state regulatory mandates.

**OTHER REQUIREMENTS**

- Willingness to work outside typical laboratory hours, including evenings, weekends and holidays as needed.

**EDUCATION AND EXPERIENCE**

Any combination of education and experience that provides the above knowledge, skills, and abilities combined with any required licenses is qualifying. A typical way to obtain the required qualifications is to possess the equivalent of the following:

- Bachelors Degree in chemistry or a related field, and

*Water Quality Chemist I*

- One year of laboratory experience in an environmental or other analytical laboratory that included the performance of physical, inorganic, and organic chemical, biochemical, microbiological, and bacteriological tests related to the analysis of water or wastewater.

*Water Quality Chemist II*

- Two years of experience as a professional level chemist which included at least one year of experience conducting physical, inorganic, and organic chemical, biochemical, microbiological, and bacteriological tests related to the analysis of water or wastewater in a state certified laboratory.

*Water Quality Chemist III*

- Four years of experience as a professional level chemist, which included at least three years of experience conducting physical, inorganic, and organic chemical, biochemical, microbiological, and bacteriological tests related to the analysis of water or wastewater in a state certified laboratory; and
- Some experience performing lead duties in water quality sampling and analysis.

**LICENSES/CERTIFICATIONS**

- Possession of and ability to maintain a valid California driver's license and a safe driving record.

**DESIRABLE QUALIFICATIONS**

- Certification by the American Water Works Association as a Water Quality Analyst.
- Certification by the California Department of Public Health as a Water Treatment Operator or Water Distribution Operator.

Classification No.: 251/252/253

Date of Issue: 11/09

Supersedes: New

**Career Ladder**

- Water Quality Laboratory Manager
- *Water Quality Chemist III*
- Water Quality Chemist II
- Water Quality Chemist I
- Water Quality Laboratory Technician