

## **SENIOR CHEMIST**

### **TASK LIST - 2016**

1. Oversees the collection of samples at designated locations and, if necessary, in the field, according to guidelines specifying the types of container, frequency of sampling, and proper procedures, in order to obtain a representative sample.
2. Mixes reagents using chemicals, water, acids, organic solvents, and bases in proper proportions, and using equipment such as volumetric glassware, balances, and stirring motors, in order to prepare homogeneous solutions for subsequent tests.
3. Performs a wet chemistry colorimetric analysis on samples of water, air, tissue, gases, vapors, sediment, sludge, and biosolids using flasks, pipettes, and indicators by adding the proper reagent and then agitating the solution by stirring or shaking, in order to isolate one substance in a colorimetric process.
4. Oversees the preparation of samples for instrumental analysis using separatory funnels, drying ovens, hoods, and hot plates to extract organic substances by adding proper organic solvents and then agitating, in order to isolate organics from water to test more than one substance from the same sample.
5. Converts the sample into an analyzable form or isolates components from the sample, using techniques such as purge and trap, solvent extraction, distillation, filtration, and digestion, according to standardized methods for analysis of the sample.
6. Determines the concentrations of organic and inorganic substances such as nitrogen, phosphorus, fluoride, silica, cyanide, phenol, metals, and detergent by using spectrophotometers (i.e. either atomic absorption and ion chromatograph emission, ultra violet/visible, or infra-red), a Gas Chromatograph or Gas Chromatograph/Mass Spectrometer, volumetric titration (where the reagent is put in a buret, and released to drip on the sample, and when the appropriate amount has been added, the sample turns a specific color), and gravimetric analysis to test samples for organic substances such as phenol, pesticides, herbicides, volatile organics, and base neutral/acid extractable in order to measure the level of known or unknown chemicals in samples, to test samples for alkalinity, hardness, nitrogen, chlorine, chloride, chemical oxygen demand, and biochemical oxygen demand, and to test for suspended solids, total solids, and oil/grease by weighing the amount of substance remaining after wet chemistry analysis on a balance to determine the amount of substance in samples.

7. Determines the amount of electrolytes in the sample, test samples for total organic carbon levels, and test liquids for ignitability by using a pH meter, conductivity meter, total organic carbon analyzer, flow injection analyzer, and/or flash point tester in order to measure the Hydrogen Ion concentration of the sample.
8. Repeats analyses and tests spiked samples, quality control samples and surrogate samples in order to ensure a high standard of accuracy and precision in accordance with regulatory guidelines and Quality Assurance Programs.
9. Fills out periodic result sheets (daily, weekly, monthly), manually and/or electronically, including the conditions of analysis, raw data, type of sample, time, method used, and results in order to document information required by management and/or regulatory agencies.
10. Analyzes a standard solution by implementing standard methods, improving on current test methods and analyses, and setting up, calibrating, and manipulating instruments for testing, manually or through a data station, by selecting appropriate lamp, adjusting the lamp position, flame, fuel flow, and/or aspiration rate, setting proper wavelength, setting proper burner head position, selecting proper column, detector, temperatures, and carrier gas in order to ready equipment for testing, optimize the operating conditions, and develop methodology for the analysis of samples.
11. Analyzes a standard solution at different concentrations to establish a standard curve (i.e. plots concentration vs. some quantifiable parameter within the linear range of detection) in order to have a basis for determination of sample concentration.
12. Calculates the concentration of a sample from data arrived at through analysis, using basic math skills such as arithmetic and statistics and on occasion higher level math such as differential equations and calculus, manually or through a data station (i.e. a computer that controls the instrument operation, data collection/calculation, and data reporting).
13. Visually inspects inventory of supplies and expendable items, and approves and oversees the ordering of items through appropriate suppliers based on need in order to maintain sufficient inventory for operation.
14. Evaluates the energy recovery beneficial use of biosolids and wastewater treatment processes, considering issues such as rate or extent to which chemicals are spent, the level of material of interest in influent and effluent water, effectiveness of the disinfection process, and how stable the water is in order to assure efficiency of processes, effective maintenance, and control over what type of water is appropriate for specific uses such as irrigation reclamation, receiving water or in City ponds.

15. Performs special analysis of sewer lines by collecting air samples from the air treatment facilities in sewer lines, wastewater treatment plants, and landfill facilities and performs an air analysis in order to determine the concentrations of Reduced Sulfur Compounds such as Hydrogen Sulfide and Mercaptan and Volatile Organic Compounds by using a Gas Chromatography (GC) and Gas Chromatography/Mass Spectroscopy (GC/MS) instrument to address odor complaints.
16. Compares the results of the laboratory analysis with the results found in other organization's tests of the same sample by analyzing unknown samples brought from a certified agency using Environmental Protection Agency (EPA) approved methods and determining if the result is within an acceptable range in order to participate in inter-laboratory studies and satisfy one of the requirements of the laboratory certification.
17. Conducts time and motion studies, calculates material costs, reviews price lists and current salaries plus projected increases, and spreads the cost of quality assurance and calibration between samples tested in order to perform a cost analysis and estimate personnel, maintenance, and supply requirements used in budget preparation.
18. Testifies in court as an expert witness as to the results of chemical analyses in order to provide testimony regarding the validity of results when a case is brought to court.
19. Supervises the fabrication of a bench top pilot process, including setting up systems and methodology, in order to simulate the design engineer's recommendation for processes of sewage disposal, including treatment and sedimentation with recycling of activated sludge, to determine whether the recommendation is appropriate to produce the required results.
20. Confers with other employees, supervisors, plant engineers, consultants, operations personnel, outside maintenance personnel, representatives from regulatory agencies, governmental groups, other organizations and the public, in person and over the phone, in order to:
  - give group tours;
  - discuss the preparation for assigned work including methodology to clearly define requirements and expectations;
  - explain how the results of the analysis relate to specific problems and/or suggest further actions to be taken in order to interpret the results of data collected;
  - put information gathered from tests to practical use;
  - answer questions concerning test results, hazardous materials, and chemicals;

- explain laboratory functions and processes as well as air and wastewater quality control facilities;
  - determine the sampling procedures used for projects such as industrial wastes, process control, and special projects;
  - provide technical advice, as needed, regarding chemical, or physical processes;
  - update staff concerning changes in administrative policies, rules, and regulations; and/or
  - provide or receive information and gain approval on desired projects.
21. Represents the Department in coordinating the work of laboratories with the regulatory agencies such as the Los Angeles Regional Water Quality Control Board, Southern California Coastal Waters Research Project, Department of Public Health Services, Air Quality Management District, and other regulating and research organizations.
  22. Attends seminars, workshops, expositions, training sessions, and industry organization meetings and conferences such as the California Water Environment Association, the Water Environment Federation American Chemical Society, and the Southern California Environmental Chemists Society of Testing Materials in order to participate in current research and new testing and method development, keep up-to-date on current changes in technology and methodology and survey new equipment, read literature, and speak with salespeople and see demonstrations of equipment uses in order to determine which new products are appropriate for the needs of the laboratory.
  23. Approves or recommends approval of personnel transactions including reassignments, job rotation, and sick leave, vacation, and other time off by assessing staff and laboratory capabilities, time requirements, and workload in order to ensure adequate staffing and to plan and assign the work of subordinate personnel to complete assignments efficiently, utilizing the best resources.
  24. Reviews and evaluates the progress and completed work of subordinate personnel by taking into consideration the quality and quantity of work while using standard performance evaluations or weekly activity reports, in order to make changes, ensure timely completion of work, advise the employee of their performance, discuss the progress of work, document performance, and check for completeness, quality, and accuracy of work completed.
  25. Conducts training and orients new employees on issues such as safety, chemical analysis, administrative and technical processes, and instrumentation in order to disseminate information and develop employees.
  26. Interviews eligible candidates using applications, standard training guides and procedures in order to evaluate the eligible candidates and recommend the most suitable for vacant positions, considering Equal Employment Opportunity.

27. Counsels and disciplines subordinates and keeps records of such, in accordance with provisions of the Memorandum of Understanding (MOU), City, and department personnel policies, rules and regulations in order to maintain department standards with regard to sick leave, attendance, and work performance.
28. Reviews grievance and discrimination complaints, keeping in mind Equal Employment Opportunity efforts and attempts to resolve the problem or directs grievant on the procedure to file a formal grievance.
29. Writes performance specifications for desired equipment after assessing the needs of the laboratory and specifying what capabilities the equipment should have, and compares it to the manufacturer's specification to determine whether or not the equipment is suitable for the needs of the department.
30. Inspects laboratory and field conditions and operations through personal observations and verbally instructs or writes reports to management concerning matters such as safety, laboratory operation, and administrative issues (i.e. planning, budgeting, purchasing, and personnel) in order to convey analysis of current and pending legislation, regulation and directives on quality control standards, treatment process, and testing, as well as to alert management of problems so that appropriate actions may be taken, to ensure conformance with safety regulations according to CAL/OSHA, to make recommendations, and to provide requested information.
31. Reads and reviews safety labels on reagent bottles, safety data sheets (SDS), procedures manuals, safety manuals, and governmental regulations such as the Environmental Protection Agency (EPA), Air Quality Management District (AQMD), Water Quality Management District (WQMD), and Water Quality Control Board (WQCB) in order to determine the analysis needed to be performed to comply with the regulations and understand the implications and promote a safe working environment.
32. Performs tests and analyses on substances necessary to meet the Environmental Protection Agency, law enforcement and public safety requirements for samples of water, air, gases, tissue, sediment, sludge, and biosolids.