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| **ENVIRONMENTAL SERVICE SYSTEMS, 01.0100.00** |
| **STANDARD 1.0 – USE ANALYSIS PROCEDURES TO PLAN AND EVALUATE ENVIRONMENTAL SERVICE IMPACTS** |
| 1.1 | Operate basic laboratory equipment and environment monitoring instruments (e.g., pHmeter/ISE meter,compound microscope/dissecting microscope, sound level measuring devices, turbid meter, conductivity meter, chlorine meter OVA, HNMU) |
| 1.2 | Perform chemical laboratory sample preparation |
| 1.3 | Perform analytical separation techniques |
| 1.4 | Use computers to interface with chemical analytical instruments |
| 1.5 | Perform instrumental analysis (e.g., mass spectrometers, chromatographs, electron microscopes) |
| **STANDARD 2.0 – CALIBRATE AND SERVICE INSTRUMENTS ON A TIMELY SCHEDULE TO MAINTAIN ENVIRONMENTAL INSTRUMENTATION** |
| 2.1 | Maintain instruments using gas systems |
| 2.2 | Calibrate chemical analytical instruments |
| 2.3 | Operate and maintain flow instrument systems |
| 2.4 | Operate and maintain pressure test instruments (e.g., manometers, vacuum pumps, pressure, and vacuum gages) |
| 2.5 | Service thermal measuring instruments |
| 2.6 | Service physical property (e.g., sample control) measuring instruments |
| **STANDARD 3.0 – APPLY STATISTICS, CHARTS, AND SCATTER GRAMS TO MEASURE AND MONITOR OPERATIONS** |
| 3.1 | Apply basic statistics concepts |
| 3.2 | Interpret scatter grams |
| 3.3 | Analyze probability theories |
| 3.4 | Determine control limits |
| 3.5 | Determine process capability |
| 3.6 | Prepare and evaluate charts |
| 3.7 | Conduct process improvement studies |
| 3.8 | Interpret quantitative and graphic output from chemical analysis instruments |
| **STANDARD 4.0 – UTILIZE A GLOBAL POSITIONING SYSTEM (GPS) UNIT** |
| 4.1 | Identify the latitude and longitude of a given set of points |
| 4.2 | Detect boundaries of a given area |
| 4.3 | Calculate land area and linear feet of boundaries |
| 4.4 | Layout location of fence line, pond, drainage structure, or other related facility |
| 4.5 | Mark a location of a path or road through a given area |
| 4.6 | Determine slope of land area for installation of drainage, etc. |
| **STANDARD 5 .0 – CONSULT RELIABLE RESOURCES OR TRAINING TO IDENTIFY THE MAJOR LAWS IMPACTING ENVIRONMENTAL SERVICES** |
| 5.1 | Identify key components of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) |
| 5.2 | Identify requirements of Superfund Amendment Reauthorization Act (SARA) |
| 5.3 | Identify requirements of waste and material transportation |
| 5.4 | Describe job-related activities subject to the Occupational Safety and Health Administration (OSHA) |
| 5.5 | Describe requirements of Resource Conservation and Recovery Act (RCRA) |
| 5.6 | Explain requirements of Clean Water Act |
| 5.7 | Explain requirements of Safe Drinking Water Act (SDWA) |
| 5.8 | Explain requirements of Clean Air Act |
| 5.9 | Identify requirements of the Nuclear Waste Policy Act |
| 5.10 | Identify key components of ISO 14000 |
| **STANDARD 6 .0 – APPLY METEOROLOGICAL KNOWLEDGE TO RECOGNIZE WEATHER SYSTEMS AND WEATHER PATTERNS** |
| 6.1 | Identify the components of the earth’s atmosphere |
| 6.2 | Explain basic meteorology principles |
| **STANDARD 7.0 – DESCRIBE SOIL COMPOSITIONS AND PROPERTIES TO DEMONSTRATE KNOWLEDGE OF SOIL SCIENCE** |
| 7.1 | Describe soil geology |
| 7.2 | Describe composition of soil |
| 7.3 | Describe the biological properties of soil |
| 7.4 | Identify the physical properties of soil |
| 7.5 | Describe the chemical properties of soil |
| 7.6 | Test soil samples to determine characteristics |
| 7.7 | Explain classification of soil water |
| 7.8 | Explain the relationship between soil classifications and land use |
| **STANDARD 8 .0 – EXPLAIN WELL DESIGN AND GROUNDWATER SUPPLIES TO DEMONSTRATE KNOWLEDGE OF HYDROLOGY** |
| 8.1 | Explain hydrology |
| 8.2 | Explain geological and meteorological principles affecting groundwater supply |
| 8.3 | Identify basic criteria for water well design |
| 8.4 | Identify environmental hazards associated with groundwater supplies |
| **STANDARD 9.0 – DISCUSS PROPERTIES, CLASSIFICATIONS, AND FUNCTIONS IN ORDER TO UNDERSTAND WETLAND PRINCIPLES** |
| 9.1 | Explain wetlands classification |
| 9.2 | Explain the function of wetlands |
| 9.3 | Describe the living components of wetland habitats |
| 9.4 | Delineate wetlands |
| 9.5 | Identify techniques used in wetland management, enhancement, and restoration programs |
| 9.6 | Identify principles used in wetland mitigation and restoration |
| **STANDARD 10 .0 – DISCUSS PROPERTIES, CLASSIFICATIONS, AND FUNCTIONS IN ORDER TO UNDERSTAND WATERSHED PRINCIPLES** |
| 10.1 | Identify properties of watersheds |
| 10.2 | Explain watershed management |
| 10.3 | Delineate watersheds |
| 10.4 | Assess source water |

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| **STANDARD 11.0 – USE CHEMICAL ANALYSIS TO CONDUCT TESTS** |
| 11.1 | Explain basic chemistry principles (e.g., elements, compounds) |
| 11.2 | Apply chemical laboratory skills |
| **STANDARD 12.0 – INVESTIGATE LIVING ORGANISMS AND THEIR INTERACTIONS WITH THE ENVIRONMENT** |
| 12.1 | Identify native and invasive organisms within a given area |
| 12.2 | Inventory resources that resident species depend on for survival |
| 12.3 | Define relationships among plants and animal species |
| 12.4 | Recognize causes of changes in ecological succession patterns |
| 12.5 | Determine if a healthy balance exists between the environment and the native species |
| 12.6 | Suggest remediation practices |
| 12.7 | Perform common microbiology procedures to examine cell types and conduct tests |
| 12.8 | Identify groups of microorganisms |
| 12.9 | Analyze factors affecting microbial growth |
| **STANDARD 13.0 – APPLY SAMPLING TECHNIQUES AND OTHER ASSESSMENTS TO DEMONSTRATE BACKGROUND KNOWLEDGE OF MICROBIOLOGY** |
| 13.1 | Apply microbiological principles and procedures |
| 13.2 | Explain immunological procedures |
| 13.3 | Describe roles of microorganisms in the environment |
| 13.4 | Explain microbial growth |
| 13.5 | Describe influence of environmental factors on microbes |
| **STANDARD 14 .0 – USE POLLUTION CONTROL MEASURES TO MAINTAIN A SAFE FACILITY ENVIRONMENT** |
| 14.1 | Identify types of pollution (e.g., ground, surface water, air, noise, radioactive contamination) |
| 14.2 | Identify presence of pollution |
| 14.3 | Describe environmental impact from industrial and nonindustrial processes |
| 14.4 | Quantify extent of pollution |
| 14.5 | Locate sources of pollution |
| 14.6 | Establish pollution management and prevention program |
| **STANDARD 15 .0 – APPLY PRINCIPLES OF SOLID WASTE MANAGEMENT (LANDFILL) TO MANAGE SAFE DISPOSAL OF ALL CATEGORIES OF WASTE** |
| 15.1 | Identify characteristics of solid waste treatment |
| 15.2 | Identify the risks associated with solid waste accumulation and disposal |
| 15.3 | Describe methods of site identification and acceptance |
| 15.4 | Explain sanitary landfill operating procedures |
| 15.5 | Describe methods to operate a composting facility |
| 15.6 | Describe methods to incinerate solid waste |
| 15.7 | Describe recycling methods |
| **STANDARD 16 .0 – APPLY WATER TREATMENT OPERATIONS PRINCIPLES TO ASSURE SAFE WATER AT A FACILITY** |
| 16.1 | Identify characteristics of drinking water treatment |
| 16.2 | Explain the aeration process in water treatment |
| 16.3 | Describe taste and odor control in water treatment |
| 16.4 | Identify facility operational problems in water treatment |
| 16.5 | Identify methods for backflow prevention |
| **STANDARD 17 .0 – APPLY WASTEWATER TREATMENT OPERATIONS PRINCIPLES TO MANAGE WASTEWATER DISPOSAL IN KEEPING WITH RULES AND REGULATIONS** |
| 17.1 | Identify characteristics of wastewater treatment |
| 17.2 | Sample wastewater |
| 17.3 | Describe wastewater collection systems |
| 17.4 | Analyze the constituents of wastewater entering wastewater treatment facility |
| 17.5 | Describe the mixing, coagulation, and flocculation in processes in wastewater treatment |
| 17.6 | Describe the disinfection process in wastewater treatment |
| 17.7 | Describe the treatment train, effluent disposal, and biosolids management in wastewater |
| 17.8 | Analyze process optimization for the treatment train, effluent disposal, and biosolids management in wastewater treatment |
| 17.9 | Analyze treatment process control for the treatment train, effluent disposal and biosolids management in wastewater |
| 17.10 | Describe common facility operational problems |
| 17.11 | Identify methods for cross-connection and backflow prevention |
| **STANDARD 18.0 – APPLY HAZARDOUS MATERIALS MANAGEMENT PRINCIPLES TO ASSURE A SAFE FACILITY AND TO COMPLY WITH APPLICABLE REGULATIONS** |
| 18.1 | Describe risks related to hazardous materials |
| 18.2 | Demonstrate appropriate responses for major types of hazardous materials disasters (e.g., chemical, fire and explosion, general safety hazards; FRA, FRO, HMT, HMS) |
| 18.3 | Describe appropriate use of Personal Protective Equipment (PPE) |
| 18.4 | Explain hazardous substance regulations |
| 18.5 | Demonstrate ability to obtain and use information addressing hazardous substance release |
| 18.6 | Demonstrate safe handling procedures for hazardous materials and hazardous waste |
| 18.7 | Evaluate laboratory results |
| 18.8 | Demonstrate methods for identify hazardous material |
| 18.9 | Retrieve and evaluate hazardous materials and hazardous waste sample data |
| 18.10 | Respond to mock hazardous materials emergency situations |
| 18.11 | Describe use of equipment related to hazardous materials and hazardous waste operations |
| 18.12 | Prepare hazardous materials for transportation and storage in accordance with regulations |
| 18.13 | Demonstrate ability to operate treatment and disposal systems for hazardous materials and hazardous waste |
| **STANDARD 19 .0 – EXPLORE CONVENTIONAL AND ALTERNATIVE SUPPLIES TO DEFINE ENERGY SOURCES** |
| 19.1 | Identify conventional energy sources and their environmental impact |
| 19.2 | Identify alternate energy sources and their environmental impact |

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| **STANDARD 20 .0 – USE TECHNOLOGICAL TOOLS TO MAP LAND, FACILITIES, AND INFRASTRUCTURE** |
| 20.1 | Apply surveying and mapping principles to make site measurements and map facility accesses and infrastructure |
| 20.2 | Apply basic drafting skills to create working drawings |
| 20.3 | Use CADD fundamentals to create specialized documents |
| 20.4 | Apply cartographic skills |
| 20.5 | Apply surveying skills |
| 20.6 | Use geospatial analysis processes for an environmental services application |