Need to Know Criteria: Water Supply Certifications-All Levels

Subject	Certification Level
Administration (ADMIN)	
Finance	3, 4
Personnel	3, 4
Supervision	3, 4
Records	3, 4
Chemical Stabilization (CHEMSTA)	
Corrosion Control	S, A, 1, 2, 3, 4
Chemistry of corrosion	4
Provisions Lead & Copper Rule	S, A, 1, 2, 3, 4
Tests for corrosion	4
Treatment	4
Iron & manganese control	S, A, 2, 3, 4
Calculations	2, 3, 4
Treatment	S, A, 2, 3, 4
pH adjustment	S, A, 2, 3, 4
Coagulation & flocculation (COAG)	
Operation & maintenance	A, 3, 4
Normal & abnormal conditions	A, 3, 4
Problems & corrections	A, 3, 4
Troubleshooting	A, 3, 4

Subject	Certification Level
Coagulation & flocculation (COAG) continued	
Process control	A, 3, 4
Jar test	A, 3, 4
Process description	A, 3, 4
Chemicals used	A, 3, 4
Components	A, 3, 4
Purpose	A, 3, 4
Cross-connection control (XCONN)	
Applications	S, A, 1, 2, 3, 4
General	S, A, 1, 2, 3, 4
Maintenance	A, 2, 3, 4
Programs	2, 3, 4
Types of devices	S, A, 1, 2, 3, 4
Disinfection (DISINF)	
Gas chlorination	2, 3, 4
Changing cylinders	2, 3, 4
Components	2, 3, 4
Equipment used	2, 3, 4
Leaks	2, 3, 4
Maintenance	2, 3, 4

Subject	Certification Level
Disinfection (DISINF) Continued	
Operation	2, 3, 4
Safety	2, 3, 4
Storage & handling	2, 3, 4
Troubleshooting	2, 3, 4
Hypochlorination	S, A, 2
Equipment used	S, A, 2
Maintenance	S, A, 2
Operation	S, A, 2
Safety	S, A, 2
Storage & handling	S, A, 2
Process description	S, A, 2, 3, 4
Dosage	2, 3, 4
Factors affecting disinfection	S, A, 2, 3, 4
Purpose	S, A, 2, 3, 4
Reactions of chlorine	S, A, 2, 3, 4
Typical pathogens	S, A, 2, 3, 4
Residual	S, A, 2, 3, 4
Ozone Disinfection	A, 3, 4

Subject	Certification Level
Distribution (DISTRIB)	
Customer services	1, 2, 3, 4
Hydrants	1, 2, 3, 4
Components	1, 2, 3, 4
Flow testing	3, 4
Installation	1, 2, 3, 4
Maintenance & flushing	1, 2, 3, 4
Purpose	1, 2, 3, 4
Hydraulics	2, 3, 4
System pressure	2, 3, 4
Maps	S, A, 1, 2, 3, 4
Meters	S, A, 1, 2, 3, 4
Accountability	S, A, 1, 2, 3, 4
Maintenance	3, 4
Types	S, A, 1, 2, 3, 4
Piping & joints	S, A, 1, 2, 3, 4
Hydraulics	S, A, 1, 2, 3, 4
Installation	S, A, 1, 2, 3, 4
Materials	S, A, 1, 2, 3, 4
Operation & maintenance	S, A, 1, 2, 3, 4
Thrust	1, 2, 3, 4

Subject	Certification Level
Distribution (DISTRIB) Continued	
Valves	S, A, 1, 2, 3, 4
Operation & maintenance	1, 2, 3, 4
Purpose	S, A, 1, 2, 3, 4
Types	S, A, 1, 2, 3, 4
Water quality	3, 4
Fluoridation (FLUOR)	
Chemical compounds used	S, A, 2, 3, 4
Process control	S, A, 2, 3, 4
Laboratory procedure	S, A, 2, 3, 4
Process description	S, A, 2, 3, 4
Chemical storage & handling	S, A, 2, 3, 4
Components	S, A, 2, 3, 4
Dosage	2, 3, 4
Purpose	S, A, 2, 3, 4
General (GENERAL)	
Basic chemistry	S, A, 1, 2
pH	S, A, 1, 2
Symbol identification	S, A, 1, 2

Subject	Certification Level
General (GENERAL)-continued	
Calculations *[Generally under specific topic!]*	
Dosage	2, 3, 4
Efficiency	2, 3, 4
Flow	1, 2, 3, 4
Hydraulics	2, 3, 4
Power	3, 4
Pressure	1, 2, 3, 4
Temperature	3, 4
Volume	1, 2, 3, 4
Hydrologic cycle	S, A, 1, 2, 3, 4
Ground water	S, A, 1, 2, 3, 4
Surface water	A, 3, 4
Measurement Units	S, A, 1, 2, 3, 4
Purpose	S, A, 1, 2, 3, 4
Terms	S, A, 1, 2, 3, 4
Water characteristics	S, A, 1, 2, 3, 4
Chemical	S, A, 1, 2, 3, 4
Microbiological	S, A, 1, 2, 3, 4
Physical	S, A, 1, 2, 3, 4
Terms	S, A, 1, 2, 3, 4

Subject	Certification Level
Gravity Filtration (FILT)	
Operation & maintenance	A, 3, 4
Backwash	A, 3, 4
Maintenance	A, 3, 4
Normal & abnormal conditions	A, 3, 4
Problems & corrections	A, 3, 4
Troubleshooting	A, 3, 4
Process control	A, 3, 4
Process description	A, 3, 4
Components	A, 3, 4
Purpose	A, 3, 4
Slow sand filteration	A, 3, 4
Types	A, 3, 4
Ion exchange softening (IONEXCH)	
Operation & maintenance	A, 3, 4
Maintenance	A, 3, 4
Normal & abnormal conditions	A, 3, 4
Problems & corrections	A, 3, 4
Troubleshooting	A, 3, 4
Process control	A, 3, 4

Subject	Certification Level
Ion exchange softening (IONEXCH)-continued	
Process description	A, 3, 4
Compoonents	A, 3, 4
Chemistry of softening	A, 3, 4
Purpose	A, 3, 4
Laboratory procedures (LAB)	
Laboratory safety	3, 4
Tests	S, A, 1, 2, 3, 4
Dissolved oxygen	3, 4
Hardness	A, 3, 4
pH	3, 4
Turbidity	A, 3, 4
Mechanical systems (MECHSYS)	
Chemical feeders	S, A, 2, 3, 4
Calibration	S, A, 2, 3, 4
Operation & maintenance	S, A, 2, 3, 4
Types	S, A, 2, 3, 4
General maintenance	S, A, 1, 2

Subject	Certification Level
Mechanical systems (MECHSYS)-continued	
Instrumentation	A, 3, 4
Measured variables & equipment	4
Measurement & control systems	A, 3, 4
Metering equipment	S, A, 1, 2
Operation & maintenance	2, 3, 4
Motors	S, A, 1, 2
Components	S, A, 1, 2
Controls & wiring	2, 3
Coupling alignment & maintenance	2, 3
Maintenance-general	S, A, 1, 2
Operation	S, A, 1, 2
Pumps	S, A, 1, 2
Components	S, A, 1, 2
Hydraulics	S, A, 1, 2, 3
Maintenance	S, A, 1, 2, 3
Operation	S, A, 1, 2, 3
Power *(efficiency)*	3, 4
Troubleshooting	S, A, 1, 2, 3
Types	S, A, 1, 2

Subject	Certification Level
Mechanical systems (MECHSYS)-continued	
Valves	S, A, 1, 2
Characteristics	S, A, 1, 2
Operation & maintenance	S, A, 1, 2
Types	S, A, 1, 2
Membrane Filtration (Microfiltration, Ultrafiltration)	
Difference between microfiltration and ultrafiltration	3, 4
Membrane fiber geometry	3, 4
Membrane unit operations	3, 4
Pressurized membrane filtration process	3, 4
Submerged membrane filtration process	3, 4
Backwashing of membranes (aka reverse filtration)	3, 4
Membrane water flux	3, 4
Trans membrane pressure	3, 4
Membrane fouling	3, 4
Membrane cleaning	3, 4
Troubleshooting	3, 4
RO/NF process monitoring	3, 4
MF/UF data normalization	3, 4
RO/NF data normalization	3, 4

Subject	Certification Level
Membrane Biological Reactors (MBR)	
Advantages	3, 4
Typical MBR system schematic	3, 4
Three types of MBR	3, 4
Membrane Desalting (Nanofiltration, Reverse Osmosis)	3, 4
Difference between nanofiltration & RO	3, 4
RO process design (schematic)	3, 4
RO terminology	3, 4
Concentrate disposal for RO systems	3, 4
RO theory	3, 4
Typical osmotic pressures	3, 4
Water flux calculation	3, 4
Recovery calculation	3, 4
System salt rejection calculation	3, 4
Strategies to increase recovery	3, 4
RO/NF limitations	3, 4
RO membrane operating parameters	3, 4
RO pressure vessel assembly	3, 4
RO unit array design	3, 4
RO pressure problems	3, 4
RO membrane fouling & scaling (causes & impact)	3, 4
Threshold inhibitors (antiscalants)	3, 4

Subject	Certification Level
Oxidation/Disinfection	
Advanced Oxidation Processes (ozone, H_2O_2, UV)	3, 4
UV light uses & characteristics	3, 4
UV lamp considerations	3, 4
Ozonation process	3, 4
Parts/schematic of typical ozone system	3, 4
UV-AOP process	3, 4
Other AOP processes (i.e., O_3/UV; O_3/H_2O_2; TiO_2/UV; Fenton's Reagent; Cavitation & sonication; Electron Beam)	
Adsorption/Absorption (granular activated carbon [GAC])	3, 4
GAC purpose & uses	3, 4
Ozonation & biologically active filtration (BAC) process	
Desalination	3, 4
Advanced Water Treatment Facility Considerations	3, 4
Process monitoring & reporting	3, 4
Membrane integrity for MF/UF	3, 4
Pressure filtration (PRESS)	
Operation & maintenance	A, 2
Backwash	A, 2
Normal & abnormal conditions	A, 2

Subject	Certification Level
Pressure filtration (PRESS)-continued	
Operation & maintenance-cont'd	A, 2
Problems & corrections	A, 2
Troubleshooting	A, 2
Process controls	A, 2
Process description	A, 2
Components	A, 2
Purpose	A, 2
Types	A, 2
Regulations (REGS)	
EPA SDWA regs	S, A, 1, 2, 3, 4
NM Utility Operator Certification Regs	S, A, 1, 2, 3, 4
NM drinking water regs	S, A, 1, 2, 3, 4
NPDES permit requirements	3, 4
Reservoirs (RESERV)	
Reservoir management	4
Algae control	4
Water quality problems	4

Subject	Certification Level
Safety (SAFETY)	
Chemical handling	S, A, 1, 2, 3, 4
Confined space entry	S, A, 1, 2, 3, 4
Electical	S, A, 1, 2, 3, 4
Emergency Action Plan	S, A, 1, 2, 3, 4
Excavation & shoring	S, A, 1, 2, 3, 4
Facility Security	S, A, 1, 2, 3, 4
Fire	S, A, 1, 2, 3, 4
First aid	S, A, 1, 2, 3, 4
Hazardous gases	S, A, 1, 2, 3, 4
Job Safety Hazard Analysis	S, A, 1, 2, 3, 4
Ozone Safety	S, A, 1, 2, 3, 4
Personal	S, A, 1, 2, 3, 4
Programs	3, 4
Rotating machinery	S, A, 1, 2, 3, 4
Safety Data Sheets	S, A, 1, 2, 3, 4
Working in streets	S, A, 1, 2, 3, 4
Sampling & Reporting (SAMP)	
Records	S, A, 1, 2, 3, 4
Reporting requirements	S, A, 1, 2, 3, 4

Subject	Certification Level
Sampling & Reporting (SAMP)-continued	
SDWA compliance sampling	S, A, 1, 2, 3, 4
Asbestos	S, A, 1, 2, 3, 4
Chemical contaminants	S, A, 1, 2, 3, 4
Disinfection byproducts group	S, A, 1, 2, 3, 4
Lead and Copper Group	S, A, 1, 2, 3, 4
Microbiological contaminants	S, A, 1, 2, 3, 4
Physical contaminants	S, A, 1, 2, 3, 4
Public notification requirements	S, A, 1, 2, 3
Sampling procedure	S, A, 1, 2, 3, 4
Preservation	S, A, 1, 2, 3, 4
Representative sampling	S, A, 1, 2, 3, 4
Testing	S, A, 1, 2, 3, 4
Process description	S, A, 1, 2, 3, 4
Components	S, A, 2, 3, 4
Purpose	S, A, 2, 3, 4
Types	S, A, 2, 3, 4
Sedimentation (SED)	
Loading rates & efficiency	A, 3, 4
Hydraulic	A, 3, 4
Removal efficiency	A, 3, 4
Solids	A, 3, 4

Subject	Certification Level
Sedimentation (SED)-continued	
Operating characteristics	A, 3, 4
Operation & maintenance	A, 3, 4
Factors affecting setting	A, 3, 4
Maintenance	A, 3, 4
Normal & abnormal conditions	A, 3, 4
Problems & corrections	A, 3, 4
Troubleshooting	A, 3, 4
Process control	A, 3, 4
Detention time	A, 3, 4
Process description	A, 3, 4
Components	A, 3, 4
Purpose	A, 3, 4
Storage (STORAGE)	
Operation & maintenance	S, A, 1, 2, 3, 4
Corrosion control	S, A, 1, 2, 3, 4
Disinfection	S, A, 1, 2, 3, 4
Inspection	S, A, 1, 2, 3, 4
Process description	S, A, 1, 2, 3, 4
Components	S, A, 1, 2, 3, 4
Purpose	S, A, 1, 2, 3, 4
Types	S, A, 1, 2, 3, 4

Subject	Certification Level
Taste & odor control (T&O)	
Causes & Prevention	S, A, 2, 3, 4
Operation & maintenance	S, A, 2, 3, 4
Normal & abnormal conditions	S, A, 2, 3, 4
Problems & corrections	S, A, 2, 3, 4
Troubleshooting	S, A, 2, 3, 4
Process control	S, A, 2, 3, 4
Process description	S, A, 2, 3, 4
Activated carbon	S, A, 2, 3, 4
Aeration	2, 3, 4
Purpose	S, A, 1, 2, 3, 4
Types	S, A, 1, 2, 3, 4
Wells (WELLS)	
Components	S, A, 1, 2, 3, 4
Construction	2, 3, 4
Maintenance	2, 3, 4
Disinfection	2, 3, 4
Inspection	2, 3, 4

Subject	Certification Level
Wells (WELLS)-continued	
Operation	S, A, 1, 2, 3, 4
Troubleshooting	S, A, 1, 2, 3, 4
Water level measurement	S, A, 1, 2, 3, 4
Process description	S, A, 1, 2, 3, 4
Sanitary characteristics	S, A, 1, 2, 3, 4
Well Pumps	S, A, 1, 2, 3, 4

Operator Level Key

S = Small Water

A = Small Water Advanced

1 = Water Supply Level 1

2 = Water Supply Level 2

3 = Water Supply Level 3

4 = Water Supply Level 4