

DACUM Research Chart for Class III Water Supply Operator

DACUM Panel

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Duties		← Tasks →				
A	Analyze Water Quality	A-1 Analyze source (raw) water	A-2 Perform water treatment plant chemical analyses	A-3 Conduct jar test	A-4 Test finished water	A-5 Test water in distribution system
		A-13 Conduct fluoride tests	A-14 Conduct chlorine tests	A-15 Conduct manganese tests	A-16 Conduct TOS tests	A-17 Conduct TOC tests
B	Comply with Regulatory Requirements	B-1 Secure license to operate	B-2 Maintain laboratory certification(s)	B-3 Create well head/source water protection plan		B-4 Update well head/source water protection plan
		B-10 Secure discharge permit(s)	B-11 Complete NPDES report	B-12 Complete water quality test(s) per monitoring schedule		B-13 Secure wet chemistry laboratory certification
C	Participate in Fiscal & Capital Improvement Planning	C-1 Develop proposed annual budget	C-2 Justify proposed annual budget	C-3 Supervise departmental budget adherence	C-4 Develop 5- and 10-year capital improvement plans	C-5 Apply for grants
		C-12 Generate asset management reports	C-13 Perform analysis of production & distribution costs	C-14 Oversee annual bidding for supplies	C-15 Develop cost comparisons for purchases	C-16 Procure purchase orders
D	Ensure Customer Satisfaction	D-1 Respond to customer water quality complaints (e.g., taste, odor, color, pressure, hardness, chlorine levels)		D-2 Respond to customer billing questions & complaints		D-3 Notify customers of water quality problems & scheduled outages
		D-11 Participate in community meetings (e.g., CCR explanation, infrastructure upgrades, grant caucus)		D-12 Provide public education on industry policies & procedures		D-13 Provide CCRs using media (e.g., newspaper, mail, Internet)
E	Maintain Source Water Supply	E-1 Secure water source (e.g., reservoir, storage tanks & well fields)		E-2 Protect source water from surface contamination		E-3 Maintain source water security system (e.g., cameras, fence, gates, locks)
		E-10 Replace water pumps	E-11 Repair water pumps	E-12 Clear intake screens (e.g., debris, fish, leaves)	E-13 Clean storage tanks, reservoirs, & wells	E-14 Clean water lines (well to plant)
F	Manage Water Treatment Plant	F-1 Maintain treatment plant facility security systems		F-2 Supervise deliveries & visitors (e.g., chemical deliveries)		F-3 Regulate flow rates & levels
		F-10 Scrape slow sand filter(s)	F-11 Inspect water treatment equipment (See List a)	F-12 Repair water treatment equipment (See List a)	F-13 Conduct plant safety inspections (See List b)	F-14 Clean water treatment plant structures (see List c)

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A-6 Conduct PH tests	A-7 Conduct total coliform tests	A-8 Conduct taste & color (odor?) tests	A-9 Conduct hardness tests	A-10 Conduct phosphate tests	A-11 Conduct alkalinity tests	A-12 Conduct turbidity tests
A-18 Conduct iron tests	A-19 Conduct stability tests	A-20 Conduct conductivity tests	A-21 Conduct particle count tests	A-22 Conduct UV54 tests	A-23 Conduct carbon tests	
B-5 Prepare contingency plans (e.g., power outage, loss of source, chlorine levels)		B-6 Update contingency plans	B-7 Complete MOR (e.g., plant distribution, fluoride, bacteria, contact time)		B-8 Complete ODNR report(s)	B-9 Complete quarterly chlorine report
B-14 Secure bacteriological laboratory certification	B-15 Maintain facilities to meet OEPA recommendations	B-16 Develop CCR & VA (Consumer Confidence Reports and Vulnerability Assessment)		B-17 Complete PTI applications	B-18 Secure line application license	B-19 Complete line application report
C-6 Apply for loans	C-7 Recommend capital improvement projects	C-8 Justify capital improvement projects	C-9 Conduct rate analysis	C-10 Recommend increases in service fees, maintenance fees, & rates		C-11 Justify increases in service fees, maintenance fees, & rates
C-17 Maintain parts & chemical inventory	C-18 Approve invoices & checks (e.g., A/P, payroll)					
D-4 Investigate possible leaks	D-5 Inspect customer water lines	D-6 Coordinate water service shut offs/turn-ons	D-7 Verify water meter accuracy	D-8 Perform customer water quality test(s)	D-9 Negotiate with customers re: easements	D-10 Perform job site restoration
D-14 Paint fire hydrants	D-15 Provide rate discounts (e.g., senior citizens)	D-16 Sell secondary water meter(s) for sewage discount	D-17 Provide web site to general public			
E-4 Manage monitoring wells	E-5 Monitor water supply (e.g., water table, reservoir levels)	E-6 Determine need for water restrictions	E-7 Enforce water restrictions	E-8 Inspect storage tanks, reservoirs, & wells	E-9 Perform well efficiency tests (e.g., specific capacity, wire to water efficiency)	
E-15 Install source water telemetry & electrical controls	E-16 Perform source water telemetry & electrical controls maintenance	E-17 Perform well house, well head or raw water maintenance (e.g., paint)		E-18 Cut well field grass	E-19 Perform well field snow removal	
F-5 Perform process control analysis (e.g., alkalinity, coliforms, PH)		F-6 Manage chemical inventory	F-7 Calibrate water treatment equipment (See List a*)	F-8 Manage SCADA system	F-9 Backwash water filter(s) (e.g., pressure filter, rapid sand filter)	
F-15 Troubleshoot electrical controls (e.g., contactors, heaters, VFDs, & soft starts)		F-16 Perform building maintenance (e.g., paint, replace lights)	F-17 Perform housekeeping (e.g., mopping, buffing floors, trash)	F-18 Maintain water plant grounds (e.g., mow lawn)	F-19 Manage by-product removal (e.g., lime, brine, wash water)	

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Duties		Tasks				
G	Manage Water Distribution System	G-1 Regulate water tank levels	G-2 Regulate water flow rates	G-3 Regulate water pressure (e.g., suction, discharge)	G-4 Install water distribution infrastructure (See List d)	G-5 Inspect water distribution infrastructure (See List d)
		G-12 Read water meters	G-13 Locate service lines	G-14 Perform work orders (e.g., turn ons, turn offs, meter installations)		G-15 Maintain communication between remote sites
H	Perform Administrative Activities	H-1 Seek approval for raises (HR)	H-2 Prepare bid packets	H-3 Review system improvement plans	H-4 Develop operational plans & procedures (See List e)	H-5 Develop personnel policies & procedures
		H-12 Approve payroll (e.g., time sheets)	H-13 Develop educational presentations (e.g., general public, board of directors, politicians)		H-14 Create asset management programs (e.g., fire hydrant, meter, valve replacement)	
I	Continue Professional Development	I-1 Teach classes (CEU credit)	I-2 Attend classes (for CEU credit)	I-3 Participate in industry conferences & trade shows (CEU credit)		I-4 Serve on industry related panels

Acronyms

AWWA	American Water Works Association
CCR	Consumer Confidence Report
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CEU	Continuing Education Unit
HR	Human Resources
MOR	Monthly Operating Report
NPDES	National Pollutant Discharge Elimination System
OTCO	Operator Training Committee of Ohio
ORWA	Ohio Rural Water Association
ODNR	Ohio Department of Natural Resources
PTI	Permit to Install
QA/QC	Quality Assurance Quality Control
SARA	Superfund Amendments and Reauthorization Act
SCADA	Supervisory Control & Data Acquisition
TDS	Total Dissolved Solids
TOC	Total Organic Carbon
VA	Vulnerability Assessment
VFD	Variable Frequency Drive

G-6 Repair water distribution infrastructure (See List d)	G-7 Flush distribution system (e.g., fire, flush hydrants, dead end lines)		G-8 Test fire hydrants	G-9 Maintain fire hydrants	G-10 Replace fire hydrants	G-11 Test water meter(s)
G-16 Conduct telemetry tests						
H-6 Develop safety policies	H-7 Develop employee handbook	H-8 Develop job descriptions	H-9 Develop job hazard analysis	H-10 Manage personnel schedules (e.g., vacations, comp time, shift coverage)		H-11 Assign job duties
H-15 Perform record retention (e.g., MOR, personnel records, customer records)		H-16 Determine need for new employee(s)	H-17 Hire new employee(s)	H-18 Evaluate personnel performance	H-19 Mentor personnel	H-20 Provide personnel training & development
I-5 Network with other water professionals	I-6 Pursue higher education (e.g., college degrees)					

List a: Water Treatment Equipment

*Lime slakers	Air scour system
*Chemical pumps	Blowers
*Turbid I meters	GAC
*Augers	Bulk storage containers
*Altitude valves	Heaters
*Chlorinators	Injectors
Actuators	Back flow preventers
*Analyzers	Pump control systems
*Probes	Evaporators
*SCADA system	Scrubber system
*Scales	Generators
*Rotometers	Valves
*Ph meters	Storage tanks
*Flow meters	Roto dips
*Conductivity meters	Air bubblers
*Level indicators	Diffusers
*DP cells	Sludge thickeners
*Chemical detectors	Softeners (ion exchange)
*VFDs	Brine tanks
*Air quality monitors	Water lines (supply)
*Noise level monitors	Chemical feed lines
Gates	Low service pumps
Pumps/motors	High service pumps
Filters	Dehumidifiers
Basins	Sump pumps
Rakes	A/C unit
Collectors	Doors
Floculators	Manways
Rapid mix	Hatches
Channels	Pilot plant
Upflow clarifiers	Fork lifts
Recarbonation tanks	Rotating Screen
	Gates

List b: Safety Plant Inspections

Fire extinguisher	A, B, & C chlorine kits
Eye wash stations	Emergency evaluation & notification procedures
Showers	Overhead lifts
Exit lights, doors	Safety equipment
Emergency exits	Emergency first aid kits
Fall protection systems	Chlorine evaporators
MSDS reports	Chlorinators
Chemical leak detectors (P)	Foul weather gear
Scrubber system	Vehicles
SCBA packs	Chemical feed pumps
Incident/accident reports	Emergency generator

List c: Water Treatment Plant Structures

Basins
Channels
Brine tanks
Filters
Aerators
Recarbonation tanks
Solid contact

Air stripping towers
Influent lines
Floculators
Tanks
Drains
Sample lines
Gates

List d: Water Distribution Infrastructure (* = installed)

Booster pumps*
Water meters*
Control valves*
Isolation valves*
Telemetry*
Pressure sensors*
Leak detections*
Pressure reducers*
Backflow preventer*
Chemical feeders*
Water mains*
Storage tanks
Generators
Vehicles
Heavy equipment
Booster stations

Monitor:

Water pressure (suction and discharge)
Water pressure flow rates
Water pressure tank levels
Water pressure communication between remote sites
Meter readings

List e: Operational Plans and/or Procedures

Preventive maintenance
Standard operating procedures (e.g., filter backwash, customer notification)
Emergency plans
Contingency plans
Emergency response plans
New employee operational manuals
Mapping program
Safety plans & procedures