

DACUM Research Chart for Wastewater Treatment Plant Operator--Class 3

Produced for



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DACUM Research Chart for Wastewater Treatment Plant Operator

DUTIES	TASKS			
A. Inspect Wastewater Treatment Plant (WWTP)	A.1 Conduct visual quality WWTP inspection (e.g., listen, smell, see, touch)	A.2 Conduct preliminary WWTP inspection (e.g., screening, grinding, grit removal)	A.3 Conduct primary WWTP inspection (e.g., primary clarifier, skimmer area/sludge blanket)	A.4 Conduct secondary WWTP treatment for conversion inspection (e.g., color, foam, odor)
B. Maintain Safe Workplace	B.1 Participate in safety training (e.g., cold weather, back safety, hazcom)	B.2 Maintain PPE	B.3 Participate in safety inspections (e.g., fire extinguishers, clear aisle ways)	B.4 Maintain clean/obstruction free environment (e.g., oil spills, equipment storage, housekeeping)
C. Perform Process Control of Plant Operations	C.1 Analyze WWTP flows (e.g., influent, effluent, wasting)	C.2 Perform ammonia profile testing	C.3 Analyze MLSS and RAS	C.4 Analyze dissolved oxygen
	C.10 Analyze chlorine	C.11 Analyze e-coli	C.12 Analyze total solids and volatile solids	C.13 Perform phosphorus profile testing
D. Perform Preventive WWTP Equipment Maintenance	D.1 Create equipment maintenance schedule	D.2 Maintain inventory of replacement parts and tools	D.3 Maintain inventory of lubricants	D.4 Maintain preventive maintenance log book
	D.10 Monitor motor amperage draws	D.11 Check gear box temperatures	D.12 Check equipment for loose fasteners	D.13 Inspect equipment compliance
	D.19 Inspect process tanks (e.g., clarifiers, chlorine contact tanks, aeration tanks)	D.20 Perform rebuild of chlorinator/dechlorinator feeders	D.21 Rotate equipment operation	D.22 Clean WWTP equipment
E. Perform Corrective WWTP Equipment Maintenance	E.1 Identify equipment/structure failures	E.2 Implement emergency response plan(s)	E.3 Analyze equipment/structure failure	E.4 Estimate equipment/structure repair costs
	E.10 R/R blowers	E.11 R/R belt presses	E.12 R/R centrifuges	E.13 R/R gear boxes
	E.19 R/R compressors	E.20 R/R SCADA	E.21 R/R gates	E.22 R/R HVAC

A.5 Conduct secondary WWTP treatment for separation inspection (e.g., color, foam, odor)	A.6 Conduct tertiary WWTP treatment inspection (e.g., filtration, fine screens)	A.7 Conduct WWTP post aeration system inspection	A.8 Conduct WWTP disinfection system inspection	A.9 Collect WWTP operating data during inspection (chemical usage, pump discharge pressure, flow meters)
B.5 Participate in safety training program review (e.g., CSE, LOTO, hazcom)	B.6 Perform vehicle inspections	B.7 Maintain critical control sensors (e.g., chlorine, LEL, hydrogen sulfide)	B.8 Maintain OSHA approved signage (e.g., no trespassing, no smoking)	B.9 Update SDS sheets
C.5 Perform microscopic examination of biota	C.6 Perform pH test	C.7 Perform alkalinity testing	C.8 Measure sludge blankets	C.9 Analyze CBOD
C.14 Adjust return activated sludge rates	C.15 Adjust wasted activated sludge rates	C.16 Perform oxygen uptake rate test	C.17 Interpret data for each process (C-1 through C-16)	C.18 Document process data and changes for trends (e.g., SCADA)
D.5 Prepare run time hours report	D.6 Change equipment oil (e.g., gear box, blower)	D.7 Lubricate equipment bearings	D.8 Check belt deflection	D.9 Check belt condition
D.14 Inspect operating level of auto oilers	D.15 Replace aeration system filters	D.16 Replace HVAC unit filters	D.17 Replace diffuser membrane	D.18 Acid wash tertiary screens
D.23 Paint WWTP equipment				
E.5 Troubleshoot equipment controls	E.6 Prioritize equipment/structure repairs	E.7 Analyze plant changes required	E.8 Recommend equipment/structure repair options	E.9 R/R pumps
E.14 R/R motors	E.15 R/R UV unit	E.16 Repair hydraulic system	E.17 R/R primary clarifier flights	E.18 R/R backup generator
E.23 R/R valves	E.24 R/R actuators	E.25 R/R piping		

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DUTIES

TASKS

F. Oversee WWTP Lab Analysis Requirements	F.1 Develop NPDES sample schedule	F.2 Identify NPDES contract labs	F.3 Develop lab SOPs	F.4 Develop QC/QA criteria
	F.10 Analyze NPDES samples	F.11 Prepare NPDES sample results report	F.12 Maintain reagent inventory	F.13 Maintain lab supplies & equipment (e.g., glassware, balance recertification)
G. Perform Administrative Tasks	G.1 Prepare electronic discharge monitoring report	G.2 Create shift schedule (e.g., leave approval, schedule adjustments)	G.3 Maintain administrative files (e.g., EDMR shift schedule, sample sheets)	G.4 Prepare purchase orders (e.g., contractual material)
	G.10 Coordinate events and activities with local agencies (e.g., confined space entry, traffic control, emergency scheduling)	G.12 Coordinate compliance during plant projects (e.g., contractors, engineers, consultants)	G.13 Respond to employee grievances	G.14 Conduct employee performance evaluations
H. Manage WWTP Solids Handling	H.1 Perform sludge analysis	H.2 Identify type of sludge produced	H.3 Evaluate cost of sludge disposal options	H.4 Perform solids concentration/sludge thickening
	H.10 Manage solids disposal record (e.g., CPLR, sludge reports)			
I. Oversee Wastewater Collections System	I.1 Maintain field log book	I.2 Maintain sanitary sewer collection lines (e.g., jet, televise)	I.3 Minimize storm water infiltration into sewer collection lines	I.4 Manage FOG control (e.g., jetting, cleaning)
Subduty I (a). Maintain Lift Stations	I(a)1. Monitor lift pump run-time hours	I(a)2. Test lift station alarm system	I(a)3. Clean lift station bar racks	I(a)4. Clean lift station wet well
	I(a)10. R/R lift station components (e.g., piping, safety grating)	I(a)11. Maintain lift station backup generator		

F.5 Maintain equipment temperature logs (e.g., refrigerator, incubator)	F.6 Calibrate lab equipment	F.7 Clean sampling equipment	F.8 Collect NPDES samples	F.9 Prepare NPDES samples (COCs, preservatives)
F.14 Maintain reagent logbook	F.15 Maintain NPDES logbooks	F.16 Manage hazardous materials (e.g., COD vials, universal hazardous waste)		
G.5 Respond to email and telephone inquiries	G.6 Prepare request for capital budget	G.7 Prepare request for annual budget	G.8 Respond to customer requests	G.9 Prepare building & grounds maintenance schedule
G.15 Conduct staff meetings	G.16 Identify training needs (e.g., in-service, new employee)	G.17 Regulate industrial customers (e.g., permits, letter, notice of violations)	G.18 Prepare plant bypass report	
H.5 Prepare sludge disposal forms	H.6 Coordinate land requirements with agronomist (e.g., soil sampling, application rates)	H.7 Coordinate hauling events with contractor and land owner	H.8 Oversee land application of bio solids (e.g., procuring fields, loading rates, setbacks)	H.9 Respond to citizen complaints (e.g., odor, debris on road)
I.5 Analyze pre-treatment discharge for compliance with local limits	I.6 Prepare SSO and CSO reports	I.7 Respond to customer complaints (e.g., odor, backup)	I.8 Inspect new sewer taps	
I(a)5. Maintain lift station signage	I(a)6. Maintain grinder system	I(a)7. Maintain lift station flow meters	I(a)8. Maintain lift station controls (e.g., level controls, starters)	I(a)9. Inspect lift station for leaks in grouting

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DUTIES	TASKS			
J. Maintain WWTP Buildings and Grounds	J.1 Mow facility yard	J.2 Weed facility grounds	J.3 Perform minor structural repairs (e.g., concrete, grout)	J.4 Perform facility snow removal
	J.10 Maintain security fence integrity (e.g., brush, debris)	J.11 Control pests in and around facility (e.g., rodents, deer, squirrels)	J.12 Perform building repairs (e.g., roof, doors, windows)	
K. Participate in Professional Development	K.1 Maintain OEPA certification	K.2 Mentor other operators	K.3 Complete college courses	K.4 Publish industry related articles
	K.10 Participate in peer group committees (e.g., operations collections, young professionals)	K.11 Research industry-related literature		

NOTE: Although all panelists are Class 3 WWTP operators, not all panelists perform all tasks on this chart, and not necessarily in

J.5 Power wash facility buildings and tanks	J.6 Sweep facility floors, walls and ceilings	J.7 Mop facility floors	J.8 Paint facility structures and equipment	J.9 Maintain facility lighting (e.g., light bulbs, security lights)
K.5 Attend professional classes	K.6 Participate in professional workshops	K.7 Conduct WWTP presentations to public and peers	K.8 Attend professional conferences	K.9 Conduct tours of WWTP

the order presented.

General Knowledge and Skills

Knowledge:

Safety procedures
Basic chemistry
Company procedures
Blueprint reading
Safety Data Sheets
Basic electricity
Standard methods [for examination of water and wastewater]
NPDES permits
Basic algebra/math
Basic biology
General maintenance
Plant flow hydraulics

Skills:

Analytical
Computer
Interpersonal
Mentoring
Prioritizing
Listening [abnormal equipment sounds]
Communication (written, oral)
Critical thinking
Customer service
Conflict management

Behaviors

Self-motivated
Honest
Team player
Dependable
Sense of humor
Patient
Flexible
Observant
Professional
Organized
Cooperative
Persistent
Safety-conscious
Cordial
Inventive
Process-oriented

Acronyms

EPA	Environmental Protection Agency	BOD	Biochemical Oxygen Demand
PPE	Personal Protective Equipment	WO	Work Order
I&I	Inflow and Infiltration	ERP	Emergency Response Plan
LOTO	Lock Out Tag Out	UV	Ultraviolet
QA/QC	Quality Assurance/Quality Control	SMP	Standard Methods and Procedures
R/R	Repair/Replace	FOG	Fats, Oil, Grease
SOP	Standard Operating Procedure	SSO	Sanitary Sewer Overflow
OEPA	Ohio Environmental Protection Agency	LS	Lift Station
CCT	Chlorine Contact Tank	CPLR	Cumulative Pollutant Loading Rate
COC	Chain of Custody	MLVSS	Mixed Liquor Volatile Suspended Solids
DO	Dissolved Oxygen	TMDL	Total Maximum Daily Load
NPDES	National Pollutant Discharge Elimination System		
CSO	Combined sewer overflow		
WWTP	Waste Water Treatment Plant		
SDS	Safety Data Sheets		
IPP	Industrial Pre-Treatment		
SCADA	Supervisory Control and Data Acquisition		
DMRQA	Discharge Monitoring Report Quality Assurance		
MSDS	Materials Safety Data Sheet		
MLSS	Mixed Liquor Suspended Solids		
IT	Information Technology		
CBOD	Carbonaceous Biochemical Oxygen Demand		

Tools, Equipment, Supplies and Materials

Hand tools
Power tools
Lawn mower
Communication devices
Basic hand tools
Fire extinguisher
PPE
Centrifuge
Tractor
Settleometer
Infrared thermometer
Amp meter
Core taker
Thermal imaging camera
Belt deflection tool
Operations manuals
Ultrasonic unit
Suspended solids meter
General laboratory supplies
General laboratory equipment
Human interface module
Electrical hand tools
Plumbing equipment
Computer (hardware, software)
Snow removal equipment
Lockout/tagout equipment
Chemical spill kits
Customized tools

Future Trends and Concerns

Reliance on private labs
Limited budgets
Expanding contaminants and drug exposures
Questionable job security
Limited human resources
Increase in inspection hours
Incorporation of in-house research projects
Lowering detection limits
Lack of upper management support for conference participation
Decreased sample analysis time