Texas Water Operator Study Sheet

Conversions · water & wastewater formulas · TCEQ license classes & training hours · Texas standards

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EXAM FACTS — TCEQ

Item	Fact
Passing score	minimum score of 70 percent on the applicable exam — the standard TCEQ publishes
Delivery	computer-based testing at registered CBT centers; application pre-approval required before scheduling
Time limit	3 hours by default; Class A exams (Water and Wastewater) run 6 hours
Authorized aids	pencil or pen, proctor-provided scratch paper (collected after), non-programmable calculator

UNIT CONVERSIONS

From	To
1 cubic foot	7.48 gallons
1 gallon of water	8.34 pounds
1 MGD	694 gpm
1 MGD	1.547 cfs
1 cfs	448.8 gpm

From	To
1 psi	2.31 feet of head
1 foot of head	0.433 psi
Circle area	0.785 × D²
1 hp	0.746 kW

WATER FORMULAS

Calculation	Formula
Chemical feed (pounds formula)	`lb/day = Flow (MGD) × Dose (mg/L) × 8.34`
Feed with purity	`actual chemical = pure lb/day ÷ purity (decimal)`
Dose from feed rate	`Dose (mg/L) = lb/day ÷ (MGD × 8.34)`
Chlorine balance	`Dosage = Demand + Residual`
CT	`residual (mg/L) × contact time (min)`
Detention time	`Time = Volume ÷ Flow`
Tank volume, rectangular	`gal = L × W × H (ft³) × 7.48`
Tank / pipe volume, cylindrical	`gal = 0.785 × D² × depth or length (ft³) × 7.48`
Pressure / head	`psi = ft of head × 0.433 · ft of head = psi × 2.31`
Flow	`Q = Area × Velocity`
Water horsepower	`hp = (gpm × head, ft) ÷ 3,960`

WASTEWATER FORMULAS

Calculation	Formula
BOD / TSS loading	`lb/day = Flow (MGD) × Concentration (mg/L) × 8.34`
F/M ratio	`BOD applied (lb/day) ÷ MLSS under aeration (lb)`
SVI	`settled volume (mL/L) × 1,000 ÷ MLSS (mg/L)`
MCRT / SRT (sludge age)	`solids under aeration (lb) ÷ solids removed per day (lb/day)`
WAS rate	`gpd = solids (lb/day) × 1,000,000 ÷ (WAS mg/L × 8.34)`

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Percent removal	`% = (in − out) ÷ in × 100`
Clarifier surface loading	`gpd/ft² = Flow (gpd) ÷ surface area (ft²)`
Percent of total (e.g., volatile solids)	`% = part ÷ total × 100`

TCEQ LICENSE CLASSES & TRAINING HOURS

Water license	Training
Ladder	Class D (entry) → C → B → Class A (highest)
Class D	single combined entry license; 22 hours (20-hour Basic Waterworks Operation + 2-hour Resiliency Overview)
Class C	specialties: Groundwater / Surface Water / Water Distribution; 62 credits (60 + 2-hour Resiliency Overview)
Class B	122 hours (Distribution / Groundwater) · 146 hours (Surface Water)
Class A	single license; 186 hours on every route
Renewal CE	30 hours per 3-year cycle, including at least 2 hours approved for Resiliency

Wastewater license	Training
Ladder	Class D → C → B → Class A; a single license at each class
Class D	20 hours — flat, no Resiliency Overview
Class C	60 hours — flat, no Resiliency Overview
Class B	100 hours — flat, on both routes
Class A	160 hours — flat, on all three routes
Renewal CE	30 hours per 3-year cycle, no resiliency component

TEXAS-SPECIFIC FACTS

Item	Standard
Minimum free chlorine residual	0.2 mg/L in finished-water storage and throughout distribution
Minimum chloramine residual	0.5 mg/L, measured as total chlorine
Boil water notice triggers	pressure below 20 psi; adequate disinfectant residuals not maintained for more than 24 hours
Class D minimum license	purchased-water and groundwater systems serving no more than 250 connections
Class D at a surface water plant	may not adjust or modify treatment processes unless a Class C-or-higher surface license holder is present and has issued specific instructions
Resiliency Overview (water)	must be completed and on the training record before applying for an initial water license or upgrading

WHAT THIS SHEET DOESN'T COVER

- Class-by-class blueprint coverage — Class D math stops at volumes and dosage; detention, filtration, and horsepower enter at Class C and above.
- Blueprint-weighted scenario application: plant-upset, water-quality, and safety scenarios, not just formulas.
- Timed, full-length exam simulation at your class's length.
- An explanation for every answer — why the right answers are right and the wrong ones are wrong.
- A fresh set of questions on every attempt, so practice never repeats itself.

Start with free Texas Water Operator sample questions: passprofessor.com/free-samples/

Formulas and TCEQ facts are those used across the PassProfessor Texas Water Operator question banks (Water and Wastewater, Classes D–A). Confirm current licensing requirements with TCEQ.