



# Certification Boulevard

## *Test Your Knowledge of Conservation and Reuse – Answer Key*

*Submitted By: David Stevens, Certified Operator – City of Plant City*

1. Chlorination of reclaimed water may generate trihalomethanes ... true or false
2. What is a typical permit requirement for chlorine residual maintenance of reuse water as it leaves the Reclamation Facility in Florida?
  - a. No greater than 1.0 mg/L Total Chlorine Residual
  - b. No less than 0.5 mg/L Total Chlorine Residual
  - c. No greater than 1.0 mg/L Free Chlorine Residual
  - d. **No less than 1.0 mg/L Total Chlorine Residual**
3. What is the typical permit requirement for Total Suspended Solids (TSS) of reuse water as it leaves the Reclamation Facility in Florida?
  - a. No greater than 1.0 mg/L
  - b. No greater than 10.0 mg/L
  - c. **No greater than 5.0 mg/L**
  - d. No greater than 2.0 mg/L
4. What is a typical permit requirement for chlorine residual maintenance of reuse water that is being applied to a Rapid Infiltration Basin in Florida?
  - a. No greater than 1.0 mg/L Total Chlorine Residual
  - b. **No less than 0.5 mg/L Total Chlorine Residual**
  - c. No greater than 1.0 mg/L Free Chlorine Residual
  - d. No less than 0.1 mg/L Total Chlorine Residual
5. Given the following information, does this reuse water satisfy the FDEP requirements for fecal coliform standards?
  - 80% of the samples are below the detection limits per 100 ml of sample
  - The highest day of the month was 2 per 100 ml of sample
  - a. **Yes, this meets typical requirements in Florida for reuse water fecal coliform**
  - b. No, this fails to meet typical requirements in Florida for reuse water fecal coliform

*The Florida rule for fecal coliform in reuse water states: "over a 30 day period, 75% of the fecal coliform values (the 75% percentile value) shall be below detection limits. Any one sample shall not exceed 25 fecal coliform values per 100 ml of sample."*

6. Which DEP rule governs water reuse in Florida?
  - a. 62-602
  - b. 62-699
  - c. 62-503
  - d. **62-610**

7. Given the following data, what is the TSS concentration of this reuse grab sample, and, does it meet the FDEP requirements for reclaimed water TSS standards:

- 100 ml of sample
- Tare weight of filter is 11.8873 grams
- Final weight of filter after drying is 11.8877 grams

- a. 10 mg/L - No
- b. 4 mg/L - No
- c. 2 mg/L - Yes
- d. **4 mg/L - Yes**

$$TSS, \text{ mg/L} = (\text{final wt., gm} - \text{tare wt., gm}) \times 10,000$$

$$TSS, \text{ mg/L} = (11.8877 \text{ gm} - 11.8873 \text{ gm}) \times 10,000 = 4 \text{ mg/L}$$

*Yes, the FDEP standard for reclaimed water TSS is no greater than 5.0 mg/L*

8. Given the following data, what is the detention time of this reuse water storage tank?

- The flow entering is 92.84 cfm
  - The tank dimensions are: 50 feet diameter and 20 feet deep
- a. 3.77 hours
  - b. 67 minutes
  - c. **7.05 hours**
  - d. 0.29 hours

*Detention Time, hrs*

$$= (\text{Tank Vol, gal} \times 24 \text{ hrs/day}) \div \text{Flow Entering Tank, gpd}$$

$$= (\pi r^2 \times \text{depth, ft} \times 7.48 \text{ gal/ft}^3 \times 24 \text{ hrs/day}) \div \text{Flow Entering Tank, gpd}$$

$$= (3.14159 \times 25 \text{ ft} \times 25 \text{ ft} \times 20 \text{ ft} \times 7.48 \text{ gal/ft}^3 \times 24 \text{ hrs/day}) \div 1,000,000 \text{ gpd}$$

$$= 7,049,728 \div 1,000,000$$

$$= 7.049 \text{ hours}$$

*Note: 1 mgd is equal to 92.84 cfm (cubic feet per minute)*

$$1,000,000 \text{ gals} \div 1,440 \text{ mins/day} \div 7.48 \text{ gal/ft}^3$$

9. Given the following data, how much rainwater will enter this open storage pond?

- Rainfall is 3.5 inches
- The storage pond is 125 feet long, 45 feet wide and has a maximum depth of 8 feet

- a. **12,272 gals**
- b. 42,075 gals
- c. 336,600 gals
- d. 3,506 gals

$$\begin{aligned} \text{Volume of pond per foot} &= 125 \text{ ft} \times 45 \text{ ft} \times 1 \text{ ft.} \times 7.48 \text{ gals per cu. ft.} \\ &= 42,075 \text{ gals per foot} \end{aligned}$$

$$\begin{aligned} \text{Volume of pond per inch} &= 42,075 \text{ gals per foot divided by 12 in/ft} \\ &= 3,506.25 \text{ gals per inch} \end{aligned}$$

$$\begin{aligned} \text{Volume of pond per 3.5 inches} &= 3,506 \text{ gals per inch} \times 3.5 \text{ inches} \\ &= 12,271.88 \text{ gals} \end{aligned}$$

10. What does this formula represent?

$$\frac{\text{Tank Volume, ft}^3}{\text{Flow, mgd} \times 92.84 \text{ cfm/mgd}}$$

- a. Chlorine residual, mg/l
- b. Detention time, mins**
- c. Fecal coliform, #/100 ml
- d. Tank volume, gallons

*Thanks to David Stevens for his submittal of Question No.1*

*Please forward your comments and sample questions for publication to:*

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