



Certification Boulevard – Answer Key

Test Your Knowledge of Stormwater Management & Other Various Wastewater Treatment Topics

1. In today's environmentally conscious business/industrial community, stormwater management is a primary concern. Name four (4) primary components of a facility stormwater management program.

1. Pollution Prevention Plan

2. Sampling program

3. Periodic inspections

4. Employee training

2. Which of the following items can be considered stormwater?
- A. Storm runoff
 - B. Snow-melt runoff
 - C. Drainage
 - D. All of the above**
3. Best Management Practices (BMPs) are those practices oriented toward common industrial activities to reduce and/or eliminate storm water pollutants. **True** or **False**
4. What is the minimum velocity in a sanitary sewer pipeline necessary to prevent settling of solids and debris?
- A. 1 fps
 - B. 0.5 fps
 - C. 2 fps**
 - D. 2 fpm
5. What is the detention time in a primary clarifier that is 100 feet long, 25 feet wide, 13 feet deep, and the influent flow is 5 mgd?
- A. 2.3 hours
 - B. 1.8 hours
 - C. 1.2 hours**
 - D. 3.1 hours

length 100 feet x width 25 feet x depth 13 feet x 7.48 gal/ft³ x 24 hrs/day
5,000,000 gal/day

6. Given the following data, what is the surface settling rate of the secondary clarifiers?
- Three (3) Secondary Clarifiers
 - Each Clarifier Has a Diameter of 100 Feet
 - The Plant Influent Flow is 15 mgd

- A. **637 gal/day/ft²**
- B. 3,414 gal/day/ft²
- C. 736 gal/day/ft²
- D. 159 gal/day/ft²

Each Clarifier Surface Area in ft² = 50 x 50 x 3.14 = 7,850 ft²

$$\frac{15,000,000 \text{ gal/day}}{3 \text{ Clarifiers}} = 23,550 \text{ ft}^2$$

7. Given the following data, how many gallons of WAS should be removed if a 10 day SRT is the desired target?

- Two (2) Aerations Tanks
- Each Aeration Tank is 140 Feet Long, 45 Feet Wide, and 15 Feet Deep
- The MLSS Concentration is 3,500 ppm
- The WAS Concentration is 8,500 ppm

- A. 1.12 mgd
- B. 158,250 gpd
- C. 20,790 gpd
- D. **58,217 gpd**

Lbs in Aeration =

$$140 \text{ ft} \times 45 \text{ ft} \times 15 \text{ ft} \times 7.48 \text{ gal/ft}^3 \times 2 \text{ tanks} = 1,413,720 \text{ gals}$$

$$1,413,720 \text{ gal} \times 3,500 \text{ ppm} \times 8.34 \text{ lbs/gal} = 41,266 \text{ lbs MLSS}$$

Lbs/day to WAS =

$$\frac{41,266 \text{ lbs MLSS}}{10 \text{ day SRT}} = 4,127 \text{ lbs WAS}$$

Gals/day to WAS =

$$\frac{4,127 \text{ lbs WAS}}{8,500 \text{ ppm WAS} \times 8.34 \text{ lbs/gal}} = 0.058217 \text{ mgd} \times 1,000,000 = 58,217 \text{ gpd}$$

8. Which term is most related to vector attraction reduction in an anaerobic digester?

- A. Settleometer
- B. Pathogen
- C. SOUR
- D. **40-day bench test**

9. What does the term absorption mean?

- A. Impregnate a liquid with air
- B. **The taking in of one substance into the body of another**
- C. To gather onto the surface of a substance
- D. Soak like a sponge

10. Which chemical is most commonly used for odor control when dealing with ammonia odors from a solids handling process?

- A. Polymer
- B. Acid**
- C. Alum
- D. Water

Please forward your comments and sample questions for publication to:

**Roy Pelletier, Assistant Bureau Chief
City of Orlando Public Works Department
Wastewater Bureau
5100 L.B. McLeod Road
Orlando, Florida 32811**

roy.pelletier@cityoforlando.net (407) 246-2213

Questions 1,2 and 3 were submitted by:

Shane Benner, Plant Manager – Water Conserv II Facility – City of Orlando