



Certification Boulevard · Answer Key

Test Your Knowledge of Water Resources Management ... And Other Miscellaneous Wastewater Treatment Topics

1. What does the term aliquot mean:
 - A. Composite sample
 - B. Grab sample
 - C. The total volume of sample
 - D. A portion of a sample**

2. 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***

3. What is the closest loading equivalent in domestic wastewater?
 - A. About 1.0 lb TSS per capita per day
 - B. About 0.17 lbs CBOD₅ per capita per day**
 - C. About 500 to 750 gals per capita per day
 - D. About 5.0 to 7.5 lbs NH₃ per capita per day

4. Given the following data, how much alkalinity is required to accomplish nitrification?
 - Influent Flow is 0.59 mgd
 - Influent TKN is 35 mg/L
 - Effluent NH₃ value is 0.75 mg/L
 - 90% of TKN will become NH₃ to be nitrified
 - SCBOD₅ removal is 98%
 - 7.14 lbs of alkalinity consumed per lb of ammonia converted
 - A. 1,300 lbs
 - B. 1,107 lbs
 - C. 1,080 lbs**
 - D. 1,356 lbs

Lbs/day of ammonia converted = 0.59 mgd x (35 x 0.90 - 0.75) x 8.34 = 151.3
Lbs/day Alkalinity required = 151.3 lbs/day ammonia converted x 7.14 lbs
alkalinity per lb ammonia = 1,080 lbs/day alkalinity required

5. Which types of bacteria are responsible for conversion of ammonia in wastewater?
- Facultative
 - Heterotrophic
 - Anaerobic
 - Autotrophic**
6. Which types of bacteria are responsible for converting NO₃ to N₂?
- Heterotrophic**
 - Nitrosomonas
 - Nitrobacter
 - Anaerobic
7. Given the following data, what is the daily volume of WAS (gpd) to be removed in this activated sludge process?
- Aeration Tank Dimensions: 100 ft long, 35 ft. wide and 14.5 ft. deep
 - MLSS Concentration is 2,750 mg/L
 - Mixed Liquor is 79% Volatile
 - Desired MLSS Inventory is 7,750 Lbs
 - WAS Concentration is 7,500 mg/L
- 8,706 gals/day
 - 15,284 gals/day**
 - 123,900 gals/day
 - 956 gals/day

Lbs MLSS Inventory

$$= \text{Aeration tank volume, mg} \times \text{MLSS conc., mg/L} \times 8.34$$

$$= (100 \text{ ft.} \times 35 \text{ ft.} \times 14.5 \text{ ft.} \times 7.48 \text{ gal/c.f.} \div 1,000,000) \times 2,750 \text{ mg/L} \times 8.34$$

$$\text{lbs/gal} = 8,706 \text{ lbs MLSS}$$

Excess Inventory (to waste)

$$= 8,706 \text{ actual lbs MLSS} - 7,750 \text{ desired lbs MLSS}$$

$$= 956 \text{ lbs/day to waste}$$

mgd to Waste

$$= \text{lbs/day to waste} \div (\text{WAS conc., mg/L} \times 8.34 \text{ lbs/gal})$$

$$= 956 \text{ lbs/day} \div (7,500 \text{ mg/L} \times 8.34 \text{ lbs/gal})$$

$$= 0.0152838$$

gpd to Waste

$$= \text{mgd to waste} \times 1,000,000$$

$$= 0.0152838 \times 1,000,000$$

$$= 15,284 \text{ gpd to waste}$$

8. What is the term that describes the combination of ammonia-nitrogen, nitrate-nitrogen and nitrite-nitrogen?
- A. Total Nitrogen (TN)
 - B. Total Soluble Nitrogen (TSN)
 - C. Total Kjeldahl Nitrogen (TKN)
 - D. Total Inorganic Nitrogen (TIN)**

9. Which type of solid is typically the highest percentage in the total solids profile of raw wastewater?
- A. Suspended
 - B. Dissolved**
 - C. Colloidal
 - D. Settleable

Typically, the dissolved solids fraction is about 80% of the overall total solids concentration.

10. What is another term for inorganic solids?
- A. Volatile
 - B. Non-Volatile**
 - C. Dissolved
 - D. Soluble

Please forward your comments and sample questions for publication to:

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