Certification Boulevard

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

1. What does the term adsorption mean?

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

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

    (1) Pollution Prevention Plan
    (2) Sampling program
    (3) Periodic inspections
    (4) Employee training

3. What type of solids cannot be removed with standard effluent filters?

    A. Settleable
    B. Suspended
    C. Total
    D. **Dissolved**

4. Which types of bacteria are responsible for converting nitrite-N to nitrate-N in the Nitrification process?

    A. Nitrosomonas
    B. **Nitrobacter**
    C. Carbon Eaters
    D. Heterotrophic

5. Given the following data, how much alkalinity is required to accomplish nitrification?

    ➢ Influent Flow is 1.25 mgd
    ➢ Influent NH_3 is 24.5 mg/L
    ➢ $CBOD_5$ removal is 2,346 lbs/day
    ➢ 7.2 lbs of alkalinity consumed per lb of ammonia converted
    ➢ Effluent NH_3 is 0.5 mg/l

    A. **1,801 lbs**
    B. 9,160 lbs
    C. 250 lbs
    D. 1,655 lbs

Lbs/day of ammonia converted = 1.25 mgd x (24.5 – 0.5) x 8.34 = 250.2
Lbs/day alkalinity required = 250.2 lbs/day ammonia converted x 7.2 lbs alkalinity per lb ammonia
= 1,801 lbs/day alkalinity required

6. Given the following data, what is the daily volume of WAS to be removed?

    ➢ Three (3) aeration tanks, each 140 ft long, 40 ft wide, 15 ft SWD
    ➢ Aeration MLSS 3,000 mg/L
    ➢ WAS concentration 8,500 mg/L
    ➢ Desired SRT 18 days

    A. 0.01232 mgd
    B. 7,439 gals/day
    C. **0.03696 mgd**
    D. 15,333 gals/day

    Lbs Aeration MLSS = (140 ft x 40 ft x 15 ft x 7.48 gal/ft³ x 3 tanks ÷ 1,000,000)
    x 3,000 mg/L x 8.34 = 47,162 lbs MLSS
    Lbs/day to waste = 47,162 lbs MLSS ÷ 18 day SRT = 2,620 lbs/day
    mgd to waste = 2,620 lbs/day ÷ (8,500 mg/L x 8.34)
    = 0.03696 mgd

7. 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.

8. What is the term called when all forms of chlorine demand have been satisfied, and every ppm of chlorine feed becomes a ppm of free chlorine residual?

    A. Chloramines
    B. Combined Residual
    C. **Breakpoint Chlorination**
    D. ORP

9. What is another term for inorganic solids?

    A. Volatile
    B. **Non-Volatile**
    C. Dissolved
    D. Soluble

10.   What is the term when nitrite-N and nitrate-N are added together?

    A. TKN
    B. SON
    C. TN
    D. <u>NO_x</u>

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**