



# Certification Boulevard

Roy Pelletier



## Test Your Knowledge Of Operational Topics

Thanks to Neil R. Kirkland and Michael Martin, operator trainees from the Marion Correctional Institution Wastewater Treatment Facility in Lowell, Florida, for providing these questions and answers. — Roy

- What is the FIRST warning that trouble is starting in an anaerobic digester?
  - Increase in carbon dioxide
  - Increase in pH
  - Increase in sludge volume
  - Increase in volatile acid/alkalinity relationship
- What is the MAXIMUM recommended holding time for a sample to be tested for CBOD?
  - No holding time
  - 28 hours
  - 48 hours
  - 72 hours
- What is the oxygen concentration in the atmosphere?
  - 15.2 percent
  - 19.5 percent
  - 20.9 percent
  - 23.5 percent
- Which of the following is a harmful physical agent?
  - Hydrochloric acid
  - Methane
  - Solvents
  - Temperature
- How long should an RBC unit be rotated when superchlorinating the unit for snail removal?
  - 2 to 3 hours
  - 8 to 12 hours
  - 2 to 3 days
  - 5 to 7 days
- What safety precaution should be taken when starting a positive displacement pump?
  - The discharge valve should be closed.
  - The inlet valve must be grounded.
  - The discharge valve must be opened.
  - There should be no people near the pump.
- Most activated sludge mixed-liquor suspended solids fall into a range of what percent volatile content for municipal waste when the process is operating properly?
  - 5 to 15 percent
  - 30 to 40 percent
  - 50 to 70 percent
  - 70 to 80 percent
- What may be the FIRST corrective action taken to resolve floating sludge conditions in a secondary clarifier, given these observations:
  - SVI is 132
  - Microscopic exam reveals abundance of filamentous organisms
  - Decrease the D.O.
  - Increase the D.O.
  - Increase the WAS rate
  - Reduce the RAS rate
- A spray field has a total of 80 acres and is divided into four equal zones. Only one zone may be operated at a time and the permit states that no more than 4 inches

- of water can be applied to the zone. How long can a zone be operated at a rate of 0.7 mgd before it must be rotated to another zone?
- 48 hours
  - 3.1 days
  - 4.2 days
  - 144 hours

- What may be the PROBABLE CAUSE for low chlorine gas pressure at a chlorinator?
  - Chlorine cylinders are full
  - Low injector vacuum
  - Insufficient number of cylinders connected to the system
  - Plugged diffusers

ANSWERS ON PAGE XX.

## SEND US YOUR QUESTIONS FOR CERTIFICATION BOULEVARD

Do you have a question or an exercise you would like to feature in "Certification Boulevard?" We'll be glad to publish it. Just send your question (with the answer) or your exercise (with the solution) to:

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There is no limit to the number of questions or exercises you may submit. Please include your name, city, and organization or company so we can give you credit.

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## Answer Key

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1. What is the FIRST warning that trouble is starting in an anaerobic digester?  
**D. Increase in volatile acid/alkalinity relationship**  
*Because the alkalinity is so high in an anaerobic digester, the pH is slow changing and the digester will basically go "sour" before the pH begins to drop. This is why the acid/alkalinity ratio is the best process tool to use to monitor the performance efficiency of anaerobic digestion.*
2. What is the MAXIMUM recommended holding time for a sample to be tested for CBOD?  
**C. 48 hours**
3. What is the oxygen concentration in the atmosphere?  
**C. 20.9 percent**
4. Which of the following is a harmful physical agent to microbiology?  
**D. Temperature**  
*These other agents can certainly be harmful to microbiology; however, they are chemical and not physical agents.*
5. How long should an RBC unit be rotated when super-chlorinating the unit for snail removal?  
**A. 2 to 3 hours**
6. What safety precaution should be taken when starting a positive displacement pump?  
**C. The discharge valve must be opened**  
*If a positive displacement pump is started with the discharge valve closed, severe damage can occur within the pump and discharge piping. This can be a very dangerous condition, as pieces of the pump, pipe or devices on the pipe (like pressure gauges) can become projectiles.*
7. Most activated sludge mixed liquor suspended solids fall into a range of what percent volatile content for municipal waste when the process is operating properly?  
**D. 70 to 80 percent**  
*Younger sludge will generally have a higher volatile content, while older sludge will have a lower volatile fraction of the mixed liquor total suspended solids.*
8. What may be the FIRST corrective action taken to resolve floating sludge conditions in a secondary clarifier, given these observations:
  - SVI is 132
  - Microscopic exam reveals abundance of filamentous organisms**B. Increase the D.O.**
9. A spray field has a total of 80 acres and is divided into four equal zones. Only one zone may be operated at a time and the permit states that no more than 4 inches of water can be applied to the zone. How long can a zone be operated at a rate of 0.7 mgd before it must be rotated to another zone?  
**B. 3.1 days**  
*Step 1: 80 acres ÷ 4 zones = 20 acres per zone  
1 acre = 43,560 ft<sup>2</sup>  
Step 2: 4 inches ÷ 12 inches per foot  
= 0.333 feet of water applied  
Step 3: 20 acres x 43,560 ft<sup>2</sup> per acre  
= 871,200 ft<sup>2</sup> x 0.333 feet of water applied  
= 290,109.6 ft<sup>3</sup>  
Step 4: 290,109.6 ft<sup>3</sup> x 7.48 gals per ft<sup>3</sup>  
= 2,170,019.8 gals per zone  
Step 5: 2,170,019.8 gals per zone ÷ 700,000 gals per day  
flow rate  
= 3.1 days*
10. What may be the PROBABLE CAUSE for low chlorine gas pressure at a chlorinator?  
**C. Insufficient number of cylinders connected to the system**