

Operator Quiz Test No. 122 – Aeration

The following questions are designed for trainees as they prepare to take the ABC wastewater operator test. It is also designed for existing operators to test their knowledge. Each issue of *Clear Waters* will have more questions from a different section of wastewater treatment. Good luck!

- Which of the following is not a form of a diffused aeration system?
 - Ultrafine bubble
 - Fine bubble
 - Course bubble
 - Surface aerator
- The growing or coming together of small scattered particles into larger particles, also known as floc, is called?
 - Agglomeration
 - Algorithm
 - Aerobic digestion
 - Anaerobic digestion
- Aeration tank diffusers are most commonly found:
 - Upstream of the blower discharge valve
 - Downstream of the blower discharge and near the surface
 - At the bottom of the aeration tank
 - At the surface of the aeration tank
- Calculate the pounds of solids under aeration within an aeration system that has a volume of 2.5 MG and an MLSS of 1500 mg/L.
 - 28,050
 - 31,275
 - 12,510
 - 3,750
- An aeration tank is showing characteristics of white sudsy foam. This is an indication of which of the following?
 - The MLSS is too low
 - The MLSS is too high
 - The WAS rate is too low
 - The RAS rate is too high
- Which of the following most accurately describes the stages in a sequencing batch reactor (SBR)?
 - Fill, Suspend, Digest, Incinerate, Chlorinate
 - Empty, Fill, Aerate, Decant, Chlorinate
 - Fill, Aerate, Settle, Decant, Idle
 - Remove FOG, Aerate, Decant, Fill, Repeat
- The typical MLSS concentration range of an SBR is:
 - 100 to 1,000 mg/L
 - 1,000 to 2,000 mg/L
 - 2,000 to 6,000 mg/L
 - 6,000 to 10,000 mg/L
- These common protozoa, found in activated sludge, possess one or more long hair-like appendages used to propel themselves. Also known as Mastigophora, they are called:
 - Amoebas
 - Free-swimming ciliates
 - Stalked ciliates
 - Flagellates
- What is the procedure for finding the weight of volatile solids of an MLSS sample?
 - Find the amount of total solids, ignite dried solids at 550°C, cool in desiccator, weigh remaining white ash and calculate
 - Evaporate water from dried total solids sample, ignite at 103°C, measure wet sludge sample
 - Find the amount of total solids, cool sample in desiccator, ignite sample at 550°C, calculate the amount of MLSS
 - Find the amount of total solids, ignite sample at 103°C, cool in desiccator, weigh remaining white ash and calculate
- When using the Off-Gas test method to determine the OTE of an aeration system, the OTE is known as:
 - Organically Tested Element
 - Oxygen Theoretical Equation
 - Operator Tested Efficiency
 - Oxygen Transfer Efficiency

Answers and explanations on next page.

For those who have questions concerning operator certification requirements and scheduling, please contact Tanya May Jennings at 315-422-7811 ext. 4, tmj@nywea.org, or visit www.nywea.org/OpCert.

Operator Quiz Test No. 122 “Aeration” Answers Explained

1. A surface aerator is an example of a mechanical aeration system.
2. (b) an algorithm is a procedure for solving a mathematical problem; (c) aerobic digestion breaks down waste solids in the presence of oxygen; (d) anaerobic digestion breaks down waste solids in the absence of oxygen.
3. Aeration diffusers are located at the bottom of the aeration tank to allow for necessary contact time of air bubbles with the mixed liquor and to allow for mixing within the tank.
4. Solids (lbs) = 2.5 MG x MLSS of 1,500 mg/L x 8.34 lbs/gal
5. Thick billowy foam is indicative of low MLSS, reduce wasting to increase MLSS and MCRT.
6. The typical sequence of operation of an SBR includes filling the tank; aerating the tank for a reaction period; settling the MLSS; decanting or withdrawal of clarified effluent; and idling the tank.
7. MLSS of 2,000 to 6,000 mg/L is common in an SBR as well as a sludge age between 25 and 45 days and a F/M ratio of 0.02 to 0.05 lbs BOD/day/lb MLVSS.
8. (a) amoebas use a flexible cell membrane or false foot to move; (b) free-swimming ciliates possess many short hair-like extensions to move; (c) stalked ciliates are tulip-shaped and grow on a flexible stalk.
9. Total solids are first analyzed by drying sample in a drying oven set to between 103°C to 105°C. The remaining sample is then ignited in a muffle furnace set to 550°C.
10. (d) The Oxygen Transfer Efficiency can be used to determine localized diffuser performance data. The other answers are made-up terminology.