

Operator Quiz Spring 2020 – Activated Sludge

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 terms refers to a hydraulic condition, typically indicated by billowing solids flowing over the effluent weir, where a portion of the flow through a clarifier experiences a much shorter detention time than the rest of the wastewater in the tank?
 - Surging.
 - Short-circuiting.
 - Overload.
 - Dispersion.
- The typical range of suspended solids in domestic influent wastewater is:
 - 100-300 mg/L.
 - 400-600 mg/L.
 - 700-900 mg/L.
 - 1,000-12,000 mg/L.
- If mixed liquor is black in color and the level of DO is extremely low, this typically indicates that the mixed liquor is:
 - Healthy.
 - Recycling.
 - Septic.
 - Reversing.
- Which of the following is an appropriate location to collect a final effluent sample for a chlorine residual test?
 - At the chlorine injection point.
 - At the point where influent enters the plant.
 - At the downstream end of the chlorine contact tank or just before the point of discharge.
 - At the downstream end of the aeration tanks.
- The target DO level in a biological reactor of an efficiently operated activated sludge process should fall within the range of:
 - 0.0 to 1.0 mg/L.
 - 2.0 to 3.0 mg/L.
 - 4.0 to 6.0 mg/L.
 - 8.0 to 12.0 mg/L.
- Which of the following types of solids most accurately represent the microorganisms in the activated sludge process?
 - Total suspended solids.
 - Mixed liquor suspended solids.
 - Mixed liquor volatile suspended solids.
 - Total dissolved solids.
- What piece of laboratory glassware is used mainly to mix chemicals and measure approximate volumes?
 - Burette.
 - Pipette.
 - Graduated cylinder.
 - Beaker.

- What is the maximum recommended holding time for a sample that is to be analyzed for pH?
 - None, it must be analyzed immediately.
 - 30 minutes.
 - 4 hours.
 - 5 days.
- Given the following information, calculate the BOD of this sample:
 Initial sample DO = 8.5 mg/L
 Final sample DO = 5.1 mg/L
 Amount of sample used = 9 mL
 Total sample volume = 300 mL
 - 62 mg/L.
 - 85 mg/L.
 - 102 mg/L.
 - 113 mg/L.
- The temperature of a drying oven used for TSS analysis must be kept at:
 - 104 ± 1°F.
 - 104 ± 1°C.
 - 180 ± 2°C.
 - 500 ± 50°C.

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.

1. (b) Short-circuiting.
- (a) 100-300 mg/L. Suspended solids removal is one of primary process goals for activated sludge treatment. Typically, raw wastewater contains approximately 100-300 mg/L of suspended solids.
- (c) Septic.
- (c) At the downstream end of the chlorine contact tank or just before the point of discharge.
- (b) 2.0 to 3.0 mg/L.
- (c) Mixed liquor volatile suspended solids.
- (d) Beaker, they are suitable for mixing chemicals and measuring volumes.
- (a) None, it must be analyzed immediately.
- (d) 113 mg/L.
- BOD mg/L = (Initial sample DO mg/L - Final sample DO mg/L) / (amount of sample used, mL/total sample volume, mL)
 = (8.5mg/L - 5.1mg/L) / (9mL/300mL)
 = 3.4mg/L / 0.03
 = 113.3 mg/L
- (b) 104 ± 1°C. For TSS analysis, samples must be dried to a constant weight at 104 ± 1°C.

Answers: