

Certification Boulevard Answer Key

From page 54

1. B. In one direction only

2. B. Sulfuric acid

Sodium hydroxide is typically used when a wet scrubber is treating odorous air high in hydrogen sulfide; however, it typically requires a low pH when scrubbing air high in ammonia.

3. B. 3 hours 31 minutes

Formula for Detention Time in Minutes

= pipe volume in cubic feet ÷ (flow pumped in mgd x 92.84 cfm/mgd)

Pipe Volume

= $r^2 \times \text{length, ft.}$

= $3.14 \times 1 \text{ ft.} \times 1 \text{ ft.} \times 14,700 \text{ feet}$

= 46,158 ft^3

Flow Pumped

= 6 mins On + 5 mins OFF

= 11 mins per cycle

= 1,440 mins per day / 11 mins per cycle

= 130.9 cycles per day

= 6 mins ON per cycle x 130.9 cycles per day

= 785.4 mins per day

= 3,000 gpm x 785.4 mins per day

= 2,356,200 gpd

= 2.3562 mgd

$46,158 \text{ ft}^3 \div (2.3562 \text{ mgd} \times 92.84 \text{ cfm/mgd})$

Detention Time

= 211 Minutes divided by 60 mins/hr

= 3.516 hrs

4. D. Ultimately will result in premature failure of the motor winding insulation

5. D. Exfiltration

• Waste leaking out of a collection system pipe is called **exfiltration**

• Water seeping into a collection system pipeline is called **infiltration**

6. D. 187 yd^3

Cu. Yards

= 9.25 feet wide x (28 yards long x 3 feet/yard) x 6.5 feet deep ÷ by 27 ft^3 per yd^3

= 187.06 yd^3

7. D. All of the above

8. C. 2 fps

9. B. 8,925 gals

$Q, \text{ mgd} \div 24 \text{ hrs/day} \times D.T., \text{ hrs} = \text{Volume, mg}$

$Q = 20 \text{ mins/hr} \times 24 \text{ hrs/day}$

= 480 mins/day x 255 gpm

= 122,400 gpd

$0.1224 \text{ mgd} \div 24 \text{ hrs/day} \times 1.75 \text{ hrs}$

= 0.008925 mg x 1,000,000

= 8,925 gals

10. D. Force main

