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Continuing Education Course #401
Lift Station Design

1. Which is NOT a purpose or function of a lift station?
- a. To move wastewater to the destination
- b. To receive and store wastewater from gravity sewer pipes
- c. To recirculate wastewater

2. What is the main benefit to using lift stations rather than only gravity sewers?
- a. To allow shallow pipes of smaller diameter
- b. To avoid odor issues
- c. To reduce energy consumption

3. Which lift station location will likely have the greatest discharge pressure?
- a. Nearest to the regional pump station
- b. Furthest from the regional pump station
- c. Neither, all locations will have the same pressure

4. What is a common industry standard for the design of wastewater facilities?
- a. Ten States Standards
- b. NFPA 820
- c. AWWA Standard E103

5. Which of the following is NOT a step for lift station design?
- a. Intake design
- b. Headworks design
- c. Pump selection

6. What do you call the design flow that includes potential future developments?
- a. Average design flow
- b. Ultimate design flow
- c. Peak design flow

7. Which are methods for measuring flow rates on an existing lift station?
- a. Install a flow meter, use consumption data, or use pump run times
- b. Install a flow meter, use pipe diameter, or use pump run times
- c. Install a flow meter, use consumption data, or use fiber optic cable.

8. Which type of lift station is most common for collection systems?
- a. Suction Lift Station
- b. Vacuum Sewer Station
- c. Submersible lift station

9. Which is NOT an advantage of a submersible lift station?
- a. Less expensive
- b. Can have indoor facilities
- c. Simple design

10. Which is NOT another name for a separate pump room?
- a. Clean room
- b. Dry well
- c. Dry pit

11. Which is an option for pulling a lift?
- a. Check valve
- b. Blower
- c. Self-priming pump

12. What are the advantages of a vertical lift station?
- a. Can remove without a crane
- b. Energy efficiency and flow stability
- c. Pump access without exposure to wastewater

13. Which are main components of a vacuum lift station?
- a. Collection sump, vacuum valve, vacuum tank
- b. Collection sump, plug valve, vacuum tank
- c. Collection sump, vacuum valve, vacuum truck

14. When are three or more pumps beneficial?
- a. Large flows, large peak factor, large pressure range
- b. Small flows, large peak factor, large pressure range
- c. Large flows, large peak factor, small pressure range

15. Which are the benefits to variable speed control?
- a. May allow fewer pumps, less power use, and a no wet well.
- b. May allow fewer pumps, less power use, and a smaller wet well.
- c. May allow no stand-by pump, less power use, and a smaller wet well.

16. What is the recommended minimum floor slope in a wet well per the Ten States Standards?
- a. 1 to 1
- b. 0.5 to 1
- c. 0.25 to 1

17. What is the basis for calculating the MINIMUM wet well volume?
- a. Maintaining pump efficiency
- b. Preventing air entrainment
- c. Preventing excessive pump cycling

18. What is the basis for calculating a MAXIMUM wet well volume?
- a. Preventing septic conditions
- b. Controlling construction costs
- c. Controlling buoyancy

19. What is the recommended force main velocity per the Ten States Standards?

- a. 2 to 6 fps
- b. 2 to 8 fps
- c. 4 to 8 fps

20. Which condition results in the lowest static head?
- a. LOW water level in the wet well and LOW force main pressure
- b. HIGH water level in the wet well and HIGH force main pressure
- c. HIGH water level in the wet well and LOW force main pressure

21. The TDH is the sum of what three losses?
- a. minor, pipe friction, and static
- b. minor, major, and static
- c. minor, dynamic, and static

22. Which types of pumps can handle rags?
- a. chopper, screw, and self-cleaning
- b. reducer, screw, and self-cleaning
- c. chopper, screw, and self-priming

23. Where should the BEP be located?
- a. To the right of the low head curve
- b. Between the high head and low head curves
- c. To the left of the high head curve

24. What can be done if the NPSHr is greater than NPSHa?
- a. No change is needed
- b. Increase the wet well diameter
- c. Increase the inlet submergence

25. Which is NOT an option for reading water level?
- a. Buoys
- b. Bubbler
- c. Ultrasonic sensor
- d. Several floats