

Kansas Small System Wastewater Operator Need to Know

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Healthy Kansans living in safe and sustainable environments

The Kansas Department of Health and Environment (KDHE) has compiled the following minimum knowledge expectations for water operators. The intent of this document is to identify those items which individuals are expected to comprehend in order to serve as water operators. This document is not intended to serve solely as a study guide for operator certification examinations. In order to pass a certification examination, an operator must possess knowledge gained through formal education and training as well as on-the-job experience.

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I. Why Treat Wastewater

- Human health
 1. Pathogens
 2. Sterilization
 3. Disinfection
- Dissolved oxygen (D.O.) depletion causes fishkills

II. Chemistry

- Characteristics of wastewater
 1. Grit
 2. Organic
 3. Inorganic
- pH
- Biochemical oxygen demand (BOD)
- Solids
- Composite vs grab sampling

III. Safety

- Confined space
- Lock out/tag out
- General first aid
- Typical hazards encountered
- No job worth losing your life over

IV. Basic Math

- Surface area
- Perimeter/Circumference
- Volume
- Flow rate ($Q=VA$)

V. Sewers - Collection Systems

- Types (sanitary, industrial, gravity, force main, etc.)
- I/I

VI. Basic Operation and Maintenance

- Pumps
 1. Types
 2. Centrifugal pump components
 3. Valving
 4. General concepts of head, suction, and head loss
- Pump Stations
 1. Alarm condition

- 2. Routine maintenance
- 3. Confined space
- General housekeeping

VII. Treatment

- Primary treatment
 - 1. Bar screen
- Secondary treatment
 - 1. Definition
 - 2. Ponds
 - a. Biology
 - b. Facultative vs aerated ponds
 - c. Series vs parallel operation
 - d. Pest control
 - e. Vegetation control
 - f. Sludge build up and removal