

SANITATION AND SAFETY

“Wastewater workers are exposed to about every type of occupational hazard except nuclear radiation.” – OSHA Training Manual

- I. Three main hazard categories for OMP personnel
 - A. Biological
 - B. Chemical
 - C. Physical
- II. You're the professional, protect
 - A. Yourself
 - B. Your workers
 - C. Occupants
- III. Biological
 - A. Bacteria
 - 1. Diseases
 - a. Cholera
 - b. Typhoid
 - c. Salmonella
 - d. E. coli
 - e. Shigella
 - 2. Viruses
 - a. Hepatitis A
 - b. Norwalk & Norwalk type
 - c. Polio
 - 3. Protozoa
 - a. Cryptosporidium
 - b. Toxoplasmosis
 - 4. Helmenths (roundworms)
 - B. Precautions
 - 1. Hand washing
 - a. Disinfectant soap
 - b. Clean water
 - c. 30 seconds minimum
 - 2. Avoidance of skin contact
 - a. Protective clothing
 - b. Gloves
 - 1. disposable
 - 2. heavy, re-usable
 - 3. Avoid sewage aerosols
 - a. Consider a mask
 - b. Avoid creating dust plumes in dry bed areas
- IV. Chemical hazards
 - A. Explosions
 - 1. Explosive gasses produced by sewage
 - a. Methane (natural gas)

- b. Carbon monoxide
- c. Hydrogen sulfide
- 2. Chlorine tablets
 - a. Calcium hypochlorite
 - b. Powerful oxidizer
 - c. Burns or explodes if exposed to:
 - 1. petroleum products
 - 2. many other organic compounds
 - d. Always store:
 - 1. in original, marked container
 - 2. away from petroleum products
 - e. Fire extinguisher
 - f. Always handle with gloves

B. Confined spaces

- 1. What is a confined space?
 - a. Areas with:
 - 1. poor ventilation
 - 2. restricted air movement
 - b. Enclosed areas with limited entry
 - c. Examples:
 - 1. deep pits with open tops
 - 2. storage tanks
 - 3. pump tanks
 - 4. manholes
- 2. Dangers include:
 - a. Explosion
 - b. Poisoning
 - 1. Hydrogen sulfide
 - smell like rotten eggs
 - more toxic than cyanide gas
 - dulls sense of smell
 - kills in seconds
 - 2. Carbon monoxide
 - bonds with hemoglobin
 - blood can't carry oxygen
 - Face & body turn red
 - death can occur in minutes
 - c. Asphyxiation
 - 1. Oxygen & air **not** the same
 - a. air is ~ 21% oxygen
 - b. can be reduced confined space
 - 2. Asphyxiation symptoms

- a. at 17% oxygen
 - increased breathing rate
 - accelerated heart rate
- b. 14-16% oxygen
 - increased breathing rate
 - accelerated heart rate
 - poor muscle control
 - rapid fatigue
 - intermittent breathing
- c. 6-10% oxygen
 - nausea
 - vomiting
 - inability to perform
 - unconsciousness
- d. >6% oxygen
 - spasmodic breathing
 - convulsive movements
 - death in minutes

3. Precautions

- a. ventilate
 - before entry
 - twenty minutes
- b. don't work alone
- c. have a rescue plan
- d. DON'T GO IN

V. Physical hazards

A. Heavy objects

- 1. Crush hands & feet
- 2. Break bones
- 3. Precautions

a. Vehicles

- 1. routinely use emergency brakes
- 2. block wheels
- 3. turn engine off unless you need it
- 4. maintain equipment & vehicles

b. Heavy objects

- 1. get help
- 2. use mechanical aids
 - a. jacks
 - b. hoists
 - c. cranes

3. DON'T TRUST IT

- a. use blocks for support
- b. don't get under it

- B. Sharp objects
 - 1. Cut skin
 - 2. Puncture wounds
 - 3. Portal for disease organisms
 - 4. Precautions
 - a. Wear gloves
 - b. Remove sharp edges
 - c. Cover sharp edges and points
- C. Electrical shock
 - 1. Water and electricity don't mix
 - 2. Control panel should be in sight of work area
 - 3. Disconnect power before beginning work
 - 4. Don't run extension cords through standing water