Lesson Objectives

- Match a list of terms related to water treatment with a list of corresponding definitions.
- Identify the importance of water in the practice of sanitation.
- Determine the required quantity of potable water for a unit.
- Match a list of organizations with their respective responsibilities for the production of potable water in the field.
- Identify the rules of water discipline.
Lesson Objectives

- Determine the best water source based upon the unit's situation.
- Identify water treatment processes used in the field.
- Demonstrate the knowledge of the steps for inspection of a 400-gallon water trailer.
- Demonstrate the knowledge of the steps to perform chlorine residual monitoring.
- Demonstrate the knowledge of the steps to disinfect water in the field.
- Monitor bottle water operations.
Definitions

- **Palatable Water** - Water that looks, smells, and tastes good.

- **Potable Water** - Water that is fit for human consumption.

- **Water Treatment** - Procedures that are used to change the chemistry of water to improve its quality.
Definitions (2)

- **Disinfection** - A process of killing infectious agents outside the human body by direct exposure to chemical or physical agents.

- **Chlorination** - A treatment process that combines the water with chlorine or chlorine compound.

- **Chlorine Dosage** - The total amount of chlorine or chlorine compound added to a given amount of water.
Definitions (3)

- **Chlorine Demand** - The amount of chlorine dosage used or consumed by substances in the water.

- **Chlorine Residual** - The amount of chlorine left in the water after the chlorine demand has taken effect.

- **Parts per Million (PPM)** - The parts of chlorine present in a given volume of water (concentration). (This value may also be expressed in Milligrams per Liter (Mg/L).)
Safe water is essential.
Water-borne bacteria are a contributing source of disease to soldiers in the field.
Testing is the best indicator that contamination exists.
Water requirements vary with the seasons, the geographical location, and the tactical situation.
General Planning Guidance

- **Cold Climate** - Only 2 gallons (7.75L) of water per soldier per day may be required for drinking purposes even if engaged in physical activity.

- **Hot Climate** - 3 or 4 gallons (11.355 to 15.14 L) per man per day may be required when engaged in only sedentary duty.

- **Arid Zone** - 3 to 6 gallons (11.355 to 22.71L) per individual per day. Shower facilities increase requirement to 15 gallons (56.775L) or more.
Army Medical Department Responsibilities

- Performs bacteriological testing; advises authorities on water purification methods.
- Establishes safe water standards, inspects water points, approves water for consumption.
Corps of Engineers Responsibilities

- Selects water sources.
- Establishes water points.
Quartermaster Corps Responsibilities

- Sets up and operates bulk water treatment equipment.
- Procures, treats, distributes treated water.
Unit Commander Responsibilities

- Ensures adequate water supply in the unit.
- Monitors water treatment processes.
Rules of Water Discipline

- Drink approved water only.
- Prevent water waste.
- Protect water sources with good sanitary practices.
In an emergency, the FST may be called upon to select a water source.
Surface Water

- Includes streams, ponds, rivers, and lakes.
- Most commonly selected for use.
Ground Water

- Includes wells and springs.
- Quantity difficult to determine.
- Costly to obtain.
Rainwater, Ice and Snow
Seawater
You should consider all these factors when you select a water source.

- The military situation
- The quantity needed
- The accessibility of the source
- The general quality of the source
- The type of purification equipment available for use
The goal of water treatment is to produce potable water.
Methods of Water Treatment

- Coagulation / sedimentation.
- Filtration.
- Disinfection.
Chemical Water Treatment

- Chlorine treatment.
- Calcium hypochlorite treatment.
Inspecting the 400-Gallon Water Trailer

- Container.
- Manhole cover.
- Spigots.
- Drains.
- Site.
- Inspect interior of a water trailer
  - Seams should be free of rust
  - Interior should be free from paint or other coatings
  - Cracks or dents are OK as long as they don't expose the foam insulation
  - Clean, if necessary, and rinse thoroughly
The words, “Potable Water Only,” should be in plain view.
Check seal, gaskets, locking mechanism, insulation and pressure relief valve.
Dispensing Spigots

- Check T-handle, spigots, protective box, and locks.
Drains

- Should be easy to remove - hand tight only.
- Threads should not be stripped or damaged.
Chlorine residual should be checked immediately upon arrival to the site.
Chlorine Residual Monitoring Kit

- **Components.**
- 6 oz. Calcium Hypochlorite bottle.
- Half gram spoon.
- Chlorine residual test strips.
Procedure for monitoring residual

- Wash your hands.
- **Flush the taps of 400-gallon water trailer for several seconds.**
- Hold the test strip under water stream for 10 seconds.
- Monitor the color changes carefully.
Compare the free chlorine pads to the color chart on the bottle. Estimate results if the color of the test pad falls between two color blocks.

Approx. 2-3 ppm
Re-chlorinating a Water Buffalo

- Mix 5 half-gram spoonfuls of Calcium hypochlorite from the 6-ounce bottle with one-half canteen cup of water.

- Thoroughly mix the slurry and then add it to the water in the trailer.

- Mix the solution with a clean stick or other clean device and flush the four taps.

- Wait 10 minutes, flush the taps again, and check the chlorine residual.
When chlorine residual reaches 1 ppm, wait 20 minutes and release water.
Re-chlorinating a 5-gallon Water Can
Re-chlorinating a 5-gallon Water Can

- Add 1 half gram spoonful of calcium hypochlorite to a ½ canteen cup of water and stir the slurry solution.
- Add approximately ½ of the solution to one 5-gallon can.
- Shake the container and wait 10 minutes. Loosen the cap and invert the can to let some treated water flow over the threads of the can.
- Wait an additional 20 minutes, for a total contact time of 30 minutes.
Disinfecting a 1-quart Canteen

Method #1: Use Iodine Tablets
Disinfecting a 1-quart Canteen with Iodine

- Drop two iodine tablets into a canteen filled with water and wait 5 minutes for the tablets to dissolve.
- Cover the canteen and shake it.
- Loosen the canteen cap and invert the canteen to allow the treated water to flow across the threads of the canteen neck.
- Wait a minimum of 30 minutes before consumption.
Disinfecting a 1-quart Canteen (2)

 Method #2: Use Calcium Hypochlorite
Disinfecting a 1-quart Canteen (2)

- Dissolve the contents of 1 half gram spoon in ½ canteen cup of water to make a slurry.
- Fill an NBC compatible canteen cap or ½ non-NBC cap with the slurry. Pour the cap contents into the canteen and wait 5 minutes.
- Cover the canteen and shake it.
- Loosen the cap and invert the canteen to allow treated water to flow across the threads of the canteen neck.
- Wait a minimum of 30 minutes before consumption.
Method #3: Use Chlor-Floc

Follow directions listed on the Chlor-Floc package.
Disinfecting Water by Boiling

- Use in emergencies ONLY.
- Boil water for 5-10 minutes.
It is important to protect open bottles of water from secondary contamination.
SUMMARY