

Water Purification

A photograph of two military personnel in camouflage uniforms working on a large, tan-colored cylindrical water purification tank. One person is kneeling on the left, and the other is kneeling on the right, using a tool to work on a black and yellow fitting on the tank. The background shows a gravel area with other equipment and a blue sky. The image is framed by a blue geometric pattern on the right side.

HM3 Stephanie Solache, 8th Engineer Support Battalion,
Destroyer Squadron 40, Puerto Barrios, Guatemala, 2014.



OVERVIEW

- ▶ Water Sources and Characteristics
- ▶ Factors Affecting Sources of Water
- ▶ Procedures for Water Purification
- ▶ Water Testing



Learning Objectives

Please read your
Terminal and Enabling
Learning Objectives



The background of the slide features a photograph of hands holding a clear plastic container with a liquid sample, set against a gravelly surface. A large, semi-transparent blue geometric shape, composed of several overlapping triangles, is positioned on the right side of the slide, partially obscuring the background image.

Background

- ▶ Safe water is essential
- ▶ Insufficient quantity or quality can affect operational readiness
- ▶ All personnel must be familiar proper water discipline



WATER SOURCES AND CHARACTERISTICS

Water may be obtained from various sources in the field including the following:

Salt Water

- ▶ Sources:
 - ▶ Ocean, sea
- ▶ Characteristics
 - ▶ Less contaminated
 - ▶ Unlimited supply
 - ▶ Best source of water if a ROWPU is available



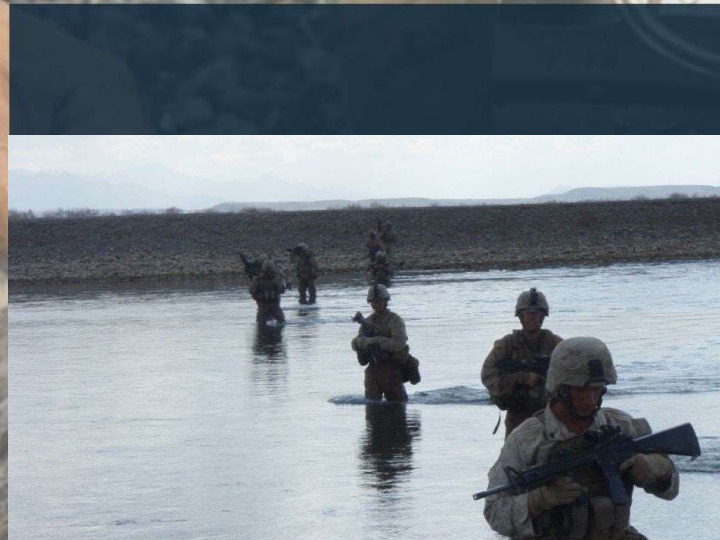
Ground Water



- ▶ Sources
 - ▶ Wells & Springs
- ▶ Characteristics
 - ▶ Best source of water during an NBC attack
 - ▶ Less chemical & biological pollution
 - ▶ Quantity is hard to determine

Surface Water

- ▶ Sources
 - ▶ Rivers, lakes, ponds, streams
- ▶ Characteristics
 - ▶ Larger sources less contaminated
 - ▶ Moving water is preferable
 - ▶ Easiest to procure for individual use
 - ▶ Readily accessible



3/5 Kilo Company patrols the Helmand River.
Sangin, Afghanistan. 2011.

Rain Water



- ▶ Not a reliable source
- ▶ May not provide an adequate supply



The background image shows a person's arm with a tattoo, holding a clear plastic tube that filters water from a dark, gravelly container into a clear glass. The scene is set outdoors on a gravel surface. A large, dark blue rectangular box is centered over the image, containing the title text. To the right of the box, there are several overlapping, semi-transparent blue geometric shapes, including triangles and polygons, creating a modern, abstract design.

Factors Affecting Sources of Water

Quantity

- ▶ Source should provide adequate supply for all troops
- ▶ Must last for the duration of operations



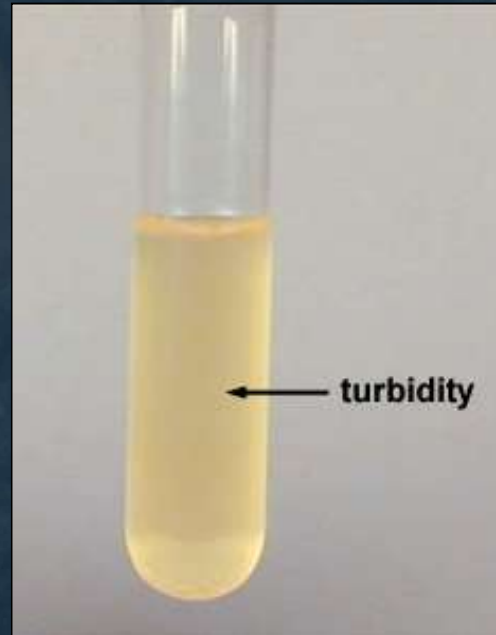
Quality



- ▶ Free of contamination from sewage, toxic elements and NBC agents
- ▶ Source protected from runoff from latrines, showers, motor pools, etc.
- ▶ Should be clear/colorless

Quality

- ▶ Water should not be objectionable due to turbidity, color, taste or odors
- ▶ Remove turbidity to reduce contamination if possible
 - ▶ Suspended particles often contain organisms that cause disease
 - ▶ Particles decrease effectiveness of chlorine



Quality



► Temperature


- Warm water is not a palatable
- Consumption rate decreases as water gets warmer
- Cool water retains chlorine longer

Accessibility

- ▶ Must be easily ACCESSIBLE to water purification and transport equipment





The background image is a dark, blue-tinted photograph showing a pair of hands filtering water through a piece of cloth into a container. The hands are positioned over a large, dark, textured surface, possibly a filter or a piece of cloth. The water is being poured from a small container into a larger one. The overall tone is serious and focused, emphasizing the process of water purification.

PROCEDURES FOR INDIVIDUAL WATER PURIFICATION

Types of Containers

- ▶ Canteen

- ▶ Individual use
- ▶ 1 qt



- ▶ Jerry Can

- ▶ 5 gallon container
- ▶ Must be labeled
“POTABLE WATER ONLY”



Types of Containers

- ▶ Lyster Bag

- ▶ 36 gallon capacity
- ▶ Used for hand washing stations
- ▶ Rarely used in current operations



Types of Containers



- ▶ Water Bull
 - ▶ 400 gallon capacity
 - ▶ Mobile potable water
 - ▶ Easily accessible

IODINE TABLETS

- ▶ NO LONGER ISSUED
- ▶ However, if you have them and need to use them:
- ▶ Inspect tablets for signs of deterioration
- ▶ Should be solid and steel gray in color
- ▶ Tablets that are yellow or brown, that stick together or crumble easily are no longer effective



IODINE TABLETS

- ▶ Purifying water in canteens:
 - ▶ Fill canteen with cleanest water possible
 - ▶ Add two iodine tablets to 1 quart canteen
 - ▶ If using tincture of iodine, five drops are equal to one tablet
 - ▶ Replace cap and shake to dissolve tablet
 - ▶ Wait 5 min, loosen cap and allow leakage around the threads
 - ▶ Tighten cap and wait an additional 25 min before drinking

IODINE TABLETS

- ▶ Purifying water in hydration systems
 - ▶ Fill hydration system with cleanest water possible
 - ▶ Use four tablets for 70-72 oz system
 - ▶ Use six for 100-102 oz system
 - ▶ Allow 30 min total contact time



CHLORINE BLEACH

- ▶ Add two drops of bleach per quart for canteens
- ▶ Use four drops for 70 oz reservoir
- ▶ Use six drops for 100 oz reservoir
- ▶ Let stand for 30 min before drinking



MICROPUR

- ▶ MICROPUR is what is issued in the IFAK, CLS Bag, and CAP Bag
- ▶ Purifying water in canteens:
 - ▶ Fill canteen with cleanest water possible
 - ▶ Add one tablet to 1 quart canteen
 - ▶ Replace cap and shake to dissolve tablet
 - ▶ Wait 5 min, loosen cap and allow leakage around the threads
 - ▶ Allow 30 min contact time before consuming water, 4 hours for cold or cloudy water



MICROPUR


- ▶ Purifying water in hydration systems:
 - ▶ Fill hydration system with cleanest water possible
 - ▶ Use two tablets for 70-72 oz system
 - ▶ Use three for 100-102 oz system
 - ▶ Allow 30 min contact time before consuming water, 4 hours for cold or cloudy water

BOILING WATER

- ▶ Used in emergency situations for small amounts of water
- ▶ Vigorously boil water for 5 minutes
- ▶ Does not provide for residual disinfectant capabilities
- ▶ Not to be used to store large quantities of water





A hand holding a test tube with pink liquid, set against a dark blue background with geometric shapes.

PROCEDURES FOR WATER TESTING

TESTING OF WATER

- ▶ All bulk water supplied for drinking must be tested daily for FAC
- ▶ Perform weekly bacteriological testing



WATER TESTING

Procedure for water testing

- ▶ Fill sample test tube to line
- ▶ Add (1) DPD #1 tablet, place cap on tube
- ▶ Agitate until tablet is completely dissolved
- ▶ Compare color of water to comparator



TESTING OF WATER

Acceptable Range

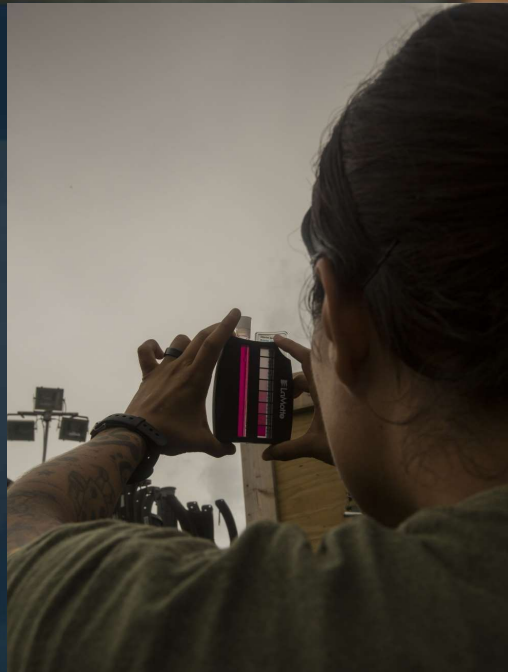
- ▶ Range should be between
 - ▶ 2.0 and 5.0 ppm

Chlorine Concentration (ppm)

0 0.5 1 2 5 10



Diagrams are for illustration purposes only.
Always use the color blocks on the
actual bottle label to interpret results.

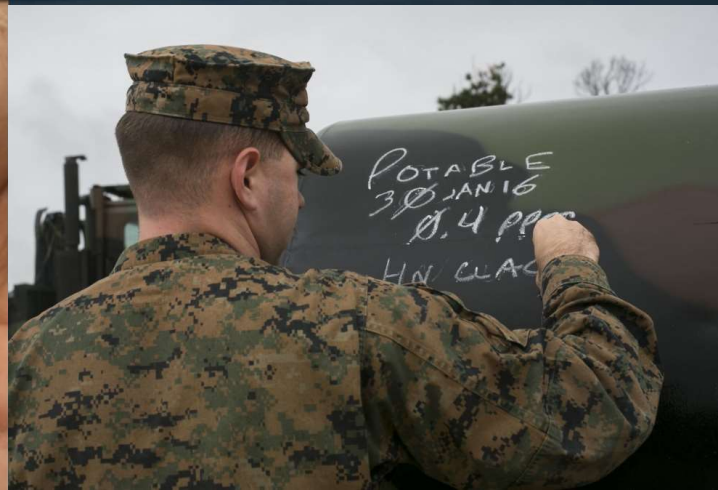


TESTING OF WATER

Required Documentation

- ▶ “Potable” / “Not Potable”
- ▶ Date
- ▶ PPM findings
- ▶ Name

Record Test Information at Source



A hand holding a test tube with pink liquid. The background is dark blue with geometric shapes.

Demonstration

Water Purification

A close-up photograph of a person's hand holding a pink test tube filled with a pink liquid. The person's arm, which has a tattoo, is visible in the background. The image is overlaid with a dark blue banner at the top containing the title 'Water Purification' in white text. The right side of the image features a blue geometric pattern.

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