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FIELD HYGIENE AND SANITATION

PREFACE

The purpose of this manual is to assist individual soldiers, unit commanders, leaders and field sanitation teams in preventing disease and environmental injuries. The manual provides information on preventive medicine measures (PMM) to the individual soldier as well as essential information for the unit commander, unit leaders, and the unit field sanitation team on applying unit level PMM.

When a problem exists beyond unit capabilities, the division preventive medicine section or Corps preventive medicine detachments should be called upon to assist in countering the threat.

The proponent of this publication is the Academy of Health Sciences. Submit changes for improving this publication on DA Form 2028 (Recommended Changes to Publications and Blank Forms) and forward it to: **COMMANDANT, ACADEMY OF HEALTH SCIENCES, US ARMY, ATTN: HSHA-TLD, Fort Sam Houston, Texas 78234-6100.**

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CHAPTER 1

INTRODUCTION TO THE MEDICAL THREAT

Section I. Message To The Unit Commander

DISEASES AND NONBATTLE INJURIES

What action do you think should be taken against a commander who allows his unit to sustain 40% combat injuries through neglect? How about a commander with a unit 40% ineffective due to malaria, cold injuries, or diarrhea?

Historically, in every conflict the US has been involved in, only 20% of all hospital admissions have been from combat injuries. The other 80% have been from diseases and nonbattle injuries (DNBI). Excluded from these figures are vast numbers of soldiers with decreased combat effectiveness due to DNBI not serious enough for hospital admission.

Preventive medicine measures are simple, commonsense actions that any soldier can perform and every leader must know. The application of PMM can significantly reduce time loss due to DNBI.

***How Much Time Does Your Unit Spend Training Soldiers on:
Disease and Nonbattle Injury Prevention?
Combat Injury Prevention?***

YOUR RESPONSIBILITY

You are responsible for all aspects of health and sanitation of your command. Only you can make command decisions concerning the health of your unit in consideration of the—

- Mission.
- Medical threat.
- Condition of troops.

DO NOT LET THIS HAPPEN TO YOU

Togatabu Island 1942: The 134th Artillery and the 404th Engineer Battalions were part of a task force preparing to attack Guadalcanal. Fifty-five percent of the engineers and 65% of the artillerymen contracted a disease called “Filariasis” transmitted by mosquitoes. Both units had to be replaced (medically evacuated)

without seeing any enemy action because they were not combat ready. The use of insect repellent, insecticides, and elimination of standing water would have prevented this.

Merrill's Marauders: Disease was an important detractor to this famous unit. The medical threat faced by the Marauders in the jungles of Burma was great. Everyone was sick, but some had to stay and fight. Evacuation was limited to those with high fever and severe illness. One entire platoon cut the seats from their pants because severe diarrhea had to be relieved during gunfights. After a bold and successful attack on a major airfield, Merrill's Marauders were so decimated by disease that they were disbanded.

Section II. The Medical Threat and Principles of Preventive Medicine Measures

The medical threat is—

- Heat
- Cold
- Arthropods and other animals

- Food/waterborne diseases
- The unfit soldier
- Noise
- Toxic chemicals-nonNBC
- Nonbattle injury

PRINCIPLES OF PREVENTIVE MEDICINE MEASURES

Soldiers perform individual principles of PMM.

Chain of command plans for and enforces PMM.

Field sanitation teams train soldiers in PMM and advise the commander on implementation of unit level PMM.

***Failure to Apply the Principles of PMM
Can Result in Mission Failure***

CHAPTER 2

INDIVIDUAL PREVENTIVE MEDICINE MEASURES

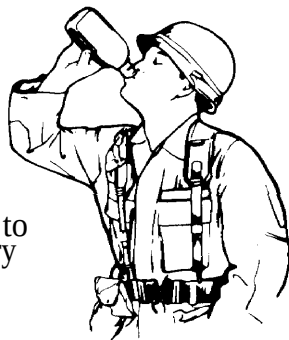
Section 1. Heat Injuries

DRINK PLENTY OF WATER

Depending on the heat, you may need to drink from 1/2 to 2 quarts of water per hour—**4 gallons** or more per day in hot dry climates.

Drink extra water **before** starting any mission or hard work. Cool water (50° to 55°F) is absorbed faster than cold water.

- Drink small quantities frequently.
- Drink water even if you are not thirsty.
- Refill your canteens at every opportunity.





NOTE

If your urine is dark yellow,
you are not drinking enough water!
Thirst is not a good indicator of dehydration.

USE WORK/REST CYCLES

Work and rest as your leader directs.

Work and rest in the shade, if possible.

EAT ALL MEALS TO REPLACE SALT

Take a salt solution *only* when directed by the medical personnel.



RECOGNIZE THE RISK OF MOPP/ BODY ARMOR/ARMORED VEHICLES

MOPP/body armor increases your heat stress. You must:

- Drink more water.
- Work and rest as your leader directs.

You are at a greater risk of heat injuries when in armored vehicles-you must drink more water.

MODIFY YOUR UNIFORM

If directed/authorized by your commander:

- Unblouse pants from boots.
- Keep skin covered in the sun; remove shirt in the shade.
- Keep clothing loose at the neck, wrists, and lower legs.

If the threat from biting insects is high, leave shirt sleeves down, and pants bloused in boots.



NOTE

See GTA 8-5-45, heat injury prevention and first aid and FM 21-11, first aid for soldiers, for information on heat injury prevention and first aid.

Section II. Cold Injuries



WEAR UNIFORM PROPERLY

Wear the clothing your commander directs.

Wear clothing in loose layers (top and bottom). Avoid tight clothing including tight underwear.

Keep clothing clean and dry. Remove or loosen excess clothing when working or in heated areas to prevent overheating that causes sweating.

Wear headgear to prevent body heat loss.

Avoid spilling fuel or other liquids on clothing (or skin).

KEEP YOUR BODY WARM

Keep moving, if possible.

Exercise your big muscles (arms, shoulders, trunk, and legs) frequently to keep warm.

If you must remain in a small area, exercise your toes, feet, fingers, and hands.

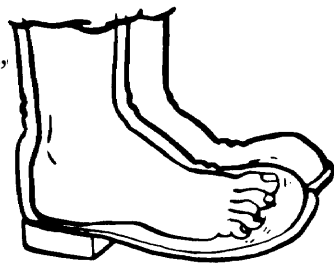
Avoid the use of alcohol.

Avoid standing directly on cold, wet ground, when possible.

Avoid tobacco products. The use of tobacco products decreases blood flow to your skin.

Eat all meals to maintain energy.

Drink plenty of water and/or warm nonalcoholic fluids. Dark yellow urine means you are not drinking enough fluids! You can dehydrate in cold climates too!



PROTECT YOUR FEET

Bring at least five pairs of issue boot socks with you.

Keep socks clean and dry.

Change wet or damp socks as soon as possible. Beware of wet socks from sweating!





Wash your feet daily, if possible.

Avoid tight socks and boots (lace boots as loosely as possible).

Wear overshoes to keep boots dry.

PROTECT YOUR HANDS

Wear gloves (with inserts) or mittens (with inserts).

Warm hands under clothing if they become numb.

Avoid skin contact with snow, fuel, or bare metal.

PROTECT YOUR FACE AND EARS

Cover your face and ears with a scarf or other material, if available.

Wear your insulated cap with flaps down and around your chin.

Warm your face and ears by covering them with your hands.

Exercise facial muscles.

PROTECT YOUR EYES

Wear sunglasses to prevent snowblindness.

Improvise sunglasses (slit goggles) if actual glasses are not available.

PROTECT YOUR BUDDY

Watch for signs of frostbite on his exposed skin—pale/gray/waxy areas.

Ask him if his feet, hands, ears, or face are numb and need rewarming.

Do not let him sleep in or near the exhaust of a vehicle with the engine running or in an enclosed area where an open fire is burning (carbon monoxide poisoning). Do not allow him to sleep directly on the ground.



NOTE

See GTA 8-6-12, adverse effects of cold, cause and symptoms and FM 21-11, first aid for soldiers, for information on cold injury first aid procedures.

Section III. Arthropods and Other Animals of Medical Importance.



USE INSECT REPELLENT

Use on all exposed skin: face, ears, neck, arms, and hands.

Use where clothing fits tightly, such as: upper back, buttocks, and knees. Apply to all openings of the uniform (collar, cuffs, shirt front, waistband, and boot tops).



Reapply a thick coat immediately if you get wet or --

- Every two hours if get sweaty.
- Every four hours if you don't wet or sweaty.

Read the label for directions and precautions before using.

WEAR UNIFORM PROPERLY

Wear uniform as your commander directs.

Wear headgear to protect the top of your head.

Wear loose fitting uniform, not tightly tailored, repair tears/holes.

When the arthropod threat is high—

- Blouse pants in boots and completely lace boots.
- Tuck undershirt in at waist.
- Wear sleeves down.
- Button blouse/shirt at the neck and wrist.
- Do not wear after-shave lotion or cologne in the field; they attract biting or stinging insects.



KEEP UNIFORM CLEAN

Wash your uniform frequently to remove arthropods and their eggs. If the situation permits, use the quartermaster laundry. Otherwise, use a can, stream, or lake.

FOLLOW MEDICAL ADVICE

Take malaria pills when directed by your commander.

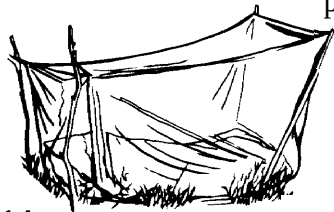
Use insect powder/cream/shampoo when prescribed by medical personnel.

PROTECT YOURSELF AT NIGHT

Use your bednet when sleeping. Tuck net under sleeping pad/sleeping bag so there are no openings.

Use an aerosol insect spray inside the bednet after it is tucked (or in your tent if it can be sealed). Spray for only 1 or 2 seconds. Allow at least 10 minutes for aerosol to disperse before occupying the bednet or tent.

Repair holes in your bednet.



PROTECT YOURSELF FROM OTHER MEDICALLY IMPORTANT ANIMALS

Spiders—

- Remove spider webs from buildings.
- Shake out and inspect clothing, shoes, and bedding before use.
- Eliminate collections of papers and unused boxes.
- Thoroughly clean beneath and behind furniture.
- Check field latrines before use.
- Wear gloves when handling paper or cloth that has been stored for long periods.

Scorpions—

Use a long handled tool or stick to turn over debris before removing it.

Remove accumulations of boards, rocks, and other debris.

- Wear leather gloves to remove rocks, lumber, and such from ground.
- Inspect and shake out clothing and shoes before putting them on.

Snakes—

- Avoid swimming in areas where snakes abound.
- Keep hands off rock ledges where snakes may be hiding and sunning.
- Look over the area before sitting down, especially if in deep grass or among rocks.
- Sleep off the ground, if possible.
- If military situation permits, avoid walking about an area during the period from twilight to complete daylight, as many snakes are active at this period.
- Avoid camping near piles of brush, rocks, or other debris.
- Never step over large rocks or logs without first checking to see what is on the other side.

- Turn rocks and logs toward you when they have to be removed so you will be shielded should snakes be beneath them.
- Handle freshly killed snakes only with a long tool or stick, as snakes can inflict fatal bites by reflex action after death.
- If bitten, try to get an accurate description of the snake to assist medical personnel in treating you. Do not panic!

DOMESTIC AND WILD ANIMALS OR BIRDS

Avoid handling or approaching so-called “pets.”

Exclude such animals from your work and living areas, unless cleared by veterinary personnel.

Do not collect or support (feed or shelter) stray, domestic, or domestic-like animals/birds in the unit area, unless cleared by veterinary personnel.

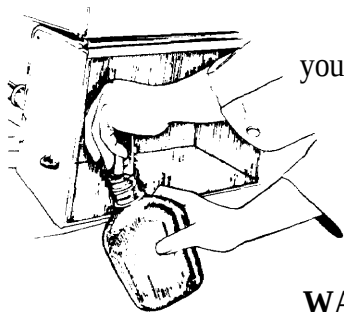
Section IV. Poisonous Plants and Toxic Fruits

Avoid contact with poisonous plants by properly wearing the uniform.

Avoid areas where poisonous plants grow.

Do not eat plants or parts of plants which might be unsafe. If you do not know, do not eat it.

Do not put field or turf grasses or woody twigs or stems in your mouth.



Section V . Food/Waterborne Diseases/Illness

WATER

Fill your canteen with treated water at every chance. When treated water is not available, you must disinfect water in your canteen using one of the following methods.

PREFERRED METHOD—IODINE TABLETS

Fill your canteen with the cleanest water available.

Put one tablet in clear water, or two in cold or cloudy water.. Double these amounts in the 2 quart canteen.

Place cap on canteen, wait 5 minutes, then shake. Loosen the cap and tip the canteen over to allow leakage around canteen threads. Tighten the cap and wait an additional 25 minutes before drinking.



ALTERNATE METHODS

CHLORINE AMPULES

Fill your canteen with cleanest water available.

Mix one ampule of chlorine with one-half canteen cup of water, stir the mixture with a clean device until contents are dissolved. Take care not to cut your hands when breaking open the glass ampule.



Pour one-half plastic canteen capful or one NBC canteen capful of the above solution into your canteen of water.



Place the cap on your canteen and shake. Slightly loosen the cap and tip the canteen over to allow leakage around threads. Tighten cap and wait 30 minutes before drinking.

TINCTURE OF IODINE

Fill canteen with cleanest water available.

Add 5 drops of 2 percent Tincture of Iodine per canteen/quart. If water is cold or cloudy, add 10 drops.

Mix thoroughly by shaking canteen. Slightly loosen the cap and tip canteen over to allow leakage around threads. Tighten cap and wait 30 minutes before drinking.

Very cloudy or cold water may require prolonged contact time. Let stand several hours or overnight if possible.

HOUSEHOLD/COMMON BLEACH

Fill canteen with cleanest water possible.

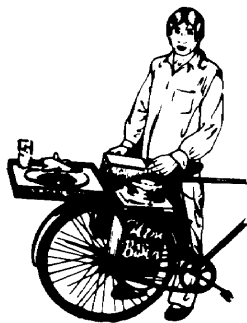
Read label on bleach bottle to determine amount of available chlorine. Liquid chlorine laundry bleach usually has 4 to 6 percent available chlorine.

Drops to be Added to a One Quart Canteen		
Available Chlorine	Clear Water	Cold or Cloudy Water
1%	10	20
4—6%	2	4
7--10%	1	2

Place cap on canteen and shake. Slightly loosen the cap and tip canteen over to allow leakage around threads. Tighten cap and wait 30 minutes before drinking.

When chlorine or iodine is not available, boil water for 5 to 10 minutes.

In an emergency, even boiling water for 15 seconds will help. Boiled water must be protected from recontamination.



FOOD

- Obtain food from approved sources (dining facility) when possible.
- Do not buy food, drinks, or ice from civilian vendors unless approved by veterinary personnel.
- When eating in local establishments or from approved vendors only eat hot food entrees, or raw foods that can be washed and peeled prior to eating.
- Inspect all cans and food packets prior to use.
- Discard all cans with leaks or bulges.
- Discard food packets with visible holes or obvious signs of deterioration.
- Do not eat foods or drink beverages that have been prepared in galvanized containers (zinc poisoning).

WASH YOUR HANDS

After using the latrine.

Before touching eating utensils or food.

After eating.



WASH YOUR MESS KIT

A sure way to get diarrhea is to use a dirty mess kit. Protect yourself by washing your mess kit—

- In a mess kit laundry.
- With treated water or disinfectant solution.



BURY YOUR WASTE

Always bury your waste immediately to prevent flies from spreading germs from waste to your food. Also, burying your waste helps keep unwanted animals out of your bivouac area.

Section VI. Personal Hygiene, Physical, and Mental Fitness



KEEP PHYSICALLY FIT

Physically fit soldiers are less likely to get sick or injured.

Use caution when exercising in extremely hot weather, heat injuries can occur. Actively participating in physical fitness training aids in your becoming acclimatized to the field environment.



NOTE

See FM 21-20, physical readiness training, for more information.

PREVENT SKIN INFECTIONS

Bathe frequently, take a full bath at least once every week, if showers or baths are not available, use a washcloth daily to wash:

- Your genital area.
- Your armpits.
- Your feet.
- Other areas where you sweat or that become wet, such as: between thighs or (for females) under the breasts.



Keep skin dry:

- Use foot powder on your feet, especially if you have had fungal infections on the feet in the past.
- Use talcum powder in areas where wetness is a problem, such as: between the thighs or (for females) under the breasts. Cornstarch may be used as a substitute for talcum powder.
- Change to clean clothing at the time of the full bath to aid in the control of lice.



Wear proper clothing:

- Wear loose fitting uniforms; they allow for better ventilation. Tight fitting uniforms reduce blood circulation and ventilation.
- Do not wear nylon or silk-type undergarments; cotton undergarments are more absorbent and allow the skin to dry.

PREPARE FOR THE FIELD

All soldiers need to bring toilet articles such as: soap, shampoo, washcloths, towels, toothbrush, dental floss, and toothpaste. Do not share items, prevent infections.

Male soldiers need a razor and blades.

Female soldiers need sanitary napkins or tampons.

Some soldiers need talcum powder and/or foot powder.

*Remember, in Combat You May Not Be Able to Easily
Obtain These Items If You Run Out. Bring
at Least a ONE Month Supply.*

PREVENT DENTAL DISEASE

Go to the dentist at least annually for examination and treatment.

Brush at least once a day. If available, toothpaste helps but it is not a necessity.

Use dental floss at least once a day.

Rinse your mouth with potable water after brushing and flossing.



PREVENT GENITAL AND URINARY TRACT INFECTIONS

For males:

- Wash the head of your penis when washing your genitals. If uncircumcised, pull the foreskin back before washing.



- Protect yourself from sexually transmitted disease (STD). Use a condom—condoms help prevent STD transmission.

For females:

- Wash your genital area daily.
- Don't use perfumed soaps or feminine deodorants in the field—they cause irritation.
- Protect yourself from STD. Insist that your sex partner use a condom—condoms help prevent STD transmission.
- Don't douche unless directed by medical personnel.
- *Drink extra fluids, even when it is not hot.*
- Wear cotton underwear, not silk or similar materials.

NOTE

Some individuals don't drink enough fluids and tend to hold their urine due to the lack of privacy in field latrines. Urinary tract infections are one of the most frequent medical problems females face in the field. Drinking extra fluids will help prevent these infections.

SLEEP WHEN YOU CAN

Follow your leaders' instructions and share tasks with buddies so everyone gets some time to sleep safely.

Sleep whenever possible (6 to 9 hours per 24 hours).

Take catnaps whenever you can, but expect to need a few minutes to wake up fully.

Sleep as much as you can ***before*** going on a mission which may prevent sleep.

After going without sleep, catch up as soon as possible.

Learn and practice techniques to relax yourself quickly.

NOTE

Do not sleep where you may be run over
by vehicles or on other unsafe areas.

MEASURES AGAINST THE EFFECTS OF SLEEP LOSS

If you cannot sleep because of the mission, discomfort, or mental tension, don't worry about it—sleep loss does NO permanent harm to body or mind.

Protect against the temporary effects of sleep loss on alertness, mood, and task performance.

- Play mental games or talk with buddies to stay alert during dull watches or monotonous critical jobs such as driving at night.
- Take short stretch breaks or get light exercise in place.
- Do not trust your memory-write things down. Double check your communications and calculations.

Watch out for your mind playing tricks (seeing things that are not there) when very tired, and check strange observations before acting.

Do not let bad dreams frighten you into staying awake-they are a normal way your mind has of dealing with combat experiences.

IMPROVE RESISTANCE TO STRESS

Fear and physical signs or symptoms of stress are normal reactions before and during combat or other dangerous/life threatening situations. You should not let fear or stress keep you from doing your job.

Talk about what is happening with your buddies, especially during after action debriefings.

Learn ways to relax quickly.

Welcome new replacements into your group and get to know them quickly.

If you must join a new group, be active in establishing friendships.

Give each other moral support if things are tough at home or in the unit.

Care for your buddies and work together to provide everyone food, water, sleep, and shelter, and to protect against heat, cold, poor sanitation, and enemy action.

NOTE

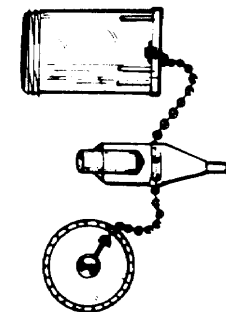
See FM 21-11, first aid for soldiers,
for first aid procedures.

Section VII. Noise

RECOGNIZE THE TYPES OF NOISE

Impact noise—very loud-short burst of noise such as small arms fire, cannon, or gun fire.

Continuous noise—loud, steady noise such as wheeled vehicle, tracked vehicle, aircraft, and other equipment operations.



**EARPLUG
CARRYING CASE**

RECOGNIZE THE EFFECTS OF NOISE

To the soldier—

- Immediate—ringing in ears; temporary loss of some hearing that last for minutes to hours; or pain/broken ear drums.

- Long-term—permanent, early hearing loss.
- To the mission
- Soldiers cannot hear important combat noise such as snapping of twigs; metal to metal; and approaching vehicles resulting in the unit position being overrun or destroyed.

PROTECT YOURSELF AND YOUR MISSION FROM NOISE

Wear ear plugs such as single flange; triple flange; and hand formed.

Use on vehicle headgear such as helicopter crew helmet; armor crew helmet; or earmuffs for others.

Keep earplugs and muffs clean to prevent ear infections.

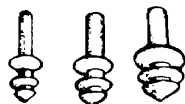
Avoid noise or limit time around noise to only critical tasks.

NOTE

If you have to raise your voice to be understood, it is too noisy. Put on hearing protectors.



SINGLE FLANGE



TRIPLE FLANGE



IMPREGNATED COTTON



SILICONE



FOAM



Section VIII. Toxic Chemicals NonNBC

RECOGNIZE THE TOXIC CHEMICAL NONNBC THREAT

Carbon monoxide from gasoline engines and fuel space heaters.

Hydrogen chloride from rocket system exhaust.

Bore/gun gases such as lead, carbon monoxide, and other gases from ammo propellant.

Solvents, greases, and oils from vehicle maintenance and repair.

RECOGNIZE THE INJURY

Carbon monoxide is colorless, odorless, and tasteless. It causes headache, sleepiness, coma, and death.

Hydrogen chloride is a very irritating gas that reacts with water (body fluids) to produce hydrochloric acid in the throat, lungs, and eyes. It causes coughing, tissue acid burns, and flu-like lung disease.

Bore/gun gases cause the same effects as carbon monoxide and hydrogen chloride.

Solvents, greases, and oils cause skin rash, burns, drying, and infections. They cause damage to the liver, blood, and brain. Also many are poisons that may cause cancer.

PROTECT YOURSELF AND YOUR MISSION FROM TOXIC CHEMICALS NONNBC

Carbon monoxide

- Run engines outdoors or with doors/windows open.
- Keep windows cracked where you sleep.
- Do not use engine exhaust for heat.

Hydrogen chloride

- Position yourself upwind of rocket systems.
- Hold your breath until the cloud passes by you.

Bore/gun gases

- Use onboard vehicle ventilation systems.
- Keep bore evacuator well maintained.

Solvents, greases, and oils

- Use “Safety” Stoddard solvent.
- Never substitute one solvent for a “Better” one, for example, never use Benzene instead of Stoddard.
- Use coveralls and gloves.
- Wash or change clothing often, especially when soiled by chemicals.
- Always follow label instructions for use and safety precautions.

CHAPTER 3

LEADERS PREVENTIVE MEDICINE MEASURES

Section I. Heat Injuries

PLAN FOR THE HEAT

Use your field sanitation team to train individual and their leaders in PMM against heat.

Acclimatize personnel to high temperatures as gradually as the mission will allow.

Obtain weather forecast for time/area of training/mission.

Ensure adequate supplies of potable water are available (up to 4 gallons per day per soldier just for drinking!). Issue a second canteen to soldiers in hot weather operations. In the desert additional canteens may be required.

Know the location of water distribution points.

Ensure trained medical support is available for treatment of possible heat injuries.

Plan the placement of leaders to observe for and react to heat injuries in dispersed training (road marches).

If the mission permits, plan to:

- Train during the cooler morning hours.
- Serve heavy meals in the evening rather than at noon.

OBTAIN AND USE HEAT CONDITION

Obtain heat condition information per your unit SOP. Heat condition may be reported as:

- Category: I, II, III, IV, V.
- Wet bulb globe temperature index (WBGT).

Use heat condition information to determine required water intake and work/rest cycles.

CRITERIA		PMM	
HEAT CONDITION/ CATEGORY	WBGT INDEX °F	WATER INTAKE QUARTS/HOUR	WORK/REST CYCLE-MINUTES
1 *	78 ⁰ —81.9 ⁰	At least 1/2	Continuous
2	82 ⁰ —84.9 ⁰	At least 1/2	50/10
3	85 ⁰ —87.9 ⁰	At least 1	45/15
4	88 ⁰ —89.9 ⁰	At least 1 1/2	30/30
5 **	90 ⁰ & above	More than 2	20/40

* MOPP gear or body armor adds at least 10⁰F to the WBGT Index.

** Suspend physical training and strenuous activity. If operational (non-training) mission requires strenuous activity, enforce water intake to minimize expected heat injuries.

NOTE

“Rest” means minimal physical activity. Rest should be accomplished in the shade if possible. Any activity requiring only minimal physical activity can be performed during “rest” periods. EXAMPLES: Training by lecture or demonstration, minor maintenance procedures on vehicles or weaponns, personal hygiene activities, such as skin and foot care.

ENFORCE INDIVIDUAL PREVENTIVE MEDICINE MEASURES



Leaders must enforce water intake:

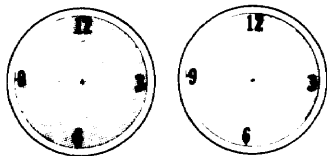
Observe soldiers drinking required amounts. Encourage frequent drinking of water in small amounts.

Provide cool water, if desired you can add citrus fruit flavoring after disinfection to enhance consumption.

Enforce water drinking before starting any hard work or mission (in the morning, with/after meals).

Frequently, check soldiers canteens for water.

Reduce heat injuries by—



- Enforcing work/rest cycles when the mission permits. Work/rest in the shade, if possible.
- Encouraging soldiers to eat all meals for needed salt.
- Adjusting work load to size of individuals.

Leaders must be prepared for heat casualties and decreased performance when water and work/rest cycle recommendations cannot be met.

RECOGNIZE RISKS OF MOPP/BODY ARMOR/ARMORED VEHICLES

MOPP and body armor adds 10° to the measured WBGT.

EXAMPLE: Soldier training in MOPP. WBGT temperature = 79° .

$79^{\circ} + 10^{\circ} = 89^{\circ}$ = Heat category 4.

ACTION—Enforce at least 1-1/2 quarts water intake/hour and 30 minute work/30 minute rest cycle.

Armored vehicles. Individuals in armored vehicles can be exposed to increased heat stress.

ACTION—Enforce increased water intake.

MODIFY WEAR OF THE UNIFORM

Direct/authorize soldier to—

Keep skin covered in sun.

Keep uniform loose at neck, wrists, and lower legs (unblouse pants).

NOTE

If the medical threat from biting insects is high, keep sleeves rolled down and pants bloused in boots.

IDENTIFY SPECIAL CONSIDERATIONS

Identify and modify training/physical activity for soldiers with high risk conditions of heat injuries such as—

- Diseases/injuries, especially fevers, vomiting/diarrhea, heat rash/sunburn.
- Recent (within 24 hours) use of alcohol.

- Overweight/unfit.
- Over 40 years old.
- Fatigue/lack of sleep.
- Taking medication (especially for high blood pressure, colds, or diarrhea).
- Previous heat stroke/severe heat exhaustion.
- Lack of recent experience in a hot environment.

Section II. Cold Injuries

PLAN FOR THE COLD

Use your field sanitation team to train individuals and their leaders in PMM against cold.

Obtain weather forecast for time/area of training/mission.

Ensure the following are available as the tactical situation permits:

- Covered vehicles for troop transport, if tactical situation permits.
- Cold weather clothing.
- Laundry services.
- Warming tents/areas.
- Hot rations/hot beverages.
- Drinking water.

Inspect soldiers (before starting training/mission):

- While wearing their cold weather gear to ensure availability, proper fit and wear.
- To ensure each soldier has at least five pairs of socks.

Frequently rotate guards or other soldiers performing inactive duties.

Ensure trained medical support is available for treatment of possible cold weather injuries.

DETERMINE AND USE WINDCHILL FACTOR

Obtain temperature and wind speed information as directed by your unit SOP (From G-2/G-3, S-2/S-3; weather, aviation, or field artillery unit; or from unit or division surgeon).

Calculate windchill from chart below:

Estimated	Actual Temperature Reading (°F)											
Wind Speed	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
(in mph)	Equivalent Chill Temperature (°F)											
calm	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
5	48	37	27	16	6	5	-15	-26	-36	-47	-57	-68
10	40	28	16	4	-9	-24	-33	-46	-58	-70	-83	-95
15	36	22	9	-5	-18	-32	-45	-58	-72	-85	-99	-112
20	32	18	4	10	-25	-39	-53	-67	-82	-96	-110	-121
25	30	16	0	-15	-29	-44	-59	-74	-88	-104	-118	-133
30	28	13	-2	-18	-33	-48	-63	-79	-94	-109	-125	-140
35	27	11	-4	-20	-35	-51	-67	-82	-98	-113	-129	-145
40	26	10	-6	-21	-37	-53	-69	-85	-100	-116	-132	-148
(Wind speeds greater than 40 mph have little additional effect.) LITTLE DANGER in less than one hour with dry skin. Maximum danger of false sense of security. INCREASING DANGER Danger from freezing of exposed flesh within one minute. GREAT DANGER Flesh may freeze within 30 seconds.												
NOTE: 1. Trench foot and immersion foot may occur at any point on this chart. 2. $F = 9.5 C + 32$												

Then use the following guidance to apply PMM:

WINDCHILL

PREVENTIVE MEDICINE MEASURES

30°F and below

Alert personnel to the potential for cold injuries.

25°F and below

Leaders inspect personnel for wear of cold weather clothing.

Provide warm-up tents/areas/hot beverages.

0°F and below

Leaders inspect personnel for cold injuries.

Increase the frequency of guards rotation to warming areas. Discourage smoking.

-10°F and below

Initiate the buddy system—have personnel check each other for cold injuries.

-20°F and below

Modify or curtail all but mission essential field operations.

The windchill index gives the equivalent temperature of the cooling power of wind on exposed flesh.

- Any movement of air has the same effect as wind—running, riding in open vehicles, or helicopter downwash.
- Any dry clothing (mittens, scarves, masks) or material which reduces wind exposure will help protect the covered area.

Trench foot injuries can occur at any point on the windchill chart and—

- Are much more likely to occur than frostbite at “LITTLE DANGER” windchill temperatures, especially on extended exercises/missions and/or in wet environments.
- Can lead to permanent disability just like frostbite.

IDENTIFY SPECIAL CONSIDERATIONS

Identify soldiers with conditions that place them at high risk of cold injuries, such as—

- Previous trench foot or frostbite.

- Fatigue.
- Use of alcohol.
- Significant injuries.
- Poor nutrition.
- Use of medications which cause drowsiness.
- Little previous experience in cold weather.
- Immobilized or subject to greatly reduced activity.
- Use of tobacco products.

Identify the special hazards of carbon monoxide poisoning and fire that may affect your cold weather operations.

ENFORCE INDIVIDUAL PREVENTIVE MEDICINE MEASURES

Ensure soldiers wear clean and dry uniforms in loose layers.

Ensure soldiers remove outer layer(s) before starting hard work or when in heated areas (before sweating).

Have soldiers inspect their socks and feet at least daily when operating in cold and/or wet environments.

Ensure soldiers:

- Wash feet daily.
- Wear clean and dry socks.
- Use warming areas when available.
- Eat all meals.
- Drink plenty of water and/or nonalcoholic fluids.
- Exercise their big muscles or at least their toes, feet, fingers, and hands to keep warm.

Ensure water consumption is adequate. Fluid intake is often neglected in cold weather.

Institute the buddy system in cold weather operations. Soldiers taking care of each other decrease cold injuries and combat stress.

Section III. Arthropods and Other Animals of Medical Importance

PLAN FOR THE ARTHROPOD AND OTHER ANIMAL THREAT

Obtain information on biting and stinging arthropods and other animals (such as snakes, domestic, and wild animals or birds) which could be a threat:

- Through unit medical channels from the command preventive medicine representative or
- From the medical annex to operations plan/order.

Use your field sanitation team to:

- Train your soldiers in preventive medicine measures.
- Control insects and other medically important arthropods in your area of operations.

Ensure the following are available and can be replenished:

- Field sanitation supplies and equipment.

Remind soldiers to avoid handling insects, arthropods, snakes and other animals to prevent bites or other injury.

Do not permit personnel to eat in sleeping/work areas; prevent attracting insects.

Do not permit “pets” in the sleeping/work areas unless cleared by veterinary personnel. Live animal mascots should not be kept or maintained unless cleared by veterinary personnel.

Ensure that:

- Each soldier has a bednet in good repair.
- Immunizations are current.
- Laundry and bathing facilities are available.

Request assistance from a preventive medicine unit (through medical or command channels) when control of biting insects is beyond the capabilities of your unit.

ENFORCE INDIVIDUAL PREVENTIVE MEDICINE MEASURES

Ensure each soldier has insect repellent and uses it. However, cooks must not use repellent on their hands when preparing or serving food.

Direct soldiers to keep:

- Shirts buttoned.
- Sleeves rolled down.
- Pants bloused inside boots.

Ensure soldiers:

- Bathe/shower regularly (field expedients will do).
- Discontinue the use of after-shave lotions and colognes; they attract insects.
- Have clean uniforms.
- Use bednets and aerosol insect spray bombs.

Observe soldiers taking malaria pills (when prescribed by the medics).

Use your field sanitation team to identify suspected lice infestations and refer for medical treatment.

MINIMIZE EXPOSURE TO INJURIOUS ANIMALS

If the mission permits:

- Use your FST to assist you in selecting bivouac sites.
- Occupy areas distant from breeding areas such as bodies of water.
- Avoid areas with high grass or dense vegetation.
- Use field sanitation team recommendations and assistance in applying pesticides for area control around living areas and in permanent standing water areas.
- Drain or fill in temporary standing water sites in occupied area (empty cans, used tires, or wheel ruts after rains).
- Clear vegetation from around occupied area.

Maintain area sanitation:

- Rats and mice carry fleas. Exclude rodents from your area of operation by burying all waste, protecting food supplies, and policing the area regularly.
- Good sanitation practices also reduce filth fly populations.

NOTE

See Appendix A for performance of tasks relating to preventive medicine measures against arthropods.

Section IV: Poisonous Plants and Toxic Fruits

Obtain information on the poisonous plants and toxic fruits which could be a threat:

- Through unit medical channels from the command preventive medicine representative or
- From the medical annex to operations plan/order.

Use your field sanitation team to:

- Train your soldiers in preventive medicine measures.
- Demonstrate the kinds of dangerous plants and fruits in the unit area.

Enforce individual preventive medicine measures:

- Proper wearing of the uniform.
- Avoidance of poisonous plants where possible.
- Avoidance of the consumption of potentially dangerous vegetation and fruits.
- Avoidance of putting grasses and twigs in the mouth.

Section V. Food/Waterborne Disease/Illness

PLAN FOR SAFE WATER

Know the location of approved water distribution points.

Make sure your unit has inadequate supply of:

- Iodine water purification tablets (1 bottle for each individual).
- Chlorination kits.
- Bulk chlorine.

Inspect water containers before use.

Check the chlorine residual of water supplies before drinking, and at least daily thereafter.

PLAN FOR SAFE FOOD

Ensure food service personnel maintain foods at safe temperatures.

Inspect food service personnel daily and refer for medical evaluation those with illness and/or skin infections.

Make sure foods, drinks, and ice purchased from civilian vendors are approved by command medical authority.

Supervise the use of the mess kit laundry.

Ensure food service personnel and soldiers use handwashing devices.

Ensure all food waste is buried or burned daily (at least 30 yards from food preparation area and water source).

PLAN FOR THE CONSTRUCTION AND MAINTENANCE OF FIELD SANITATION DEVICES

Select locations for field latrines:

- As far from food operations as possible (100 yards or more). Downwind and on down slope if possible.
- Down slope from wells, springs, streams and other water sources (30 yards or more).

Construct and maintain latrines (See Task 7, Appendix A, for requirements):

- As soon as the unit moves into a new area, detail soldiers to dig latrines.
- Detail soldiers to clean latrines daily.
- Instruct the field sanitation team to spray the latrines with insecticide as necessary (not the pit contents).
- Always provide handwashing facilities at the latrines.

Make use of handwashing devices at latrines mandatory.

- Cover, burn, or bury waste daily.

Use the Field Sanitation Team to Train Soldiers and Unit Leaders
in PMM Against Food/Water/Wasteborne Diseases

NOTE

See Appendix A for performance of tasks relating to PMM against food/water/wasteborne diseases.

Section VI. Personal Hygiene, Physical, and Mental Fitness

KEEP YOUR UNIT PHYSICALLY FIT

Ensure that leaders at all levels recognize the benefits of physical fitness.

The leader must be a role model, leading by example.

Take a positive approach to physical fitness with soldiers.

A physically fit soldier is less likely to be a combat loss from disease or injury.

NOTE

See FM 21-20, physical readiness training, for more information.

PLAN FOR PERSONAL HYGIENE

Provide showers/bathing facilities in the field. All personnel must bathe at least once a week and have a clean change of clothing to reduce the health hazard associated with body lice.

Inspect soldiers' personal field equipment to—

- Ensure they have sufficient personal hygiene supplies to include:

Soap, washcloths, towels, toothbrush, dental floss, tooth paste. Additionally, males should have a razor and razor blades; females should have sanitary napkins or tampons.

- Ensure undergarments are cotton (not silk, nylon or polyester).
- Ensure uniforms fit properly (not tight).

Use your field sanitation team to train your soldiers in personal hygiene.

Ensure soldiers receive annual dental examinations. If treatment is required, make sure appointments are kept.

ENFORCE SLEEP DISCIPLINE

The mission, unit readiness, and individual security must come first, but never miss a chance to give someone in the unit time to sleep.

When feasible, set work/rest shifts to give everyone 6-9 hours of sleep per 24 hours.

During “continuous operations,” set shifts and rotate jobs to allow everyone at least 3-4 hours uninterrupted sleep per 24-hour period.

During brief (up to 48 hours) sustained operations when shifts are impossible, rotate jobs so all individuals catnap as safely and comfortably as possible. The loss of sleep will reduce the soldier’s ability to perform his duties and leader’s ability to make decisions.

NOTE

Ensure that sleeping individuals observe safety precautions. Use ground guides for vehicles in bivouac areas.

ENFORCE PREVENTIVE MEDICINE MEASURES FOR THE EFFECTS OF SLEEP LOSS

Those with the more complex mental or decision-making jobs need the most sleep—this means you and your most critical junior leaders and operators!

Cross train individuals to perform the critical tasks and delegate limited authority among leaders to enable all to get necessary rest.

Know, practice, and teach the individual techniques for counteracting the effects of sleep loss on performance.

SHOW YOUR PERSONNEL THAT YOU CARE ABOUT THEIR WELFARE, SAFETY, AND HEALTH

Ensure the best and safest water, food, equipment, shelter, sanitation, and sleep possible are provided under the circumstances of the mission.

Educate the soldiers to maintain themselves, each other, and their equipment as a matter of professional pride and personal caring, not just as discipline.

Know the personal backgrounds, as well as the military skills of your soldiers. Chat with them informally about themselves. Be attentive and understanding while listening to soldiers.

Mobilize group support or counsel on available social service resources for soldiers with "home front" problems.

Assign jobs to maintain a balance between having qualified people at key positions while sharing the load, hardship, and risks fairly.

Share the discomforts and risks with your soldiers. Seek out challenging and difficult environments in training to increase your own and the unit's coping skills and confidence.

REDUCE UNCERTAINTY BY KEEPING EVERYONE INFORMED FOR THE UNEXPECTED

Brief unit personnel on the overall situation, objectives, and conditions which the mission or environment may involve.

Explain reasons for hardships, delays, and changes.

Don't give false reassurances. Prepare your soldiers for the worst and put any unexpected challenges or reversals in a positive perspective.

Deal with rumors firmly and honestly. Prevent the spread of rumors.

Make contingency plans and follow SOPs to reduce the harmful effects of surprise.

PROMOTE COHESION WITHIN THE UNIT

Use equipment drills, physical fitness exercises, team sports, and field "stress training" to stimulate mutual reliance and closeness.

Bring unit members together for meals, award ceremonies, and other special occasions.

Encourage unit-centered social interaction outside duty hours, but supervise to discourage fraternization and alcohol or drug abuse.

Integrate new members by assigning sponsors and ensuring rapid familiarization.

IMPART UNIT PRIDE

Educate soldiers in the history and tradition of the small unit, its parent units, the branch of service and the Army.

Honor the historical examples of initiative, endurance, and resilience, of overcoming heavy odds, and of self-sacrifice.

Section VII. Noise

PLAN FOR NOISE

Identify existing noise in your unit. If necessary, request preventive medicine assistance in identifying sources.

Ensure all soldiers are medically fitted for hearing protectors and are issued multiple sets.

Control noise sources—

- Isolate by distance, that is keep troops away from all noise if possible.

- Isolate by barrier, for example use sandbags.
- Use organic equipment controls, for example keep mufflers and engine covers in good repair.

Train unit to do mission while wearing hearing protectors.

ENFORCE INDIVIDUAL MEASURES

Ensure soldiers–

- Wear earplugs.
- Do not remove inserts from aircraft or tracked vehicle helmets.
- Avoid unnecessary exposure.
- Limit necessary exposure to short, infrequent mission essential times.
- Clean their hearing protectors.

PROTECT MISSION

Be aware of short-term noise effects on the soldier's ability to hear combat significant noise.

Man listening/observation post with troops least affected by noise.

When noise unaffected soldiers are not available, augment LP/OP with night vision devices and/or increase the number of audible alarms around your position.

Section VIII. Toxic Chemicals NonNBC

PLAN FOR CHEMICALS

Identify sources of toxic chemicals in your unit. If necessary, request preventive medicine assistance in identifying sources.

Obtain safer chemicals for unit operations, if available.

ENFORCE INDIVIDUAL PREVENTIVE MEDICINE MEASURES

Ensure that soldiers—

- Tune engines outside or vent engine exhaust to outside.
- Keep their sleeping quarters ventilated.
- Do not use vehicle engines as heaters.
- Use/maintain onboard ventilation systems.
- Are trained and drilled to self-protect themselves around hydrogen chloride.
- Maintain bore/gun gas evacuation systems.
- Use “Safety” Stoddard solvent.
- Have adequate clean gloves, coveralls, and other protective gear.
- Follow label instructions on chemical containers.

CHAPTER 4

UNIT FIELD SANITATION TEAM

FIELD SANITATION TEAM CONCEPT

During the latter part of WWII it became apparent that more “firepower” was needed at the unit level to counter the medical threat. (Remember Togatabu Island and the jungles of Burma?) To answer this need the field sanitation team (FST) concept was developed.

Selected members from each company-sized unit were designated to receive special training in DNBI prevention so they could advise the commander in PMM for DNBI. This training enabled the unit commander to provide for control of insects, proper disinfection of water, and safe food supplies. As a result of using field sanitation teams, commanders were able to reduce losses due to DNBI.

FIELD SANITATION TEAM TASKS

Today's unit field sanitation teams serves as advisors to the commander concerning those PMM that should be taken by individuals and the unit to prevent DNBI. To properly assess the medical threat (disease/illness risk) the team members must be able to perform several tasks, to include:

- Inspect water containers and trailers. *
- Disinfect unit water supplies. *
- Check unit water supply for chlorine. *
- Inspect unit field food operations. *
- Inspect unit waste disposal operations. *
- Control arthropods and other animals in unit area. *
- Train unit personnel in use of individual PMM. *
- Monitor status of PMM in unit. *

- Assist in selection of bivouac site.
- Supervise the construction of all field sanitation devices.

SELECTION OF PERSONNEL

Selection of personnel for the unit field sanitation team should be based on the following:

- Units having organic medical personnel, such as company aidmen, **WILL** use them as the field sanitation team.
- The team members should be personnel whose normal field duties will allow them to devote sufficient time to field sanitation activities.
- Each individual selected should have at least 6 months of duty remaining with the unit on the date of appointment.
- At least one member must be an NCO when organic medical personnel are not available.

SCOPE OF FIELD SANITATION TEAM OPERATIONS

Conducts control operations in the field and within the unit areas in garrison as directed by the commander. The field sanitation team is in a training status under normal garrison conditions. During mobilization the field sanitation team will perform sanitation duties.

Ensures that unit leaders are supervising the disinfection of unit water supply. Instructs the troops in methods of individual water purification.

Assists the commander by inspecting food service operations.

Monitors the construction of garbage and soakage pits and inspections for proper disposal of waste.

Monitors the construction of field latrines and urinals, and inspects for proper sanitation.

Provides prime time training in the use of individual PMM.

Applies pesticides as required/necessary for the control of arthropods.



TRAINING

Members of the field sanitation team are required to receive training in basic sanitation techniques, disease control, and individual PMM, to include—

- Use of insect repellents, uniform impregnants, and protective clothing.
- Use and repair of screening and bednets.
- Use of residual and space insecticide sprays.
- Rodent control measures.
- Food service sanitation.
- Unit waste disposal.
- Water purification procedures, to include determination of chlorine residual.
- Personal hygiene.
- Heat/cold injury prevention to include WBGT determination and use of the windchill chart.

- Other subjects as they relate to the medical threat in the unit's area of operation.

HOW TO MAKE YOUR FIELD SANITATION TEAM THE BEST IN THE BATTALION

Select soldiers you know and can rely on.

After they're trained use them during:

- ARTEP's
- FTX's
- Prime time training on PMM.
- Predeployment training on the medical threat in the area of operation.

NOTE

Do not let your field sanitation team be just another IG requirement. Make it an asset you can use. Your FST has a critical role and can assist you in protecting the health of unit personnel.

APPENDIX A

UNIT LEVEL PREVENTIVE MEDICINE MEASURES TASKS

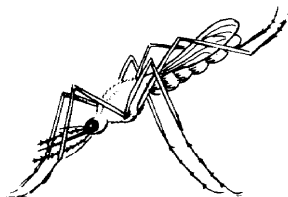
TASK 1: Control biting insects.

EQUIPMENT NEEDED: 2-gallon sprayer, ready to use insecticide. Rodent traps and individual repellent.

STEPS OF PERFORMANCE:

MOSQUITOES:

STEP 1: Identify common mosquito breeding areas:
Standing water.
Artificial water containers.



STEP 2:

Control:

If possible drain standing water.

Empty artificial water containers.

Spray, using 2-gallon sprayer (see Task 2).



FLEAS:

STEP 1:

Identify rodent infestations in unit area (rodents carry fleas).

STEP 2: Control:

Have soldiers in unit use individual insect repellent.

Apply insecticide dust to rodent burrows and harborage.

Use traps to catch rodents in infested areas.

LICE:

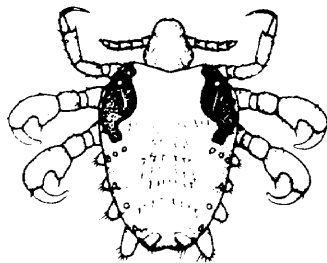
STEP 1:

Identify lice infestation:

Head Lice—normally attached to the hair close to the scalp. Eggs are attached directly to the hairs.

Crab Lice—usually associated with the pubic area (groin), but can also be found attached to body hairs. The eggs are attached directly to the hair.

Body Lice—generally found in the seams of clothing of infested persons. The eggs are attached on the fibers of the



garments. The body louse tends to move to the body of the host only during the actual feeding process.

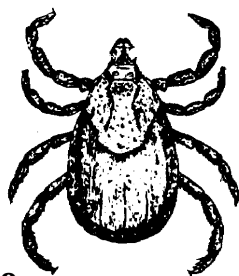
STEP 2:

Control:

Refer individuals with lice infestation for medical treatment.

Enforce high standards of personal hygiene.

Require frequent laundering of bedding and clothing.



TICKS AND MITES:

STEP 1:

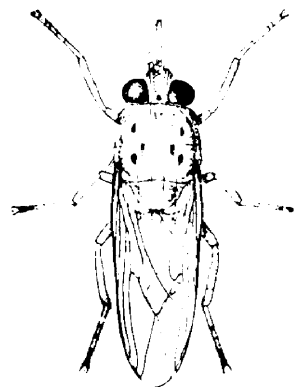
Identify tick infested areas.

STEP 2:

Control:

Enforce individual use of insect repellent.

Spray, using 2-gallon sprayer (see Task 2).



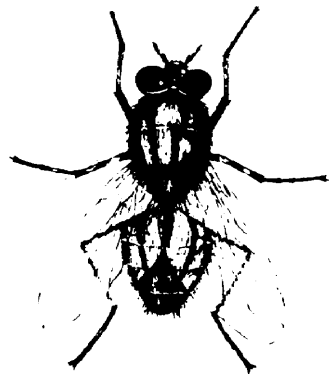
BITING FLIES:

STEP 1:

Identify problems with biting flies.

STEP 2:

Control: Enforce individual use of insect repellent.



NONBITING FLIES:

STEP 1:

Identify infestations and breeding areas, such as:

Open latrines.

Uncovered food and waste.

STEP 2:

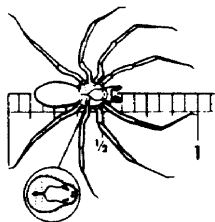
Control:

Frequently cover latrine waste.

Keep food and waste covered.

Use aerosol spray in enclosed areas (be sure not to use in food service operations).

Use 2-gallon sprayer to spray resting sites (see Task 2).



SPIDERS:

STEP 1:

Identify infestations of medically important spiders.

STEP 2:

Control:

Spray using the 2-gallon sprayer (See Task 2)

around tents, field latrines, or other spider habitats.

SCORPIONS:

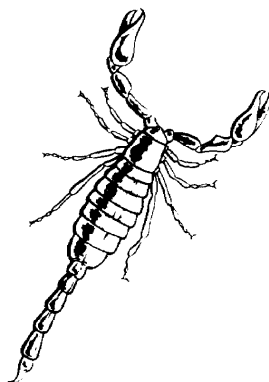
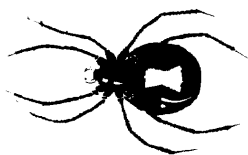
STEP 1:

Identify places where scorpions are a problem.

STEP 2:

Control:

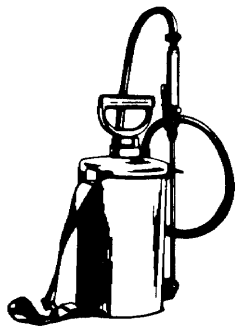
Spray using the 2-gallon sprayer (See Task 2) around the entire tent, or other structure, forming a band 2 feet high from the ground level. Saturate all cracks and crevices with insecticide.



BEEES, WASPS, AND ANTS:

STEP 1:

Identify places where these insects are a problem. Locate the nests.



STEP 2:

Control:

Spray using the 2-gallon sprayer (See Task 2) on the nesting sites. Use caution to avoid stings from disturbed insects. If the task is too great or too dangerous, contact preventive medicine personnel for assistance.

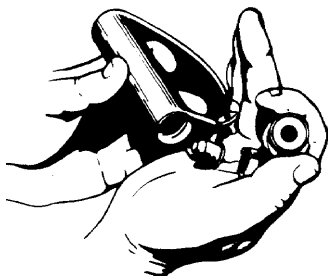
TASK 2: Using the 2-gallon sprayer.

EQUIPMENT NEEDED: 2-gallon sprayer and authorized insecticide.

STEPS OF PERFORMANCE:

STEP 1: Determine the job to be done.

STEP 2: Select correct nozzle.



STEP 3: Read the insecticide label.

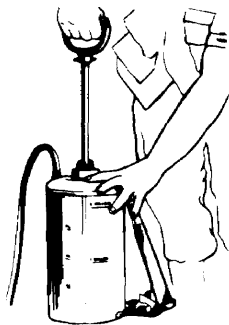
Always read the label before doing anything. Always follow all instructions on the label.

CAUTION

Wear gloves and an approved pesticide mask. The NBC protective mask is not for use when applying pesticides.

Avoid skin contact with insecticide.

STEP 4: Put insecticide in sprayer. Do not fill the sprayer to the top. Leave space to allow for pumping air pressure into the tank.



STEP 5:

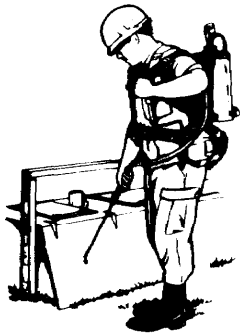
Pump the sprayer.

Put in pump assembly and pump 30-35 times to achieve 40-60 pounds PSI pressure or until there is a slight resistance. Do not over pump.

STEP 6:

Spray insecticide.

Point nozzle at area to be sprayed and squeeze the handle on the wand. Continue spraying until area is covered or pesticide runs out.



STEP 7:

Clean the sprayer

Clean after spraying with soap and water, then flush tank 3 times with clear water.

Rinse all parts in clear water.

Reassemble and spray clear water through nozzle. If the sprayer is not cleaned after use, vital parts will corrode.

STEP 8:

Store cleaned sprayer.

Turn the sprayer upside down with pump assembly separated to keep tank dry.

CAUTION

Always wash your hands after spraying.

TASK 3: Inspect unit food service operations.

EQUIPMENT NEEDED: Thermometer, bimetallic,
NSN 6685-00-444-6500.

BACKGROUND INFORMATION:

Some foods support the rapid growth of disease germs that cause diarrhea; these foods are called:

POTENTIALLY HAZARDOUS FOODS

Examples of potentially hazardous foods include but are not limited to: Meats, fish, milk, creamed beef, gravies, soups and chicken. Extra care and precautions must be taken with these potentially hazardous foods.

Five factors most often involved in outbreaks of diarrhea caused by contaminated foods are:

Failure to keep potentially hazardous food cold (below 45°F), or hot (above 140°F).

Allowing potentially hazardous foods to remain at warm temperatures (46°F to 139°F).
Preparing foods 3 hours to a day or more before being served.

Allowing sick employees to work.
Poor personal hygiene or sanitation practices of food handlers.
Example: not washing hands after using the latrine.

STEPS OF PERFORMANCE:

IN GARRISON OR FIXED FACILITIES:

STEP 1: Have the supervisor check the temperature of potentially hazardous foods.

If hot—food should be 140°F or above.

If cold—food should be
45°F or below.

STEP 2: Check personnel for illness and skin infection.

STEP 3: Check food handling techniques and personal hygiene.

STEP 4: Have the supervisor check the food temperature in cold storage units.

STEP 5: Check handwashing facilities—are they being used by food handlers?

STEP 6: Check doors and windows—are they closed or screened to prevent flies from entering?

NOTE

See FM 10-23 for the correct operating procedures for a field kitchen facility (MKT-75) mobile field kitchen or (M-1948) kitchen tent.

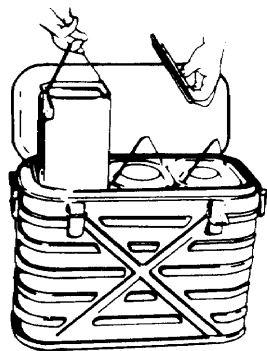
IN THE FIELD WHEN FOOD IS BROUGHT TO YOUR UNIT

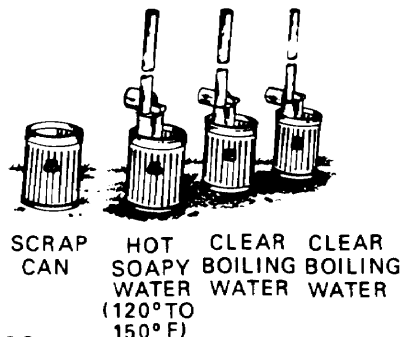
STEP 1:

Check the preparation of insulated containers.

For hot foods the container should be preheated by the use of boiling water. Foods should be placed in the container while they are hot (above 140°F).

For cold foods the container should be prechilled by the use of ice. Foods placed in the container should be cooler than 45°F. Always check the container and insert seals to ensure that they are intact and in good condition to aid in keeping food at its required temperature.





NOTE

See FM 8-34 and FM 10-23 for the correct procedures for preparing the insulated containers.

STEP 2:

When the insulated container arrives the supervisor must check the temperature before serving. Make sure it is 140°F or above for hot foods and 45°F or below for cold foods. If the temperatures are in the danger zone, contact the medical authority for instructions.

STEP 3:

Check for handwashing devices for use by soldiers.

STEP 4:

Check the mess kit laundry. Make sure soldiers are using the mess kit laundry correctly. The food waste is placed in a scrap can. Wash by using a

long handle brush to scrub the mess kit in warm soapy water (120°F to 150°F). Rinse the mess kit in clear boiling water. Disinfect the mess kit by immersing it in clear boiling water for 10 seconds. Each hot water setup of four cans will support 80 personnel.

NOTE

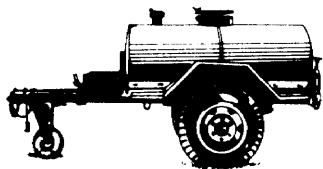
If immersion heaters are not in use, food service disinfectant may be used. Make sure the label directions are being followed. Each setup of four cans will support 100 personnel.

TASK 4: Inspect water containers.

EQUIPMENT NEEDED: None

WHEN TO INSPECT WATER CONTAINERS:

Quarterly in garrison when not being used.
Before filling at water distribution points.
Prior to deployment.



STEPS OF PERFORMANCE:

UNIT WATER TRAILER:

QUARTERLY:

STEP 1:

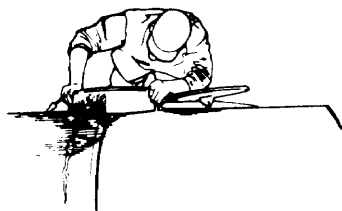
Manhole cover: Make sure the sealing gasket is in place, free of excessive cracks and dry rot. Cover should provide effective seal.

STEP 2:

Drain plug: Make sure it is operable—it should be removable without excessive effort.

STEP 3:

Interior: Check surface for excessive cracks; check for signs of being used for storage of products other than water such as oil products and gasoline. Rust stains and other discoloration caused by common natural chemicals in water (iron, manganese) pose no health problem.



STEP 4:

Spigots: Make sure spigots are clean and operable. Covers over spigots should open and close with ease. Spigot handles should operate freely.

NOTE

Questions concerning excessive interior cracks or chipping and use after storage of products other than water should be directed to preventive medicine. Refer to TM 9-2330-267-14 & P (maintenance circular for 400 gallon water trailer) for maintenance instructions.

**BEFORE FILLING AT WATER
DISTRIBUTION POINTS:**

STEP 1:

Check interior for gross contamination.

STEP 2:

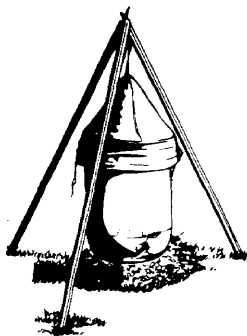
Check hose used to fill trailer. Water point fill hose should not come in contact with the ground. If the hose is lying on the ground, wash the end before use.

STEP 3:

After filling, check manhole cover and drain plug to ensure that they are secure.

CAUTION

Personnel detailed to fill water trailers must be directed to fill the trailers only at approved water points.



LYSTER BAGS:

STEP 1:

Interior: Check for dirt and other contamination; check for holes.

- STEP 2: Cover: Check to make sure it fits; Check for holes.
- STEP 3: Spigots: Make sure spigots are clean and in place.
- STEP 4: Location: Elevate Lyster bag sufficiently to prevent contamination of spigots by wildlife.

NOTE

Always clean the Lyster bag prior to its first use.

WATER CANS:

Check interior for contamination; if can has a fuel odor such as gasoline, do not use for drinking water.



TASK 5. Check unit water supply for chlorine residual.

EQUIPMENT NEEDED: Chlorination kit containing 3 color comparison tubes with color bands and bottle of chlorine test tablets.

Check the chlorine residual when:

Filling unit containers at water distribution points.

Water containers arrive in unit area.

Directed by command medical authority.

Treating a raw water supply.

STEPS OF PERFORMANCE:

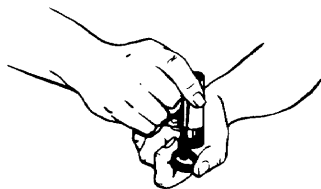
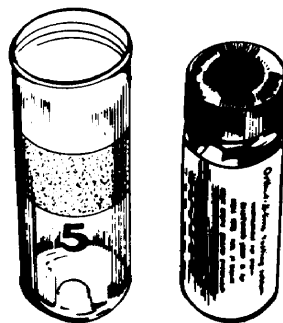
STEP 1: Determine the desired chlorine residual in parts-per-million (ppm).

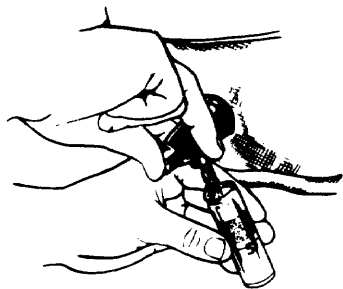
At the point of consumption, water obtained from an approved water distribution point should have at least 1 ppm chlorine residual.

When the unit must obtain water from a raw water supply, or from another source, such as a stream or pond, the finished product should have a 5 ppm chlorine residual after 30 minutes. Under certain conditions the local medical authority may direct a higher residual of 10 ppm.

STEP 2:

Select the desired color comparison tube (marked 1, 5, or 10) based on the desired chlorine residual from STEP 1.





STEP 3:

NOTE

The test tablets in all 3 color comparison tubes are the same. They can be used to test water in any of the tubes.



STEP 4:

Flush the spigots of the water container being checked and fill the tube to a point just below the bottom of the color band.

Place one test tablet in the color comparison tube cap and crush it with the top of the test tablet bottle. Put the crushed tablet into the color comparison tube.

STEP 5:

Place the cap on the color comparison tube and shake until the test tablet is completely dissolved.

STEP 6:

Compare the color shade of the water with the color band on the comparison tube.

The water is safe to use if the color of the water is the same shade or darker than the color band on the tube.

The water must be dechlorinated if the color is lighter than the color band on the tube (see TASK 6).

TASK 6: Chlorinate water supplies.

EQUIPMENT NEEDED: Chlorination Kit, 6 oz jar of calcium hypochlorite (70% chlorine) or container of 5% household bleach.

Chlorinate the water supply when:

Water supply has no chlorine residual.

Chlorine residual is below required level.

Raw (untreated) or unapproved water supply must be used.

STEPS OF PERFORMANCE:

STEP 1: Before adding chlorine, check the chlorine residual following procedures in TASK 5.

STEP 2: If the chlorine residual is less than the desired level, add enough chlorine to raise the residual to 5 ppm. Use the table below to determine the amount to add to untreated water. If a 10 ppm chlorine residual is required, double these amounts. To increase the residual in treated water, smaller quantities of chlorine will be needed.

**TABLE: AMOUNTS OF HTH AND BLEACH EQUIVALENT TO
A 5 ppm DOSE IN VARIOUS VOLUMES OF WATER**

VOLUME	AMPULES	HTH		5% BLEACH	
		MRE SPOON	MESSKIT SPOON	MRE SPOON	MESSKIT SPOON
5 gal	0.5			0.5	
10 gal	1.0			1.0	
20 gal	1.0			2.0	
32 gal	2.0			2.0	1.0
36 gal	2.0	0.5		3.0	1.0
50 gal	3.0	0.5		3.0	1.0
55 gal	3.0	0.5		4.0	1.0
100 gal	6.0	1.0		7.0	2.0
150 gal	8.0	1.0		10.0	3.0
160 gal	9.0	1.0		11.0	3.0
250 gal	14.0	2.0	0.5	17.0	5.0
400 gal	22.0	3.0	1.0	26.0	7.0
500 gal	27.0	3.0	1.0	33.0	9.0
1000 gal	54.0	7.0	2.0	66.0	18.0
3000 gal	162.0	20.0	6.0	196.0	54.0
5000 gal	270.0	33.0	10.0	327.0	90.0
10000 gal	541.0	66.0	20.0	653.0	180.0
20000 gal	1081.0	132.0	39.0	1305.0	360.0
50000 gal	2704.0	330.0	97.0	3263.0	901.0

- STEP 3: Wait 10 minutes, then check the chlorine residual.
- STEP 4: If the residual is less than 5 ppm, repeat steps 2 and 3 using a smaller amount of chlorine.
- STEP 5: If the residual is at least 5 ppm, wait an additional 20 minutes before drinking.

TASK 7: Construct and maintain field waste disposal devices.

EQUIPMENT NEEDED:

Material as required for type of facilities to be constructed.

Additionally, a detail will be required to construct the devices.

FIELD METHODS OF DISPOSAL THAT MAY BE USED:

Garbage/rubbish disposal.

Burial—Less than 1 week.

Incineration—Longer than a week.

Liquid kitchen or bathing waste disposal.

Grease trap.

Soakage pits.

Soakage trenches.

Evaporation beds.

Human waste disposal.

Cat-hole latrine for marches.

Straddle trench for 1-3 day bivouac sites.

Deep pit latrine for temporary camps.

Burn-out latrine or pail-latrine when the ground is too harder the water table is too high (soil is very wet).

Soakage pits for urinals at temporary camps:

Trough urinal.

Pipe urinal.

Urinoil.

STEPS OF PERFORMANCE:

STEP 1: Use the chart below to determine disposal requirements.

	Highly Mobile	Short Bivouac	Extended Bivouac
CAT-HOLE Cover with dirt after use.	◀		
STRADDLE TRENCH Enough for 4% of males and 6% of females. Cover with dirt after each use.		▶	
DEEP PIT Enough for 4% of males and 6% of females. Add urinals to protect seats.			▶
CHEMICAL TOILETS Use where devices are prohibited.		▶	▶
GARBAGE PIT Locate near dining facility, but not closer than 30 yards. One pit per 100 soldiers served per day. Cover with dirt after each meal, close daily.		▶	▶
SOAKAGE PIT (FOOD SVC) Locate near dining facility, alternate daily use. Fill with loose rocks. Add grease trap for dining facility waste.		▶	▶
SOAKAGE PIT (OTHER) Provide pit for urinals, shower, Lyster bag, or other locations where water collects.			▶
MESS KIT LAUNDRY Dig soakage pit to provide good drainage.		▶	▶
HANDWASHING DEVICES Dig shallow soakage pit. Collocate with latrine and Food Facilities.		▶	▶
SHOWERS Dig soakage pit.			▶
URINALS Trough			▶
105 Pipe			
Urinoil			

STEP 2: Select site of construction.

Garbage and soakage pits should be at least 30 yards from food service.

Latrine should be as far as possible from food service (100 yards or more is best).

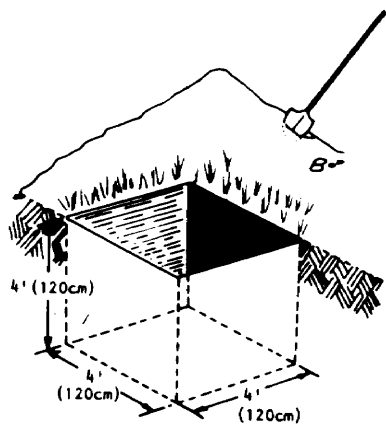
Latrine should be located on level ground. Never uphill from the campsite or water supplies.

STEP 3: Construct disposal facility.

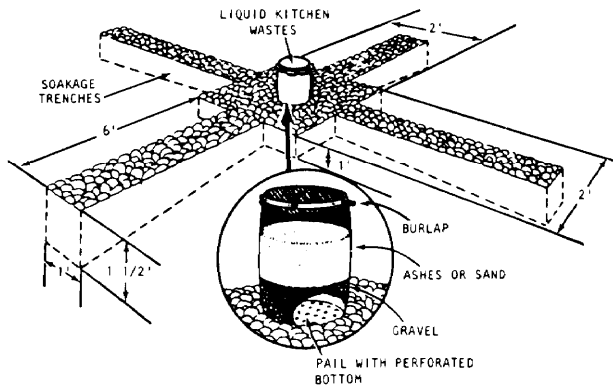
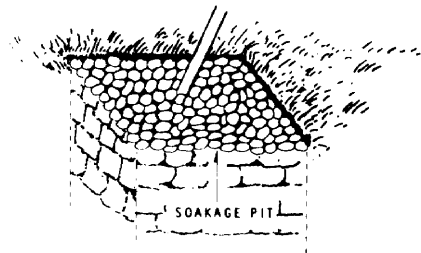
Garbage pit--Used to prevent accumulation of garbage in the unit area.

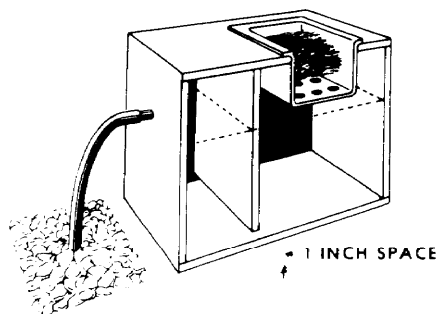
NOTE

Garbage and rubbish must be buried or burned. For short stays, bury and cover daily. For longer periods, garbage and rubbish may have to be burned; however, the ashes should be buried.

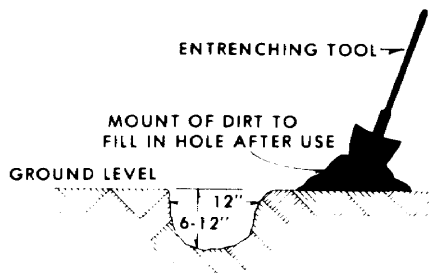


Soakage pit/trench--Used to prevent accumulation of liquid waste (water from showers, sinks, and field kitchens).



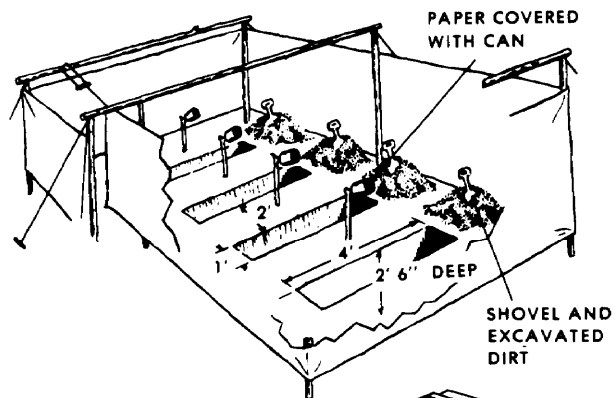


Grease trap--Used with both soakage pit and trench to prevent clogging of the soil.

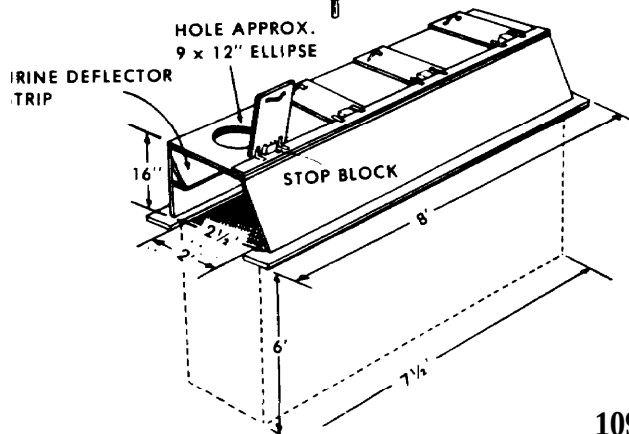


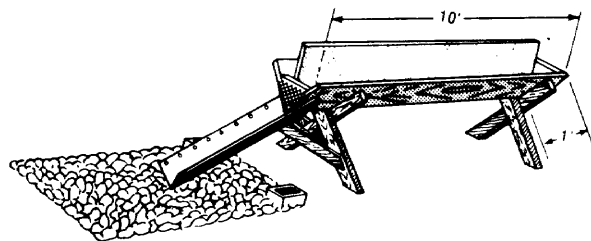
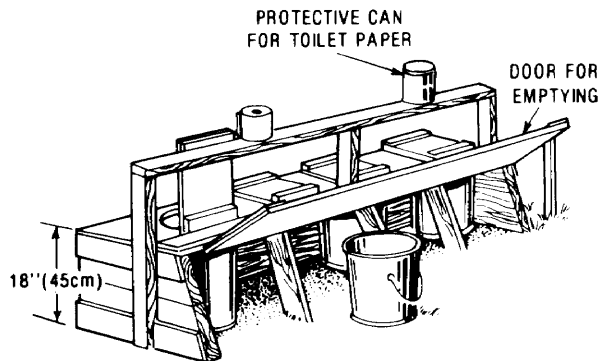
Cat-hole latrine--Used only on the march and covered immediately after use.

Straddle trench latrine--Used on short bivouacs and FTXs. Two trenches per 100 males and three trenches per 100 females.



Deep pit latrine--Used for longer periods of time and in build up areas. Collapsible 2-seat boxes are available in the supply system.





NOTE

If ground is too hard for digging, or if the water table is too high, use a pail-latrine or burn-out latrine.

Pail-latrine

Burn-out latrine

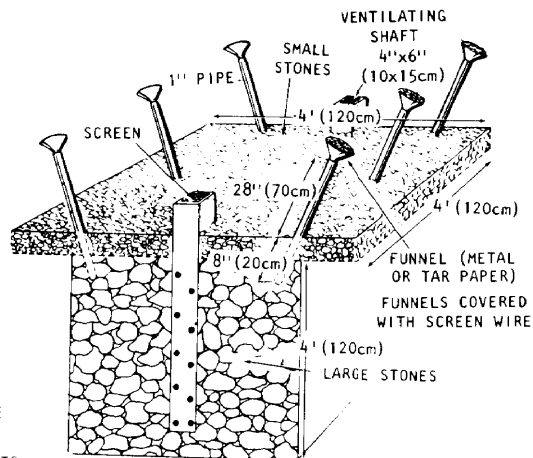
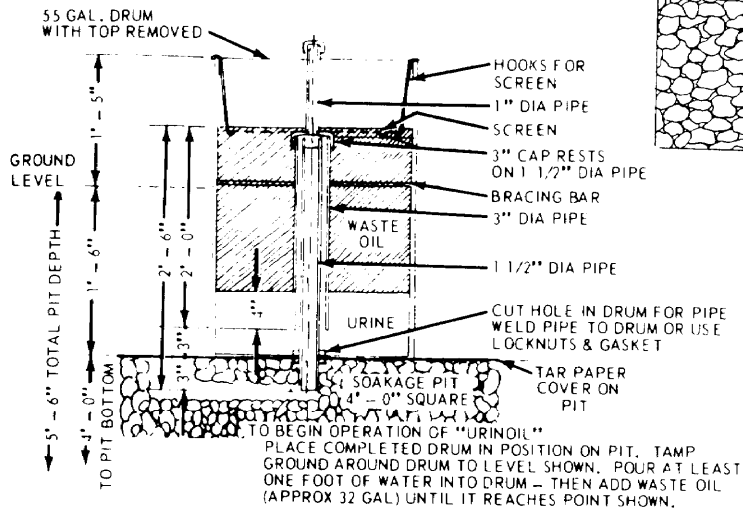
Chemical toilets--Use when local, state, or host nation laws prevent construction of standard field latrine.

Urinals--For male latrines, construct one of the following urinals:

Trough urinal

Pipe urinal

Urinoil



STEP 4: Inspect daily to make sure that the following is done:

Straddle trench latrines and garbage pits are covered with dirt daily.

Pail-latrines are emptied and cleaned daily.

Burn-out latrine containers are rotated and contents burned daily.

When flies or other insects are a problem the field sanitation team has sprayed the facilities with insecticide not the pit contents..

STEP 5:

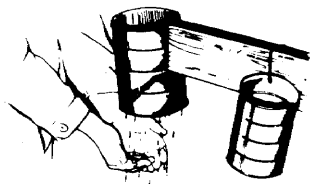
Closing: Close latrines and garbage pits when filled to within 1 foot of the ground surface. Have chemical toilet contents removed frequently.

Close out by--

Spraying with residual insecticide.

Packing earth in successive 3-inch layers until mounded 1 foot above ground level. Spraying again with residual insecticide.

Posting a sign stating, "Closed latrine/garbage pit, and date" (except in combat).



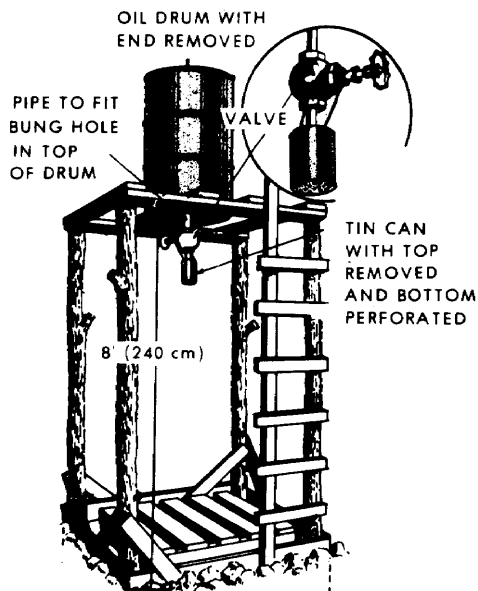
TASK 8: Construct and maintain field handwashing and shower devices.

EQUIPMENT NEEDED: Personnel detailed to construct and maintain field handwashing and shower devices. Material as required for type of facilities to be constructed.

STEPS OF PERFORMANCE:

STEP 1: Select device to be constructed:
Handwashing devices





Shower devices

STEP 2: Construct devices.

Collocate handwashing devices at food service and latrine locations.

NOTE

A soakage pit should be provided for all handwashing and shower facilities.

STEP 3: Maintain devices. A supply of soap and water must be available at all times.

STEP 4: Close devices.

GLOSSARY

DNBI	diseases and nonbattle injuries
FST	field sanitation team
FTX	field training exercise
HTH	calcium hypochlorite, 70% available chlorine
LP	listening post
MOPP	mission oriented protective posture
MRE	meal ready to eat
OP	observation post
PMM	preventive medicine measures
ppm	parts per million
psi	per square inch
STD	sexually transmitted disease
WBGT	wet bulb globe temperature index

REFERENCES

ARMY REGULATIONS (AR)

40-5	Preventive Medicine
40-562	Immunization Requirements and Procedures

FIELD MANUAL (FM)

8-33	Control of Communicable Diseases in Man, 14th Edition
8-34	Food Sanitation for the Super- visor
8-250	Preventive Medicine Specialist
10-23	Army Food Service Operations
10-52	Field Water Supply
10-52-1	Commander's Handbook for Water Usage in Desert Opera- tions

21-11	First Aid for Soldiers
21-15	Care and Use of Individual Clothing and Equipment
21-20	Physical Fitness Training

TECHNICAL BULLETIN (MEDICAL) (TBMED)

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114	Immunization
269	Carbon Monoxide: Symptoms, Etiology, Treatment and Prevention of Overexposure
507	Occupational and Environmental Health Prevention, Treatment, and Control of Heat Injury

530 Occupational and Environmental Health Food Service Sanitation

577 Sanitary Control and Surveillance of Field Water Supplies

TECHNICAL MANUAL (TM)

5-632 Military Entomology Operational Handbook 9-2330-267-14 & P Operator's, Organizational, Direct Support and General Support Maintenance Manual including repair parts and special tools list for trailer tank, potable water, 400 gallons, 1 1/2 ton, 2-wheel, M149 (NSN 2330-00-542-2039) M149A (NSN 2330-00-832-8801) and M625 (NSN 2330-00-782-6059)

GRAPHIC TRAINING AID (GTA)

8-6-12	Adverse Effects of Cold, Cause and Symptoms
8-5-45	Heat Injury Prevention and First Aid

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FM 21-10

22 NOVEMBER 1988

By Order of the Secretary of the Army:

CARL E. VUONO

*General, United States Army
Chief of Staff*

Official:

WILLIAM J. MEEHAN II

*Brigadier General, United States Army
The Adjutant General*

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