Army in Europe
Pamphlet 200-2

Environmental Quality

Contingency Operations Environmental Guide

Headquarters
United States Army, Europe, and Seventh Army
United States Army Installation Management Agency
Europe Region Office
Heidelberg, Germany

24 June 2005

FOREWORD

This pamphlet provides environmental standards for the U.S. Forces occupying base camps during contingency operations where USAREUR has been designated as having Title 10 responsibility.

This pamphlet explains U.S. Forces policy and responsibilities for managing environmental issues. This pamphlet will help deployed commanders, Soldiers, and other DOD personnel understand and comply with environmental standards and procedures during contingency operations. Site commanders should use the information in this pamphlet to monitor and measure performance and compliance with environmental standards.

Headquarters
United States Army, Europe, and Seventh Army
United States Army Installation Management Agency
Europe Region Office
Heidelberg, Germany

Army in Europe
Pamphlet 200-2

24 June 2005

Environmental Quality

Contingency Operations Environmental Guide

For the CG, USAREUR/7A:

E. PEARSON
Colonel, GS
Deputy Chief of Staff

Official:

GARY C. MILLER
Regional Chief Information
Officer - Europe

Summary. This pamphlet explains policy and responsibility for managing of environmental issues by U.S. Forces conducting contingency operations (CONOPS). This pamphlet also explains environmental standards for initial, temporary, and semipermanent deployments. Commanders should use the information in this pamphlet to monitor and measure performance and compliance with environmental standards.

Applicability. This pamphlet applies to U.S. Forces conducting CONOPS in a USAREUR area of responsibility (AOR).

Forms. AE and higher-level forms are available through the Army in Europe Publishing System (AEPUBS).

Records Management. Records created as a result of processes prescribed by this pamphlet must be identified, maintained, and disposed of according to AR 25-400-2. Record titles and descriptions are available on the Army Records Information Management System Web site at *https://www.arims.army.mil*.

Suggested Improvements. The proponent of this pamphlet is the Deputy Chief of Staff, Engineer (DCSENGR), USAREUR (AEAEN-EN, DSN 370-6488). Users may suggest improvements to this pamphlet by sending DA Form 2028 to the USAREUR DCSENGR (AEAEN-EN), Unit 29351, APO AE 09014-9351.

Distribution. C (AEPUBS).

CONTENTS

SECTION I
INTRODUCTION

1. PURPOSE

This pamphlet explains policy and responsibilities for managing environmental issues during contingency operations (CONOPS). This pamphlet provides environmental standards for CONOPS for initial, temporary, and semipermanent deployments. Commanders should use the information in this pamphlet to monitor and measure performance and compliance with environmental standards.

2. REFERENCES

a. AR 25-400-2, The Army Records Information Management System (ARIMS).

b. Base Camp Facilities Standards (commonly called the Red Book) (available through the Deputy Chief of Staff, Engineer (DCSENGR), USAREUR, Web site at *https://engrep.hqusareur.army.mil*).

c. Base Camp Closure Guide (available through the DCSENGR Web site at *https://engrep.hqusareur.army.mil*).

d. You Spill, You Dig (*https://www.denix.osd.mil/denix/Public/News/Army/Dig/cover.html*).

e. DA Form 2028, Recommended Changes to Publications and Blank Forms.

3. EXPLATATION OF ABBREVIATIONS AND TERMS
The glossary defines abbreviations and terms.

4. AUTHORITY
Operation orders (OPORDs) for applicable CONOPS and engineer annexes to OPORDs establish the rules for the mission. Annex L (Environmental Considerations) to applicable USEUCOM operation plans (OPLANs) will establish environmental considerations for CONOPS. This pamphlet provides environmental guidelines and procedures for U.S. Forces to use during CONOPS. Commanders at all levels will ensure environmental standards are met, and all activities and facilities comply with the requirements of this pamphlet. Requests for exceptions to the standards in this pamphlet must be sent through the DCSENGR to the DCG/CofS, USAREUR/7A, for approval.

SECTION II
ENVIRONMENTAL MATRIX

5. DURATION
Environmental facilities and standards in this pamphlet apply to three specific CONOPS durations (time expected to be on site) as defined in the Red Book (para 2b).

6. INITIAL
The “initial” phase is characterized by austere facilities requiring minimal engineer effort. Facilities at this phase are intended for immediate operational use by units from arrival for up to 6 months. These facilities may require replacement by more substantial or durable facilities during the course of the operation.

7. TEMPORARY
The “temporary” phase is characterized by austere facilities requiring additional engineer effort above that required for initial standard facilities. These facilities are intended to increase efficiency of operations for use up to 24 months to provide for sustained operations. These facilities will replace initial-phase facilities in cases where mission requirements dictate. The temporary standard may be used initially if so directed by the combatant commander. Temporary standards provide a wider selection of minimum facilities to increase the efficiency, safety, durability, morale, and health standards of personnel involved in the CONOPS.

8. SEMIPERMANENT
At this phase, facilities are designed and constructed with finishes, materials, and systems selected for moderate energy efficiency, maintenance, and life-cycle costs and with a life expectancy of more than 2 years, but less than 25 years.

SECTION III
ENVIRONMENT STANDARDS

9. CONOPS ENVIRONMENTAL MATRIX
Table 1 summarizes key environmental facilities and standards based on CONOPS construction standards. The glossary defines abbreviations used in the table.

10. SITE ENVIRONMENTAL DOCUMENTATION

a. CONOPS facility environmental documentation includes the following:

(1) Environmental baseline survey (EBS).

(2) Joint assessment/preliminary environmental assessment (JA/PEA).

(3) Environmental condition report (ECR).

(4) Spill reports and documentation of clean-up actions and an environmental closure report.

b. When possible, the EBS should be conducted before occupation or as soon as possible after occupation. An EBS is essential for establishing preoccupation environmental conditions for the protection of troop health and safety, and for establishing preexisting environmental conditions to protect U.S. interests from spurious claims at closure.

(1) An EBS is required as soon as practicable after a site has been identified for occupation for any extended period of time.

Table 1 **CONOPS Environmental Matrix**			
	Initial **(0 to 6 months)**	**Temporary** **(6 to 24 months)**	**Semipermanent** **(More than 24 months)**
Site Environmental Documentation	EBS, JA/PEA, ECR, environmental closure report	EBS, JA/PEA, ECR, environmental closure report	EBS, JA/PEA, ECR, environmental closure report
Potable Water Sources	Bottle, water points, wells, other potable water production, pressurized water distribution systems, ROWPU, force provider	Wells, treatment plants (purchase locally with DCSENGR approval)	Wells, treatment plants (purchase locally with approval DCSENGR)
Nonpotable Water Use	Dust control, wash racks, irrigation, toilets	Dust control, wash racks, irrigation, toilets, grease-trap cleaning	Dust control, wash racks, irrigation, toilets, grease-trap cleaning
Wastewater	Toilet: organic equipment, burn barrels, facultative lagoons, force provider; Graywater: facultative lagoons, municipal or camp WWTP	Toilet: AB units or SEAhuts to austere treatment facility Graywater: facultative lagoons, municipal or camp WWTP	Toilet: WWTP from SEAhuts or AB units, masonry prefabricated buildings Graywater: facultative lagoons, municipal or camp WWTP
Sewage Sludge	Not applicable	Contract off-site disposal, land apply, or compost if practical	Contract off-site disposal, land apply, or compost if practical
Grease Traps	Not applicable	Required for DFAC and gray water; dispose grease using anaerobic digester, contract off-site disposal, compost	Required for DFAC and gray water; dispose grease using anaerobic digester, contract off-site disposal or compost
Hazardous Waste	DLA, PCW treatment, oil blending	DLA, PCW and PCS treatment, oil blending	DLA, PCW and PCS treatment, oil blending
Spill-Response Planning	Unit SOP, SPCC, spill-response plan, equipment and reporting	Unit SOP, SPCC, spill-response plan, equipment and reporting	Unit SOP, SPCC, spill-response plan, equipment and reporting
Spill Cleanup	POL sheen field test, 2,000 ppm TPH (JP-8), 10 ppm (gasoline)	POL sheen field test, 2,000 ppm TPH (JP-8), 10 ppm (gasoline)	POL sheen field test, 2,000 ppm TPH (JP-8), 10 ppm (gasoline)
Petroleum-Contaminated Soil	Clean up using spill-cleanup standards above, then DLA contract off-site disposal	Clean up using spill-cleanup standards above, then DLA contract off-site disposal, land farm, or biopile	Clean up using spill-cleanup standards above, then DLA contract off-site disposal, land farm, or biopile
Petroleum-Contaminated Water	Sorbant treatment, DLA contract off-site disposal; limit emulsions	Sorbant treatment, DLA contract off-site disposal, OWS; limit emulsions	Sorbant treatment, DLA contract off-site disposal, OWS; limit emulsions
Infectious Waste	Contract off-site disposal, transport back to home station, two-stage incinerator	Contract off-site disposal, transport back to home station, two-stage incinerator	Contract off-site disposal, transport back to home station, two-stage incinerator
Natural Resources and Endangered Species	Obtain lists, survey base camps, limit impacts	Obtain lists, survey base camps, limit impacts	Obtain lists, survey base camps, limit impacts
Historic and Cultural Resources	Obtain lists, survey base camps, limit impacts	Obtain lists, survey base camps, limit impacts	Obtain lists, survey base camps, limit impacts

(2) Coordination with the commander's environmental management officer (EMO) during site selection will minimize future challenges. The EMO will confirm the existence of an EBS for all sites in the AOR.

(3) The site commander will ensure that copies of all EBSs are sent to the DCSENGR (AEAEN-ES) and the USAREUR Judge Advocate (JA) (AEAJA-CD).

(4) A comprehensive EBS must include the following:

(a) Observed spills or soil staining.

(b) Sanitary waste disposal.

(c) Water supply and discharge.

(d) Hazardous-waste collection and disposal.

(e) Underground and above-ground storage tanks.

(f) Drums and containers of hazardous materials.

(g) Other items of significance to existing baseline conditions.

(5) The EBS will be conducted by the EMO, engineer representative, or as contracted by the commander.

c. The JA/PEA must be conducted when it is known that a site will close. The JA/PEA is the first formal environmental closure action for a site. When it is known that a site will close, the EMO and the task force surgeon will conduct a joint assessment to determine any known imminent and substantial endangerments (KISE) to human health and safety because of environmental contamination caused by DOD operations and located on or emanating from a site (such as unexploded ordnance (UXO), stockpiled munitions, containers of hazardous waste). KISE must be reported to the appropriate site commander for action. The site commander will ensure that copies of all JA/PEAs are sent to the DCSENGR (AEAEN-ES).

d. An ECR must be completed after any KISE has been identified or eliminated and before site closure.

(1) The EMO will prepare an ECR for the property. The ECR must be signed by the site commander.

(2) ECRs must include the following:

(a) A description of the property with background and historical perspective.

(b) A list of all reported spills on the property since U.S. Forces first occupied the property.

(c) Maps, drawings, and diagrams that show the location of structures and activities that affect the environment.

(d) A summary of the environmental condition of the property (including significant incidents and any KISE).

(e) A commander's finding and determination statement, which must include any environmental actions or projects that must continue after transfer of the base camp area because of KISE.

(3) After careful consultation with appropriate staff personnel and approval by the CG, USAREUR/7A, the commander may decide to approve additional remediation of environmental contamination on a site that has been designated for return if the commander determines—in light of the projected return date—that additional remedial measures are required to maintain operations or protect human health and safety.

(4) The USAREUR Base Camp Closure Guide (para 2c) provides a template for completing an ECR. The commander will ensure that copies of all ECRs are sent to the DCSENGR (AEAEN-ES) and the JA (AEAJA-CD).

e. An environmental closure report must be conducted before property turnover. An environmental closure report is essential to document post-occupation environmental conditions to help protect the U.S. Government from liability for pollution that occurs after departure from the site. The EMO or a designated representative will prepare the environmental closure report. The report must exactly parallel the most recently prepared EBS.

(1) Every topic mentioned in the EBS must be addressed and reported in the environmental closure report

(2) If samples were taken and analyzed in the EBS, samples must be taken from the same spots and analyzed using the same procedures as those which were used for the environmental closure report. There may also be additional areas of concern that require sampling and analysis if the site significantly changed from the time that the original EBS was prepared.

(3) The environmental closure report and the EBS will be maintained by the directorate of public works (DPW) and kept by higher headquarters for use by real estate personnel or the JA.

(4) The site commander will ensure that copies of all environmental closure reports are sent to the DCSENGR (AEAEN-ES) and the JA (AEAJA-CD).

11. SPILL RESPONSE

a. Each deployed unit is responsible for reporting and cleaning up its spills. Deployed forces must have written SOPs, plans, hazardous-materials management plans, spill kits, and proper containers and equipment for the storage of hazardous waste. Personnel must be trained in spill-management procedures.

b. Each site commander will develop a spill prevention, control, and countermeasures (SPCC) plan and submit it to the EMO. The SPCC plan should be a very simple document. Deployed units must provide adequate types and quantities of containment and cleanup supplies and equipment at all petroleum, oils, and lubricants (POL) and hazardous-materials storage and transport locations. POL facilities must be designed with leak-detection and spill-containment provisions. The EMO will coordinate spill-response plans with HN authorities and responders. The use of spill-response contractors is authorized for spills that are beyond the unit training and response capabilities.

c. If a unit causes a spill, its SOP will dictate the steps needed for spill response, but will generally follow these steps:

(1) On recognizing a petroleum spill—

(a) Ensure all personnel are safe.

(b) Stop the flow of petroleum and contain the source of the product.

(c) Notify the chain of command.

(2) After the immediate response actions in (1) above, the unit will—

(a) Assess how much fuel was spilled.

(b) Determine if the spill is near water or other sensitive zones (wells, drainage ways, crop areas).

(c) Document the steps required to remove the contaminated material in case a contracted spill cleanup will be required.

(3) The unit must complete a spill report and send it through the chain of command, including to the EMO. At this point the critical actions are complete. Refer to the "You Spill, You Dig" handbook (para 2d) for additional procedural guidance. The site commander will ensure that copies of all spill reports are sent the DCSENGR (AEAEN-ES) as soon after the spill as possible.

12. SPILL CLEANUP

a. Units must immediately remove petroleum-contaminated soil (PCS) and petroleum-contaminated water (PCW) from spill sites (for fuel spills of 25 gallons and less) and deliver it to the authorized holding area as soon as possible.

b. Table 1 and paragraph 21 provide cleanup standards for PCS. The use of spill-cleanup contractors may be required for spills that are beyond unit training and response capability or as specified in an existing contract.

c. Table 1 and paragraph 15 provide cleanup standards for PCW.

d. Cleanup is required for spills caused by U.S. operations. Spills caused by other than U.S. Forces are not the responsibility of the U.S. Government. It is imperative that all spills are documented and an environmental closure report is completed when documenting the closure or transfer of U.S. camps to landowners or other nations or forces. Spills that are a threat to the health of U.S. personnel (as determined by the site commander) must be cleaned up to the extent that the threat to U.S. and coalition forces and noncombatants is removed.

e. Because of the high cost of disposal, it is important not to remove or containerize water or soil that is not contaminated. To determine if a soil layer is contaminated, the responder should mix a representative soil sample with clean water in a clean container. If POL sheen is detected on the water surface, the soil layer will be considered to be PCS. Water with POL sheen will be treated with absorbent pads or containerized for disposal as PCS. Soil that is stained with POL will be removed and containerized for disposal as PCS or treated on site (land farmed). The EMO is considered to be the expert in spill response. As such, the EMO may direct a deviation from these requirements. All deviations must be documented.

f. Paragraph 21d provides more information about PCS that is collected from a spill site.

13. POTABLE WATER

The order of precedence for obtaining potable water services is as follows:

a. Local commercial or municipal sources approved by the preventive-medicine staff.

b. On-base wells, water-treatment facilities, storage, and distribution.

c. Trucked bulk water or bottled water.

14. NONPOTABLE WATER

Nonpotable water is used for industrial purposes such as dust control on roads, vehicle washing, toilet flushing, and grease-trap maintenance. Nonpotable water used in such applications does not have to meet Safe Drinking Water Act standards. Nonpotable water should be used to reduce demand on the potable water system. Potential sources for nonpotable water include rivers, lakes, ponds, and municipal water supply systems as well as treated effluent from wastewater treatment plants (WWTPs).

15. PETROLEUM-CONTAMINATED WATER

a. PCW is generated from POL-tank secondary containment, wash racks, and spill cleanup. If a water sample exhibits POL sheen, the water is considered to be PCW. Base camp facilities must be designed to reduce the quantities of PCW by shielding precipitation from secondary containment spaces when practicable. PCW can be treated by a coalescing oil-water separator (OWS) followed by a sediment trap or other comparable technology before the water is released to the environment. If there is no OWS, PCW must be treated with absorbent pads before the water is released to the environment. Wash-rack facilities must be designed to confine and limit the surface drainage area to the OWS. This will limit the OWS size and cost. Wash-rack operation must limit temperature and pressure to 60 ^{o}C and 60 Bar, and refrain from using detergents. High pressure and detergents are typical causes for OWS emulsions, and emulsified water makes OWS ineffective. Wash-rack water from closed-loop water recycling systems should be discharged to a WWTP after OWS treatment.

b. Wash-rack wastewater in fine-soil areas will contain high concentrations of silt that does not readily settle in a sediment trap or settling basin. Silt can prematurely clog textile-based filter elements on coalescing OWS. Therefore, OWS technology that uses vortex coalescence rather than coalescing elements is preferred for base camp applications.

16. WASTEWATER

a. In a base camp setting, wastewater comprises toilet waste (black water) and other wastewater from laundry, showers, handwashing, and dining facilities (DFACs) (gray water). A semipermanent base camp with a central water supply and a WWTP will generate approximately 100 gallons per day of wastewater per person. The number of daytime HN workers must be included when determining base camp population for wastewater load.

b. Toilet waste may be disposed of using burn-barrel latrines, hauling it to HN sewage systems, or using on-site WWTPs. Gray water may be discharged directly only after preventive-medicine personnel and the EMO have been consulted. The use of an on-site or off-site WWTP, however, is preferred for disposing of gray water.

(1) Burn-barrel latrines provide a high level of sanitation but produce bad odors and poor air quality in the vicinity of the latrines. Burn-barrel latrines also require recurring maintenance to remain sanitary and functional. Burn-barrel latrines are appropriate for short-term measures in remote locations.

(2) Connecting or hauling sewage to HN sewage systems may result in the discharge of the sewage to HN waterways with no or very little treatment because of the poor conditions of some HN infrastructures. If a municipal WWTP is confirmed by inspection of knowledgeable personnel (for example, preventive medicine, EMO) to provide appropriate treatment performance (BOD5 and TSS of 30 ppm (see glossary)) or be readily upgradeable, and has reserve capacity, then use of a nearby municipal system is often the best solution. Depending on the distance to the municipal facility, constructing an onsite WWTP may be more practical and cost- effective.

(3) Gray water carries a lower disease threat than toilet wastewater because it has relatively low pathogen levels, though waterborne disease and fecal coliform are present in gray water (primarily from shower and laundry water). Nevertheless, from a troop-health perspective, gray water is accepted as relatively safe for release to the environment in a military CONOPS setting where local wastewater treatment is not available. As the CONOPS matures, semipermanent base camps must install WWTPs and phase out the release of gray water. More advanced treatment measures may be necessary if the gray water creates vector-attraction issues.

(a) If regularly maintained, grease traps (devices designed to remove grease from DFAC wastewater) will remove a portion of the settleable solids in addition to fats, oils, and grease (FOG). If vectors are attracted to grease-trap discharge, a small packaged system may be required.

(b) Because of the high organic strength (BOD) of DFAC kitchen wastewater, a site commander may elect to adjust food rations from A-A-A to A-C-A or adjust kitchen cleanup procedures (such as scraping out food residue from pots and pans for separate disposal before washing).

(c) DFAC wastewater has enormous concentrations of BOD and food-based FOG. High concentrations of BOD and FOG can be extremely disruptive to WWTPs, resulting in process upsets and unsanitary conditions at the WWTP and receiving waters. "Sizing" WWTPs for DFAC organic load and the military and civilian population is vital. Sizing the WWTP for approximately twice the normal daytime capacity is recommended.

(d) Kitchen food waste must be handled and disposed of as a solid waste to the maximum extent possible. The installation and use of food grinders that discharge to the sanitary sewer is not authorized. Food grinders are not authorized even when the sewage is routed to a municipal WWTP, because of the enormous BOD load placed on the system from undigested food.

(e) Kitchen operating policy must ensure cafeteria- and kitchenware are physically wiped clean before they are rinsed. Food must be scaped into a solid-waste receptacle. Wiping before rinsing will minimize the food content of kitchen wastewater and reduce BOD.

(4) Facultative lagoons are area-intensive treatment systems. Facultative lagoons provide good destruction of pathogens and typically treat BOD to just above secondary treatment levels in the range of 30 to 40 ppm. Because of the algae content in facultative lagoons, effluent suspended solids are typically higher (30 to 100 ppm). Facultative lagoons provide the advantage of allowing near-secondary treatment without the requirement for equipment or energy. As such, a deployed engineering unit can build lagoon WWTPs using heavy equipment and easily acquired materials. A major construction limitation is that the soil must be largely impermeable. Otherwise, clay or geotextile liners need to be imported so the lagoon can hold wastewater and not pollute the local groundwater. The biggest disadvantage of facultative lagoons is the large land area required compared to other treatment options. Typically, one acre of lagoon area is required for every 70 Soldiers served. Most base camps do not have the available area to implement lagoon treatment.

(5) An on-site WWTP based on the sequencing batch reactor (SBR)-activated sludge process can reliably treat base camp wastewater under a wide range of site conditions. SBRs involve less tankage than flow-through WWTPs, which results in lower construction costs and fewer site area requirements. SBRs have highly efficient settling; consequently, effluent BOD and suspended solids are markedly lower than flow-through treatment processes (almost always below 10 ppm). This characteristic makes effluent reuse of nonpotable water possible and inexpensive. SBRs are available in packaged and field-erected configurations, depending on the base camp size. A company-sized base camp can be served with deployable, containerized units. Battalion- and brigade-sized base camps are most economically served with field-erected units composed of standard bolted-steel process tanks and a control building. SBRs are relatively simple to operate (for example, SBR WWTPs deployed in Bosnia and Herzegovina use one full-time HN operator). A disadvantage of central WWTPs is the generation of sludge, which must be disposed of or composted.

(6) WWTP equipment selection must be conducted by a sanitary engineer who understands base camp requirements. Depending on the size of the base camp and the details of DFAC kitchen operations, the average influent BOD can range from 300 ppm to more than 500 ppm. The use of fixed film WWTPs in cold weather regions or for base camps with A-A-A ration DFACs is not recommended. For the purposes of sizing the WWTP, the extremely high BOD of the DFAC and the confinement of personnel within base camp populations result in an equivalent population of approximately 2 times the actual population. Consideration of daytime-only personnel (HN shift workers or temporary personnel) must also be factored into WWTP sizing.

(7) The following are water treatment standards for treated effluent intended for reuse as industrial nonpotable water:

(a) The quality of treated effluent should be monitored for the purpose of reuse on the base camp. Monitoring includes standard tests performed by the WWTP operator. WWTPs are mandated to discharge effluent at or below 30 ppm BOD5 and 30 ppm TSS. It is recommended that treated effluent not be used in public places if BOD5 or TSS exceeds 10 ppm because of potential odors that may be encountered at that level. For added safety, nonpotable water may be disinfected with chlorine before transportation or piping.

(b) Treated effluent may be stored for short periods to facilitate distribution. Chlorine injection is more easily facilitated if located near the effluent source. This will allow better mixing.

(c) To avoid contamination of the potable water supply, nonpotable water trucks must not be used for hauling potable water.

17. SEWAGE SLUDGE

a. Sewage sludge from WWTPs can be managed as a liquid (2 percent solids) or a cake (15 to 20 percent solids) depending on the dewatering equipment available. Common sewage sludge disposal options for base camps include municipal sewage systems, municipal landfills, land application of nonstabilized sludge, and composting.

b. Hauling the sewage sludge to HN sewage systems or landfills often results in the discharge of the sludge to HN waterways or land with no or very little treatment because of the poor condition of HN infrastructure typically found in CONOPS environments. If the municipal disposal site is confirmed by inspection to be adequate to receive sewage sludge without environmental damage or be readily upgradeable, and it has a reserve capacity, then use of the disposal system is often the best solution. Depending on the distance to the municipal facility, constructing onsite sludge-processing facilities may be more cost effective according to standard cost analyses.

c. Under controlled conditions, nonstabilized sewage sludge in liquid or cake form can be land applied on the base camp or U.S.-leased off-camp property. This disposal method applies if uninhabited land tracts are available where human contact can be limited—both from direct contact with the land and from ingestion of crops from the tract. These cases would require land-access restrictions and physical provisions, such as warning signs and fencing. After sludge is land applied, it naturally degrades and eventually will no longer be a vector or pathogen threat. The vector and pathogen threat is greatly diminished if the sludge is plowed into the soil within 24 hours after application.

d. Paragraph 20 provides information on composting sewage sludge.

18. GREASE TRAPS

a. Grease traps are normally not used for initial base camps.

b. For temporary and semipermanent base camps, grease traps are required on all wastewater discharges from DFACs and other kitchens. Grease traps are also required on all untreated gray water discharges to land, streams, and storm-water facilities.

c. All automatic dishwasher and toilet waste drains must be connected to the sanitary sewer at a point downstream of the grease trap. Grease traps must be sized according to a national standard plumbing code by a sanitary engineer who understands base camp requirements. No enzymes, chemicals, heat, or other emulsifying agents may be used to clean a grease trap or to keep a grease trap free of grease accumulations.

d. To remain functional, the accumulations of solid and liquid grease must be regularly removed from grease traps. The grease-trap-cleaning frequency will depend on grease-trap size and loading. DFAC grease traps must be cleaned as required. Cleaning must include removal of the liquid and solid grease accumulations by scraping, scooping, or pumping out the grease. The removal of water from the grease trap is not desired because it increases the amount of grease trap waste to be disposed of. Grease traps also serve as sediment traps, so the sediment blanket should be removed if detected. After cleaning operations, add enough water to the grease trap so the water surface is above the inlet baffle for the outlet box. This will prevent grease from entering the outlet box as the grease trap fills.

e. Grease trap waste is a vector attractant. It may not be disposed to a task force WWTP unless grease-receiving facilities are specifically designed for the WWTP. Otherwise, the grease trap waste will upset the WWTP and render the WWTP ineffective. Provisions for the treatment and disposal of grease trap waste include dewatering and composting, or anaerobic digestion at a WWTP.

f. Grease trap waste may also be combined for disposal with food waste swill. The recommended disposal method for kitchen grease is composting. Grease trap waste may be disposed of by hauling it to a HN landfill (where available). Special provisions may be needed at the landfill for containment and treatment of the liquid grease portions. Grease trap waste may also be disposed of by hauling it to a HN sewer system if the available HN system is capable of properly treating this waste. Since disposal to HN sewage systems often results in the discharge of the grease trap waste to HN waterways with no or very little treatment because of the probable poor condition of HN infrastructure in CONOPS environments, this is not recommended. Furthermore, disposal of grease trap waste to a functional WWTP with no grease-treatment processes will upset the plant and cause pollutant discharges. If the municipal WWTP is confirmed by inspection to have grease-treatment processes (such as anaerobic digestion) or can be readily upgradeable, and it has reserve capacity, then use of a nearby municipal system is often the best solution. Unless functional or readily upgradeable grease-disposal facilities are confirmed through inspections, the disposal of grease trap waste to HN infrastructure should be considered as a last resort for grease or sludge disposal, because it could result in the implication of the U.S. Government as a contributor to public disease outbreaks or environmental degradation.

19. SOLID WASTE

a. General. A semipermanent base camp can generate 2.5 tons (20 cubic yards) of solid waste per year per Soldier, 75 percent of which is wood. Table 2 shows a breakdown of solid waste generated at a typical base camp. Generally, 25 percent of the original weight of solid waste is converted into ash when incinerated. With a thorough solid-waste reduction, recycling, and reuse program, the quantity of solid waste that needs to be incinerated or land filled can be a small percentage of the total solid waste.

Table 2
Base Camp Solid Waste Survey

Solid Waste	Per 1,000 Soldiers (tons per year)	Total %
Aluminum	5	0.2
Cardboard	165	6.4
Food Waste	24	0.9
Glass	20	0.8
Grass Clippings	18	0.7
Light Metal	5	0.2
Miscellaneous	2	0.1
Other Paper	84	3.3
Other Plastics	68	2.6
Plastic Bottles	139	5.4
Polystyrene	4	0.2
Rubber	14	0.5
Saw Dust	22	0.9
Scrap Wood	1,961	76.0
Textile	4	0.2
Total Waste	**2,567**	**100**

NOTES: 1. Total waste comes to 56 cubic yards per day.
2. The information in this table is based on a 1-day survey of the U.S. Army Bosnia in 2002.

b. Waste Reduction and Reuse. Waste reduction must be addressed even during CONOPS. Effective solid-waste management at base camps will begin with evaluating and implementing waste-reduction practices.

(1) Changes in facility design, processes, and product selection and procurement can result in the generation of less waste overall and less hazardous waste.

(2) Good practices may include the following:

(a) Avoiding stockpiling.

(b) Substituting products for products with environmentally preferable attributes (for example, biobased, durable, less toxic, recyclable, recycled content, reduced packaging, repairable, reusable, returnable).

(c) Reusing items (for example, coffee cups or other tableware, packaging materials, office supplies).

(d) Salvaging or on-site reuse of construction materials.

(e) Reusing excess items (possibly through establishment of a hazardous material control center, commonly known as HAZMART).

(f) Reducing paper consumption by double-sided copying and electronic communication.

c. Recycling.

(1) A strong base camp recycling program will recycle the following principal components:

(a) Aluminum cans.

(b) Cardboard.

(c) Ferrous scrap metal.

(d) Nonferrous scrap metal.

(e) Plastic bottles.

(f) Scrap wood.

(g) Steel cans.

(2) Recycling must be conducted as a central operation using recycling laydown yards at the logistics hub camp. The goal is to collect recyclables from all camps in the task force, distribute them on the public market through sales and purchase contracts or public auction, and conduct continual cost-benefit analyses of recycling programs.

d. Remaining Refuse. For refuse remaining after composting and recycling efforts, the following solid-waste-disposal options are recommended:

(1) Solid-waste facilities will be identified by the EMO in cooperation with the task force surgeon to minimize the effect of emissions, vectors, and leachate on the base camp population, local population, water supply, and environment.

(2) During initial base camp phases, solid-waste disposal must be based on field incineration (burn pit) or "direct buried" with daily soil cover. The ash from solid waste incineration must be buried. HN solid-waste infrastructures may also be used where they are readily available.

(3) During the temporary and semipermanent base camp phases, a solid-waste processing and disposal facility must be established at a central location or at HN solid-waste-management facilities if applicable. Solid waste from satellite installations should normally be hauled to the central processing facility for sorting and removal of ammunition and recyclable products. A two-stage incinerator should be used for solid waste disposal. Other alternatives include HN facilities or composing. Air curtain destructors are not recommended for burning solid waste.

(4) The two-stage incineration technology provides a second combustion chamber for post-combustion flue gas treatment. A containerized, mobile, two-stage incinerator has a throughput of 330-pounds per hour. This incinerator size can serve a battalion-sized base camp that recycles and reuses 50 percent of its solid waste.

20. COMPOST

a. Composting organic solid waste (waste products that can rot such as sewage sludge, food waste, and paper) is recommended for base camps. Composting is a biological process for reducing and destroying pathogens from waste material. The composting process converts waste into an inert product suitable for use as backfill material or soil amendment in erosion-control projects on base camps. The composting process typically varies from 6 to 20 weeks depending on the waste and process employed. Process controls in composting involve balancing the ratio of carbon to nitrogen, oxygen to carbon dioxide, moisture, temperature, bulk density, pore size, trapped air space, and salinity inside the compost heap. The major steps in the compost process include ingredient preparation, active composting, curing, screening, and application.

b. Composting in a base camp setting may include one of three technologies depending on the material being composted and site constraints (such as space availability, odor and vector control issues). Of the three technologies, aerated membrane systems have the highest potential for successfully operating in a variety of CONOPS environments. Balkans experience has shown that a base camp population of 2,500 in a temporary or semipermanent base camp (6 months or more) produces approximately 5,500 cubic meters or 1,500 tons of compostable solid waste (including sewage sludge) per year. (Paragraph 19 has information about the solid-waste survey (excluding sludge)). It is essential to match the selected composting-unit design capacity to the base camp's organic waste-generating capacity.

(1) Aerated Membrane. This controlled process uses pumped air and a semipermeable membrane cover to promote accelerated decomposition of the heap ingredients during a two- or three-phased application. Some waste material may require an additional maturation phase (in addition to the standard intensive and curing phases). The typical total processing time for the aerated membrane process is 6 to 9 weeks. After the initial setup, the only time the heap is handled is when the entire heap is moved from the intensive phase to the curing phase. The membrane cover provides a physical barrier from vectors and precipitation. It provides a vapor layer that reduces the emission of odors and pathogen compounds in exhaust air. The membrane also provides even air distribution throughout the heap. The system includes a computer-controlled instrumentation system that regulates the blower operation using feedback from temperature and oxygen probes inserted inside the heap. Advantages include simplicity; shorter processing times; automated operation; less potential for failure; protection from vectors, precipitation, and odors; and relatively long equipment life. Disadvantages include higher up-front costs; cost for aeration energy; and the costs for the membrane cover, blower, and associated equipment. The major requirements for this system are as follows:

(a) Polyvinyl chloride (PVC) aeration pipes, blowers, probes, computer system, membrane cover, and container or fixed winding devices for the cover.

(b) Heavy duty chipper or tub grinder (majority of wood will be dry pallets and excess building materials).

(c) Star or trommel screen.

(d) 2.5- to 5-cubic yard bucket loader (recommend an Allutype machine with mixing/chopping screws in the bucket).

(e) Manure spreader.

(f) Space of approximately 5,000 square meters per 1,500 annual tons, or 5,500 annual cubic meters of annual organic waste generation.

(2) Open Windrow Heap. This process uses covered or uncovered windrows that are periodically turned based on manual temperature and oxygen monitoring. The total processing time can be 6 to 20 weeks depending on the waste being processed. The windrows must be turned frequently. Specialized equipment is required. The process has an initial high rate of ingredient breakdown and heat in the beginning of the active compost phase followed by a longer maturation phase at lower temperatures. Weather can greatly affect the rate of composting activity. Prolonged rain, subfreezing temperatures, and snow can have a significantly bad effect on this process. The advantage of this process is its lower up-front costs. Disadvantages include high maintenance and labor, high energy demand (tractor fuel), susceptibility to weather, vulnerability to vector and odor problems, and relatively short equipment life because of the corrosive environment. The open windrow process tends to be operationally complex, requiring careful management of the heaps. The open windrow technology differs from aerated membrane in that its efficiency is managed by turning based on manual temperature and oxygen readings taken daily. Major requirements include the following:

(a) Tractor with creeper gear and power take-off for windrow turner.

(b) Thermometers and oxygen probes.

(c) Windrow turner that fits the tractor.

(d) Water tank that fits the tractor.

(e) Heavy duty chipper (majority of wood will be dry pallets and excess building materials generated at the camp (a tub grinder is not recommended)).

(f) Manure spreader.

(g) Star or trommel screen.

(h) 2.5- to 5-cubic yard bucket loader (recommend an Allu-type machine with a mixing/chopping screws in the bucket).

(i) Space of approximately 15,000 square meters per 1,500 annual tons, or 5,500 annual cubic meters of annual organic-waste generation.

(**3) Aerated Container Vessel.** This process uses a manufactured container of at least 40 cubic meters with a built-in, active aeration system and may have internal mechanical turning devices to stir the composting material. The in-vessel composting phase occurs in approximately 3 weeks. An additional 3- to 8-week curing cycle (using open windrows) is required after the material is removed from the container, for a total processing time of approximately 11 weeks. This system may apply to base camps with small volumes of compostable material where a centralized task force composting facility is not available or readily accessible. The advantages to this process include shorter reaction times, protection from vectors, mitigation of environmental influences, and transportability and reusability. Disadvantages include potential odor issues; costs for aeration energy; the potential for vector and precipitation problems during the curing phase; and the need for the manufactured vessels, blowers, and associated equipment. Major equipment items include the following:

(a) Aerated vessels. The number required is based on the daily amount of material produced. For example, a camp producing 5 cubic meters of compostable material will use about 5 cubic meter of bulking agent a day. Therefore, a 3-week in-vessel composting cycle will require six 40-cubic meter containers.

(b) Heavy duty truck or crane that can dump the vessel at the curing site.

(c) Instrumentation.

(d) Heavy duty chipper (majority of wood will be dry pallets and excess building materials (a tub grinder is not recommended)).

(e) Star or trommel screen.

(f) 2.5- to 5-cubic yard bucket loader (recommend an Allu type machine with a mixing and chopping screws in the bucket).

(g) Manure spreader.

(h) Space of approximately 5,000 square meters per 1,500 annual tons, or 5,500 annual cubic meters of annual organic waste generation.

c. The composting site surface must include 6 inches of compacted, well-graded gravel over 12 inches of compacted engineered base over a compacted base composed of either low-permeable native soil or impermeable geotextile. If soil permeability is unknown, soil percolation tests must be conducted. The maximum site slope must be 3 percent or 3 inches of rise per 100 inches of run. Storm-water runoff from the site to a retention pond must be collected. If petroleum sheen is observed in the retention pond, the runoff may need to be collected and transported to a WWTP. All-weather access roads and electrical power service must be provided. Hard-wear surface pads may be required for some technologies, such as container vessels.

21. PETROLEUM-CONTAMINATED SOIL

a. Sources of PCS in a CONOPS setting include POL-spill cleanup soil, wash-rack-waste soil, and wash-rack-sediment-trap soil.

b. During initial base camp phases, PCS is transported off site by a contract using DLA channels.

c. On-site remediation of PCS is authorized for temporary and semipermanent base camps for U.S. Forces' spills where economical HN disposal services are not available. If HN PCS disposal services are available and deemed suitable by the DPW EMO, the local service should be the first choice.

d. The preferred method of on-site PCS remediation is through the process known as "land farming" by bio-remediation. Land farming is a process that digests POL from the soil using naturally occurring microorganisms similar to composting. After successful treatment, POL levels will be low enough to allow the remediated soil to be used as backfill around the base camp for a variety of purposes including erosion control, promoting grass growth for dust control, or building force-protection berms. The following requirements are needed for successful land farming operations:

(1) PCS Holding Area. The PCS holding area must be located on a "hard stand," such as concrete or an engineered site that will keep any petroleum product from entering the soil. Placing PCS on impermeable geotextile or plastic for temporary storage is acceptable.

(2) Site Preparation. The site surface must be 6 inches of compacted, well-graded gravel over 12 inches of compacted engineered base over a compacted base composed of either low-permeable native soil or impermeable geotextile. If soil permeability is unknown, soil-percolation tests must be conducted. The maximum site slope will be 3 percent or 3 inches of rise per 100 inches of run. Collect storm-water runoff from the site to a retention pond. If petroleum sheen is observed in the retention pond, the runoff may need to be collected and transported to a WWTP. All-weather access roads must be provided. The site should be located with a composting operation (para 20) so resources can be shared.

(3) Equipment Requirements. A recommended major equipment list is provided below. Except for the farm tractor with aerating discs, the list includes the same equipment used for solid waste or sludge composting.

(a) Allu-type machine with a mixing scoop or a 2.5- to 5-cubic yard front-end loader.

(b) Farm tractor with aerating discs or tines.

(c) Heavy duty wood chipper (should be able to grind up 4-by 4-inch lumber).

(d) Dump truck.

(e) Star screen or trommel screen (optional).

(f) Space of approximately 20,000 square meters per 3,000 tons of PCS soil to be treated.

e. PCS treatment (land farming) operations will be conducted as follows:

(1) Place 2 to 4 centimeters (1 to 2 inches) of used or new wood chips, straw, hay, or other suitable bulking agent on the stone pad.

(2) Place 5 to 10 centimeters (2 to 4 inches) of PCS.

(3) Place 5 to 10 centimeters (2 to 4 inches) of sewage sludge (or other manures) to provide nitrogen. Agricultural fertilizer may be used.

(4) Place 8 to 15 centimeters (3 to 6 inches) of used or new wood chips, straw, hay, or other suitable bulking agent.

(5) Place 8 to 15 centimeters (3 to 6 inches) of PCS.

(6) Mix the entire layered pile with a tractor or the Allu mixing scoop until the ingredients are homogeneous. The size of the PCS land farm will dictate which equipment to use. Relatively smaller plots can be turned by any scoop loader on hand (such as backhoes or track hoes); large plots will have to be turned by farm implements (such as plows and disks).

(7) Add water as required to keep the moisture content between 35 and 55 percent.

(8) Collect samples immediately after constructing the pile and then every month thereafter for 4 months or until the total petroleum hydrocarbons (TPH) concentration is consistently below 2,000 ppm. Create a random sampling strategy that is adequately representative based on the site conditions and provide this strategy to the DCSENGR. An example of a sampling strategy would be to lay out a grid map of the site and take 6 samples per 1,000 cubic meters of the PCS, sludge, and wood-chip mixture.

(9) The need to remix the PCS mixture will depend on initial contamination levels. The depth of the land farm should not exceed 30 to 40 centimeters (12 to 16 inches). Plan to remix the land farm once a week for the first month. Continue to remix the land farm once a week until the TPH concentration falls below 2,000 ppm when the soil can be reused for other purposes.

(10) Additional PCS can be added to the ongoing bio-remediation plot as long as there is a definitive line between the various working plots. Accurate records must be kept. A logbook is recommended for recording land farming events such as turning, sampling, and sampling results.

(11) Once a plot has consistent TPH concentrations below 2,000 ppm, the soil can be used for erosion control or backfill. The material does not have to be screened.

(12) Save at least one cubic meter of the bio-remediated soil and any screened-out wood chips to inoculate the next PCS plot. Large quantities of these materials are not needed to inoculate a new plot.

f. The use of biopile remediation is an on-site PCS remediation alternative for wet climates and sites with area limitations. Biopile remediation is similar to land farming, except the PCS and bulking agent is placed into static, covered windrows, which are aerated with forced air. The DCSENGR will provide more information about biopile remediation design and operating requirements on request.

22. INFECTIOUS WASTE

a. “Infectious waste” is waste that is potentially capable of causing disease in humans and may pose a risk to both individual or community health if not handled or treated properly. Infectious waste is also referred to as “biohazardous waste” and “medical waste.” Regulated medical waste (RMW) is generally produced at medical, dental, and veterinary treatment facilities. RMW is divided into the following categories:

(1) Category 1, Cultures, Stocks, and Vaccines. Examples include cultures and stocks of infectious agents and associated biologicals, including cultures from medical and pathological laboratories; discarded live and attenuated vaccines; culture dishes and devices used to transfer, inoculate, and mix cultures.

(2) Category 2, Pathological Waste. Examples include human pathological wastes, including tissues, organs, body parts, extracted human teeth; body fluids that are removed during surgery, autopsy, or other medical procedures.

(3) Category 3, Blood and Blood Products. Examples include—

(a) Free-flowing liquid human blood, plasma, serum, and other blood derivatives that are waste (for example, blood in blood bags, blood or bloody drainage in suction containers).

(b) Items such as gauze or bandages that are saturated or dripping with human blood, including items produced in dental procedures, such as gauze or cotton rolls saturated or dripping with saliva.

NOTE: Products saturated or dripping with blood used for personal hygiene, such as diapers, facial tissues, and sanitary napkins and tampons, are not subject to the management procedures of RMW. Medical personnel need to use judgment in deciding when and where these items from patients need to be managed as RMW.

(c) Items caked with dried blood and capable of releasing the blood during normal handling procedures.

(4) Category 4, Used Sharps and Unused Sharps. Examples include sharps used in animal or human patient care or treatment in medical, research, or support laboratories. These include hypodermic needles, syringes (with or without the attached needle), Pasteur pipettes, scalpel blades, blood collection tubes and vials, test tubes, needles attached to tubing, and culture dishes (regardless of presence of infectious agents).

(5) Category 5, Animal Waste. Examples include contaminated animal carcasses, body parts, and bedding of animals known to have been exposed to infectious agents during research. Carcasses of road kills, euthanized animals, animals dying of natural causes and waste produced by general veterinary practices are not considered category-5 animal waste.

(6) Category 6, Isolation Wastes. Examples: bedding from patients or animals with etiologic agents classified by the Centers for Disease Control and Prevention (CDC) as biosafety level 4 (including biological waste and discarded materials contaminated with blood, excretion exudates, or secretions from humans who are isolated to protect others from highly communicable diseases such as pox viruses and arboviruses).

(7) Other. Fluids that are designated by the local infection-control authority. These include but are not limited to semen, vaginal secretions, cerebrospinal fluid, synovial fluid, pleural fluid, peritoneal fluid, pericardial fluid, and amniotic fluid.

b. Personnel must be trained in the management and handling of infectious waste. They also must wear gloves appropriate to the task when handling bagged RMW. If necessary, guidance from preventive-medicine personnel should be requested.

c. Infectious waste must be segregated at the point of origin. Collection and disposal containers deemed appropriate by preventive-medicine personnel must be used. As a minimum, RMW must be collected in puncture-resistant, plastic-bag-lined receptacles. Sharps must be collected in designated puncture-resistant sharps containers.

d. When being sealed, the bag must not be shaken or squeezed in an attempt to reduce volume. RMW must never be compacted before disposal.

e. The RMW storage area must be in a secure location and free of vermin. The area must be away from food and common areas.

f. Infectious waste must be appropriately labeled according to HN and U.S. laws during collection, storage, transport, and disposal. Preventive-medicine personnel will provide assistance in labeling requirements.

g. Infectious waste must never be transported on the same vehicle with food items. A spill containment and cleanup kit must be maintained in each vehicle transporting RMW. The kit should include appropriate personal protective equipment (PPE), disinfectant, and appropriate absorbent and housekeeping equipment for cleaning up a spill.

h. For initial, temporary, and semipermanent base camp phases, infectious waste must be disposed of using high temperature, two-stage incinerators. These incinerators are designed to meet infectious-waste disposal requirements. Typical solid waste incinerators will not be used. Use HN infectious-waste-disposal services when available. Before using HN disposal facilities, the EMO and surgeon will jointly conduct inspections to confirm that the waste is reduced to a safe environmental standard.

i. For CONOPS phases at a multiple-installation task force, a centralized infectious-waste incinerator must be sited by the EMO. Infectious waste from outlying installations will be hauled to the infectious-waste incinerator except when economic justification or mission objectives warrant otherwise.

23. HAZARDOUS WASTE

a. Hazardous waste includes all hazardous materials that are being discarded. Annex L to the appropriate USEUCOM OPLAN will provide specific directives for the collection, transportation, and disposal of hazardous waste.

b. With the exception of alternative hazardous-waste disposal measures in subparagraph c below, hazardous-waste disposal for all CONOPS phases will be managed by the Defense Reutilization Marketing Service - International.

c. CONOPS experience has shown that significant U.S. Government funds can be saved using alternative disposal measures for certain hazardous waste streams. Alternative disposal measures include recycling, reuse, and on-site remediation. EMOs should propose alternative disposal measures with cost justifications for other hazardous waste streams when applicable.

(**1) PCW.** Paragraph 15 provides guidance for on-site PCW remediation.

(**2) PCS.** Paragraph 21 provides guidance for on-site PCS remediation.

(3) Engine Oil Blending. Used-oil blenders may be used to blend used engine oil (only from diesel engines) into the fuel tanks of the vehicle or generator being serviced. The result of using an engine-oil blender is gaining the ability to convert used oil into fuel and consume it as fuel at regularly scheduled oil-change intervals. Blenders are specially designed shop tools that collect used oil from a diesel engine crankcase, collect an equal amount of fuel from the vehicle or generator's fuel tank, blend the two products together, and filter the blended product before pumping it back into the tank as fuel. This procedure avoids the cost of collecting, storing, transporting, and disposing of used engine oil. In addition, the value of the fuel displaced by the engine oil is also avoided. The use of engine oil blending is approved for all diesel engines during all CONOPS phases. Used engine oil is not to be blended into any gasoline engine fuel.

(4) Used Oil Management. Oils that cannot be used for its intended purpose may be transferred through an official Government contract to local vendors for use as fuel in various manufacturing processes. The EMO will verify and document this use before transferring oil to the local vendor.

d. The EMO should use cost-effective pollution-prevention process changes and technology that minimize the generation of hazardous waste. Process changes and technology improvements must be coordinated with the DCSENGR.

24. FIRING RANGES

Certain firing range designs and materials can minimize hazardous-waste generation and reduce costs at the time of a base closure. Task force commanders will coordinate firing range designs with the Seventh Army Training Command and the DCSENGR before constructing or operating a firing range. The use and closure of the range must be according to approved practices. EMOs will review and approve these practices in coordination with the DCSENGR.

25. NATURAL RESOURCES AND ENDANGERED SPECIES

a. Annex L to the appropriate USEUCOM OPLAN provides specific directives for the identification and protection of natural resources and endangered species.

b. The EMO will investigate HN environmentally sensitive natural resources as well as endangered or threatened plant or animal species and their habitats that may be encountered during CONOPS. The identified sensitive areas and habitats must be included in the EBS.

c. All forms of land development, pollutant discharges, firing ranges, and demolition ranges have the potential to negatively affect sensitive natural and threatened species habitats. To the extent practicable consistent with operational conditions, efforts must be made to protect sensitive natural resources and threatened species habitats, even if specific resources or habitats have not been identified by HN authorities or field inventory. These efforts include consolidation and limitation of land-development sprawl and range activities, restoring mine-clearing and -proofing areas, and minimizing pollutant discharges.

26. HISTORIC AND CULTURAL RESOURCES

a. Annex L to the appropriate USEUCOM OPLAN will provide specific directives about historic and cultural resources.

b. The EMO will coordinate with HN environmental authorities to identify historic and cultural resources that may be encountered during CONOPS. Identified areas must be inventoried as part of the EBS.

c. Specific activities conducted as part of the CONOPS that have the potential to negatively affect or damage historic and cultural resources include all forms of land development, pollutant discharges, firing ranges, and demolition ranges. To the extent practicable under operational conditions, efforts must be made to protect historic and cultural resources, even if HN authorities or a field inventory has not identified specific resources.

GLOSSARY

SECTION I
ABBREVIATIONS

AB	ablution
AOR	area of responsibility
BOD	biochemical oxygen demand
BOD5	5-day biochemical oxygen demand
^{o}C	degrees Celsius
CDC	Centers for Disease Control and Prevention
CG, USAREUR/7A	Commanding General, United States Army, Europe, and Seventh Army
CONOPS	contingency operations
DCG/CofS	Deputy Commanding General/Chief of Staff, United States Army, Europe, and Seventh Army
DCSENGR	Deputy Chief of Staff, Engineer, United States Army, Europe
DFAC	dining facility
DLA	Defense Logistics Agency
DOD	Department of Defense
DPW	directorate of public works
EBS	environmental baseline survey
ECR	environmental condition report
EMO	environmental management officer
FOG	fats, oils, and grease
HN	host nation
JA	Judge Advocate, United States Army, Europe
JA/PEA	joint assessment/preliminary environmental assessment
KISE	known imminent and substantial endangerments
OPLAN	operation plan
OPORD	operation order
OWS	oil-water separator
PCS	petroleum-contaminated soil
PCV	polyvinyl chloride
PCW	petroleum-contaminated water
POL	petroleum, oils, and lubricants
PPE	personal protective equipment
ppm	parts per million
RMW	regulated medical waste
ROWPU	reverse osmosis water-purification unit
SBR	sequencing batch reactor
SOP	standing operating procedure
SPCC	spill prevention, control, and countermeasures
TPH	total petroleum hydrocarbons
TSS	total suspended solids
U.S.	United States
USAREUR	United States Army, Europe
USEUCOM	United States European Command
UXO	unexploded ordnance
WWTP	waste-water treatment plant

SECTION II
TERMS

base camp
Contingency operations installation. This includes cooperative security locations, forward operating bases, forward operating locations, forward operating sites, joint main operating bases, and outposts.

HAZMART
Common term for a hazardous material control center.