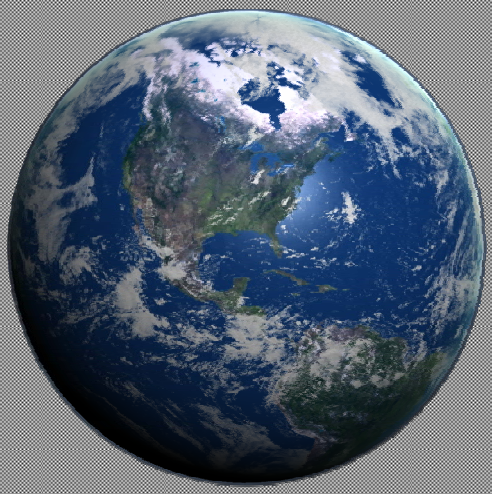
AIR FORCE HANDBOOK 10-222, VOLUME 4
1 March 2007

ENVIRONMENTAL GUIDE FOR CONTINGENCY OPERATIONS OVERSEAS



DEPARTMENT OF THE AIR FORCE

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BY ORDER OF THE SECRETARY OF THE AIR FORCE

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Operations

ENVIRONMENTAL GUIDE FOR CONTINGENCY OPERATIONS

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This handbook contains guidance on environmental considerations for Air Force civil engineer personnel, including Air National Guard and Air Force Reserve personnel deployed in support of contingency operations in foreign countries. It outlines strategies that may be used to alleviate negative impacts on the mission as a result of health hazards, loss of assets, or political conflict resulting from environmental neglect. These practices can help to avoid or minimize adverse impacts to human health and the environment once contingency operations stabilize. Note: Ensure that all records created as a result of processes prescribed in this publication are maintained in accordance with AFMAN 37-123 (will convert to AFMAN 33-363), *Management of Records*, and disposed of in accordance with the Air Force Records Disposition Schedule (RDS) located at https://afrims.amc.af.mil.

SUMMARY OF CHANGES: This publication has been substantially revised and must be completely reviewed. All references to military operations within the U.S. have been removed. Appendixes A-H have been eliminated.

Preface

The United States Air Force (USAF) is committed to maintaining environmental quality to ensure long-term access to the air, land and water needed to protect U.S. interests. Although a high level of environmental quality can be difficult to achieve during contingency operations, this responsibility is becoming less of an option and more of a mandate. By their very nature, contingency operations are rapid and time-constrained. Time is not always available to conduct comprehensive environmental planning prior to entering foreign countries to confront enemies, conduct disaster relief or perform humanitarian operations. During initial stages of a conflict, the focus will likely be on accomplishing the mission and preserving human life. However, we must recognize both the mission and personnel will suffer if we fail to protect the environment. Failure to maintain basic environmental standards could result in illnesses, diseases and even death. An unacceptable disease and non-battle injury (DNBI) rate resulting from poor environmental standards and conditions will impact the mission. Contingency operations and environmental functions are interdependent. The mission is dependent upon the environment for sustainment, and the environment is dependent upon us for preservation and maintenance. We simply cannot afford to neglect environmental concerns without understanding the risks involved.

This handbook contains guidance. It does not create any rights, duties, obligations, or causes of action, implied or otherwise, in any third parties. Nothing contained in this handbook may be construed as an admission that the USAF has not complied with any environmental law in the past during contingency operations, or intends to violate any such laws in the future. It is good practice to coordinate environmental activities while executing contingency plans. Coordination with agency counterparts includes offices such as: bioenvironmental engineering (BEE), medical service preventive medicine, environmental, readiness and safety.

Chapter 1
INTRODUCTION

1.1. Overview. This handbook addresses environmental concerns overseas. It describes environmental goals and provides guidance for Air Force civil engineers deployed in support of contingency operations. Guidance is provided on environmental planning, methods for maturing existing environmental functions, and preparing sites for closure. This handbook does not address disposal of munitions. Guidance on waste munitions is covered in the Environmental Protection Agency's (EPA) Military Munitions Rule (MMR). This document is located on the Defense Environmental Network and Information Exchange (DENIX) website at https://www.denix.osd.mil. Also, contact the Logistics representative for guidance on munitions disposal. **NOTE:** All references noted throughout this handbook are linked to the DENIX and Air Force Civil Engineer Support Agency (AFCESA) websites and should be downloaded to portable media prior to deploying. In addition, make contact with the Area of Responsibility (AOR) environmental staff.

1.2. Goals. USAF environmental goals during contingencies are aimed at minimizing risks to human health and the environment without impacting readiness and mission accomplishment.

1.2.1. **Protection.** The health and safety of personnel are paramount in any contingency operation. Safe, medically approved food and water and means of properly disposing of waste must be ensured. Effective controls and countermeasures must be implemented to prevent losses due to DNBI. Protecting the force and the environment sustains operational capability.

1.2.2. **Prevention.** Prevention is the preferred means of maintaining environmental compliance. Although military necessity complicates efforts during certain stages of operations, we must take every opportunity to minimize pollution, conserve resources, reduce health and safety hazards, and integrate environmental considerations into day-to-day operations.

1.2.3. **Planning.** Environmental considerations must be part of initial planning and decision-making. Identifying potential environmental impacts during initial planning allows commanders to evaluate alternative courses of action to mitigate the effects of military operations on personnel and the environment. Knowing what to expect provides insight needed to effectively plan for hazards that could threaten personnel health and safety and to determine what areas may need to be avoided because of environmental concerns. This is why the site selection process is so critical.

1.2.4. **Management.** Effective management must be applied to environmental functions. Hazardous material, hazardous waste, and spill prevention/response must be top priorities. The Civil Engineer assumes management of environmental functions and works with Commanders, Unit Environmental Coordinators (UECs), Safety and Medical, and other key experts to provide effective environmental leadership.

1.2.5. **Mitigation/Restoration.** When a site is to be vacated by U.S. personnel, there are certain responsibilities a commander must address to mitigate environmental impacts and/or restore areas impacted by military operations to a state that does not present imminent danger to personnel or future military operations. This is an area of U.S. law that is constantly being revisited. Therefore, always contact the Environmental Executive Agent (EEA) for the country in which the unit will be deployed to obtain guidance on site closure and environmental mitigation/restoration policies.

1.3. Policies. Contingency operations conducted overseas, outside areas where the U.S. maintains permanent overseas basing, are excluded from most U.S. environmental laws, but not necessarily from U.S. environmental standards. Environmental compliance for a particular contingency operation will likely come from one or more key sources including the Operational Plan (OPLAN) and/or Operational Order (OPORD) under which military action is being executed, International Agreements, Host Nation (HN) law, Status of Forces Agreement (SOFA), the Overseas Environmental Baseline Guidance Document (OEBGD), and Final Governing Standards (FGS).

1.3.1. **Operational Plans/Operational Orders (OPLAN/OPORD).** The Joint Force Commander (JFC) prepares the "Environmental Considerations" annex of an OPLAN and/or OPORD. The intent of this annex is to protect the health of personnel and minimize the impact of operations on the environment. Commanders are responsible for complying with the applicable environmental requirements established by this annex and must keep leaders informed of conditions that may result in noncompliance with the annex.

1.3.2. **Overseas Environmental Baseline Guidance Document (OEBGD).** The OEBGD prescribes implementation guidance, procedures, criteria, and standards for environmental compliance on DOD installations outside the U.S., but does not directly apply to ships, aircraft, contingencies or deployments off DOD installations. In countries where no FGS have been established, it can be used as guidance if so determined by the Lead Component, in coordination with the Joint Task Force (JTF) Commander.

1.3.3. **Final Governing Standards (FGS).** The FGS must be published by the designated environmental executive agent for each host nation where DOD operates an installation. The standards are based on criteria of the OEBGD and include applicable HN laws, SOFA, and international agreements. FGS are country-specific, substantive provisions addressing limitations on wastes, discharges, etc., or a specific management practice with which installations must comply and contingency deployments should comply unless a waiver has been approved. Waivers may be requested if compliance would seriously impair operations, adversely affect relations with the HN, or require a substantial expenditure of funds which are unavailable.

1.3.4. **International Treaties.** It is important to be aware of international treaties that may affect the conduct of operations during contingencies. For example, the Basel Convention (signed but not ratified by the Congress) is an international treaty designed to reduce the movement of hazardous wastes between nations and, specifically, to prevent the transfer of hazardous wastes from developed countries to less developed countries. The EEA can provide specific guidance on international treaties, such as the Basel Convention, that might affect the conduct of military operations in a particular AOR.

1.3.5. **Applicable AF Instructions.** Policy Directives and several AFIs implement the AF environmental program. These documents provide guidance and procedures for environmental planning and compliance.

1.3.5.1. AFI 32-7006, *Environmental Program in Foreign Countries*, outlines environmental requirements for OCONUS deployments and provides guidance for exercise or contingency environmental plans. It provides numerous sources of information for assistance in developing an environmental plan that will ensure compliance with applicable environmental guidance.

1.3.5.2. AFI 32-7086, *Hazardous Materials Management*, outlines hazardous materials (HM) management and AFPAM 32-7043, *Hazardous Waste Management Guide*, outlines hazardous waste (HW) management. Although these publications are primarily applicable to permanent CONUS bases, they contain excellent guidance that can be used to implement an effective environmental program during sustained contingency operations. The guidance in these publications can assist in developing very effective HM/HW management plans. In addition, once the guidance is extracted, it can be lawfully integrated into environmental standard operating procedures at the JFC's discretion. Always be cognizant of force protection and the mission, and be careful about recommending environmental policies that might negatively impact personnel health, operational readiness, or the ability of forces to accomplish the mission.

1.3.5.3. Armed Forces Pest Management Board - Technical Guide No. 24, *Contingency Pest Management Guide*, provides guidance on using pesticides, pesticide application equipment, and other techniques to control arthropods, vertebrate, vegetation, and other pests during contingencies. Pesticides are used in conjunction with other traditional pest management methods as part of an overall Integrated Pest Management (IPM) program. Additional guidance in numerous Technical Guides can be found on the Armed Forces Pest Management Board website located at http://www.afpmb.org/. Download the information that will be needed during planning and preparation to make sure it will be available during the deployment.

1.4. Administrative and Disciplinary Action. Personnel who violate environmental rules or laws are subject to discipline. Commanders may take administrative action against violators.

1.5. Responsibilities. All personnel should be knowledgeable of environmental considerations during deployments and consistently follow guidance developed for environmental protection. Although contingency operations present difficult challenges, diligence and persistence will ensure everything possible is done to protect personnel health and safety, minimize damage to the environment, and successfully accomplish the mission.

1.5.1. **Installation Commanders.** Installation commanders guide the activities of military and contract personnel under their authority. They should be briefed on all environmental activities and be immediately notified of any health and safety issues or potential violations of regulatory guidance.

1.5.2. **Unit Commanders.** Unit commanders designate UECs to perform tasks necessary to reduce or eliminate impacts on human health and the environment. While deployed, the UEC functions are the same.

1.5.3. **Civil Engineer (CE).** The CE oversees base operations and construction, and conducts environmental planning in coordination with BEE, Public Health (PH) and Safety. The CE appoints an individual to assist with implementing and managing environmental activities for the deployment.

1.5.4. **Environmental Officer.** The environmental officer integrates environmental protection into daily activities and develops environmental plans to support contingencies. This individual serves as the commander's advocate for environmental concerns throughout all phases of planning and execution. The environmental officer contacts key personnel such as the AOR environmental staff and personnel currently deployed to the region to obtain all available information on the proposed deployment site.

1.5.5. **Individual.** Every individual must receive environmental awareness training. Individuals should be aware of environmental requirements associated with their deployed location, avoid areas declared off-limits, identify potential risks associated with certain tasks, immediately report spills, provide recommendations to reduce reliance on HM and enhance environmental protection, and comply with AF and BEE guidance on wear of personal protective equipment (PPE). Training should be obtained through the Environmental Flight prior to deploying. Hazard Communication (HAZCOM) training is conducted by each shop using Hazardous Material (HAZMAT). The Fire Department and/or Readiness Flight provides Hazardous Waste Operations (HAZWOPER) training. In addition, there are numerous sources for training on-line such as the Air Force Center for Environmental Excellence's web university.

1.5.6. **Medical Group.** The Medical Group includes a Preventive and Aerospace Medicine (PAM) team comprised of Aerospace Medicine Specialists, PH, BEE, and Independent Duty Medical Technicians (IDMTs). This team is designed to prevent DNBI during contingency operations. The PAM team assesses environmental and occupational health hazards and risks, evaluates safety and vulnerability of local food/water sources, performs Chemical, Biological, Radiological, and Nuclear (CBRN) assessments and emergency response, performs epidemiological risk assessments, evaluates local medical capabilities, performs vector/pest risk assessments, determines the adequacy of local billeting and public facilities, and provides medical intelligence. The PAM team also provides input for the site layout and operations, particularly on food, waste, characterization of water quality, billeting, and medical and sanitation facilities. The PAM team leader is considered the functional expert in casualty prevention.

1.5.7. **Coalition Forces.** U.S. forces work closely with forces from other nations and other U.S. agencies during contingencies. All components are covered by the same OPLAN during contingencies. When the U.S. is the lead agency with responsibilities to maintain base operations, this includes environmental protection. It is essential to provide coalition forces environmental awareness training before and during conflict operations.

1.5.8. **Contracting Officer.** The contracting officer ensures engineering and environmental contract projects comply with applicable environmental guidance, ensures all Performance Work Statements (PWSs) stipulate environmental requirements and contract proposals include detailed plans and costs associated with environmental considerations that must be addressed.

1.5.9. **Contracting Officer Representative (COR) and Quality Assurance Personnel (QAP).** The COR and QAP ensure contractors meet requirements outlined in the PWS. For assistance with training or inspection requirements, contact the AOR environmental staff, who may be able to provide checklists tailored for a particular AOR.

1.5.10. **Contractors.** Contract personnel providing services under a PWS must comply with DOD environmental regulations specified in the PWS. The contractor must include proposed methods to ensure compliance with the PWS in his/her proposal and fully comply once the contract is initiated. The COR and QAP oversee the contractor during performance of the contract.

1.5.11. **Defense Logistics Agency (DLA) and Defense Reutilization and Marketing Service (DRMS).** DRMS, which falls under DLA, establishes on-site support within or near the AOR to manage disposal of HW. DRMS is subject to applicable force protection and/or security concerns within the contingency environment. DRMS develops guidance on turn-in procedures for HW and excess HM. Attachment 7 contains examples of documentation that may be required by DRMS. Once turned in by U.S. forces, DRMS is responsible for ensuring the HW is properly treated and disposed of in an environmentally safe manner. DRMS determines the optimum HW treatment and disposal options for the AOR and ensures DRMS contracts achieve cost-effective disposal consistent with DOD's emphasis on environmental leadership. For additional information on DRMS services and processes, search the DRMS website located at http://www.drms.dla.mil. Time permitting, download as much information that may be needed to portable media (CD, thumb drive, etc.) prior to deploying in case internet access is not immediately available.

Chapter 2
PREDEPLOYMENT PLANNING

2.1. Overview. Environmental planning must be an integral part of contingency operations. A dedicated and motivated environmental officer should be appointed immediately upon notification of a potential deployment. The environmental officer must be intimately involved in planning, site selection, and beddown. Obtain as much existing information as possible for environmental planning. In many instances, documentation may already exist for certain deployment areas, particularly if previous deployments have occurred at or near the location.

2.1.1. **Risk Management.** Risk Management is an effective method for ensuring all environmental concerns are addressed. Environmental risk management matrices can be used to identify when, where, and how planned training activities or fast-paced military operations might cause damage to the environment and to what extent. Plans can then be adjusted to minimize adverse effects on the environment and personnel without jeopardizing the mission. This increases the overall chance of mission success.

2.1.2. **Documentation.** The key to predeployment planning is documentation. Obtaining any available information for inclusion in operational, environmental, and beddown planning is valuable. Contact the AOR environmental staff and the servicing Logistics Plans office to see if survey data for the proposed deployment site is available. There are several automated assessment tools fielded and under development that may contain most of the survey data needed. However, if no information has been previously collected, it becomes more important as an addition to the operational plan. Taking photos, using Geographic Information Systems (GIS) information, Global Positioning System (GPS) data, and interviewing any knowledgeable or available people about prior existing conditions and local population will be helpful in preparing an Environmental Baseline Survey (EBS). The EBS will serve as a critical reference in the event liability disputes arise over land usage during deployments.

2.2. Resources and Reports. Following are examples of predeployment contacts, reports and information available, and guidance on using this information to plan for a successful contingency operation while ensuring personnel and resources are protected.

2.2.1. **AOR Environmental Staff.** Contact the AOR Environmental staff or the Environmental Office at the deployed location early in the planning phase. The person contacted for predeployment information can serve as the point of contact (POC) during and after the operation. The AOR Environmental staff serves as the focal point for all available policy, guidance, surveys, and reports and should be available to assist throughout planning, execution, and redeployment.

2.2.2. **Environmental Surveys and Reports.** Environmental surveys have already been conducted on many regions of the world, and site-specific surveys have been conducted on past and potential beddown locations. This information is typically available at the MAJCOM or FOA/DRU level and can be used for environmental planning and site layout.

2.2.3. **Environmental Health Site Assessment (EHSA).** The EHSA is usually the first report prepared for a potential deployment location. It is usually prepared by AF Bioenvironmental Engineers or the U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM). The EHSA is conducted according to American Society for Testing and Materials (ASTM) Standard E2318-03. The purpose of the EHSA is to identify any contaminants present, disease vectors, or environmental conditions that may pose health risks. During the assessment, medical personnel identify areas of concern where deployed personnel may become exposed to hazards such as radiological or other hazardous waste burial or storage sites, known contamination and pollution affecting the air, soil and/or water sources, climate conditions, etc. The report will contain results from soil, air, surface water, and drinking water sampling. In addition, industrial facilities such as chemical or power plants located near the potential site, are examined to determine if current operations or accidental releases could result in catastrophic risk to deployed personnel.

2.2.4. **Environmental Impact Analysis Process (EIAP).** Executive Order (E.O.) 12114, *Environmental Effects Abroad of Major Federal Actions*, requires environmental impacts to be considered when planning federal actions outside U.S. territory. DOD Directive (DODD) 6050.7, *Environmental Effects Abroad of Major Department of Defense Actions*, implements E.O. 12114 and requires environmental assessments to be conducted prior to military action in foreign countries. The results are used to determine if an environmental impact statement, environmental study, or environmental review is required, or if a request for categorical exclusion should be submitted. Executive Order 12114 provides for exemptions from these requirements for actions taken by the President or a cabinet officer, such as actions taken in the course of armed conflict. The AOR Environmental staff and MAJCOM functional experts determine EIAP requirements. The DENIX website also contains information on the EIAP.

2.2.5. **Risk Assessment (RA).** A Risk Assessment (RA) is normally included in the EIAP and can be conducted prior to operations to determine potential environmental impacts. The RA can be used to assess alternative methods or actions which might minimize environmental impacts. The RA is also used to determine the level of acceptable risk in the contingency environment when operations take priority.

2.2.6. **Environmental Baseline Survey (EBS).** The EBS is used to document existing conditions of a potential beddown location. It is an absolutely critical survey that should be initiated prior to deploying and completed immediately upon arrival. The EBS can prevent the U.S. from being held liable for contamination in areas where contamination was present before U.S. forces arrived. It is used to document all environmental data, including hazardous materials, pollution, geography, water resources, soil characteristics (Figure 2.1), previous use, and local population. U.S. Central Command Regulation 415-1, *Construction and Base Camp Development in the USCENTCOM Area of Responsibility (AOR)*, also referred to as "The Sand Book," and Field Manual (FM) 3-100.4, *Environmental Considerations in Military Operations*, contain guidance on preparing the EBS. Instructions for completing the EBS can be found in Attachment 2.

Figure 2.1. Soil Samples Being Collected for Analysis.

2.2.7. **Environmental Condition Report (ECR).** Depending on the duration of the deployment, an ECR can be prepared periodically to document existing site conditions or when a potentially significant environmental incident occurs. It can be used to provide "interim snapshots" of site conditions over a period of time and document the types of HM/HW stored at the site. In addition, the ECR can be used as a reference document to complete the site closure report once it is determined a site will be abandoned (see Attachment 3 for the ECR format).

2.2.8. **Closure Report.** The closure report is prepared upon notification that a site is to be abandoned. This report is critical to protecting the U.S. against unsubstantiated claims of environmental damage. Along with the initial EBS, it can be used to determine if U.S. forces are liable for environmental damages. The report should include photographs and detailed information on all environmental factors considered during the initial EBS. The report should also list the method of remediation and intent to restore the site to its previous condition if required. Contact the AOR Environmental POC for proper closure activities, report formats, and assistance.

2.2.9. **Geographic Information Systems (GIS).** Geographic Information Systems can be a force multiplier in conducting environmental planning and assessments if this type of information is available for the proposed deployment location. GIS data saves commanders a considerable amount of time since all of the information needed to effectively plan does not have to be obtained through ground surveillance or from other potentially unreliable sources. The need to deploy reconnaissance forces into potentially dangerous areas to obtain information can be eliminated in some cases if GIS information is available. Keep in mind, however, GIS data analysis cannot suffice for a full-blown site survey where air, water, and soil sampling is conducted along with the identification of numerous other potential health threats. Satellite imagery can assist commanders with critical tasks such as terrain analysis and water source identification. The National Geospatial-Intelligence Agency (NGA) provides satellite imagery (usually classified), often accompanied by reports outlining a variety of environmental factors for a particular location. These reports may also include historic data that will assist with site planning. GeoReach, an expeditionary site mapping tool, compiles all expeditionary site survey data into a single view. Contact the AOR Environmental POC to determine if this information is available for a particular site or region. The Air Force Special Operations Command (AFSOC) has developed a GIS tool that assesses risks at forward operating locations. The Global Situational Awareness Tool (GSAT) is an assessment model that aids the site selection process, unit basing, and troop movement planning. It integrates a variety of environmental, geographical, and epidemiological information with user-defined areas of interest to assess suitability, safety, and occupational health risks and provides alternatives for mitigating risks where possible. GSAT is designed to work with existing mapping and expeditionary basing tools, such as GeoReach, to provide risk reports and scalable effects maps of areas on/surrounding airfields, encampments, and movement areas. It provides detailed reports, maps, and data that can be used to assess risks to personnel, health, and readiness that might result from factors such as weather, flooding, soil composition, pests, industrial discharges, nuclear contamination, and endemic diseases. Contact the AFSOC Environmental Office or Command Surgeon to gain access to this information.

2.2.10. **Air Force Contract Augmentation Program (AFCAP).** As with GIS, AFCAP is also a force multiplier. This contract option is used to augment civil engineer capabilities, principally in lesser contingencies and sustainment operations, when it is expected an operation will continue for an extended period of time (Figure 2.2). AFCAP support generally cannot be used during initial beddown in high-threat environments. However, once contingency operations begin to stabilize, this support can be used to help transition from initial facility and utility beddown standards to semi-permanent facilities and infrastructure. Contractors employed under this option will have access to any commercially available equipment (i.e., generators, HVAC equipment, vehicles, tools, etc.) and can assume management of critical functions such as Petroleum, Oils, and Lubricants (POL) storage and distribution, Solid Waste (SW) management, HM Pharmacy, HW accumulation points, pest and vegetation control, and limited cleanup activities. The environmental officer should consider this option during the earliest stages of planning. Requests for AFCAP support are channeled through the MAJCOM Civil Engineer. For more information on AFCAP support, access the AFCESA website at https://wwwmil.afcesa.af.mil.

Figure 2.2. AFCAP Contractor Providing Power.

2.3. Environmental Planning Considerations. Environmental planning is critical, and making contact with key environmental personnel in the AOR is absolutely necessary. Alternate plans may need to be developed to mitigate damage to the environment and eliminate threats to human health. Table 2.1 contains environmental factors that should be addressed during planning.

Table 2.1. Environmental Planning Considerations.

Environmental Planning Considerations
Access to and availability of supplies locally or within the AOR
Lack of a government or proximity to a functioning government
Level of support from local population (hostile, cooperative, etc.)
Existing agreements with HN for HW, SW and liquid waste disposal
Condition and capacity of terrain, roads, bridges, utility infrastructure
Climate conditions of the region, including seasonal weather hazards
Soil type/percolation rates on construction and waste management
Potential impact of natural and/or cultural resources on the mission
Impact of regional precipitation (including seasonal) and flood plains
Impact of vectors and poisonous or dangerous rodents and animals
Potential for existence of unexploded ordnance or depleted uranium
Potential for site contamination from previous occupation/activities
Potential for contamination from off-base/local industrial plants
Potential for water source contamination from storm water runoff
Potential for air pollution from the site or nearby industrial activities
Potential for noise pollution from the site or nearby local activities
Safe and adequate water resources, location, and means of protection
Wastewater management requirements, resources, and equipment
Solid waste management requirements, resources, and equipment
Pest management requirements, resources, equipment, and supplies
Medical waste management requirements, resources, and equipment
Hazardous Material (HM)/Hazardous Waste (HW) equipment/supplies

2.4. Site Selection and Survey. The site selection and survey processes are critical aspects of operational planning. Site selection decisions are usually made at the operational level. AFI 10-404, *Base Support and Expeditionary Site Planning*, governs the Expeditionary Site Planning (ESP) process. Once sites are selected, the Expeditionary Site Survey Process (ESSP), a subset of ESP, is used to guide the site survey effort. A great deal of environmental information on a proposed site may already be available as a result of previous deployments to the area. Aerial or space-based imagery may also be available. This data can be used as a starting point for the site survey. Site survey teams can be sourced from different organizations based on combatant command (COCOM) authority. Some examples of Air Force units that may be tasked to perform site surveys are 820 CRG (CENTCOM), 86 CRG (EUCOM), 613 CRS (PACOM), and Deployable Air Mobility Operations Groups (AMOGs) from the Air Mobility Command (TRANSCOM). These contingency response units can be augmented by functional experts from other organizations including the Air Force Medical Service (AFMS), AFCESA, and RED HORSE units. Survey teams usually include functional experts from a variety of areas including Security Forces, Civil Engineering, Medical, Contracting, Fuels, Munitions, Legal, Weather, and Communications. The environmental officer should make every effort to be a part of the ESSP to ensure environmental considerations are integrated into site layout and beddown planning. Every possible environmental factor should be considered and addressed during the site survey. Prevailing wind direction, drainage, and water tables are just a few examples of factors that must be considered when focusing on site layout. This type of information should be used to determine where to set up industrial, airfield support, and billeting activities. While planning, anticipate and designate potential expansion areas to allow for safe distances between airfield operations and personnel work and living areas. This is also a good opportunity to begin developing a list of equipment and supplies that will be needed (i.e., spill kits, drums, tarps, concertina wire, etc.) to manage HM/HW until resupplies begin to arrive or approval is granted to procure such items locally (see Attachment 5). The remainder of this chapter covers the many environmental aspects that should be considered during site surveys and beddown planning.

2.5. Environmental Plans. Use all information obtainable on the deployed location along with details outlined in the OPORD/OPLAN to develop strategies to ensure environmental considerations are integrated into all phases of contingency operations. Standard Operating Procedures (SOPs) are needed to instruct personnel on accomplishing routine tasks in an environmentally safe manner. Address the elements listed in Table 2.2, and keep in mind environmental considerations may increase as the operational security threat decreases. Assumptions might need to be made when data is lacking or when environmental issues, such as solid waste disposal, have not been resolved. Continually review plans, make adjustments as needed, and ensure personnel are trained, equipped, and prepared to carry out their assigned responsibilities prior to deploying.

Table 2.2. Environmental Plans.

Environmental Plans
Site-specific environmental Concept of Operations (CONOPS)
Pollution Prevention (P2) plan (conservation, recycle, reuse, etc.)
Procedures for spill prevention, response, containment, cleanup
Identification, location, and BEE approval of all water sources
Plan and methods for treating, reusing, disposing of gray water
Plan and methods for managing wastewater (treatment/disposal)
Plan to minimize the impact of storm water on water resources
Plan for safe and proper disposal of non-hazardous solid wastes
Plan to store, secure, utilize and dispose of pesticides/equipment
Plan to handle, transport, segregate, store, label and issue HM
Plan to handle, collect, segregate, store, label and dispose of HW
Plan to store, secure, issue petroleum, oils, and lubricants (POL)
Plan for segregating, treating, and disposing of medical waste
Plan to minimize the impact of air pollution on personnel health
Plan to protect/preserve natural, cultural, and historical sites
Plan to protect and preserve flora and fauna within the region

2.6. Pollution Prevention (P2). Planning for P2 will help prevent unnecessary exposure to environmental hazards (Figure 2.3). Methods of P2 can be mechanical solutions, product substitution, changes to SOPs, conservation, recycling, and waste output reduction. By identifying the need for certain resources early in the planning process, the environmental officer can help to minimize the impact of environmental conditions that might hinder the success of the mission. Considering the long lead-time for supplies at remote locations, it is best to plan for and order the equipment and supplies that will be needed during the initial planning phase and have these items shipped with the operational equipment. If the deployed site is already occupied by U.S. or coalition forces, contact the personnel involved with environmental functions to get as much information as possible. This insight will help to determine what will be needed during the course of the trip and immediately upon arrival. Always keep copies of requisition documents/receipts for continuity.

Figure 2.3. Polluted Forest Area.

2.7. Water Resources. A safe and adequate supply of water must be available for deployed personnel. Although bottled water may be used during initial stages of contingency operations, plans must be in place to shift from bottled water to water production. Ensure all water sources identified are approved by the BEE, and develop a plan for purifying, storing, transporting, and distributing potable water to predetermined water points (Figure 2.4). While planning, do not forget to consider the amount of supplies that will be needed to sustain the initial deployed force. Population estimates will be needed in order to calculate the amount of potable water needed to be produced and stored to sustain the deployed force, including contractors and host nation personnel directly supporting the mission. Consult the BEE in considering where water purification and testing can be conducted and to ensure there will be sufficient space between water resources and other activities such as leach fields, retention ponds, HM\HW storage, and waste disposal activities. For specific guidance on establishing and maintaining a potable water production capability during deployments, refer to AFPAM 10-219, Volume 5, *Bare Base Conceptual Planning Guide,* and the U.S. Army's Technical Bulletin (TB) MED 577, *Sanitary Control and Surveillance of Field Water Supplies.*

Figure 2.4. Typical Water Source.

2.8. Wastewater. Black water (predominantly human waste) and gray water (wastewater from showers, laundry, kitchen, etc.) collection and treatment areas must be considered. Local support for treatment and disposal may not be available or feasible based on the location or mission. If expeditionary methods are used to manage wastewater, site latrines, the dining facility (DFAC), laundry, leach fields and ponds at least 50 meters downgradient from water sources, intakes, and surface bodies of water. Leach fields and ponds should also be downwind of living and work areas. Separate gray water and black water storage and treatment areas, and consider constructing a gray water collection pond (Figure 2.5) to collect and use gray water for dust suppression, construction activities, laundry, and irrigation. Depending on usage, the collected gray water may need to be treated before using it for other purposes. The BEE will make this determination. Ensure U.S. wastewater activities will not impact HN water. For details on erecting and constructing field expedient wastewater collection and treatment systems, refer to AFPAM 10-219, Volume 5, *Bare Base Conceptual Planning Guide.*

Figure 2.5. Gray Water Collection Pond.

2.9. Non-hazardous Solid Waste (SW). If a local contract is not established at the deployed location, plans must be developed for SW disposal using expedient methods. Landfill (Figure 2.6) or burn pit operations can be used initially. Site SW activities downwind and a safe distance from personnel and water sources, away from areas with high water tables, channels, creeks, and areas significantly impacted by storm water runoff. Consider soil characteristics; look at topography, soil permeability, potential for runoff, etc. Keep in mind SW activities attract rodents, snakes, etc., and must be considered in plans for pest management. Coordinate pest management plans with Public Health (PH).

Figure 2.6. Landfill Operations.

2.9.1. **Landfills.** Landfill operations attract large birds and flocking birds that are hazardous to aircraft operations. If possible, landfills should be sited at least 10,000 feet from active aircraft ramps, taxiways, and runways where fixed-wing and variable geometry wing jet aircraft operate. This may not always be practicable when deployed in support of contingency operations in foreign countries. The working face of the landfill should be kept as small as possible. Solid wastes should be compacted and covered with a minimum of six inches of soil to discourage bird activity. Units should deploy with lethal bird control and dispersal equipment along with trained personnel. Pyrotechnics are very effective and highly recommended for bird dispersal. Bird dispersal equipment should be immediately available to disperse birds when landfill operations are being conducted. The use of shotguns for lethal control may be necessary to reinforce dispersal techniques. If it is impracticable to site a landfill outside of the 10,000 foot criterion, bird dispersal and lethal control activities must be coordinated with air traffic control to avoid dispersing birds into the path of arriving and/or departing aircraft. Before employing lethal controls ensure that birds targeted for depredation are not protected by host nation laws or international treaties.

2.9.2. **Burn Pits**. Weather personnel track wind speed and direction to help establish typical or prevailing wind data. Use this data to best orient burn operations to keep the path of plumes away from other activities as much as possible. Designate space adjacent to the burn area to establish a Property Holding Area (PHA) for segregating and storing items not being burned (i.e., toxic materials, refrigerators, fuel bags, metal, etc.). Consult BEE to determine what items can be burned. Lastly, consider equipment requirements (i.e., backhoe, front end loader, etc.) and material needed to limit site access.

2.10. Hazardous Material/Hazardous Waste. Site HM/HW storage in an industrial area large enough to meet anticipated needs (Figure 2.7). Select a site downwind and a considerable distance away from living and work areas. Also, make sure the area is not near a water source and the surface is level. Although it may not be possible initially, at some point, the storage area should be upgraded to include concrete or other types of flooring that can serve as secondary containment. The site should be near service roads for access by vehicles and potential contractors. Develop standard operating procedures for HM/HW management that can be tailored upon arrival at the location. If Satellite Accumulation Points (SAPs) will be set up, establish procedures to periodically inspect these areas (see checklist in Attachment 4). Deploy with a sufficient amount of spill response supplies, at least enough to absorb 110 percent of the largest container on-hand. A wealth of information on managing HM/HW can be downloaded from the Defense Environmental Network and Information Exchange website at https://www.denix.osd.mil. The Air Force Center for Environmental Excellence also has a website where information can be downloaded prior to deploying, located at http://www.afcee.brooks.af.mil. More information on handling HM/HW during the initial deployment and sustainment phases of contingency operations will be covered in later chapters.

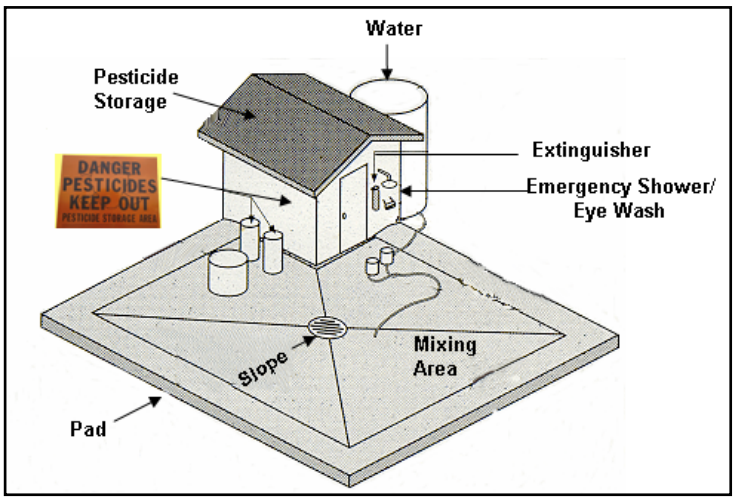
Figure 2.7. Hazardous Waste Storage.

2.11. Regulated Medical Waste (RMW). Plan for regulated medical waste (also referred to as infectious medical waste) storage areas near medical units (Figure 2.8), and make sure these areas can be secured. Keep in mind, RMW must be separated from general waste at the point of origin because handling, storage, and disposal procedures for RMW differs significantly from those procedures used to manage other HW. For pathological wastes, factor in space for power generators and refrigeration units needed for storage. In addition to waste storage, plan for space needed to store supplies, including spill and cleanup kits, medical storage bags, sharps containers, storage drums, PPE, and shipping labels. If contract disposal is not immediately available upon deployment, an area can be set aside near the SW disposal facility to set up an inclined-plane field incinerator for medical waste. For construction details, refer to FM 21-10-1, *Unit Field Sanitation Team*. Construct a berm or fence around the medical waste incinerator to prevent unauthorized access. Plan to post warning signs in both the medical waste storage and disposal areas. For additional information concerning management of RMW, refer to 29 CFR Part 1910.1030, Occupational Exposure to Bloodborne Pathogens.

Figure 2.8. Designated Medical Waste Storage.

2.12. Pest Management. Identify entomological hazards associated with the area or region. Of primary concern are vector-borne diseases carried by arthropods such as mosquitoes, ticks, and mites. Additional hazards include biting/stinging arthropods (fire ants, spiders, scorpions, etc.), rodents, snakes, bats, birds, and poisonous plants. Download pest management information from the Armed Forces Pest Management Board (AFPMB) website at http://www.afpmb.org/. This information will help in developing plans and establishing an effective pest management operation. Consult with PH when developing pest management plans. Designate a storage and mixing area away from personnel and water resources. Consider space needed for storage, mixing, pesticide and safety equipment, supplies, secondary containment, etc. (Figure 2.9). Plan for fencing to control access and for storm water retention areas to prevent runoff and possible contamination of other resources. Also plan for treatment of leach fields, ponds, and storm water retention areas. Designate an area adjacent to the SW disposal area for incinerating and/or burying pests removed from the site.

Figure 2.9. Pesticide Storage Area.



2.13. Storm Water. Planning for storm water is critical to determining the amount of equipment and supplies that may be needed immediately upon arrival. Storm water is precipitation that runs off impervious surfaces and does not naturally infiltrate the soil. As a result, it eventually flows into lakes, rivers, streams, and other bodies of water. This happens either naturally or by conveyance as a means to prevent flooding and eliminate standing water in certain areas (Figure 2.10). Storm water can carry contaminants, such as plastic bags, detergents, heavy metals, chemicals, biological contaminants, and other pollutants, directly into natural water resources. This result, along with pooling in certain areas that can become breeding grounds for disease-carrying insects, is a definite health concern. During planning, consider factors such as soil permeability and natural features that minimize the impact of storm water runoff. Although these and other factors should be considered during site selection, the flexibility to avoid certain areas during contingencies may not always be available. Plans must be made to minimize the impact of storm water runoff on natural water sources and in camp areas.

Figure 2.10. Storm Water Being Conveyed.

2.14. Air Pollution. In the U.S., where strict environmental laws are in place to govern activities that contribute to air pollution, safe air to breathe might be taken for granted. For military operations in foreign countries, the quality of air is of significant importance. Military operations suffer if DNBI rates caused by air pollution in foreign countries begin to take a toll on personnel. This potential hazard must be considered during planning. The EBS and EHSA will provide crucial information concerning the quality of air in the proposed region of deployment. If these reports were previously prepared, they will be invaluable for planning. All of the information gathered about the site should be used to develop strategies to minimize the impact of air pollution on the health of deployed personnel. The risks associated with nearby industrial facilities (Figure 2.11) that could pose a health risk to personnel must be considered. Chapter 3 contains information that can help minimize air pollution during initial stages of contingency operations. Chapter 4 provides additional information and guidance focused on integrating environmental practices into daily operations and further protect the environment and the health of deployed personnel.

Figure 2.11. Industrial Plant.

2.15. Natural/Cultural Resources. Natural and cultural resources such as flood plains, marshlands, lakes, rivers, certain plant/animal species and their habitat, archeological sites (Figure 2.12), burial grounds and other historic facilities can restrict beddown plans and limit military operations. These resources are preserved for the inspiration and benefit of HN citizens. Conduct research, access all environmental sources of information available on the region, contact key environmental personnel in the AOR, and query the local population during the site survey, if feasible, to obtain as much information about natural and cultural resources in the region as possible. Map these areas (i.e., districts, sites, buildings, miscellaneous structures, etc.) in relation to any proposed beddown location(s). Attempt to site all military activities at least 50 meters from these areas. Consider developing a plan to protect these areas to the extent possible by making personnel aware of these assets prior to deploying and developing SOPs that can be integrated into official environmental guidance applicable to the military operation. If any operation may result in damage or destruction to these assets, commanders must be made aware and given the opportunity to make adjustments to plans and/or balance this factor against the need to maintain operational capability.

Figure 2.12. Historic Site in Iraq.

2.16. Flora and Fauna. Flora and fauna include all plant and animal life found in a particular region (Figure 2.13). Although force protection and mission accomplishment must take precedence during contingencies, care must be taken to avoid destroying flora and fauna, which could be a significant part of a host nation's culture and pride. Ideally, areas of significant importance to host nations should be avoided. However, mission priorities and force protection could make some damage unavoidable. Plans must be developed to eliminate or minimize the impact of military operations on flora and fauna of host nations to ensure continued access to certain areas and host nation cooperation during contingencies. Time permitting, research the flora and fauna for the region of the proposed deployment and consider these environmental factors during planning.

Figure 2.13. Flora and Fauna.

Chapter 3
INITIAL BEDDOWN

3.1. Implementing Environmental Management. Initial stages of contingency operations are usually characterized by austere facilities and limited supplies and equipment, making it difficult to implement environmental protective measures. However, action must be taken to protect the environment or personnel health will suffer. In addition to the OPORD, which contains guidance on environmental considerations, Table 3.1 contains key tasks necessary to implement environmental management activities.

Table 3.1. Implementing Environmental Management.

Environmental Management Initial Beddown
Appoint an environmental officer for program planning and oversight
Make initial contact with the deployed units, BEE, Safety, PH, Fire
Establish environmental continuity (SOPs, contacts, file plans, etc.)
Requisition additional environmental equipment and supplies needed
Determine if site layout threatens personnel health or the environment
Appoint personnel to manage Hazardous Waste Storage Area (HWSA)
Train personnel on HWSA management and provide PPE
Appoint and train personnel to manage burn pit and landfill operations
Appoint UECs to manage and oversee unit environmental activities
Conduct environmental awareness training for all deployed personnel
Conduct HM/HW training for personnel who will handle HM/HW
Appoint teams and conduct spill prevention and response training
Conduct required Hazardous Communication (HAZCOM) training
Focus on pollution prevention; begin monitoring site activities
Implement ideas for HM/HW/SW substitution, reduction, recycling
Initiate research on disposal options via DRMS or local contract

3.2. Pollution Prevention (P2). The preferred means of protecting human health, mission assets, and the environment is through pollution prevention. During initial beddown, the operational tempo will be high and the focus will be on the mission; P2 will be difficult. Nevertheless, environmental considerations must be integrated into beddown activities or personnel health will suffer. The personnel involved in the initial stages of deployment must understand that protection of the environment helps to ensure their own survival. It can be difficult to rely on an environment that is being constantly polluted for survival. Work to minimize losses to DNBI as a result of poor environmental practices. Table 3.2 contains tasks that can be accomplished during initial beddown to minimize the impact of pollution on personnel health and the environment. Chapter 4 contains recommendations to guide P2 efforts once the focus shifts to sustainment.

Table 3.2. Implementing Pollution Prevention (P2).

Pollution Prevention (P2) Initial Beddown
Conduct environmental awareness training for all personnel at the site
Develop site-specific P2 plan in conjunction with PH, BEE and Safety
Identify sources of pollution; develop goals for reduction or elimination
Prohibit wastes from being improperly dumped or buried on the site
Ensure liners are used at HM/HW storage, SW disposal, refueling areas
Ensure HM/HW storage areas are located far from billeting/work areas
Conduct frequent HM/HW spill prevention training/response exercises
Establish SW activities downwind and downgradient of water sources
Separate RMW at the point of generation and consult BEE on disposal
Construct leach fields at a lower elevation, far away from water sources
Construct holding ponds at a lower elevation and far from living areas
Collect, treat, and reuse gray water for vegetation and dust control
Encourage recycling/conservation; focus on HM/HW/SW/water supply

3.3. Water Resources. Safe and adequate water supplies are critical to sustained military operations. During beddown, the CE, BEE, PH, and Safety personnel must work together to ensure water sources are adequate and protected from intentional or unintentional contamination. Table 3.3 contains some elements to consider in managing water resources during the early stages of deployments. Detailed guidance on managing water supplies can be found in the U.S. Army's Technical Bulletin (TB) MED 577, *Sanitary Control and Surveillance of Field Water Supplies.*

Table 3.3. Managing Water Resources.

Managing Water Resources Initial Beddown
Develop site-specific SOP for managing water resources and supplies
Test several water sources to determine the sources of higher quality
Ensure all water sources have been approved by medical personnel
Ensure all treated water is certified as potable by medical personnel
Establish water storage and water points; include alternate locations
Conduct routine testing of water points (tanks, trailers, bladders, etc.)
Plan to control source contamination from soil erosion and storm water
Plan to secure and protect water sources from intentional sabotage
Designate a secure and covered area to store bottled water supplies
Develop plan for sanitary control and surveillance of water supplies
Frequently test water sources and water supplies for contamination
Test water distribution points (showers, laundry, etc.) for contamination
Use HN support for water requirements if agreed upon and approved
Absent HN support, set up ROWPU as close to the source as possible
Ensure waste disposal activities are downgradient of water sources
Ensure refueling operations are as far from water sources as possible
Minimize refueling operations over raw water sources if possible
Closely monitor the quantity of water purification equipment/supplies
Clean and disinfect water storage/distribution equipment regularly

3.4. Managing Wastewater. Wastewater generated during contingency operations can total 16 gallons per person per day. Wastewater is typically separated into different types, including gray water and black water.

3.4.1. **Gray Water.** Gray water is produced from kitchen activities such as food preparation and equipment sanitation. This type of gray water is heavily contaminated with food particles, cooking oils, grease, detergents, and other cleaning agents, and usually cannot be reused for other non-potable purposes. Gray water produced by shower and laundry facilities can be treated and reused for laundry, washing vehicles, vegetation, fire fighting, dust suppression, construction activities, etc.

3.4.2. **Black Water.** Black water refers to latrine water containing human waste. Many methods exist for disposing of black water. Preferred methods include use of HN fixed facilities and systems or chemical latrines supplied and serviced via local contract. However, these options are not always available or feasible, and expedient methods may have to be employed. Effective treatment and disposal of black water must be accomplished to prevent the spread of disease and to ensure the site does not become infested with flies, rats, and other vermin that cause diseases such as dysentery (amoebic and bacillary), typhoid, paratyphoid, and cholera.

3.4.3. **Expedient Methods.** There are many expedient methods that can be employed to handle wastewater. For example, evaporation beds can be used along with ditches to direct gray water to certain areas for collection, treatment, reuse, or disposal. Table 3.4 contains elements to consider in managing field wastewater. For detailed guidance on constructing and managing expedient wastewater collection and treatment systems under field conditions, refer to AFPAM 10-219, Volume 5, *Bare Base Conceptual Planning Guide*, and FM 21-10, *Field Hygiene and Sanitation.* Additional guidance for managing wastewater can be downloaded from the Air Force Institute for Operational Health website located at http://www.brooks.af.mil/afioh or the U.S. Army Center for Health Promotion and Preventive Medicine (CHPPM) website at http://chppm-www.apgea.army.mil.

Table 3.4. Considerations for Managing Wastewater.

Managing Wastewater Initial Beddown
Erect Basic Expeditionary Airfield Resources (BEAR) assets if available
Consider use of chemical toilets and HN support for disposal if feasible
Designate areas for soakage pits and trenches to dispose of gray water
Perform soil percolation test on areas designated for pits and trenches
Use grease traps to remove fats, oil, and grease from kitchen wastewater
Construct soakage pits near DFAC to avoid need to transport wastewater
Provide two pits to allow a rest period for each pit every other day
Use soakage trenches if the groundwater table is too high for soakage pits
Use evaporation beds in hot/dry climates where soil percolation is bad
Build enough beds to flood each one on successive days and rotate use
Inspect areas for standing water that could indicate bad soil percolation
Construct drainage to convey gray water to a designated collection area
Ensure gray water collection area is located downstream of water sources
Collect, treat, and reuse gray water for vegetation, dust suppression, etc.
Include latrines and treatment/disposal areas in pest management program
Determine if applicable guidance prohibits any type of expedient latrines
Base the type of latrines on the location, duration, climate, HN restrictions
Site latrines 30 meters downhill/downwind of water sources/personnel
Coordinate with BEE on amount, type, and location of expedient latrines
Consider one commode/urinal per 25 males; one commode per 17 females
Construct separate expedient latrine facilities for urination and defecation
Ensure field expedient hand washing devices are located adjacent to latrines
Construct leach field for on-site physical, biological, chemical treatment
Recover/transport waste to on-site or approved off-site disposal facility
Construct screens around expedient latrines to prevent filth fly breeding
Include gray water collection/pooling areas in pest management program

3.5. Solid Waste. Solid waste buildup can quickly become a health hazard during contingency operations, attracting dangerous animals and disease-carrying insects. Examples of solid wastes include construction debris, packing materials, plastic, water and food containers, and scrap wood. Under ideal conditions, the DRMS establishes a PHA. However, DRMS capabilities may not be integrated into operations until the region is stabilized. Initially, the CE must plan for and manage SW disposal. Tables 3.5 and 3.6 contain elements to be considered in managing solid waste and conducting burn pit operations during initial beddown. For details on constructing and managing landfill operations, reference AFPAM 10-219, Volume 5, *Bare Base Conceptual Planning Guide*. Also, information on managing SW can be found in AFI 32-7042, *Solid and Hazardous Waste Compliance*, or downloaded from either the Air Force Institute for Operational Health website located at http://www.brooks.af.mil/afioh or the Army Center for Health Promotion and Preventive Medicine website at http://chppm-www.apgea.army.mil.

Table 3.5. Considerations for Managing Solid Waste.

Managing Non-Hazardous Solid Waste Initial Beddown
Develop site-specific SOP for collecting/disposing of non-hazardous SW
Determine if HN laws restrict burning; negotiate terms of SW disposal
Coordinate plans for burn pits with BEE, PH, Safety, and Fire Dept
Locate landfill operations downstream and far away from water sources
Install liners in all landfills to prevent leachate releases into groundwater
Cover the landfill area daily with soil to control insect/rodent infestation
Designate space for the PHA and develop a plan to secure the area
Separate hazardous solid waste in the PHA; do not allow it to be burned
Coordinate with other units to gain access to, or purchase an incinerator
Initiate SW disposal contracts if approved by AOR Environmental POC

Table 3.6. Considerations for Burn Pit Operations.

Burn Pit Operations
Use burn pits when other SW disposal options are unavailable
Reference USACHPPM Fact Sheet #65-035-0503 for SW burning
Use solid waste generation estimates to determine burn pit size
Use USACHPPM estimate of 100 lbs of SW per person per day
Coordinate burn operations with Fire Dept, BEE, Safety, and PH
Site burn pits downwind and far away from living and work areas
Select a site large enough to allow for future expansion if needed
Build several chambers to allow for continuous burning operations
Design each chamber to hold 125% of one week's estimated waste
Dig chambers far apart to allow room for equipment to maneuver
Consider reach capability of equipment in determining chamber depth
Use high-density liners in burn pits to minimize soil contamination
Surround chambers with 15-20 feet of earthen berm for added safety
Construct aboveground burn pits in areas with high water tables
Construct berm or fence around burn pits to keep out stray animals
Assign/train personnel to monitor off-loading/segregation/burning
Coordinate with BEE to determine appropriate PPE for operators
Ensure monitors observe burning operations from a safe distance
Exclude HM, UXO, tires, bladders, plastics, metals from chambers
Carefully place solid waste material into one chamber at a time
Conduct a controlled burn whenever the cell reaches 75% capacity
Use one part gasoline to five parts JP8 fuel to ignite the burn
Use a stick or pole to light the fuel while maintaining 3-ft distance
Completely burn all material; remove ash to a landfill holding area
While one chamber burns, use another chamber for additional waste
Consider monitoring equipment to sample pollutants being emitted

3.6. Hazardous Materials (HM). HM include any material, based on chemical or physical characteristics (i.e., corrosive, explosive, flammable, reactive, toxic) that pose a threat to human health and/or the environment if improperly disposed of, handled, stored, or transported. Proper management of HM will reduce personnel injuries and help to protect valuable resources and the environment. All personnel should be familiar with proper methods of handling and storing HM. Table 3.7 contains key elements to focus on when establishing initial HM management procedures.

Table 3.7. Managing Hazardous Materials.

Managing Hazardous Materials Initial Beddown
Develop HM management SOP in conjunction with Fire, BEE, PH, Safety
Store only the amount of HM needed for operations; do not stockpile
Reduce the amount of HM stored through reuse, recycling, or substitution
Establish a centralized HM storage area to provide enhanced accountability
Store HM at least 100 meters downwind and downgradient of living areas
Provide secondary containment to minimize contamination due to leakage
Maintain an accurate inventory of all HM being stored to include locations
Ensure all HM are properly stored, containerized and labeled with contents
Segregate ignitables, reactives, flammables, corrosives (see Attachment 6)
Ensure HM storage area is ventilated and contains an eyewash and shower
Ensure Material Safety Data Sheets (MSDS) are on hand for every HM
Secure HM storage area (ex., fence, berm) to prevent unauthorized access
Conduct routine inspections of HM storage to detect and correct hazards
Ensure personnel handling HM receive HAZCOM and HAZMAT training
Ensure personnel handling HM are trained on Spill Prevention/Response
Ensure personnel handling HM are trained on disposal/turn-in procedures
Ensure personnel handling HM know what to do in case of fire/explosion
Ensure personnel handling HM wear proper personal protective equipment

3.6.1. **Storing HM.** Initially, use whatever space is available to properly store highly volatile items, poisons, and corrosives. Supplies can be very limited during contingencies, and those supplies available may not be the items specified by different manufacturers for handling certain types of HM. Resourcefulness and creativity are essential traits for "making things happen" during contingencies.

3.6.2. **Handling HM**. Employ whatever techniques and materials are available to prevent pollution and properly manage POL, HM and HW. Excess tent parts can be used for expedient storage (see Figure 3.1), expired fuel bags can be used temporarily as liners, sand bags can be used for containment, wooden pallets can be used for flooring and scrap wood, and camouflage netting can be used to build covered storage areas. Construct berms around HM storage areas as barriers. The USCENTCOM "You Spill You Dig" handbooks, available on-line at www.denix.osd.mil (Defense Environmental Network and Information Exchange website), are excellent field expedient environmental guides. These guides provide examples of creative solutions to handling HM/HW.

Figure 3.1. Expedient Storage Facility.

3.7. Hazardous Waste (HW). HW is waste which, if improperly managed, can risk the safety or health of personnel or the environment. HW, as defined by U.S. law, exhibits a hazardous characteristic (i.e., ignitability, corrosivity, toxicity or reactivity) or is listed as HW in 40 CFR Part 261, Subpart D. Ignitable wastes are those with a flashpoint below 140°F. Corrosive wastes consist of acids and bases with a pH less than 2 or greater than 12.5. Toxic wastes, such as polychlorinated biphenyls (PCBs), asbestos, and lead-based paint contain certain levels of specific materials that are harmful to living organisms. Reactive wastes include unstable materials such as munitions and other explosive components. Initially, environmental personnel appointed by the commander manage HW during contingencies. These individuals will set up a centralized HWSA and assist HW generators in setting up satellite accumulation points (at or near the point of generation and under the control of the HW generator). The HWSA could become a target for intentional sabotage, or accidents could happen. For these reasons, do not locate the HWSA near living and work areas. Locate the HWSA far enough inside the camp boundary so that it is not easily accessible to the local population. Also, make sure the HWSA is downwind and downgradient of water sources and in an area not prone to frequent flooding. The HWSA must have enough space to segregate incompatible wastes (reactives, ignitables, corrosives, oxidizers, and toxics), allow for unobstructed movement, and storage for spill response and decontamination equipment. Post warning signs (i.e., “Danger, Unauthorized Personnel Keep Out,” “No Smoking,” etc.) in both English and the language that is predominant for the area. From a broad perspective, key aspects of HW management include collection, storage, transportation, treatment, and disposal. Table 3.8 contains items that should be considered when managing hazardous waste. Always consult with BEE, PH, Safety and Fire Department personnel on plans and procedures for handling hazardous wastes. Reference AFI 32-7042, *Solid and Hazardous Waste Compliance*, and USACHPPM Technical Guide 217, *Hazardous Material/Hazardous Waste Management Guide for Maneuver Units During Field and Deployment Operations*, for additional guidance on managing HW during contingency operations. Additional information on HW management during contingencies can also be downloaded from the DENIX website.

Table 3.8. Considerations for Managing Hazardous Wastes.

Managing Hazardous Waste Initial Beddown
Establish HW turn-in procedures utilizing DRMS services if possible
Designate HWSA far away from and downwind of personnel activities
Designate a centralized HWSA large enough to meet anticipated needs
Maintain a level surface to minimize the impact of runoff from flooding
Ensure area is near a road and accessible by material handling equipment
Secure the HWSA from unauthorized entry and post warning signs
Ensure fire extinguishers and eyewash and shower equipment are available
Appoint an HWSA staff; ensure personnel are trained on HW management
Formally establish satellite accumulation points (SAP); appoint monitors
Develop site-specific operating procedures for the HWSA and SAPs
Limit amount of HW at SAPs to 55 gallons of HW or 1 quart of acute HW
Ensure PPE is always being used and emergency first aid kits are on hand
Segregate ignitables, reactives, flammables, corrosives (see Attachment 6)
Keep all reactive materials (i.e., lithium batteries) out of the elements
Establish procedures for transporting HW from the SAP to the HWSA
Ensure spill kits are available and personnel are trained in spill response
Make sure HW is stored in proper containers with labels and warnings
Store waste POL in bladders until disposal procedures can be established
Store small amounts of wastes in original containers until proper disposal
Store pesticide wastes away from all other HW and out of the elements
Ensure the HWSA is covered and provides for secondary containment
Maintain an accurate inventory; track the duration of storage for all HW
Develop procedures to routinely inspect all containers for damage or leaks
Minimize HW generation through HM substitution and reduction in use
Minimize HW storage whenever possible through recycling and reuse

3.8. Spill Response. Spills can occur during any phase of an exercise or contingency. Ensure spill kits are available and a spill response team is appointed immediately. A site-specific Spill Response Plan (SRP) must be developed by every deploying unit and updated when major changes occur. If an SRP does not already exist, develop one immediately. Table 3.9 contains key elements to be addressed in the SRP.

Table 3.9. Elements of the Spill Response Plan.

Spill Response Plan
Appoint a spill coordinator and members of the spill response team
Outline procedures for limiting or containing spills if safely possible
Maintain a copy of the SRP at each HM/HW storage/accumulation area
Conduct spill response exercises and correct deficiencies in procedures
Include the procedures for obtaining spill kits and other needed supplies
Ensure spill kits are located outside (near) HM/HW storage areas
Stress safety and list precautions to take in responding to spills
Include guidance to ensure personnel use PPE in reacting to a spill
Include fire/explosion procedures and emergency first aid procedures
Include location of fire extinguishers, emergency eyewash, shower, etc.
Develop methods to prevent spills from reaching drains, ditches, etc.
Include procedures for notifying personnel and evacuating the area
Include guidance to use MSDSs in determining how to react to a spill
Include guidance for contacting spill response team, fire dept, etc.
Include procedures for obtaining vehicles and additional equipment
Include procedures for contacting the theater component for guidance
List emergency contacts: UECs, Safety, BEE, commander, supervisor
Include multiple ways to make contact (i.e., phones, radios, pagers, etc.)
Include guidance on replacing spill response equipment and supplies
Provide site-specific guidance on conducting land farming if necessary

3.9. Land Farming. Spills are likely to occur in the contingency environment due to the rapid pace of beddown and mission activities. Contaminated soil must be removed to protect human health and maintain environmental quality standards. Most spills tend to be POL-related; accidents usually occur during fueling, de-fueling, transport, transfer and maintenance activities. When soil is contaminated, it should be removed and placed in a designated land farm area for aeration and/or microbe treatment (see Figure 3.2). This is referred to as land farming. Contaminated soil is removed and taken to a pre-designated area, where it is mixed with healthy soil containing microorganisms that will metabolize the waste contents of the contaminated soil. Once the site is designated, construct a bermed area and install liners to contain the contaminant. This is where the contaminated soil will be mixed with healthy soil. Have a plan to turn the soil (aeration) and keep it moist (spraying or other means) to enhance biodegradation. The soil may have to be covered to keep it moist. There is no set timeframe for this process. Once land farming has begun, the soil will have to be tested periodically to determine the remaining level of contamination. Detailed information on land farming and other techniques for bioremediation can be found on the Defense Environmental Network and Information Exchange (DENIX) website located at https://www.denix.osd.mil.

Figure 3.2. Land Farming.

3.10. Regulated Medical Waste (RMW). RMW includes those wastes with the potential for causing infection and for which special precautions are prudent. There are specific procedures, unique equipment and supplies, and possibly HN laws governing disposal of RMW. Medical personnel are responsible for managing RMW disposal; however, assistance from the environmental officer and civil engineers may be required. Table 3.10 contains some elements to consider in managing and disposing of RMW.

Table 3.10. Managing Regulated Medical Waste.

Managing Regulated Medical Waste Initial Beddown
Medical personnel develop site-specific RMW disposal procedures
Ensure all personnel involved in handling RMW are properly trained
Wear proper PPE for handling, transporting, and disposing of RMW
Ensure medical waste is separated from normal waste and properly stored
Use “red bags” or any uniquely identified or marked bags to hold RMW
Use sharps containers (or closeable metal pails) for syringes, needles, etc.
Do not snip or cut needles; discard these items intact into containers
If 55-gallon drums are used to store RMW, do not add fuel to the drums
Research option of having RMW picked up and disposed of via contract
If contracted, state specific requirements for proper disposal
If possible, dispose of RMW via incineration (preferred method)
Consider retrograding sharps to a location with a waste incinerator
Consider constructing an inclined-plane incinerator (ref: FM 21-10-1)
Obtain approval for open burning prior to using inclined-plane incinerator
Ensure any burning takes place downwind of work and living areas
Store medical waste ash in a drum to be retrograded back to the U.S.
Consider steam sterilization for treating sharps (must use autoclave bags)
Bury sharps only when no other form of disposal is available
If sharps must be buried, bury them below scavenger depth (approx 8 ft)

3.11. Pest Management. Pest Management personnel have dual responsibilities in the field: vector/pest control and HW storage. During contingencies, pest management must focus on removing disease vectors and medical pests from the site and, later on, surveillance to evaluate the problem species and disease threat. Controlling wild animals, insects, rodents, and heavy bird populations is the main focus in the field. Disease vectors (some species of mosquitoes, ticks, sand flies, etc.) can transmit causative agents responsible for rabies, malaria, leishmaniasis, dengue, etc. Although conventional integrated pest management techniques that include pesticides still apply during contingency operations, implementation is complicated by limited control and equipment, inadequate supplies, construction and manpower priorities, pest problems not previously encountered, and a public health infrastructure that is not yet fully established. Pesticides (insecticides, herbicides, rodenticides) and repellents can affect personnel through direct contact, water, air, and food. Additionally, many insecticides are nerve agents which may predispose personnel to chemical warfare agents, set off chemical alarms or adversely affect personnel with chemical sensitivity. A list of contingency pesticides can be found on the AFPMB website. Pesticides must be applied by certified applicators in accordance with label instructions (Figure 3.3).

Figure 3.3. Pesticides Being Applied.

3.12. Storm Water. Storm water, while often seasonal, poses a serious hazard to contingency operations. Sites constructed on land that is relatively dry most of the year may be under water in a short period of time during the rainy season. In locations that usually experience little rain, soils may become impervious and not allow for quick drainage, resulting in the potential for intense flooding. Plans must be in place to minimize the impact of storm water pollution on site operations and nearby water sources. Additional information on managing storm water can be found in AFI 32-7041, *Water Quality Compliance*. The recommendations in Table 3.11 are provided for consideration in managing storm water during initial beddown.

Table 3.11. Considerations for Managing Storm Water.

Managing Storm Water Initial Beddown
Avoid destroying any vegetation needed to minimize storm water runoff
Construct berms around HM/HW storage to limit runoff contamination
Store HM/HW on level surfaces, downgradient of all water sources
Construct berms around POL storage areas to limit runoff contamination
Ensure HM/HW storage and maintenance areas are under protective cover
Test storm water for POL contamination; locate and neutralize the source
Construct trenches and retention ponds capable of diverting storm water
Construct drainage and storm water collection areas to prevent pooling
Use natural low-lying areas to create retention ponds/collect storm water
Collect, treat, and use storm water for fire fighting, vegetation, dust control
Avoid construction activities that may contribute to storm water runoff
Ensure watershed protection is considered in all construction activities
Prohibit construction involving paved surfaces near groundwater sources
Collect and treat storm water contaminated from construction activities
Maintain vehicles and equipment to prevent leaks on impervious surfaces
Install oil/water separators in all maintenance areas and inspect regularly
Regularly inspect septic systems and immediately make needed repairs

3.13. Air Pollution. Air pollution poses a serious threat to the health of deployed personnel. We cannot control natural occurrences, such as the fierce sandstorms often experienced in Southwest Asia which expose personnel to particulate matter in the air. However, we can limit the sources of air pollution resulting from military operations. Equipment and supplies used during military operations emit various concentrations of Volatile Organic Compounds (VOCs) and can possibly be substituted. Minimizing air pollution at the height of contingency operations can be challenging. However, for the sake of personnel health, it is extremely important to focus on limiting exposure to unnecessary hazards. Table 3.12 contains recommendations that help to reduce air pollution during contingencies.

Table 3.12. Minimizing Air Pollution.

Minimizing Air Pollution Initial Beddown
Develop site-specific SOP to minimize/eliminate sources of air pollution
Establish local contracts to remove and properly dispose of SW if possible
Locate burn activities downwind and far away from living and work areas
Segregate SW materials and remove all hazardous SW before burning
Reduce SW generation and recycle/reuse SW to maximum extent possible
Minimize fuel jettisons during flight activities to reduce vapors if possible
Acquire modern power generation equipment with newer filtration systems
Acquire larger power units to cover more area/reduce overall emissions
Locate older equipment in areas where emission hazards are minimized
Extend the smoke stack on older heating units above the breathing zones
Acquire newer heating units equipped with filtration systems if possible
Obtain BEE/Safety approval for heaters in tents with adequate ventilation
Use gray water or soil solidification products to reduce dust particulates
Keep vehicles and fueling equipment well maintained and inspect often
Replace equipment and substitute products with those that emit less VOCs

3.14. Natural and Cultural Resources. Natural and cultural resources are very sensitive issues in the contingency environment. Although some operations could take place before these assets are identified, every effort should be made to avoid environmentally sensitive areas during initial beddown. A nation's natural and cultural resources are often a source of pride. Causing unnecessary damage to environmentally sensitive areas could make it difficult for the U.S. to maintain good relations with the host country. When pottery, bones, graveyard markers, religious sites, or other marked areas are discovered during construction, activities should cease. Although operations might be temporarily affected, destroying a national asset will seriously impede long-term peacekeeping efforts with the host nation. Table 3.13 contains considerations for protecting natural and cultural resources during contingency operations.

Table 3.13. Protecting Natural and Cultural Resources.

Natural and Cultural Resources Initial Beddown
Integrate the JFC's natural and cultural resource policy into site SOPs
Maintain maps identifying environmentally sensitive areas in the region
Consider officially declaring environmentally sensitive areas off limits
Query the local population on locations of natural and cultural resources
Seek to avoid those areas of significant historical importance to the HN
Seek to avoid those areas of significant spiritual importance to the HN
Seek to avoid archeological sites that may contain historical HN artifacts
Seek to avoid disturbing habitats of endangered and threatened species
Construct fencing to prevent entry into environmentally sensitive areas
Post signs warning troops upon entry into environmentally sensitive areas
Establish requirement to obtain a dig permit prior to any site excavation
Assess the impact of required excavation on natural/cultural resources
Avoid sensitive areas if planning for expansion and during construction
Prohibit removal of any historically or culturally significant HN artifacts

3.15. Flora and Fauna. Flora and fauna are environmentally sensitive issues that must be taken into consideration throughout the length of the deployment and taken into consideration before any operations. Flora and fauna are often sources of pride for different countries, and their damage or destruction may adversely affect our long-term relationship with a host nation. During initial beddown, pre-planned actions may need to be adjusted to accommodate on-going operations (i.e., camp area may need to be expanded, layout may need to be adjusted, excavation may be required, etc.). Hopefully, prior research into flora and fauna for the deployment region was conducted and some alternatives were developed and included in SOPs. If adjustments must be made to initial plans, ensure the protection of flora and fauna is considered in operational and beddown activities. The AOR Environmental POC is also a source of information concerning flora and fauna for the particular region. Table 3.14 contains some elements to be considered to minimize damage to flora and fauna during initial beddown.

Table 3.14. Protecting Flora and Fauna.

Protecting Flora and Fauna Initial Beddown
Integrate JFC's policy on flora and fauna into site-specific SOPs
Maintain maps identifying all environmentally sensitive areas
Avoid constructing landfills or storing HM/HW near these areas
Avoid expanding into areas inhabited by sensitive flora/fauna
Avoid planning military maneuvers that may damage flora/fauna
Officially declare all environmentally sensitive areas off limits
Construct fencing or berms to prevent entry into sensitive areas
Post warning signs to inform personnel entering sensitive areas
Prohibit construction activities in these areas if at all possible
Require permits prior to allowing any excavation on/near the site
Assess the impact of all required excavation on flora and fauna
Be aware of the seasonal behaviors of all wildlife in the region

3.16. Identification and Storage of Unknowns. During contingency operations, "unknowns" will be discovered or found during patrols or mission-related activities. Unknowns are usually quarantined and BEE and/or Readiness personnel are immediately notified. Always handle an unknown as a potentially dangerous agent. Conduct tests using available field instruments. If identification can be made, seal the item for proper storage, if warranted.

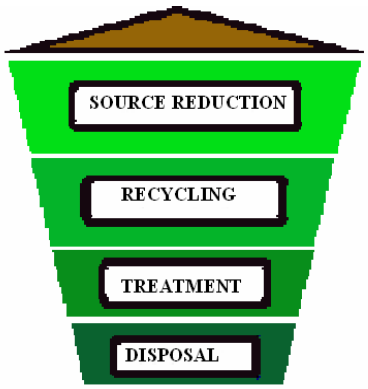
3.16.1. Consider establishing a separate "facility of the unknowns" to ensure safe handling and storage of unknowns. Locate the facility away from all others, downwind of the camp, and preferably in a bunker-type location. Ideally, this facility should be capable of being secured to prevent items from being dropped off without coordination. All unknowns can then be taken to this location for testing. If a proper identification is not possible, the item should remain in storage.

3.16.2. Unknown items or material not U.S.-generated cannot be disposed of through normal U.S. channels. At some point, negotiations with the HN environmental council will be initiated, and these materials will be designated as non-U.S.-generated. For this reason, it is important to keep these unidentifiable materials out of the HWSA, where only coalition waste should be stored. Keep in mind it is possible to have some U.S.-generated unknowns. If these can be identified by any means of investigation, the waste must be disposed of through normal U.S. channels.

Chapter 4
SUSTAINMENT

4.1. Sustaining Environmental Management. Once contingency operations begin to stabilize, increased focus can be placed on environmental concerns. Austere facilities, utility systems, and disposal methods can be upgraded and augmented with contract support. These efforts will increase the level of protection for human health and further limit losses as a result of DNBI. Significant gains can be made in waste minimization. The model shown in Figure 4.1 (Waste Management Hierarchy of Preference) depicts, from top to bottom, the most to least preferred options of dealing with wastes. Source reduction is given the highest preference since a reduction in waste generation eliminates the need to handle it in the first place. Recycling helps to preserve raw materials, which reduces the amount of wastes requiring disposal. Treatment makes the waste less hazardous (and possibly reusable). Disposal is the least preferred option, which usually involves returning wastes to the land, air, or water (following treatment). Apply this model to all environmental processes in an effort to minimize environmental impacts.

Figure 4.1. Waste Management Hierarchy of Preference Model.



4.2. Sustaining Pollution Prevention (P2). Sustaining P2 efforts after initial beddown has occurred and operations become more stabilized requires diligence and commitment. P2 should become the mindset at this point and must be continually promoted as the primary means of achieving and maintaining the environmental standards. Environmental training must be increased (amount and frequency), particularly in those areas that historically experience high turnover rates. Adequate supplies should be available, facility and utility infrastructure upgrades may be completed at this point, and education and training efforts should be firmly established and routine. Table 4.1 contains elements that should be considered to enhance P2 efforts once contingency operations begin to shift towards sustainment.

Table 4.1. Considerations for P2 During Sustainment.

Pollution Prevention Sustainment
Revise SOP and establish site goals for reducing sources of pollution
Focus on source reduction and reuse as the preferred means of P2
Acquire incinerators for SW/RMW disposal and cease open burning
Construct semi-permanent facilities/utility systems to control pollution
Require documentation for all HM/HW procurement/disposal requests
Implement energy conservation program; identify targets of opportunity
Consider purchasing and installing more energy-efficient equipment
Consider purchasing and installing equipment with emission controls
Consider use of solar energy for requirements not mission critical
Reduce the HM inventory through conservation and reuse initiatives
Reduce the amount of HW generated by reducing dependency on HM
Substitute HM for those less hazardous to personnel or the environment
Continually assess daily operations to minimize/reduce waste streams
Compost SW to reduce waste stream; use compost for vegetative needs
Reduce fuel expulsions during flight activities as much as possible
Use gray water, traffic control, gravel, paving to minimize dust

4.3. Water Resources. The size of deployments can fluctuate rapidly and often. From initial beddown to sustainment, estimates of water requirements must be reevaluated and production and storage requirements adjusted as needed. Additional resources, such as RED HORSE or AFCAP, may need to be considered if well-drilling or other requirements exceed on-hand capabilities. The site layout should be reexamined (from a perspective of sustainment rather than expediency) and decisions made on whether to relocate HW storage or SW disposal activities to further protect water sources. Table 4.2 contains recommendations for effectively managing water resources once military objectives require the focus to be shifted more towards sustainment.

Table 4.2. Managing Water Resources During Sustainment.

Managing Water Resources Sustainment
Use HN support to satisfy water requirements if agreed upon and approved
Consider reducing reliance on bottled water and focus on water production
Continue ROWPU operations until leadership approves local water supplies
Continually inspect/safeguard water purification equipment and accessories
Continually inspect, clean, disinfect water storage/distribution equipment
Develop a schedule for testing water points (tanks, trailers, bladders, etc.)
Maintain an adequate inventory of water purification chemicals and test kits
Replace water storage bladders with semi-permanent fiberglass water tanks
Replace distribution system with semi-permanent, buried distribution lines
Acquire chilled water trailers and install chilled water fountains if possible
Refine plans to control source contamination via soil erosion/storm water
Refine plans to secure water sources and protect from intentional sabotage
Refine emergency water plans and include additional water points/locations
Reevaluate location of waste disposal activities in relation to water sources
Reevaluate location of vehicle refueling points in relation to water sources
Minimize or prohibit aircraft refueling over raw water sources if possible

4.4. Wastewater. Once in the sustainment phase, begin to explore and take advantage of opportunities to improve how wastewater is managed. Some slight risks may have been taken during the initial beddown due to the urgency of the mission, operational tempo, limited personnel, resources, and equipment that need not be taken at this point. Means of adequate and safe disposal of wastewater must be achieved to sustain a military force after initial beddown has occurred. Access to an on-site or municipal wastewater treatment plant (WWTP) is preferable. Table 4.3 contains items for consideration in managing wastewater after initial beddown has occurred.

Table 4.3. Managing Wastewater During Sustainment.

Managing Wastewater Sustainment
Obtain HN support to provide and service chemical latrines via contract
Lease sewer trucks to service latrines; transport waste to municipal WWTP
Construct semi-permanent latrines using locally procured septic tanks
Negotiate use of HN facilities and wastewater collection/treatment system
Connect BEAR waste collection/distribution system to municipal WWTP
Connect other expedient wastewater treatment system to HN sewer system
Purchase and install prefabricated wastewater treatment system on site
Purchase materials locally and construct semi-permanent WWTP on site
Install sewer lines and lift stations to convey wastewater to lagoons
Consider designating an area for composting sewage sludge if practical
Establish a contract to haul gray water to approved off-site treatment facility
Use government vehicles/equipment to haul gray water to off-site facility
Consider RED HORSE for constructing wastewater treatment system
Consider AFCAP for operating and maintaining wastewater system
Replace expedient grease traps with commercially available grease traps
Collect and reuse gray water for laundry, dust suppression, fire fighting
Inspect/treat gray water and sewage collection/treatment areas frequently

4.5. Solid Waste. Once initial beddown has occurred and operations begin to stabilize, look for opportunities to more effectively manage SW. Methods used for managing SW during initial stages of contingencies may not be effective during sustainment, especially if the site population begins to increase. The environmental officer must always be thinking ahead and planning for different possible scenarios. Considering all of the different alternatives for handling SW (i.e., conservation, recycling, reuse, composting, incineration, etc.), the total amount of SW committed to landfills can be significantly reduced. Table 4.4 contains some elements to consider for improving SW management once initial beddown tasks are accomplished and the focus is shifted more towards sustainment.

Table 4.4. Managing Solid Waste During Sustainment.

Managing Solid Waste Sustainment
Update SOP to include additional guidance/procedures for SW disposal
Establish goals for waste reduction via recycling, reuse, and conservation
Purchase/lease quality incinerator meeting HN standards for SW disposal
Procure equipment to shred water bottles and reduce the volume of SW
Transfer PHA operations to DRMS for recycling, resale, redistribution
If landfilling is still used, provide additional security to prevent scavenging
Obtain agreement to transport SW to municipal landfill for proper disposal
Designate area for composting, identify types of wastes, establish guidance
Provide designated/labeled collection containers for compost materials
Provide designated/labeled collection containers for recyclable containers
Establish local contract for SW disposal; contract must meet HN standards
Designate official SW collection/pickup points; inspect areas frequently
Ensure dumpsters are clean, watertight, and have secondary containment
Ensure SW containers are emptied and cleaned often to discourage insects
Consider AFCAP support for managing SW collection/disposal activities

4.6. HM Management. During sustainment, focus on improving equipment and advancing processes used to manage HM. If internet access is available, there are several sources that can be helpful. For example, the Hazardous Materials Information Resource System (HMIRS) is a central repository for MSDSs developed and maintained by the DLA. The system can be accessed through the DLA website at http://www.dlis.dla.mil/hmirs/. Another valuable on-line reference is the Military Items Disposal Instructions (MIDI) database made available through the USACHPPM. This database provides guidance for disposal of military items. It can be accessed through the USACHPPM website at http://chppm-www.apgea.army.mil. Table 4.5 contains elements to be considered in managing HM during sustainment.

Table 4.5. HM Management During Sustainment.

Hazardous Materials Management Sustainment
Adopt more stringent compliance procedures (i.e., OEBGD, FGS, etc.)
Reduce the dependency on HM via conservation, reuse, and substitution
Replace fuel storage bladders with steel tanks and bury distribution lines
Consider AFCAP capabilities and options available for HM management
Requisition supplies/equipment needed to address areas of noncompliance
Implement standard training program for all and begin refresher training
Consider relocating HM/HW storage areas to provide additional security
Construct semi-permanent storage facility with segregated storage areas
Allow only approved containers and labels to be used in identifying HM
Consider implementing an automated tracking system for all HM on site
Request Fire Dept and Safety conduct an inspection of the HWSA
Request Fire Dept recommendations on smoke/fire alarm systems
Install an intercom to enhance emergency notification communications
Ensure existence of safety measures (i.e., eyewash, shower, first aid kit)
Conduct weekly inspections and maintain records of HM received/issued

4.7. HW Management. Most likely, DRMS will be the disposal agent for HW once contingency operations stabilize. Nevertheless, the focus should be on improving overall HW management and bringing site activities more in line with environmental compliance if more stringent standards are adopted or applied to the operation as a result of action taken by the HN and/or EEA. Table 4.6 contains considerations for managing HW during sustainment.

Table 4.6. HW Management During Sustainment.

Hazardous Waste Management Sustainment
Adopt more stringent compliance procedures (i.e., OEBGD, FGS, etc.)
Apply Waste Management Hierarchy of Preference model to management
Revise HW SOP to reflect more advanced procedures for managing HW
Ensure a full-time, dedicated, and trained environmental staff is in place
Consider relocating the HWSA if needed to expand the access perimeter
Requisition supplies/equipment needed to address areas of noncompliance
Construct semi-permanent facilities with segregated HM storage areas
Ensure appropriate containers, labels, and testing equipment are on hand
Replace temporary fuel bladders with permanent fuel storage tanks
Request Fire Dept and Safety conduct an inspection of the HWSA
Request Fire Dept recommendations on smoke/fire alarm systems
Construct access roads to facilitate HW transport to HW collection areas
Require periodic reports from SAPs; conduct frequent site inspections
Acquire additional safety equipment, PPE, first aid kits for every SAP
Develop guidance and conduct frequent inspections of HWSA and SAPs
Focus on projects needed to secure the area (i.e., fencing , alarms, etc.)
Install automated HW inventory/tracking system for accurate accounting
Increase contact with other units in AOR to expand reuse/recycle efforts
Establish local contract to dispose of HW in accordance with HN laws
Turn over HWSA management to DRMS; update site-specific SOPs

4.8. RMW Management. The BEE will most likely be managing all RMW during contingencies but may require assistance from environmental personnel. If the scope of contingency operations begins to expand, additional equipment (i.e., generators, refrigeration units, etc.) may be required to ensure RMW is properly managed. Table 4.7 contains elements to be considered along with recommendations for managing RMW during sustainment. Additional information, including fact sheets on managing RMW during contingencies can be found on the USACHPPM website at http://chppm-www.apgea.army.mil/hmwp/Factsheets/.

Table 4.7. RMW Management During Sustainment.

Managing Regulated Medical Waste Sustainment
Adopt stringent standards for RMW management and revise SOPs as needed
Ensure all RMW disposal techniques do not violate HN environmental laws
Acquire additional equipment and supplies needed to properly manage RMW
Identify and separate RMW from all other waste at the point of generation
Ensure containers used to store RMW are marked with the biohazard symbol
Establish security and other controls to prevent unauthorized access to RMW
Ensure labels on RMW containers being transported identify the generator
Purchase high-quality incinerator meeting HN standards for RMW disposal
Use steam sterilization for decontaminating RMW; maintain sterilization log
Consider a chlorine solution for sharps containers to kill biological organisms
Consider transporting RMW to the nearest installation for proper disposal
Contract with medical waste facility (preferred method) for RMW disposal
Consider a local contract within host country/AOR for RMW incineration
Ensure contractors are inspected regularly for proper RMW management
Consider purchasing/installing commercial medical waste treatment system
Consider retrograding RMW to the U.S. for proper treatment and disposal

4.9. Storm Water. Once initial beddown is complete, the environmental officer should begin focusing on upgrading expedient methods used to manage storm water, particularly if the deployment site will be occupied for an extended period. A network of drains and ditches can be constructed to direct storm water away from the camp, construction areas, HM/HW storage areas, vehicle refueling points, and potential water sources. Storm water can be a valuable source of non-potable water that can be used for various needs. Table 4.8 contains elements to consider for managing storm water during sustainment.

Table 4.8. Managing Storm Water During Sustainment.

Managing Storm Water Sustainment
Develop a site-specific storm water pollution prevention plan
Require watershed protection to be considered during construction
Require written approval for any activities that destroy vegetation
Purchase tanks to collect/treat/store storm water for non-potable use
Use compost to prevent storm water from reaching water sources
Relocate HM/HW storage downgradient of water sources if needed
Construct berms around HM/HW, POL and pesticide storage areas
Focus on leveling areas to minimize the impact of storm water
Install catch basins and oil/water separators in maintenance areas
Ensure oil/water separators are working properly; clean as needed
Ensure waste collection containers have lids and are leak free
Designate level areas with cover for waste collection containers
Provide secondary containment for waste collection containers
Ensure toxic or hazardous substances are not placed in dumpsters
Have solid waste picked up frequently and keep containers clean
Regularly inspect septic systems and immediately repair any leaks

4.10. Air Pollution. During sustainment, efforts to minimize air pollution should become more focused. If the site population increases, so will the sources and amount of pollution. The environmental officer should have a good feel for the sources of pollution at this stage. Focus on sources of particulate matter, carbon monoxide, sulfur dioxide, nitrogen dioxide, and lead; particulate matter is usually generated from factories, power plants, incinerators, vehicles, equipment, burn pits, burn-out latrines, construction activities and fugitive dust. The BEE monitors these pollutants to measure air quality. The environmental staff should be aware of these sources and involved in minimization efforts. Table 4.9 contains recommendations on minimizing the impact of air pollution on personnel health. Additional information concerning air pollution during contingency operations can be found on the USACHPPM website at http://chppm-www.apgea.army.mil.

Table 4.9. Minimizing Air Pollution During Sustainment.

Minimizing Air Pollution Sustainment
Establish local contracts to remove and properly dispose of SW if possible
Eliminate open burning for SW; purchase high-quality incinerators
Minimize fuel jettisons during flight activities to reduce vapors
Minimize refueling during hottest part of day; reduce VOC emissions
Acquire modern power generation equipment with filtration systems
Acquire larger units to cover more area and reduce overall emissions
Locate older equipment where it poses the least hazard to personnel
Extend the stack on older heating units well above breathing zones
Acquire newer heating units equipped with modern filtration systems
Upgrade exhaust systems on vehicles and limit traffic in certain areas
Use gray water or soil solidification products to reduce air particulates
Issue PPE (i.e., goggles, cravats, etc.) for protection against dust and sand
Focus educational and training efforts on product recycling and reuse
Substitute hazardous products with those less harmful to the environment

4.11. Natural and Cultural Resources. Natural and cultural resources are very sensitive issues in the contingency environment. Operations are typically conducted without knowing where these areas are located. The sites are often discovered during beddown operations. When pottery, bones, graveyard markers, religious sites, or other marked areas are discovered during construction, all activities must stop. Although operations will be temporarily affected, the destruction of a national asset will seriously impede long-term peacekeeping efforts with the host nation. A good way to reduce the possibility of degrading natural or cultural assets is by requiring digging permits prior to starting any work. The permit will require coordination by several sections, in addition to an environmental review, to ensure natural or cultural resources will not be harmed. In addition, the permit can prevent personnel from unknowingly damaging existing electrical or communication lines, water, sewage, POL distribution systems or underground storage equipment.

Table 4.10. Natural and Cultural (N/C) Resources.

Natural and Cultural Resources Sustainment
Continually update the SOP as additional N/C resources are discovered
Maintain a list of N/C resources (including endangered species) in the area
Advise leadership of the potential impact of missions on N/C resources
Maintain location of all N/C resources on maps and other diagrams
Conduct training to make personnel aware of these assets and current policy
Declare N/C resource areas off-limits if operational mission is unaffected
Conduct training and other military maneuvers away from these areas
Consider fencing, berms, signage to protect the area and warn personnel
Require permits for activities needing to be placed on or near N/C resources
Relocate any HM/HW storage areas hastily sited during initial beddown
Relocate refueling/maintenance activities hastily sited during initial beddown
Minimize the effects of demolition/munitions activities near these areas

4.12. Flora and Fauna. During sustainment, avoiding or minimizing damage to flora and fauna should remain a high environmental priority. As contingency operations begin to stabilize, there may be a tendency to expand and explore areas further outside of the initial camp boundaries. Care should be taken not to encroach upon areas inhabited by environmentally sensitive flora and fauna and/or threatened or endangered species. The environmental officer must continually advise leadership on operational plans that could damage or destroy these assets so that informed decisions can be made. Table 4.11 contains additional recommendations to consider when planning for the protection of flora and fauna during contingency operations.

Table 4.11. Protecting Flora and Fauna.

Flora and Fauna Sustainment
Integrate the JFC's policy into SOPs affecting daily operations
Maintain maps identifying environmentally sensitive areas
Seek to avoid sensitive areas inhabited by flora and fauna
Seek to avoid the habitats of endangered and threatened species
Officially declare environmentally sensitive areas off limits
Construct fencing or berms to prevent entry into sensitive areas
Post signs warning personnel about environmentally sensitive areas
Prohibit construction activities in these areas if at all possible
Require an environmental impact study prior to any construction
Require an environmental impact study prior to vegetation removal
Assess the impact of mission-essential excavation on flora and fauna
Be aware of the seasonal behavior of wildlife in the deployed region

Chapter 5
SITE CLOSURE/REDEPLOYMENT

5.1. Introduction. Once it is determined a site occupied by U.S. forces will be closed and forces redeployed, actions must be taken to fulfill U.S. obligations based on international agreements, to protect the U.S. from unsubstantiated claims of environmental damage, and to eliminate known imminent and substantial dangers to human health and safety.

5.2. Closure Survey. Upon notification of site closure, the environmental function must conduct a thorough environmental survey of the site. The purpose of the survey is to identify all critical environmental issues that must be resolved prior to departure. The environmental officer and BEE, PH, and Safety personnel should conduct the survey together. It is important to compare the results of this survey with the EBS conducted upon initial occupancy of the site to assess the effectiveness of environmental initiatives and determine what cleanup actions might be required. The list is not all-inclusive, but it can provide a good starting point for focusing on other environmental concerns that may be unique to the area. Maintain all documentation to prepare the final closure report prior to redeployment.

5.3. Site Closure Plan. The site closure plan is developed to ensure all tasks necessary to properly close the site are identified. Attachment 9 contains a checklist that may be useful. It might be helpful to use backwards planning if a reasonably firm date for redeployment has been established. Start with that date and work backwards, establishing timelines for every action required to properly close the site. At a minimum, address procedures for turn-in and accountability of HW and excess HM, cleanup and documentation of POL spills, emptying and cleaning POL tanks and separators, and POL waste turn-in. Stay in close communication with the AOR Environmental POC, and maintain all documentation. This will assist in preparing the final closure report prior to redeployment.

5.3.1. **Determine Contract Support.** At this point in contingency operations, DRMS will likely be established within or near the AOR to perform proper disposition of excess HM and HW. This resource, as well as any local contracts established (i.e., SW removal, medical waste collection and disposal, etc.), should be considered in developing the closure plan. Coordinate with these resources and establish timelines for cleanup and disposal activities. Also, address terminating any local contracts no longer required.

5.3.2. **Shut Down Disposal Sites.** The closure plan should also address timelines and procedures for cleaning, clearing, and closing disposal sites, including burn pits, landfills, lagoons, latrines, etc.

5.4. Closing Standards. Make sure actions taken to close down the site are consistent with applicable guidance (i.e., OPORD, FGS, OEBGD). Key areas to focus on include:

5.4.1. **Medical Supplies.** Serviceable medical supplies should be collected and retrograded through medical channels. Medical waste will be removed and disposed of with guidance from medical personnel.

5.4.2. **Pesticides and HM.** Serviceable pesticides and hazardous materials will be collected and retrograded through supply channels.

5.4.3. **Solid Waste.** Collect and dispose of all solid waste. Also make sure any contractor-provided equipment is removed from the site. Collect serviceable metals and scrap (i.e., drums, concertina wire, vehicle parts, etc.) for turn-in and reissue through supply channels.

5.4.4. **Pits and Latrines.** Cover and mark all urine, soakage, SW, and burn pits. Empty and clean burn-out latrines for storage or disposal.

5.4.5. **Recycling.** Wood and cardboard products should be collected and turned in through supply channels for recycling if this option is available.

5.4.6. **Fuel Equipment.** Fuel bladders, liners, and fuel distribution equipment should be cleaned up (including any contamination).

5.5. Disposition of Hazardous Materials.

5.5.1. **Reissue.** Turn in excess HM to the established supply function and attempt to transfer the material to main supply points or other units in the AOR that may require the material for continued operations.

5.5.2. **Retrograde.** HM that cannot be reissued within the AOR should be transported back to home station. Make sure containers are properly packaged, labeled, and prepared for transportation and shipped according to HN laws and Department of Transportation (DOT) requirements.

5.5.3. **Disposal.** HM that cannot be reissued to other units in the AOR, or for which it has been determined to be impractical to transport back to home station, should be disposed of as HW.

5.6. Disposition of Hazardous Waste.

5.6.1. **DRMS.** If DRMS is established in or near the AOR, DRMS personnel will be responsible for ensuring proper disposal of HW, and any HW not disposed of through DRMS should be reported through the chain of command to the AOR Environmental POC.

5.6.2. **Retrograde.** If returning HW to home station, consider international agreements (i.e., SOFA, transit, and disposal agreements) and the laws of all nations involved with transporting the HW from its origin to destination.

5.6.3. **Recycling.** This alternative can be used for select HW (i.e., recovered POL) if consistent with local practices and medical personnel determine there is no risk to human health and safety and the environment. Approval should be obtained from the AOR Environmental POC.

5.6.4. **Local Contract.** Disposing of HW via local contract is allowed if done in a manner protective of human health and safety and the environment. Obtain approval from the AOR Environmental POC.

5.6.5. **Abandonment.** HW may be abandoned if senior leadership determines it is necessary under combat or other hostile conditions. If this becomes necessary, note the quantity, type, and location so it can be recovered as soon as practicable upon cessation of hostile conditions.

5.7. Site Remediation. U.S. forces should take action to remediate known imminent and substantial endangerment to human health and safety due to environmental contamination caused by U.S. forces during the course of contingency operations. Guidance for conducting remediation at non-permanent DOD installations overseas is usually contained in the Environmental Considerations Annex of the applicable OPORD and may be based on DOD directives and international agreements. For permanent DOD installations overseas, guidance can usually be found in the FGS or, where no FGS have been issued, the OEBGD.

5.8. Closure Report. The purpose of the closure report is to document the environmental conditions of the site as close as possible to redeployment. This provides time in between notification of redeployment and actual redeployment to conduct the environmental site survey, develop the camp/site closure plan, and perform any required site remediation. This report should be prepared by the environmental officer with assistance from BEE, PH, and Safety. The report is used to document the condition of water sources, soil, natural and cultural resources, air quality, and other environmental conditions as documented in the initial EBS. This process ensures environmental conditions of the site are documented when opened and again when closed. The closure report is also needed to ensure the U.S. is not blamed for environmental damage not related to U.S. operations conducted during the period of occupancy. Make sure the report includes maps, photos, and grid coordinates for all areas where activities potentially harmful to the environment are located (i.e., maintenance functions, burn pits, HWSA, medical facilities, landfills, latrines, etc.). Contact the AOR Environmental

POC for complete guidance on preparing the closure report for the particular area. Once completed, a copy of the closure report should be forwarded to the AOR Environmental POC or as directed in the Environmental Annex of the OPORD under which the unit is deployed.

5.9. **Forms Adopted.**

5.9.1. DD Form 1348-1A, Issue Release/Receipt Document.

5.9.2. DRMS Form 1930, Hazardous Waste Profile Sheet.

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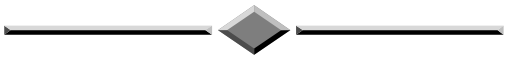
DCS/Logistics, Installations and Mission Support



Attachment 1

GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION

References:

AFI 10-404, *Base Support and Expeditionary Site Planning*, 9 March 2004
AFI 32-1053, *Pest Management Program*, 1 April 1999
AFI 32-7001, *Environmental Quality* (to be published)
AFI 32-7006, *Environmental Program in Foreign Countries*, 29 April 1994
AFI 32-7040, *Air Quality Compliance and Resource Management* (under revision)
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AFI 32-7042, *Solid and Hazardous Waste Compliance (*under revision)
AFI 32-7061, *The Environmental Impact Analysis Process*, 12 March 2003
AFI 32-7065, *Cultural Resources Management Program*, 1 June 2004
AFI 32-7080, *Pollution Prevention Program*, 12 May 1994
AFI 32-7086, *Hazardous Materials Management*, 1 November 2004
AFI 91-202, *The US Air Force Mishap Prevention Program*, 1 August 1998
AFPAM 10-219, Volume 5, *Bare Base Conceptual Planning Guide* (under revision)
AFPAM 32-7043, *Hazardous Waste Management Guide*, 1 November 1995
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FM 3-100.4, *Environmental Considerations in Military Operations*, 1 June 2000
FM 21-10, *Field Hygiene and Sanitation*, 21 June 2000
FM 21-10-1, *Unit Field Sanitation Team*, 11 October 1989
TB MED 577, *Sanitary Control and Surveillance of Field Water Supplies*, December 2005
USACHPPM Technical Guide 217, *Hazardous Material/Hazardous Waste Management Guidance for Maneuver Units During Field and Deployment Operations*, October 2000
USCENTCOM Regulation 415-1, *Construction and Base Camp Development in the USCENTCOM Area of Responsibility (AOR), "The Sand Book,"* 1 December 2004

JP 4-04, *Joint Doctrine for Civil Engineering Support*, 27 September 2001
ASTM Standard E2318-03, *Standard Guide for Environmental Health Site Assessment Process for Military Deployments*, 1 January 2003
Unified Facilities Criteria (UFC) 3-240-10A, Sanitary Landfill, 16 January 2004
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DOD 4160.21-M, *Defense Materiel Disposition Manual*, August 1997
DOD 4160.21-M-1, *Defense Demilitarization Manual*, October 1991
DODI 4715.4, *Pollution Prevention*, 6 June 1998
DOD 4715.5-G, *Overseas Environmental Baseline Guidance Document*, (under revision)
DODI 4715.6, *Environmental Compliance*, 24 April 1996
DODD 6050.7, *Environmental Affects Abroad of Major Department of Defense Actions (32 CFR Part 187)*, 31 March 1979
29 CFR Part 1910.1030, Occupational Exposure to Bloodborne Pathogens, 5 March 1992
32 CFR Part 989, *Environmental Impact Analysis Process*, 14 January 1995
Executive Order 12114, *Environmental Effects Abroad of Major Federal Actions*, 4 January 1995

Abbreviations and Acronyms:
AFI – Air Force Instruction
AFCAP – Air Force Contract Augmentation Program
AFCESA – Air Force Civil Engineer Support Agency
AFMAN – Air Force Manual
AFPMB – Armed Forces Pest Management Board
AFSOC – Air Force Special Operations Command
AMOG – Air Mobility Operations Group
AOR – Area of Responsibility
ASTM – American Society for Testing and Materials
BEAR – Basic Expeditionary Airfield Resources
BEE – Bioenvironmental Engineering
CBRN – Chemical, Biological, Radiological, and Nuclear
CE – Civil Engineer
CFR – Code of Federal Regulations
CHPPM – Center for Health Promotion and Preventive Medicine
CLIN – Contract Line Item Number
COCOM – Combatant Command
CONOPS – Concept of Operations
COR – Contracting Officer Representative
CONUS – Continental United States
DENIX – Defense Environmental Network and Information Exchange
DFAC – Dining Facility
DLA – Defense Logistics Agency
DNBI – Disease and Non-battle Injury
DOD – Department of Defense
DODAAC – Department of Defense Activity Account/Address Code
DODD – Department of Defense Directive
DOT – Department of Transportation
DTID – Defense Turn In Document
DRMS – Defense Reutilization Marketing Service
EBS – Environmental Baseline Survey
ECR – Environmental Condition Report
EEA – Environmental Executive Agent
EHSA – Environmental Health Site Assessment

EIAP – Environmental Impact Analysis Program
E.O. – Executive Order
EPA – Environmental Protection Agency
ESP – Expeditionary Site Planning
ESSP – Expeditionary Site Survey Process
FGS – Final Governing Standards
FM – Field Manual
GIS – Geographic Information System
GPS – Global Positioning System
GSAT – Global Situational Awareness Tool
HAZCOM – Hazards Communications
HAZMAT – Hazardous Materials
HAZWOPER – Hazardous Waste Operations
HMIRS – Hazardous Materials Information Resource System
HM – Hazardous Materials
HN – Host Nation
HW – Hazardous Waste
HWPS – Hazardous Waste Profile Sheet
HWSA – Hazardous Waste Storage Area
IDMT – Independent Duty Medical Technician
IPM – Integrated Pest Management
JFC – Joint Forces Commander
MHE – Materials Handling Equipment
MAJCOM – Major Command
MIDI – Military Items Disposal Instructions
MR – Munitions Rule
MSDS – Material Safety Data Sheet
NGA – National Geospatial-Intelligence Agency
OCONUS – Outside the Continental United States
OEBGD – Overseas Environmental Baseline Guidance Document
OPLAN – Operation Plan
OPORD – Operational Order
PAM – Preventive and Aerospace Medicine
PCB – Polychlorinated Biphenyls
P2 – Pollution Prevention

PH – Public Health
PHA – Property Holding Area
POC – Point of Contact
POL – Petroleum, Oils, and Lubricants
PPE – Personal Protective Equipment
PWS – Performance Work Statement
QAP – Quality Assurance Personnel
RA – Risk Assessment
RMW – Regulated Medical Waste
SAP – Satellite Accumulation Point
SOFA – Status of Forces Agreement
SOP – Standard Operating Procedures
SRP – Spill Response Plan
SW – Solid Waste
T.O. – Technical Order
TRANSCOM – Transportation Command
USCENTCOM – U.S. Central Command
UEC – Unit Environmental Coordinator
UFC – Unified Facilities Criteria
USACHPPM – U.S. Army Center for Health Promotion and Preventive Medicine
USAF – United States Air Force
U.S. – United States
UXO – Unexploded Ordnance
VOC – Volatile Organic Compound
WWTP – Wastewater Treatment Plant

Attachment 2

EBS SURVEY INSTRUCTIONS
AND EXAMPLE CHECKLIST

A.2.1. Purpose of EBS. State reason(s) for the EBS, the site/location where the survey was/is being conducted, and include the date(s) of the survey.

A.2.1.1. The primary reasons are to identify environmental, health, and safety conditions that pose a potential health threat to deployed personnel and to alert personnel to existing contamination at a site prior to a deployment.

A.2.1.2. The EBS is also used to document environmental conditions during initial occupancy to protect the U.S. from unfounded claims of environmental damage. The EBS captures predeployment environmental damages and serves as a basis for comparing post-deployment environmental conditions to determine the extent, if any, of damage caused by U.S. personnel.

A.2.2. Survey Methodology. State the methods, procedures, and techniques used to gather and analyze the information.

A.2.2.1. Methods, procedures, and techniques usually involve searching for and analyzing existing surveys, inspection reports, hazardous waste management plans, spill plans, utility drawings, previous EBS, etc. Other sources include maps, titles, and deeds that can be used to determine locations of tanks/equipment.

A.2.2.2. Sample collections can be taken to determine water quality, quality of surface and ground water supply, radon levels, presence of PCBs or lead paint, and sources of contamination.

A.2.2.3. Interviews with personnel familiar with the site/location or persons who live nearby are useful in gathering information to complete the EBS.

A.2.3. Findings. Describe the history, current use and condition.

A.2.3.1. History.

A.2.3.1.1. Contact the AOR Environmental POC to obtain relative data, review chain of title records if available and accessible, and analyze any reports that can be obtained locally. In addition, conduct interviews with persons in the area who are familiar with the site/location.

A.2.3.1.2. Attempt to identify specific chemicals and/or materials associated with the site, and determine whether any spills or cleanup actions took place.

A.2.3.1.3. Evaluate aerial images to help determine past uses or to provide indications of previous beddowns, hazardous material usage and storage, hazardous waste storage and/or disposal, storage tanks, landfill areas, etc.

A.2.3.2. Current Use. Identify current use of the property and each facility therein.

A.2.3.2.1. Describe the land area, all structures, roads, and utilities.

A.2.3.2.2. If there are training areas, describe how they are used.

A.2.3.2.3. Interview individuals on the site/location and those nearby.

A.2.3.2.4. Describe areas adjacent to the site/location; include past use of the property and determine for what purpose the adjacent property is currently being used.

A.2.3.2.5. Describe the proposed site usage including the expected duration of an operation, activities to take place and equipment to be used. Determine the possible effect the operation or activities might have on the health and safety of deployed personnel and the host nation.

A.2.3.3. Environmental Condition.

A.2.3.3.1. Check for problems with air quality in all facilities on the site.

A.2.3.3.2. Identify water source(s), capacities, and the condition of water supply lines (check for corrosion, leaks, lead pipes, etc.). Determine if water samples were taken and whether medical personnel conducted an inspection of water sources. Check supply lines; assess vulnerability of water source to tampering or contamination by outside sources.

A.2.3.3.3. Identify sources of wastewater and describe the capacity and condition of existing wastewater systems (pits, catch basins, dry wells, lagoons, etc.). Describe how wastewater is collected, treated, discharged or reused, and how it will be done under the proposed usage.

A.2.3.3.4. Determine if hazardous waste was stored at the location. Check for hazardous substances and petroleum products. Check aboveground and underground storage tanks, wells, and drums for hazardous materials or wastes. Look for vent pipes, fill pipes, or other indicators of underground storage tanks. Look for signs of spills, leakage or contamination (stained soil, distressed vegetation, dead/diseased wildlife). Determine the affect on the proposed usage.

A.2.3.3.5. Identify solid waste disposal areas. Check for signs of dumping. Try to determine what materials were dumped. Look for areas where solid waste may have been burned or buried. Determine if disposal contracts or other agreements exist and describe how deployed forces will handle solid waste, including proposed layout of storage areas in relation to beddown areas.

A.2.3.3.6. Identify sources of medical/biohazard wastes, accumulation and disposal areas. Check for signs of dumping. Look for areas where medical waste may have been buried. Describe how deployed forces might handle medical waste, including proposed collection and disposal areas and their relation to beddown areas, food service areas, and water sources.

A.2.3.3.7. Determine if any fixed petroleum distribution points exist and look for ground contamination around these areas. If areas previously used as field distribution points are discovered, check for ground contamination. Look for signs of aboveground or underground storage tanks and check these areas for leaks, spills, and/or contamination. Determine if the tanks are still in use; if they are not, attempt to determine when they were taken out of service. Look for petroleum storage throughout the site, including all training areas, if applicable.

A.2.3.3.8. Determine if any areas at the location or areas adjacent to the site might present a noise hazard. Also, based on proposed activities at the site, determine if any areas might pose restrictions on deployed forces based on the noise produced by the proposed activities.

A.2.3.3.9. Describe pesticide and herbicide storage and use. Try to determine to what extent chemicals were used, where and how often. Attempt to identify precisely what was used and exactly where chemicals may have been stored. Look for indications that pesticides or herbicides may have been dumped or buried. Try to apply these same criteria to adjacent areas to determine what impact these activities might have on deployed forces, water sources, beddown areas and food service areas/operations.

A.2.3.3.10. Determine if there are any cultural or historical areas or facilities and what restrictions might be placed on deployed forces or activities as a result.

A.2.3.3.11. Look for species of threatened or endangered plants or animals, and determine if any areas are wetlands or wildlife habitats. Describe these animals, plants, and habitats in detail, and determine what restrictions might be placed on deployed forces or activities as a result.

A.2.3.3.12. Identify electrical sources. Inspect transformers, substations, power lines, hydraulic systems, voltage regulators, circuit breakers, etc. Characterize the equipment’s condition and age, and determine if any of the equipment contains polychlorinated biphenyls.

A.2.3.3.13. Check all areas for asbestos and lead paint. Note the exact location of suspected asbestos or lead paint. Comment on the condition of asbestos (i.e., friable or non-friable), take photos, and coordinate with BEE for sampling.

A.2.3.3.14. Check facilities with basements for airflow. Make sure basements are aired out prior to use to prevent radon exposure.

A.2.4. Soil Type and Land Cover. Provide a description of the soil type, condition, and land cover. Describe how well the soil drains. Attach a map of the area and take photos if possible.

A.2.5. Topographic, Hydrologic, and Geologic Features. Describe the topography, state whether there are rivers and streams in the area, and determine if the area might be prone to flooding (look for indications of past flooding). State if there is geologic activity that could affect operations.

A.2.6. Unexploded Ordnance (UXO). Provide type(s) and grid coordinates of any UXO in the area.

A.2.7. Sanitary Waste Disposal. State whether these facilities are available; provide locations.

A.2.8. Radiological Hazards. Identify any sources of radiation that could be harmful. Provide a listing to BEE.

A.2.9. Heating and Ventilation Systems. Provide the type, location(s), source of power, type of fuel (if applicable), and storage tank(s) locations for existing heating and ventilation systems.

A.2.10. Electrical Hazards. Provide the size and location of high-power lines and transformers.

A.2.11. Fire Protection Systems. Identify type, location, and condition of fire protection systems.

A.2.12. Site Survey Maps. Include maps, sketches, and proposed site layout plan, if applicable.

A.2.13. Photographs. Cross-reference photos of land areas, facilities, and equipment to maps.

A.2.14. Samples. If samples were taken, include the results and state whether further sampling is required. Provide photos where samples were taken, and where additional sampling needs to be done. Cross-reference the photos with maps, plans, or sketches.

A.2.15. Related Documents. List all other documentation used to conduct the survey.

A.2.16. Outside Agency Assisting on Documentation. List point of contact information for other agencies that provided information used to produce the EBS report.

A.2.17. Environmental Requirements. List U.S., host nation, and local laws, regulations, guidance, and standards deployed forces must adhere to during the course of operations; i.e., Overseas Environmental Baseline Guidance Document, Final Governing Standards, etc.

A.2.18. References Used. List references used to conduct the survey and produce the EBS report.

A.2.19. Images. This section can be used to catalog photographs and provide date/time photographs were taken, angle or location of photographer, etc.

EBS – EXAMPLE CHECKLIST

1. Document Title: Environmental Baseline Survey of _____		
2. Survey Administrative Data		
a. Date of survey:	b. Assessment performed by:	
Name/Grade	Duty Position	Contact Information
3. Document Date:		
4. Site Survey Data:		
a. Description of the site:		
Installation(s)		
(1) Installation Name:		
(2) Installation Number:		
(3) Facility Identification:		
(4) Street Address:		
(5) City/Town:		
(6) State/Province:		
(7) Zip Code:		
(8) Command Jurisdiction:		
Facility Type		
(9) Description and Condition of Property:		
(10) Description of Training Areas:		
(11) Description of Adjacent Land Usage:		
b. Description of Proposed Site Usage:		
c. Current Environmental Conditions:		
Survey of Site Conditions		
Air Quality:	Drinking Water:	Waste Water:
Hazardous Materials:	Hazardous Waste:	Solid Waste:
Medical Waste:	Petroleum:	Noise:
Pesticides:	Historic and Cultural Resources:	Natural Resources/Endangered Species:
Polychlorinated Biphenyls (PCBs)	Asbestos:	Radon:
5. Soil Type and Land Cover:		
6. Topographic, Hydrologic, and Geologic Features:		
7. Unexploded Ordnance:		
8. Sanitary Waste Disposal:		
9. Heating and Ventilation Systems:		
10. Electrical Associated Hazards:		
11. Fire Protection Services:		
12. Radiological Hazards:		
13. Site Survey Maps:		
14. Photographic:		
15. Samples:		
16. Related Documents:		
17. Outside Agency Assisting on Documentation:		
18. References Used:		
a.	b.	c.
d.	e.	f.
19. Satellite Imagery and Aerial Photographs:		

Attachment 3

ENVIRONMENTAL CONDITIONS REPORT (ECR) FORMAT

A.3.1. Installation Description and Background: Give a brief (one-half to one page) description of the installation, including its historical use. Reference the EBS. Information should be geared to events and operational history that may bear on environmental problems and their causes.

A.3.2. Include all spill records in the report.

A.3.3. Layout map or plan view of installation should identify storage of hazardous substances (hazardous waste accumulation points, fuel storage and retail points and hazardous material storage sites).

A.3.4. Summary of Environmental Conditions. List significant incidents at the site. State significant findings for all areas of concern in bottom-line terms.

A.3.5. Findings and Determinations. Describe whether or not significant environmental impacts will occur as a result of turnover/return of the site. Base findings on applicable environmental guidance. Following are some example statements that might be used:

A.3.5.1. "Turnover of this site will not result in environmental impacts significant enough to warrant additional environmental analysis."

A.3.5.2. "Turnover of this site will result in environmental impacts significant enough to warrant additional environmental analysis. Environmental actions or projects must continue after transfer of this site due to imminent threat to human health or safety. Impacts of concern are:", followed by a list of impacts.

Attachment 4

ACCUMULATION POINT INSPECTION CHECKLIST

A.4.1. Are appointment letters for satellite accumulation point (SAP) managers on file?

A.4.2. Are SAP managers and supervisors trained?

A.4.3. Does the SAP display appropriate hazard warning placards?

A.4.4. Is the SAP protected to prevent unauthorized entry?

A.4.5. Are portable fire extinguishers available?

A.4.6. Are spill kits on hand?

A.4.7. Is appropriate PPE on hand and being used?

A.4.8. Are eyewash and/or shower facilities available and working?

A.4.9. Is the SAP at or near the point of generation, and is there no more than 208 L (55 gals) of HW or 1 L (1 qt) of acute HW?

A.4.10. Is the SAP manager prepared to move HW to the HWSA when accumulation limits are reached?

A.4.11. Is the SAP designed to segregate incompatible waste streams?

A.4.12. If any waste streams are turned in for energy recovery, is there applicable data to state it is suitable for energy recovery?

A.4.13. Are unregulated rags recycled/reused?

A.4.14. Are "Danger/Warning" signs and emergency contact information posted in both English and the host nation and/or predominant language?

A.4.15. Is there sufficient space for movement of emergency responders in the event of an emergency?

A.4.16. Are containers placed so as not to obstruct the exits?

A.4.17. When waste is being handled, is there immediate access to an internal alarm or emergency communication through visual or voice contact with another person?

A.4.18. Are containers in good condition, free from severe rusting, bulging, gouging or structural defects?

A.4.19. Are containers carefully handled to prevent ruptures or leaks?

A.4.20. Are containers (including overpacks) used to store hazardous waste compatible with the materials stored?

A.4.21. Do containers remain closed during storage, except when adding or removing waste?

A.4.22. Are containers holding hazardous waste marked with bilingual hazardous waste markings?

A.4.23. Are containers properly marked as per applicable transportation regulatory packaging requirements?

A.4.24. Are incompatible wastes stored in separate containers and separated by a berm, dike, wall, or other device?

A.4.25. Is the SAP flooring and/or secondary containment impervious to the HW material to prevent spills or leaks from reaching the ground?

A.4.26. Is containment sufficient to contain 10% of the volume of all containers or the volume of the largest container (whichever is greater)?

A.4.27. Is secondary containment inspected at least weekly and after rains to ensure holding capacity is not compromised from accumulated precipitation?

A.4.28. Are liquids accumulated in secondary containment being tested for the presence of contaminants prior to being released into the environment?

A.4.29. Are oil/water separator valves closed at all times except when draining rain water and spill residue?

A.4.30. Are containers elevated or protected from contact with accumulated liquid?

A.4.31. Are areas used to store containers holding ignitable or reactive waste at least 50 feet inside the installation's boundary?

A.4.32. Is an HW disposal log being maintained?

A.4.33. Are the contents of HW containers indicated?

A.4.34. Are HW logs readily available to emergency personnel in the event of a fire or spill, and are they being maintained until site closure?

A.4.35. Are waste analysis and characterization records being retained until five years after closure of the hazardous waste accumulation point?

A.4.37. Does the continuity book contain the following: SAP manager appointment letter, training documentation, inspection schedule, waste stream inventory, waste characterization forms, SAP inspection checklist, and spill response plan?

Attachment 5

ENVIRONMENTAL SUPPLIES

A.5.1. NSN Environmental Supplies.

NSN	Item
8105-00-848-9631	Bag, Polyolefin, 5ml., 36 x 54 in
8125-00-174-0852	Bottle, Plastic 1 gal.
8125-00-731-6016	Bottle, Plastic, 13 gal.
8125-00-888-7069	Bottle, Plastic, 5 gal.
8110-00-254-5719	Drum, Steel, 1 gal.
8100-00-128-6819	1 gal. Steel Drum (open top container)
8110-00-254-5722	4 gal. Steel Drum (open top container)
8110-00-282-2520	5 gal. Steel Drum (DOT 17C) (open top container)
8110-00-254-5713	6 gal. Steel Drum w/ring (open top container)
8110-01-204-8697	Pail, Shipping, Steel, 5 gal. (DOT 17E) (open top container)
8110-00-519-5618	10 gal. Steel Drum (DOT 17C) (open top container)
8110-00-735-4643	19 gal. Steel Drum (17C) (open top container)
8110-00-366-6809	30 gal. Steel Drum (17C) (open top container)
8110-00-030-7779	30 gal. Steel Drum (open top container)
8110-00-823-8121	55 gal. Steel Drum (17M) (open top container)
8110-00-030-9783	55 gal. Steel Drum (bung & vent) (DOT 17E) (open top container)
8110-01-282-7615	Drum, Polyethylene, 55 gal (open top container)
8110-01-101-4055	85 gal. Steel Disposal Drum (no lining) (open top container)
8110-01-101-4056	85 gal. Steel Recovery Drum (epoxy phenolic lining)/(open top container)
8110-01-101-4055	Drum, Hazardous Material (open top container)
9330-01-431-9896	6 lb. Bag Oclansorb
9330-01-431-9900	18 lb. Bag Oclansorb
9330-01-391-2046	2’x4’ Sorb Sox

A.5.1. NSN Environmental Supplies (Continued).

9330-01-391-2050	10’x8’ Boom
9330-01-391-2052	Peat Pads
9330-01-417-1958	Ultra Granules
9330-01-417-1959	Absorbent Sheets
7930-00-296-1272	Clay, Ground
7510-01-V55-0756	Super Absorbent
1939-01-154-7001	Non Skid Absorbent
5640-00-801-4176	Insulation, Thermal Vermiculite (packaging material)
4235-01-423-1466	Loose Absorbent, 1CF bag
4235-01-423-0711	Loose Absorbent, 2 CF bag
4235-01-423-1463	Pads, 18”x18”x3”
4235-01-423-1465	Socks, 4”x8’
4235-01-423-1467	Socks, 2”x10’
4235-01-423-2787	Boom, w/clamps, 10”x10’
9330-01-391-3113	Spill Kit, 14 gal.
9330-01-391-3110	Spill Kit, 55 gal.
9330-01-391-2047	Spill Kit, 55 gal. Bulk Filled
4235-01-420-0905	Small Camo Spill Kit
4235-01-420-0895	Large Camo Spill Kit
4235-01-432-7909	Spill Kit, Complete, Small
4235-01-432-7912	Spill Kit, Complete, 25 gal. drum
4235-01-423-7214	Spill Kit, Complete, 55 gal. drum
4235-01-423-7221	Spill Kit, Complete, 55 gal. drum
6850-01-420-3081	Micro-Blaze, 5 gal. container

A.5.2. Non-NSN Environmental Supplies.

Including commercially available products does not constitute endorsement of any particular brand or product. These items are shown merely as examples of the types of supplies that may be needed to establish an effective environmental function.

4-Drum Pallet

2-Drum Pallet

Battery Pallet

Acid Spill Kit

Oil Spill Kit

Overpack Drum

Acid Cabinet

Flammable Cabinet

Cage Cylinder Storage

A.5.2. Non-NSN Environmental Supplies (Continued)

.

Grounding and Bonding

Drum Cable

Can Puncture Kit

Bulb Crusher

Filter Crushers

Rag/Sock Wringer

Oil and Corrosive Material Containers

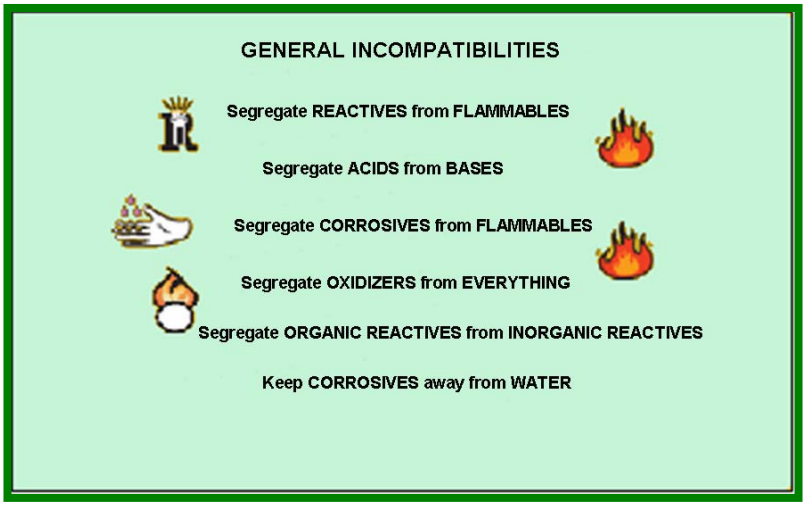
Attachment 6

STORAGE SEGREGATION

A.6.1. Generators of HW must ensure that waste streams remain segregated. Improper segregation of HW streams at the point of generation could result in an incompatible waste mixture that may pose a significant health risk.

A.6.2. If hazardous wastes and non-hazardous wastes are mixed, the wastes must be managed and disposed of as hazardous waste. This will drastically increase the cost of disposal.

A.6.3. Proper segregation at the point of generation simplifies overall management and goes a long way towards protecting human health and the environment, reducing disposal costs, and enhancing recycling potential.



A.6.4. Segregate storage into general categories (i.e., reactives, flammables/ignitables, corrosives, toxics, etc.).

A.6.5. Further segregation may be required based on the compatibility of individual materials. Reference the MSDS for each material to identify appropriate storage.

A.6.6. Storage sections should be separated by a distance of six feet or a physical barrier to prevent incompatible materials from mixing and producing chemical reactions or toxic fumes (see charts below).

A.6.7. Containers that hold reactive or flammable materials or waste should be grounded during storage, and only non-sparking tools should be used when handling these containers.

Flammables	**Corrosives (Acids)**	**Corrosives (Bases)**
Carburetor Cleaners Engine Cleaners Adhesives Rubber Cements Fuels, Fuel Oil Waste Fuels Lacquers Paints Paints Thinners Paint Wastes Solvents: Acetone Benzene Ethanol (Ethyl Alcohol) Isopropanol (Isopropyl Alcohol)	Battery Acids Degreasers Engine Cleaners Rust Removers Most Acids	Alkaline Battery Acids Alkaline Cleaners Alkaline Degreasers Potassium Hydroxide Rust Removers Sodium Hydroxide
Oxidizers	**Reactive Metals**	**Reactive Organics**
Chlorine Gas DS2 Nitric Acid (Red Fuming Nitric) Perchlorates Perchloric Acid Peroxides	Lithium (Batteries) Aluminum Beryllium Calcium Magnesium Sodium Zinc Powder	Alcohols Chromic Acids Hypochlorite Organic Peroxides (Hydrogen Peroxide) Perchlorates Sulfides

Acids	→	Oil/Grease		Fire
Acids	→	Caustics		Heat/Spattering
Caustics	→	Epoxies		Extreme Heat
Flammable Liquids	+	Hydrogen Peroxide	=	Fire/Explosion
Aluminum Powder		Ammonium Nitrate		Explosion
Sodium Cyanide	→	Sulfuric Acid		**Lethal Hydrogen Cyanide**
Chlorine Gas	→	Acetylene		Explosion
Ammonia	→	Bleach		Poisonous Fumes

Attachment 7

DISPOSAL DOCUMENTS AND INFORMATION

A.7.1. The information provided in this attachment will be helpful in preparing unserviceable items and waste for disposal. Additional information can be found in the following publications:

DOD 4160.21-M, *Defense Materiel Disposition Manual*
http://www.dla.mil/dlaps/dod/416021m/guide.asp

DOD 4000.25-1-M, *Military Standard Requisitioning and Issue Procedures (MILSTRIP) Manual*
http://www.dla.mil/j-6/dlmso/eLibrary/Manuals/MILSTRIP/default.asp

DOD 4160.21-M-1, *Defense Demilitarization Manual*
http://www.dla.mil/dlaps/dod/416021m1/guide.asp

A.7.2. General Turn-in Procedures.

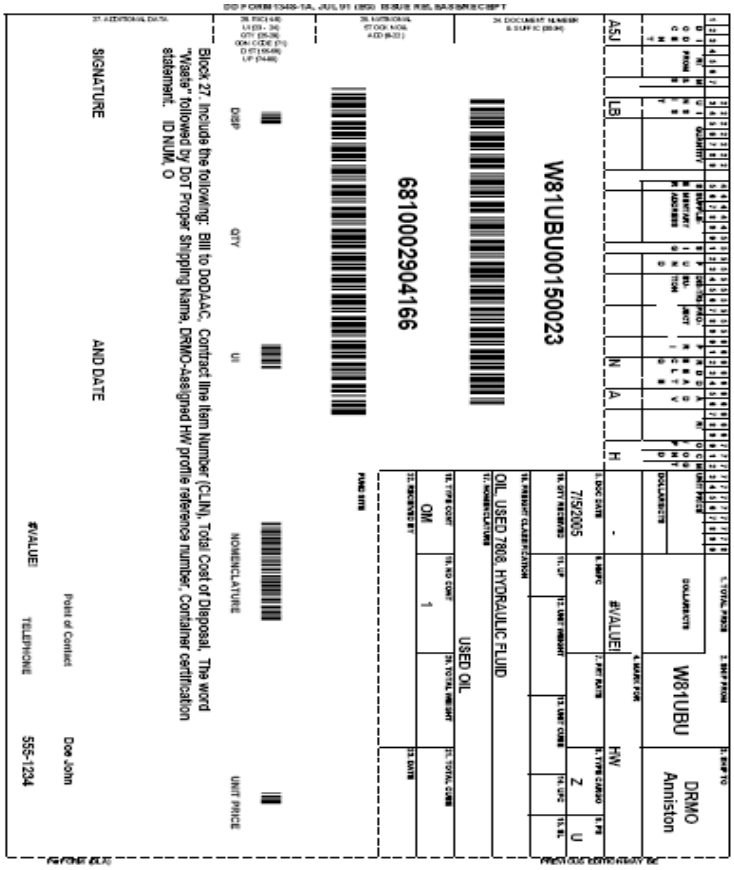
A.7.2.1 HW containers must be labeled with contents. Drums must be stenciled or have contents listed. Containers cannot be leaking. Rusted drums with compromised container integrity will be rejected. Drums must be properly closed (bungs). No other closure is acceptable (i.e., rags stuffed in the bung hole). Drums cannot be filled to the top; allow at least 5 inches for expansion. Severely bulging drums will not be accepted.

A.7.2.2. A completed DD Form 1348-1A, Issue Release/Receipt Document, must accompany each turn-in and waste stream.

A.7.2.3. Complete a Hazardous Waste Profile Sheet (HWPS) with the turn-in of each initial waste stream. DRMS Form 1930 is an acceptable form. Fill in the data based on user's knowledge or laboratory results. Do not commingle wastes (i.e., types of batteries turned in separately).

A.7.3. Instructions for Completing Documentation.

A.7.3.1. DD Form 1348-1A. The following information must be provided with all turn-ins of hazardous waste:



A.7.3.1.1. Unit Requesting Services (unit identification).

A.7.3.1.2. Defense Turn In Document (DTID) Number. The generator's six-character DODAAC (Department of Defense Activity Account/Address Code), four-digit Julian date, and generator-provided 4-digit serial number (e.g., the DTID for NSA Bahrain: N63005 2203 NA01).

A.7.3.1.3. Service MILSBILLS and Fund Code. MILSBILLS is a 6-digit military billing code used to fund disposal of hazardous waste. The Fund Code is a two-character code that is service and activity/installation specific. Both codes must be included on all waste disposal transactions. (e.g., 30 = USAF, PP = USN, 21 = USA). For more information on MILSBILLS and Fund Codes, refer to the Defense Materiel Disposition Manual.

A.7.3.1.4. Item Description. Describes type of material requiring disposal.

A.7.3.1.5. Contract Line Item Number (CLIN). The CLIN identifies the type of waste, unit of measure, and cost per unit for disposal when contracted through DRMS. It is available in the DRMS hazardous waste contract. Contact the theater DRMS representative for a copy of the contract.

A.7.3.1.6. Total Quantity (in kilograms). Waste must be ordered for disposal in kilograms (kg), including packaging; i.e., drums (not pallets).

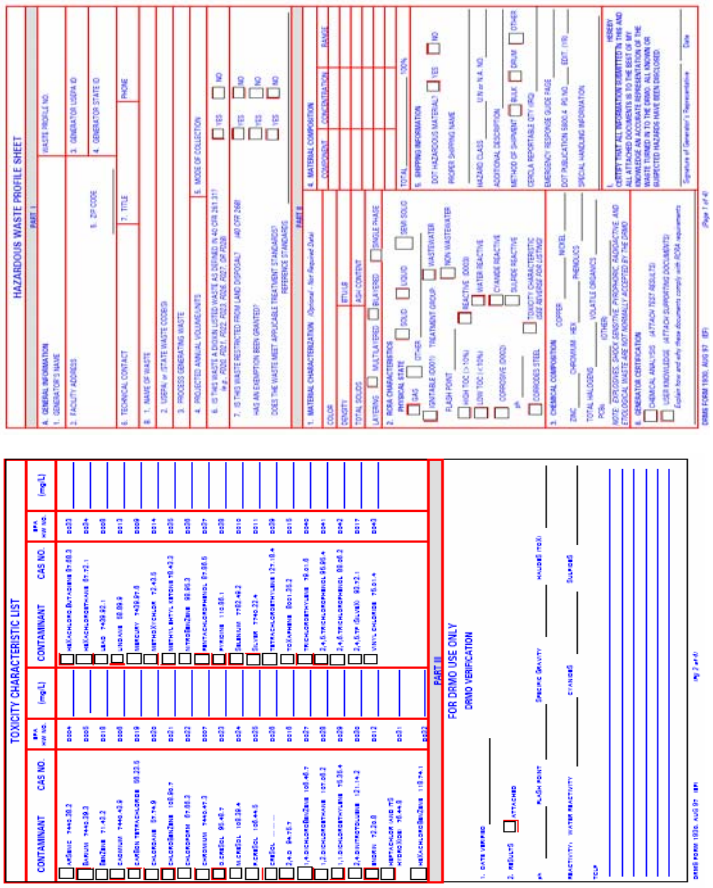
A.7.3.2. Size and Number of Containers (e.g., 200-liter drums, 10 each; 8-liter cans, 5 each; compressed gas cylinders, 5 each).

A.7.3.3. Activity POC, Address and Phone Number. Provide primary POC for waste and waste removal. Include accurate address and phone number.

A.7.3.4. Physical Location of the Waste. If different from the activity address, provide a building number or site location (e.g., Bldg. 1004, Deployed Forces Compound).

A.7.3.5. DOD MILSTRIP information for HW as follows: DEMIL Code A, Disposal Authority Code N, Condition Code H. These codes are constant and do not change for hazardous waste transactions.

A.7.3.6. DRMS Form 1930, Hazardous Waste Profile Sheet. This is a four-page form which includes two pages of instructions.



Attachment 8

SAMPLE PERFORMANCE WORK STATEMENT (PWS)

A.8.1. Scope of Work. The contractor shall provide all personnel, equipment, tools, materials, supervision, and other items necessary to perform refuse collection and disposal services as defined in this PWS. The contractor shall perform to the standards outlined in this contract.

A.8.2. Technical Definitions Specific to this PWS.

A.8.2.1. Dumpsters: large containers that can either be pulled or lifted mechanically into a service vehicle and dumped.

A.8.2.2. Collection Station: locations designated on the drawing, Technical Exhibit 1, where refuse may be assembled and stored in containers for collection (also may be referred to as collection points or pick-up stations).

A.8.2.3. Collection Frequency: number of times collection is provided within a given period of time.

A.8.2.4. Refuse Collection Containers: cans, drums, bins or similar receptacles which can be handled easily.

A.8.2.5. Refuse: includes all garbage, ashes, debris, rubbish, scrap wood, wood pallets, steel, and other similar waste material intended for disposal. Not included are explosives and incendiary waste and contaminated waste from medical and radiological processes.

A.8.2.6. Refuse Collection: a system of transporting refuse from collection stations to points of disposal.

A.8.3. Contractor Furnished Items and Services.

A.8.3.1. General: The contractor shall furnish all materials, vehicles and labor required to perform to the standards of this PWS. All dumpsters shall be capable of holding a minimum of 6 cubic meters of refuse. Dumpsters will have nonobstructive closers to contain trash.

A.8.3.2. Contractor shall provide a copy of the collection schedule to the contracting officer and civil engineer for approval. The contractor shall develop a schedule using the frequencies listed in Technical Exhibit 1.

A.8.3.3. Vehicle(s): The contractor shall provide all vehicles necessary to fulfill requirements of the contract. All vehicles shall be in operable condition and meet local and base entry requirements. Vehicles shall be neat in appearance and bear the contractor's name for easy identification. Vehicles shall be operated in accordance with local and base traffic regulations. Vehicles must not leak petroleum, corrosive or waste fluids.

A.8.3.4. All vehicles shall be empty upon entering the base/site/camp area. Vehicles and personnel are subject to 100% security inspection and search at any time. Vehicles shall remain on the installation at all times and will be stored at (list location). The contractor will be authorized to remove vehicles from installation for scheduled maintenance and repairs. However, this requirement shall not affect the level of service.

A.8.3.5. The contractor shall be responsible for maintaining all dumpsters on the site. All dumpsters shall be clearly labeled with the contractor's name, address, and local phone number, and numbered for easy recognition.

A.8.3.6. Dumpsters shall be marked with reflective material (minimum of 25-cm high and 1-meter wide) on all sides.

A.8.3.7. Dumpsters shall be marked on all visible sides with clearly visible and readable text, 'No Parking Within 15 Meters.

A.8.3.8. All dumpsters shall be placed in such a manner as to maintain a professional appearance.

A.8.3.9. Dumpsters should be leakproof, waterproof, and vermin-proof, including sides, seams and bottoms, and be durable enough to withstand anticipated usage and environmental conditions without rusting, cracking or deforming. Storage containers should have functional lids.

A.8.3.10. Deteriorated containers will be replaced or repaired by the contractor at no additional cost to the government.

A.8.3.11. Additional dumpsters shall be added to the contract if required by the installation for unique situations such as facility or equipment repairs, demolitions, or new construction.

A.8.4. Specific Tasks.

A.8.4.1. Points of Collection: The contractor shall pick up refuse dumpsters according to the schedule listed in Technical Exhibit 1.

A.8.4.2. Frequency of Collection: The contractor shall empty all dumpsters according to the schedule (reference paragraph A.6.3.2).

A.8.4.3. Position of Containers:

A.8.4.3.1. The contractor shall position the containers at collection points to best aid users in disposing of refuse and to minimize interference with adjacent parking lots, roadways, overhead utilities, and other obstructions.

A.8.4.3.2. Contractor shall relocate dumpsters to other locations when directed. Request for change will come from the CE representative. One dumpster shall be made available for immediate relocation at all times. This dumpster will be placed at various locations throughout the base on an as-needed basis. Upon notification from the contracting officer (CO) and CE representative, the contractor shall move this dumpster within 24 hours.

A.8.4.3.3. The contractor shall furnish replacement containers for all containers removed for cleaning, maintenance, or repair to ensure collection stations have adequate refuse containers present at all times.

A.8.4.4. Spillage: The contractor shall pick up all spillage and wood pallets around bulk containers within a radius of 5 meters.

A.8.4.5. Special Collection: In addition to the regularly scheduled refuse collections, the contractor shall be required to make special collections within 24 hours of notification by the CO and CE representative.

A.8.4.6. Inclement Weather Schedule: The contractor shall collect refuse during inclement weather except in case of unduly severe weather and as authorized by the contracting officer. Make-up collections shall be performed within 24 hours after the severe weather has terminated. If all make-up collections cannot be made within 24 hours, the contractor shall submit a revised schedule to the contracting officer for approval.

A.8.4.7. The contractor shall dispose of all refuse on base at an approved disposal site (on-base disposal). Contractor is not responsible for separating refuse at the disposal site.

A.8.5. General Information.

A.8.5.1. Quality Control: The contractor shall develop and maintain a quality program to ensure services are performed in accordance with this PWS. The contractor shall develop procedures to identify, prevent, and ensure nonrecurrence of defective services. The contractor is strictly prohibited from removing items from the trash. Employees found removing items from the trash will be searched and banned from the installation.

A.8.5.2. Hours of Operation: Unless otherwise specified, all work shall be performed between the hours (include hours), 7 days per week, including religious holidays. Any work outside these hours shall require prior approval and notification by the contracting officer.

A.8.5.3. Security Requirements: It is the responsibility of the contractor to secure and maintain all necessary clearances and passes for entry of personnel and vehicles to the installation.

A.8.5.4. Contract Manager: The contractor shall designate a representative who shall be on site during the performance of all work and can speak/act for the contractor. The representative shall be able to speak, write, and understand English and shall speak with the CE representative at the start and end of each work day for updates, progress, and government concerns.

A.8.5.5. Accident Reporting: Contractor shall notify the Force Protection escort of any incident and relay this information to the Contracting Officer.

A.8.5.6. Environmental: The contractor shall be responsible for any spill of waste or vehicle fluids which occurs during the performance of this PWS.

A.8.5.7. Theft and Damages: All theft and damages shall immediately be reported to the CO and CE representative. Damages by the contractor shall be repaired or replaced at no cost to the government.

A.8.5.8. Government Furnished Fuel: Government will provide fuel for the contractor's vehicles.

A.8.5.9. Maps: Maps showing location of facilities cannot be provided to the contractor. Contract or CE personnel can assist the contractor.

A.8.5.10. **NOTE:** Attach Technical Exhibit 1 to the PWS. This document should indicate (at a minimum) the location and frequency of each dumpster to be collected and emptied by the contractor. Tailor the sample PWS to meet the needs of the location.

Attachment 9

SITE CLOSURE CHECKLIST

A.9.1. Contact with the AOR Environmental POC made for guidance?

A.9.2. Camp closure plan developed?

A.9.3. DRMS contacted to coordinate turn-in of HM/HW?

A.9.4. Environmental function providing camp closure oversight?

A.9.5. Medical waste red bagged and prepared for turn-in?

A.9.6. All medical waste removed from the site?

A.9.7. Sufficient amount of UN-approved shipping containers on hand?

A.9.8. Containers being properly labeled and prepared for turn-in?

A.9.9. Placards on hand for vehicles used to transport HM/HW?

A.9.10. Used spill response equipment collected and containerized?

A.9.11. Bulk turn-in points established?

A.9.12. Spills at the HWSA cleaned up and all material removed?

A.9.13. Maintenance HM/HW storage and HW satellite accumulation points cleaned up?

A.9.14. Serviceable hazardous materials in original packing containers being prepared for turn-in through the supply system?

A.9.15. Expired HM/HM opened and contaminated being identified for turn-in as HW?

A.9.16. All metal removed from burn pits and segregated for recycling?

A.9.17. Is there a plan for closing burn pit(s)?

A.9.18. Burn pits covered with a 6” layer of soil?

A.9.19. Burn pits marked with signs indicating its use, closing date, and the closing unit?

A.9.20. All solid waste removed from the solid waste landfill (if required)?

A.9.21. Is there a plan to close the landfill?

A.9.22. Solid waste dumps covered over with soil?

A.9.23. Is there a plan for closing expedient latrines?

A.9.24. All trash and waste removed from latrines?

A.9.25. Latrine pits treated for vectors, covered, and have signs placed indicating closure date and closing unit?

A.9.26. All HW turned in by maintenance functions?

A.9.27. All contaminated soil collected for treatment and/or disposal?

A.9.28. Contamination around generators cleaned up?

A.9.29. Contamination at bulk fuel storage/distribution points cleaned up?

A.9.30. Maps, photos, grid coordinates of all areas with closure report?

A.9.31. Unit requires assistance for spill cleanup?

A.9.32. Unit requires assistance for coordinating HM/HW turn-in?

A.9.33. Unit requires assistance with any environmental concerns?

A.9.34. Final walkthrough/inspection with HN representative conducted and documented?

A.9.35. Closure report with full documentation and references to the EBS completed?

A.9.36. All environmental documentation and reports forwarded to the AOR Environmental POC, higher headquarters, and other appropriate agencies?