

**FM 3-34.500  
MCRP 4-11B  
NTTP 4-11.1  
AFTTP 3-4X**

**ARMY, MARINE CORPS,  
NAVY, AIR FORCE**

**ENVIRONMENTAL  
CONSIDERATIONS IN  
CONTINGENCY OPERATIONS**

**INITIAL DRAFT (Version 2)  
30 SEPTEMBER, 2004**

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## FOREWORD

This publication has been prepared under our direction for use by our respective commands and services. This multiservice document supports both joint and service doctrine.

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FM 3-34.500	U.S Army Combined Arms Center Fort, Leavenworth, Kansas
MCRP 4-11B	Marine Corps Combat Development Command Quantico, Virginia
NTTP 4-11.1	Navy Warfare Development Command Newport, Rhode Island
AFTTP 3-4X	Headquarters Air Force Doctrine Center Maxwell Air Force Base, Alabama

# Environmental Considerations in Contingency Operations

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\*This publication will supersede Field Manual (FM) 3-100.4/MCRP 4-11B, 15 June 2000.

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## **Preface**

Doctrine provides military organizations with a common philosophy and language. It enhances unity of effort. FM 3-34.500/MCRP 4-11B/NTTP 4-11.1/AFTTP 3-4X establishes and explains the multiservice principles of integrating environmental considerations in planning, training, and operations.

### ***Purpose***

This field manual (FM) guides each of the services of the Department of Defense (DOD) in applying appropriate environmental considerations and procedures during all types of contingency operations. It also provides basic techniques and procedures for selected specific environmental considerations. This manual describes the growing strategic significance of environmental factors in the twenty-first century; states the purposes and methods for integrating environmental considerations into planning, training, and operations; and provides a brief description of key environmental references and sources; focused on contingency operations. The appendices provide references, formats, and selected guidance on procedures associated with environmental considerations.

### ***Scope and Applicability***

As a multiservice document, this doctrine applies to all Army, Marine Corps, Navy, and Air Force commanders and staffs (and other DOD units/staffs and other elements operating under their command authority) responsible for planning and executing contingency operations. While its focus is on units with staffs, it applies to all service members as well-disciplined stewards of the natural and cultural resources of this country and protects, within mission requirements, the environment in every area of operations (AOs). For overseas theaters, this doctrine applies to United States (US) unilateral operations and US forces in multinational operations, subject to applicable host nation (HN) laws and agreements. Finally, it applies to support provided by the Logistics Civil Augmentation Program (LOGCAP) or other contracted support.

### ***Administrative Information***

The US Army Engineer School (USAES) developed this publication as the Army's executive agent for environmental considerations with the participation each of the services as identified in the Foreword. USAES will review and update this publication as necessary.

The proponent of this publication is Headquarters Training and Doctrine Command (HQTRADOC). Send comments and recommendations on Department of the Army (DA) Form 2028 (Recommended Changes to Publications and Blank Forms) directly to Commandant, United States Army Engineer School, ATTN: ATSE-DEI, Directorate of Environmental Integration, 320 MANSCEN Loop, Suite 370, Fort Leonard Wood, Missouri 65473-8929.

Unless this publication states otherwise, masculine pronouns do not refer exclusively to men.

The short synopses of laws and regulations contained herein are meant to provide only a thumbnail sketch of the laws and regulations described and are not inclusive of all requirements.

## Introduction

The military's primary mission is to win this nation's wars through the application of overwhelming combat power. Warfare, by its very nature, is usually destructive to humans and their natural environment. Environmental damage may be a consequence of combat. However, the commander in the field (air, land, or sea) is often required to restrict the application of force. The commander must conform to the law of warfare (LOW): those written and unwritten conventions and customs that protect against unnecessary suffering and facilitate the restoration of peace. With increasing frequency, the commander is also constrained by mission requirements that may restrict the use of much of the combat power inherent in his organization. Environmental considerations are greater than the aspects of environmental protection, but the majority of the restrictions are concerned with environmental protection.

The US military has historically exercised restraint, even in general war. For example, during World War II in Europe, the military was ordered to limit damage to works of art, churches, monuments, archives and libraries, whenever possible, without endangering troops or mission. Field commanders incorporated this information into their standard decision-making process and made judgments based on military necessity. As the military looks to the future, service members and their commanders should try to avoid unnecessary environmental damage, not only in training, but also across the spectrum of operational missions. A mission's success may be determined by political or socio-economic stability, both of which are affected by environmental factors and resources. Commanders must identify ways to minimize damage to the natural environment while executing the full range of missions and protecting their deployed service member by doing the following:

- Using risk management to identify environmental-related hazards and controls to reduce/eliminate negative effects on mission accomplishment.
- Understanding the collective nature of environmental considerations and the linkages between environmental protection issues and their associated impact on safety, force health protection, civil affairs, and other areas of concern and consideration.
- Considering the environment in planning and decision-making in conjunction with national policy and strategic objectives.
- Protecting the service member from adverse effects of environmental exposures.
- Protecting the home station and training area environments as a means of retaining resources for mission purposes and ensuring their use as viable projection platforms.
- Instilling an environmental awareness (situational awareness) in service members to understand how environmental considerations impact operations and how the service member can minimize or mitigate their effect on the environment.

The above actions identify environmental considerations as an important aspect to be considered in conjunction with mission planning and execution. Through planning and execution, the services include environmental considerations and address them appropriately in training and across the entire spectrum of operations.

### ***Fundamental Change***

Military actions, at the dawn of the twenty-first century, are undergoing revolutionary changes in methods, weapons, and even strategic objectives. Extraordinary advances in technology accompanied by a historically unprecedented growth in global population have dramatically altered the characteristics and demands of the battlefield. Service members must be prepared to respond across the “entire operational spectrum, from humanitarian to combat” and the four operational categories (offense, defense, stability, and support operations), sometimes within the same operation. Deployed forces must be able to conform to the theater commander’s guidance on environmental considerations without impairing combat effectiveness and understand that this guidance is also a part of mission accomplishment.

This requirement is new and fundamentally different from the traditional, organized application of violence that is the core of military capability. It stems from mankind’s capacity to cause irreparable harm to vital natural resource systems and our growing understanding of the consequences of such damage. The environmental resources of these natural systems, such as clean air, water, land, forests, and wildlife, were once considered limitless. Today, it is clear that these resources are limited and require protection. Where these resources are scarce, they are increasingly significant to economic well-being and human health.

In regions where increasing numbers of people occupy a finite and densely crowded area, urbanization, migration, public health, and refugees are factors of growing strategic importance. In these circumstances, environmental resources may assume a substantial role in conflict origin and resolution. US land forces will increasingly operate in or near urban environments. For example, US forces may conduct stability operations and support operations to establish order in the aftermath of an insurgency or civil war, a failed government, or lawlessness. Shortages of basic resources such as clean water, food, and fuel will complicate the mission. Thus, environmental resources can be operational as well as strategic factors.

US forces (land, air, and sea) must be versatile and capable of rapid deployment to perform the full range of missions from humanitarian to total war. Recent operations have shown that they must also be flexible within the strategic or operational mission. For example, units may execute combat operations, limited in time or space, within the context of larger stability operations. They must also be able to apply environmental protection measures and other environmental considerations appropriate to the situation.

National recognition of environmental threats to the population’s safety and well-being has inspired laws, regulations, and international agreements. Americans value and demand a clean and healthy environment. Successful

operations within a coalition or with allies may demand US adherence to certain environmental standards. US military forces do not function independently of political policy and the desires of the people; they reflect national values and obey the laws. Therefore, the US military have developed skills and procedures for integrating environmental considerations into contingency operations.

This manual devotes itself to demonstrating how this integration can be relatively seamless as it melds into the existing processes within each of the services. Integration of environmental considerations is an evolutionary, rather than a revolutionary adaptation of our current military processes. The concept must become second nature for each service member. Linking good environmental actions to sound tactical doctrine and tactics, techniques, and procedures (TTP) can and should be the standard. Environmental considerations will, in many cases, reinforce or amplify sound tactical principles and issues of force protection that the military already accepts as doctrine or TTP for other reasons. Environmental considerations are tied directly to risk management and the safety and health of service members. It is an enabling element for the commander, and as such, an essential part of military planning, training, and operations.

### ***How to Use this Manual***

The manual is organized to help commanders and staffs understand what environmental considerations are and how to integrate and apply them to existing staff processes.

- Chapter 1 – defines environmental considerations and the relationship of environmental hazards/threats to risk management.
- Chapter 2 – provides operations guidance.
- Chapter 3 – provides planning guidance.
- Chapter 4 – provides training guidance.
- Chapter 5 – provides guidance on environmental considerations associated with base camps.

The appendices provide a more in-depth look at information that supports the chapters. In general, they are designed to provide a starting point or template for the procedures or products associated with environmental considerations that service staffs and commanders will require during planning, training, and operations across the spectrum of conflict. References to other documents provide more specific information about various areas of environmental considerations.

This multiservice manual is focused on contingency operations. It links joint and other service doctrine to provide a framework for the integration of environmental considerations. Connectivity with other joint, service, and installation specific doctrine and TTP ensure higher, lower, and lateral linkage of environmental considerations without the creation of new or separate processes. Critical joint publications and documents include but are not limited to Joint Publications (JPs), Chairman of the Joint Chiefs of Staff Manuals (CJCSMs), and a Chairman of the Joint Chiefs of Staff Instructions (CJCSIs) to effectively plan for and train the integration of environmental considerations. This manual must be read in conjunction with the documents listed below:

- CJCSI 3500.01C, *Joint Training Policy and Guidance for the Armed Force of the United States*
- CJCSM 3122.01, *Joint Operations Planning and Execution System (JOPES) Volume I (Planning Policies and Procedures)*
- CJCSM 3122.02C, *Joint Operations and Execution Systems (JOPES) Volume I, (Planning Policies and Procedures)*
- CJCSM 3122.03A, *Joint Operations Planning and Execution System Volume II, Planning Formats and Guidance*
- CJCSM 3141.01A, *Procedures for the Review of Operations Plans*
- CJCSM 3500.03A, *Joint Training Manual for the Armed Forces of the United States*
- CJCSM 3500.04C, *Universal Joint Task List (UJTL)*
- JP 3-0, *Doctrine for Joint Operations*
- JP 3-34, *Engineer Doctrine for Joint Operations*
- JP 3-57.1, *Doctrine for Joint Civil Affairs*
- JP 4-02, *Doctrine for Health Service Support in Joint Operations*
- JP 4-04, *Joint Doctrine for Civil Engineering Support*

When focusing on the integration of environmental considerations on an installation, or bringing forward installation standards to use on a given base camp location, refer to –

- Army regulation (AR) 200-1, *Environmental Protection and Enhancement*;
- FM 100-22, *Installation Management*;
- Marine Corps order (MCO) P5090.2A, *Environmental Compliance and Protection Manual*;
- operational naval instruction (OPNAVINST) 5090.1B, *Navy Environmental and Natural Resources Program Manual*;
- naval warfare publication (NWP) 4-11, *Environmental Protection*;
- and other relevant documents.

Additional important supporting service manuals include training circular (TC) 3-34.510, *Command Environmental Program*, volumes 1 and 2 of the Air Force's *Bioenvironmental Engineering Environmental Field Manual*, and other references identified throughout this manual and its bibliography. For additional information and service-specific guidance, refer to the appropriate service doctrine and regulations.

## Chapter 1

# Environmental Considerations

*“An emerging class of transnational environmental issues are increasingly affecting international stability and consequently will present new challenges to US strategy.”(update this)*

National Security Strategy, July 1994

The US military’s primary mission is to defend the US—its people, its land, and its heritage. National security strategy now includes specific environmental security concerns. Strategic and operational end states support lasting victories and these end states will include environmental considerations. This manual is focused on contingency operations and acknowledges that in the context of operations, most environmental considerations fall into the category of risk management rather than being a series of absolutes, as they often present themselves when being applied to operating on installations and in training areas. While international laws will often apply, the focus for Army, Navy, Air Force, and Marine Corps personnel involved in contingency operations is on the guidance they will receive in the environmental considerations annex or appendix (and other relevant portions) of an operation plan (OPLAN) or operation order (OPORD) and the provisions of their unit standing operating procedures (SOPs).

Most relevant guidance will be obtained from these sources and any subsequent command guidance. Given the natural interface between the DOD and the warfighter tasked with carrying out the contingency mission, guidance to the warfighter is typically initially presented in OPLAN/OPORD format at the combatant commander level. Guidance on environmental considerations will be followed in the same disciplined fashion as all other portions of the OPLAN/OPORD. The policy and vision of the DOD and all four services on the integration of environmental considerations, as well as your responsibilities as leaders, are critical to understanding how to address environmental considerations in planning and training so that they are effectively implemented during contingency operations. Environmental considerations are integrated across doctrine, organization, training, materiel, leadership and education, personnel, and facilities (DOTMLPF) but the focus of this manual is on doctrinal integration and the necessary linkages to training in a manner that supports doctrine and the conduct of contingency operations.

## ENVIRONMENTAL CONSIDERATIONS DEFINED

1-1. Environmental considerations include a myriad of specifics dealing with protection of the natural and cultural environment as well as those aspects of force health protection that focus on the effects of the environment on service personnel. The JP 1-02, *Department of Defense Dictionary of Military and Associated Terms*, definition of environmental considerations is:

*The spectrum of environmental media, resource, or programs that may impact on, or are affected by, the planning and execution of military operations; factors may include by are not limited to environmental compliance, pollution prevention, conservation, protection of historical and cultural sites, and protection of flora and fauna.*

1-2. The categories of environmental considerations are more comprehensive than those specifically listed in the definition above and in its proponent manual (JP 3-34). What most people think of when they hear the term environmental considerations is the term environmental stewardship. The JP 1-02 definition of this term is:

*The integration and application of environmental values into the military mission in order to sustain readiness, improve quality of life, strengthen civil relations, and preserve valuable natural resources.*

1-3. Environmental stewardship focuses on the regulatory aspects of environmental considerations and excludes critical portions of the larger spectrum of environmental considerations. The definition of environmental considerations does allow for the inclusion of these other considerations (“but are not limited to”) but it does not highlight the critical linkages to such major subsets of considerations as force health protection and the cultural considerations embedded in civil-military operations. Finally the focus of contingency operations is not on environmental compliance and environmental protection in its own right, but rather compliance to the command guidance on the range of environmental considerations received in the OPLAN/OPORD and implementation of environmental considerations included in unit SOPs. The focus of environmental considerations during contingency operations is first and foremost on risk management rather than environmental stewardship.

1-4. Environmental considerations comprise a broad spectrum of issues that require integration into the every day lives of service members and don’t go away or become irrelevant just because we are involved in contingency operations. They require integration into daily operations and have the same habitual flow for the commander and staff as safety considerations as hazards/risks are identified and dealt with. There is a new appreciation for the interdependence between mission, the community, and the environment. This manual will focus on actions affecting contingency/expeditionary operations but will also include the relevancy of training to ensure we perform correctly upon deployment. Good unit standing operating procedures (SOPs) play a large part in this. We ultimately perform in operations based on what we have practiced and integrated into our training. Poor (or incomplete) training provides less than favorable results during operational



deployments. Leaders need to always consider and integrate environmental considerations into training and our planning processes.

## FORCE HEALTH PROTECTION CONSIDERATIONS

1-5. Force health protection (FHP) is a critical category of environmental considerations and is defined by JP 1-02 as – “All services performed, provided, or arranged by the Services to promote, improve, conserve, or restore the mental or physical well being of personnel. These services include, but are not limited to, the management of health service resources, such as manpower, monies, and facilities; preventive and curative health measures; medical evacuation of the wounded, injured or sick; selection of the medically fit and disposition of the medically unfit; blood management; medical supply, equipment, and maintenance thereof; combat stress control; and medical, dental, veterinary, laboratory, optometry, medical food, and medical intelligence services.”

1-6. FHP and the associated effect of the environment on the service member are at the very heart of a commander’s concerns for the health and safety of his command as contingency operations are conducted. While force health protection is not subordinate to environmental considerations, environmental considerations encompass many aspects of it. It is a part of environmental considerations and yet much more than just environmental considerations. Its definition demonstrates this.

*All services performed, provided, or arranged by the Services to promote, improve, conserve, or restore the mental or physical well-being of personnel. These services include, but are not limited to, the management of health services resources, such as manpower, monies, and facilities; preventive and curative health measures; evacuation of the wounded, injured, or sick; selection of the medically fit and disposition of the medically unfit; blood management; medical supply, equipment, and maintenance thereof; combat stress control; and medical, dental, veterinary, laboratory, optometry, medical food, and medical intelligence services.*

1-7. The portion of force health protection most important to environmental considerations involves the “preventive and curative health measures” relevant to medical health professionals and military commanders. In many cases, these measures may be the most important overall environmental considerations for operational commanders as they assess the potential effects of the environment on their service members. FHP is integrated throughout this manual and in all discussions of environmental considerations. For more information see JP 4-02, JP 4-02.1, *Joint Tactics, Techniques, and Procedures for Health Service Logistics Support in Joint Operations*, FM 4-02, *Force Health Protection in a Global Environment*, FM 4-02.17, *Preventive Medicine Services* (and other Service documents on preventive medicine).

## HISTORICAL AND CULTURAL CONSIDERATIONS

1-8. Historical and cultural considerations in contingency operations take on a much larger importance than the cultural considerations we have typically associated with cultural programs at installations and in training areas. Like FHP, civil-military operations (CMO) are a subset of environmental considerations and yet have a much broader set of concerns than just environmental considerations. Civil-military operations doctrine recognizes the importance of environmental considerations in the success of their roles and missions. Civil affairs (CA) units are directly concerned with the effects of CMO on the populations we are involved with during contingency operations and integrate the range of environmental considerations into their specialized operational focus of noncombatants. Both the Army and the Marines have a dedicated CA force structure.

1-9. Because of the critical affect of cultural considerations on the daily tempo of contingency operations, it is important to ensure that their environmental considerations are effectively integrated into planning, training, and operations. An example of this might be the critical importance of considering the cultural impacts associated with destruction or damage to churches/mosques or other cultural sites and their ultimate effects on the success of the operation. These considerations tend to fall into the special staff focus of the J5/G5/S5, supporting civil affairs expertise, and integration with legal advice from the Judge Advocate General (JAG). For more information see JP 3-57, *Joint Doctrine for Civil-Military Operations*, JP 3-57.1, *Joint Doctrine for Civil Affairs*, FM 3-05.401/MCRP 3-33.1A, *Civil Affairs Tactics, Techniques, and Procedures*, and FM 41-10, *Civil Affairs Operations*.

## LEVELS OF ENVIRONMENTAL CONSIDERATIONS

1-10. Environmental considerations are always an aspect of planning, training, and operations and their integration remains a constant requirement. However, the relevance of particular environmental considerations, the hazards/threats, and corresponding risks associated with them will be variable when compared to other considerations and risks that a commander must deal with when involved in contingency operations. Commanders employ risk management to mitigate many environmental related risks while continuing to achieve minimum levels of health and safety protection. This is reflected in Figure 1-1 (page 1-5) where these minimums are highlighted and the notional stair-step dotted line approximates the varying relative importance of many other environmental considerations or threats before, during, and after force projection operations.

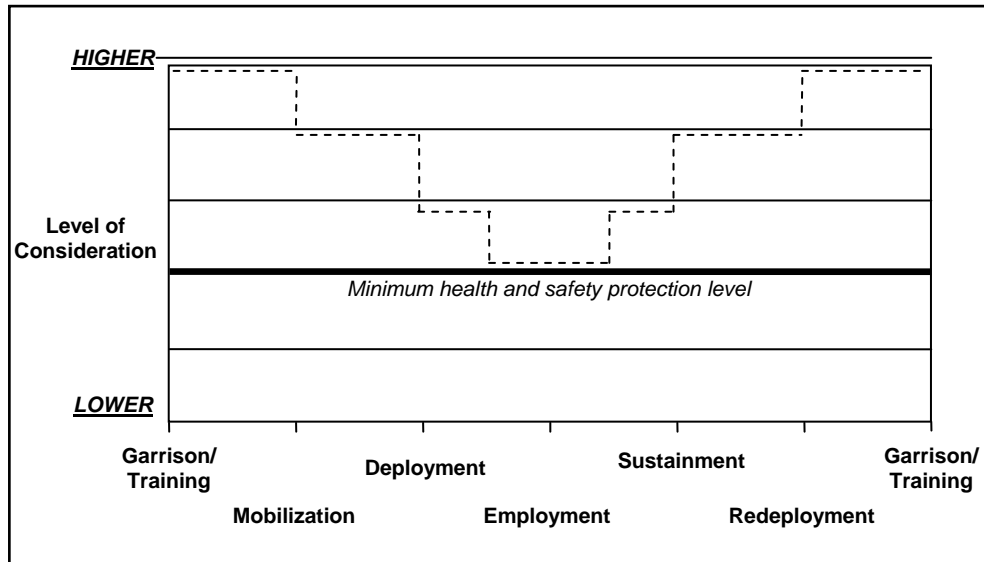


Figure 1-1. Levels of Environmental Consideration

## ENVIRONMENTAL HAZARDS/THREATS AND RISK MANAGEMENT

### HAZARDS AND THREATS

1-11. Hazards are subcomponents of threats and at times the terms are used interchangeably. A hazard is defined by JP 1-02 as:

*A condition with the potential to cause injury, or death of personnel; damage to or loss of equipment or property; or mission degradation.*

1-12. Hazards create risks that must be dealt with and commanders are required to assess risks and factor them into their planning, preparation (training), and execution (operations). This process is called risk management and it “assists decision makers in reducing or offsetting risk (by systematically identifying, assessing, and controlling risk arising from operational factors and making decisions that weigh risks against mission benefits.” While each of the services uses slightly different processes, but the single baseline process is identified in FM 3-100.12/MCRP 5-12.1C/NTTP 5-03.5/ATTP (I) 3-2.34, *Risk Management*.

1-13. An environmental hazard is simply a subset of all hazards and defined by this proponent manual as:

*All activities that may pollute, create negative noise related effects, degrade archaeological/cultural resources, or negatively affect threatened or endangered species habitats; also included are environmental health-related hazards.*

### RISK MANAGEMENT

1-14. The risk management process is one of detecting, assessing and controlling risk arising from operational factors and balancing risk with mission benefits. Risk management is an integral part of military decision

making as highlighted in FM 3-100.12. Knowledge of environmental factors is key to planning and decision-making. With this knowledge, leaders quantify risks, detect problem areas, reduce risk of injury or death, reduce property damage, and ensure compliance with environmental laws, regulations, and command guidance articulated in the OPLAN/OPORD or other command guidance. Unit leaders conduct risk assessments before and throughout the conduct of any training, operations, or logistical activities.

1-15. As with all other hazards, environmental hazards and their associated risks are assessed through risk management and assist the commander or leader by –

- Enhancing operational mission accomplishment.
- Supporting well-informed decision making to implement a course of action (COA).
- Providing assessment tools to support operations.
- Enhancing decision-making skills based on a reasoned and repeatable process.
- Providing improved confidence in unit capabilities. Adequate risk analysis provides a clearer picture of unit readiness.
- Preserving and protecting personnel, combat weapon systems, and related support equipment while avoiding unnecessary risk.
- Providing an adaptive process for continuous feedback through the planning, preparation, and execution phases of military operations.
- Identifying feasible and effective control measures where specific standards do not exist.

1-16. Environmental hazards/threats are identified and listed whenever they are identified, an assessment performed by the commander and staff, and controls created as the commander makes risk decisions. This is done during planning (Chapter 3), execution (Chapter 2), and training (Chapter 4). Specific staff functions and responsibilities for risk management are highlighted in FM 3-100.12. For additional specific staff functions and responsibilities associated with environmental considerations see Appendix C of this manual.

1-17. Associated with environmental risk management is the concept of protection levels. Protection levels can assist the command with managing the environmental protection levels in a fashion consistent with the operational realities of an operation. This is fundamentally the same as decisions made on theater construction standards in the base camp development process (see JP 4-04 and FM 3-34.250, *General Engineering*). Environmental considerations and risk management are a part of that process.

## PROTECTION LEVELS

1-18. The staff may develop an environmental protection-level matrix similar to the example in Table 1-1 (page 1-7) to assist with planning and provide a framework for tracking the status of levels of environmental protection within the command. This should be linked to the Theater Construction

Management System (TCMS), the official tool for base camp development planning and design (see Chapter 5) and included in combatant commander formalized guidance documents like the Red Book (European Command [EUCOM]), and the Sand Book (Central Command [CENTCOM]). TCMS is an automated military engineering construction planning and execution support system that provides military planners, logisticians, and engineers with the information necessary to plan, design, and manage theater construction projects where austere, temporary facilities are required.

1-19. Staffs may use a matrix to designate protection requirements for specific missions or areas, to clearly identify and quickly notify units of changes, or to notify newly arriving units of the rules in the AO.

**Table 1-1. Notional Environmental Protection Matrix**

Environmental Protection Level				
	Level 1	Level 2	Level 3	Level 4
<b>1. Waste Management</b>				
a. Human waste	Unit SOP	Slit trench	Burnout latrine	Sanitary sewer
b. Solid waste	Unit SOP	Unit incineration or burial	Incineration	Landfill
c. Medical waste	Unit SOP	Field collection, consolidate disposal	US or host nation (HN) approved disposal methods	Same
d. Hazardous waste	Unit SOP	Field collection, battalion disposal	Unit collection point, classify, label, DLA contract	Resource Conservation and Recovery Act (RCRA) or HN procedures
<b>2. Hazardous Materials</b>				
	Unit SOP	Spill response, report any water contamination	HM tracking, spill response, report spills over 50 gallons	Spill prevention plans, response teams
<b>3. Natural Resources</b>				
a. Water	Unit SOP	Unit SOP	Erosion control	No degradation of water due to erosion or effluent
b. Vegetation	Unit SOP	Restriction on camouflage	Clearing in excess of 100 acres requires joint task force (JTF) approval	Clearing requires environmental assessment
c. Air	Unit SOP	Dust suppression nonhazardous only	Control open fires, fugitive dust	Controls on incineration and traffic
d. Wildlife	Unit SOP	Unit SOP	Note and avoid specific habitats	Taking of species prohibited
<b>4. Cultural and Historical Resources</b>				
	Unit SOP	Minimize damage if possible	Division-level approval required for operations in area	JTF approval required for operations in area

1-20. Standard levels of environmental protection facilitate planning, communications, and flexibility. The notional array of protection levels in Table 1-1 ranges from Level 1 to Level 4. Level 1 is less restrictive and more appropriate for operational units in combat. Level 4 is very restrictive and more appropriate for units in garrisons, fixed installations, on major training exercises, or while performing humanitarian missions in relatively secure and developed areas. Levels 2 and 3 are merely intermediate steps between the baseline and optimum levels. Foreign nations or regions in which US forces operate may have additional environmental protection requirements.

## STRATEGIC ASPECTS OF ENVIRONMENTAL CONSIDERATIONS

1-21. There is a new appreciation for the interdependence between our missions, the community, and the environment. Strategic factors influencing international security and stability have dramatically changed. Global population and industrial activity have grown geometrically, and technological advancement has accelerated. These phenomena have begun to shift the foundations of strategic analysis, fundamentally altering the relationships between the human population and the supporting natural resources. The natural environment is defined (FM 1-02/MCRP 5-2A, *Operational Terms and Graphics*,) as “the human ecosystem, including both the physical and biological systems that provide resources (i.e., clean air, clean water, healthy surroundings, and sufficient food) necessary to sustain productive human life. Included in the natural environment are manmade structures, such as water and waste water treatment facilities and natural/cultural resources”. The natural environment has a direct affect on service members as well and this is generally more operationally significant than the effect of operations on the natural environment.

1-22. Conflict caused or aggravated by resource scarcity is not new. What was once a local or regional problem may now extend globally. Resource scarcity could reduce the ability of governments to respond to the basic needs of their people. The resulting instability can threaten regional security and lead to armed interventions.

1-23. These strategic aspects of environmental considerations are integrated into planning and guidance by combatant commanders in a joint fashion. The OPLAN/OPORD or other command guidance generated at this level defines the importance of any strategic aspects of environmental considerations and their effect on operations in terms that the operational and tactical commander can apply to their operations. This guidance must come from the highest military levels to allow the operational and tactical commanders to integrate that command guidance and then focus on the operational and tactical environmental considerations at their levels.

## ENVIRONMENTAL RESOURCES AS A CAUSE OF CONFLICT

1-24. Strategic resources (i.e., minerals, oil, or coal) have often been catalysts of conflict. The widespread distribution and product substitution associated with a global economy tend to mitigate scarcity. Renewable or “sustainable” resources—such as clean air, water, croplands, or forests—are more difficult to replace and can be a regional catalyst of instability.

1-25. Environmental degradation, natural disasters, famines, health epidemics, and changes in climate can threaten a nation’s economy and send populations across borders as refugees. Population overload, combined with the lack of capital to protect the local ecosystem, can cause severe environmental resource scarcity. Environmental resource scarcity, caused by degradation or depletion of renewable resources, may encourage groups to capture these resources or migrate to find adequate resources. Environmental resources can contribute to the potential for conflict when they become environmental threats or strategic goals.

## **ENVIRONMENTAL THREATS**

1-26. Environmental threats intensify regional instability. These threats to stability and security might result from acts of war or terrorism (i.e., the destruction of infrastructure facilities providing water or fuel). The threats (i.e., polluting the rivers or air that flow into another country) may also result from the routine activities of an industrial society.

1-27. The actions associated with developing a national infrastructure, such as building a dam, which cuts off water to downstream neighbors, may contribute to regional instability and conflict. Regional environmental threats can trigger events leading to conflict or deepening poverty. These types of situations encourage citizens to seek violent solutions.

1-28. Security from these environmental threats includes protective measures for natural resources; safety measures for service members whether at home station or deployed; and offensive, defensive, and support actions when required to meet national security goals. Environmental threats will confront theater commanders in the form of natural resource issues as strategic and operational factors before, during, and after future conflicts.

## **NATIONAL STRATEGIC AND SECURITY INTERESTS**

1-29. Resources such as minerals, oil, and water often possess strategic significance. Access to sufficient energy supplies is of vital national interest to a nation when it becomes industrialized.

1-30. Water has been a strategic resource since the beginning of recorded history. In the Middle East, three or more countries share all of the major river basins. Each of these countries now faces the possibility of severe water scarcity during the next decade and beyond.

1-31. Countries rely on natural resources to achieve political ends. A country overexploiting its own resources by deforestation or polluting a neighboring country's air or water may cause corresponding increases in regional tensions.

## **ENVIRONMENTAL PROTECTION AS A NATIONAL ETHOS**

1-32. The nation's ethos translates into national policy, national security strategy, and military strategy. The US has often been the first nation to search for solutions to environmental problems. Americans believe continued environmental degradation presents a potential short- and long-term threat to their safety and well-being. They have demanded and supported national and international environmental protection efforts. The environmental considerations associated with protection of the environment have become increasingly important to our force projection platforms and ensuring that we are able to train in a manner that allows us to be competent and operationally ready to deploy our forces and achieve mission success. US military forces are committed to supporting DOD environmental guidance and adopting environmental practices that preserve funds for force structure, modernization, and training.



1-33. Operational readiness depends on sufficient land for training individuals and units. Each of the four services manages large training and testing areas, which are increasingly valuable as part of a diminishing inventory of undeveloped land. Often, the health of the surrounding natural ecosystem also depends on the natural habitat of these training or testing areas. Fortunately, protecting and preserving these undeveloped spaces serves the interests of both operational readiness and the natural habitat. Good conservation techniques preserve training areas for future military use and reduce compliance and restoration costs.

### **ENVIRONMENTAL COMPLIANCE**

1-34. Environmental compliance for contingency operations is primarily focused on command guidance as articulated in the OPLAN/OPORD. Operational and tactical commanders will focus on the disciplined application of the command guidance provided to them in the OPLAN/OPORD they are initiating and the baseline procedures of their unit SOP for environmental considerations. Appendix A provides an overview of key environmental laws, regulations, and treaties that will be reviewed by higher level staffs and used to formulate the command guidance found in the higher level OPLAN/OPORD. These will come from a variety of sources to include US (federal, state, local), host nation, executive order, DOD policies and directives, and international agreements.

### **ETHICAL IMPLICATIONS**

1-35. The US military has always accepted and internalized its role as a moral, as well as a physical force. Senior leaders must create ethical climates in which subordinate leaders recognize that the natural resources of the earth are not inexhaustible, and they must take responsibility to protect the environment. This ethical climate is the same climate that guides the decisions to be made in areas such as the LOW. Ethical behavior is not restricted to merely following the letter of the law. It captures the ethos that caused those laws to be generated in the first place. By educating subordinates and setting the example, leaders enable their subordinates to make ethical decisions that, in turn, contribute to excellence.

1-36. Habitually protecting the environment ensures that land will continue to be available to conduct training and that environmental considerations will not disrupt operations (except as they are intentionally integrated into the training). To be successful, service members must practice pollution prevention as a proactive measure rather than just a mere compliance or reaction to laws and regulations. Doing the right thing is good. Doing the right thing for the right reason and with the right intention is even better.

### **OPERATIONAL ASPECTS OF ENVIRONMENTAL CONSIDERATIONS**

1-37. Operational considerations (at both the operational and tactical levels of war) focus on sustaining the fundamental aspects of environmental considerations as articulated in unit SOPs and applying the command guidance of the OPLAN/OPORD in a disciplined fashion. Environmental protection or environmental stewardship is not generally the most important consideration to the operational commander and service members performing

contingency operations. However, they do remain considerations that are evaluated along with all other risks that challenge the commander. Operational perspectives of what are generally environmental stewardship areas take on a slightly different focus.

- **Compliance.** For the operational commander and service members in contingency operations, this means being disciplined, following command guidance and unit SOPs. Linkages to force health protection and other aspects of environmental considerations may not be self-apparent in every case, but they are in the best interests of the well-being of service members.
- **Prevention.** Damage to the environment that can be avoided should be. Avoiding or reducing pollution is in the best interest of service members, promotes force health protection, and minimizes the likelihood of negatively affecting civil-military operations. It is generally easier to prevent than to have to expend energy and assets correcting them later. This is true for the health of service members, or repairing damage done to civil relationships, as well as damage to the natural environment itself.
- **Conservation.** This includes two types of resource management: controlled use and preservation. Reusing or recycling materials reduces the logistic load on contingency operations and retains critical materials for use. Nonrenewable resources, such as historic monuments or endangered species, require preservation. The military must balance these demands in a responsible effort to conserve natural resources and still maintain readiness.
- **Restoration.** This is not the focus for operational units and commanders, but it is a necessary component of end-state considerations. Damage to the environment can be mitigated by disciplined units as they conduct operations. Indiscriminate destruction of the natural/cultural environment or destruction as a result of lack of discipline is not in the interest of our nation. Prevention is the preferred choice if it can still support the operational and tactical imperatives of a mission since it eliminates the potential requirement for restoration.

*“Preventing environmental problems is always more cost-effective (in dollars) than trying to clean them up after the fact. During the deployment to Desert Shield, one installation spent \$1,000,000 to clean up HW improperly left behind by individuals in deploying units. Environmental protection is the smart thing to do, and it is the right thing to do.”*

After-Action Report,  
Operations Desert Shield and Desert Storm

## LINKAGE TO THE UNIVERSAL JOINT TASK LIST

1-38. In CJCSM 3500.04C the relationship between tasks and mission planning and performance is defined and articulated. The mission establishes the requirement to perform tasks and provides the context for each task performance. It determines where and when a task must be performed and the degree to which a task contributes to mission success. As

joint plans are developed, the tasks that support the plan are identified and used to provide a framework for mission analysis and structuring training events. A similar relationship for the Universal Joint Task List (UJTL) is defined for training.

1-39. Some environmental considerations are highlighted in the title and definition of a task, but in many instances the staff officer must look inside of the task using their expertise to identify the specific environmental considerations. As a framework, the tasks identified for a given mission should provide the staff officer with a means of reviewing all applicable environmental considerations for a given mission/operation.

1-40. The same is true at the service level as the strategic tasks (STs) and operational tasks (OPs) of CJCSM 3500.04C translate into tactical tasks (TAs) that are based on service specific tasks as outlined in the Army Universal Task List (AUTL), Universal Navy Task List (UNTL) (includes the Marine Corps), and the Air Force Task List (AFTL). These service specific tasks provide additional tasks for use by respective services to build mission essential task lists (METLs) for units. All services need to do a better job of highlighting applicable environmental considerations into these tasks. Further discussion of the relationship of these tasks will focus on their use in and linkage to planning and training (Chapters 3 and 4).

1-41. Environmental assistance is identified as a potential military operation for joint forces in CJCSM 3500.04C. In this case the focus of the operation is on the environment and includes responses to hazardous material release, restoring contaminated land and water, and conserving the nation's natural and cultural resources. These would be fundamental to mission success. Intelligence preparation of the battlefield (IPB) and other elements of the planning process would include significant environmental considerations and commander's critical information requirements (CCIR) would take on a distinctly environmental focus. In this type of an operation assistance is provided in support of domestic (or foreign) authorities in preserving, protecting, and enhancing the environment and has as its primary focus the areas typically associated with environmental awareness programs: compliance, prevention, restoration, and conservation. In that respect they tend to be focused on environmental stewardship rather than the broader context of environmental considerations. However, this mission still provides a good example of the inclusion of environmental considerations in military operations. This specified military operation includes no less than four of the STs and eighteen of the OPs included in the UJTL. A review of these twenty-two tasks in this joint mission is most enlightening and highlights the importance of other tasks in the integration of environmental considerations. They include:

- ST 2.4.1 – Evaluate, integrate, analyze, and interpret theater information.
- ST 5.3.3 – Issue planning guidance.
- ST 5.6.3 – Plan and conduct community relations program.
- ST 8.2.6 – Coordinate military civic action assistance.
- OP 1.3.3 – Coordinate waterspace management.

- OP 2.2.1 – Collect information on operational situation.
- OP 2.4.1 – Evaluate, integrate, analyze, and interpret operational information.
  - OP 2.4.1.1 – Identify operational issues and threats.
- OP 4.4.1 – Coordinate field services requirements.
- OP 4.4.5 – Train joint forces and personnel.
- OP 4.6.2 – Provide civil-military engineering.
- OP 4.6.5 – Provide for real estate management.
- OP 4.7.2 – Conduct civil military operations in the joint operations area (JOA).
- OP 4.7.3 – Provide support to DOD and other government agencies.
- OP 4.7.6 – Coordinate civil affairs in the JOA.
- OP 5.1.5 – Monitor strategic situation.
- OP 5.2.2 – Formulate crisis assessment.
- OP 5.5.2 – Develop joint force liaison structure.
- OP 5.7.1 – Ascertain national of agency agenda.
- OP 5.8.3 – Conduct community relations programs in the JOA.
- OP 6.2.2 – Remove operationally significant hazards.
- OP 6.2.10 – Develop and execute actions to control pollution and hazardous materials.

1-42. This operation also highlights the critical linkage of IPB and environmental considerations. Even when the focus of an operation is not on the environment, IPB is important to the integration of environmental considerations. Intelligence requirements (IRs) may become priority intelligence requirements (PIRs) and CCIR at various stages of planning and operations. An example of this may be the condition of potential sites designated to become base camps or similar sites. It is critical in the planning phase to get good and accurate information about the environmental considerations associated with base camps and other similar sites. Some of this information may be met by existing medical intelligence data bases, geospatial products, and other sources of existing information, but it may also require the creation of updated, or other necessary information, by other means. While the military operation of environmental assistance is focused on support of domestic requirements, the majority of the subordinate tasks are equally applicable to other missions across the spectrum of operations performed by joint forces and each of the respective services.

## Chapter 2

# Operations: Integrating Environmental Considerations

*“If we have to choose between destroying a famous building and sacrificing our own men, then our men’s lives count infinitely more, and buildings must go. But the choice is not always so clear-cut as that. In many cases, the monuments can be spared without detriment to operational needs. Nothing can stand against the argument of military necessity. That is an accepted principle. But the phrase ‘military necessity’ is sometimes used where it would be more truthful to speak of military convenience or even of personal convenience. I do not want it to cloak slackness or indifference.”*

General Dwight D. Eisenhower

Integrating environmental considerations into operations is the logical progression after having effectively integrated environmental considerations in both planning (Chapter 3) and training (Chapter 4). The commander is, with increasing frequency, constrained by mission requirements (to include environmental considerations) that may restrict the use of much of the combat power inherent in his organization. Both commanders and staffs must understand and analyze the implications. These implications can have a significant effect on operations across the spectrum of conflict. As the commander prioritizes and analyzes the risks associated with an operation, he may rank some considerations as less important or more critical than others. Protecting service members will always be high on the commander’s list and environmental considerations that impact force protection and/or the health and safety of his personnel will cause them to become one of his highest priorities.

## IMPLICATIONS FOR MILITARY FORCES

2-1. Environmental protection as a component of environmental considerations has several implications for military operations that affect all levels of war. When a commander orders an action that may cause environmental damage, he must determine that the military gain from the action is justifiable and in some reasonable proportion to the damage to be inflicted. This “proportionality” judgment for actions, which produce severe environmental or public health effects, requires some understanding of the impact of the effects. The effects of environmental considerations (to include environmental protection) on the strategic end state or mission success must be identified and assessed. Commanders and their staffs must understand the strategic, operational, tactical, and ethical implications of environmental protection and other environmental considerations.

## STRATEGIC IMPLICATIONS

2-2. The world's geopolitical framework will continue to undergo dramatic restructuring, accompanied by a wide array of economic, technical, societal, religious, cultural, and physical alterations. US military forces must understand these new environmental and demographic dynamics, which are becoming increasingly significant in global affairs. Strategic analysis includes environmental factors as important elements in national security considerations.

2-3. The US National Security Strategy has identified environmental threats as a primary security interest, and the public has been remarkably consistent during the last 25 years in its concern for global and local environmental degradation.

2-4. Commanders and staff officers must understand the role of these new dynamics as strategic factors that underpin the theater situation and the desired strategic end state of the operation/conflict. The theater commander may require that a strategic end state reduce environmental threats or minimize the adverse environmental impact of the military mission. This concern for the environmental end state may be particularly true for stability operations or support operations and is always a consideration as a post-hostilities cost.

2-5. The implications of large-scale environmental warfare became apparent to many on January 19, 1991. On this date, the Iraqis opened the valves on Kuwait's largest offshore oil terminal, threatening the main water desalinization plant in Saudi Arabia as well as the ecosystem of the Persian Gulf. This action presented the theater commander with a requirement for a tactical response. The allied response to this spill started about ten days later, but the oil continued to discharge into the Gulf until late May.

2-6. It is critical to articulate the appropriate level(s) of *environmental protection* given the particular nature of any operation. This will not be a constant and OPLANs/OPORDs must provide specific guidance to subordinate commanders. Application of environmental protection in a given contingency will almost certainly differ from its application in the midst of close combat during a war and it may even vary with the duration of a contingency. The higher commander's guidance is essential and is rarely initiated by commanders at the operational or tactical levels (beyond SOP type actions and minimum health and safety protection levels as discussed in Chapter 1) without initial guidance and clarification from the strategic level. Given the linkage between political and military considerations at the combatant commander level, this will generally be the vital echelon for initiating and defining the driving guidance on military environmental protection (and all other environmental considerations) for any given operation.

## OPERATIONAL AND TACTICAL IMPLICATIONS

2-7. Environmental skills and procedures are required for all military operations. As environmental factors become more important the military services and the unified commands will develop additional intelligence and operational capabilities and specific environmental procedures to match

mission categories and constraints. Environmental considerations will increasingly factor into the IPB for an operation. In addition to practicing routine environmental protection measures, force health protection, and general cultural considerations, commanders and their staffs face new environmental challenges and responsibilities including:

- Conducting humanitarian (stability or support) operations after environmental disasters. (Environmental assistance is a military operation identified in CJCSM 3500.04C).
- Integrating force health protection considerations in densely populated areas that lack operational public health measures.
- Responding to environmental terrorism or sabotage.
- Working within the limitations brought about by environmental considerations, to include civil considerations (cultural/archeological).
- Remediating (as directed) adverse environmental impacts as a part of the exit strategy, or as a directed action in support of other government agencies (for example assisting the Coast Guard with oil spills at sea).

2-8. The joint planning process and the military decision making process (MDMP)/troop leading procedures (TLP) integrate environmental considerations into mission accomplishment. Staffs, at the appropriate echelons, must identify and analyze the environmental effects of military actions, as well as characteristics of the environment and other environmental considerations influencing friendly or threat operations. Staff consideration of environmental impacts typically begins with the mission analysis and the initial IPB, continuing through the orders production process (see Chapter 3).

2-9. During missions, the integration of all environmental considerations should be, to the extent possible, a matter of standard procedures. The DOD and each of the services have established policies on environmental protection. Basic environmental policy is contained in service regulations and special publications. Joint doctrine for environmental annexes to OPORDs and OPLANs is a part of the Joint Operation Planning and Execution System (JOPES). Under JOPES, Annex L is the environmental considerations annex to the OPORD or OPLAN. When not using JOPES, Army forces conform to the guidance in FM 5-0, which directs that OPLANs/OPORDs will contain an Appendix 2 (Environmental Considerations) to Annex F (Engineer). Both formats contain similar information. Appendix B contains an example of what the FM 5-0 directed environmental considerations appendix will look like. The information contained in a JOPES document is very similar, although the format is not exactly the same. Other services use Annex L in their service formats to capture relevant information on environmental considerations. NWP 4-11 provides an outline for an environmental annex that is focused on operations while afloat.

2-10. None of the methods for decision-making in a time-constrained situation, discussed in JP 5-0, suggest that a commander leave out steps or considerations. The shortening of the process still requires the performance of all steps in the process, but in an abbreviated fashion. Commanders must always make assessments that include environmental considerations and their associated risks. Anticipation, organization, and prior preparation are

the keys to success in a time-constrained situation.

## **ENVIRONMENTAL PROTECTION DURING MILITARY OPERATIONS**

2-11. Protecting the environment during military operation may be difficult, and protecting the environment while conducting operations against a hostile force is likely to be even more difficult. Military forces should deploy and operate with minimal environmental damage. Commanders must initiate environmental control measures and establish appropriate protection levels without detracting from mission accomplishment. As the situation allows, commanders increase environmental standards as their risks gain importance to the deployed force. As with many other issues, the risks associated with environmental considerations as a whole become relatively more important further away from contact with the enemy.

2-12. Operations do not typically occur on an installation. As a result, leaders will need to rely on the guidance in higher headquarters orders to define the specific standards for environmental considerations in their AO. (This is really not significantly different from the realities of having to know and apply the variances in state and local environmental laws when performing training away from your home installation or training areas.) We have developed initial concepts for base camps that have become the norm for many operations in which US forces are currently involved (see FM 3-34.250). Base camps are not installations, even though they may employ many of the standards and methods used on installations/bases. They are in fact, small towns that have the same need to protect their occupants (service member) from environmental hazards. CALL Newsletter 99-9, *Integrating Military Environmental Considerations*, provides insights on the emerging doctrine for base camp operations and FM 3-34.250 provides the doctrinal guidelines for their creation and operation. All Service engineers are capable of building base camps and the Civil Engineer Support Plan (CESP) in JOPEs will identify how this is to be accomplished and the standards that will be associated with any given base camp or similar site.

2-13. Environmental damage is an inescapable consequence of combat operations; however, the revolution in military technology has made it possible to minimize the collateral damage from legitimate military operations. It is no longer necessary to obliterate terrain to achieve the desired military effect. Wanton employment of military weaponry can produce three primary environmental effects:

- Unnecessary impacts
- Collateral damage
- Modification of the environment

### **UNNECESSARY IMPACTS**

2-14. Unnecessary impacts are environmental damage(s) that military necessity cannot justify. These impacts are either wanton, intentional acts, or negligent, unintentional acts. Iraqi forces may have committed wanton acts during the Persian Gulf War when they set Kuwaiti oil fields ablaze and fouled the Persian Gulf by releasing millions of barrels of crude oil from tanker loading facilities. These activities may have violated the Hague or



Geneva Conventions that requires belligerents to safeguard enemy or civilian property and forbids its destruction unless absolutely necessary for military purposes. “Incidental injury to civilians and collateral damage to civilian property must not be excessive in relation to the concrete and direct military advantage gained.” See FM 27-10, *The Law of Land Warfare*.

## **COLLATERAL DAMAGE**

2-15. Collateral damage is defined as unintentional or incidental injury or damage to persons or objects that would not be lawful military targets in the circumstances ruling at the time. Such damage is not unlawful so long as it is not excessive in light of the overall military advantage anticipated from the attack. Collateral damage results from military actions used to achieve strategic, operational, or tactical objectives during armed conflict. The concentration of fire or maneuver can have serious environmental consequences.

2-16. Damaging enemy targets (such as ammunition stockpiles or enemy forces using the cover of wastewater treatment plants) can release hazardous substances that cause unintended casualties long after the battlefield/area of operations is secured. Practicing environmental concern or restraint should not result in decisions that increase the human cost of victory, the probability of a prolonged conflict, or the probability of an unfavorable outcome. Commanders must weigh the military value of the operation against collateral damage. They must continue to assess the risks and make informed, professional judgments. However, they must now give heightened consideration to the environmental consequences of their actions. See Chapter 3.

## **MODIFICATION OF THE ENVIRONMENT**

2-17. This environmental effect includes using environmental modification (ENMOD) techniques on the atmosphere, oceans, or land masses and associated water systems to cause widespread, long-lasting, or severe damage to human life, natural or economic resources, or other assets.

2-18. Environmental modification (ENMOD) may include river diversion, destruction of oil wells on the sea bed, weather modification, or large-scale burning or defoliation of vegetation. The 1977 ENMOD Convention was the first international agreement to explicitly restrict using the natural environment as a tool of warfare. It prohibits military or hostile use of ENMOD techniques to damage or injure another country. See Appendix A.

## **ENVIRONMENTAL PROTECTION OPERATIONAL PRINCIPLES**

2-19. During combat, commanders weigh concerns such as desired strategic end state and force protection in concert with environmental considerations/concerns. For example, the commander measures the military value of destroying an enemy’s POL distribution facility, against the potential for polluting his force’s future water supplies.

2-20. However, even in combat, unit actions should not unnecessarily complicate the post- conflict outcome by creating unnecessary environmental problems. In keeping with Clausewitz’s dictum that war is a political

instrument, the desired strategic and operational end state should support a lasting victory. Increasingly, this end state includes environmental components whether they are associated with environmental protection, or are viewed as civil considerations (cultural/archeological).

2-21. Commanders must balance environmental protection and mission requirements. Mission parameters for the operational area identify and quantify the time and resources devoted to environmental protection before, during, and after combat operations.

2-22. Environmental protection principles do not necessarily override other operational factors. They are a standard part of all planning processes in which a commander makes decisions based on the facts and recommendations presented by the staff (or by himself during troop leading procedures) in the context of mission priorities. These decisions include four operational environmental protection principles. The sequence in which they are discussed does not reflect an order of significance or priority. The operational environmental protection principles are:

- Avoid unnecessary environmental impact, and limit collateral damage.
- Protect service members from adverse effects of environmental exposures.
- Analyze environmental considerations and impacts in concert with mission requirements and force protection.
- Incorporate environmental considerations into planning procedures.

#### **AVOID UNNECESSARY ENVIRONMENTAL IMPACTS**

2-23. The first principle of environmental protection in a theater of operation is to avoid unnecessary damage and limit collateral damage. Following this principle helps avoid political, economic, and human suffering, which complicate the desired operational end state. Adhering to this first principle requires commanders and staffs to assess regional and local environmental strengths and vulnerabilities. It also requires that units be equipped and trained to minimize adverse environmental impacts.

#### **ANALYZE ENVIRONMENTAL CONSIDERATIONS AND IMPACTS**

2-24. US forces must be capable of decisive victory, employing all means available within the laws of war to accomplish the mission in full dimensional operations. The second principle is to analyze environmental considerations/impacts in concert with mission requirements and force protection. Protecting natural and cultural resources, as with other constraints, is neither cost nor risk free, and requires judgment. The considerations of EO 12114, *Environmental Effects Abroad of Major Federal Actions* (see Appendix A) may be especially critical. Commanders make judgments in the context of mission, enemy, terrain, troops, time available, and civil considerations (METT-TC) and moral imperatives; the long-term costs of the potential damage; and the political purposes of the conflict or mission. To exercise sound judgement, the commander must understand the application of risk management as discussed in FMs 3-100.12 and 100-14. Remember that many environmental considerations directly enhance the

health and safety of service members.

### **INCORPORATE ENVIRONMENTAL PROTECTION INTO OPERATIONAL PLANNING**

2-25. The third principle is to incorporate environmental protection considerations into operational planning procedures. Although all missions require environmental considerations planning and environmental protection as a part of the planning process, different missions require different levels of environmental planning. Environmental considerations must be practiced and integrated into both planning (Chapter 3) and training (Chapter 4).

2-26. Integrating environmental considerations into operations is a requirement that commanders have accepted. As with other planning considerations, the importance of environmental considerations should be clearly articulated in the higher commander's guidance. Integrating environmental considerations into planning and training will increase the success of the unit during operations. Restrictions on the use of combat power for reasons of environmental protection are likely to be included in some operations.

## Chapter 3

# Planning: Integrating Environmental Considerations

*“The American people will continue to expect us to win in any engagement, but they will also expect us to be more efficient in protecting lives and resources while accomplishing the mission successfully. Commanders will be expected to reduce the costs and adverse effects of military operations, from environmental disruption in training to collateral damage in combat.”*

Joint Vision 2010

Integration of environmental considerations must occur in military operations – regardless if the planning is conducted at the strategic, operational, or tactical levels; conducted for a joint, multiservice, or single service; in support of war or contingency; foreign or domestic. What will differ are the specifics of the planning guidance received to support a given situation, the relative risk associated with environmental considerations when assessed/compared to other risks facing the force, and the echelon at which the planning is performed. This varies little from other factors that are considered in any of our planning processes. Those items that tend to remain constant are placed in SOPs. Whatever the planning process [JOPES or others] the requirement to integrate environmental considerations is critical. Failure to consider the environmental impact of all activities may adversely affect the operation. Potential effects include endangering personnel health, delaying operation commencement, limiting future use of exercise or HN areas, creating adverse public opinion, and excessive financial costs.

This chapter highlights the critical nature of including environmental considerations early in the planning process (at the highest levels) and using the risk management process to help assess and manage environmental-related risk during planning, training, and operations. For specifics on the joint/multiservice planning process see JP 5-0, *Doctrine for Planning Joint Operations*; CJCSM 3122.03A, *Joint Operation Planning and Execution System Volume I (Planning Formats and Guidance)*; and other appropriate service manuals.

## PLANNING PRINCIPLES AND CONCEPTS

3-1. Planning for all operations and strategies should include efforts to minimize the release of hazardous substances into the environment, protect cultural and natural resources, prevent pollution, and minimize or eliminate

force health protection issues. In some cases that information will be fairly general, in others more specific to include the planning for environmental baseline studies (EBSs) and environmental health site assessments (EHSAs) for individual base camps and other appropriate sites. Understanding the processes, and where commanders and staffs are integrating environmental considerations at any point, is important.

3-2. Planning for the employment of military forces is an inherent responsibility of every command and commander, performed at every echelon of command, and conducted across the range of military operations. Linking that joint planning (to include its environmental considerations) to the corresponding planning done at lower echelons and within each of the services is critical. Joint planning provides the foundation of information (to include policies) necessary for lower echelon commanders and staffs to effectively integrate and implement environmental considerations into their planning and operations, ensuring their actions will be nested into those of the higher headquarters. Joint operational planning involves a sequential process performed simultaneously at the strategic, operational, and tactical levels of war. Strategic and operational levels provide the context for tactical planning and operations.

- At the strategic level, joint operation planning involves the development of strategic military objectives and tasks in support of national security strategy and the development of force and materiel requirements necessary to accomplish those tasks. This is the level where policy is translated into strategic military objectives. Combatant commanders plan at this level through participation in the development of national military strategy, the development of theater estimates, and theater strategies. Therefore, the theater strategy is an element that relates to both US national strategy and operational activities. **It is at this level that policy on environmental considerations must be decided.** An example of this would be whether or not to abide by the Basel Convention (see Appendix A), even though our nation is not a signatory to it, for political reasons and to meet the demands of potential coalition partners.
- Joint operational strategy at the operational level links the tactical employment of forces to strategic objectives. This is the level of operational art focused on the employment of military forces to attain strategic and/or operational objectives through the design, organization, integration, and conduct of strategies, campaigns, major operations, and battles. At this level decisions on the specific application of environmental policy and general procedures must be reviewed and decided.
- At the tactical level of planning, tactics is the employment of units in combat. It includes the ordered arrangement and maneuver of units in relation to each other and to the enemy in order to use their full potential. Tactics are employed to fight and win engagement and battles. Much of what occurs in terms of environmental considerations at this level of war will be decided by decisions made at the strategic or operational levels. It is at this level that most of the concerns of environmental considerations significantly affecting the tactical

operation are found. The risks associated with environmental considerations are now more likely to compete against the general safety of service members and some environmental considerations may even challenge mission accomplishment. Minimizing environmental effects while achieving the mission may be the best that can be done in some situations and this will likely be linked to the implementation of unit SOPs. Uncertainty and risk are inherent in tactical operations.

3-3. The scope of operational planning encompasses the full range of activities/processes required for conducting joint operations. This range includes mobilization, deployment, employment, sustainment, and redeployment. The integration of environmental considerations plays a part in each of these and failure or success in effectively integrating them at the earliest phase or during any of these processes can have a significant effect. Each of these activities requires integration and has its own high frequency environmental considerations associated with it. Planning is continuous and does not end with the production of an OPLAN or OPOD. Similarly, environmental considerations are constantly reviewed and assessed by commanders and by staffs as they update and revise their estimates and assessments.

3-4. To effectively integrate environmental considerations requires all staff elements to understand the importance of early integration into planning, the knowledge of how they relate to staff functions, and how staff recommendations may affect the environment and service members that will operate in that environment. Whatever the format or decisionmaking process employed, staff responsibilities and duties (see Appendix C) remain fairly constant with respect to environmental considerations. Staff proponenty and overall responsibility for the integration of environmental considerations belongs to the engineer. The engineer is assisted by all staff sections and special staff officers in the same fashion as the intelligence officer (staff proponent for intelligence preparation of the battlefield [IPB]), is supported and assisted by other staff members in their areas of expertise, capability, and responsibility.

3-5. Unless planning is focused on a specific environmental assistance mission (see CJCSM 3500.04C), the environmental considerations associated with any given mission are rarely the primary focus for a commander and yet the incorporation of environmental considerations remains important. The staff integrates environmental considerations in a manner that recognizes their supporting role in mission success, while at the same time being balanced with mission accomplishment. That certain environmental considerations may not be able to be implemented during one portion of an operation, or in one part of an AO, does not justify failure to implement them at other times and locations within an AO. **Operational necessity should never become a blanket excuse for excluding environmental considerations and protection of the environment.**

3-6. Integrating environmental considerations does not require a new process or system. The principles and concepts of planning are laid out in JP 5-0, its supporting documents, and respective service manuals. While joint planning is focused at the strategic and operational levels, the same basic

procedures apply at the operational/tactical levels whether using the military decision-making process (MDMP) or any other service decision-making or planning processes.

3-7. Our military planning processes help the commander and his staff examine the battlespace and reach logical decisions. The process helps them apply thoroughness, focus, sound judgment, logic, and professional knowledge to reach a decision. From start to finish, the commander's personal role is central. His participation in the process provides focus and guidance to the staff. The commander employs the entire staff to explore probable and likely enemy and friendly COAs and to analyze and compare his own organization's capabilities with the enemy's. This staff effort has one objective—to integrate information (including environmental considerations) collectively with sound doctrine and technical competence to assist the commander in his decisions, ultimately leading to effective plans. The selected COA and its implementing OPORD are directly linked to how well both the commander and staff accomplish each phase of the planning process.

3-8. Environmental considerations are often addressed as functions of risk, much like the application of safety considerations. Risk is expected. Commanders may be able to effectively minimize environmental-related risk while optimizing the unit's capacity to remain responsive and agile. When the command and control (C2) system places timely, comprehensive, quality information in front of the decision-maker, leaders are able to mitigate risk and maximize performance, balancing them in the context of the mission. The risk associated with environmental considerations must be stressed in planning and training to ensure it is integrated into operations. See FM 3-100.12, and FM 100-14. While the specific inclusion of environmental risk is only identified in FM 100-14, the process for its inclusion requires no deviation from that contained in FM 3-100.12 for all categories and types of risk.

## THE JOINT PLANNING PROCESS

3-9. Joint operation planning (see JP 5-0; JP 5-00.1, *Joint Doctrine for Campaign Planning*; and JP 5-00.2, *Joint Force Planning Guidance and Procedures*) encompasses the full range of activities required for conducting joint operations to include the mobilization, deployment, employment, sustainment, and redeployment of forces. It depends on the JOPES to provide a single process of interoperable planning and execution (see CJCSM 3122.01, 3122.03A, and 3122.02C). Joint operation planning is categorized as campaign, deliberate, or crisis action. These three processes are similar and interrelated although the specific steps are different.

## CAMPAIGN PLANNING

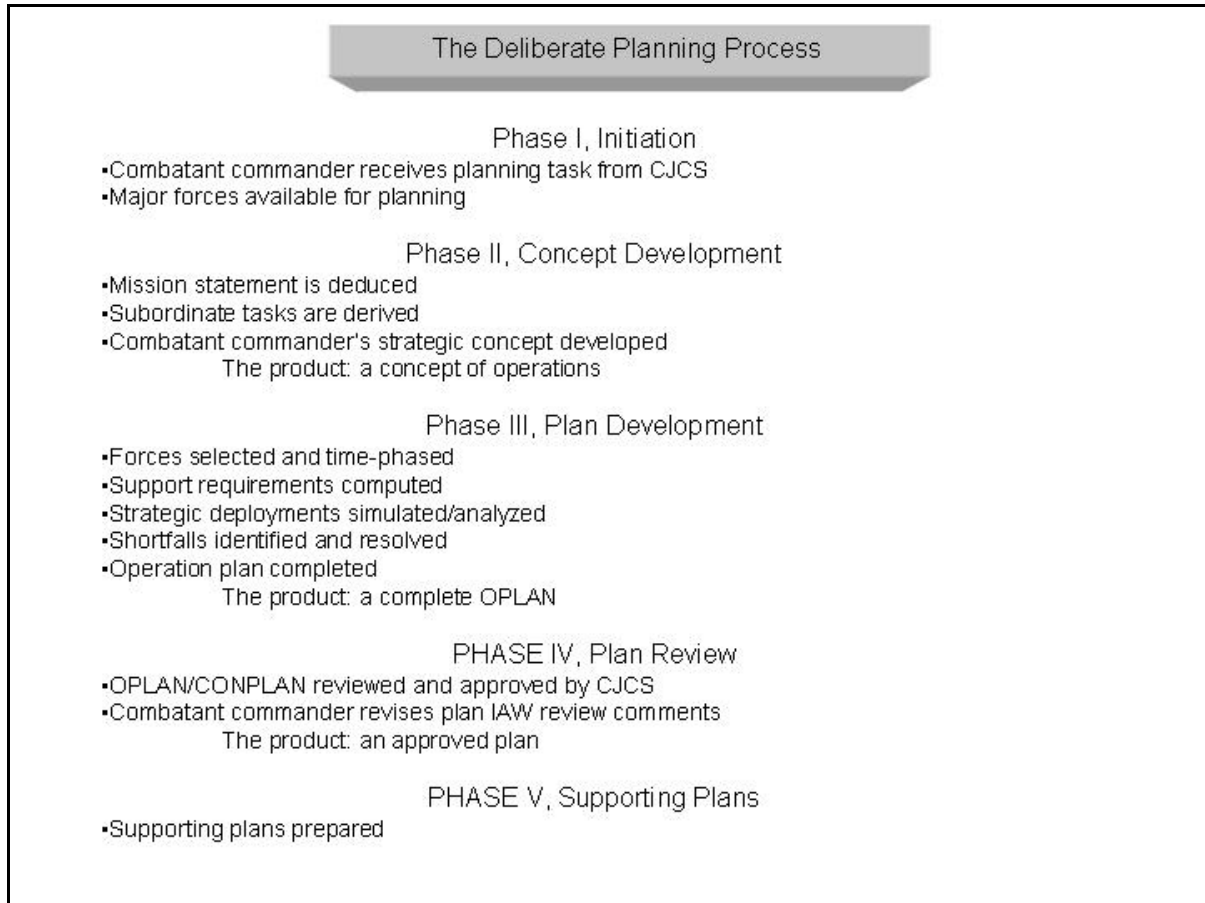
3-10. Campaign planning is employed when the scope of operations requires more than a single operation. In that respect, integrating environmental considerations into campaign planning is no different from the integration performed in deliberate planning or crisis action planning. However, during campaign planning, the standards and guidance for environmental considerations in one or more operational plan may have a significantly

different set of planning guidance given two different AOs or different situations inside of a single AO. Causes for the incongruity include a variation in the spectrum of operations (offense, defense, stability, or support), international agreements or similar documents, the specific operational objectives, and other aspects of the operational environment (OE).

## **DELIBERATE PLANNING**

3-11. Deliberate planning is conducted primarily in peacetime to develop joint operation plans for contingencies identified in strategic planning document. It relies heavily on assumptions regarding the political and military circumstances that will exist when the plan is implemented and it is important to integrate probable environmental considerations, impacts, and effects during this time. Deliberate planning is a highly structured process that engages commanders and staffs in the methodical development of fully coordinated, complex planning for all contingencies and the transition to and from war, or contingency operations. Plans developed during deliberate planning provide a foundation for and ease the transition to crisis resolution. Deliberate planning is performed in a continuous cycle that complements and supports other DOD planning cycles. This provides the opportunity to update assumptions and plan information affecting the integration of environmental considerations. Deliberate planning is accomplished in five phases: initiation, concept development, plan development, plan review, and supporting plans (see Figure 3-1, page 3-6).





**Figure 3-1. The Deliberate Planning Process**

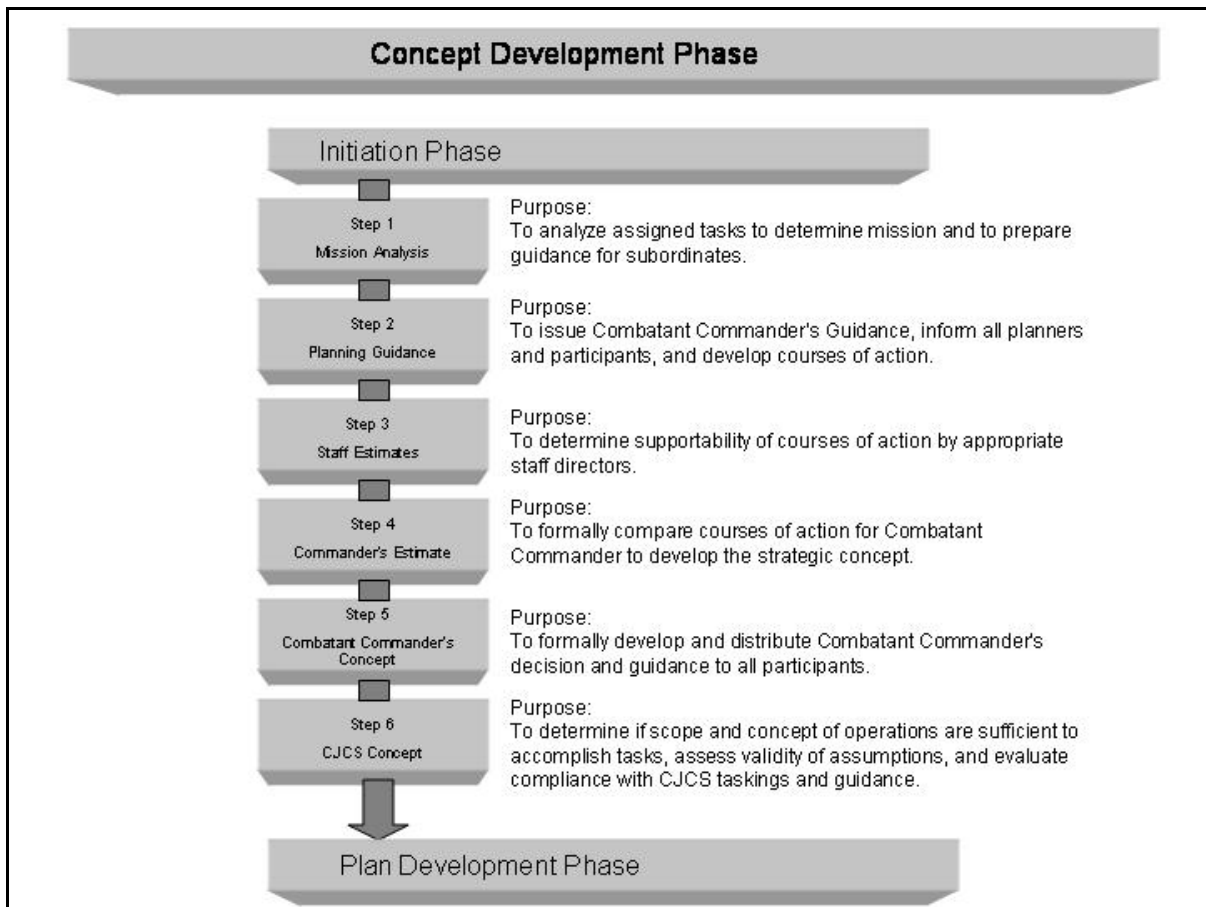
### **Initiation Phase**

3-12. Planning tasks are assigned to supported commanders, forces and resources are apportioned, and planning guidance is issued during this phase. While this phase only identifies broad scenarios for plan development, there are opportunities for integrating environmental considerations. For example, understanding the appropriate international agreements, conventions, SOFAs, and final governing standards (FGS) that will affect operations, help to effectively develop realistic plans for operations in a given AO or country. Other examples would include reviewing the medical intelligence information for designated locations within the AO, or as applicable, placing a demand on the intelligence system to create necessary planning information.

### **Concept Development Phase**

3-13. The supported commander is responsible for the concept development phase of deliberate planning. Concept development follows six steps: mission analysis, planning guidance development, staff estimates, commander's

estimate, Combatant Commander’s Strategic Concept, and Chairman of the Joint Chiefs of Staff (CJCS) review. During concept formulation, environmental considerations are often addressed as functions of risk, similar to the application of safety considerations. While some specifics will apply, most environmental considerations will be at a fairly general nature at this point. However, that does not diminish the vital role played in their early integration. Good staff estimates including relevant environmental considerations are essential to the concept development phase. See Figure 3-2.



**Figure 3-2. Concept Development Phase**

3-14. **Step 1: Mission Analysis** – The assigned task is analyzed, a mission statement is developed, and planning guidance is prepared and issued to the staff as well as subordinate and supporting commands in step one. Even in deliberate planning, where time is not as important as in crisis action planning, this allows for parallel planning between staffs. Environmental considerations should have already been analyzed and included in the initial planning guidance. At a minimum environmental planning should include confirmation of the applicable documents (SOPs, SOFAs, FGSs, and so forth) to guide planning for environmental considerations. A good mission analysis sets the stage for successful planning. All staff officers should develop a

generic list of environmental considerations and associated requirements in their respective area(s) to add to the guidelines given to subordinate and supporting staffs. Use of the factors of mission, enemy, terrain and weather, troops and support available, time available, and civil considerations (METT-TC) provide a framework for mission analysis. The “C” of this acronym is especially critical when integrating environmental considerations and applies to all staff officers. (Civil considerations are how the man-made infrastructure, civilian institutions, and attitudes and activities of the civilian leaders, populations, and organizations within an area of operations influence the conduct of military operations.)

**3-15. Step 2: Planning Guidance Development** – Alternative COAs are developed and distributed for staff estimates of supportability to be completed in step three (staff estimates). Environmental considerations will usually be most prominent in meeting the criteria of suitability and acceptability. The staff develops the COAs to accomplish the mission and meet the commander’s guidance with respect to environmental considerations. Provided that the staff has informed the commander about significant environmental considerations, the commander will have incorporated these into his guidance.

**3-16. Step 3: Staff Estimates** – Supportability of each COA is assessed by the staff of not only the staff that created the COAs, but also by the staffs of the supporting and supported headquarters. All of these staffs make an assessment as to the supportability of each COA and issues are addressed by the higher headquarters. While the staff engineer is responsible for integration, specific issues related to environmental considerations are addressed by the respective staff experts (engineer, medical, civil affairs, logistics, and such). This is critical to make an accurate comparison of COAs. A COA will have risk associated with it and that may include environmental-related risks. What is critical at this point is that the risks are identified for each COA. Staff estimates may include the following:

- Significant environmental weaknesses and sensitivities in the AO.
- Potential enemy environmental targets (with proposed contingency responses).
- Critical or unique resources or considerations for the area (and whether necessary resources exist in theater stocks).
- Environmental conditions related to the situation.
- Adequacy of environmental expertise to support potential coalition or multinational forces staffing.
- Applicable laws, regulations, treaties, coalition sensitivities, or command guidance for the AO.

**3-17. Step 4: Commander’s Estimate** – In step four, alternative COAs are wargamed, analyzed, and compared to produce an estimate containing the commander’s decision on the preferred COA. Every staff member must determine the force requirements for external support, risks, and each COA’s strengths and weaknesses. Determining evaluation criteria is one of the most important steps of war gaming for environmental considerations. If environmental considerations are prominent enough, they are included in the

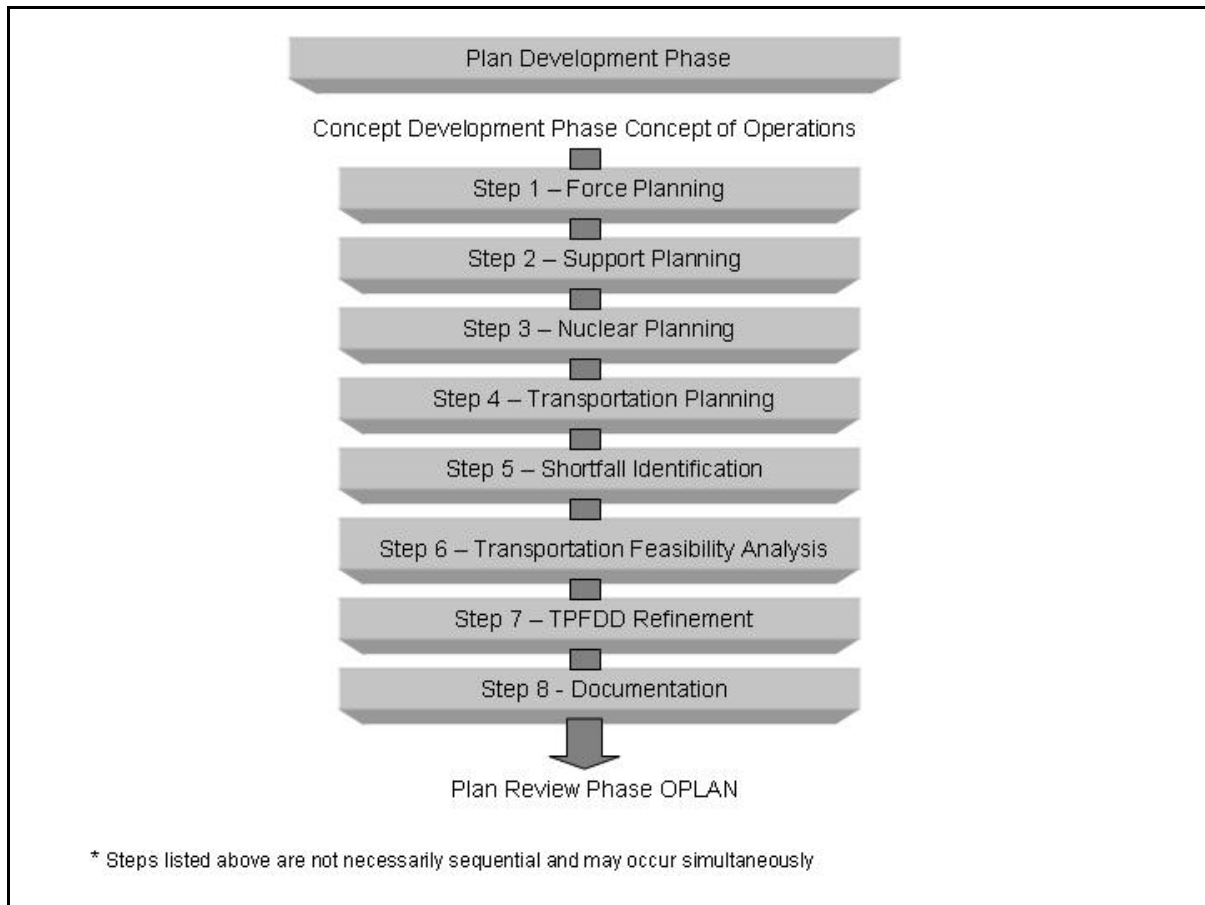
commander's guidance and intent, as well as the specified criteria for the level of residual risk for accident hazards in each COA. Every COA must clearly identify the level of risk that the commander is willing or able to accept to include those associated with environmental considerations. Environmental considerations may be included in the general criterion of "residual risk," or if significant enough, may even be a separate criterion. If any environmental consideration was important enough to be in the commander's guidance or intent, it will be listed here as well.

3-18. **Step 5: Combatant Commander's Strategic Concept** – The selected COA is then expanded into the Combatant Commander's Strategic Concept that is submitted to the Chairman of the Joint Chiefs of Staff (CJCS) for review and approval.

3-19. **Step 6: CJCS Review** – When approved, the Combatant Commander's Strategic Concept provides the basis for plan development.

### **Plan Development Phase**

3-20. A CJCS-approved concept of operations is expanded into a complete OPLAN during the development phase of deliberate planning. Plan development is accomplished by a designated supported commander, normally a combatant commander, with the assistance of supporting and subordinate commanders. The supported commander guides the plan development process by publishing a Letter of Instruction (LOI) to coordinate the activities of the commands and agencies involved. Eight steps can be identified in the plan development phase (see Figure 3-3 on page 3-10). These eight steps provide a logical planning structure where the forces and resources required to execute the concept of operations are progressively identified, sequenced, and coupled with transportation capabilities to produce a feasible OPLAN. Each of these steps contains associated environmental considerations. This phase of deliberate planning is heavily dependent on JOPES automatic data processing (ADP) to produce the time-phased force and deployment data (TPFDD).



**Figure 3-3. Plan Development Phase**

3-21. Although the plan development phase generally follows a prescribed sequence, shortfall identification is performed throughout the process. The supported commander continuously identifies limiting factors and capabilities shortfalls as plan development progresses. Where possible, the commander resolves the shortfalls through planning adjustments and coordination with component and supporting commanders. If the shortfalls cannot be reconciled and the resources provided by the Joint Strategic Capabilities Plan (JSCP) or the Services are inadequate to perform the assigned task, the supported commander reports these limiting factors and his assessment of the associated risk to the CJCS. The CJCS and the Chiefs of the Services consider the shortfalls and limiting factors. If shortfalls cannot be resolved within the JSCP time frame, the completed plan will include a consolidated summary and impact assessment of unresolved shortfalls. Some of these unresolved shortfalls may be related to environmental considerations, but they should not exist because of simple failure to address them earlier.

3-22. During plan development, an approved concept is expanded into a complete OPLAN, OPLAN in concept format (with or without TPFDD), or functional plan. Construction of the OPLAN TPFDD is one of the most time-consuming and intensively managed aspects of plan development. Staff

planners need to ensure the appropriate expertise is included in the TPFDD in a timely fashion to accomplish those tasks with significant environmental considerations. An example of this may be those elements that will perform the EBS (see Appendix D) and EHSA (see Appendix E) for each base camp or respective site. The three major areas of refinement for the TPFDD include forces, logistic, and transportation refinement. Many of the elements supporting environmental considerations will be included in the logistics refinement that confirms the sourcing of logistic requirements and assesses the adequacy of resources (including specific technical expertise) provided in the support planning.

3-23. To support this phase, the staff provides input for the appropriate annexes and appendices of the plan. While all portions of an OPLAN may contain relevant environmental considerations, certain annexes and appendices are critical and highlighted in Table 3-1, beginning on page 3-12. The format and general guidance for each is found in CJCSM 3122.03A. While the engineer is responsible for Annex L, *Environmental Considerations*, much of the information that goes into it must be provided by other staff members. In Army orders Annex L is represented by Appendix 2, *Environmental Considerations*, to Annex F, *Engineer*, and follows the same basic format as Annex L (see Appendix B). (Other services use an Annex L for environmental considerations. An example of a more nautically focused Annex L is provided in NWP 4-11.) The product of this phase is a completed OPLAN that is awaiting approval.

**Table 3-1. JOPES Annexes and Appendices with Significant Environmental Considerations**

<b>JOPES Location</b>	<b>Proponent Staff</b>	<b>Principal Staff and Special Capabilities</b>	<b>Comments</b>
Annex A	J3	All, primarily Engineer (ENGR), Surgeon, and Civil Affairs (CA)	Ensure elements to perform critical environmental missions are included in the task organization, especially engineer, medical, and civil affairs. TPFDD sequence may be critical to perform missions in a timely fashion.
Annex B, Appendix 1	J2	All, primarily ENGR, Surgeon, and CA	Environmental PIR may include information on planned base camps and other sites.
Annex B, Appendix 4	J2	Fire Support Element (FSE), ENGR, CA, Staff Judge Advocate (SJA)	Cultural considerations and the environmental effects of specific targeting must be addressed.
Annex C, Appendix 2	Chemical Officer (CHEMO)	SJA, Surgeon	Use of riot control agents and herbicides require the integration of environmental considerations.
Annex C, Appendix 7	J3	J2, CHEMO, ENGR	Reconnaissance in general, to include the use of specific engineer and chemical, biological, radiological, and nuclear (CBRN) reconnaissance assets and expertise may be necessary for verifying base camp (or other similar) locations.
Annex C, Appendix 8	ENGR	CHEMO, explosive ordnance disposal (EOD)	Clearing of hazards for air base operability (ABO) may have environmental considerations.
Annex C, Appendix 13	ENGR	EOD, CHEMO	Clearing of unexploded ordnance (UXO) for base camps and other similar sites may be necessary.

**Table 3-1. JOPES Annexes and Appendices with Significant Environmental Considerations  
(Continued)**

<b>JOPES Location</b>	<b>Proponent Staff</b>	<b>Principal Staff and Special Capabilities</b>	<b>Comments</b>
Annex D, Appendix 1	J4	ENGR, Surgeon	POL always has significant embedded environmental considerations.
Annex D, Appendix 2	J4	ENGR, Surgeon	Water sampling, well site selection and preparation contain environmental considerations.
Annex D, Appendix 6	ENGR	J4, CA, Surgeon, SJA	The Civil Engineering Support Plan (CESP) must integrate environmental considerations
Annex E, Appendix 4	SJA	J3, J4, FSE, ENGR	This includes those considerations associated with the environmental law of war (ELOW).
Annex F	Public Affairs Officer (PAO)	CA, SJA, Surgeon, ENGR	Environmental considerations will be of concern for the PAO.
Annex G	CA	ENGR, Surgeon, SJA	Civil affairs covers the spectrum of environmental considerations although it has a special focus on cultural considerations.
Annex L	ENGR	J4, SJA, Surgeon	Civil affairs, engineering, legal, medical, this may involve all members of the joint environmental management board (JEMB)
Annex M	ENGR	J2, J3, J4, any staff requiring geospatial information to support planning.	Geospatial information for base camps and other similar sites needs to be identified in this annex.



**Table 3-1. JOPES Annexes and Appendices with Significant Environmental Considerations (Continued)**

<b>JOPES Location</b>	<b>Proponent Staff</b>	<b>Principal Staff and Special Capabilities</b>	<b>Comments</b>
Annex P	J4	ENGR, CA, Surgeon, SJA	Environmental considerations and guidance must be included where applicable.
Annex Q	Surgeon		Numerous places throughout with environmental considerations embedded besides Appendices 6 and 10.
Annex Q, Appendix 6	Surgeon	ENGR, CA	Force health protection is a principal component of environmental considerations. Remediation is often linked to actions that may be taken by the engineer.
Annex Q, Appendix 10	Surgeon	ENGR	Medical intelligence is critical in the planning phase and especially critical to support EBSs and EHSAs for base camps and other similar sites.

**Plan Review Phase**

3-24. In the plan review phase, the CJCS conducts a final review of OPLANs submitted by the supported commander. The CJCS, in coordination with the other members of the Joint Chiefs of Staff, Services, and Defense agencies, assesses and validates joint OPLANs prepared by supported commanders using the criteria of adequacy, feasibility, acceptability, and compliance with joint doctrine. The review also identifies unresolved shortfalls in force and resource capabilities. The product of this phase is an approved OPLAN.

**Supporting Plans Phase**

3-25. During this final phase, the supported commander directs the completion and submission of supporting plans to the CJCS-approved OPLAN. These plans focus on the mobilization, deployment, employment, sustainment, and redeployment of forces and resources in support of the concept described in the supported commander’s approved plan. Employment planning is normally accomplished by the subordinate commands that will direct the forces if the plan is executed and this planning will be in the format and style of the respective component commanders. Instructions for

service-specific planning are included in FM 5-0; MCWP 5-1, *Marine Corps Planning Process*; NWP 5-1; and **Air Force** respectively. While slightly different in their specifics, each contains the same requirement to integrate environmental considerations early in the planning process and ensure that all staff members are integrating them throughout the planning process.

## CRISIS ACTION PLANNING

3-26. Crisis action planning (CAP) is the Joint Operation Planning and Execution System (JOPES) process involving the time-sensitive development of joint operation plans and orders in response to an imminent crisis. It follows prescribed crisis action procedures to formulate and implement an effective response within the time frame permitted by the crisis. It is the time-sensitive planning for the deployment, employment, and sustainment of assigned and allocated forces and resources that occurs in response to a situation that may result in actual military operations. Plans are based on the circumstances that exist at the time planning occurs.

3-27. The basic planning process is adapted and employed to plan and execute joint operations in crisis situations. An adequate and feasible military response to a crisis demands a flexible adaptation of the basic planning process that emphasizes the time available, rapid and effective communications, and the use of previously accomplished joint operation planning whenever possible. In crisis situations, the Joint Planning and Execution Community (JPEC) follows formally established CAP procedures to adjust and implement previously prepared joint operation plans or to develop and execute OPORDs where no useful joint operation plan exists for the evolving crisis. A campaign plan may also be developed if warranted by the scope of contemplated operations. CAP procedures provide for the rapid and effective exchange of information and analysis, the timely preparation of military COAs for consideration by the President, and the prompt transmission of his decisions to supported commanders. The importance of a having good environmental considerations assessments in plans developed to support the deliberate planning process is highlighted when dealing with CAP.

3-28. CAP procedures provide for the transition from planning of military operations to their execution. Deliberate planning supports CAP by anticipating potential crises and developing joint operation plans that facilitate the rapid development and selection of a COA and execution planning during crises. Deliberate planning relies heavily on assumptions regarding the political and military circumstances that will exist when the plan is implemented. These ambiguities make it unlikely that any joint operation plan will be usable without modification as a given crisis unfolds. However, the detailed analysis and coordination accomplished during deliberate planning can expedite effective decisionmaking and execution planning in regards to environmental considerations during a crisis.

3-29. As the crisis unfolds, assumptions and projections are replaced with facts and actual conditions. Crisis action planning is accomplished in six phases: situation development, crisis assessment, COA development, COA selection, execution planning, and execution (see Figure 3-4, page 3-16).

Comparing Crisis Action Procedures with Deliberate Planning Procedures		
	Crisis Action Planning	Deliberate Planning
Time available to plan	Hours or days	18-24 months
JPEC involvement	For security reasons, possibly very limited to close-hold procedures	Participates fully
Phases	6 Phases from situation development to execution	5 Phases from initiation to supporting plans
Document assigning task	Warning order to Combatant Commander: Combatant Commander assigns tasks with evaluation request message	JSCP to Combatant Commander: Combatant Commander assigns tasks with planning or other written directive
Forces for Planning	Allocated in the Warning, Planning, Alert, or Execute order	Apportioned in JSCP
Early planning guidance to staff	Warning order from CJCS; Combatant Commander's evaluation request	Planning Directive issued by Combatant Commander after planning guidance step of concept development phase
Commander's estimates	Communicates recommendations of Combatant Commander to the CJCS-NCA	Communicates the Combatant Commander's decision to staff and subordinate commanders
Decision of COA	NCA decide COA	Combatant Commander decides COA with review by CJCS
Execution Document	Execute order	When operation plan is implemented, it is converted to an OPORD, and executed with an Execute order
Products	Campaign Plan (of reqd) with supporting OPORDs or OPORD with supporting	OPLAN or CONPLAN with supporting plan

**Figure 3-4. Crisis Action Planning**

**JOINT PLANNING SUMMARY**

3-30. Figure 3-5 (page 3-17) shows the interrelationships of deliberate planning and CAP. Deliberate planning provides the foundation for CAP through development of detailed plans to counter likely contingencies. During CAP, existing plans, if available, are expanded or modified to meet the crisis situation. Development, adjustment, and refinement of the TPFDD are at the heart of transportation planning and execution. The end product of execution planning is the OPORD published by the supported commander. The President exercises the ultimate authority over the selection of the COA, deployment of forces, and execution of an OPORD. While environmental considerations may be added to either planning process at any time, it is clearly more effective and preferable to incorporate as many as possible as early as possible in either process to ensure they are adequately considered in planning.

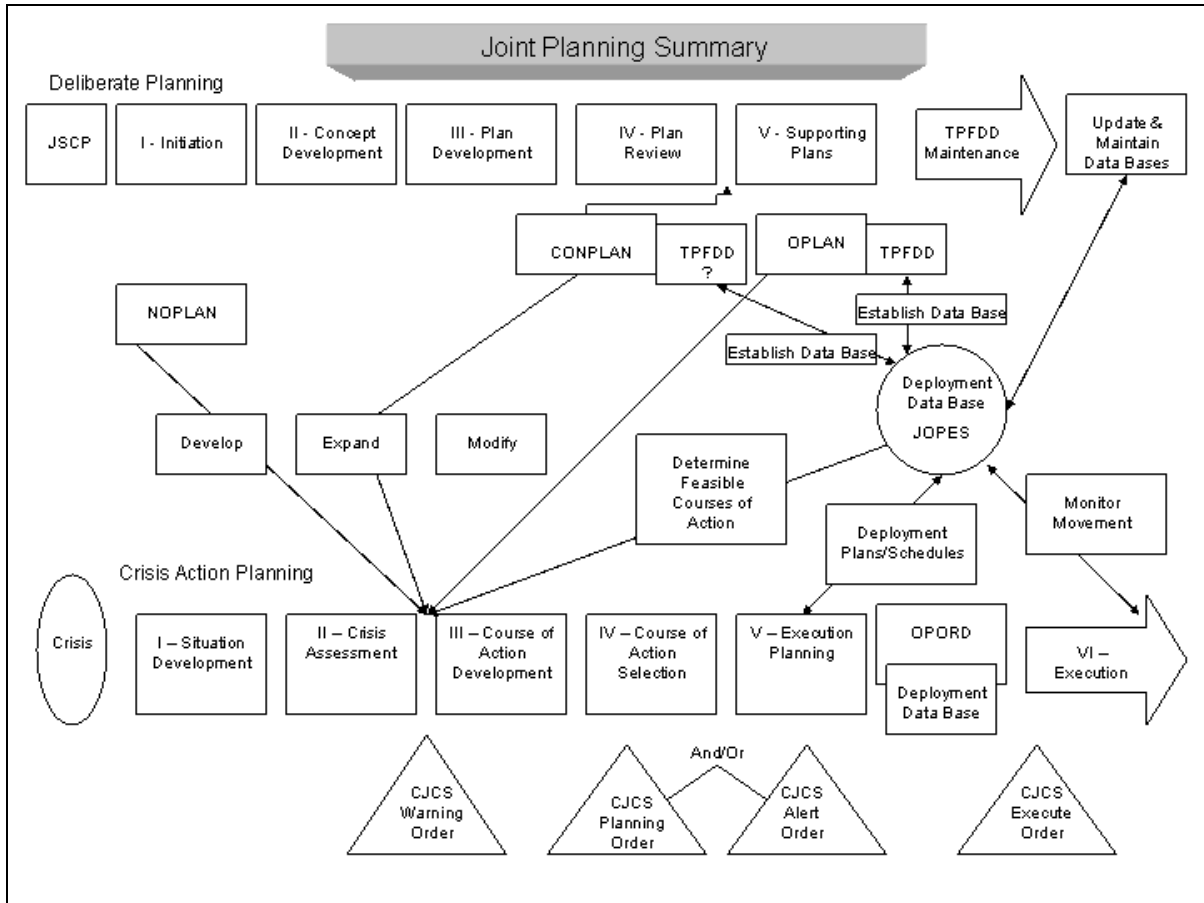


Figure 3-5. Joint Planning Summary

**Other Environmental-Related Planning Factors**

3-31. Multinational planning requires the staff to be aware of the environmental constraints placed on multinational operations by international agreements applicable to US forces. Military materiel restrictions—such as the use of depleted uranium rounds—may also limit the method by which forces conduct operations. Additionally, HN cultural and historical sensitivities must be considered as a factor in the operational planning sequence. The force headquarters should produce an environmental constraints and factors checklist for the force. (Display an example in the next version of this manual.)

3-32. Inadequate waste disposal plans cause conflicts with public and international law and increase costs. Waste and disposal streams must be addressed in the OPLAN or OPORD from initial planning to redeployment. When cost becomes paramount during redeployment, waste and disposal may be particularly important. Some commodities that will likely require disposal (most with environmental considerations) include:

- Usable property and scrap.
- Munitions list and strategic list items.

- Captured and confiscated weapons.
- Hazardous materiel and hazardous waste (to include legacy chemicals).
- Rations and food.
- Ammunition, explosives, and dangerous articles.
- Radioactive materiel.
- Medical waste.
- Classified items.
- Drugs, biological substances, and controlled substances.

3-33. Environmental assistance operations may be the focus of an OPORD or OPLAN (see CJCSM 3500.04C). This may include responding to hazardous material releases, restoring contaminated land and water, and conserving the nation's natural and cultural resources. Assistance is provided in support of domestic authorities in preserving, protecting, and enhancing the environment. Their focus will tend to be areas associated with environmental awareness programs: compliance, prevention, restoration, and conservation. Maritime forces (see NWP 4-11) may be tasked to respond to oil spills and other environmental disasters. In these cases, maritime forces can be a valuable source of trained and disciplined personnel as well as equipment. Often these operations will be conducted in concert with or in support of other governmental, international, or private agencies whose specific missions include disaster response.

## **MILITARY DECISION-MAKING AT THE OPERATIONAL LEVEL**

3-34. Although each of the services operates within the context of a joint strategy it is important to relate the operational planning conducted within the services. Those conducted by the land component commander will generally be those identified in FM 5-0 or the similar process in MCWP 5-1. The joint planning process sets the stage for planning performed by the services. Operational and tactical planning will use either the military decision making process (MDMP) or troop leading procedures (TLP). Since TLP are primarily used by small unit leaders and is a variation of the MDMP, we will only discuss the MDMP and its use by units with a staff.

3-35. The MDMP is a planning tool adaptation of Army problem solving. It is an established and proven analytical planning process that applies across the spectrum of conflict and range of military operations. The MDMP helps organize the thought process of commanders and staffs, assisting them to apply thoroughness, clarity, sound judgment, logic, and professional knowledge to reach decisions. Environmental considerations are an important part of this process.

3-36. The MDMP can be as detailed as time, resources, experience, and the situation permit. The full MDMP is detailed, deliberate, sequential, and time-consuming. It is used when enough planning time and staff support are available to thoroughly examine two or more friendly and enemy COAs. This typically occurs when developing operation plans (OPLANs), when planning for an entirely new mission, or during training designed to teach the MDMP. There are situations when the MDMP requires abbreviation, especially when

time available to plan is short. The commander decides whether to use the full MDMP, or provides guidance on how to abbreviate it, based on the situation. The full MDMP provides the foundation on which planning in a time-constrained environment it based.

3-37. There are seven steps in the MDMP (see Figure 3-6, page 3-20). Each begins with inputs that build on previous steps. Each step, in turn, has outputs that drive subsequent steps. Errors committed early affect later steps. While the formal process begins with the receipt of a mission and has as its goal the production of an order, planning continues throughout the operations process.

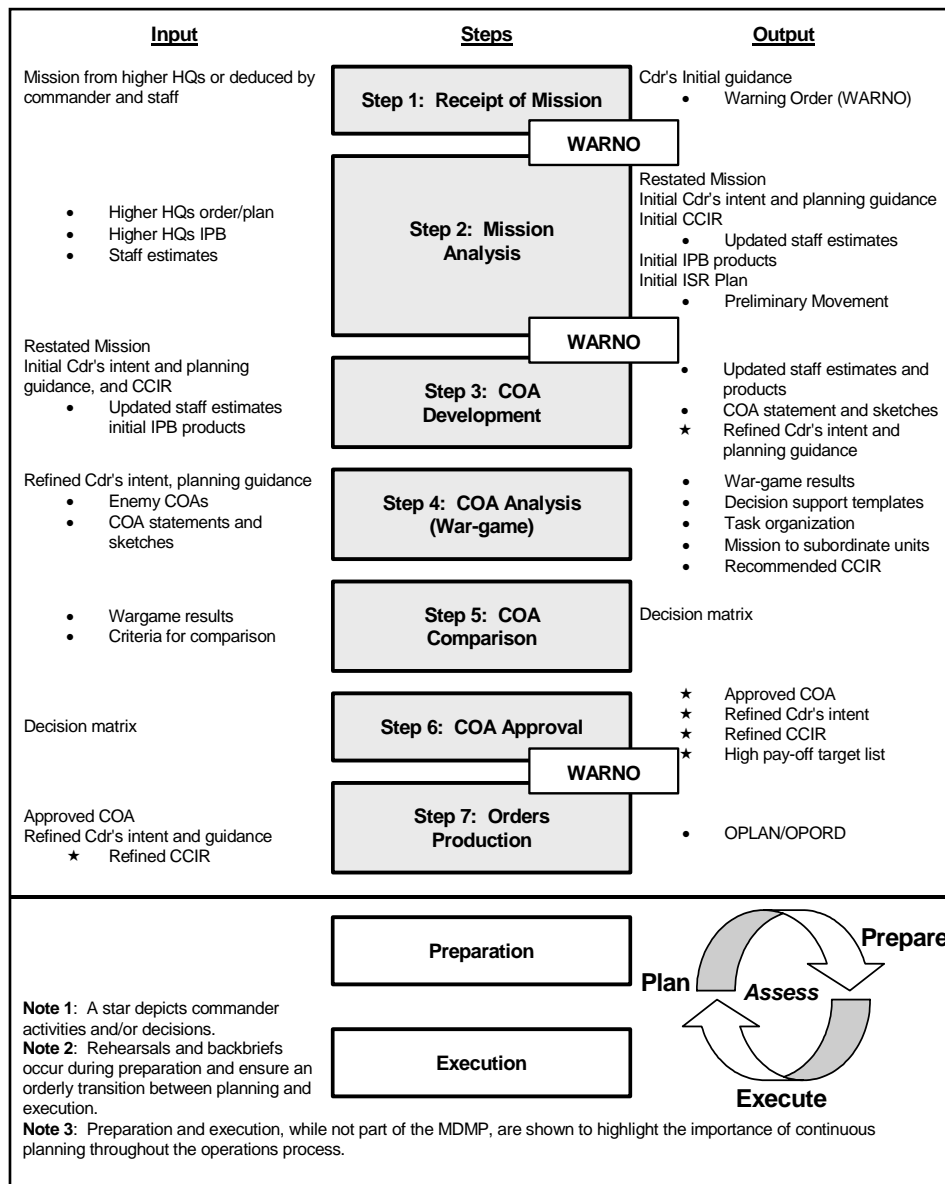


Figure 3-6. The Military Decision Making Process

3-38. Preparation and execution, while not part of the MDMP, are shown in the lower portion of Figure 3-6 to highlight the importance of continuous planning. Once a plan or order is produced, it is transmitted to those who will execute it quickly enough for them to produce their own plans and prepare for the operations. Back-brief and rehearsals occur during preparation (environmental considerations are included). They are essential to ensure those responsible for execution have a clear understanding of the mission, commander’s intent, and concept of operations (see FM 6-0, *Command and Control*).

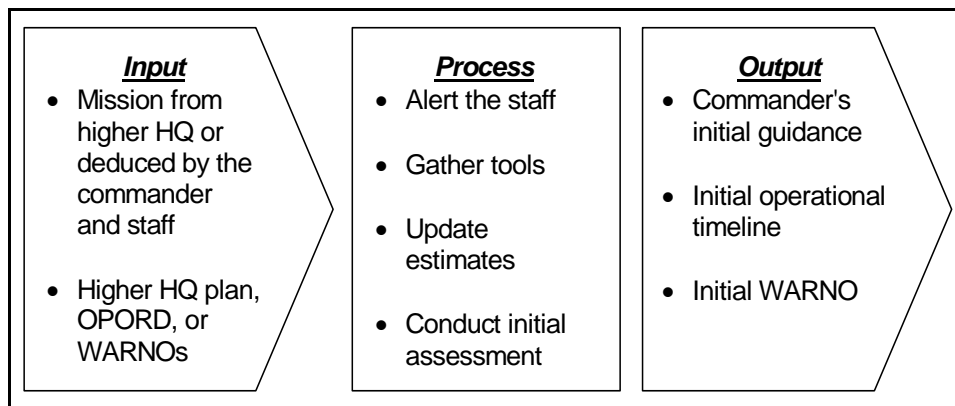
**PERFORMING THE MILITARY DECISION MAKING PROCESS**

3-39. This manual does not attempt to teach this process, but rather uses the framework provided in FM 5-0 to discuss the application of environmental considerations throughout the MDMP and highlight the critical steps for environmental input. The commander and staff perform the MDMP steps sequentially; however, there may not be distinct points at which one step ends and another begins. For example, IPB (a mission analysis task) continues throughout the MDMP. It is convenient to describe the MDMP in terms of steps; nonetheless, planners compare the process to current requirements, set priorities, and perform the necessary tasks in an order that produces the required product on time.

- 3-40. The MDMP synchronizes several processes to include—
- IPB (see FM 34-130, *Intelligence Preparation of the Battlefield*).
  - The targeting process (see FM 6-20-10, *The Targeting Process*).
  - Risk management (see FMs 3-100.12/100-14, *Risk Management*).
  - The following discussion shows where these processes provide input to the overall MDMP. All of them proceed concurrently.

**Receipt of the Mission**

3-41. The MDMP begins with receiving or anticipating a new mission. When a new mission is identified, commanders and staffs perform the process actions and produce the outputs shown in Figure 3-7.



**Figure 3-7. Receipt of Mission**

3-42. **Alert the Staff.** Receipt of mission focuses on the **proactive** requirements for environmental consideration. To be successful, input regarding environmental considerations must be both early and integrated. It must also be presented in a format (unit of measure) that is readily useful to the commander and one that allows him to formulate his initial guidance and intent rapidly. Unit SOPs identify who participates in mission analysis, who the alternatives are, and where they should assemble.

3-43. **Gather Tools.** The preparation for mission analysis focuses on gathering the necessary tools for the analysis. These tools include, but are not limited to –

- The environmental appendix or annex from the higher headquarters' order or plan. The supporting commander and staff may also find environmental guidance in the coordinating instructions of paragraph 3, the service support annex, or in guidance from the surgeon or other special staff officers.
- Maps of the AO to help the commander assess likely areas for significant environmental consideration.
- The commander's or higher headquarters' SOPs with their included procedures for environmental considerations.
- Appropriate documents and references (such as this field manual and others), applicable HN agreements, DOD overseas environmental baseline guidance document (OEBGD), final governing standards (FGS), or similar guidance.
- Any existing current staff estimates as well as applicable lessons learned or AAR materials. The commander should not be content with simply seeking out the higher headquarters' staff estimate.
- Other materials and products required to support environmental considerations.

3-44. All staff officers should develop a generic list of environmental considerations and associated requirements in their respective area(s) to add to the general guidelines given in FM 6-0, Appendix D. See Appendix C of this manual for staff roles and environmental responsibilities.

3-45. **Update Estimates.** Staff estimates are updated as staff members monitor, track, and aggressively seek information important to their functional areas. They assess how environmental considerations affect COA development and recommendations they should make.

3-46. **Conduct Initial Assessment.** The commander and staff perform a quick initial assessment to optimize the command's use of time while preserving time for subordinate commanders to plan and prepare for operations.

3-47. **Issue the Initial Guidance.** Once time is allocated, the commander determines whether to use the full or abbreviated MDMP and issues the initial guidance that includes –

- The initial operational time line.
- How to abbreviate the MDMP, if required.



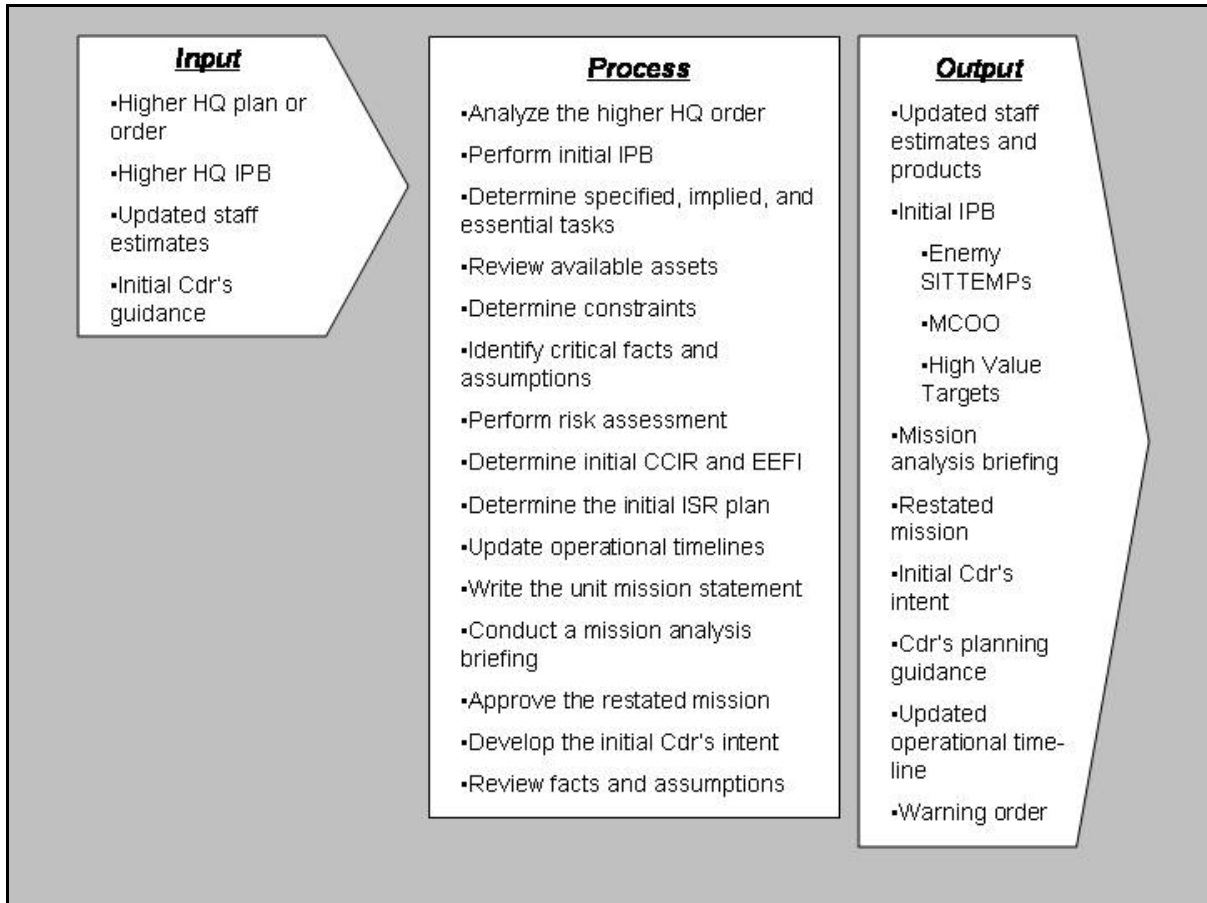
- Necessary coordination to perform, including liaison officers to dispatch.
- Initial surveillance and or reconnaissance to start.
- Authorized movement (to include positioning of C2 system nodes.
- Additional staff tasks (environmental considerations may play a role here).
- Collaborative planning times and locations (if desired).

3-48. The last task in receipt of mission is to issue a WARNO to subordinate and supporting units. This order includes, as a minimum –

- The type of operation (to include environmental assistance).
- The general location of the operation.
- The initial operational time line.
- Any reconnaissance or surveillance to begin (could involve information on prospective base camps).
- Any movement to initiate.
- Any collaborative planning sessions directed by the commander (to include the standing up of an environmental management board).

### Mission Analysis

3-49. A thorough mission analysis is crucial to planning and the integration of environmental considerations. Both the process and products of mission analysis help commanders refine their situational understanding and determine their mission. Accurate situational understanding enables them to better visualize the operation. Mission analysis consists of 17 tasks (under ***Process***), not necessarily sequential (see Figure 3-8, page 3-24). Some tasks will prove more vital than others in the application of environmental considerations. In addition to the staff's mission analysis, commanders perform their own mission analysis. This gives them a frame of reference to assess the staff's work and develop their visualization. The staff uses running estimates to record assessments and other information. Anticipation, prior preparation, and a trained staff are the keys to a timely mission analysis. There may be items of such importance to the commander and the formulation of his commander's guidance (to include some environmental considerations) that they need to be brought to the commander immediately rather than waiting until the formal briefing. Good tools to facilitate mission analysis dramatically increase staff officers' effectiveness.



**Figure 3-8. Mission Analysis**

**3-50. Task 1. Analyze the Higher Headquarters' Order:** The commander and his staff thoroughly analyze the higher headquarters' order and identify guidance on environmental considerations. While there is generally a specific annex or appendix on environmental considerations in the higher headquarters' order, it is not the only source of guidance. Coordinating instructions or guidance from the G4, SJA, Surgeon, and others may also contain information critical to environmental considerations.

**3-51. Task 2. Perform Initial Intelligence Preparation of the Battlefield:** IPB is a systematic, continuous process of analyzing the weather, terrain, threats as they relate to the mission and friendly forces in the specific geographic area (see FM 2-01.3, *Intelligence Preparation of the Battlefield*) and this includes the effects of the environment on the unit. IPB supports the commander and staff and is essential to developing estimates and performing decision-making. Staff officers must assist the G2 in developing the situation template (SITTEMP) within their own areas of expertise. It may be prudent to focus some of the IPB support to assist in site selection for units moving into an operational area. They may also focus IPB on obtaining better information on medical, civil affairs, and engineering environmental areas of concern. Environmentally sensitive areas may become environmental areas of interest (EAI). These may include natural

and manmade structures such as waste treatment plants, dams, religious and cultural sites.

**3-52. Task 3. Determine Specified, Implied, and Essential Tasks:** The staff analyzes higher headquarters' orders to determine which environmental considerations should be specified, implied, and possibly the essential tasks. A task is a clearly defined and measurable activity accomplished by individuals and organizations (FM 7-0, *Training the Force*). The mission determines if environmental considerations are essential tasks. Essential tasks are tasks that must be executed to accomplish the mission and included in the unit's mission statement. The "what" of a mission statement is always a task.

**3-53. Task 4. Review Available Assets:** The commander and staff examine additions to and deletions from the current task organization, support relationships, and status (current capabilities and limitations) of all units. They consider relationships among essential, specified, and implied tasks, and between them and available assets. From this information, they determine whether they have the assets needed to perform all tasks. If there are shortages, they identify additional resources needed for mission success. The staff also identifies any deviations from the normal task organization and provides them to the commander to consider when developing the planning guidance. A more detailed analysis of available assets occurs during COA development. Subordinate unit current capabilities and limitations to deal with environmental considerations may be limited. If environmental considerations require expertise that is not organic to the commander's unit or subordinate units, it is critical that those issues are raised. As an example, a unit will require assistance (specialized engineer and medical support) to perform effective EBSs and EHSAs of a base camp site or similar location.

**3-54. Task 5. Determine Constraints:** A higher commander normally places some constraints on subordinate commanders. These restrictions dictate an action or inaction, thus restricting the freedom of action a subordinate commander has for planning. Constraints can take the form of a requirement to do something (report all fuel spills of over 100 gallons or more) or they can prohibit action (no entry into specific religious sites). Environmental considerations based constraints are typically found in the coordinating instructions or annexes of the order. The operations overlay may also contain restricted areas or sites based on environmental considerations. Constraints may also be issued orally or in WARNOs. The commander and staff ensure that critical environmental constraints are up front in the body of the order and not merely relegated to an annex or appendix.

**3-55. Task 6. Identify Critical Facts and Assumptions:** The staff gathers two categories of information concerning assigned tasks – facts and assumptions. To determine assumptions about environmental considerations, planners –

- List all assumptions received from higher headquarters.
- State expected conditions over which the commander has no control but which are relevant to the plan.

- List conditions that would invalidate the plan or its concept of operations.

3-56. An assumption is appropriate if it meets the tests of validity and necessity. *Validity* means the assumption is likely to be true. “Assuming away” potential problems, such as weather, environmental considerations, or likely enemy COAs, produces an invalid assumption. *Necessity* is whether the assumption is essential for planning. If planning can continue without the assumption, it is not necessary and should be discarded. Assumptions are replaced with facts as soon as possible. The staff identifies the information needed to convert assumptions into facts and submits them to the appropriate agency as information requirements (IR). If the commander needs the information to make a decision, he may designate the information requirement as one of his CCIR. Requirements for information about threats and the environment are submitted to the intelligence officer. The intelligence officer incorporates them into the input to the initial ISR (intelligence, surveillance, and reconnaissance) plan.

3-57. The mission may require significant environmental considerations. In this case, the facts and assumptions regarding environmental considerations may assume a preeminent position in the planning process.

3-58. **Task 7. Perform Risk Assessment:** Risk management is the process of identifying, assessing, and controlling risks arising from operational factors, and making decisions that balance risk cost with mission benefits (FM 3-100.12 and FM 100-14). Risk management consists of five steps that are performed throughout the operations process (see Table 3-2).

**Table 3-2. Risk Management and the MDMP**

	<b>Step 1: Identify Hazards</b>	<b>Step 2: Assess Hazards</b>	<b>Step 3: Develop Controls &amp; Make Risk Decisions</b>	<b>Step 4: Implement Controls</b>	<b>Step 5: Supervise &amp; Evaluate</b>
Receipt of Mission	X				
Mission Analysis	X	X			
COA Development	X	X	X		
COA Analysis	X	X	X		
COA Comparison			X		
COA Approval			X		
Orders Production				X	
*Preparation				X	X
*Execution				X	X
*Not part of the MDMP					

3-59. Risk is characterized by both the probability and severity of a potential loss that may result from the presence of an adversary or a hazardous condition. During mission analysis, the commander and staff assess two kinds of risk:

- Tactical risk is risk concerned with hazards that exist because of the presence of either the enemy or an adversary.

- Accidental risk includes all operational risk considerations other than tactical risk. It includes risks to the friendly force. It also includes risks posed to civilians by an operation, as well as an operation's impact on the environment. Most environmental risk is a part of accidental risk.

3-60. Steps 1 and 2 of the risk management process make up risk assessment and include all of the environmental-related hazards. In step 1, the commander and staff identify the hazards that may be encountered during a mission. In step 2, they determine the direct impact of each hazard on the operation. The commander issues planning guidance at the end of mission analysis concerning risk mitigation measures for the staff to incorporate in COA development. Risk assessment enhances situational understanding and contributes to complete planning guidance.

3-61. Commanders and staffs assess risk whenever they identify hazards, regardless of type; not waiting until a set point in a cycle. The operations officer exercises overall staff responsibility for risk assessment. Other staff sections oversee risk management for hazards within their functional areas.

3-62. **Task 8. Determine Information Requirements and Initial PIR, Friendly Forces Information Requirements (FFIR), and CCIR:** The CCIR identify information that the commander needs to support his battlespace visualization and to make critical decisions, especially to determine or validate courses of action. The key question is, "What does the commander need to know in a specific situation to make a particular decision in a timely manner?" Environmental considerations that may be part of the CCIR include protection of cultural/historical sites, water sources, hazardous waste (HW)/polluted industrial sites, base camp site information, or similar considerations.

3-63. The commander alone decides what information is critical, based on his experience, the mission, the higher commander's intent, and input from the staff. During mission analysis, the staff develops information requirements. IR are all of the information elements required by the commander and his staff for the successful execution of operations, that is, all elements necessary to address the factors of METT-TC (FM 6-0). Some IR (to include environmental-related ones) are of such importance to the commander or staff that they are nominated to the commander to become CCIR.

3-64. The initial CCIR developed during mission analysis normally focus on decisions the commander makes to focus planning and select the optimum COA. Once the commander selects a COA, the CCIR shift to information the commander needs to make decisions during execution. Commanders designate CCIR to let the staff and subordinates know what information they deem essential for making decisions. The fewer CCIR, the better the staff can focus its efforts and allocate scarce resources for collecting them.

3-65. **Task 9. Determine the Initial Intelligence, Surveillance, and Reconnaissance Plan:** The initial ISR plan is crucial to begin or adjust the collection effort to help answer information requirements necessary in developing effective plans. Environmental considerations may drive portions of this plan. ISR assets are tasked or dispatched as soon as possible. The initial ISR plan sets surveillance and reconnaissance in motion. It may be issued as part of a WARNO, a fragmentary order (FRAGO), and an OPORD.

As more information becomes available, it is incorporated into a complete ISR annex to the force OPORD. As ISR sources fill in gaps or the CCIR change, ISR takings are updated. The operations officer does this with FRAGOs.

3-66. To facilitate effective planning, the unit develops and issues the initial ISR plan as soon as possible. Based on the initial IPB and CCIRs, the staff (primarily the G-2/S-2) identifies gaps in the intelligence effort and determines what assets are available to collect on these gaps. The G-3/S-3 turns this into an initial ISR Plan that tasks ISR assets as soon as possible to begin the collection effort.

3-67. Special requests for information on environmental considerations critical to the operation are included in the initial IPB and CCIR. Environmental reconnaissance is a focused type of reconnaissance that includes “the systematic observation and recording of site or area data collected by visual or physical means, dealing specifically with environmental conditions as they exist, and identifying areas that are environmentally sensitive or of relative environmental concern, for information and decision-making purposes.” Reconnaissance of sites that may become base camps, deployment sites, marshalling areas, logistical sites, or other critical areas may be included as focused sites for environmental reconnaissance. This may be a prelude to the conducting of EBS and EHSA of a given site.

3-68. The G-3/S-3 is the staff proponent of the ISR plan. It is an integrated staff product executed by the unit at the direction of the commander. The G-3/S-3, assisted by the G-2/S-2, uses the ISR plan to task and direct the available ISR assets to answer the CCIRs (PIRs and FFIRs) and other intelligence requirements.

3-69. **Task 10. Update the Operational Time Line:** As more information becomes available, the commander and staff refine their initial plan for the use of available time.

3-70. **Task 11. Write the Restated Mission:** The chief of staff/executive officer or operations officer prepares a mission statement for the unit based on the mission analysis. The unit’s mission statement is presented to the commander for approval normally during the mission analysis brief. A mission statement is a short paragraph or sentence describing the unit’s essential task (or tasks) and purpose that clearly indicate the action to be taken and the reason therefore. It contains the elements of who, what, when, and where, why, and the reasons thereof, but seldom specifies how.

3-71. Environmental considerations may be addressed in the restated mission, especially if the unit mission is to respond to a forest fire, flood, or some other natural or man-made disaster. It is even possible that the restated mission could be focused on an environmentally-related mission.

3-72. The purpose of a mission statement states provides the reason for which the force will conduct the operations. The why is expressed as a desired result, end state, or goal. The purpose of the mission is expressed in a descriptive phrase. In mission command, the purpose of the mission is often more important than the tasks assigned.

3-73. There are situations when the mission statement may have more than one essential task. On-order missions are usually included in the unit's mission statement. Be-prepared missions are placed in the concept of operations.

3-74. **Task 12. Deliver a Mission Analysis Briefing:** Time permitting; the staff briefs the commander on its mission analysis. The relevant conclusions about environmental considerations, drawn from the mission analysis, help the commander and staff develops a shared vision of the requirements for the upcoming operation.

3-75. **Task 13. Approve the Restated Mission:** Immediately after the mission analysis briefing, the commander approves a restated mission. This mission can be the staff's recommended restated mission, a modified version of the staff's recommendation, or one that the commander has developed. Once approved, the restated mission becomes the unit's mission. If environmental considerations are crucial to the mission, they may become a part of the restated mission.

3-76. **Task 14. Develop the Initial Commander's Intent:** The commander's intent is a clear, concise statement of what the force must do to succeed with respect to the enemy and terrain and to achieve the desired end state. It provides the link between the mission and the concept of the operation by stating the key tasks that, along with the mission, are the basis for subordinates to exercise initiative when unanticipated opportunities arise or when the original concept of operations no longer applies. If the commander wishes to explain a broader purpose beyond that of the mission statement, he may do so. The commander's intent may contain guidance on environmental considerations especially when mission success hinges on socio-economic, political, cultural, or similar goals that affect the end state.

3-77. **Task 15. Issue the Commander's Planning Guidance:** After the commander approves the restated mission and states his intent, he provides the staff with enough additional guidance (preliminary decisions) to focus staff activities while planning the operation. In the case of combat operations, most environmental considerations will take a relative back seat to other considerations, as greater environmental risk may be taken to reduce other tactical/operational risk.

3-78. **Task 16. Issue a Warning Order:** Immediately after the commander provides his guidance, the staff sends subordinate and supporting units a warning order (WO). The staff ensures that risk guidance includes pertinent environmental considerations.

3-79. **Task 17. Review Facts and Assumptions:** Ideally, initial mission analysis will identify and quantify most of the likely environmental considerations. During the rest of the decision-making process, the commander and staff periodically review available facts and assumptions. New facts may alter requirements and analysis of the mission. Assumptions may have become facts or may have become invalid. Whenever the facts or assumptions change, the commander and staff assess the impact of these changes on the plan and make the necessary adjustments. The discovery of additional environmental considerations is likely as the planning progresses and reconnaissance information is forthcoming.

### **Course of Action Development**

3-80. After receiving guidance, the staff develops COAs for analysis and comparison. The commander's guidance and intent focus the staff's creativity to produce a comprehensive, flexible plan within time constraints. During COA development, the commander and staff continue the risk management process.

3-81. Environmental considerations will usually be most prominent in meeting the criteria of suitability and acceptability. The staff develops the COAs to accomplish the mission and meet the commander's guidance with respect to environmental considerations. Provided that the staff has informed the commander about significant environmental considerations, the commander will have incorporated these into his initial guidance.

### **Course of Action Analysis (War-gaming)**

3-82. The war game helps the commander and his staff to focus on each stage of the operation in a logical sequence. Every staff member must determine the force requirements for external support, risks, and each COA's strengths and weaknesses. Determining evaluation criteria is probably the most important part of war gaming for environmental considerations since this is where criteria are assigned for COA comparison. If environmental considerations are prominent enough, they are included in the commander's guidance and intent, as well as the specified criteria for the level of residual risk for accident hazards in the COA. It is a requirement for staff officers to conduct risk management for each COA and each must clearly identify the level of risk that the commander is willing to accept (including those related to environmental considerations).

### **Course of Action Comparison**

3-83. Environmental considerations will normally be included in the general criterion of "residual risk," or if significant enough, may even be a separate criterion. If any environmental consideration was important enough to be in the commander's guidance or intent, it will be listed here as well.

### **Course of Action Approval**

3-84. After completing its analysis and comparison, the staff identifies its preferred COA and makes a recommendation to the commander in a decision briefing. Critical environmental considerations may have become one (or more) of the criteria in the decision matrix.

### **Orders Production**

3-85. Environmental concerns are addressed by every staff officer, as applicable, in respective annexes and appendixes. The ENCOORD, functioning in this role for the G3 (or potentially the G4) has the integrating responsibility for this environmental considerations appendix or annex in the same general fashion that the G2 is responsible for the integration of IPB.



## ENVIRONMENTAL-SPECIFIC PLANNING

3-86. Environmental-specific planning focuses on providing units with the additional environmental related resources and information necessary to accomplish their missions. Operational and support planning also includes environmental protection objectives. In operational situations (Chapter 2), environmental planning focuses on the mission requirements of military units. This planning includes identifying environmental hazards/risks posed by an operation (or the training for one) and considering ways to reduce those hazards/risks through planning. Units require projection platforms (to include facilities, training areas, and support systems) for successful force projection. Elements of environmental planning include:

- Policies and responsibilities to protect and preserve the environment during the deployment.
- Certification of local water sources by appropriate medical field units.
- Solid and liquid management:
  - Open dumping.
  - Open burning.
  - Disposal of gray water (to include vehicle wash water).
  - Disposal of pesticides.
  - Disposal of medical waste.
  - Disposal of human waste.
  - Disposal of HW.
- HM management, including the potential use of pesticides.
- Flora and fauna protection.
- Archaeological or historical preservation and other cultural considerations.
- Removal of UXO.
- Base field spill plan (to include pre-coordination of spill response material and disposal containers).

## ELEMENTS OF ENVIRONMENTAL PLANNING

3-87. The staff should plan the operation to achieve mission objectives while minimizing, to the extent possible, adverse affects on the environment. Although not all of the following elements are applicable to all operations they should prove helpful during planning:

- Identifying operational objectives and the activities that are proposed to obtain these objectives, including logistics and identification of hazardous materials that may be used.
- Identifying potential alternative means of obtaining operational objectives. Alternatives may include the use of new technologies to minimize impact on the environment.
- Identifying the environmental requirements applicable to the operational area.

- Identifying adverse environmental health and environmental impacts that may result from the operation.
- Establishing formal relationships and coordinating with other disciplines that have roles in environmental planning and operations (medical, legal, civil affairs, logistics, and others).
- Linking environmental considerations to civil affairs planning. Socioeconomic and political conditions sensitivities and desired end states related to environmental considerations.
- Identifying the environmental characteristics of the potentially affected area (to include any specific environmentally-sensitive portions).
- Identifying possible environmental contingencies that may occur during the operation, such as accidental spills.
- Determining how the environmental contingency would affect the environment in the operational area and how it could be prevented or mitigated should it occur.
- Determining the environmental and operational risk associated with the operation. If risks are unacceptable, identify alternatives that mitigate associated risks.
- Establishing standardized identification (signage or markings) of off-limits or high-risk areas.
- Negotiating applicable agreements to allow for the unimpeded transit of HAZMAT or waste by military and contracted assets for environmentally sound treatment or disposal.
- Determining contractor status, to include privileges and immunities in support of the operation.
- Identifying environmental resources and reach capabilities.

### **KEY ENVIRONMENTAL FACTORS**

3-88. Commanders should consider environmental and force health protection during each phase of an operation. In planning and conducting military operations, regardless of geographic location, commanders should give appropriate consideration to the following:

- Preexisting environmental conditions impacting site selection and environmental health vulnerabilities, as well as potential US liabilities associated with the operation.
- Ensuring a predeployment site assessment is performed. This assessment will support the eventual physical completion of an EBS and EHSA for each base camp or similar location.
- Air emissions.
- HAZMAT, including pesticides.
- Hazardous waste. Appropriate disposition could include recovery, treatment, or disposal within the operational area or, where necessary, transportation to another location for these purposes.

- Oil and hazardous substance spill prevention, control and response training.
- Medical and infectious waste.
- Solid waste.
- Water and wastewater, to include sanitary wastewater.
- Natural resources, to include endangered or threatened species and marine mammals.
- Archaeological, historic, and cultural resources.
- Noise abatement.
- Resource and energy conservation through pollution prevention practices.
- Camp closure and site cleanup before redeployment.
- Incident reporting and documenting any cleanup action.
- Transporting excess material and equipment from the tactical area in an environmentally sound manner.
- Ensuring contractors (and their vehicles) have unhindered transit across international borders and the ability to execute the terms of a contract including HM storage and HW disposal.

## Chapter 4

# Training: Integrating Environmental Considerations

The integration of environmental considerations into training is very similar to the integration of safety and force protection issues. Realistic training is critical to successfully accomplishing missions. Environmental considerations should logically meld into all portions of planning, execution, and assessment of training. The discussion of joint training and the Army's battle focused training highlight the integration of environmental considerations throughout the training cycle, across all echelons of command, and across the spectrum of operational training, as specified in joint and service doctrine. While battle focused training uses Army-specific terminology, it is similar to the processes employed by the Marine Corps and the other services. For more specifics see CJCSM 3500.03A, CJCSI 3500.01C, FM 7-0, FM 7-1, *Battle Focused Training*, MCRP 3-0A, *Unit Training Management Guide*, MCRP 3-0B, *How to Conduct Training*, Navy, and Air Force.

In addition to general environmental awareness training, specialized training is required based on certain duties and responsibilities. Some of this specialized environmental training and much of the awareness training can be addressed through integrated instruction or supplemental material as part of other ongoing unit training programs.

## JOINT TRAINING

### THE FIVE TENETS

4-1. The procedures for joint training are articulated in CJCSM 3500.03A and align with the overarching guidance of CJCSI 3500.01B. These are closely linked to CJCSM 3500.04C, *Universal Joint Task List*, that provides a common reference language for all services on tasks to support the creation of joint mission essential task lists (JMETLs)/METLs. Collectively these documents guide all of the services developing training requirements, devising training plans, executing training, and assessing joint training proficiency. They support the five tenets of joint training –

- Use joint doctrine.
- Commanders are the primary trainers.
- Mission focus.
- Train the way you intend to fight.
- Centralize planning, decentralize execution.

4-2. Integrating environmental considerations is a part of these procedures and is applicable in each phase of the process. Especially critical for the integration of environmental considerations is the forth tenet of joint training – “train the way you intend to fight”. This is because while environmental considerations are generic in their design, their specific implementation may well be dependent on where training occurs. Federal, state, and local rules and regulations may challenge the tenet of training the way we intend to fight. A simple example of this may be the use of a reverse osmosis water purification unit (ROWPU), which is significantly restricted in how it may be used during a training exercise in CONUS, but not in its use during a contingency operation in many other locations OCONUS. A second example may be that we will not induce rabid animals into a training exercise, but we do expect to face that and other similar environmental health issue during deployments. The broad categories of physical, military, and civil for the fourth tenant are derived from the assessment of mission-related political, economic, social, cultural, and geographic implications; as well as threat, forces available, and time. Environmental considerations may have a significant impact on one or more of these implications and their impact may well vary over time as a deployment develops.

#### **IMPORTANCE OF THE UNIVERSAL JOINT TASK LIST**

4-3. The UJTL of CJCSM 3500.04C is designed to serve as an interoperability tool to communicate mission requirements as described in JMETL/METL and agency mission essential task lists (AMETLs). As a common language and reference system for commanders, planners, combat developers, and trainers it assists with understanding and integrating planning, training, and operations. Training and exercise plans are developed using UJTL (and the tactically-focused AUTL, UNTL, and Air Force METL) tasks with direct connectivity between JMETL development and operational mission requirements. Since environmental considerations are not always distinctly identified in these tasks or their associated conditions, or measures and criteria of performance, it is critical for staff members to ensure that they “read between the lines”, ensuring that environmental considerations are appropriately included in planning, training, and operations. These tasks form the primary basis for JMETL and so define the focus of training by a command or unit. Operations can be described as a set of UJTL and/or service task, related through doctrine, which are conducted to accomplish the mission. As such, their critical relevance to training cannot be ignored.

#### **THE JOINT TRAINING SYSTEM**

4-4. The joint Training System (JTS) is a four-phase cyclical process that starts with identification of capability requirements and proceeds through planning, execution, and assessment. Of critical importance to environmental considerations is the embedded Joint After-Action Reporting System (JAARS) that is designed to capture, act on, and share joint lessons learned to improve our joint warfighting capabilities.

4-5. Environmental considerations must be addressed in the Joint Training Information Management System (JTIMS) as it is designed to identify,

collect, analyze, store, and disseminate the data required to execute the CJCS Joint Training System. If it isn't integrated into JTIMS, environmental considerations will be lost in the joint training system and integration will be a forced, last minute exception rather than an established norm.

4-6. Joint training requirements are derived from required capabilities identified during mission analyses by commanders and their staffs, based on approved joint doctrine, joint tactics, techniques, and procedures (JTTP), and SOPs. The final product is a combatant commander JMETL that reflects and consolidates the mission capability requirements of the combatant command into a single list of task, conditions, standards, and responsible individuals and organizations. The JMETL forms the foundation for all joint training and provide the basis for deriving the command joint training requirements in Phase II (Plans). Phase I (Requirements) includes –

- Conduct mission analysis to identify tasks
- Select mission tasks from the UJTL
- Select/apply essentiality rationale
- Identify JMETs (joint mission essential tasks)
- Select responsible organizations
- Determine and select relevant conditions and standards
- Identify support and command-linked tasks
- Commander approves JMETL

4-7. If environmental considerations have been appropriately identified as a part of the requirements, than the planning for training will include them in the training objectives and the events that are designed to accomplish those objectives based upon joint doctrine, JTTP, and SOPs. Since training events are designed to ensure that training audiences attain the training objectives, those associated with environmental considerations should also be attained. Those political and environmental resource management issues associated with environmental considerations must be considered as training scenarios are built. Phase II (Plans) includes –

- Revise commander's training guidance
- Analyze JMETs
- Review the training proficiency assessment (TPA) of JMET - Organizations
- Refine training audience based on the TPA
- Develop training objectives
- Determine training methods
- Design training event/schedule resources
- Publish joint/agency training plan (J/ATP)

4-8. Execution of training encompasses the conduct of multiple types of training events, including joint exercises. The execution should be as close to reality and training the way we intend to fight as possible. Environmental considerations must be a part of the way we intend to fight. Phase III

(Execution) is the joint event life cycle. It includes developing, conducting, and evaluating exercises and includes the actions –

- Develop/capture task performance observations (TPOs)
- Review TPOs
- Determine/document training proficiency evaluation (TPE) level of training audience(s)
  - T – Trained
  - P – Partially Trained
  - U – Untrained
  - N – Not observed
- Develop/forward JAAR

4-9. Assessment is the final part of the cylindrical training cycle. The inherent value of a system for joint training is realized in the assessment phase, where assessment refers to a compilation of evaluations providing the commander valuable information about the overall command's capability to perform assigned missions. The forum established within the JTS for the examination of these assessments is the after action review (AAR) process. Phase IV (Assessment) is done at each echelon within the command and within each subordinate organization, and by each commander/director. Environmental considerations need to be a part of the AAR and the assessment phase. Assessment includes –

- Analysis TPEs from Phase III
- Review relevant lessons learned in other military operations
- Prepare staff/unit assessment
- Develop TPSs
- Develop maneuver training areas (MTAs)
- Obtain commander's approval of proposed TPAs, and mission MTAs and place into JTIMS
- Determine/forward lessons learned
- Identify/forward issues

## **JOINT MISSION ESSENTIAL TASK LIST DEVELOPMENT**

4-10. This is explained in detail in CJSCM 3500.03A. What is important here is to highlight the critical requirement for the staff to ensure environmental considerations are integrated into and draw from the tasks that are selected from the UJTL when a unit's METL is developed.

## **OPERATIONAL TRAINING MANAGEMENT**

4-11. Training for warfighting is our number one priority in peace and in war. It is the cornerstone of readiness and the basis for credible deterrence and capable defense. At the operational level, warfighting readiness is derived from tactical and technical competence and confidence. The Army calls this battle focused training (see FM 7-1). Competence relates to the ability to fight our doctrine through tactical and technical execution.

Confidence is the individual and collective belief that we can do all things better than the adversary and the unit possesses the trust and will to accomplish the mission. The following scenario explains the role that the Joint Readiness Training Center (JRTC) plays in integrating environmental considerations into tactical scenarios and provides an example of the possibilities of similar integration into other training.

**ISSUE:**

JRTC Integrated Environmental Considerations into Tactical Scenario

**DISCUSSION:**

JRTC takes a proactive approach towards environmental considerations by writing scenarios with socio-economic implications rather than treating "no-dig" areas as administrative restrictions. For example, units are advised that the local population has reservations about American forces being in the area. Units are also informed that there is a power line which provides electrical power to the local town buried somewhere in the area, and if severed would adversely affect their units' ability to accomplish the mission. To create defensive positions and avoid digging in this area, units constructed berms by hauling soil from less sensitive areas. This JRTC scenario forces units to consider the long-term effects of their actions. Units that do not consider socio-economic and environmental impacts may affect the mission end state.

**TECHNIQUES AND PROCEDURES:**

Commanders must:

- Integrate environmental considerations into the mission analysis phase of the planning process. During mission analysis, the commander and his staff conduct a risk assessment which includes identifying all environmental-related hazards.
- Develop innovative solutions to limit training distracters which may be the result of environmental considerations (i.e. making environmental considerations part of the tactical scenario).
- Utilize the unit Environmental Officer (or similar individual) throughout the planning process.

4-12. To "train the way we fight", commanders and leaders at all levels must conduct training with respect to a wide variety of operational missions across the full spectrum of operations. These operations may include combined arms, joint, multinational, and interagency considerations; and span the entire breadth of terrain and environmental possibilities. Commanders must strive to set the daily training conditions as closely as possible to those expected for actual operations. This includes the integration of environmental considerations.

4-13. Training is the key to accomplishing the mission. The key to effective unit training is the commander's involvement and presence in planning, preparing, executing, and assessing unit training to standard. Environmental considerations should meld into the planning and implementation of the training process. The integration of environmental considerations into training is very similar to the integration of safety and force protection issues. (The discussion of battle-focused training highlights the integration of environmental considerations throughout the training cycle, as specified in FM 7-0).

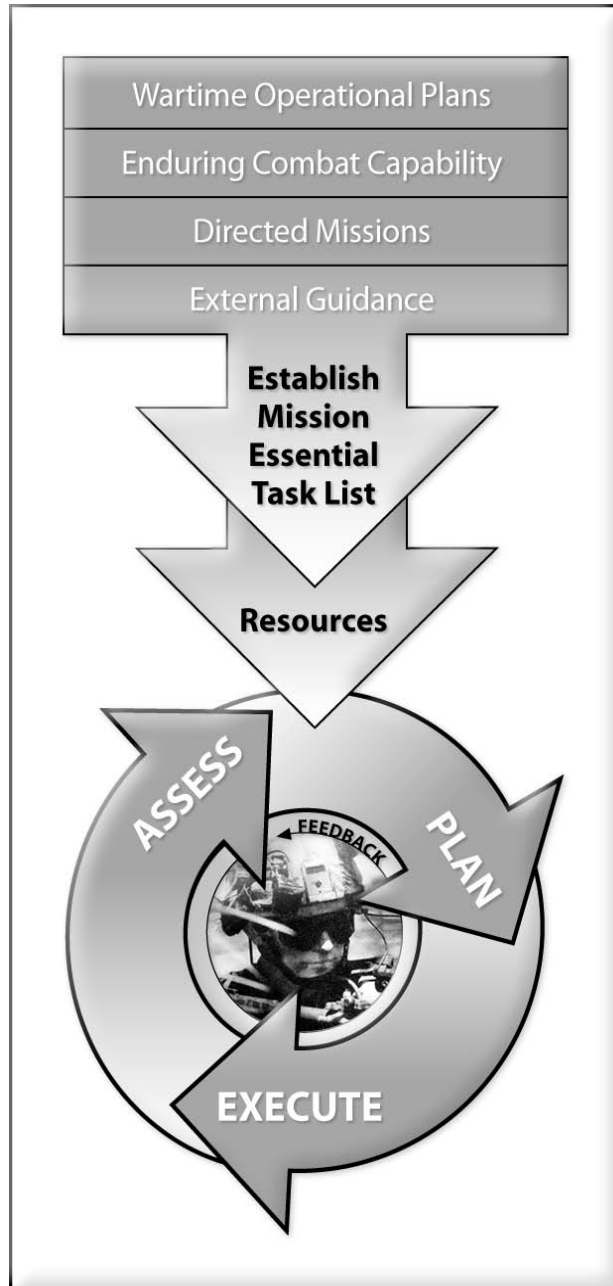
4-14. The foundation of the training process is the Training Management Cycle. In the METL development process leaders develop the long-range, short-range, and near-term training plans to effectively utilize available resources to train for proficiency on METL tasks. After training plans are developed, units execute training by preparing, conducting, and recovering from training. The process continues with training evaluations that provide



bottom-up input to organizational assessment. Organizational assessments provide necessary feedback to the senior commander that assist in preparing the training assessment.

### TRAINING MANAGEMENT CYCLE

4-15. The foundation of the training process is the Training Management Cycle depicted in Figure 4-1.



**Figure 4-1. The Training Management Cycle**

4-16. In the METL development process, training must be related to the organization's wartime operational plans and focus on METL tasks. The availability of resources does not affect METL development. The METL is an unconstrained statement of the tasks required to accomplish wartime missions. Resources for training, however, are constrained and compete with other missions and requirements.

4-17. Planning is an extension of the battle focus concept that links organizational METL with the subsequent preparation, execution, and evaluation of training. A relatively centralized process, planning develops mutually supporting METL-based training at all echelons within an organization. The planning process ensures continuous coordination from long-range planning, through short-range and near-term planning, and ultimately leads to training execution.

4-18. The planning process begins with assessment. In-depth assessment determines a strategy to improve training proficiency on specific weaknesses and plan sustainment training on demonstrated strengths. Assessment links the evaluation of completed training to the planning of upcoming training.

4-19. Commanders must assess the unit's internal and overall environmental training program status and unit proficiency. Before effective planning can occur, it is essential to perform an assessment of the current status of a unit. Table 4-1 identifies some of the environmental issues for each phase of the training cycle.

**Table 4-1. Integrating Environmental Considerations into Training Management**

<p><b>PLAN</b> (long-range)</p>	<ul style="list-style-type: none"> <li>• Conducting reconnaissance of the training site (as appropriate).</li> <li>• Assessing the environmental risks.</li> <li>• Coordinating with installation/training area environmental staffs.</li> <li>• Reviewing plans and SOPs.</li> <li>• Obtaining clearance and land use permits.</li> <li>• Conducting environmental skills training.</li> <li>• Requesting special equipment or support.</li> <li>• Coordinating with preventive medicine personnel.</li> </ul>
<p><b>PLAN</b> (short-range)</p>	<ul style="list-style-type: none"> <li>• Briefing the commander and staff.</li> <li>• Conducting reconnaissance of the training site.</li> <li>• Obtaining maps or overlays indicating environmentally sensitive areas.</li> <li>• Coordinating with the environmental management office to identify any recent changes in environmental conditions.</li> <li>• Planning for HM/HW storage and transport.</li> <li>• Reviewing spill prevention measures.</li> <li>• Updating risk assessment matrices.</li> <li>• Modifying plans as necessary.</li> </ul>

**Table 4-1. Integrating Environmental Considerations into Training Management (continued)**

<p><b>PLAN</b> (near-term)</p>	<ul style="list-style-type: none"> <li>• Briefing unit personnel on environmental constraints and issues.</li> <li>• Conducting rehearsals that include environmental considerations.</li> <li>• Conducting final reconnaissance of training sites to confirm environmental conditions prior to the execution of training.</li> <li>• Checking equipment.</li> <li>• Ensuring unit SOPs are up-to-date and meet the requirements for the specific training sites where the training will be performed.</li> <li>• Checking spill response equipment and preventive measures for spills.</li> <li>• Modifying plans as necessary.</li> </ul>
<p><b>PLAN</b> (Pre-execution checks)</p>	<ul style="list-style-type: none"> <li>• Ensuring a risk assessment (environmental) been completed and safety considerations incorporated.</li> <li>• Ensuring reconnaissance of the training ranges, sites, or facilities has been conducted.</li> <li>• Ensuring force health protection issues have been reviewed.</li> <li>• Ensuring leaders have been briefed on all environmental considerations.</li> </ul>
<p><b>PLAN</b> (Pre-combat checks)</p>	<ul style="list-style-type: none"> <li>• Briefing environmental considerations in the OPORD. Leaders and service members know what is expected of them.</li> <li>• Including environmental considerations in the safety checks and briefings.</li> <li>• Verifying completion of pre-combat (before operations) preventive maintenance checks and services (PMCS) completed on vehicles, weapons, communications, CBRN equipment, and any environmental-related equipment.</li> <li>• Checking and confirming vehicle load plans, and securing cargo (especially HM).</li> </ul>
<p><b>EXECUTE</b></p>	<ul style="list-style-type: none"> <li>• Conducting environmental awareness training.</li> <li>• Supervising high risk operations.</li> <li>• Conducting periodic environmental assessments.</li> <li>• Correcting problems on the spot.</li> <li>• Avoiding off-limits areas.</li> <li>• Preventing spills.</li> <li>• Reporting damage accurately and in a timely manner.</li> <li>• Removing HM/HW in a timely and appropriate manner.</li> </ul>
<p><b>ASSESS</b></p>	<ul style="list-style-type: none"> <li>• Ensuring environmental accountability.</li> <li>• Ensuring HM/HW accountability.</li> <li>• Including environmental issues in AARs.</li> <li>• Developing environmental lessons learned.</li> </ul>

**PREPARATION FOR THE EXECUTION OF TRAINING**

4-20. Formal planning for training culminates with the publication of the training schedule. Informal planning and coordination (pre-execution checks)

continue until the training is performed. During rehearsals, leaders ensure all safety and environmental considerations are met.

4-21. To conduct effective, meaningful training for service members, leaders, and units, thorough preparation is essential. Well prepared trainers, service members, and support personnel are ready to participate; and their facilities, equipment, and materials are ready to use.

## **EXECUTION**

4-22. A unit executes training the same way it executes a combat mission. The chain of command is present, in charge, and responsible. During operations, leaders ensure environmental considerations practices (to include preventive measures) are being employed. Once service members understand what is expected of them, these practices become merely another measure of unit proficiency and the level of unit discipline.

## **UNIT ASSESSMENT**

4-23. The training cycle restarts with unit assessment. Leaders use evaluations and other feedback measures to assess service member, leader, and unit proficiency. Commanders use the analysis of the information provided through evaluations for their assessment.

## **ENVIRONMENTAL-SPECIFIC TRAINING REQUIREMENTS**

4-24. All personnel require environmental awareness training. Such training provides basic information on installation and unit environmental practices. This training leads to safer performance and establishes an environmental ethic among service members. Awareness training occurs as early as possible following assignment to a unit, and commanders ensure that environmental awareness training is reinforced annually (or as directed by each service's guidance).

4-25. In addition to general environmental awareness training, individuals with certain duties and responsibilities (such as fuel handlers) require specialized training. As part of the unit's ongoing technical skills training, units provide some specialized environmental training through integrated instruction or supplemental material.

4-26. Unit leaders address HM/HW training separately from routine environmental training requirements. Federal law may require 40 hours of HW handler training for service members who handle specific HW. Units schedule this training as soon as possible following the assignment of personnel to positions dealing with HM. Additionally, federal law, in the RCRA, mandates HW training for personnel who handle, manage, or transport HW. The DOD directs that HM training be completed according to Department of Transportation (DOT) standards/guidance. Commanders use their Environmental Officer (or similar assistant) to check with the installation or training area/center's environmental office and determine training requirements and the availability of instruction.

## Chapter 5

# Base Camp Operations

When service members deploy operationally for any significant period of time to an AO it is likely that their new home will be a base camp. The critical necessity of including base camp development in the planning process has already been demonstrated (see Chapter 3) and the specifics of base camp design for force beddown is laid out in Chapter 11 of FM 3-34.250, *General Engineering*; AFDD 2-4.4, *Bases, Infrastructure, and Facilities*; and JP 4-04, *Joint Doctrine for Civil Engineering Support (being incorporated into the rewrite of JP 3-34)*. This chapter focuses on environmental considerations for base camps and their relationship to those practiced on our existing installations/bases. Environmental considerations (and practices) generally mirror those at established CONUS or OCONUS sites where we have agreements with an established host nation (HN), even though the base camp may be in a location where no established host nation government is in existence and no HN agreements exist for environmental considerations. Over time, many base camps will come to resemble an installation/base with a camp staff that provides necessary services and support to units utilizing them.

## LIFE OF A BASE CAMP

### BASE CAMP PLANNING

5-1. The birth of a base camp really begins with the gleam in a planner's eye as mission analysis is performed to support a given OPLAN/OPORD (see Chapter 3). This is typically initiated at a joint level and a function of collaboration between the operators and the logisticians as they attempt to define not only the number, size, and locations of potential base camps to support a deployment, but also the questions related to the standards (construction and others) that will be applied to each base camp. Staff assessments are collated by the engineer and fed into the base camp planning process. For each site a base camp development site plan (BDSP) is developed with a supporting base camp development plan (BCDP). The BCDP is a set of interrelated documents that record the planning process for laying out, determining the scope, and initiating implementing actions for a base camp. All of this is linked to the civil engineering support plan (CESP) that will be found as Appendix 6 to Annex D, *Logistics*, in an OPLAN/OPORD of a JOPES document.

5-2. The four major components of the BCDP are: antiterrorism/force protection (AT/FP), facility standards identification, master planning, and construction management. For more specifics on this see Chapter 11 of FM 3-34.250 (Draft). What is important for environmental considerations is that they are integrated into the development plan and that the engineer receives the necessary support and expertise of other staff sections in doing this.

1 Environmental considerations are linked to the components of the BCDP and  
 2 include:

- 3 • Antiterrorism/force protection. While the definition of force protection  
 4 specifically excludes most of the factors related to environmental  
 5 protection, it does include force health protection considerations and  
 6 will have a potential effect on other environmental considerations.  
 7 Those actions taken for antiterrorism or force protection reasons are  
 8 generally a higher risk consideration than most environmental  
 9 considerations. With good staff planning, many of the most damaging  
 10 actions associated with force protection may be avoided, or at least  
 11 mitigated, if environmental considerations are addressed early in the  
 12 planning process.
- 13 • Facility standards identification. The standards for base camps are  
 14 established for the joint operations area (JOA) by the FRAGO, or  
 15 commander’s guidance for the OPLAN/OPORD for a given operation.  
 16 Environmental standards must be included in these standards and  
 17 where they are not, they need to be articulated for each base camp or  
 18 similar site. These are generally based on formalized documents such  
 19 as the Red Book (USAREUR) or the Sand Book (CENTCOM) and  
 20 applied by the designated contract construction agent (CCA) (see  
 21 DODD 4270.5, *Military Construction Responsibilities*). While the Air  
 22 Force and Navy have designated geographical areas they are generally  
 23 limited to the British Isles for the Air Force and littoral areas for the  
 24 Navy and its Naval Facilities Engineering Command  
 25 (NAVFACENGCOR). The predominant CCA is the United States  
 26 Army Corps of Engineers (USACE) with the most recent experiences  
 27 and exposure to our deployments into the Balkans and the areas of  
 28 Southwest Asia. The doctrine supporting the roles of CCAs is  
 29 highlighted in JP 3-34, JP 4-04, FM 3-34, NWP 4-04.2, and AFDD 2-  
 30 4.4.
- 31 • Master planning. The master plan should take into account the range  
 32 of potential environmental considerations including environmental  
 33 protection, force health protection, cultural/architectural, and other  
 34 applicable issues for each base camp site. It should include the timing  
 35 for an environmental baseline survey (EBS) (see Appendix D) and  
 36 environmental health site assessment (EHSA) (see Appendix E) for  
 37 each site. The timeframe associated with a given base camp may have  
 38 a significant effect on how certain environmental considerations are  
 39 dealt with.
- 40 • Construction management. As construction goes forward, the  
 41 management must include the tracking of environmental  
 42 considerations as the base camp is developed. This may include  
 43 conducting an EBS and EHSA either prior to the development of the  
 44 site itself, or shortly after its occupation.

45 **BASE CAMP SUSTAINMENT**

46 5-3. Base camps require sustainment and this includes those actions taken  
 47 to apply environmental considerations in the daily life of a camp. A base  
 48 camp will have a staff that functions in a similar fashion to that of an

1 installation staff and supports the commander of that base camp. The joint  
2 environmental management board (JEMB) for the AO a base camp is in will  
3 provide the overarching guidance to assist in managing environmental  
4 requirements. While sometimes referred to as a “temporary” board, the  
5 JEMB is a requirement as long as there are base camps and similar sites to  
6 manage. The JEMB may even be created during the planning phase to  
7 support the integration of environmental considerations into the planning  
8 process, perhaps even participating in the writing of Annex L, *Environmental*  
9 *Considerations*. Chaired by the senior engineer or a member of his staff, the  
10 JEMB includes primary staff membership and includes but is not limited to  
11 legal, medical, and civil affairs expertise to round out input for all  
12 environmental considerations.

13 5-4. Sustainment from an environmental considerations view includes  
14 periodic inspections of conditions in the form of the environmental conditions  
15 report (ECR) and various medical reports in support of force health  
16 protection. This will support the base camp staff (mayor) in a similar fashion  
17 to the support provided to an installation commander and staff. A base camp  
18 coordination agency (BCCA) for the AO should be established to provide  
19 environmental expertise to the commander, primarily through its  
20 subordinate base camp assistance teams (BCATs).

21 5-5. The longer that US forces operate a base camp, the more likely efforts  
22 will be made to increase quality of life (QOL) for service members living  
23 there. This could occur in a variety of areas. One of the areas of QOL that  
24 may be impacted is in the area of environmental considerations. ~~Standards~~  
25 ~~may also be affected by the reestablishment of a HN government from a~~  
26 ~~period of relative chaos when US forces first created the base camp.~~  
27 Compliance requirements may make adjustment to the standards a  
28 requirement rather than a commander’s decision.

## 29 **BASE CAMP CLOSURE**

30 5-6. Closure of a base camp is a part of the initial planning process that  
31 identified the need for a given base camp and provided an estimate for its  
32 duration. The environmental considerations included in the initial planning  
33 must attempt to factor in the end state of a base camp and the requirement  
34 to ultimately return the real estate and facilities to some local government.  
35 An EBS is included in the process of closure to provide the final snap shot of  
36 conditions for documentation. Together with the initial EBS/EHSA and  
37 subsequent ECRs/medical inspections, ~~final~~ final EBS provides a picture of the  
38 environmental life of a base camp that may be used to deal with claims  
39 against the government, or to address questions of force health protection  
40 after the site is no longer occupied by service members.

## 41 **BASE CAMP ENVIRONMENTAL CONSIDERATIONS FOCAL POINTS**

42 5-7. While all of the environmental program areas associated with  
43 installations/bases will apply to a base camp to some degree, the guidance for  
44 their implementation will be defined in the OPLAN/OPORD directing their  
45 creation, the BCDP, and adjustments defined by the BCCA as it receives  
46 updates to command guidance. Three of the primary environmental-related

1 focal points or areas that the commander of a base camp (and the resident  
2 service members) will first and foremost always be concerned with include  
3 field sanitation, hazardous substance (HS) management, and refueling and  
4 spills.

#### 5 **FIELD SANITATION**

6 5-8. The baseline force health protection concern for field commanders in  
7 field sanitation. This is directly linked to preventive medicine and is  
8 something that each commander can directly affect as a resident unit of a  
9 base camp. For information on protective/preventive measures that are first  
10 and foremost unit focused, see FM 21-10 and FM 4-25.12. Most of these  
11 measures should be captured in unit SOPs and a transition to applying them  
12 to base camp standards should be virtually seamless in their application. As  
13 standards on the base camp improve some of these considerations will be  
14 alleviated by improvements in camp facilities.

#### 15 **HAZARDOUS SUBSTANCE MANAGEMENT**

16 5-9. Controlling and managing hazardous substances protects the water,  
17 soil, and air of a base camp from harmful levels of contamination. The  
18 military uses large quantities of hazardous substances, such as fuels, paints,  
19 batteries, and solvents. Often these compounds contain pesticides, acids,  
20 metals, and other toxins. The military work environment is at least as  
21 conducive to HM/HW spills as the normal workplace. Given these conditions,  
22 US military forces must take extra precautions to ensure they minimize  
23 environmental contamination by hazardous substances. Even low level  
24 exposures to hazardous materials can adversely affect the health of service  
25 members. This is one of the first environmental protection issues that will be  
26 addressed on a base camp. Its force health protection aspects make it of  
27 critical importance to the base camp commander and the units that are living  
28 there.

#### 29 **REFUELING AND SPILLS**

30 5-10. Refueling of vehicles and containers always raises the level of risk that  
31 spills will occur. Because refueling operations are a necessity for a base camp  
32 and the units associated with one, they must be a focus for commanders and  
33 the operation of a base camp. Spills have large implications for safety, force  
34 health protection, and environmental protection (especially the potential  
35 effect on water supplies) that can be significant. Because of these realities it  
36 will be one of the focal areas for a base camp even in the initial stages of  
37 development because of its potentially damaging effect to the inhabitants of  
38 the base camp. Planning for spills and spill response should already be a part  
39 of unit SOPs and service members will generally follow these basic  
40 procedures in conjunction with base camp guidance.

#### 41 **ENVIRONMENTAL PROGRAM GOALS AND IMPACTS**

42 5-11. Environmental program areas provide the framework for all of the  
43 programs that are in place on an installation to support environmental  
44 protection. To a degree these are also used to support base camps. While  
45 focused on their use on an installation, these program areas are also relevant



1 for base camps, especially those with a long life where the base camp  
 2 approaches the standards associated with installations.

3 5-12. Military programs that protect the environment correspond to legal  
 4 requirements to protect air, land, water, human health, and natural and  
 5 cultural resources. Portions of these programs will almost certainly be  
 6 brought forward to affect life on a base camp. To the degree that they do,  
 7 Table 5-1 summarizes program goals and their impacts. Service member  
 8 health is always an important military impact consideration.

9 5-13. In general, at battalion level or below, these program requirements are  
 10 integrated into existing unit programs and procedures. They need not be  
 11 addressed as separate environmental programs. However, commanders  
 12 should coordinate with appropriate base camp environmental staff (and the  
 13 BCCA/BCAT) to determine their application.

14 **Table 5-1. Typical Environmental Program Areas and Their Goals/Impact**

Environmental Programs		
Program Area	Goal	Military Impact
Air	Control emissions	POL storage, energy production, waste disposal, smoke operations, fugitive dust
Asbestos management	Minimize release of and exposure to asbestos	Building acquisition, site demolition, vehicle repair parts
Cultural resource management	Protect historic and cultural heritage	Training area restrictions, additional costs for building renovations
Environmental noise management	Protect health and reduce community annoyance	Timing and location of training events, flight paths, firing points
HM management	Prevent pollution, comply with HM regulations	Procurement, installation storage and inventory management, turn-in programs for HM
HW and solid waste management	Minimize generation of wastes	Training in segregation, recycling, and substitution to minimize HM and medical waste
Natural resource management	Protect natural environment	INRMP, ITAM, training area protection and maintenance
Pollution prevention	Reduce pollution and waste generation	Turn-in procedures for reusable items, energy efficiency programs, recycling
Spill prevention and response	Prevent and respond to spills	Installation and unit spill plans
Water resources management	Conserve and protect water	Erosion control, storm water control, vehicle drip pans, wash racks

15  
 16 **BASE CAMP ORGANIZATIONS AND STAFF**

17 5-14. Both the higher unit staff and the base camp staff provide expertise  
 18 and assistance for environmental assistance. One of the primary keys to a  
 19 successful unit environmental program is to ask questions and know where  
 20 to go for help. An example directory of key environmental topics and

1 corresponding POCs at both the unit and the installation/base is provided in  
 2 Table 5-1. (This is merely representative of the sort of table that will be  
 3 included to identify base camp topics and points of contact.) See also  
 4 Appendix C for higher unit staff expertise. This should then identify the  
 5 offices/base camp staff available to assist commanders and their chain of  
 6 command in solving environmental problems and making soldiers aware of  
 7 environmental requirements.

8 **Table 5-1. Environmental Assistance**

Topic	Point of Contact
Air pollution	EMO
Audits/ECAS	EMO
Archeological and historic sites	EMO, range control (DPTM)
Clean/safe water	EMO
Command Environmental Issues	Tactical Chain of Command/EQCC/Environmental Compliance Review Board (ECRB)
Environmental training	G3/S3, EMO
HAZCOM training	G3/S3, safety office, fire department
Hazardous materials	G4/S4, DOL, safety office, fire department
Hazardous waste	G4/S4, EMO, DRMO
Laws and regulations	G1/S1, EMO, JAG/legal office
Noise pollution	EMO, range control (DPTM)
Range clearances/restrictions	Range control (DPTM)
Recycling program	G4/S4, EMO
Standing operating procedures	G3/S3 and G4/S4, EMO
Spill reporting/planning	G3/S3 and G4/S4, EMO, fire department
Threatened/endangered species	EMO
Water pollution	EMO, G3/S3 and G4/S4
Wetland protection	EMO, range control
Wildlife management	EMO, range control, PMO

9  
10  
11 **GENERIC BASE CAMP LAYOUT**

12 5-15. While all base camps will be unique in their layout due to variables  
 13 such as terrain, use, size and type of tenant units, there are certain  
 14 relationships between facilities and the associated environmental  
 15 considerations that will tend to be constant. A simple example of this is that  
 16 latrines will not be placed uphill from the dining facility. The layout in  
 17 Figure 5-1 (page 5-8) shows these general relationships and highlights some  
 18 of the more critical environmentally-related facilities such as hazardous  
 19 substance (HS) and refueling sites. (The specifics of this graphic and the

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supporting paragraphs to discuss it will appear in the next version of this manual).

**Figure 5-1. Generic Base Camp Layout**

## **Appendix A**

### **Environmental Regulations, Laws, and Treaties**

Environmental issues are a major concern for all of the services of DOD, and with emerging new laws and regulations, environmental protection will continue to have a growing impact on military operations. Violations of federal, state, or local environmental laws can result in both civil and criminal penalties. Unit leaders must understand the laws and respond accordingly. They must understand and apply the respective service regulations, to ensure that unit personnel are properly trained, and that all legal and regulatory guidance and requirements (both military and civilian) are met.

This appendix provides a brief description of the primary DOD and related service environmental regulations and the principal environmental laws applicable to military activities. Military facilities in CONUS are subject to federal, state, and local law; when the requirements differ, the most stringent generally applies. OCONUS military installations follow the OEBGD or, if applicable, FGS. HN environmental laws must be taken into account when planning contingency operations. Services do not expect commanders to be legal experts, yet they should be familiar with the requirements of environmental laws and regulations. The installation's environmental staff is the best source of assistance to ensure unit compliance with environmental laws and regulations. As discussed in Chapter 5, help is also available to the subordinate unit commander by the higher headquarters' staff, especially during an operation that takes the unit away from an installation. Ignorance of environmental laws is not an excuse for noncompliance, and it will not protect commanders, service members, or the military services from civil and criminal liability. The environmental considerations annex or appendix of an OPORD/OPLAN will generally either refer to these documents or base command guidance on them for contingency operations in AOs, to include those for which FGS or HN agreements may not exist.

These short synopses of laws and regulations provide only a brief sketch and are not inclusive of all requirements.

## SOURCES OF ENVIRONMENTAL LAWS AND REGULATIONS

A-1. Federal, state, local, and host nation governments have established laws and regulations to protect human health and natural and cultural resources from environmental degradation. Heightened environmental awareness has led agencies to develop policies to support regulatory compliance and stewardship. The primary sources of environmental law that influence the DOD and the subordinate services' actions are federal, state, local; for OCONUS installations, the OEBGD and, if applicable, the FGS. The President also directs the federal government through the use of Executive Orders (EOs) and the DOD complies with EOs as it does with any other federal law. DOD/service regulations, orders, and pamphlets identified in this appendix provide additional guidance for commanders. Each service will comply with these laws and regulations as they pertain to individual localities or installations, deployments, or operations.

A-2. Compliance with applicable environmental laws and regulations, to the extent permitted by law, is a necessary cost of doing business. To that end, each of the services are committed to setting the standards for the DOD and other federal agencies as the leaders in compliance with environmental laws, prevention of environmental damage, and the protection and stewardship of natural resources. In doing so, each of the services is making a concerted effort to integrate environmental considerations into all service activities.

A-3. At most locations, installation environmental support personnel are available to help unit leaders understand the various laws and regulations. These support personnel include the chain of command and key installation personnel (e.g. Directorate of Public Works (DPW)/environmental officer, SJAs, range officers). Installation support personnel and unit staff expertise are addressed in more detail in Chapter 5 and Appendix C. Consult with installation environmental agencies and unit staff expertise on specific requirements for each location. Given the state and local differences on environmental laws, service members need to understand that what is environmentally permissible on one installation may not be permissible on another. Similarly, international or HN requirements need to be reviewed for each AO and deployment.

## JOINT AND SERVICE REGULATIONS, ORDERS, INSTRUCTIONS, DIRECTIVES, AND PAMPHLETS

### AFI 32-7061

A-4. *Environmental Impact Analysis Process*, 24 January 1995 – This Air Force instruction describes specific tasks and procedures for the Air Force Environmental Impact Analysis Process, (EIAP).

### AFI 32-7064

A-5. *Integrated Natural Resources Management*, 22 July 1994 – This Air Force instruction explains how to manage natural resources on Air Force property in compliance with Federal, State, and Local standards for natural resource management.

**AFI 32-7065**

A-6. *Cultural Resources Management*, 13 June 1994 – This Air Force instruction sets guidelines for protecting and managing cultural resources in the United States and US territories and possessions.

**AFI 32-7006**

A-7. *Environmental Program in Foreign Countries*, 29 April 1994 – This Air Force instruction covers the four environmental pillars: cleanup, compliance, conservation, and pollution prevention. It provides reporting requirements as well as environmental requirements for deployments.

**AR 200-1**

A-8. *Environmental Protection and Enhancement*, date TBP – (Major revision, recheck the data below to include material from old -3, -4, -5 ARs) defines environmental program objectives and assigns management responsibilities. This regulation lists duties and responsibilities for each level of command from DA through the unit level. It also requires company, battery, or troop commanders in the Army, Army NG, and Army RC to appoint trained environmental officers. AR 200-1 addresses the following major areas:

- Research and development.
- Water resources.
- Air pollution.
- HM/HW and solid waste.
- Noise.
- Environmental restoration.
- Asbestos.
- Radon reduction.
- Environmental training.

**AR 200-2**

A-9. *Environmental Effects of Army Actions*, 23 December 1988 – This regulation implements National Environmental Policy Act (NEPA) within the Army. This regulation sets forth Army policies and responsibilities for the early integration of environmental considerations into Army planning and decision-making. The NEPA process described in this regulation applies to installations and units. This regulation establishes criteria for determining if Army actions are covered under categorical exclusion, of if an environmental assessment (EA) or environmental impact statement (EIS) is required.

**AR 350-4**

A-10. *Integrated Training Area Management*, 8 June 1998 – This regulation sets forth the objectives, responsibilities, and policies for the Integrated Training Area Management (ITAM) Program. ITAM establishes the procedures to achieve optimum, sustainable use of training lands by implementing a uniform land management program that includes inventorying and monitoring land conditions, integrating training requirements with land carrying capacity, educating land users to minimize adverse impacts, and providing for training land rehabilitation and maintenance.

**AR 420-49**

A-11. *Utility Services*, 28 April 1997 – This regulation rescinds AR 420-47. It establishes policies, criteria, and procedures for facilities engineering responsibilities in utilities management and services. It describes the responsibilities, regulatory requirements, and procedures for providing and managing utility services at Army installations in a safe, efficient, and environmentally sound manner. It specifies responsibilities, regulatory requirements, and procedures for HW and solid waste management as a part of the broader area of utility services. The current AR 200-1 incorporates most of these requirements. The solid waste management policy and responsibilities that still apply address solid waste collection procedures and operation of solid waste disposal facilities located on installations.

**CJCSI 2430.01A**

A-12. *Operational Support of High Seas Driftnet Fisheries*, 6 June 2002 – This instruction establishes policy, assigns responsibilities, and provides joint planning and reporting guidance concerning DOD support in the monitoring, collection, and reporting of high seas driftnet fishing. This instruction also implements references from other documents that direct DOD assets will be used in the identification and location of large-scale, high seas driftnet fishing vehicles.

A-13. This instruction applies to the US Armed Forces, including military and civilian personnel assigned to the services, Joint Staff, combatant commands, Defense agencies, or other subordinate agencies, organizations, or units thereof, reporting to the Secretary of Defense through the CJCS. Unless operating with an embarked law enforcement detachment, DOD units will limit their activities to unit monitoring and general reconnaissance and information support to the fisheries and general law enforcement activities of the National Marine Fisheries Service ([NMFS], a subdivision of the Department of Commerce [DOC]) and the United States Coast Guard (USCG).

**CJCSI 5810.01B**

A-14. *Implementation of the DOD Law of War Program*, 25 March 2002 – This instruction establishes joint policy, assigns responsibilities, and provides guidance regarding the law of war obligations of the United States. It supports DODD 5100.77, *DOD Law of War Program*, which provides policy guidance and assigns responsibility within the DOD for a program to ensure

compliance with the law of war. It also supports DODD 5100.1, *Functions of the Department of Defense and its Major Components*, which assigns the CJCS the responsibility to develop and establish military doctrine and guidance for all aspects of joint employment and activities of the Armed Forces. This instruction implements the requirements of CJCSM 3150.03, *Joint Reporting Structure Event and Incident Reports*, to provide common policy for coordinated actions by the Military Services and combatant commands.

**DA PAM 200-1**

A-15. *Environmental Protection and Enhancement*, 17 January 2002 – This pamphlet explains how the Army will execute the “U.S. Army Environmental Strategy into the 21<sup>st</sup> Century.” It portrays environmental stewardship in all actions as part of the Army mission. It describes in detail the procedures and methodology to be followed in preserving, protecting, and restoring environmental quality in accordance with AR 200-1. This pamphlet is a companion to AR 200-2, designed to assist Army users in the preparation and review of EAs and EISs that stem from NEPA.

**DA PAM 200-4**

A-16. *Cultural Resource Management*, 1 October 1998 – This pamphlet provides guidance for implementing cultural resources management, and includes applicable statutory and regulatory requirements for cultural resource and Native American programs.

**DODD 4715.1**

A-17. *Environmental Security*, 24 February 1996 – This Directive applies to all DOD components and establishes the Defense Environmental Security Council (DESC); the Environment, Safety, and Occupational Health Policy Board (ESOHPB); the DESC Committee structure; and the Armed Forces Pest Management Board (AFPMB). This document highlights DOD policy to show environmental leadership by considering environmental issues along with other relevant issues, ensuring full compliance with all environmental statutes, protecting and restoring environmental quality, and preventing adverse impacts to the environment. It includes general guidance for supporting international activities, consistent with national security policy, related to environmental security programs.

**DODD 6050.7**

A-18. *Environmental Effects Abroad of Major Department of Defense Actions*, 31 March 1979 (Certified current as of 5 March 2004) – This directive provides policy and procedures to enable DOD officials to be informed and take account of environmental considerations when authorizing or approving certain major federal actions that do significant harm to the environment of places outside the United States. The objective is to establish internal procedures to achieve this purpose.



**DODD 6490.2**

A-19. *Joint Medical Surveillance*, 30 August 1979 – This Directive establishes policy and assigns responsibility, under DODD 5136.1 and DODD 4715.1, for routine joint medical surveillance of all Military Service members during active Federal service, especially military deployments. It also designates the Secretary of the Army as the DOD Executive Agent for medical surveillance related to deployments and for the maintenance of the Armed Forces Serum Repository, consistent with this Directive.

**DODD 6XXX.X**

A-20. *Force Health Protection (FHP)*, **date (draft)** – This directive will provide critical information on joint medical surveillance for deployments. **Identified in the draft of DODI 6490.3**

**DODI 4150.7**

A-21. *DOD Pest Management Program*, 22 April 1996 – This instruction implements policy, assigns responsibility, and prescribes procedures for the DOD pest management program.

**DODI 4690.3**

A-22. *Implementation and Application of Joint Medical Surveillance for Deployments*, 7 September 1997 (**To be reissued as DODI 6490.3 *Deployment Health Surveillance and Readiness***) – This instruction implements policy, prescribes procedures, and assigns responsibilities under DODD 6490.2 for joint military medical surveillance in support of all applicable military operations. Medical surveillance of all military service members during active Federal service, including Reserve components, especially before, during, and after military deployments, is mandated. The identification of health threats and the routine, uniform collection, analysis, and rapid dissemination of information relevant to troop health have proven of inestimable value in recent operations. The intent of this instruction is to expand the concept of joint deployment medical surveillance to a more comprehensive approach to monitoring and assessing health consequences related to participation of service members in deployments. It also describes routine military medical surveillance activities during major deployments, or for deployments in which there is a significant risk of health problems, as identified by the CJCS in coordination with the Assistant Secretary of Defense for Health Affairs (ASD[HA]).

**DODI 4715.2**

A-23. *DOD Regional Environmental Coordination*, 3 May 1996 – This instruction implements policy, assigns responsibilities, and prescribes procedures under DODD 4715.1 for the establishment and operation of a program for regional environmental coordination within the DOD.

**DODI 4715.3**

A-24. *Environmental Conservation Program*, 3 May 1996 – This instruction implements policy, assigns responsibilities, and prescribes procedures under

DODD 4715.1 for the integrated management of natural and cultural resources on property under DOD control.

**DODI 4715.4**

A-25. *Pollution Prevention*, 18 January 1996 – This instruction implements policy, assigns responsibility, and prescribes procedures DODD 4715.1 for implementation of pollution prevention programs throughout the DOD.

**DODI 4715.5**

A-26. *Management of Environmental Compliance at Overseas Installations*, 22 April 1996 – This instruction replaces DODD 6050.16. It establishes policy, assigns responsibilities, and prescribes procedures for establishing the implementing environmental guidance and standards to ensure environmental protection at DOD installations and facilities in foreign countries. The key supporting document for this instruction is DOD Publication 4715.5-G, the Overseas Environmental Baseline Guidance Document (OEBGD).

**DODI 4715.6**

A-27. *Environmental Compliance*, 24 April 1996 – This instruction replaces DODI 4120.14, and implements policy, assigns responsibility, and prescribes procedures as established under DODD 4715.1 for achieving compliance with applicable EOs and Federal, State, inter-state, regional, and local statutory and regulatory environmental requirements.

**DODI 4715.8**

A-28. *Environmental Remediation for DOD Activities Overseas*, 2 February 1998 – This instruction implements policy, assigns responsibilities and prescribes procedures for remediation of environmental contamination on DOD installations or facilities, or caused by DOD operations outside the United States. It authorizes cleanups that the United States is obligated to perform by international agreement for past activities and residual cleanup of off-installation spills caused by current operations.

**DODI 4715.9**

A-29. *Environmental Planning and Analysis*, 3 May 1996 – This instruction implements policy and assigns responsibilities for integration of environmental considerations into DOD activity and operational planning.

**DODI 4715.10**

A-30. *Environmental Education, Training and Career Development*, 24 April 1996 – This directive implements policy, assigns responsibilities, and prescribes procedures to ensure effective and efficient environmental education, training, and career development programs for DOD personnel.

**DODI 6055.1**

A-31. *DOD Safety and Occupational Health (SOH) Program*, 19 August 1998 – This instruction outlines the policy, procedures, and responsibilities for

administering a comprehensive DOD on-the-job occupational safety and health program.

#### **DOD PUBLICATION 4715.5-G**

A-32. *Overseas Environmental Baseline Guidance Document (OEBGD)*, 15 March 2000 – This guide (in conjunction the directives of DODI 4715.5) provides criteria, standards, and management practices for environmental compliance at DOD installations overseas. The OEBGD provides the baseline information and standards from which all final governing standards (FGS) for individual nations are derived. This document supports the provisions of DODI 4715.5.

#### **DON ENVIRONMENTAL POLICY MEMORANDUM 93-02(1)**

A-33. *Application of the RCRA Hazardous Waste Management Requirements to Conventional Explosive Ordnance Operations*, 10 November 1993 – This guidance establishes Department of Navy (DON) policy for the designation of conventional explosive ordnance as hazardous waste and the application of hazardous waste management requirements of the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. 6901-6922(k), and the implementing regulations at 40 CFR Parts 260-271, to operations conducted on conventional explosive ordnance and to operations conducted on non-military ordnance at the request of civilian authorities by the Navy, Marine Corps, and their Reserve elements.

#### **MCO P5090.2A**

A-34. *Environmental Compliance and Protection Manual*, 10 July 1988 – This Marine Corps order, in part, provides policy and responsibilities for cultural resources management, and identifies applicable statutory and regulatory requirements for cultural resource and Native American programs.

A-35. This order provides guidance to Marine Corps forces operating ashore after disembarking. For guidance while afloat, see NWP 4-11 to incorporate environmental considerations into naval doctrine and reference Operational Naval Instruction (OPNAVINST) 5090.1B for specific guidance/regulations.

A-36. This order establishes Marine Corps policy and responsibilities for compliance with federal, state, and local environmental legislative and regulatory requirements. MCO P5090.2A addresses the following major areas:

- Protection of human health and the environment.
- Compliance with appropriated laws and regulations.
- Remediation of past contamination.
- Pollution prevention.
- Preservation of natural, cultural, and historic resources.

**OPNAVINST 3100.5E**

A-37. *Navy Operating Area and Utilization of Continental Shelf Program*, 17 November 1988 – This instruction applies to operations in all offshore public lands and their associated waters and airspace, the use of which is controlled or scheduled by Navy and Marine Corps authorities.

**OPNAVINST 5090.1B**

A-38. *Navy Program for the Protection of the Environment and Conservation of Natural Resources*, 1 November 1994 (change dated 9 September 1999) – The purpose of this manual is to discuss requirements, delineate responsibilities, and issue policy for the management of the environment and natural resources for all Navy ships and shore activities. This is a significant revision to the Environmental and Natural Resources Program Manual.

**OPNAVINST 6250.4B**

A-39. *Pest Management Programs*, 27 August 1998 – This instruction provides Navy and Marine Corps policies and procedures for implementing pest management (PM) programs. It applies to all ships, stations, and deployed units of the Navy and Marine Corps including government-owned contractor-operated (GOCO) installations; base operating services (BOS); morale, welfare, and recreation (MWR) functions including golf courses; land management planning including agricultural outleases; and non-Department of the Navy (DON) property under Navy stewardship where pest control operations are conducted.

**SECNAVINST 5090.6A**

A-40. *Environmental Planning for Department of the Navy Actions*, 26 April 2004 – This instruction revises previously established policy for environmental planning in the DON, providing a comprehensive program of environmental planning and stewardship consistent with, and in support of the readiness of the naval forces of the United States. It supplements DODI 4715.9 and DODD 6050.7.

**UG-2046-ENV**

A-41. *Guidance Manual For Preparation Of Navy Shore Installation Pollution Prevention Plan Updates*, February 2001 – This Navy Facilities Engineering Service Center (NFESC) document supports the requirement for all Navy shore installations to develop, implement, and update Pollution Prevention (P2) Plans. The purpose of this guidance manual is to provide Navy personnel with a reference document to assist them in updating P2 Plans at their installations. The guidance document has been prepared to communicate lessons learned from review of existing installation P2 Plans and to provide a recommended standardization format to Navy installations for updating their P2 Plans. It also provides general recommendations for required annual review of their P2 Plans.

## FEDERAL LAWS

A-42. These laws provide states and federal agencies a legal framework within which to operate. For example, the Federal Facilities Compliance Act (FFCA) allows regulatory agencies to impose civil fines on other federal agencies, like the DA, because in part, it waives federal sovereign immunity from civil fines and penalties for federal agency violations of the Resource Conservation and Recovery Act (RCRA).

### ARCHAEOLOGICAL RESOURCES PROTECTION ACT (ARPA) OF 1979

A-43. The ARPA requires Federal land managers to issue permits for the excavation or removal of artifacts from lands under their jurisdiction. Persons requesting an ARPA permit should be directed to the local US Army Corps of Engineers (USACE), district engineer. Installation law enforcement personnel should be aware of archaeological resources that need protection, and such sites should be monitored regularly. Unit leader actions include:

- Avoiding digging or conducting operations in or near cultural sites or structures.
- Briefing service members on the importance of avoiding, protecting, and safeguarding archaeological sites, to include not collecting any of the artifacts.
- Reporting the discovery of any artifact and waiting for clearance to resume training.

### CLEAN AIR ACT OF 1970

A-44. The CAA, as amended, in part, provides for the establishment of National ambient air Quality Standards. Each state must achieve these standards and develop state implementation plans (SIPs) to achieve and maintain them. Stationary and mobile air emissions sources must comply with regulatory requirements established to meet the requirements of each state's SIP. A state's SIP may require the regulation of volatile organic compounds (VOCs) from fuel storage and dispensing, spray painting, and solvent use. Additional impacts include open burning, smoke obscurant generation, incineration of waste, and fugitive emissions.

A-45. The CAA implementing regulations concerning vehicle inspection and maintenance requirements do not apply to military tactical vehicles. However, increasingly, stringent requirements for civilian vehicles may not apply to other military vehicles. The CAA also controls open burning operations that result in nitrogen oxide (NOX). The inherent CAA requirement to control air pollutants and fugitive dust affects military activities. The CAA also regulates asbestos removal and disposal. Recent amendments include provisions for control of air toxins (hazardous air pollutants, including particulate matter), acid rain, and ozone depleting compounds, such as chlorofluorocarbons (CFC). Unit leader actions include:

- Advising the chain of command of air pollution sources.
- Identifying and reducing sources of air pollution (dust control in training areas, excessive emissions from poorly maintained vehicles).

- Using riot control and smoke agents only in approved training areas.

## **CLEAN WATER ACT OF 1972**

A-46. The CWA, as amended in part, regulates point source discharges into navigable waters of the US. This law applies most often to industrial facilities, sewage treatment facilities, and ships. Requirements for oil and HS spill reporting and waterways cleanup affect military operations, including river crossings and other amphibious operations. The CWA requires owners and operators of some facilities to prepare and maintain plans for responding to oil and HS spills. The plans are called “Spill Prevention Control and Countermeasures Plans.”

A-47. The CWA also regulates storm water discharges from certain industrial activities. These activities may require permits if they discharge to navigable waters (e.g. wetlands). There is also an inherent requirement to prevent soil erosion during construction and earth moving activities. Unit leader actions include:

- Knowing the locations of surface water and groundwater in the training areas or areas of operations.
- Planning and conducting training, operations, and logistics activities in a manner that takes surface and groundwater areas into account where possible.
- Crossing streams and ditches at designated vehicle crossing locations as directed in training areas.
- Ensuring service members use designated vehicle wash areas and do not perform maintenance or refuel vehicles or equipment where a spill can easily contaminate surface water or groundwater.
- Ensuring released or spilled vehicle fluids do not contaminate surface water or groundwater. Taking immediate corrective action should oil or hazardous substance spills occur.
- Reporting all spills/releases as stated in the Installation Spill Contingency Plan (ISCP).
- Using proper preventive medicine and sanitation procedures to prevent surface water and groundwater contamination.
- Disposing of liquid waste from kitchens, showers, and baths properly.
- Avoiding entering terrain drainage areas with vehicles unless the area is dry and the ground will support such activities.
- Ensuring service members do not pour chemicals into sinks or storm drains.

A-48. For wetland and coastal water areas unit leader actions include:

- Requesting a map of designated wetlands and coastal water areas from the environmental office or range control.

- Ensuring service members are aware of wetland and coastal water areas and the restrictions for each area.
- Planning and conducting training, operations, and logistics activities without contaminating or causing unnecessary damage.
- Ensuring service members use designated vehicle wash areas and do not perform maintenance or refuel vehicles/equipment in these areas.
- Crossing streams and ditches only at designated vehicle crossings as directed in training areas.
- Ensuring permits are obtained before any operations resulting in dredging or filling of wetlands.

A-49. For erosion control and its associated considerations, unit leader actions include:

- Verifying restrictions with range control.
- Briefing service members on environmental and safety considerations before field training.
- Planning missions to reduce the possibility of erosion. Prohibiting the use of live vegetation unless permitted; driving or parking vehicles close to trees; and cutting trees without permission from range control or the installation forester.
- Avoiding compaction of soil to the point that water can no longer percolate through it.
- Avoiding tactical maneuvers in erosion-susceptible areas, and refilling all fighting positions.
- Reducing maneuvers during periods of high rainfalls and saturated soil conditions.
- Making maximum use of existing roads and trails.

#### **COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT OF 1980**

A-50. The CERCLA, in part, is designed to respond to (e.g. cleanup) a release or a substantial threat of release of a HS. This act establishes personal liability of the individual responsible for the release. The Superfund Amendments and Reauthorization Act (SARA) amended the CERCLA in 1986. Together, these laws establish the "superfund" program to clean up inactive HW sites. The corresponding DOD program is the Installation Restoration Plan (IRP). The IRP helps identify, investigate, and clean up contamination on DOD property. Unit leader actions include:

- Reporting any suspected contamination site to the chain of command.
- Ensuring service members understand the environmental ethic and apply it to avoid any future liabilities.

- Disposing properly of all HM/HW.

### **EMERGENCY PLANNING AND COMMUNITY RIGHT TO KNOW ACT OF 1986**

A-51. The EPCRA established programs to provide the public with important information on the hazardous and toxic chemicals in their communities, and established emergency planning and notification requirements to protect the public in the event of a release of extremely hazardous substances. To implement EPCRA, Congress required each state to appoint a state emergency response commission (SERC). The SERCs were required to divide their states into emergency planning districts and to name a local emergency planning committee (LEPC) for each district. Title III of SARA also authorized EPCRA and it originally applied only to industry. EO 12856 now extends the EPCRA to federal facilities, including DOD. EPCRA requires military installations to plan for effective emergency procedures in the event of a spill or other uncontrolled release of HMs.

A-52. Facilities with HM operations submit nonclassified inventories to the LEPC and immediately notify the LEPC when any release of HM occurs in quantities greater than permissible levels. Installations prepare annual reports of HM released through accident and normal operations. Unit leader actions with regard to EPCRA include:

- Training service members on spill prevention planning, reporting, and cleanup IAW the ISCP.
- Maintaining a current HM inventory and an MSDS for every HM in the unit. Providing a copy of the HM inventory to the fire department or installation Environment Management Office (EMO).
- Complying with the ISCP.

### **ENDANGERED SPECIES ACT OF 1973**

A-53. This act, as amended, protects threatened or endangered plants and animals (to include fish, insects, and invertebrates). All federal agencies ensure their actions do not jeopardize threatened or endangered species or their habitats. The Secretary of the Interior publishes lists of endangered and threatened species in the Federal Register.

A-54. The ESA prohibits anyone from “taking”, harassing or harming, a listed fish and wildlife species unless permitted by the ESA. Additionally, the ESA makes it unlawful to remove or to maliciously damage or destroy listed plants in areas under federal jurisdiction.

A-55. The ESA prohibits the destruction, capture, trading, selling, or buying of listed species. The DOD consults with the National Marine Fisheries and the United States Fish and Wildlife Service (USFWS) before taking any action that may affect, adversely or beneficially, a listed species or designated critical habitat. Unit leader actions include:

- Enforcing range control and installation environmental regulations.
- Avoiding actions that could harm protected plants and animals and their habitats on the installation and any off-post training areas.



- Recognizing threatened and endangered species' habitat and avoiding it during training, operations, and logistics activities.
- Marking environmentally sensitive areas as restricted movement areas during field training.
- Consulting the environmental office for other local requirements relating to wildlife and natural vegetation.
- Avoiding cutting brush and trees for camouflage.
- Coordinating with preventive medicine personnel.
- Avoiding damage to marked wildlife food plots and watering areas.
- Complying with the installation endangered species management plan.

#### **FEDERAL FACILITIES COMPLIANCE ACT OF 1992**

A-56. The FFCA made all Federal agencies subject to all substantive and procedural requirements of Federal, state, and local solid and hazardous waste laws in the same manner as private party.

A-57. One of the major changes of the FFCA is the waiver of sovereign immunity for fines and penalties for violations of hazardous and solid waste requirements. While the states have always had injunctive authority, it now appears that states have the ability to sue the Federal government for fines and penalties. In addition, as the states have penalty authority, it appears that the Environmental Protection Agency (EPA), likewise, has penalty authority. The FFCA also allows EPA to issue notices of violations (NOVs), and impose civil fines and administrative action for solid waste and HW violations. Unit leader actions include:

- Cooperating with environmental inspectors.
- Performing assessments of the work areas of service members to ensure compliance with environmental guidelines.
- Informing the chain of command when environmental problems are discovered.

#### **FEDERAL INSECTICIDE FUNGICIDE, AND RODENTICIDE ACT OF 1972**

A-58. The FIFRA, as amended, is to provide Federal control of pesticide distribution, sale, and use. EPA was given authority under FIFRA not only to study the consequences of pesticide usage, but also to require users (farmers, utility companies, and others) to register when purchasing pesticides. FIFRA requires licensing or registering pesticide products by the US EPA. It also requires proper management of pesticide use, storage, and disposal. Only certified personnel, or someone under the direct supervision of a certified person, may use restricted use pesticides. (In addition, DODI 4150.7 requires all pesticide applications to be made by properly trained and certified personnel) IAW the DOD plan for the certification of pesticide applicators of restricted use pesticides. Applying arthropod skin and clothing repellents, performed during military operations is excluded from this requirement.

Integrated Pest Management Plan (IPM) is the Army's comprehensive approach to the prevention, elimination, and control of pests. The IPM concept addresses pest problems in various ways and considers all options for pest removal/control. Unit leader actions include:

- Ensuring field sanitation teams are properly trained in the use of HM in the field sanitation kit (i.e., pesticides, rodenticides, insecticides [insect repellent], and fungicides [foot powder]).
- Employing procedures IAW FM 21-10 and FM 4-25.12.
- Notifying the installation DPW or G4 (Marines) concerning pest control in unit billets and dining facilities.

#### **FEDERAL HAZARDOUS MATERIALS TRANSPORTATION LAW (FEDERAL HAZMAT LAW) OF 1988**

A-59. The Federal Hazardous Materials Transportation Law (Federal Hazmat Law), 49 U.S.C. § 5101 et seq., (formerly the Hazardous Materials Transportation Act, 49 App. USC § 1801 et seq.) is the basic statute regulating hazardous materials transportation in the United States. The purpose of the law is to provide adequate protection against the risks to life and property inherent in transporting hazardous materials in commerce by improving the regulatory and enforcement authority of the Secretary of Transportation. DOT oversight applies to packing and repacking; handling; labeling, marking, and placarding; routing.

A-60. In addition, record keeping requirements and a registration program for shippers, carriers, and container manufacturers are a part of this law. Units most commonly haul HM in the form of petroleum, oil, and lubricants (POL) products and ordnance. Units comply with these requirements during operations and deployments that require vehicle movement or convoys on federal and state highways. Unit leader actions include:

- Training service members on proper transportation procedures to include vehicle placarding, material packaging, vehicle loading, operator requirements, safety precautions, and spill procedures.
- Ensuring accountability for all HM.
- Applying the risk management process to each unit movement requirement.

#### **MARINE MAMMAL PROTECTION ACT OF 1972**

A-61. The MMPA, as amended, establishes a Federal responsibility to conserve marine mammals with management vested in the Department of Interior for sea otter, walrus, polar bear, dugong, and manatee. The Department of Commerce is responsible for cetaceans and pinnipeds, other than the walrus. With certain specified exceptions, the Act establishes a moratorium on the taking and importation of marine mammals as well as products taken from them, and establishes procedures for waiving the moratorium and transferring management responsibility to the States. The MMPA also prohibits hunting or harvesting these animals except by permit

or as identified in amendments to the MMPA. The term "marine mammal" means any mammal which (A) is morphologically adapted to the marine environment (including sea otters and members of the orders Sirenia, Pinnipedia and Cetacea), or (B) primarily inhabits the marine environment (such as the polar bear); and, for the purposes of this Act, includes any part of any such marine mammal, including its raw, dressed, or dyed fur or skin.

A-62. Unit leader actions include:

- Ensuring service members understand they are not to harass, capture, or injure marine mammals.
- Planning operations to avoid sensitive marine mammal habitats.
- Reporting suspected violations through the chain of command.

### **MILITARY MUNITIONS RULE OF 1997**

A-63. This rule amends RCRA and identifies when conventional and chemical munitions become HW under the RCRA. It is a minimum federal standard for management of waste military munitions and provides new procedures for the storage, transport, and disposal of such waste. The DOD, other federal agencies, and government contractors who produce or use military munitions for the DOD are affected by this rule. States may adopt military munitions requirements more stringent than the federal rules.

A-64. Unused munitions become solid waste when abandoned (i.e., buried, placed in a landfill, dumped at sea, etc.); detonated (except as a consequence of intended use); burned, incinerated, or treated before disposal; removed from storage for treatment/disposal; deteriorated or damaged beyond repair; recycled, or reused; or declared a solid waste by an authorized military official.

A-65. Military munitions are not solid waste when used for their intended purpose, such as for training or part of research, development, testing, and evaluation activities, or during range clearance activities on active and inactive ranges. This rule excludes unused munitions that are repaired, reused, recycled, reclaimed, disassembled, reconfigured, or otherwise subject to materials recovery activities. Assignment of a particular condition code or placement in one of DOD's demilitarization accounts is not dispositive of whether an item is a waste because many of these materials are subjected to recovery, reuse, and recycling activities. (See the actions associated with the Federal Hazardous Materials Transportation Law.) Unit leader actions include:

- Training service members on proper procedures for the transportation, storage, handling, and turn-in of military munitions.
- Ensuring accountability for all munitions.
- Reporting all problems with damaged or malfunctioning munitions through the chain of command and the issuing/turn-in facility.

## **NATIONAL ENVIRONMENTAL POLICY ACT OF 1969**

A-66. The NEPA, as amended, affects virtually every proposed action on military installations. Installations pay particular attention to actions that may present a danger to the health, safety, or welfare of civilian and military personnel, or may cause irreparable harm to animal or plant life. The NEPA requires federal agencies to consider the environmental impacts of their actions during planning and decision making.

A-67. Installations document these considerations, while ensuring public involvement in the planning process. Only those actions categorically excluded from NEPA documentation requirements are exempt. (See AR 200-2 for a list of categorical exclusions.) EO 12114 extends the application of the NEPA philosophy to major federal actions in foreign nations. Unit leader actions include:

- Identifying areas of environmental concern.
- Identifying mission-related environmental risks.
- Identifying potential effects of environmental factors on missions and operations.
- Discussing environmental risk in training meetings and briefings.
- Identifying alternative training scenarios and techniques.
- Consulting installation environmental office personnel regarding requirements for NEPA documentation.

## **NATIONAL HISTORIC PRESERVATION ACT OF 1966**

A-68. The NHPA, as amended, requires federal agencies to consider the effects of their actions, such as construction, leasing, land transactions, and base realignment and closure (BRAC), on cultural and historic resources. The act seeks to safeguard against the loss of irreplaceable historic properties, especially those located on federal land. Many of the DOD facilities are located on historic and archaeological sites, to include prehistoric settlements and 19th century cantonments. Unit leader actions include:

- Identifying and recognizing possible archaeological and historical artifacts, sites, and structures.
- Planning and conducting training, operations, and logistics activities to avoid damage to archaeological or historic artifacts, sites, or structures.
- Instructing service members to leave historic artifacts in place and report newly discovered items to the chain-of-command.
- Reporting vandalism, theft, or damage to historic, cultural, or archaeological sites.

## **NATIVE AMERICAN GRAVES PROTECTION AND REPATRIATION ACT OF 1990**

A-69. The intent of this act is to ensure the protection and rightful disposition of Native American cultural items (as defined in the Act), including human remains, from federal lands. It establishes a consultation process for the intentional excavation or inadvertent discovery of NAGPRA cultural items. Service members must immediately report the discovery of Native American remains and artifacts. Unit leader actions include:

- Identifying and recognizing possible Native American historic artifacts, sites, and remains.
- Planning and conducting training, operations, and logistics activities to avoid damage to Native American historic artifacts, sites, or remains.
- Instructing service members to leave Native American historic artifacts, sites, or remains in place and report newly discovered items to the chain-of-command.
- Reporting vandalism, theft, or damage to Native American artifacts, sites, or remains.

## **NOISE CONTROL ACT OF 1972**

A-70. The NCA establishes a national policy to promote an environment free from noise that jeopardizes the public's health and welfare. It also regulates noise emissions from commercial equipment, such as transportation and construction equipment. The NCA exempts noise from military weapons or combat equipment. However, the goal of the Army's environmental noise abatement program is to achieve compliance with applicable noise regulations in a manner consistent with mission accomplishment. Unit leader actions include:

- Complying with local and installation noise restrictions.
- Maintaining equipment to perform to maintenance specifications.
- Checking with range control to confirm installation compatible use zone (ICUZ) program requirements.

## **OIL POLLUTION ACT OF 1990**

A-71. The Oil Pollution Act (OPA) of 1990 streamlined and strengthened EPA's ability to prevent and respond to catastrophic oil spills. A trust fund financed by a tax on oil is available to clean up spills when the responsible party is incapable or unwilling to do so. The OPA requires oil storage facilities and vessels to submit to the Federal government plans detailing how they will respond to large discharges. EPA has published regulations for aboveground storage facilities; the Coast Guard has done so for oil tankers. The OPA also requires the development of area contingency plans to prepare and plan for oil spill response on a regional scale. The OPA is far more comprehensive and stringent than any previous US or international oil pollution liability and prevention law. It is divided into nine titles focused on oil spills by vessels and facilities. It is principally a response to events like the grounding of the Exxon Valdez and several subsequent accidents in

1989/1990. It establishes a standard for measuring natural resource damage applicable to all actions for such damage. Emphasis is on federal direction of public and private efforts. This includes both the proactive actions to avert the threat of an oil spill and the reactive actions associated with the removal of oil that has been spilled. While the act specifies federal preeminence in undertaking and directing response actions, it preserves state authority over significant aspects of removal activities. Unit leader actions include:

- Training unit spill prevention/response teams.
- Reporting all known or suspected spills through the chain of command and IAW your unit SOP.
- Complying with the ISCP.
- Applying the risk management process to each operation to reduce the probability and severity of potential spills.

### **QUIET COMMUNITIES ACT OF 2003**

A-72. Pursuant to authorities granted under the Clean Air Act of 1970, the Noise Control Act of 1972, and the Quiet Communities Act (QCA) of 1978, the Environmental Protection Agency established an Office of Noise Abatement and Control. Its responsibilities included promulgating noise emission standards, requiring product labeling, facilitating the development of low emission products, coordinating Federal noise reduction programs, assisting State and local abatement efforts, and promoting noise education and research. However, funding for the Office of Noise Abatement and Control was terminated in 1982 and no funds have been provided since. Because the EPA remains legally responsible for enforcing regulations issued under the Noise Control Act of 1972, even though funding for these activities were terminated, and because the Noise Control Act of 1972 prohibits state and local governments from regulating noise sources in many situations, noise abatement programs across the country lie dormant. The QCA of 2003 reestablished the Office of Noise Abatement and Control within the EPA. The responsibilities of the office are included in the OCA of 2003. To minimize contention between installations and surrounding communities, the DOD established the ICUZ program. Following are the program's objectives:

- Assessing environmental impacts of the noise produced by proposed actions and both on-post and off-post noise sources.
- Complying with federal regulations.
- Ensuring installation mission compatibility with local land use.
- Minimizing environmental noise impact through engineering, operational controls, siting, and architecture.
- Protecting the health and welfare of all individuals adjacent to installations.

A-73. Unit leader actions include:

- Complying with local and installation noise restrictions.

- Maintaining equipment to perform to maintenance specifications.
- Confirming ICUZ program requirements with range control.

### **SOLID WASTE DISPOSAL ACT OF 1976**

A-74. The SWDA regulates the treatment, storage, or disposal of solid, nonhazardous and hazardous, waste, as amended by RCRA and the Hazardous and Solid Waste Amendments of 1984.

### **RESOURCE CONSERVATION AND RECOVERY ACT OF 1976**

A-75. The RCRA of 1976 gave the US EPA the authority to control hazardous waste from “cradle-to-grave.” This includes the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA also set forth a framework for the management of nonhazardous wastes. 1986 amendments to RCRA enabled EPA to address environmental problems that could result from underground tanks storing petroleum and other hazardous substances. RCRA focuses only on active and future facilities and does not address abandoned or historical sites (see CERCLA). In 1984 the Hazardous and Solid Waste Amendments (HSWA) were added to RCRA that required phasing out land disposal. All states require RCRA operating permits for HW treatment, storage, and disposal facilities (TSDF). The RCRA also covers the laws surrounding the disposal of solid waste to include solid waste management, landfill regulation, recycling, and affirmative procurement.

A-76. RCRA regulations require training for service members handling or managing HM. It also requires management of underground storage tanks (USTs) and clean-up of hydrocarbon contamination. Unit leader actions include:

- Complying with the installation HW management plan.
- Supporting the installation recycling program (ensuring service members understand its importance).
- Removing expended brass, communications wire, concertina, and trip wires from waste (see the Military Munitions Rule).
- Conducting police calls to collect and dispose of solid waste (trash).
- Disposing of kitchen waste only as authorized; prohibiting garbage burning/burying.
- Ensuring the unit SOP covers HW and HM, including spill contingencies.
- Collecting and turn-in HM/HW according to local and installation procedures, both in garrison and in the field.
- Proper set up and storage of satellite accumulation points for use prior to turn in to collection point.
- Properly cleaning up, reporting, and documenting any hazardous spills.

- Transporting HW according to local and installation procedures.
- Conducting maintenance, and allowing the use of HM only after service members have been properly trained.
- Ensuring the unit environmental officer is properly trained and that the training is documented.
- Maintaining a current HM inventory and an MSDS for every HM in the unit. Providing a copy of the HM inventory to the fire department or installation EMO.

### **SAFE DRINKING WATER ACT OF 1974**

A-77. The SDWA, as amended, was established to protect the quality of drinking water in the US. This law focuses on all waters actually or potentially designed for drinking use, whether from above ground or underground sources. The Act authorized EPA to establish safe standards of purity and required all owners or operators of public water systems to comply with primary (health-related) standards. It bases assessments of water quality on levels of pollutants present in the water. Water supply facility managers analyze treated water regularly. If the water quality is below standards, water supply providers notify their customers. Each service has dual program objectives to conserve water resources by implementing conservation plans and to provide drinking water that meets regulatory standards. Unit leader actions include:

- Enforcing the installation water conservation plan.
- Briefing service members on the impact of polluting water sources.
- Employing pollution prevention practices.
- Reporting all concerns about water quality through the chain of command.

### **SIKES ACT OF 1960**

A-78. The SA, as amended in November 1989, authorized the Secretary of Defense to carry out a program of planning for, and the development, maintenance, and coordination of, wildlife, fish, and game conservation and rehabilitation in each military reservation in accordance with a cooperative plan mutually agreed upon by the Secretary of Defense, the Secretary of the Interior, and the appropriate State agency designated by the State in which the reservation is located.. The military coordinates work with federal and state fish and wildlife conservation agencies. Unit leader actions include:

- Enforcing range control and installation environmental regulations.
- Avoiding actions that could harm protected animals and their habitat on the installation and any off-post training areas.
- Recognizing threatened and endangered species' habitat and avoiding it during training, operations, and logistics activities.
- Marking environmentally sensitive areas as restricted movement areas during field training.



- Consulting with the environmental office for other local requirements relating to fish and wildlife.
- Avoiding damage to marked wildlife food plots and watering areas.
- Complying with the installation endangered species management plan.

## TOXIC SUBSTANCES CONTROL ACT OF 1976

A-79. The TSCA was enacted by Congress to give EPA the ability to track the 75,000 industrial chemicals currently produced and imported into the US. EPA repeatedly screens these chemicals and can require reporting or testing of those that may pose an environmental or human-health hazard. EPA can ban the manufacture and import of those chemicals that pose an unreasonable risk. EPA has mechanisms in place to track the thousands of new chemicals that industry develops each year with either unknown or dangerous characteristics. EPA then can control these chemicals as necessary to protect human health and the environment. TSCA supplements other Federal statutes, including the Clean Air Act and the Toxic Release Inventory under EPCRA. Restrictions imposed by EPA on specific chemicals seek to limit human and environmental exposure to highly toxic substances, including CFCs, polychlorinated biphenyls (PCBs), and asbestos. TSCA requires chemical testing of substances entering the environment. It also regulates the release of these chemicals. Unit leader actions include:

- Reporting any suspected asbestos containing material or PCBs to the installation EMO.
- Training all service members (mechanics) that perform maintenance on any air conditioning system on proper procedures for the use, recovery, recycling, or disposal of refrigerants.

## EXECUTIVE ORDERS

A-80. Executive orders are official documents, numbered consecutively, through which the President of the United States manages the operations of the Federal Government. Many times an executive order may have an impact on environmental considerations for military operations. Changes to EOs make it difficult to track and keep current on. The judge advocate should be consulted for the review of the current executive orders that apply to the environmental considerations for training and military operations.

A-81. For information on environmentally related EOs refer to the web site address at <http://www.denix.osd.mil/denix/Public/Legislation/EO/toc.html> or the web site at <http://128.174.5.51/>.

## STATE LAWS

A-82. Each state has its own regulatory organization charged with developing and implementing environmental regulations. Many of the state regulations parallel federal environmental regulations and are often more stringent.

## LOCAL LAWS

A-83. Local laws and ordinances address the concerns of the local communities. Generally, they are based on federal and state laws. However, each municipality or community may place more stringent restrictions on certain activities (noise restrictions during certain hours of the day). “Local laws” may also apply to portions of the AO where CA teams are in effect performing as the acting local government and have applied certain restrictions in the interest of good relations with the local population.

## HOST NATION LAW/FINAL GOVERNING STANDARDS

A-84. All of the services are committed to actively addressing environmental quality issues in relations with neighboring communities and assuring that consideration of the environment is an integral part of all decisions. Installations and units OCONUS that are not subject to federal environmental regulations promulgated by EPA will, in areas where a HN has minimal or no environmental laws and regulations, comply with AR 200-1, MCO 5090.2A, OPNAVINST 5090.1B, and AF XXXXXXXXXX. In countries where there are HN laws, the FGS will be used according to the executive agent of that country.

## INTERNATIONAL LAWS AND TREATIES

A-85. US armed forces are obligated to abide by the provisions of treaties and conventions to which the US is bound (ratified or reflects customary international law). These treaties can impact military operations in several ways. The United States is not a party to the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, but some of our allies are parties. Some movements of hazardous waste in, or to, countries that are parties to the Convention could be affected. Whether bound by a treaty or not, its mere existence may affect operations. Recent examples from Bosnia-Herzegovina have confirmed this situation. See Center for Army Lessons Learned (CALL) Newsletter 99-9 for more information on this recent example. Some of the more important environmental international laws and treaties include:

- Biological Diversity Convention
- International Tropical Timber Agreement.
- International Convention for the Prevention of Pollution from Ships.
- Convention on International Trade in Endangered Species.
- Basel Convention (HW).
- NOX Protocol (air pollution).
- London Dumping Convention (marine pollution from ships dumping wastes generated on land).
- Montreal Protocol (ozone depleting substances).
- Kyoto Accord (greenhouse gases).

A-86. Another body of laws that affect US military forces is international treaties that govern armed conflict, known collectively as the LOW or the law

of armed conflict (LOAC). (See, e.g., DODD 5100.77 *DOD Law of War Program*). Another treaty that is relevant is the *Convention on the prohibition of military or any other hostile use of environmental modification techniques*, with annex, done at Geneva May 18, 1977; entered into force October 5, 1978; for the United States January 17, 1980; 31 UST 333; TIAS 9614. The State Parties to this treaty have agreed not to engage in military or any other hostile use of environmental modification techniques having widespread, long-lasting or severe effects as the means of destruction, damage or injury to any other State Party.

A-87. While the United States is not a Party to it, the 1977 Protocol I addition to the 1949 Geneva Convention also places restrictions on environmental warfare—using terms similar to those in the ENMOD Convention. This convention requires combatants to “...protect the natural environment against widespread, long-term, and severe damage” during war. This protection includes a prohibition of the use of methods or means of warfare that could cause extensive damage to the natural environment and endanger the health or survival of the population. This convention also prohibits attacks against the natural environment as a means of reprisal. Although the United States has not ratified all of the provisions of Protocol I, the provisions, as applied by other nations, may still affect operations. Commanders must consult the SJA for specific advice on international laws or conventions.

## **ENVIRONMENTAL COMPLIANCE ENFORCEMENT**

A-88. Under the FFCA, federal and state environmental regulatory agencies can impose civil fines on federal agencies, including each of the services, for RCRA violations. For the services, penalties can be fines, damage awards, and intervention from the EPA and other federal, state, and regional agencies. An additional consequence is an increase in monitoring by these agencies.

A-89. Unit leaders and their subordinates are required to comply with all federal, state, and local laws designed to protect the environment. Violators can be held personally liable and may be denied military legal representation for clean up costs and civil or criminal penalties. Violators include the actual person who causes contamination and the commanders, supervisors, and leaders who allowed the contamination to occur and did not take immediate action to prevent or correct the occurrence. The penalty can be up to \$50,000 for each day of violation and/or up to two years in jail.

## Appendix B

### Environmental Appendix to the Engineer Annex

The following annex format lists typical environmental considerations for OPLAN, contingency plan (CONPLAN), OPORD and execution. For small units (battalions and companies), the format will provide a guide for finding necessary information for developing their own orders. For larger units (brigade and divisional), the format should provide an example for developing a similar appendix. This format conforms to **FM 5-0** and is an example of Appendix 2 (Environmental Considerations) to Annex F (Engineer), which is included in Figure B-1, pages B-2 through B-7. **FM 5-0** directs that OPLANs/OPORDs/CONPLANs will contain an appendix to address environmental considerations. Each service uses its own format for similar appendixes/annexes. Annex L (Environmental Considerations) to a JOPEs OPLAN/OPORD/CONPLAN is the parallel document for a joint staff.

The considerations and level of detail in this format are appropriate for corps, divisions, and, on some occasions, regiments/brigades. Unit planning at the regiment or brigade level and below will normally include only those elements required by the higher HQ order or plan and not included in a unit SOP.

Unit orders and plans follow individual service formatting conventions. Army orders normally include environmental considerations in the coordinating instructions (paragraph 3, Execution) if not in a separate appendix. When specific command procedures dictate, staff officers include some environmental considerations in logistics and medical annexes.

All operations comply with federal law to the extent possible. This example assumes an overseas deployment in which the vast majority of federal environmental law is not applicable. Plans for training or operations in the US must conform to federal and state laws.

Tab A of this example appendix, included in Figure B-2, pages B-8 and B-9, implements the requirement of EO 12114 to conduct environmental assessments (in the form of the EBS) before taking actions that significantly harm the environment of a foreign nation or the global commons. It may be applicable during selected support operations or stability operations. Actions taken during combat are excluded. DODD 6050.7, which implements EO 12114, defines the environmental impact statement (EIS), environmental statement (ES), and environmental report (ER) directed in this tab.

<p><b>CLASSIFICATION</b></p> <p>Copy ___ of ___ copies</p> <p style="text-align: right;"> <b>Issuing Headquarters</b>  <b>Place of Issue</b>  <b>Date-Time Group of Signature</b>  <b>Message Reference Number</b> </p> <p><b>APPENDIX 2 (ENVIRONMENTAL CONSIDERATIONS) TO ANNEX F (ENGINEER) TO 54th MECH DIV OPLAN 99-7 (U)</b></p> <p><b>References:</b></p> <ul style="list-style-type: none"> <li>a. JP 3-34, "Engineer Doctrine for Joint Operations," 5 July 2000.</li> <li>b. JP 4-04, "Joint Doctrine for Civil Engineer Support," 27 September 2001.</li> <li>c. JSI 3820.01A, "Environmental Engineering Effects of DODA," 16 January 1996.</li> <li>d. DODI 4715.5, "Management of Environmental Compliance at Overseas Installations," 22 April 1996.</li> <li>e. DODI 4715.8, "Environmental Remediation for DOD Activities Overseas," 2 February 1998.</li> <li>f. Applicable country-specific FGS.</li> <li>g. DOD Publications 4715.5-G, <i>Overseas Environmental Baseline Guidance Document (OEBGD)</i>, 15 March 2000.</li> <li>h. HN agreements, local operating standards if different from FGS, command special instructions, SOPs, policies, guidance for environmental considerations, or references pertaining to significant environmental factors in the AO.</li> <li>i. Unit SOPs.</li> </ul> <p><b>Time Zone Used Throughout the Order:</b></p> <p><b>1. SITUATION.</b></p> <p>a. Enemy forces. Refer to an OPORD or to an environmental annex/appendix to an OPORD. State any environmental factors or conditions which could adversely affect the successful completion of the mission, and/or the health or welfare of friendly forces and the indigenous population. Environmental threats can be natural, collateral, accidental, or caused by actions of the population or enemy forces. <i>(This operation depends upon our ability to provide water for both our forces and the indigenous population through desalinization plants drawing water from the Gulf...the enemy has large amounts of chemical munitions. Special care must be taken when destroying enemy munition dumps to ensure chemical munitions are not being detonated...due to the extremely high water table in the area, special care and considerations must be taken in the siting of landfills and the collection of all waste products...)</i></p> <ul style="list-style-type: none"> <li>(1) Terrain. List all critical terrain aspects that impact functional areas operations.</li> <li>(2) Weather. List all critical weather aspects that impact functional areas operations.</li> <li>(3) Enemy functional area capability and/or activity:             <ul style="list-style-type: none"> <li>(a) List known and templated significant environmental hazards. If the information is large and specific enough, this list may become an overlay.</li> </ul> </li> </ul> <p style="text-align: center;"><b>CLASSIFICATION</b></p>
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**Figure B-1. Appendix 2 (Environmental Considerations) to Annex F (Engineer)**

**CLASSIFICATION**

(b) List significant enemy capabilities to use environmental manipulation as a means to impede friendly forces or jeopardize long-term objectives. *(Enemy may release oil directly into the Gulf...Enemy may set oil wells afire to cover their retreat...)*

(c) State the expected employment of enemy functional area assets based on the most probable course of action. *(Enemy will not be affected by international opinion...they will use all means at their disposal to include releasing oil directly into the gulf and setting oil wells afire in an orgy of destruction...)*

(4) Limiting factors. Outline limitations that are due to lack of foreign access, time, operations security (OPSEC), HN rules or sensitivities, public affairs (foreign and domestic), legal considerations, and resources. *(Operations by 54<sup>th</sup> MECH DIV will inherently have an environmental impact. Environmental considerations require early integration in the planning process and will be accomplished in conjunction with other planning and the risk management process. The environmental protection level will vary as levels of risk are anticipated to be lower and the correspondingly environmental efforts more comprehensive in proportion to the distance from the combat zone [CZ]. This appendix does not address munitions storage/disposal, CBRN activities, or activities on naval ships at sea.)*

b. Friendly forces. Refer to an OPORD or to an annex to an OPORD. State the concept of environmental operations for the higher headquarters. This concept covers relationships between environmental considerations and the supported OPORD, OPLAN, CONPLAN, or support plan.

c. Attachments and detachments. Refer to an OPORD or an annex to an OPORD (Annex L if it is a JOPES OPORD). Identify special environmental-related teams or personnel.

**2. MISSION.** State the commander's concept for environmental actions. This concept answers the who, what, when, where, how, and why of the relationship between environmental considerations and the supported OPORD, OPLAN, CONPLAN, or functional plan. Normally, the mission will be to protect, as much as practicable, the health and welfare of US personnel and the indigenous population from environmental threats during the conduct of the operation; to reduce long-term, adverse impact on the economy and public health; and to reduce US costs and liabilities at the completion of the operation.

**3. EXECUTION.**

a. Scheme of Environmental Operations. Summarize the commander's concept of environmental actions required to support the OPLAN, OPORD, or CONPLAN. Identify issues and actions that should be addressed during all phases of the operation. Identify the desired environmental endstate.

(1) Operational effect on the environment. List critical resources that should be protected during the operation such as forests, croplands, or water- and sewage-treatment facilities. Describe factors to be considered by subordinate unit commanders when making collateral damage decisions.

(2) Environmental resource effect on the operation. List any environmental conditions or factors that could impede successful completion of the operational mission or jeopardize the desired endstate. Identify possible targets of environmental sabotage or terrorism.

(3) Compliance requirements. State regulatory, statutory, and HN compliance requirements that will apply and under what conditions they may be applicable (combat versus nonhostile, stability operation or support operation; geographical differences; or event-triggered changes).

(4) Phased compliance. Describe in general terms the major environmental concerns and requirements during different phases of the operation. Specify transition tasks and measures and the appropriate initiating control measures.

b. Tasks to subordinate units. It will be unusual to have an entry here. If it is important enough to task a given maneuver element to accomplish an environmental task, this tasking must be identified in paragraph 3b of the base order. An example is the tasking of specific units (in conjunction with the surgeon or chemical officer) to perform environmental reconnaissance missions. If only placed here it is likely to be overlooked by the tasked unit. If including tasks to subordinate units:

**CLASSIFICATION**

**Figure B-1. Appendix 2 (Environmental Considerations) to Annex F (Engineer) (continued)**

**CLASSIFICATION**

(1) List functional area tasks that specific maneuver elements must accomplish and that the base OPORD does not contain.

(2) List functional area tasks the functional area units supporting maneuver elements must accomplish only as necessary to ensure unity of effort.

c. Coordinating Instructions. Outline key coordination that must be accomplished by two or more units and not routinely covered in unit SOPs. Pay particular attention to coordination requirements with higher HQs, Office of the Secretary of Defense (OSD), and other federal agencies. Unit responsibilities and requirements may vary according to location, activity, or phase of the operation; attach a matrix that specifies various levels of environmental protection. Environmental responsibilities of the surgeon, the logistics officer, and others may be included here if not incorporated in their respective annexes.

(1) Environmental reconnaissance. Identify general responsibilities here.

(2) Environmental vulnerabilities. Specify general responsibilities for intelligence collection, identification, and response planning for environmental threats to mission success.

(3) Environmental assessments. List conditions under which environmental assessments may be required, conditions when assessments may be sensible even when not required by law or order, and responsibilities for conducting and approving assessments (See Tab A and B).

(4) Occupation of base camps and similar sites. *(Occupation of base camps or similar sites, and subsequent operations, will be accomplished incorporating environmental considerations whenever feasible and commensurate with the operational situation.)*

(a) An initial EBS (see Tab A) will be conducted to determine the preexisting condition of the site and its ecological resources. Direct the conduct of ECRs based on the duration of stay at a given site (to give interim snapshot condition reports) and in response to environmental incidents.

(b) Before departure or abandonment, units will ensure that a final EBS (see Tab A) is performed to document the condition of the site to include water sources, soil, flora, archaeological/historical facilities, air quality, and other environmental conditions/considerations. Document the location of latrines, hazardous waste sites, landfills, hospitals, maintenance activities, POL storage, and any other environmentally-sensitive activities.

(5) Facilities.

(a) Environmental baseline surveys. Specify conditions, formats, responsibilities, and reporting of initial EBS, final EBS, and any interim ECRs (see Enclosures 1 and 2 and Tab C).

(b) Operating procedures. Provide guidance for environmental considerations and services in established facilities.

(c) Closure. Specify closure activities such as documentation of the location of latrines, HW sites, landfills, hospitals, maintenance activities, POL storage, and other environmentally-sensitive activities. Publication of these procedures may be delayed until a more appropriate phase of the operation.

(6) Construction. When planning and conducting general engineering operations, military designers should consider the project's effect on the environment as well as the applicable US and HN agreements, and applicable environmental laws and regulations. *(Soil erosion/runoff control procedures and other common sense procedures will be applied to the maximum extent possible in any case.)* This is a standard consideration of the Civil Engineer Support Plan (CESP) in a JOPES document.

(7) Claims. *(Under the provisions of Article XXIII of the United States – Republic of Korea [US-ROK] Status of Forces Agreement (SOFA), claims by local national individuals or organizations for damages arising from spills will be handled through established claims procedures.)*

**CLASSIFICATION**

**Figure B-1. Appendix 2 (Environmental Considerations) to Annex F (Engineer) (continued)**

**CLASSIFICATION**

**4. SERVICE SUPPORT.**

a. Identify those environmental planning factors which, although not mandated as law or regulation, will support successful execution of the OPLAN, OPORD, CONPLAN, or functional plan in all phases and protect the health and safety of US, allied forces, and noncombatants. As a minimum, address certification of local water sources by medical field units, solid and liquid waste management, HM management, flora and fauna protection, archaeological and historical preservation, and spill response. Disposal of solid and liquid waste will depend upon the location and surrounding environment of the disposal area. The intent is to minimize the environmental impact and to limit potential contamination to the holding site.

(1) Development, use, and protection of potable water sources. Certification of water sources includes: special considerations for the protection of surface water, groundwater, and water in distribution systems; location and special protection requirements for water and wastewater (gray water, see below) treatment facilities; disposal of effluents from showers and laundry facilities; disposal of brine water (or wastewater) from ROWPU operations. In CONUS, training exercises require a permit to discharge ROWPU brine into a water source. Returning brine (or wastewater) directly to the source, untreated, also violates the OEBGD. *(Water will be obtained or processed from approved sources. Water quality certifications will be accomplished according with procedures outlined in the 54<sup>th</sup> MECH DIV SOP. Operational and support elements will not contaminate potable water resources.)*

(2) Solid and liquid waste management. *(Disposal of solid and liquid wastes will be dependent on location and surrounding environment of the disposal area. The intent is to minimize the environmental impact and to limit potential contamination to the holding site.)*

(a) Solid waste. Requirements include: Disposal of solid waste (includes sludge); approval process for the use of landfills or incinerators; and protection of solid waste transportation, transfer, and disposal facilities. *(Solid waste will be removed and disposed of at ministry of environment approved facilities via wartime HN support agreements. In the absence of HN support, solid waste should be incinerated as the preferred method of disposal. Alternatively, burial of waste is acceptable and will employ the characteristics of landfill operations. Trenches will be perpendicular to the prevailing winds, deep enough to contain the long-term waste stream expected and to execute a daily cover of not less than 6 inches of earth, with a final cover of not less than 30 inches. Any trench will be properly marked when closed.)*

(b) Human waste. Handle storage and disposal of human waste in a way that best supports the mission and is most protective of human health. This factor is a particularly significant in densely populated areas where basic public health services may be disrupted, and standard field sanitation procedures are inadequate. *(Existing sanitary latrines, sewers, and treatment plants should be used to the maximum extent possible. If such facilities have exceeded their capacity or do not exist, human waste will be disposed of according to the operation and the situation encountered. The preferred methods of disposal in order of precedence are sanitary wastewater disposal systems, portable latrines, and slit trenches. Expeditionary sewage collection and disposal will be sited and operated to minimize environmental impact according to unit field sanitation procedures. If possible, do not conduct open burning upwind of populated areas. As a minimum, all slit trenches will be covered with not less than 24 inches of earth fill [12 inches of compacted fill level to the ground surface, and 12 inches of mound fill] before departure from the site. A sign showing the date of closure and the words "Closed Latrine" will be posted at each closed site.)*

(c) Gray water. *(At locations that lack sewage treatment facilities, the preferred method of handling gray water will be by collection and proper disposal via wartime HN support. In the event these preferred options are not achievable during contingency operations or wartime, effluents from showers/ bathing facilities will be located downstream of water sources, both civilian and military. Most rivers in the Republic of Korea supply water to Korean populations, and gray water discharges into central waters are prohibited. Construction of temporary drainage facilities must ensure proper drainage of gray water runoff that precludes pooling. Measures will be taken to prevent creation of pest breeding sites.)*

(3) Medical waste. This section includes procedures and locations for storage and disposal of medical waste under normal and emergency conditions, as well as the responsibilities and procedures for approval of disposal methods. *(Disposal of medical waste will be according to guidelines established by the XX [US] Corps Surgeon. Should facilities be unavailable for permanent disposal, suitable temporary disposal should be accomplished through the use of a suitably labeled, segregated containment area. Wastes will be held in sealed containers or another appropriate manner that minimizes the release of biological contamination into the environment. A record will be made of the type, quantity, and location of the containment area. A copy of the report will be forwarded to the XX (US) Corps Staff Engineer Section and the Surgeon.)*

(4) HM/HW management.

**CLASSIFICATION**

**Figure B-1. Appendix 2 (Environmental Considerations) to Annex F (Engineer) (continued)**



**CLASSIFICATION**

(a) HW management. This section includes procedures and locations for the storage and disposal of HW under normal and emergency conditions, operations of the Defense Reutilization and Marketing Office (DRMO) or approved contractor facilities, and the recording of abandoned HW sites. *(HW will be collected, packaged, and transferred to the Defense Logistics Agency (DLA)/DRMO when feasible according to guidelines established by the XX [US] Corps G4.) (If the operational situation dictates abandonment of HM/HW, consolidate, contain, and record the location of the items, type of items, and any other information that will facilitate future recovery operations. Forward a copy of the report to both the XX [US] Corps Staff Engineer Section and G4.)*

(b) HM management. *(HMs will be stored, transported, and used according to established procedures and in a manner that precludes improper human or ecological exposure. To the extent practical, consolidation and reutilization will be applied to reduce the amount of HM expended and waste generated.)*

(c) Abandonment. *(If the operational situation dictates abandonment of hazardous material/waste; consolidate, contain, and record the location of the items, type of items, and any other information that will assist future recovery operations. Forward a copy of the report to both the XX [US] Corps Staff Engineer Section and G4.)*

(d) Spill prevention/control procedures. *(Commanders will maintain spill-prevention/control plans with battalion level spill response teams, according to the 54<sup>th</sup> MECH DIV SOP. Units will take immediate action to contain the spill, clean up the site to the limit of their capability, mark the site, and report the spill through their chain of command to the XX [US] Corps Staff Engineer Section, PAO, and G4. The spill report should be in basic ECR format [see Tab B] and at a minimum contain the location, type and quantity of contaminant[s], status of the clean up, and an estimate of additional resources required to complete the clean up.*

(5) Ecosystem protection. Protect special flora and fauna, wetlands, forests, and croplands, and seek approval for the clearing of large areas and approved methods and chemicals, if any, for clearing. *(The requirement to clear fields of fire [as well as limited clearance for health, safety, and troop welfare] may cause the destruction of ecosystems. Destruction and clearing of areas in excess of 100 acres requires the approval of Commander, XX [US] Corps.)*

(6) Air and noise emissions. Give special consideration to preventing air and noise emissions—normally confined to theater rear areas or to security, support, or humanitarian missions. *(Generators will be operated only in the reduced sound signature mode as defined in 54<sup>th</sup> MECH DIV SOP... Movement of tracked vehicles outside of designated assembly areas, from 0001-2400 on Sundays during this exercise, is prohibited without permission of Commander, XX [US] Corps.)*

(7) Archaeological and historical preservation. State the requirements to minimize damage to historical sites and buildings, monuments, and works of art. A separate overlay may be required. *(Operational activities that adversely impact on archaeological and historic sites and buildings are to be minimized. If damage occurs, a report of circumstances will be made through operational channels to XX [US] Corps Civil Affairs and the PAO.)*

b. Logistics. Address any necessary guidance for administering the environmental effort by the commander. Provide guidance for logistic support to environmental support and compliance.

(1) HM management. Specify unique control measures used in supply, storage, transportation, and retrograde to reduce and regulate the use of HM.

(2) Environmental considerations and services locations. Provide, when appropriate, the location of landfills, incinerators, HW collection facilities, water and wastewater treatment plants, watershed protection areas, ecologically-sensitive areas, contaminated areas, potentially dangerous industrial facilities, and other points of environmental sensitivity or interest to the command. Include cultural resources if not noted elsewhere.

**5. COMMAND AND SIGNAL.**

a. Command. Identify the executive agent for environmental functions in the command and command post (CP) location. Specify responsibilities and levels for issuing guidance and waivers.

b. Signal. List environmental reporting instructions not specified in unit SOPs; identify the required reports, formats, times and distribution lists.

NAME (AN APPENDIX MAY BE SIGNED BY THE COMMANDER OR THE PRIMARY STAFF OFFICER.)

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**CLASSIFICATION**

**Figure B-1. Appendix 2 (Environmental Considerations) to Annex F (Engineer) (continued)**

**CLASSIFICATION**

Tabs:

- A. Environmental Assessments
- B. Environmental Assessment Exemptions
- C. Environmental Baseline Survey
- D. Base Camp Closure Standards (TBP)
- E. Electronic Environmental Report Message Formats

**CLASSIFICATION**

**Figure B-1. Appendix 2 (Environmental Considerations) to Annex F (Engineer) (continued)**

**CLASSIFICATION**

**TAB A (ENVIRONMENTAL ASSESSMENTS) TO APPENDIX 2 (ENVIRONMENTAL CONSIDERATIONS) TO ANNEX F (ENGINEER) TO 54TH MECH DIV OPLAN 99-7 (U)**

**References:**

- a. DODD 6050.7, "Environmental Effects Abroad of Major Department of Defense Actions," 31 March 1979.
  - b. JSI 3820.01, "Environmental Engineering Effects of DOD Actions," 28 September 1993.
  - c. JP 4-04, "Joint Doctrine for Civil Engineer Support," 27 September 2001.
  - d. DODD 6050.16, "Policy for Establishing and Implementing Environmental Standards at Overseas Installations," 20 September 1991.
  - e. Applicable country-specific FGS.
  - f. DOD Publications 4715.5-G, *Overseas Environmental Baseline Guidance Document (OEBGD)*, 15 March 2000.
  - g. Civil Engineering Support Plan (CESP), in AOR.
1. Purpose. State the regulatory, statutory, troop protection, financial, or other reason for conducting an environmental assessment in conjunction with the supported operation.
  2. Background. State the purpose and concept of the operation and a brief explanation of the relationship of environmental assessments to the successful completion of the operational mission.
  3. Description of the Actions. State the types of assessments and the conditions under which actions are required. When "major actions" (defined in Reference A) are included in the operation, indicate whether an exemption applies (Tab B of this appendix). If no exemption is being invoked, state the type of assessment(s) to be prepared: EIS, ES, or ER (see Reference A). Indicate requirements for a facility EBS.
  4. Exemption or Exclusion. Describe the basis for exemption (Tab B of this appendix). Finally, determine and document the applicability to the operation. Seek approval from a higher authority according to Reference A if applicability is not clearly stated.
  5. Analysis of Options or Alternatives. If an ER, ES, or EIS is required, document the actions and alternatives that were considered in planning the supported operation to minimize environmental impact.
  6. Environmental Setting of the Operation. (This and the following paragraphs are useful for scoping/tiering analyses.) Describe or provide references for the description of the general environmental conditions of the operational area, including (a) vegetation, (b) climate, (c) wildlife, (d) archeological and historic sites, (e) water quality, and (f) air quality.
  7. Environmental Impact of the Operation. Describe the impact on the (a) topography, (b) vegetation, (c) water quality, (d) air quality, (e) ecosystem functioning, (f) archeological and historical sites, (g) wildlife, (h) socio-economic and political end state, (i) land use, (j) safety and public and occupational health, and (k) HM and HW use and disposal.

**CLASSIFICATION**

**Figure B-2. Tab A (Environmental Assessments) to Appendix 2 (Environmental Considerations) to Annex F (Engineer)**

**CLASSIFICATION**

8. Mitigation and Monitoring.

(a) Requirements. Describe actions and assign responsibilities for mitigation and monitoring of environmental impacts of the supported operation (see Reference C, Chapter II, paragraph 4).

(b) Compliance Responsibilities. State applicability and responsibility for implementation of the OEBGD or FGS during the post-hostilities phase. (See Reference D for assistance.)

**CLASSIFICATION**

**Figure B-2. Tab A (Environmental Assessments) to Appendix 2 (Environmental Considerations) to Annex F (Engineer) (continued)**

**CLASSIFICATION**

**TAB B (ENVIRONMENTAL ASSESSMENT EXEMPTIONS) TO APPENDIX 2 (ENVIRONMENTAL CONSIDERATIONS) TO ANNEX F (ENGINEER) TO 54TH MECH DIV OPLAN 99-7 (U)**

**References:**

- a. DODD 6050.7, "Environmental Effects Abroad of Major Department of Defense Actions," 31 March 1979.
- b. JSI 3820.01, "Environmental Engineering Effects of DOD Actions," 28 September 1993.

1. Purpose. State the basis for invoking or requesting an exclusion or exemption from environmental assessment, according to Reference A, for the supported operation.
2. Background. State facts identified in the planning process which support an exemption from the requirement of environmental analysis and documentation.
3. Discussion. Provide factual rationale for invoking an exemption. Assign responsibility for making exemption determination.
4. Determination. Identify and document the authority making the exemption determination.

**CLASSIFICATION**

**Figure B-3. Tab B (Environmental Assessment Exemptions) to Appendix 2 (Environmental Considerations) to Annex F (Engineer)**

**CLASSIFICATION**

**TAB C (ENVIRONMENTAL BASELINE SURVEYS [EBS]) TO APPENDIX 2 (ENVIRONMENTAL CONSIDERATIONS) TO ANNEX F (ENGINEER) TO 54TH MECH DIV OPLAN 99-7 (U)**

**References:**

- a. DODD 6050.7, "Environmental Effects Abroad of Major Department of Defense Actions," 31 March 1979.
- b. JSI 3820.01, "Environmental Engineering Effects of DOD Actions," 28 September 1993.

1. Purpose. The primary purpose of an EBS is to identify environmental, health, and safety conditions that pose a potential health threat to military personnel and civilians that occupy properties used by the US military in the Theatre of Operations (TO). The secondary purpose is to document environmental conditions at the initial occupancy of property to prevent the US from receiving unfounded claims for past environmental damages. All environmental considerations may be touched upon by an EBS. There is an important relationship to the EHSA performed at each site since it will go into much greater depth in the medical-related areas. The two documents are mutually supportive and should be done in conjunction with one another if that is possible.

2. EBS Requirement. State the requirement for performing an EBS, the time by which the initial EBS is to be completed, and responsibilities for conducting and reporting.

3. Applicability. Describe conditions under which the EBS is required or may be waived.

4. Description. EBSs are divided into initial and closure investigations. The initial investigation is designed to provide an initial overview of the property using real-time field sampling. The initial investigation is updated when there are indications of the potential for significant environmental or health hazard and involves a more comprehensive analysis designed to quantify an identified hazard. Comprehensive analysis requires more time when it uses more specialized equipment that may not be available to all survey teams. The closure EBS is a part of base-camp closure standards but is not limited to base camps (logistics areas, communications sites, airfields, staging areas). To effectively complete the closure report it is essential to reference the initial EBS (and update if applicable) and the log of periodic environmental conditions report(s) (ECRs) that have been completed on the particular site/area. The ECR is completed on a periodic basis to document conditions at the site/area as well as any time a potentially significant environmental event occurs. See Enclosure 2 of this tab for an example. This description identifies the protocol to be used in conducting both the initial and closure EBSs. This may include a checklist from a theater regulation or environmental compliance assessment or some other means of guidance. Also address the frequency of ECRs and what constitutes a "significant environmental event."

5. Support. List military or contractual support for conducting an EBS. This list may include training for unit officers, preventive medicine personnel, chemical reconnaissance platoons, Logistics Civil Augmentation Program (LOGCAP), and Corps of Engineers support. Remember that where possible it should be conducted in conjunction with and EHSA of the same site.

6. Reporting. Describe report formats, reporting chain, and disposition.

**Enclosures:**

- 1. Environmental Baseline Survey
- 2. Environmental Conditions Report
- 3. Maps, Photographs, and Digital Data

**CLASSIFICATION**

**Figure B-4. Tab C (Environmental Baseline Surveys) to Appendix 2 (Environmental Considerations) to Annex F (Engineer)**

**CLASSIFICATION**

**ENCLOSURE 1 (ENVIRONMENTAL BASELINE SURVEY [EBS]) TO TAB C (ENVIRONMENTAL BASELINE SURVEYS) TO APPENDIX 2 (ENVIRONMENTAL CONSIDERATIONS) TO ANNEX F (ENGINEER) TO 54TH MECH DIV OPLAN 99-7 (U)**

**References:**

- a. DODD 6050.7, "Environmental Effects Abroad of Major DOD Actions," 31 March 1979.
  - b. JSI 3820.01, "Environmental Engineering Effects of DOD Actions," 28 September 1993.
  - c. DODD 6050.16, Policy for Establishing and Implementing Environmental Standards at Overseas Installations" 20 September 1991, "
  - d. Other applicable environmental laws and regulations.
  - e. Command guidance references.
  - f. For a closure EBS, the initial EBS (and any applicable update) and any ECRs are also reference documents.
1. Site/Property Location. List the legal address and 6-digit military grid location or latitude and longitude.
2. General Site Setting. Note whether the site was visually observed or identified from interviews or record reviews. For an updated initial EBS or a closure EBS, the site should always be visually observed.
- a. The methodology used and limitations encountered during the initial (or updated) site reconnaissance or the closure inspection. Describe the method used to reconnoiter the property; for example, the use of grid patterns or other systematic approach. List and describe any limitations encountered during the reconnaissance such as physical obstructions, bodies of water, pavement, weather, or uncooperative occupants.
  - b. The current uses of the property. Be as specific as possible.
  - c. The past uses of the property. List all known past property uses. If a past use is likely to have involved the use, treatment, storage, disposal, or generation of HMs or petroleum products, include a detailed description or indicators of this use. A closure EBS includes information obtained from ECRs as well.
  - d. Current uses of adjoining properties. Be as specific as possible.
  - e. Past uses of adjoining properties. If a past use is likely to have indicated recognized adverse environmental conditions, include a detailed description.
  - f. Current or past uses of the surrounding areas: list general types of past uses; for example, residential, agricultural, or industrial. Limit surroundings to that which can be seen or would clearly affect the area, such as upstream on a waterway.
  - g. Geologic, hydrogeologic, hydrologic, or topographic conditions. List the conditions and give a general description of the topography in the area. If indicated, analyze the likelihood of contaminant migration on or to the property through the soil or groundwater from the adjacent properties or the surrounding areas.
  - h. General description of structures. List the buildings, and their locations, size, basic construction type, stories, and approximate age.
  - i. Roads. List all public thoroughfares adjoining the property and describe all roads, streets, parking areas, and walkways.

**CLASSIFICATION**

**Figure B-5. Enclosure 1 (Environmental Baseline Survey) to Tab C (Environmental Baseline Surveys) to Appendix 2 (Environmental Considerations) to Annex F (Engineer)**

**CLASSIFICATION**

- j. Water supply. List and differentiate all sources of potable and nonpotable water.
  - k. Sewage disposal system. Describe sewage disposal systems on the property and their general condition, and approximate age.
3. Interior and Exterior Observations. To the extent visually/physically observed or identified from interviews or record reviews (list actual source).
- a. HM and petroleum products. Describe uses and types of products used on the property, and the approximate amount and storage conditions. Indicate if treatment, storage, disposal, or generation occurred on the property.
  - b. Storage tanks. Describe size, location, condition, and approximate age of all above and below-ground storage tanks.
  - c. Odors. Describe any noticeable odors and their source.
  - d. Pools of liquid. Note all surface water and describe all pools or sumps that contain water or other liquids that may contain HM.
  - e. Drums. Describe all drums and their conditions. If they are known to contain no HM, list contents only.
  - f. Hazardous substances and petroleum products. Describe all products to include type, amount, and manner/condition of storage.
  - g. Unidentified substance containers. Describe any open or damaged containers suspected of containing HM or petroleum products.
  - h. PCBs. Include a description of electrical or hydraulic equipment likely to contain PCBs.
  - i. Interior observations of the following:
    - (1) Heating and cooling systems. Describe, to include the fuel source and amount on hand.
    - (2) Stains and corrosion. Describe stains on floors, walls, and ceilings.
    - (3) Drains and sumps. Describe floor drains and sumps.
  - j. Exterior observations of the following:
    - (1) Pits, ponds, and lagoons. Describe the pit, pond, or lagoon, especially if it may have been used for HW disposal or waste treatment. Include a discussion and description of any on adjacent or adjoining properties as well.
    - (2) Stained soil or pavement. Describe any stained soil or pavement.
    - (3) Stressed vegetation. Describe any stressed vegetation and probable cause.
    - (4) Solid waste. Describe any filled, graded, or mounded areas that would suggest the disposal of trash or solid waste.
    - (5) Wastewater. Describe every discharge of a liquid into a stream or ditch that is adjacent to the property.
    - (6) Wells. Locate and describe all wells (monitoring, potable, dry, irrigation, injection, abandoned, etc.) on the property.

**CLASSIFICATION**

**Figure B-5. Enclosure 1 (Environmental Baseline Survey) to Tab C (Environmental Baseline Surveys) to Appendix 2 (Environmental Considerations) to Annex F (Engineer) (continued)**



**CLASSIFICATION**

- (7) Septic systems. List indications or the existence of on-site septic systems or cesspools.
- (8) Ambient air quality. Smog, smoke, and odors from industrial facilities and many HW products can be detected easily. Terrain can also affect air quality. Mountains and canyons can cause temperature inversions, which impact air quality. Setting up base camps with heating units and vehicles in an area prone to temperature inversions can cause poor air quality. Prevailing winds should also be considered.
- (9) Unexploded ordnance. Identify and ensure clearance before occupation.
- 4. Deletions and Deviations. Describe all deviations or deletions from the protocol (checklist) used or the environmental standards currently in use by the command. Discuss each one individually and in detail.
- 5. Findings and Conclusions Statement. List the protocol used for the survey, exceptions to the protocol, and any evidence of recognized adverse environmental conditions.
- 6. Qualification Statement. List the qualifications and duty position(s) of the individual(s) preparing the EBS.

**CLASSIFICATION**

**Figure B-5. Enclosure 1 (Environmental Baseline Survey) to Tab C (Environmental Baseline Surveys) to Appendix 2 (Environmental Considerations) to Annex F (Engineer) (continued)**

**CLASSIFICATION**

**ENCLOSURE 2 (ENVIRONMENTAL CONDITIONS REPORT [ECR]) TO TAB C (ENVIRONMENTAL BASELINE SURVEYS) TO APPENDIX 2 (ENVIRONMENTAL CONSIDERATIONS) TO ANNEX F (ENGINEER) TO 54TH MECH DIV OPLAN 99-7 (U)**

**References:**

- a. DODD 6050.7, "Environmental Effects Abroad of Major Department of Defense Actions," 31 March 1979.
- b. JSI 3820.01, "Environmental Engineering Effects of DOD Actions," 28 September 1993.
- c. DODD 6050.16, "Policy for Establishing and Implementing Environmental Standards at Overseas Installations," 20 September 1991.
- d. Other applicable environmental laws and regulations, OPORD, and unit SOP.
- e. Site specific EBS (if applicable).
- f. Electronic Environmental Message Formats in Tab E.

1. Site/Incident Location. List the legal address and 6-digit military grid location or latitude and longitude of the incident location or reference the applicable EBS to link the ECR to a given site. Refer to the electronic environmental message formats at Tab E. (The ECR functions as a situation report [SITREP], or interim report, for a given site. The frequency of ECR reports is a higher headquarters' decision but supports the need to document the condition of a given site over time [interim snapshots], as well as helping to ensure that an appropriate environmental focus is being maintained at a given site. The basic format of the ECR may also be used when reporting an incident, such as a POL spill, not related to a given EBS or site location.)

2. Site/Incident Description and Background. Give a brief description of the site (installation), including its related EBS/historical use(s) or the circumstances surrounding the incident. For an incident at a location not covered by an EBS, it is critical to provide the same sort of information contained in a standard accident report.

3. Map/Description of the Incident Location. If the ECR is related to a site covered by an EBS, this entry is able to relate to the information already provided in the EBS (a baseline document). If the ECR defines a location where an incident has occurred that is not covered by an EBS, the description needs to be adequate to direct a follow-on element to the site. In this respect, it is similar to the graves-registration report if the incident occurs during a tactical operation where time precludes remaining at the site.

4. Summary of Environmental Conditions. List the environmental event(s) at the site/location. All spills should be inventoried. If the ECR is a periodic report for a given site, significant events, such as major spills, should have been reported using the basic ECR format. In this case, simply reference any significant incident report ECRs that may have occurred at the given site over the time frame that the periodic ECR covers. Also provide a "snapshot" report of the types of HM/HW that are stored at the site. Describe minor spills and other events that have occurred over the time frame in question in basic terms, including quantities and the method(s) used to clean the site.

Example: Four gallons of waste oil spilled at the hazardous waste accumulation site (HWAS) located northwest of the maintenance building (shown on map) at 1600 hours on 16 December 2000. The 22nd Military Police Battalion (MP Bn) contained the spill with assistance by White & Jones, by 1725 hours. About 3 cubic yards of contaminated soil was taken to the White & Jones HW disposal area in Juvonia.

Example: Raw sewage ran from a pump house behind the main warehouse (shown on map) for an estimated 3 days during the initial stages of occupying the camp in early June 2000. The problem was identified on 13 June and corrected when the pump was repaired on 14 June.

**CLASSIFICATION**

**Figure B-6. Enclosure 2 (Environmental Conditions Report) to Tab C (Environmental Baseline Surveys) to Appendix 2 (Environmental Considerations) to Annex F (Engineer)**

**CLASSIFICATION**

Example: A fuel tanker overturned at the road intersection vicinity NV 123456 (see map) at 092000 November 2000 during the road march to Bigtown. Immediate mitigation included spill containment by the employment of all available spill kits with the unit. Higher HQ was immediately notified. An estimated 4000 gallons of jet petroleum (JP)-8 spilled at that site. The vehicle has been righted, and excavation of the site will begin at first light, 10 November.

5. Interior and Exterior Observations. These entries should be viewed as an abbreviated version of the information that would be found in an EBS. Items should only be addressed if they differ from the last ECR or vary from the initial EBS.

6. Findings and Determinations with Qualification Statement. A statement similar to the following should appear in this paragraph of the ECR:

According to \_\_\_\_\_ Reg \_\_\_\_\_, I have considered whether or not significant environmental impacts will occur as a result of turnover/return of this site (base camp, logistics area) and have determined that (include one of the following statements):

a. Turnover of this base camp area will not result in environmental impacts significant enough to warrant additional environmental analysis.

**OR**

b. Turnover of this base camp area will result in environmental impacts significant enough to warrant additional environmental analysis. Environmental actions or projects must continue after transfer of the base camp area because of substantial (imminent) threat to human health or safety. The impacts of concern are (list impacts):

(If the report is due to an incident not connected to a specific site/installation, this paragraph is an assessment by the commander/individual on the scene.)

John Q. Jones  
MAJ, QM  
Mayor, Camp Swampy

**CLASSIFICATION**

**Figure B-6. Enclosure 2 (Environmental Conditions Report) to Tab C (Environmental Baseline Surveys) to Appendix 2 (Environmental Considerations) to Annex F (Engineer) (continued)**

**CLASSIFICATION**

**TAB E (ELECTRONIC ENVIRONMENTAL MESSAGE FORMATS) TO APPENDIX 2 (ENVIRONMENTAL CONSIDERATIONS) TO ANNEX F (ENGINEER) TO 54TH MECH DIV OPLAN 99-7 (U)**

**References:** FM 101-5-2, "US Army Reports and Message Formats," 29 June 1999.

1. ( ) ECR Format.

TITLE: ENVIRONMENTAL CONDITION REPORT (ECR)  
 REPORT NUMBER: E035

GENERAL INSTRUCTIONS: Used to send periodic information (interim snapshots) of the environmental status of specific sites (assembly areas, base camps, logistical support areas, and medical facilities) where hazards are likely to occur and can result in significant, immediate and/or long-term effects on the natural environment and/or health of friendly forces and noncombatants. Sent in accordance with unit SOP and commander's direction.

LINE 1—DATE AND TIME \_\_\_\_\_ (Date-time Group [DTG])

LINE 2—UNIT \_\_\_\_\_ (Unit making report)

LINE 3—LOCATION \_\_\_\_\_ (universal traverse mercator [UTM] or six-digit grid coordinate with MGRS grid zone designator of site/incident)

LINE 4—DESCRIPTION \_\_\_\_\_ (Description of site/incident)

LINE 5—CHANGES \_\_\_\_\_ (Changes from last ECR or EBS)

LINE 6—HAZARDS \_\_\_\_\_ (Hazards to natural environment, friendly forces, and/or civilian personnel)

LINE 7—ACTIONS \_\_\_\_\_ (Summary of actions to minimize hazards/remedial effects)

LINE 8—UNIT POC \_\_\_\_\_ (Reporting unit point of contact)

LINE 9—ASSISTANCE \_\_\_\_\_ (Assistance required/requested)

LINE 10—REFERENCE \_\_\_\_\_ (Site specific EBS, if required)

LINE 11—NARRATIVE \_\_\_\_\_ (Free text for additional information required for clarification of report)

LINE 12—AUTHENTICATION \_\_\_\_\_ (Report authentication)

**CLASSIFICATION**

**Figure B-7. Tab E (Electronic Environmental Message Formats) to Appendix 2 (Environmental Considerations) to Annex F (Engineer)**

<b>CLASSIFICATION</b>	
2. ( ) <u>Electronic Spill Report Message Format.</u>	
TITLE: SPILL REPORT (SPILLREP) REPORT NUMBER: S055	
GENERAL INSTRUCTIONS: Used to send timely information or status of an oil, hazardous material, or hazardous waste spill that could have immediate environmental and/or health effects. Sent in accordance with SOP and commander's direction. <b>NOTE:</b> Spill reporting and reportable quantities are mandated by federal and local law.	
LINE 1—DATE AND TIME _____	(DTG)
LINE 2—UNIT _____	(Unit making report)
LINE 3—DATE/TIME _____	(DTG of spill discovery)
LINE 4—MATERIAL _____	(Material spilled)
LINE 5—QUANTITY _____	(Quantity of spilled material)
LINE 6—LOCATION _____	(UTM or six-digit grid coordinate with MGRS grid zone designator of spill)
LINE 7—CAUSE _____	(Cause and supervising unit)
LINE 8—SIZE _____	(Size of affected area)
LINE 9—DAMAGE _____	(Damage to the natural environment, if required)
LINE 10—HAZARDS _____	(Hazards to natural environment, friendly forces, and/or civilian personnel)
LINE 11—ACTIONS _____	(Summary of actions taken)
LINE 12—UNIT POC _____	(Supervising unit POC)
LINE 13—ASSISTANCE _____	(Assistance required/requested)
LINE 14—NARRATIVE _____	(Free text for additional information required for clarification of report)
LINE 15—AUTHENTICATION _____	(Report authentication)
<b>CLASSIFICATION</b>	

**Figure B-7. Tab E (Electronic Environmental Message Formats) to Appendix 2 (Environmental Considerations) to Annex F (Engineer) (continued)**

## **Appendix C**

### **Staff Roles and Environmental Responsibilities**

This appendix provides factors to consider during the performance of mission analysis. The list is not all-inclusive, but should be helpful in sensitizing personnel on their roles and responsibilities.

Commanders, staffs, subordinate leaders, and service members must understand their individual duties and responsibilities for environmental protection and become environmental stewards. They must also have an understanding for the relationship of all environmental considerations and which staff officers are focused on, or involved with those areas. To practice stewardship, US military personnel must understand the basic environmental management responsibilities that apply to their work area or assigned duties. They must also understand what their roles and responsibilities are with respect to incorporating environmental considerations into mission analysis for the planning of operations (See Chapter 3). This includes not only the specific planning process for those missions, but also the integration of environmental considerations during and in support of all of the training (See Chapter 4) that their unit undertakes.

#### **UNIT RESPONSIBILITIES**

C-1. Installation regulations or operational directives, such as OPLANs, OPORDs, or CONPLANs, generally define a unit's environmental program. (See Appendix B for an example of the Environmental Considerations Appendix to an Army plan). SOPs usually establish a unit's environmental plan. (See TC 3-34.501 for an example SOP). These documents integrate installation and operational requirements into daily routines. Unit-level environmental management always includes guidance for commanders, staffs, subordinate leaders, and service members.

#### **COMMANDERS**

C-2. The commander's role in environmental stewardship centers on instilling an environmental ethic in their service members and civilians under their control. Commanders train their subordinate leaders on stewardship, counsel them on doing what is right, lead by example, and enforce compliance with laws, regulations, and command guidance.

C-3. Commanders will meet with key installation environmental personnel to obtain information on and assistance with environmental protection issues to include setting up a unit program. Commanders should also turn to these personnel for detailed guidance on regulatory compliance, environmental

assessments, and to review environmental problems common to other commanders on the installation or in the unit.

C-4. The primary point of contact should be located at the installation's environmental office. This office is normally part of the DPW at Army installations, the facilities or base engineer office on Marine Corps installations, or the State Area Command (STARC) for the National Guard. **Navy and Air Force...**

C-5. The DOL (Army) or the G-4 (Marine Corps), the safety office, and the supporting DRMO may also provide commanders with environmental information.

C-6. When deployed, commanders will often deal with the phenomenon known as the base camp. Base camps, while not installations, are comparable to small towns and require many of the considerations applied to installations. A military mayor assists the base camp commander with control of base operations. A BCCA will provide expertise and support to the commander, largely through its subordinate BCAT. Environmental expertise is resident or aligned with this team and available to support the base camp commander and the designated mayor of the base camp, provide technical recommendations, and maintain appropriate standards. More information about this phenomenon is provided in the CALL Newsletter 99-9, *Integrating Military Environmental Protection*. **(Many other examples as well)**

C-7. AR 200-1, TC 3-34.501, OPNAVINST 5090.01B **Air Force (XXXXXXXXXXXXXXXX)**, MCO P5090.2A, and the *Commander's Guide to Environmental Compliance and Protection* specify commanders' environmental responsibilities. To carry out these responsibilities, commanders do the following:

- Comply with an installation's environmental policies and legally applicable and appropriate federal, state, and local laws and regulations or country-specific FGS if OCONUS.
- Comply with the guidance in Annex L, *Environmental Considerations* (or Appendix 2 to Annex F for Army OPLANS/OPORDS) for operations, especially in those areas where FGS are non-existent, or there is in effect no HN government.
- Demonstrate a positive and proactive commitment to environmental stewardship and protection.
- Provide environmental training required by law, regulation, or command policy.
- Ensure that all personnel can perform their duties in compliance with environmental laws and regulations, and can respond properly to emergencies.
- Promote proactive environmental measures and pollution prevention.
- Supervise compliance with environmental laws and regulations during operational, training, and administrative activities.
- Include environmental considerations in mission planning, briefings, meetings, execution, and AARs.
- Understand the requirements of service environmental programs.

- Identify and assess the environmental risks of proposed programs and activities. See FMs 3-100.12 and 100-14.
- Coordinate unit activities with higher HQs' environmental elements.
- Ensure that SOPs contain all environmental considerations and regulatory requirements appropriate for the level of command. (See TC 3-34.501 for Army battalion and company level units.)
- Conduct environmental self-assessment or internal environmental compliance assessments.
- Understand the linkages between environmental considerations and their associated impact on safety and force health protection.
- Understand the linkages between environmental considerations and their civil-military considerations.

## UNIT STAFFS

C-8. Whether developing the staff estimate, protection levels, or the necessary preparatory information for the EBS, environmental considerations require active participation from multiple staff members. Environmental factors may affect or influence a wide range of activities or require a significant expenditure of resources. Considering the environmental effects of training, operations, and logistics activities in planning reduces environmental damage and costs. Commanders, staffs, subordinate leaders, and service members must understand their individual duties and responsibilities for environmental protection and become environmental stewards as a part of their role in all environmental considerations. They must also understand the linkages between environmental considerations and their associated impact on safety, force health protection, and even geopolitical and legal issues.

C-9. Unit staffs have inherent responsibilities within their areas of expertise that require environmental actions. Unit SOPs at battalion and company levels (and perhaps higher levels as well) incorporate specific responsibilities. Of particular importance at the unit level is the Army environmental officer, the Marine Corps military occupational specialties (MOS) 9631 and 9954, the Navy's focused Watchstation positions, and the **Air Force ...**.

C-10. The unit staff also integrates environmental considerations into planning, training, and execution of OPLANs/OPORDs. While the engineer is the staff proponent for environmental considerations, all staff sections have the requirement to integrate appropriate environmental considerations into planning, training, and operations. Many staff officers have critical roles to play in this integration in addition to the engineer. Additional staff officer environmental integration responsibilities include the following:

### CHIEF OF STAFF (COFS), EXECUTIVE OFFICER (XO)

C-11. As the commander's principal staff officer, the Chief of Staff (CofS) directs staff tasks, conducts staff coordination, and ensures efficient and prompt staff response. The CofS is responsible for supervising the staff's integration of risk management for all planning and the execution of



operations. As a supervisor, the CofS ensures all staff members analyze and assess the operational effects of environmental considerations and their status as the J3/G3/S3 integrates environmental planning and execution into operations in the same general fashion as safety is integrated.

## **COORDINATING STAFF**

C-12. Military services historically integrate planning factors into multiple staff agencies to ensure operational coordination. With environmental considerations, as with the protection of noncombatants, the command is best served when the functional staff includes them in planning and execution. Coordinating staff officers each have specific environmental protection responsibilities derived from common staff duties, specific responsibilities of the position as derived from (or described in) JP 5-00.2 and FM 6-0, and the generic coordinating responsibilities of special staff officers. The following are the principal environmental responsibilities of coordinating staff officers:

### **ASSISTANT CHIEF OF STAFF, J1/G1/S1, PERSONNEL**

C-13. As the principal staff officer for all matters concerning human resources and personnel, the J1/G1/S1 ensures that the command has the requisite expertise to fulfill environmental requirements. Depending on the level of the command, experts may include both military and civilian personnel. As the coordinating staff officer for the surgeon, the SJA, and the public affairs officer (PAO), the J1/G1/S1 coordinates environmental issues between them and across the staff.

### **ASSISTANT CHIEF OF STAFF, J2/G2/S2, INTELLIGENCE**

C-14. As the staff officer responsible for conducting IPB and defining and characterizing the AO, the J2/G2/S2 is responsible for incorporating significant environmental factors and integrating intelligence requirements associated with environmental considerations. These environmental factors are generally provided by the engineer coordinator (ENCOORD), the Surgeon, the SJA, the J4/G4/S4, and other staff elements. Environmental considerations will generate IR and some of those (to include intelligence on base camp locations) may even become PIR during the planning process to ensure service members are not placed in hazardous sites.

### **ASSISTANT CHIEF OF STAFF, J3/G3/S3, OPERATIONS**

C-15. The J3/G3/S3 is the principal staff officer for all matters concerning training, operations, and plans. It is the J3/G3/S3's responsibility to ensure that any significant collateral environmental damage caused by command directed operations is understood and approved by the commander during the decision-making process. Geopolitical concerns that include architectural and cultural issues; and force health protection issues, must be integrated into OPLANS/OPORDS/CONPLANS.

C-16. The J3/G3/S3 establishes and supervises the command training programs. These programs include environmental skill and awareness training that support the unit mission. He also ensures that the unit protects and maintains training areas. As the overall ground manager and planner of

troop movements, bivouacking, and quartering, the J3/G3/S3 understands and considers environmental vulnerabilities and the associated force health protection during operations. Placement of base camps and other such sites is of critical concern to the J3/G3/S3 and environmental considerations are as important as the considerations of force protection.

C-17. The J3/G3/S3 may assign special missions to tactical units to secure and safeguard critical environmental resources, such as wastewater treatment plants in urban areas; or cultural locations such as museums/sacred sites. When appropriate, the J3/G3/S3 prepares counterterrorism and security plans to combat possible environmental sabotage. The J3/G3/S3 exercises coordination staff responsibility over the ENCOORD (if it is not a separate staff element), the leading/integrating special staff officer for environmental considerations, to include preparing for and implementing the necessary EBS for each base camp or similar site.

#### **ASSISTANT CHIEF OF STAFF, J4/G4/S4, LOGISTICS**

C-18. As the principal staff officer for coordinating the logistic integration of supply, maintenance, and services for the command, the J4/G4/S4 oversees many functions with a potential for generating HW. The J4/G4/S4 establishes procedures for reducing and controlling HM. He recommends command policies for solid waste and HM/HW disposal. The J4/G4/S4 is responsible for all aspects of HAZMATs and regulated (hazardous) waste management to include minimizing use, storage, transportation, disposition, and return to home station of excess materials. He also recommends command policies for pollution prevention and, in coordination with the J3/G3/S3, oversees the preparation of spill prevention and response plans. The J4/G4/S4 coordinates the SJA and other appropriate staff officers to ensure that current environmental considerations (such as water or soil contamination), epidemiological surveys, and disease risk assessments have been completed, are sustained, and comply with legal requirements. He ensures that the data has been recorded for future review and potential remediation consideration.

C-19. In the exercise of staff planning and supervision of food, bath, and laundry services, the J4/G4/S4 ensures that the staff exercises and implements appropriate controls over wastes and effluents. The J4/G4/S4 is responsible for constructing facilities and installations (in conjunction with the engineer) and for controlling real property, upon occupation and redeployment.

C-20. The J4/G4/S4 coordinates property disposal actions such as disposal of HM and HW (to include medical waste). The J4/G4/S4's office tracks disposal actions on the unit's document register, prepares appropriate turn-in documentation, and maintains turn-in receipts. To perform these actions, the J4/G4/S4 coordinates with appropriate DOD activities—DRMO, DLA; or through the use of contractors as appropriate. The J4 coordinates closely with the SJA in negotiating transit agreements and establishing procedures for the turn-in of regulated (hazardous) wastes for proper treatment and disposal.

C-21. The J4/G4/S4 coordinates property disposal actions such as disposal of HM and HW (to include medical waste). The J4/G4/S4's office tracks disposal

actions on the unit's document register, prepares appropriate turn-in documentation, and maintains turn-in receipts. To perform these actions, the J4 coordinates with appropriate DOD activities—DRMO, DLA; or through the use of contractors as appropriate.

C-22. In some organizations without an engineer staff officer, the S4 may also be responsible for performing the role of staff integration for environmental considerations that would otherwise be performed by the engineer on the staff. This is particularly true for many of the Marine Corps echelons of command.

### **ASSISTANT CHIEF OF STAFF, J5/G5/S5, CIVIL-MILITARY OPERATIONS**

C-23. As the principal staff officer for all matters concerning civil affairs, the J5/G5/S5 is familiar with the relationships between the local populace and their environment. While not always present as a separate staff member in lower echelon units, the functions associated with civil-military operations will still need to be performed. These relationships include elements of the underlying causes of the conflict, threats to public health, cultural sites and issues, and critical vulnerabilities to disruption of environmental services such as clean water or useable croplands. Civil affairs expertise will generally be available at the higher echelons to assist the J5/G5/S5 and other staff sections in accomplishing environmental responsibilities.

C-24. In conjunction with the SJA, the J5/G5/S5 advises the commander on his legal obligations concerning the local populace. In many areas of the world, these obligations include protecting critical environmental resources. He is responsible (along with the SJA) for being familiar with local environmental laws, especially in overseas deployment areas. The J5/G5/S5 may also supervise civil affairs units assisting local governments with environmental protection services. He also serves as the focus of coordination for HN support and indigenous labor and coordinates with the SJA on civilian claims against the US government for environmental damage.

### **SPECIAL STAFF**

C-25. Special staff officers have functional environmental responsibilities. The following are the key special staff officers with environmental protection expertise and responsibilities:

#### **SURGEON**

C-26. The surgeon advises the commander and the staff on regional health matters and services (e.g., preventive medicine and occupational health) to the joint force. Priorities include water vulnerability assessment support, sanitation, waste disposal (e.g., hazardous and infectious waste), health risk assessment, environmental health sampling and surveillance, and vector control to protect human health and welfare within the commander's AO. He advises on the effects of the health threat, including environmental, endemic, and epidemic diseases. The surgeon also has direct access to environmental, preventive medicine, and public health services. He provides health risk assessment guidance (e.g., base camp site selection) to support the commander's risk management decision-making process. The surgeon relates

the effects of environmental hazards to the environmental health of service members.

C-27. In more demanding situations, he can rely on the capabilities of the Army Medical Laboratory (AML), the US Army Center for Health Promotion and Preventive Medicine (USACHPPM), the Navy Environmental Health Center (NEHC), and the Air Force Force Institute for Operational Health (AFIOH) to assist him in providing recommendations to the commander. He can reach back to draw on the resources of the Armed Forces Medical Intelligence Center (AFMIC) for updated medical intelligence about a particular AO. The commander and the unit staff may call on the surgeon to assist in determining the public health implications of damage to critical environmental resources. The surgeon is responsible for planning and ensuring the implementation of EHSAs (see Appendix E), whenever possible, in conjunction with EBSs (see Appendix D), of base camps and similar sites.

### **CHEMICAL OFFICER**

C-28. The CHEMO is the special staff officer responsible for the use of and requirement for chemical assets, NBC defense, and smoke operations. A chemical officer is at every echelon of command. The CHEMO integrates chemical reconnaissance assets to assist in performing site assessments. In conjunction with the surgeon, the CHEMO advises the commander on possible hazards (such as low-level radiation and toxic industrial material) and their effects on personnel and equipment.

### **ENGINEER COORDINATOR**

C-29. The ENCOORD is the special staff officer for coordinating engineer assets and operations for the command. As the senior engineer officer in the force, the ENCOORD advises the commander and staff (in conjunction with the SJA, Surgeon, and others) on environmental issues. Working with other staff officers he determines the impact of operations on the environment, the corresponding effect of the environment on service members, and integrates environmental considerations into the decision-making process. The ENCOORD functions as the chairman of the JEMB and is the integrator for the writing/publishing of Annex L (Appendix 2 to Annex F for Army orders). For additional information, refer to Annex L, Environmental Considerations, to CJCSM 3122.03A; and Appendix B of this manual for Army orders. Although the JEMB is often identified as a temporary board, it may be wise to create it early to support mission analysis and the planning process. It may also be necessary/desirable to maintain it on a permanent basis to support sustaining operations. The JEMB can be used to assist the commander with environmentally-related risk management.

C-30. The ENCOORD works with primarily the J4/G4/S4 and the Surgeon in performing site assessments for installations, facilities, base camps, and other sites. He and the SJA advise the commander on the necessity for environmental assessments to meet HN, EO 12114, or OPORD/OPLAN requirements. The accomplishment of all EBSs is coordinated through the ENCOORD and coordination is made with the Surgeon to synchronize the performance of an EHSAs to support each EBA at the time it is completed.

The ENCOORD is also responsible for advising the J2/G2/S2 on significant environmental factors and ensuring these impacts are integrated into the IPB process. As a member of the targeting cell, the ENCOORD integrates considerations into the process of target nomination incorporating legal/civil affairs expertise as appropriate. Coordination for geospatial products and potential EOD support for the clearing of base camps (or other locations) is done through the ENCOORD. For additional information see JPs 2-03, 3-34, 4-04; FMs 3-34, 3-34.230, 3-34.250 (Draft); NWP 4-04.2, and AFDD 2-4.4.

### **TRANSPORTATION OFFICER**

C-31. The transportation officer plans and supervises administrative movements. When these movements contain HM or HW, he ensures that unit personnel follow applicable laws and regulations. These requirements include: manifesting cargo, inspecting loads, segregating loads, marking vehicles, and arranging for hazardous cargo routes (as necessary).

### **MAINTENANCE OFFICER**

C-32. The maintenance officer plans and supervises maintenance and repair activities. In many instances, these activities use significant quantities of HM and generate HW. The maintenance officer ensures safe use, storage, and disposal of these materials, that often includes operating temporary storage areas for products such as used oils, contaminated fuels, paint residues, spill cleanup residues, and solvents. Since maintenance personnel work with hazardous chemicals, the maintenance officer must ensure that all personnel comply with hazardous communications (HAZCOM) requirements.

### **PERSONAL STAFF**

C-33. Some staffs have personal officers who work under the immediate control of the commander and therefore have direct access to him. The commander establishes guidelines or gives specific guidance to the personal staff officer who informs, or coordinates with, the chief of staff or other members of the staff.

### **STAFF JUDGE ADVOCATE (LEGAL ADVISOR)**

C-34. The SJA advises the commander and the staff on legal matters, including legal advice relating to environmental laws, regulations, treaties, and relevant international conventions. He also interprets existing SOFAs and may assist in the drafting of new SOFAs. The SJA provides legal advice on environmental assessment requirements and is the proper office to receive and process civilian claims resulting from environmental damage. He provides legal advice to the commander on how to deal with cultural/architectural issues. The SJA assists other members of the joint force staff (e.g., J4) and defense agencies in negotiating transit agreements in advance of the actual deployment, to permit the transit of regulated (hazardous) wastes to effect their disposal in an environmentally sound manner. He provides legal advice on EBS requirements. The SJA should participate in the development of any EBS exemptions as they may apply. He helps other staff officers to understand the legal aspects involved in their respective specialties and areas of responsibility.

## **PUBLIC AFFAIRS OFFICER**

C-35. Public perceptions of environmental threats may be more significant to mission accomplishment than the threat itself. In this role, the PAO coordinates with J5/G5/S5 and civil affairs personnel to ensure all cultural environmental considerations have been taken into account by the commander. The PAO advises the commander and staff on methods of conveying information to and responding to information from the public. When deployed overseas, the PAO coordinates with appropriate staff and commanders to plan and execute public relations efforts in support of mission objectives. In the continental United States (CONUS), various environmental laws require public involvement. The PAO identifies and prepares plans for meeting these requirements. The joint force public affairs officer (PAO) coordinates with appropriate staff and commanders to plan and accomplish public relations efforts in support of mission objectives. Special attention should be given to potentially sensitive environmental issues associated with a joint operation. The joint force PAO will be a significant participant in public outreach efforts. The joint force PAO should participate in development of and be aware of assigned responsibilities in environmental related contingency plans. For additional information on other joint force PAO responsibilities, refer to JP 3-61, *Doctrine for Public Affairs in Joint Operations*.

## **ADDITIONAL OR SPECIALIZED DUTIES**

### **ENVIRONMENTAL OFFICER (ARMY)**

C-36. The key to fulfilling environmental requirements successfully at the lower unit level is the environmental officer. AR 200-1 directs all Army unit commanders to “appoint and train environmental officers at appropriate levels to ensure compliance actions take place.” In units where there is a staff officer with similar responsibilities, he will usually be given this additional duty. In company-sized units, this duty will generally translate into an extra duty. The environmental officer manages environmental issues within the unit level and ensures environmental compliance. He also coordinates through the respective chain of command with the supporting installation environmental staff and those staff sections of higher echelon operational headquarters to clarify requirements and obtain assistance. See TC 3-34.510 for more specifics on the duties of the environmental officer.

C-37. The environmental officer accomplishes environmental compliance requirements on behalf of the commander. He also coordinates with supporting installation environmental staff and those staff sections responsible for specific environmental areas of concern of in higher echelon operational headquarters to clarify requirements and obtain assistance. While this position of responsibility is not a formal staff position, the environmental officer is critical to the commander’s environmental program. The environmental officer does the following:

- Advises the unit on environmental compliance during training, operations, and logistics functions.
- Serves as the commander's eyes and ears for environmental matters.

- Coordinates between the unit and higher/installation headquarters' environmental staffs.
- Manages information concerning the unit's environmental training and certification requirements.
- Performs unit environmental self-assessment inspections.
- Performs environmental risk assessments.

#### **ENVIRONMENTAL ENGINEER/MANAGEMENT OFFICER (MARINE MOS 9631)**

C-38. The 9631 MOS is assigned duties at many of the Corps' major installations and major subordinate commands (MSCs). As a trained environmental professional, the 9631 provides linkage between commanding generals/officers and the civilian regulatory community. The 9631 can be a valuable asset in planning operations and exercises by providing an environmental perspective while maintaining mission awareness. He is generally not found below the Marine Expeditionary Force (MEF) operational echelon of command.

#### **HM/HW MARINE (MOS 9954)**

C-39. The HM/HW Marine is the Marine Corps equivalent of the Army environmental officer. Marines holding the MOS 9954 provide unit-level expertise regarding the safe use of HMs and the environmentally compliant disposal of HW. Unit TOs reflect the MOS as a "required additional" for designated line numbers. These Marines have received formal training that meets federal requirements for HW handlers and have the following general responsibilities:

- Coordinating and conducting unit-level environmental awareness training in concert with the installation comprehensive environmental training and education (CETEP) coordinator.
- Ensuring unit compliance with all applicable federal, state, and local laws and regulations regarding HM/HW.
- Providing a link between unit commanders and installation-level environmental staff.
- Providing advice to unit commanders regarding HM/HW.

C-40. Specific duties and a broader definition for Marine Corps MOSs are fully outlined in the current version of MCO P1200.7Y, *MOS Manual*.

#### **AFLOAT ENVIRONMENTAL PROTECTION COORDINATOR (NAVY)**

C-41. The afloat environmental protection coordinator completes Watchstation 304 in the HM/Environmental Protection Programs Afloat Personnel Qualifications Standards (PQS) within 6 months of assignment. One petty officer per firefighting or repair party will also be qualified as Watchstation 303 – HM Spill Response Scene Leader. One petty officer will also qualify as Watchstation 305 – Oil/Hazardous Spill Response Scene Leader. On submarines, type commanders specify how many personnel are required to ensure appropriately qualified individuals are present at the scene of any HM or oil spill. On Military Sealift Command (MSC) ships, the

Commander MSC will specify the AEPC requirements. For more information see OPNAVINST 5090.1B.

## ENVIRONMENTAL XXXXX (AIR FORCE)

C-42. The Air Force...

## SUBORDINATE LEADERS

C-43. The role of leaders in environmental stewardship and other areas of environmental considerations centers on building an environmental ethic in their service members by training and counseling subordinates on environmental stewardship, leading by example, and enforcing compliance with laws and regulations. Leaders do the following:

- Communicate the environmental ethic to service members while training them to be good environmental stewards.
- Develop and sustain a positive and proactive commitment to environmental protection.
- Identify environmental risks associated with individual, collective, and METL task performance. (See Chapter 4.)
- Plan and conduct environmentally sustainable actions and training.
- Protect the environment during training and other activities.
- Analyze the influence of environmental considerations on mission accomplishment.
- Integrate environmental considerations into unit activities.
- Train peers and subordinates to identify the environmental effects of plans, actions, and missions.
- Counsel service members on the importance of protecting the environment and the possible consequences of not complying with environmental laws and regulations.
- Ensure that service members are familiar with the unit SOPs, and supervise their compliance with laws and regulations.
- Incorporate environmental considerations into AARs.
- Understand the linkages between environmental considerations and their associated impact on safety and force health protection.
- Understand the linkages between environmental considerations and their associated impact on civil considerations.

## SERVICE MEMBERS

C-44. Service members have the inherent professional and personal responsibility to understand and support their service's environmental program. They must do the following:

- Comply with environmental requirements in unit and installation SOPs.
- Maintain environmental awareness throughout daily activities.



- Provide recommendations to the chain of command on techniques to ensure compliance with environmental regulatory requirements and other environmental considerations.
- Identify the environmental risks (to the environment and from the environment) associated with individual and team tasks.
- Support recycling programs.
- Report HM and HW spills immediately.
- Make sound environmental decisions based on guidance from the chain of command, training, and personal concepts of right and wrong.

## Appendix D

# Environmental Baseline Surveys in Operations

*If you can figure out the criteria for base camp selection...you've done something the Army (all services) can use.*

LTG Robert B. Flowers, Chief of Engineers

The EBS is a multi-discipline site survey. It is conducted during the initial stage of any service or joint operational deployment as an initial EBS, and as a close-out EBS when a site is returned to the HN, or when joint forces depart the site. The initial EBS documents existing deployment area environmental conditions (to include cultural), determines the likelihood for present and past site contamination (e.g., hazardous substances, petroleum products, and derivatives), and identifies potential vulnerabilities (to include occupational and environmental health risks). The closeout EBS defines the conditions existing at the time of departure from a site and documents any changes/variations in conditions from the initial EBS. Surveys accomplished in conjunction with operational deployments that do not involve training or exercises (contingency/expeditionary operations) should be completed to the extent practicable consistent with operational requirements for all occupations exceeding 30 days. The EBS is generally performed in conjunction with an environmental health site assessment (EHSA). JP 1-02 (**change to be submitted**).

## PREPARATION AND IMPLEMENTATION OF THE ENVIRONMENTAL BASELINE SURVEY

### PREPARATION

D-1. The EBS addressed in this manual is focused for use during contingency/expeditionary operations where other established host nation agreements or arrangements for a base camp site may not exist (see Chapter 5). (See FM 3-34.250 (**Draft**), *General Engineering*, and AFDD 2-4.4, *Bases, Infrastructure, and Facilities*, for specific planning considerations.) Guidance should be provided in Annex L of the joint OPORD/OPLAN to direct the conduct of surveys, especially in those situations where specific host nation agreements or arrangements may not exist, or a HN government may not be operating. Through the use of the EBS, services can maintain battlespace awareness, maximize combat power, and reduce and/or eliminate the negative effects of occupational and environmental health exposures. The primary purposes for an initial operational EBS are: (1) the protection of service personnel (eliminating, minimizing, or mitigating environmental health risks to service members); (2) sustainability determination of a

designated location (includes encroachment considerations and potential requirements to increase the population of service members or that actions performed at a site); (3) sensitivities involved with cultural or architectural considerations; (4) and minimizing any potential US liability for the condition of a site at the time US forces depart. Environmental specialists initiate EBS planning and preparation during the initial planning stages of any military operation through deliberate information gathering and staff estimates. These specialists include, but are not limited to, engineer and medical expertise that incorporate medical intelligence and geospatial information in the planning process. While containing some considerations of force health protection, the EBS is not a complete medical assessment and is always linked to the conduct of the EHSA and ideally accomplished in direct conjunction with this document and process.

D-2. Researching the AO and the specific potential sites that the operational commander will want to inhabit and use for base camps, airfields, logistic sites and a host of other relatively permanent locations in an area of operations are part of the staff planning process. This includes map reconnaissance with supporting geospatial products, review of medical information and intelligence about a site, cultural information, and any other information obtainable (historical or current information) about proposed locations during the planning process. The respective staff estimates by the engineer, surgeon, logistician, J5/G5/S5 (with civil affairs support), and others must include this assessment as a part of their normal planning process to evaluate all relevant environmental considerations. The preparation work performed at this point is not considered an EBS, but rather merely the preparation work to minimize the likelihood of choosing poor sites from an environmental and force health protection viewpoint. If adequate information is not available on likely sites to be used, this information becomes IR that are fed into the IPB. Some of these may be critical enough to be considered PIR. All of this assessment process is a part of the pre-deployment work required to ultimately create EBSs for specific sites, but does not in itself create EBSs. A physical visit of each site by environmental specialists is required for an EBS to be completed. Similarly, while research and preparation are completed to be able to perform a close out EBS, a physical survey is required for one to be accomplished.

D-3. The preventive aspects present through the planning of required EBSs serve as a force multiplier and mission enabler through the early identification of environmental, health, and safety conditions that may pose potential health threats to military personnel and civilians that occupy designated areas within the theater of operations. They also assist in making recommendations on a particular site by taking into consideration a sustainability determination for that site. It is critical to obtain an assessment of projected/sustained use for a site and a projected duration of use for a given site from the operational planners. The engineer staff officer is directly involved and uses this information in the CESP and integrates this information into staff planning.

D-4. The Theater Construction Management System (TCMS) is the official tool for base camp development planning and design. It is an automated military engineering construction planning and execution support system

that delivers Army Facilities Components System (AFCS) engineering and construction information for use in a theater of operation. It provides military planners, logisticians, engineers, and others with the information necessary to plan, design, and manage thereafter construction projects where austere, temporary facilities are required.

## IMPLEMENTING

D-5. Estimates from the planning process are confirmed or adjusted based upon physical site inspection of the initial EBS. An initial EBS is conducted for any base camp or similar site that will be in existence for greater than 30 days. Ideally the initial EBS will be accomplished in conjunction with an EHSA. If this is not possible, it is generally preferable for the EBS to precede the EHSA. These surveys/assessments conducted during contingency/expeditionary operations document environmental conditions before (or immediately after) the occupation of any base camp or related site. This serves to protect service members by documenting property suitability as well as prevent the US from receiving unfounded claims for past environmental damage.

D-6. While damage claims are the primary focus for many of the other EBSs performed by the DOD, it is of secondary importance in supporting the operational commander during contingency operations. When ultimately departing from a site, a closure environmental survey is completed using the same format as the initial EBS, to provide comparative information documenting the change in conditions over the life of occupation of that site by service members.

D-7. This appendix describes how to execute an EBS during contingency operations and includes a multiservice EBS template to guide performance of an environmental baseline survey of specific sites within the deployment area. While each situation/site will be unique, the format for the EBS is intended to provide the standardized multiservice framework for completion of the physical survey/assessment. Additional applicable references and tools are also listed with this template. See Table D-1, page D-7.

D-8. In between the timeframe of the initial and closeout EBS is a requirement to periodically conduct inspections of the base camp or other similar facility to ensure environmental considerations are being actively incorporated in the life of the site. This report is called an ECR and is focused on how well the commander of that site is applying relevant and directed environmental considerations. ECRs will be conducted for as long as the site is occupied and not less than on a quarterly basis to measure the environmental health/status of the base camp or similar site. These are ideally linked to medical survey efforts to both combine their effect and to minimize their administrative effects on the command. A standardized template is included as Figure D-1 on page D-9.

## COMPARISON TO OTHER ENVIRONMENTAL BASELINE SURVEY USES

D-9. In the context of use for federal real property (see D 6008-96, *Standard Practice for Conducting Environmental Baseline Surveys*) the EBS is

designed to determine the environmental condition of that property with a focus on closing excess or surplus property or realigning military installations. BRAC process is a good example of the sorts of uses typically associated with an EBS in the federal context. This is important to the military for use with installations and has similarities to an EBS performed in support of base camps and other sites associated with contingency/expeditionary operations. However, it has a significantly different focus being driven by rules/laws/regulations/liabilities and only marginally concerned with health force protection issues. A modified EBS may still be used for OCONUS bases in conjunction with the OEBGD and other documents as those sites are returned to the HN, but again, this focus is different from the one applied to the tactically/operationally focused EBS associated with base camps and other similar sites included in contingency/expeditionary operations.

D-10. In the context of this manual an EBS is a physical site survey. If not performed as a site survey by environmental professionals (engineer, medical, and others as appropriate) it is not considered an EBS; although, commanders would still be wise to conduct a reconnaissance of their sites to look at similar considerations with the general knowledge they have about environmental considerations and the included force health protection concerns, prior to occupation of a potential site. The EBS performed in a tactical/operational context of a contingency/expeditionary operation contains legal considerations as well, but the focus of this sort of an EBS is less initially on the effects of a base camp or similar site on the environment than it is on the effects of a potential site on the service members that will be operating there.

## **ENVIRONMENTAL BASELINE SURVEY CONTENT**

D-11. For contingency or expeditionary operations, an initial EBS is prepared to the fullest extent possible for each site to document environmental and environmental health conditions prior to the time of service member arrival. This snapshot provides immediate information to the commander as well as creating a baseline record of conditions at that time. At some point it is also likely that a closure EBS will also be completed, but this is not the focus of the commander occupying the site. The initial EBS investigation is designed to provide the commander and his staff with a professional yet thorough overview of the designated location/site using real-time field sampling, historical information, and readily available intelligence. This initial process involves a physical and visual inspection of the property through the use of available technologies and information sources by environmental professionals. Information sources include but are not limited to:

- IPB.
- Current reconnaissance reports of a given location/site.
- Intelligence reports.
- Digital information sources (National Imagery and Mapping Agency (NIMA), AFMIC, Defense Intelligence Agency (DIA), and others).
- Other geospatial information and products.

D-12. Deliberate information gathering and research for environmentally specific and historical information must be part of the investigative process in the execution of the initial EBS. This will include interviews with personnel having knowledge of the designated location and other research methods in an attempt to gain historical information about a site on all aspects of environmental considerations. In some cases this may be performed by real estate personnel before a site is ever occupied.

D-13. A physical site inspection is performed by environmental specialists to obtain first-hand visual and physical information pertaining to the property to identify recognized environmental conditions and characteristics. The linkage of environmental and occupational health hazards are integrated as a part of the inspection. These inspections include the information categories contained in the EBS format. This inspection should include as a minimum:

- **Physical description and condition.** Note the condition and location of facilities/improvements (if applicable) including the presence of buildings and other structures. Also record sites of known contamination within or immediately adjacent to the property boundaries and, if possible, try to determine the contaminant(s) of concern and the media affected. Ensure you know and annotate the prevailing wind conditions for the site. Include information, if available, on any remediation efforts and sampling conducted.
- **Historical Use(s) and User(s).** Identify any visual and physical indications of past use(s) that may have impacted the property through the use, treatment, storage, disposal, or generation of hazardous substances or petroleum products. Include a list of past owners, occupants and past uses of the property where available. Ensure you have considered cultural history of the site as appropriate.
- **Adjacent Land Use.** The general type of property usage (i.e., residential, commercial, industrial) should be documented. Identify any visual and physical indications (e.g. soil staining, stressed vegetations) of current and past land use practices that may be indicative of a contaminant release.
- **Soil type and land cover.** Note the soil type and general types of vegetation present on the property. Include in this paragraph any observations of stressed vegetation and potential causes (i.e., hazardous substances or petroleum product release, lack of irrigation, high traffic area, etc.).
- **Hydrologic and Geologic Features.** In this portion, include hydrologic features important to drainage such as creeks, ditches, and riverbeds.
- **Water supply.** Identify any sources of potable water on the property as well as an estimated associated capacity. Note the presence of water facilities such as pump stations, storage tanks, system age and condition, and its components. In addition, document any wastewater or other liquids discharging from the property into a drain, ditch or stream on or adjacent to the location/property.

D-14. It is highly likely that an EBS will come upon situations that will cause the survey team to want to take samples to obtain more detailed analysis of concerns identified either during the survey or as a result of information developed during the planning process. The procedures associated with sampling, whether their focus is engineering or medical related, are very similar. Refer to Appendix F for a discussion of these procedures.

## **STANDARDIZED MULTISERVICE ENVIRONMENTAL BASELINE SURVEY FORMAT**

D-15. The importance of a standardized multiservice format should be apparent. This format is intended to include adequate minimal medical considerations in the case where an EHSA is not able to be conducted in conjunction with the EBS. The environmental health hazards and sampling portions of the EBS format (Table D-1, page D-7) will generally only become fully developed when an EHSA is performed.

**Table D-1. Environmental Baseline Survey Format**

<p>1. Cover page for EBS.</p> <p>1.1. Title will be “Environmental Baseline Survey”</p> <p>1.2. Location identification.</p> <p>1.2.1. This identification will indicate the location’s recognized name or similar means of identification, i.e., <i>Logistics Staging Area Doe</i>. (Highlight if this includes any sub-sites.)</p> <p>1.2.2. Name of city, township, or area of operation for the location of the site.</p> <p>1.3. Identification of lead surveyor.</p> <p>1.3.1. Organization/agency with responsibility for conducting EBS</p> <p>1.3.2. Standard Name Line of project leader.</p> <p>1.3.3. Period of survey.</p> <p>1.3.3.1. Start date of survey</p> <p>1.3.3.2. End date of survey</p> <p>1.3.4. DSN Phone Number (if available)</p> <p>2. Executive summary (separate page).</p> <p>2.1. Findings. Written to provide users of the EBS a broad overview of the findings regarding the designated location where the EBS was conducted</p> <p>2.2. Recommendations. General recommendations to be considered by users of the EBS that addresses any controls or actions that should be addressed. Recommendations must be supported by findings during the execution of the EBS.</p> <p>2.3. Notes. General comments regarding sampling, additional testing conducted and related items considered during the development of the recommendations in 2.2.</p> <p>3. Introduction.</p> <p>3.1. Provide purpose of the EBS.</p>	<p>3.2. Limitations of assessment in the execution of the EBS.</p> <p>4. Site description. (Use pictures/photographs whenever possible to support this.)</p> <p>4.1. Location. General description of the site location that will include the following information.</p> <p>4.1.1. Detailed description of the site location (include the prevailing winds).</p> <p>4.1.2. Organization designated for occupation of the site.</p> <p>4.1.3. Grid location of area.</p> <p>4.1.4. Map series.</p> <p>4.2. Site and Vicinity characteristics.</p> <p>4.2.1. Physical setting.</p> <p>4.2.2. Topography.</p> <p>4.2.3. Geology.</p> <p>4.2.4. Soils.</p> <p>4.2.5. Vegetation.</p> <p>4.2.6. Hydrology.</p> <p>4.2.7. Raw materials.</p> <p>4.3. Detailed Site Description.</p> <p>4.3.1. Structures.</p> <p>4.3.2. Roads.</p> <p>4.3.3. Drinking Water Sources.</p> <p>4.3.4. Waste disposal.</p> <p>4.3.5. Other improvements.</p> <p>4.4. Use of site.</p> <p>4.4.1. Current use of site.</p> <p>4.4.2. Historical use of site to include cultural considerations.</p> <p>4.5. Use of adjoining properties.</p> <p>4.5.1. Current use of adjoining properties.</p> <p>4.5.2. Historical use of adjoining properties.</p>
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**Table D-1. Environmental Baseline Survey Format (continued)**

<ul style="list-style-type: none"> <li>5. Information sources and supporting documents.</li> <li>6. Information from Site Reconnaissance.             <ul style="list-style-type: none"> <li>6.1. Background of location upon identification for occupation.</li> <li>6.2. Detailed analysis of information gathered in that includes (but not limited to):                 <ul style="list-style-type: none"> <li>6.2.1. Presence of animals.</li> <li>6.2.2. Potential radioactive sources (present or past).</li> <li>6.2.3. Hazards and health risks.                     <ul style="list-style-type: none"> <li>6.2.3.1. Site specific.</li> <li>6.2.3.2. Offset site.</li> </ul> </li> <li>6.2.4. Environmental hazards.                     <ul style="list-style-type: none"> <li>6.2.4.1. Site specific.</li> <li>6.2.4.2. Offset site.</li> </ul> </li> <li>6.2.5. Waste disposal.                     <ul style="list-style-type: none"> <li>6.2.5.1. Current status.</li> <li>6.2.5.2. Historical perspective.</li> <li>6.2.5.3. Planned Improvements or changes</li> </ul> </li> <li>6.2.6. Agricultural implications.                     <ul style="list-style-type: none"> <li>6.2.6.1. Site specific.</li> <li>6.2.6.2. Offset site.</li> </ul> </li> <li>6.2.7. Identified Environmental and Environmental Health Hazards.                     <ul style="list-style-type: none"> <li>6.2.7.1. Historical</li> <li>6.2.7.2. Present</li> <li>6.2.7.3. Potential future</li> </ul> </li> <li>6.2.8. Site assessment to include detailed walk-through with building and infrastructure assessments.</li> <li>6.2.9. Other relevant information.</li> </ul> </li> </ul> </li> <li>7. Environmental and Environmental Health Sampling Data. (Expanded in the EHSA.)</li> </ul>	<ul style="list-style-type: none"> <li>7.1. Sampling and analysis plan(s) to include justification for number, type, and location of samples collected, as well as analysis to be performed on the samples collected. Sampling should be identified as either confirmation or delineation.</li> <li>7.2. Sampling results analysis to include a summary table of sampling results.</li> <li>7.3. Environmental Health Site Assessment Summary (if applicable).</li> <li>8. Findings and Conclusions.             <ul style="list-style-type: none"> <li>8.1. Identification of environmental conditions that have the potential for significant impacts to health or mission.</li> <li>8.2. Detailed concerns.</li> </ul> </li> <li>9. Recommendations.             <ul style="list-style-type: none"> <li>9.1. Usability.</li> <li>9.2. Further investigation and additional assessments required to fully address concerns.</li> <li>9.3. Identify &amp; recommend controls to address concerns where applicable.</li> </ul> </li> </ul>
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## **SUSTAINED SITE SURVEYS**

D-16. The primary purpose for a base camp is mission support, synchronized with the overall military mission of the deployed force. To execute mission support, a base camp must provide force protection to deployed forces, resource management of critical infrastructure, training opportunities for deployed forces and permanent party, and maintenance of the facilities. The continued application of environmental considerations is a part of mission support and this includes the critical aspects of force health protection. This includes periodic, sustained site surveys/assessments similar to those performed by an installation staff. The ECR (see Figure D-1, page D-10) assists with that requirement and is also used to record significant hazardous spills or other environmental events.

<b>CLASSIFICATION</b>
<b>ENVIRONMENTAL CONDITIONS REPORT [ECR]</b>
<b>References:</b>
<ul style="list-style-type: none"> <li>a. DODD 6050.7, "Environmental Effects Abroad of Major Department of Defense Actions," 31 March 1979.</li> <li>b. JSI 3820.01, "Environmental Engineering Effects of DOD Actions," 28 September 1993.</li> <li>c. DODD 6050.16, "Policy for Establishing and Implementing Environmental Standards at Overseas Installations," 20 September 1991.</li> <li>d. Other applicable environmental laws and regulations, OPORD, and unit SOP.</li> <li>e. Site specific EBS (if applicable).</li> </ul>
<p>1. <u>Site/Incident Location</u>. List the legal address and 6-digit military grid location or latitude and longitude of the incident location or reference the applicable EBS to link the ECR to a given site. Refer to the electronic environmental message formats at Tab E. (The ECR functions as a SITREP, or interim report, for a given site. The frequency of ECR reports is a higher headquarters' decision but supports the need to document the condition of a given site over time [interim snapshots], as well as helping to ensure that an appropriate environmental focus is being maintained at a given site. The basic format of the ECR may also be used when reporting an incident, such as a POL spill, not related to a given EBS or site location.)</p>
<p>2. <u>Site/Incident Description and Background</u>. Give a brief description of the site (installation), including its related EBS/historical use(s) or the circumstances surrounding the incident. For an incident at a location not covered by an EBS, it is critical to provide the same sort of information contained in a standard accident report.</p>
<p>3. <u>Map/Description of the Incident Location</u>. If the ECR is related to a site covered by an EBS, this entry is able to relate to the information already provided in the EBS (a baseline document). If the ECR defines a location where an incident has occurred that is not covered by an EBS, the description needs to be adequate to direct a follow-on element to the site. In this respect, it is similar to the graves-registration report if the incident occurs during a tactical operation where time precludes remaining at the site.</p>
<p>4. <u>Summary of Environmental Conditions</u>. List the environmental event(s) at the site/location. All spills should be inventoried. If the ECR is a periodic report for a given site, significant events, such as major spills, should have been reported using the basic ECR format. In this case, simply reference any significant incident report ECRs that may have occurred at the given site over the time frame that the periodic ECR covers. Also provide a "snapshot" report of the types of HM/HW that are stored at the site. Describe minor spills and other events that have occurred over the time frame in question in basic terms, including quantities and the method(s) used to clean the site.</p>
<p>Example: Four gallons of waste oil spilled at the HWAS located northwest of the maintenance building (shown on map) at 1600 hours on 16 December 2000. The 22nd Military Police Battalion (MP Bn) contained the spill with assistance by White &amp; Jones, by 1725 hours. About 3 cubic yards of contaminated soil was taken to the White &amp; Jones HW disposal area in Juvonia.</p>
<b>CLASSIFICATION</b>

**Figure D-1. Environmental Conditions Report Format**

**CLASSIFICATION**

Example: Raw sewage ran from a pump house behind the main warehouse (shown on map) for an estimated 3 days during the initial stages of occupying the camp in early June 2000. The problem was identified on 13 June and corrected when the pump was repaired on 14 June.

Example: A fuel tanker overturned at the road intersection vicinity NV 123456 (see map) at 092000 November 2000 during the road march to Bigtown. Immediate mitigation included spill containment by the employment of all available spill kits with the unit. Higher HQ was immediately notified. An estimated 4000 gallons of jet petroleum (JP)-8 spilled at that site. The vehicle has been righted, and excavation of the site will begin at first light, 10 November.

5. Interior and Exterior Observations. These entries should be viewed as an abbreviated version of the information that would be found in an EBS. Items should only be addressed if they differ from the last ECR or vary from the initial EBS.

6. Findings and Determinations with Qualification Statement. A statement similar to the following should appear in this paragraph of the ECR:

According to \_\_\_\_\_ Reg \_\_\_\_\_, I have considered whether or not significant environmental impacts will occur as a result of turnover/return of this site (base camp, logistics area) and have determined that (include one of the following statements):

a. Turnover of this base camp area will not result in environmental impacts significant enough to warrant additional environmental analysis.

**OR**

b. Turnover of this base camp area will result in environmental impacts significant enough to warrant additional environmental analysis. Environmental actions or projects must continue after transfer of the base camp area because of substantial (imminent) threat to human health or safety. The impacts of concern are (list impacts):

(If the report is due to an incident not connected to a specific site/installation, this paragraph is an assessment by the commander/individual on the scene.)

John Q. Jones  
MAJ, QM  
Mayor, Camp Swampy

**CLASSIFICATION**

Figure D-1. Environmental Conditions Report Format (continued)

## Appendix E

# Environmental Health Site Assessment

EHSAs are conducted to determine if environmental contaminants from current or prior land use, disease vectors, or other environmental conditions exist at deployment sites that could pose health risks to deployed personnel. Additionally, they identify industrial facility operations, and/or commodities on/near a deployment site/base camp that, if destroyed, damaged, or released could result in catastrophic health risk to deployed forces. They are generally conducted in conjunction with an initial EBS since the two documents support one another (melding primarily engineer and medical focuses). They define the overall profile of a base camp or similar site at a snapshot in time with the EBS being generally more visual and the EHSA being more analytical in their approaches. The procedures for an EHSA are related and generally linked to those of an initial or closure EBS. If unable to be performed at the same time, it is generally better for the EHSA to follow an EBA rather than to be at a given site. As with the EBS, an EHSA cannot be accomplished without physical access to a site.

The assessment protocol outlined in this appendix describes a mission-oriented approach to determine the nature and magnitude of the health risks associated with industrial, agricultural, and urban activities to support the commander in making informed risk management decisions. It provides a series of steps designed to obtain sufficient information to evaluate potential environmental exposures that may affect the health of deployed personnel. The procedures and methods described are based on the American Society for Testing and Materials (ASTM), International standard guide *E2318-03, Standard Guide for the Environmental Health Site Assessment Process for Military Deployments*. Although specifically designed to foster informed operational risk management of potential environmental health threats to deployed U.S. Forces, data gathered via these methods may also be useful for more definitive health risk analyses.

### PRE-DEPLOYMENT ACTIVITIES

E-1. Before deploying, information should be gathered, processed, condensed, and presented to all team members in conjunction with the staff assessments performed by the controlling headquarters. The type of mission supported dictates what level of assessment will be necessary. Review the OPLAN, or the OPORD if it is later in the process, and talk directly with mission planners, if that is possible, to obtain answers to your questions, define the level of assessment required, and link-up with those performing the EBS of the same

site. Geospatial products provided through the engineer staff section provide important planning information. Several of the questions you will want to answer include:

- Where will the operation occur and what are the specific sites being chosen that need to be surveyed?
- When will the operation occur, how long will it last, and how soon will surveys be required for each site? What is the projected timeline and sequence of surveys? Can an EHSA be performed in conjunction with an EBS at each of the projected sites?
- Why is the operation being conducted (training, consequence management, disaster relief, combat, nation building, etc.)?
- Who is involved in the operation and what will be the nature/purpose of each of the projected sites? What type of units will be at each site and what unique considerations may exist at any given site?
- What are the specific tasks/activities required of the survey team?
  - What tasks/activities will be required for each site?
  - How many personnel will be required to perform the tasks/activities at each site? How will performing the EHSA in conjunction with an EBS change those requirements and improve the quality of the survey?
  - What tasks/activities will need to continue after the initial EHSA? If so, what will be the frequency of revisits? Which sites will require continuous monitoring activities?
  - What are the potential stressors involved with each of the sites to be surveyed (i.e., environmental/occupational)?
- What are the current and historic weather patterns in the area? How will the timeframe of the operation be affected by the weather and climate?
- What are the topographic/geological conditions in the area and how will the specific location and site layout affect health? Has coordination with the engineer been completed to choose the best camp layouts for each site?
- What vector control information is available?
  - What information is available prior to deployment (vector assessment profiles [VECTRAPS], disease vector ecology profiles [DVEPs], medical environmental diseases and countermeasures [MEDIC])? What is the level of confidence in the information? (Contact the Defense Pest Management Information Analysis Center, the Armed Forces Medical Intelligence Center [AFMIC], and the cognizant Disease Vector Ecology and Control Center [DVECC].)
  - What are the potential risks from location, season, nature and duration of mission, based of historical data? (Incidence of diseases such as typhus and plague may increase in colder weather, particularly in urban environments.) What are the risk periodicity and the risk distribution?
  - Is there any documented pesticide resistance in vectors or drug resistance in parasites in the AO?

- What are the human distribution patterns and historic endemicity on major diseases? (Consider anticipated level of medical care, medical assets, and acceptable level of attrition).
- What vector control assets (equipment, pesticides) and personal protective measures will be available?
- What special equipment will be required for surveillance or control operations?
- What are the commander's expectations for the force health protection of his service members at each site?

## PRELIMINARY HAZARD ANALYSIS

E-2. A preliminary hazard analysis is completed by reviewing relevant intelligence data for the AO and as much intelligence as is available, or can be made available, for each of the projected sites in the AO.

E-3. All team members should review the Armed Forces Medical Intelligence Center's Environmental Health Risk Assessments, Infectious Disease Risk Assessments and Industrial Facility Health Risk Assessments for each country in the AO. Other intelligence (classified and unclassified) should be requested/compiled and reviewed to include, but not limited to, weather patterns (historic/current/projected) and supporting geospatial products/information about each of the projected sites. Collaborate with the engineer and other staff sections as necessary/possible to exhaust all relevant information about each of the projected sites. Some of those sources include:

- SIPRNET (Secret Internet Protocol Router Network) Sources:
  - AFMIC – <http://www.dia.smil.mil/intel/afmic/afmic.html>
  - NGIC (National Ground Intelligence Center) (chemical, biological, and radiological [CBR]) – <http://www.ngic.army.smil.mil/functionpgs/nbc/index.php>
  - GEMINI – <http://magellan.dia.smil.mil/gemini>
  - DIA – <http://www.dia.smil.mil/>
  - <http://ismc.sgov.gov/>
  - [http://www.ismc.sgov.gov/Intelink\\_servers/Text\\_listing/](http://www.ismc.sgov.gov/Intelink_servers/Text_listing/)
  - National Imagery and Mapping Agency (NIMA) – <http://www.nima.smil.mil/products.html#force>
  - Port and Airfield Collaborative Environments (PACE) – <http://intelinks-s.intel.scott.af.smil/pace/query.cfm>
  - Community On-line Intelligence System for End Users and Managers (COLISEUM) – <http://coliseum.dia.smil.mil>
  - USACHPPM – <http://usachppm1.army.smil.mil>
- Open net sources:
  - The Library of Congress Country Studies – <http://lcweb2.loc.gov/frd/cs/cshome.html>
  - State Department Country Background Notes – <http://www.state.gov/r/pa/ei/bgn/>

- Department of Energy Country Analysis Briefs – <http://www.eia.doe.gov/emeu/cabs/contents.html>
- Central Intelligence Agency (CIA ) World Factbook – <http://www.odci.gov/cia/publications/factbook/indexgeo.html>
- Perry-Castañeda Library Map Collection – <http://www.lib.utexas.edu/maps/>
- CountryWatch – <http://www.countrywatch.com/>
- World Health Organization (WHO) Health Intelligence Network for Advanced Planning – <http://www.who.int/disasters/>
- Environmental Network – <http://unep.net/>
- U.S. Environmental Protection Agency – <http://www.epa.gov/compliance/resources/publications/assistance/sectors/notebooks/index.html>
- Vector Control Focused Sources:
  - Walter Reed Biosystematics Unit – <http://wrbu.si.edu/wrbu.html>
  - Armed Forces Pest Management Board (AFPMB) – [www.afpmb.org](http://www.afpmb.org)
  - Defense Pest Management Information Analysis Center (DPMIAC) – <http://www.afpmb.org/mission/dpmiacstatement.htm>

E-4. If there is no readily available intelligence for an area of interest, contact the Plans & Operations Directorate at NEHC, Deputy chief of Staff for Operations at USACHPPM, or the Operations and Planning Directorate at AFIOH who will validate and request intelligence production from the COLISEUM or through other means. Emergent requests for Industrial Facility Health Risk Assessment information should be directed to AFMIC Operations directly at (301) 619-7574. Information on industrial hazard assessments (IHAs) may be obtained by contacting the Deployment Environmental Surveillance Program at USACHPPM at (410) 436-6096 (DSN 584-6096).

### **Preliminary Site Conceptual Model**

E-5. The development of a preliminary conceptual site model (CSM) is based on the nature of the mission and the intelligence products reviewed. Prioritize potential environmental health vulnerabilities. Figure E-1, page E-5, shows an example of a CSM for a chemical (PCB in this case) release in soil in which there are five completed exposure pathways associated with the single environmental release. The CSM serves as the basis for all further evaluation of completed exposure pathways, including any environmental sampling necessary to document exposure point concentrations. Exposure point concentrations are used to determine the magnitude of the health risk posed by the site.



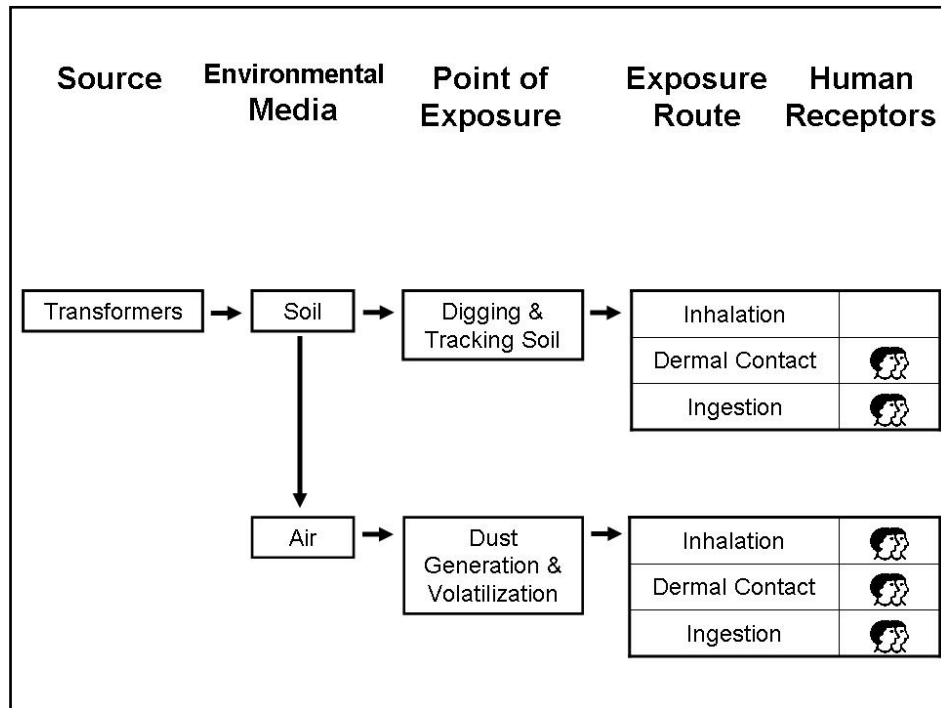


Figure E-1. Example of a Conceptual Site Model for PCBs in Soil

## ACTIVITIES UPON ARRIVAL IN COUNTRY

### GENERAL SITE RECONNAISSANCE

E-6. Prior to physically entering the site, investigate the area around the site. Ideally this will be conducted as a multi-disciplined survey in conjunction with engineers and other environmental specialties performing an EBS. Ensure the site of interest and the surrounding area has been secured by friendly forces or ensure a security element is included in the reconnaissance team. Four critical steps include the following:

- Review information from the preliminary hazard analysis. (If radioactive contamination is suspected, ensure CBRN reconnaissance elements are included in the reconnaissance team. Suspected areas would include hospitals with oncology and x-ray services, medical or other research facilities, mining and drilling operations, and power generation facilities).
- If facilities on the site are currently occupied or locked, seek the manager/commander/base camp mayor to obtain site entry permission. Try to obtain contact information on individuals who may be able to be interviewed on the present and historic uses of the site as well as provide potential site related health risk information. Interviews with these individuals may be conducted before, during, or after the on-site reconnaissance.
- Seek an elevated location (hill, rooftop, helicopter, or other means) to observe the overall site and surrounding area. Confirm the validity of

geospatial or other documents in your possession and verify the prevailing wind direction).

- Drive or walk the perimeter of the site and physically inspect the complete boundaries of the site. View the immediately adjacent land/water. While accomplishing this –
  - Identify onsite environmental releases, potential or possible releases, and/or other environmental conditions that might compromise the safety of service personnel (to include the assessment team).
  - Identify potential hazardous/radioactive material/waste sources, including source types, dimensions, locations, and any evidence of poor containment. To the extent possible, estimate the area or volume of these sources.
  - Identify any potential environmental conditions that may require the use of personal protective equipment (PPE) during site reconnaissance.
  - Look for evidence of hazardous/radioactive material migration on or from the site, including stressed vegetation, areas of visible stained soil, or outfalls discharging to holding ponds or other surface bodies of water (see Figure E-2, page E-7).
  - Identify potential harborage areas, breeding sites and/or other evidence of pest infestation.
  - Record observations, including a physical and operational description of the site in a logbook, Personal Digital Assistant (PDA), etc. and begin to construct a site map (see Figure E-3, page E-8). If possible, photograph the site, focusing on areas where a suspected environmental release has occurred.
  - Prioritize each potential source of release for further investigation based on its potential to create health risks or impact on the mission.

- Note the types of containers, impoundments, and/or other storage systems:
  - Metal or plastic barrels or drums
  - Underground tanks
  - Aboveground tanks
  - Compressed gas cylinders
  - Pits, ponds or lagoons
  - Paper or wood packages and containers
- Note any information on tags, labels, markings or other identifying indicators.
- Note the condition of all waste containers and storage systems:
  - Undamaged
  - Visibly rusted or corroded
  - Leaking or bulging
  - Size and type of container
  - Labels on containers indicating corrosive, explosive, flammable, radioactive, or toxic materials
- Note the physical condition of the materials:
  - Gas, liquid, or solid
  - Color and turbidity
  - Behavior, e.g., foaming, crystallizing, vaporizing, or corroding
  - Conditions conducive to splash or other means of contact
- Identify wind barriers:
  - Buildings
  - Fences
  - Vegetation
- Determine the potential environmental media of exposure:
  - Air
  - Soil
  - Surface Water
  - Ground Water
- Note any indicators of past or ongoing environmental release:
  - Dead fish, animals or vegetation
  - Dust or spray in the air
  - Fissures or cracks in solid surfaces that reveal buried waste layers
  - Pools of liquid
  - Gas generation or effervescence
  - Deteriorated or leaking containers
  - Cleared land areas representing possible landfill areas
  - Subsiding areas or other anomalous topography indicating possible waste burial locations
- Note any safety hazards. Consider:
  - Condition of site structures
  - Obstacles to entry and exit
  - Terrain homogeneity
  - Terrain stability
  - Stability of stacked materials
  - Metal protruding from the ground or other surfaces
- Identify any potentially radioactive, reactive, incompatible, flammable, or highly corrosive materials or wastes.
- Note land features.
- Note the presence of any poisonous plants or animals.

**Figure E-2. Visual Inspection Checklist**

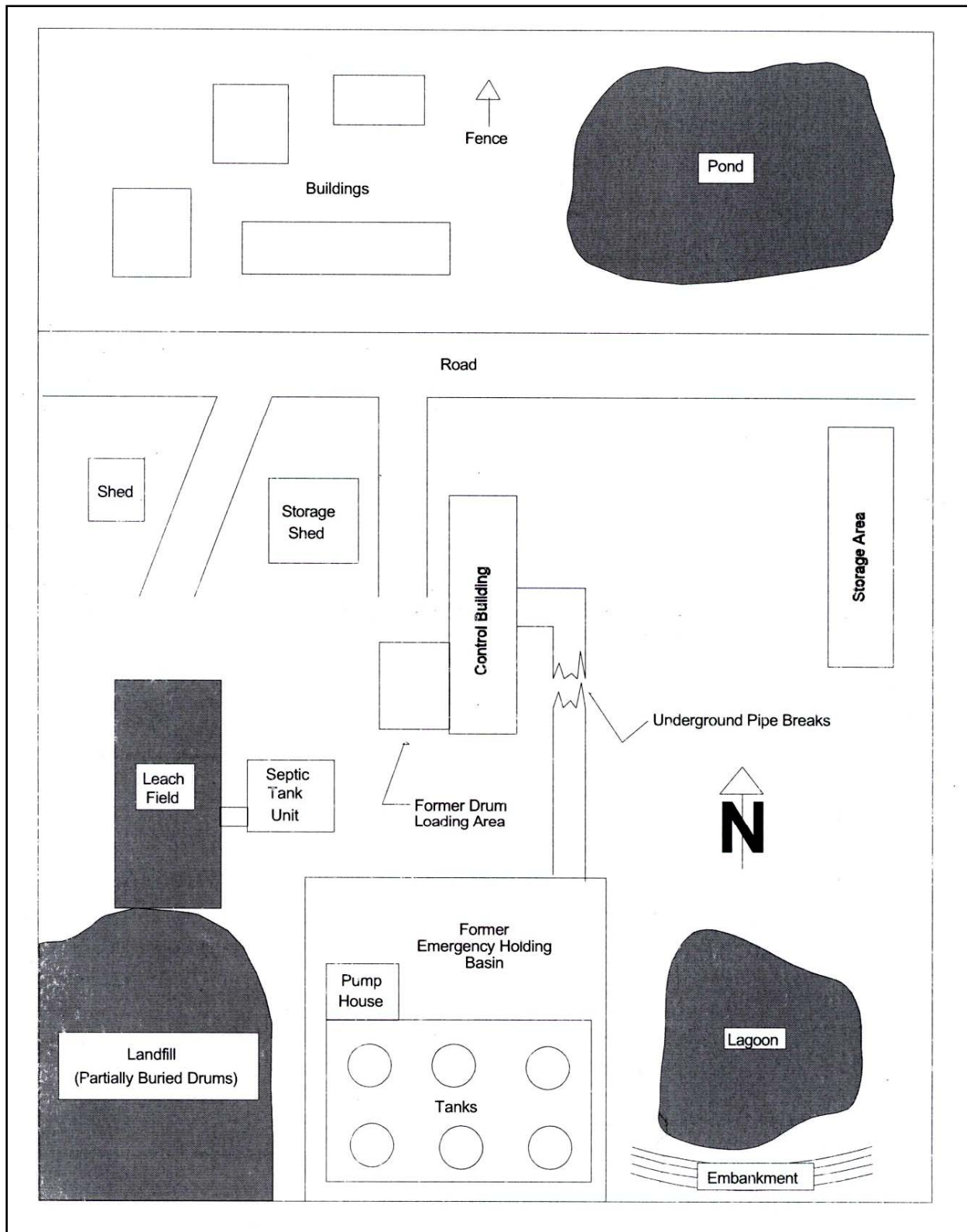


Figure E-3. Sample Site Drawing

## INTERVIEWS

E-7. Interviews are conducted to obtain historical information that may not be available from other sources and to further refine information gained by reviewing intelligence data, direct observations from a site reconnaissance and/or the IHA. Individuals or agencies to consider interviewing include but are not limited to: the U.S. Embassy Defense Attaché, the host nation military liaison, health officials, local fire brigade, emergency responders, site occupants, site workers, and occupants of adjacent properties. The U.S. Embassy's Defense Attaché Office should be contacted prior to scheduling interviews with HN military or HN government officials. The Defense Attaché may also be able to assist in arranging interviews and/or identify other persons that may be appropriate to interview.

E-8. Interviews may be conducted by telephone or in person and should include the following considerations:

- Seek information concerning past and present operations.
- Ask about waste disposal practices and if there are any environmental problems. (i.e. have there ever been spills on the site, problems with contaminated wells either onsite or on adjacent properties), health problems in site workers, complaints from occupants of adjacent properties about odors, or other environmental impacts.
- For agricultural lands, ask about commonly used pesticides, herbicides, and fertilizers.
- Attempt to obtain information about communicable and/or infectious disease prevalence within the local population.
- Ask about the incidence of crime in the area surrounding the deployment site and/or any other areas in the vicinity that will be frequented by deployed personnel.

## ON-SITE RECONNAISSANCE

E-9. Site reconnaissance is designed to fill in gaps in data remaining after reviewing data from intelligence sources and completing the perimeter survey. The actual reconnaissance will confirm or refute other intelligence and information potentially obtained from interviews and other research.

E-10. Prior to actual site entry, all necessary site safety precautions (including PPE) should have been considered and applied. The standing orders/procedures for initial site entry assume that the site is currently unoccupied and the assessment is being conducted by an advance party for future use. The guidelines are necessarily conservative due to incomplete knowledge of site conditions. If the site is currently occupied, or after completing initial site entry, it will be possible to implement site specific (and less restrictive) health and safety procedures for the remainder of the site assessment. Those orders/procedures are:

- Based on the perimeter survey, designate a rallying location and an entry/exit point for initial site entry. Both the rallying location and entry/exit point should be upwind and uphill (if possible) of any suspected contaminated areas or releases.

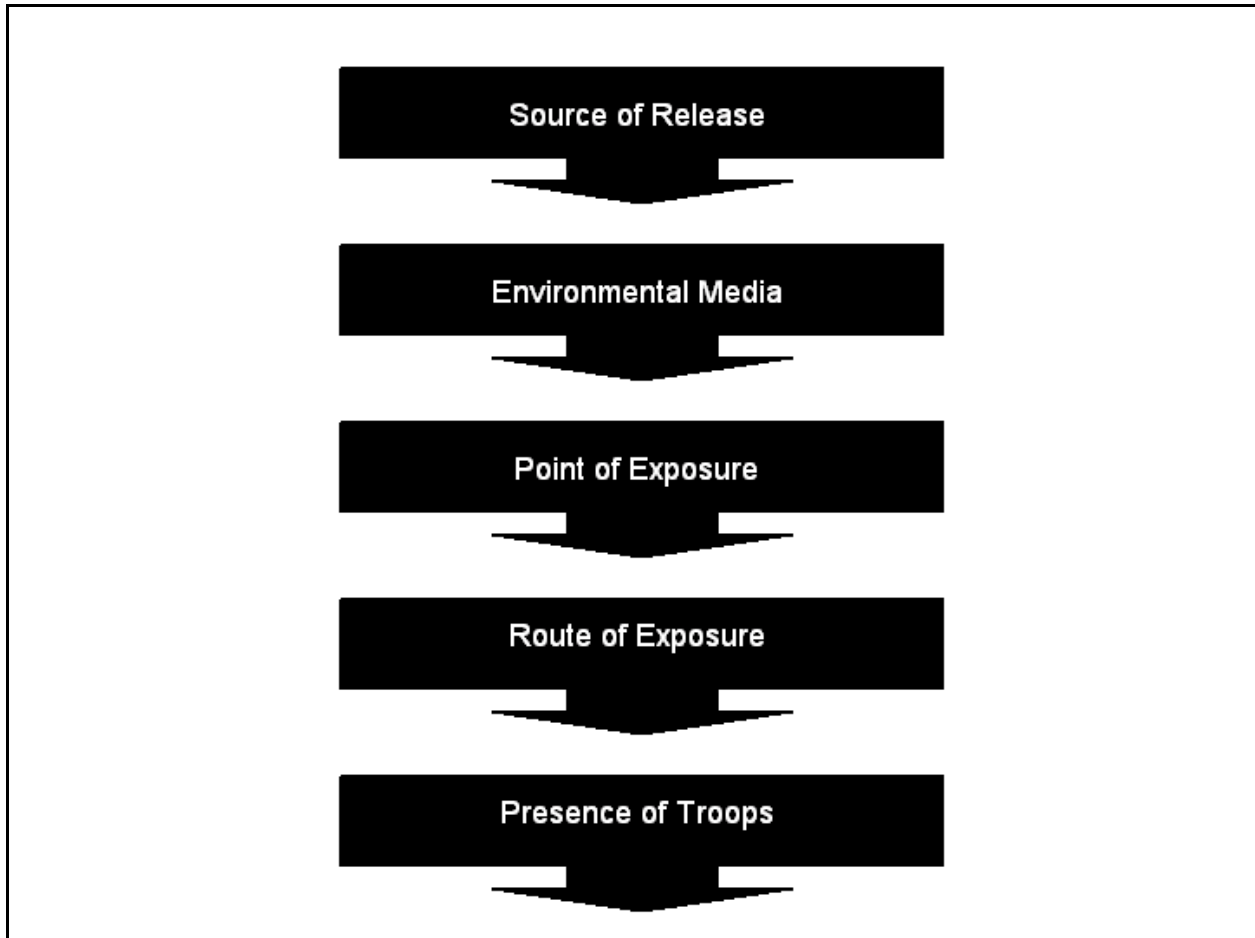
- Assemble all required PPE at the rallying point. Interviews and the perimeter survey should provide some insight into appropriate PPE. Don all required PPE prior to sight entry as required.
- At least one assessment team member must remain at the rallying point at all times to monitor weather conditions and call for assistance if necessary.
- Set a time limit for initial site entry. The assessment team(s) and the preventive medicine staff member at the rallying location must agree upon any extension of the established time limit.
- All initial site entries will be accomplished using the buddy system. Buddies shall remain in line of site and maintain voice communication at all times during initial site entry.
- Establish and maintain radio communications between the assessment team(s) and the rallying point. The assessment team(s) should contact the rallying point via radio at regular intervals.
- The assessment team(s) must make contact at the rallying point before entering and upon exiting any on-site structure.
- If multiple assessment teams will be performing initial site entry, radio contact between teams must be made via radio at regular intervals.
- Assemble at rallying point at the agreed upon time and report observations.
- Based on observations from initial site entry, develop site-specific health and safety procedures as required for completing the site assessment.

**Exposure Pathways**

E-11. Focus on confirming or refuting the presence of environmental releases or suspected/potential releases that have a complete/potentially complete exposure pathway. Table E-1 highlights the four exposure pathways that must be evaluated for each site. A complete exposure pathway links the contaminated source to the receptor population as demonstrated in Figure E-4, page E-11.

**Table E-1. The Four Exposure Pathways**

<b>Pathway</b>	<b>Accounts for</b>
Soil Exposure	Potential threat to individuals on or near a site who come in contact with contaminated areas. Includes skin absorption and incidental ingestion.
Air	Hazardous substance migration, in gaseous or particulate form through the air representing a potential threat to individuals via inhalation.
Ground Water	Hazardous substance migration to and within aquifers representing a potential threat to individuals who use groundwater sources for drinking or other domestic purposes.
Surface Water	Hazardous substance migration to surface water bodies representing potential threats to individuals who use surface water for drinking and/or who have skin contact or incidental ingestion resulting from recreational use.



**Figure E-4. Completed Exposure Pathway**

E-12. Visibly and physically observe the property and all structures on the site. Use site screening instrumentation and organoleptic (sight, smell) senses as appropriate, to identify potential areas of contamination, insect breeding, and vermin infestation.

### **Vector Control**

E-13. Vector-borne diseases are much more predictable than many other types of illness. Vectors are dependent upon environmental conditions which change little and slowly, if at all. Historical data is extremely valuable, even information that is decades old. When you are conducting on-site vector surveillance and control activities remember the following:

- Ensure that commanders know who you are and what you need to do. Demonstrate your equipment for security personnel when necessary. Remember that your priorities are secondary to theirs.
- If there is evidence of mosquito, tick, or mite activity, begin stressing personal protection measures actively at all levels in the chain of command. Ensure camp sanitation is being appropriately stressed to

reduce fly and rodent problems. Remember that large rodent populations may equate to increased snake populations.

- Quickly cover as much of the area as possible by vehicle or on foot, to determine likely problem areas. Consider the following in/during your assessment:
  - Breeding sources – water (mosquitoes, blackflies, deerflies, ceratopogonids); garbage (flies, rodents); and caves, tunnels, and burrows.
  - Nature of vegetation – dry, ground cover, canopy, aquatic, sparse, extensive.
  - Access for control efforts – roads or paths to breeding sites, roads located where prevailing winds favor ultra low volume (ULV) pesticide applications.
  - Recent and current weather, and seasonal weather patterns – floods, drought, low temperatures.
  - Farming activity – unintentional vector control, resistance issues, movement of rodents from fields post-harvest.
  - Nature and location of berthing – tents, existing structures, screens, sanitation.
  - Prevailing winds.
  - Proximity to potential reservoirs of disease – humans, livestock.
  - Talk with local health officials.
  - Request information on known or possible vector-borne illness in local population, infection rates, drug resistance.
  - Concurrently, begin standard vector surveillance.
  - Record the position of any confirmed/suspected releases with a global positioning system (GPS) and document your findings with photographs.
- If temperatures allow insect activity at night, begin light trapping as soon as possible. If security is an issue, try to run the traps without light, using a different attractant. If no other option is available, continue to run traps without light or attractant if specimens are being collected.
- Conduct landing/biting collections if possible. Use volunteers judiciously. Remember, insect repellents (such as **DEET**) will affect results.
- Determine which bodies of water contain mosquito larvae. Treat during surveys if possible.
- Use baited cone traps or nets to collect flies from garbage, feces, and carcasses.
- To collect rodents and determine location, species, and level of infestation, place live or snap traps in appropriate likely established habitats, and around the operation's food storage, preparation, and eating areas.

E-14. Proper preservation and curation of specimens are not primary objectives but are necessary for correct identification. Ensure preservation of what may



become very valuable information. New specific biological information may be important for future risk assessments.

E-15. Entomological Operational Risk Management (ORM) is discussed in detail in USACHPPM TG 288, *Entomological Operational Risk Management*, (<http://chppm-www.apgea.army.mil/documents/TG/TECHGUID/TG288.pdf>).

Although the method of determining risk is slightly different from those associated with Military Exposure Guidelines (MEGs), the results are communicated to the commander in common ORM terminology. Some MEG standard terms are used to communicate consistently in terms more familiar to decision-makers and other medical personnel. For vector control we assign the following relationships:

- **Findings** (facts) – vectors and diseases present.
- **Conclusions** (based on findings) – logical application of facts to current situation, "probability of occurrence".
- **Opinions** (evaluation of potential impact) – What is the "severity of effect." Are troops likely to become ill, how ill will they be, and how long will they be unavailable to the commander for operations?
- **Recommendations** – scientifically defensible, within context of mission.

### Facilities, Buildings, and Structures

E-16. If the opportunity arises to review facility records, look specifically for documents that provide information about processes, raw materials used, intermediate/final products formed, and waste produced. Additionally, review past/present disposal practices. Record all source information in the logbook/PDA.

E-17. Any structures or building interiors that will be occupied by deployed forces must be visually inspected for conditions that may pose health risk. When doing a walk-through inspection, look for items to include: faulty building infrastructure; slip, trip, and fall hazards; hazardous materials used in processes currently or formerly performed within the structure and/or in construction; moisture accumulation from leaks or broken plumbing; pest infestations.

E-18. The inspection must include all common areas (such as lobbies, hallways, utility rooms, etc.) maintenance and repair areas, boiler rooms, and a representative sample of areas that will be routinely occupied. Document your findings with photographs. It is not necessary to look under floors, above ceilings or behind walls unless construction/demolition activities are planned, or when necessary, to identify the source and initiate control of pest infestations.

E-19. Building materials suspected of containing asbestos and/or lead based paint need not be routinely sampled if they are in good condition and the activities of the deployed forces will not disturb the integrity of the suspect materials. If the suspect materials are deteriorated or construction or demolition activities will disrupt the suspect building materials, sampling is appropriate and remedial action is required to minimize potential exposures.

### Industrial Hazard Assessment

E-20. The IHA may be accomplished as a windshield (driving) survey to support security considerations. It is performed to verify the existence and locations of

major industrial facilities in the area of the deployment site that may pose a health risk to deployed forces. Locate all industrial/nuclear facilities, operations, and/or commodities near a deployment site that, if destroyed, damaged, or released could result in health risks to deployed forces. As a minimum, all industrial facilities within a 10-kilometer radius of the deployment site fence line must be identified. Record the position of each facility with a GPS. All nuclear power plants within a 200-mile radius of the deployment site should be identified. If the local area is heavily industrialized and/or the weather or terrain could enhance the transport of an environmental release, the survey distance may need to be increased.

E-21. Identify industrial discharges such as smoke plumes and/or wastewater outfalls (photograph if possible). Attempt to identify and locate any underground storage tanks (USTs) and note their proximity to potable water sources. Record the location of each facility using a GPS and/or describe the distance and direction to the deployment site. Describe hazardous/nuclear material/waste sources, including source types, dimensions and the relative location of all storage containers. If possible, photograph and record all markings or labels on storage containers that may aid in identifying the contents. Estimate the storage volume and describe the condition of the container. If safe to do so, photograph each location for documentation purposes and record each photograph in your logbook/PDA. Record the names of all existing roads, if applicable.

E-22. If large storage volumes of toxic industrial materials (TIMs) (includes biologicals, chemicals, and radiologicals) and/or nuclear power plants are present within the search radii, modeling should be accomplished using the Hazard Prediction and Assessment Capability (HPAC) and the Consequences Assessment Tool Set (CATS) automated software systems. For preventive medicine units deploying without this capability, HPAC/CATS modeling support may be available from the service environmental health centers (USACHPPM, NEHC, and AFIOH), a Defense Threat Reduction Agency (DTRA) detachment, or Navy meteorological detachment deployed in theater.

E-23. Negative determinations are made when complete and/or potentially complete exposure pathways are absent. Upon completion of site reconnaissance, the industrial hazard assessment and interviews, the assessment team should finalize the site map and revise the CSM. If the revised CSM indicates that there are no complete/potentially complete exposure pathways, no further assessment is needed. (Note: Should site conditions or the mission change, re-evaluation of your initial site assessment findings may be required.) Document findings, conclusions, and recommendations, including rationale for any negative determinations in a site report. If complete/potentially complete exposure pathways exist, continue the assessment as dictated by the revised CSM.

E-24. **Environmental Sampling for Chemical Contaminants.** The purpose of environmental sampling is to obtain information about the contaminants present at a site and to what extent they have migrated from the area of initial release. Environmental sampling serves to validate the CSM and provides the information necessary to estimate potential health risks associated with completed exposure pathways by documenting exposure point concentrations. All sampling will be accomplished in accordance with a dynamic, site-specific sampling and analysis plan.

E-25. The sampling and analysis plan defines the locations, type and number of samples that will be taken. The fundamental objective of developing the plan is to ensure that all samples collected are representative of the environmental media under investigation. The sampling and analysis plan need not be a stand-alone document as long as all of the following elements are included in the site report:

- The purpose of sampling and rationale for sampling strategies employed.
- The environmental media to be sampled and the target analytes.
- The sampling equipment and/or direct reading instrumentation that will be used.
- Quality assurance/quality control procedures.
- Decontamination procedures.

E-26. The sampling and analysis plan is based on the CSM, but is dynamic and may change with in-the-field sampling results. All changes made to the sampling and analysis plan should be tracked and documented. Specific sampling procedures, sample submission forms, and sample shipping procedures are discussed in Appendix F.

**E-27. Screening Health Risk Assessments for Chemical Contaminants.** Screening health risk assessments for deployments will be completed within an ORM context using the guidance provided in the USACHPPM Technical Guide 248 (TG-248), *Guide for Deployed Preventive Medicine Personnel on Health Risk Management*. A *deployment* is defined as a land based joint military operation, or major joint training exercise lasting 30 or more continuous days. It involves movement of individual personnel and entire military units to locations where medical support is provided by field tactical/operational (Echelon I/II/III) military treatment elements; and/or where personnel live under semi-permanent or field conditions supported by US or coalition fixed medical treatment facilities. For operations that fall outside this definition, Naval and/or other service specific occupational exposure guidelines will apply.

E-28. TG 230, *Chemical Exposure Guidelines for Deployed Military Personnel*, provides MEGs for chemicals in air, water, and soil applicable to deployment conditions. The MEGs were specifically developed as a tool to characterize health risks associated with the type of exposure conditions likely to be encountered during military deployments. The following conventions apply when using the TG 230:

- If two or more chemicals have the same target organs or systems, then their effects should be considered additive.
- In addition to the potential additive effects of multiple contaminants, military personnel may be exposed to the same contaminants from multiple sources (e.g., air, water, and soil). The effects of exposure to the same or similar chemicals through different media should be considered additive.

E-29. If there is a completed exposure pathway for a chemical that lacks a MEG, contact the USACHPPM Deployment Environmental Surveillance Program Manager at 410-436-6096 (DSN 312-584-6096, FAX 410-436-2407). Provide a courtesy copy of the request to NEHC or AFIOH depending on your service. USACHPPM will work with the appropriate technical experts to establish a site

specific MEG for the chemical of concern and/or establish a risk estimate based on chemicals with similar toxicological properties. For more information on derivation and use of the MEGs consult the USACHPPM TG 230 and TG 248.

**E-30. Screening Health Risk Assessment Procedures.** These procedures include the following five steps:

- (1) Begin with determining exposure point concentrations to compare to the MEG.
  - Environmental monitoring may indicate fluctuations in actual concentrations over time. The MEGs should be compared with the most representative exposure concentration associated with the actual scenario of concern.
  - Averaging exposure levels spatially and temporally is one way to look at data, however, it should be noted that peaks of short duration may have health effects.
  - The user should assess data against all guidelines and durations for initial health risk screening.
  - If any MEG is exceeded, then in most cases that exposure scenario should proceed to Step 2 of the process.
- (2) Determine the probability of occurrence from Table 3-2, Chemical Hazard Probability Ranking Chart for Military Deployments, in the TG 230.
- (3) Determine the severity of effect from Table 3-1, Chemical Hazard Severity Ranking Chart for Military Deployments, of TG 230.
- (4) Risk Characterization:
  - Estimating the Risk: The risk level is estimated using the probability and severity information from TG 230 using Table 3-3, Risk Assessment Matrix.
  - Determine Confidence in Risk Estimate: A confidence level should be assigned to each risk estimate. The degree of confidence will be important when determining possible courses of action. (1) Confidence levels should be simple categories that can be rationally explained (e.g., high, medium, low). (2) The confidence level assigned to a risk estimate should integrate uncertainty associated with each of the elements of the risk assessment. (3) Key areas of uncertainty that should be considered include: sampling or field data quality, actual exposures of field personnel, field unit attributes (e.g., demographics, activity patterns), comparability of standard guideline assumptions (e.g., exposure duration, exposure frequency, and route of exposure) to expected field exposure patterns, expected symptoms of exposure (i.e., hazard severity), including consideration of exposure to multiple hazards, other uncertain/missing information relevant to the process, whether the predicted health outcome is plausible, given weight of evidence or real-world experiences.
- (5) Evaluate risk management and risk communication options. Whenever possible, a variety of management and communications options should be developed to present to the operational commander.

## Site Assessment Reports

E-31. Upon completion of the site assessment, the assessment team must evaluate all information obtained and prepare a written and verbal health risk analysis for the operational commander. To effectively complete the evaluation process, four key elements must be considered: Findings, Conclusions, Opinions, and Recommendations.

E-32. **Findings.** Findings are the facts uncovered during the course of the environmental assessment. All findings concerning environmental conditions that may pose a health risk to deployed forces and/or impact the intended mission must be reported. The commander must make a decision about what to do about environmental conditions at a specific site that could impact the mission and the findings will aid in that decision-making process.

E-33. **Conclusions.** Conclusions are based on the evaluation of the findings. They are determinations that potential health risks to deployed forces and/or potentially mission compromising environmental conditions exist or do not exist at a site. A conclusion can be a determination that no environmental conditions exist that pose health risks or could impact the mission.

E-34. **Opinions.** Opinions are a determination of the potential impacts of existing environmental conditions on the health of deployed forces and/or the mission. They are based on quantitative and qualitative data collected during the site assessment and the screening health risk assessment performed using the TG 230. Opinions assist the commander's risk management decision-making by prioritizing environmental conditions for remedial action.

E-35. **Recommendations.** Recommendations range from taking no action, to continued monitoring or, if the potential risk is severe enough, relocating an encampment site. Providing a commander with a selection of risk reduction options is better than recommending a single risk management strategy. Recommendations should always be formulated in a mission context and supported by scientifically defensible data. A recommended report format outline is shown in Figure E-5, page E-18.

E-36. Archiving environmental data is important and it is necessary to archive negative findings from site assessments as well since the findings (both positive and negative reports) will assist potential future investigations. Send a copy of all completed EHSAs to your respective environmental health centers (NEHC or AFIOH) and to the USACHPPM Deployment Data Archive and Policy Integration Program at [chppm-oehs-data@apg.amedd.army.mil](mailto:chppm-oehs-data@apg.amedd.army.mil) or if it needs to be secure, at [oehsdata@usachppm.army.smil.mil](mailto:oehsdata@usachppm.army.smil.mil).

- |                                     |   |
|-------------------------------------|---|
| <input checked="" type="checkbox"/> | Executive Summary   |
|                                     | <ul style="list-style-type: none"> <li>➤ Prepared in Issue/Point Paper format</li> <li>➤ Included prioritized list of health/mission issues from site assessment</li> <li>➤ Contains a preferred and secondary remedial alternative for each issue</li> </ul>   |
| <input checked="" type="checkbox"/> | Introduction  |
|                                     | <ul style="list-style-type: none"> <li>➤ Purpose</li> <li>➤ Methodology i.e., employed American Society For Testing &amp; Materials protocol for Phase I &amp; II Environmental Site Assessments</li> <li>➤ Limitations of Assessment e.g., time on site, weather conditions, pending laboratory results, etc.</li> </ul>   |
| <input checked="" type="checkbox"/> | Site Description  |
|                                     | <ul style="list-style-type: none"> <li>➤ Location</li> <li>➤ Site and Vicinity characteristics including the physical setting</li> <li>➤ Description of structures, roads, drinking water source, waste disposal, other improvements</li> <li>➤ Current and past uses of property</li> <li>➤ Current and past uses of adjoining properties</li> </ul>   |
| <input checked="" type="checkbox"/> | Information Sources   |
|                                     | <ul style="list-style-type: none"> <li>➤ What pre-deployment information sources were consulted</li> <li>➤ What sources were consulted during site reconnaissance (who did you interview, what records were reviewed, etc.)</li> </ul>  |
| <input checked="" type="checkbox"/> | Information from Site Reconnaissance  |
|                                     | <ul style="list-style-type: none"> <li>➤ Hazardous/unidentified substances present (storage, handling, disposal)</li> <li>➤ Potential radioactive sources present</li> <li>➤ Storage tanks (contents, storage volume, past releases, potential for release)</li> <li>➤ Evidence of other hazardous material use/release</li> <li>➤ Indications of solid waste disposal</li> <li>➤ Migration of hazardous materials release on or off site</li> <li>➤ Presence of friable asbestos</li> <li>➤ Industrial operations in surrounding environs with potential site impacts</li> <li>➤ Site map and photographs</li> <li>➤ Presence of animals</li> <li>➤ Agricultural fields in surrounding area</li> <li>➤ Other environmental pollutants</li> </ul> |
| <input checked="" type="checkbox"/> | Environmental Sampling Data (if done)   |
|                                     | <ul style="list-style-type: none"> <li>➤ Sampling and analysis plan</li> <li>➤ Sample results tables</li> </ul>   |
| <input checked="" type="checkbox"/> | Findings and Conclusions  |
|                                     | <ul style="list-style-type: none"> <li>➤ Detail environmental conditions of health/mission significance</li> <li>➤ Explain completed exposure pathways</li> <li>➤ Explain basis for hazard assessment i.e., USACHPPM TG 230</li> </ul>  |
| <input checked="" type="checkbox"/> | Recommendations   |
|                                     | <ul style="list-style-type: none"> <li>➤ Detail risk reduction options</li> </ul>   |

**Figure E-5. Site Assessment Report Format Outline**

## TECHNICAL SUPPORT CELL

E-37. NEHC, USACCHPM, and AFIOH each provide technical support to deployed preventive medicine elements. The technical support cell includes representatives from Occupational and Environmental Medicine, Industrial Hygiene, Preventive Medicine and Environmental Programs Directorates, and various contractors as well. The technical support cell for NEHC can be activated by contacting the Plans & Operations Directorate at (757) 953-0694 with the after hours contact through the Command Duty Officer at (757) 621-1967. The

USACHPPM POC is the Program Manager, Deployment Environmental Surveillance Program at (410) 436-6096 (DSN 584-6096) ([chppm-ochs-data@apg.amedd.army.mil](mailto:chppm-ochs-data@apg.amedd.army.mil)). The POC for AFIOH is **XXXXXXXXXXXXXXXXXX**.

## Appendix F

# Environmental Sampling

The basic principles and procedures for environmental sampling are essentially the same for all of the services to include both health-related and civil engineer-related sampling. This appendix provides a brief discussion of the general considerations associated with environmental sampling in the areas of soil, water, and ambient air quality. Additionally this appendix provides sample USACHPPM formats and shipping forms associated with the sampling process. Other services may have similar forms. The primary reference for this appendix is USACHPPM Technical Guide (TG) 251, *A Soldier's Guide to Environmental and Occupational Health Field Sampling during Military Deployment*.

### SAMPLING CONSIDERATIONS

F-1. The nature of the media or materials under investigation must be determined before selecting a specific sampling technique or strategy. Materials can generally be classified as homogeneous or heterogeneous. Homogeneous materials are those in which there is no change in the characteristics of the material on the site. Heterogeneous are those in which there are either discrete or continuous changes in the characteristics of the material on the site.

F-2. Collecting samples from a homogeneous material/matrix presents few problems due to the uniformity of the sampling medium. Heterogeneous materials can present a sampling challenge due to their non-uniform nature and the variability as characteristics of the site change over distance. In general, more samples will be required to assess heterogeneous sites than homogeneous sites.

### SAMPLING STRATEGIES

F-3. Implementing an appropriate sampling strategy depends on three essential points: the amount of time available to assess the site, the equipment and/or materials available for sampling, and the amount of information available on the parameters of interest, i.e. time elapsed since the release, spatial distribution of contaminants on the site and the variability of the site itself. The following descriptions of sampling strategies summarize methods for site assessment.

F-4. *Random Sampling* – Random sampling is generally used when there is little information available about the nature and/or distribution of contaminants at a site. It is most effective when the population of available sampling locations is large enough to lend statistical validity to the random selection process.



F-5. *Systematic Sampling* – Systematic sampling involves collecting samples at predetermined, regular intervals. It is the most often used sampling strategy, but care is required to avoid bias. For example, if there is considerable variation in the material to be sampled and/or the terrain at a site and the sampling interval becomes partially phased to this variation, bias results.

F-6. *Stratified Sampling* – Data obtained from site reconnaissance, previous assessments and/or experience with similar sites can be useful in reducing the number of samples needed for assessing potential health risks associated with a site. Stratified sampling essentially involves dividing the site into homogenous sections based on soil type, terrain, etc. The purpose of this approach is to increase the precision of the sampling results.

F-7. *Judgment Sampling* – Judgment sampling is a biased approach used when the intent is only to document the presence of contamination, e.g. sampling only in the immediate area of a suspected or confirmed environmental release. It is often used to document past exposures to deployed service members.

## **SAMPLING EQUIPMENT AND DIRECT READING INSTRUMENTATION**

F-8. The concept of operation for preventive medicine units requires rapid assessment of potential health risks to meet the time constraints faced by operational commanders for risk management decision-making. To that end, state of the art field screening and field analytical instruments will be used to the maximum extent possible for qualitative and quantitative confirmation of the presence of environmental contaminants that could pose a health risk to deployed forces. The decision to collect samples for shipment to out of theater laboratories ultimately lies with the PM Element (division, brigade, special operations, area support medical battalion [ASMB], or detachment) Commander. Some of the factors to be considered include:

- The amount of time available for the assessment.
- The requirement for more detailed chemical analyses not available in the theater.
- Whether the specific chemicals or classes of chemicals of potential concern can be quantified with the available instrumentation.
- Whether the field analytical instrument(s) possess the required sensitivity to yield a result usable for assessing potential impacts to health.

F-9. When necessary to ship samples out of theater for more rigorous analysis, field-screening instruments such as the photo-ionization detector should guide the collection of these samples.

## **ANALYTICAL LABORATORY SUPPORT**

F-10. The laboratory at the USACHPPM in Aberdeen, Maryland (or Landstuhl, Germany) will provide all required laboratory support for preventive medicine units from any service deployed in support of ongoing military operations and/or designated exercises. Other services may also be able to provide these services and support.

F-11. Preparation. Determine shipment options (military airlift or commercial carrier) and departure times as soon as possible after arriving at the site. **RETURN SAMPLES TO:**

USACHPPM  
ATTN: MCHB-TS-LID  
5158 Blackhawk Road, Bldg E2100  
Aberdeen Proving Ground, MD 21010-5403  
Phone 410.436.4336

**OR** the USACHPPM subordinate command at:

USACCPM-Europe  
ATTN: MCHB-AE-LM  
Landstuhl, Germany CMR 402  
APO AE 09180  
Phone 011-49-6371-86-7198

F-12. Verify shipment options and departure times immediately before sampling. Prior to shipping, contact USACHPPM at (410) 436-6096 (DSN 312-584-6096) or by e-mail (at [chppm-oehs-data@amedd.army.mil](mailto:chppm-oehs-data@amedd.army.mil)). They will link you and your shipment with the appropriate Deployment Environment Surveillance Program (DESP) Combatant Commander Manager POC as appropriate.

F-13. Inform the POC of the following information:

- Number and type of samples being shipped.
- Number of coolers shipped.
- Date of shipment.
- Carrier used (Fed Ex, DHL, military airlift).
- Shipper's tracking number for commercial shipments or tracking control number (TCN) (see below) and flight number for military airlift.

F-14. Sample packaging.

- Secure glass containers with bubble wrap or other suitable material.
- Fill voids in shipping container(s) with suitable packing material.
- Chill shipment (freeze bricks or ice). Do not freeze the samples!
- Ensure all field data sheets and other required documents are properly filled out and packed with the samples.
- Seal and label shipping container(s).

F-15. Military airlift shipments. Two forms are required to ship via Military Airlift. The Department of Defense (DD) Form 1384, *Transportation Control and Movement Document*, and DD Form 1387, *Military Shipment Label*.

F-16. Commercial shipments. If commercial shipping is available ship as follows:

- Obtain commercial carrier's International Air Waybill.
- Contact USACHPPM for shipping account information.

## QUALITY ASSURANCE AND QUALITY CONTROL PROCEDURES

F-17. The two primary QA/QC concerns are quality control samples and document control.

F-18. *Quality Assurance Samples* – Quality Assurance samples should be collected periodically in order to ensure the quality of the data being collected. The following lists the types of quality assurance samples (both contained in the USACHPPM water sampling kits) typically used:

- Blank Samples – Blanks are samples of deionized/distilled water, rinses of collection devices or containers, sampling media, etc. that are handled and analyzed in the same manner as environmental samples. They are useful in identifying contamination that occurs during collection, preservation, handling and transport. (Laboratory blanks will be filled by USACHPPM and sent with sampling kits.)
- Duplicates – Duplicates are identical samples collected at the same time, in the same manner and contained, preserved, and transported in the same manner. They are useful in verifying reproducibility.

F-19. *Document Control* – The purpose of document control is to ensure that all project documents are accounted for upon completion of the site assessment. Essential documents include, site maps/drawings, photographs, logbooks, sample forms, sampling and analysis plans, assessment reports, calibrations logs, maintenance records, sample analysis reports, and operator training records. These records need to be readily accessible to defend the scientific rigor of the assessment.

## SOIL SAMPLING

F-20. The purpose of soil sampling during a deployment is to determine the health risks to deployed personnel from exposure to the soil. Soil samples are used to determine the nature and extent of contamination and to identify hazardous substance source areas. With knowledge about the nature and extent of soil contamination, the appropriate measures to mitigate exposures can be implemented. If possible, it may be best to simply avoid the contaminated area rather than using other methods of mitigation. Early identification of contaminated areas in the planning process (especially for those sites identified for base camps and such) is essential to reducing the requirements for mitigation. See Figures F-2 and F-3 on pages F-12 and F-13 for example data sheets.

F-21. Even if the normal turn around time for a standard soil sample analysis is not fast enough for a commander to make an immediate decision using the sample results, ensure that you take all appropriate samples. The duration of stay at a site may still allow the commander to make use of the information later in the deployment, or in the worst case the data will still be available to assist DOD with reconstructing potential past exposures of deployed personnel at that site.

## SYSTEMATIC GRID SAMPLING

F-22. Systematic grid sampling is the most appropriate method used to complete the soil assessment. Systematic grid sampling involves the collection of samples at fixed intervals when contamination is assumed to be

randomly distributed. This method allows for easy location of exact sample locations within each grid.

F-23. Determining the number of samples to collect is the first step in conducting systematic grid sampling. The Table F-1 provides guidance for sample collection at various size sites based on sound statistical principles. The number of samples taken may be modified up or down depending on the tactical situation or the concentration of personnel at a site.

**Table F-1. Appropriate Number of Samples to Collect**

Area to be Sampled (Acres)	Area to be Sampled (Meters <sup>2</sup> )	Number of Samples
2	8100	7
7	28000	15
10+	40500	26
20+	81000	40

F-24. The next step is developing the sample grid. Place a grid pattern over a map of the site. Determine the number of samples required from Table F-1. Number the grids and then use the random number table (Table F-2, page F-7) to select which grid squares to sample.

F-25. A composite sample should be collected within each selected grid to provide representative data. Composite samples within the grid will have the effect of averaging the contaminate concentrations in a grid. Figure F-1 (page F-6) shows two simulated based camps with study grids overlaid. An example using Table F-3 (page F-8) to select the composite sample points follows:

- Overlay a 5x5 grid on area of overall sample grid.
- Select 4-6 areas of the grid overlay to collect sample aliquots using random number table. For this example, the first two digits were used because our example has more than 10 squares, starting in column 1, going down the column vertically. You may choose any column or row when using this table. The numbers are: 96, 03, 22, 63, 55, 81, 06, etc. The numbers highlighted in gray in Table F-3 were the ones selected from the random number table (skipping the numbers that are larger than our sample size of 25.)
- For the next grid to be selected using the random number table, start at the end point for the last grid. Otherwise, the sample points will be the same for every grid sampled.

F-26. After the sample points have been located in this manner, they may have to be moved if they fall within buildings or paved surfaces. If this occurs, move the sampling points a few feet in any direction. If a large area of soil is covered, eliminate that numbered grid and select the next random number to get another grid to sample.

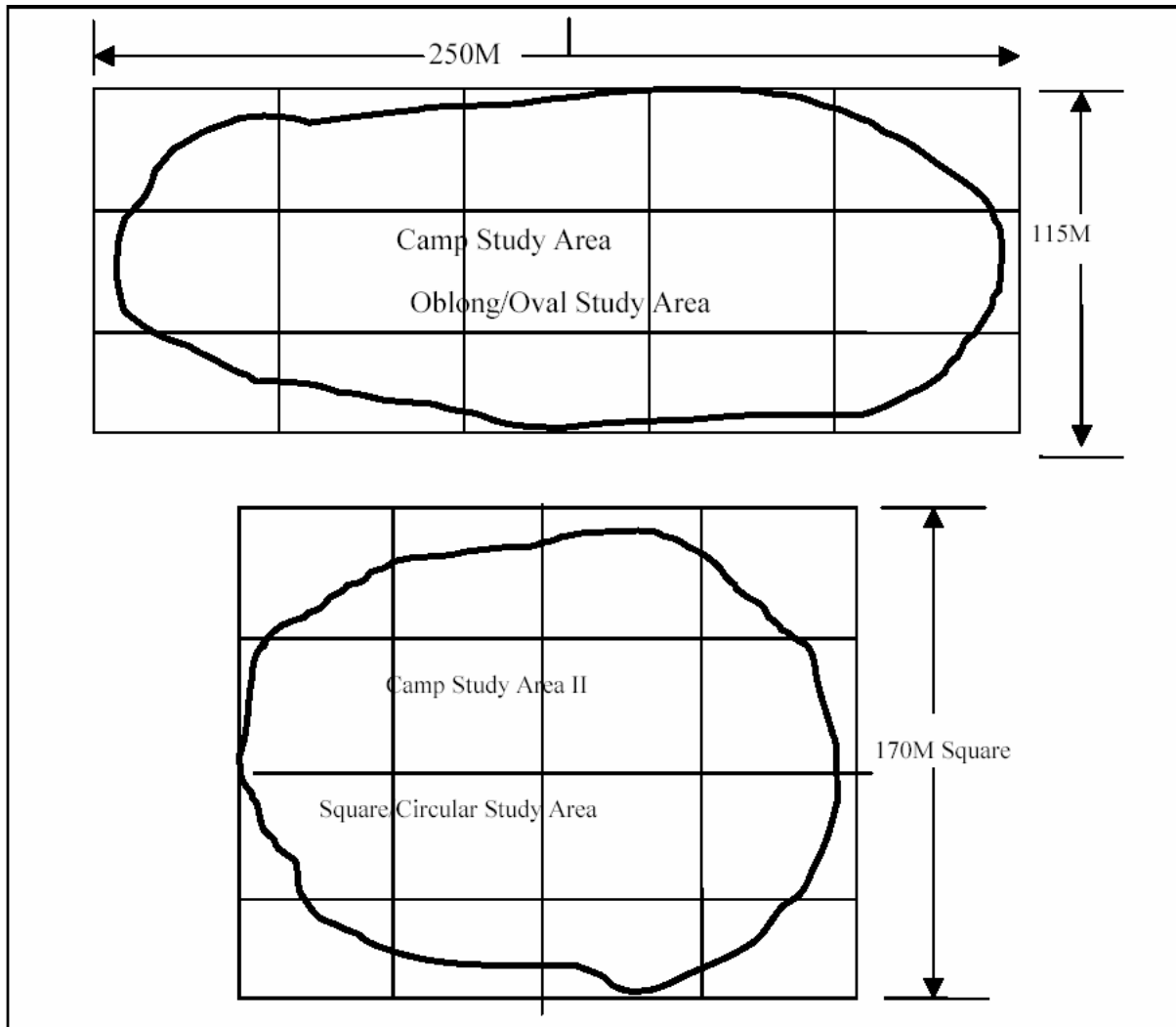


Figure F-1. Grid Overlay for a Hypothetical Base Camp

Table F-2. Random Number Table

	1	2	3	4	5	6	7	8	9	10
1	96268	11860	83699	38631	90045	69696	48572	05917	51905	10052
2	03550	59144	59468	37984	77892	89766	86489	46619	50236	91136
3	22188	81205	99699	84260	19693	36701	43233	62719	53117	71153
4	63759	61429	14043	44095	84746	22018	19014	76781	61086	90216
5	55006	17765	15013	77707	54317	48862	53823	52905	70754	68212
6	81972	45644	12600	01951	72166	52682	37598	11955	73018	23528
7	06344	50136	33122	31794	86723	58037	36065	32190	31367	96007
8	92363	99784	94169	03652	80824	33407	40837	97749	18361	72666
9	96083	16943	89916	55159	62184	86206	09764	20244	88388	98675
10	92993	10747	08985	44999	35785	65036	05933	77378	92339	96151
11	95083	70292	50394	61947	65591	09774	16216	63561	59751	78771
12	77308	60721	96057	86031	83148	34970	30892	53489	44999	18021
13	11913	49624	28519	27311	61586	28576	43092	69971	44220	80410
14	70648	47484	05095	92335	55299	27161	64486	71307	85883	69610
15	92771	99203	37786	81142	44271	36433	31726	74879	89384	76886
16	78816	20975	13043	55921	82774	62745	48338	88348	61211	88074
17	79934	35392	56097	87613	94627	63622	08110	16611	88599	02890
18	64698	83376	87527	36897	17215	74339	69856	43622	22567	11518
19	44212	12995	3581	37618	94851	63020	65348	55857	91742	79508
20	89292	00204	00579	70630	37136	50922	83387	15014	51838	81760
21	08692	87237	87879	01629	72184	33853	95144	67943	19345	03469
22	67927	76855	50702	78555	97442	78809	40575	79714	06201	34576
23	62167	94213	52971	85794	68067	78814	40103	70759	92129	46716
24	45828	45441	74220	84157	23241	49332	23646	09390	13031	51569
25	01164	35307	26526	80335	58090	85871	07205	31749	40571	51755
26	29283	31581	04359	45538	41435	61103	32428	94042	39971	63678
27	19868	49978	81699	84904	50163	22652	07845	71308	00859	87984
28	14292	93587	55960	23159	07370	65065	06580	46285	07884	83928
29	77410	52135	29495	23032	83242	89938	40516	27252	55565	64714
30	36580	6921	35675	81645	60479	71035	99380	59759	42161	93440
31	07780	18093	31258	78156	07871	20369	53977	08534	39433	57216
32	07548	08454	36674	46255	80541	42903	37366	21164	97516	66181
33	22023	60448	69344	44260	90570	01632	21002	24413	04671	05665
34	20827	37210	57797	34660	32510	71558	78228	42304	77197	79168
35	47802	79270	48805	59480	88092	11441	96016	76091	51823	94442
36	76730	86591	18978	25479	77684	88439	34112	26052	57112	91653
37	23439	02903	20935	76297	15290	84688	74002	09467	41111	19194
38	32927	83426	07848	59372	44422	53372	27823	25417	27150	21750
39	51484	05286	77103	47284	00578	88774	15293	50740	07932	87633
40	45142	96804	92834	26886	70002	96641	36008	02239	91563	66423

**Table F-3. Selecting Sample Point in a Single Area of Grid**

1	6	11	16	21
2	7	12	17	22
3	8	13	18	23
4	9	14	19	24
5	10	15	20	25

Note: For instructions on how to apply this table, see the instructions in paragraph F-25

F-27. Other than sampling for volatile organic compounds (VOCs), all samples collected during the soil assessment should be composite samples collected from areas where service members are living and working. Generally, only surface soil samples (from 0-6 inches) will be collected. If there is advanced knowledge of subsurface excavation that is going to be conducted, shallow subsurface samples to a depth of 5 or 6 feet can be collected using the procedure below. If excavation work is ongoing, samples may be collected from the bottom and/or sides of the excavation.

**SOIL SAMPLE COLLECTION PROCEDURES**

F-28. There are six basic actions in the procedure for soil sample collection. They are:

- Determine the extent of the sampling effort, the sampling methods to be employed.
- Consider specific site factors, including extent and nature of contaminant, when selecting sample locations. If required, the proposed locations may be adjusted based on site access, property boundaries, and surface obstructions. If there is a possibility that underground utilities are present, clearance should always be confirmed before beginning work. Record the location of each sample with GPS. (If buried unexploded ordnance is a potential issue in your AO, contact explosive ordnance disposal/detection [EOD] to clear soil sampling sites prior to sampling.)
- Use the DESP Backpack Sampling Kit (national stock number [NSN] 6545-00-949-4000) developed by USACHPPM for the vast majority of soil sampling needs. Follow the instructions for collecting and packing surface soil samples provided with the backpack sampling kit.
- Sampling at depth with augers and/or thin wall tube samplers. This system consists of an auger, or a thin-wall tube sampler, a series of extensions, and a "T" handle. The auger is used to bore a hole to a desired sampling depth, and is then withdrawn. The sample may be



collected directly from the auger. If a core sample is to be collected, the auger tip is then replaced with a thin wall tube sampler. The system is then lowered down the borehole, and driven into the soil to the completion depth. The system is withdrawn and the core is collected from the thin wall tube sampler.

## WATER SAMPLING

F-29. Sampling situations vary widely; therefore, no universal sampling procedure can be recommended. However, streams, rivers, lakes, ponds, lagoons, surface impoundments, groundwater, and treated water are generally sampled using either a direct method or dip sampler technique. Procedures for screening potential sources of potable water and certifying potable water sources can be found in Appendix G. See Figures F-4 and F-5 on pages F-14 and F-15 for example data sheets.

F-30. The procedures associated with water sampling are listed below. The preparation includes the first four steps of the procedure.

- (Step 1) Determine the extent of the sampling effort, the sampling methods to be employed.
- (Step 2) Obtain the necessary sampling and monitoring equipment.
- (Step 3) Record the sampling location(s) with a GPS.

F-31. (Step 4) Use the DESP Backpack Sampling Kit developed by USACHPPM for the vast majority of water sampling needs. Follow the instructions for collecting and packing water samples provided in the backpack sampling kit. The information in the next paragraph is intended to augment procedures provided with the backpack sampling kits.

F-32. Sample collection can be either by the direct method or the dip sampler method.

- Direct Method: For streams, rivers, lakes, and other surface waters, the direct method may be used to collect water samples from the surface directly into the sample bottle. This method is not to be used for sampling lagoons or other impoundments where contact with contaminants is a concern. Using adequate protective clothing, gain access to the sampling location by appropriate means. For shallow streams, collect the sample under the water surface while pointing the sample container upstream; the container must be upstream of the collector. Avoid disturbing the substrate. For lakes and other impoundments, collect the sample under the water surface avoiding surface debris and the boat wake (if a boat is used). When using the direct method, do not use pre-preserved sample bottles as the collection method may dilute the concentration of preservatives that are in the sample container.
- Dip Sampler: A dip sampler is useful in situations where a sample is to be recovered from an outfall pipe or along a lagoon bank where direct access is limited. The long handle on such a device allows access from a safe location. Sampling procedures are as follow:
  - Assemble the device in accordance with the manufacturer's instructions.



- Extend the device to the sample location and collect the sample by dipping the sampler into the substance.
- Retrieve the sampler and transfer the sample to the appropriate sample container.
- Clean the sampler between samplings (Triple rinse the dip sampler with the sample water prior to taking the actual sample.)

F-33. The sample collection includes the last two steps of the procedure.

- Record the date, time, location, sample type, media sampled, a discrete sample number, etc. for each sample on the Field Data Sheet.
- Enter the (approximate) location of each sample on the site map.

## AMBIENT QIR QUALITY SAMPLING

F-34. The purpose of ambient air quality sampling is to determine the concentration of particles in the air that can cause breathing problems in deployed personnel, especially in restricted or confined areas. The technical characteristics of air sampling are found in USACHPPM TG 251 (available at <http://chppm-www.apgea.army.mil/tg.htm>). This sampling discussion is focused on the use of the MiniVol™ Portable Air Sampler although there are other potential tools available for sampling. See for Figures F-6 through F-9 on pages F-16 through F-19 for example data sheets.

## PARTICULATE SAMPLING

F-35. The MiniVol™ Portable Air Sampler can be configured to collect PM<sub>2.5</sub>, PM<sub>10</sub>, or total suspended particles (TSP) samples – but only one type at a time.

F-36. The MiniVol's pump draws air at 5 liters/minute through a particle size separator (impactor) and then through a 47mm filter. The 10 micron or 2.5 micron particle separation is achieved by impaction. A TSP sample can be collected by removing the impactor(s). Gas samples can be taken simultaneously with particulate matter samples.

F-37. The particulate sample is caught on the filter, which must be weighed pre- and post-exposure with a microbalance accurate to one microgram. The USACHPPM provides pre-weighed filters and post sampling weighing and chemical analysis. Sampling results are reported in micrograms/cubic meter. Coordinate with USACHPPM before deployment to make sure you have a sufficient supply of pre-weighed filters to take with you.

F-38. The battery can power the sampler for 24 hours of continuous sampling before the battery pack must be exchanged for a freshly charged one.

F-39. The MiniVol flow rate must be established for each sampling project using the MiniFlo transfer standard. This calibration ensures that the sampler has an ambient flow rate of 5 liters per minute and that there is consistent performance of the inertial size separator. The calibration accounts for the differing air temperatures and atmospheric pressures due to elevation and seasonal changes.

F-40. The actual ambient temperature and barometric pressure must be measured or obtained locally. The USACHPPM soil sampling backpack contains a thermometer/barometer useful for this purpose.

## **GAS SAMPLING**

F-41. When used for gas sampling the MiniVol pumps air into six-liter Tedlar bags over a predetermined length of time. The bags are contained within collection canisters arranged on either side of the sampler, hanging from a common 24" bale.

F-42. The MiniVol uses an adjustable pulse circuit that allows the operator to set a sampling rate over a specified time period, up to 24 hours. One or both bags can be filled during a sampling run, and particulate matter samples can be collected simultaneously.

F-43. To reduce the effective flow rate low enough to permit two 6-liter bags to fill in about 16 hours, the MiniVol is equipped with a tunable intervalometer circuit and a sequencing valve. The intervalometer is programmed to direct pulses of gas to the canisters and can be adjusted for frequency (from one to fifteen seconds) and duration (from 50 to 750 milliseconds), allowing for sample collection over minutes or hours.

## **FORMS RELATED TO SAMPLING**

F-44. The following graphics (F-2 through F-9, pages F-12 through F-19) present examples of the sampling related USACPPM data (for soil, water, and air sampling) and shipping forms that are not already available as DD forms. Figures F-10, page F-20 and F-11, page F-21, provide a sample TSCA Certification form and guidance on how to fill it out.

USACHPPM-DESP		SOIL-FDS-V2.0																			
<b>Soil Sampling Field Data Sheet</b>																					
<b>Section I - Administrative Data</b>																					
1. Sample ID*:	6. Sampling Date*:	9. Percent of personnel exposed**																			
2. Location:	7. Sampling Time*:																				
3. Country:	8. Length of Stay*: < 2 weeks / < 6 months / < 1 year / > 1 year (Select One)																				
4. Operation:	10. Exposure Notes*																				
5. Collecting Unit*:																					
<b>Section II - Field Data</b>																					
11. Collectors Name*:		14. Sample Type*: Surface / Sub-Surface (Select One)																			
12. Collectors Phone No*:		15. Collection Type*: Composite / Discrete (Select One)																			
13. Temperature (oC)*:	16. Weather Conditions*:																				
17. Field Notes* (Location Description / Current Uses / Potential Contamination):																					
18. Potential Exposure to soil*: <input type="checkbox"/> HIGH: fighting position, maintenance area, PT area, excavating, filling sandbags, etc (Check One) <input type="checkbox"/> MEDIUM: walking area, common areas, grassy athletic fields, etc <input type="checkbox"/> LOW: non traffic areas, restricted areas, etc																					
19. Sampling Site Graphic and MGRS Corners**:  MGRS Corner locations of sampling area  1. _____ 2. _____          3. _____ 4. _____		20. Single Area of Grid Graphic**  Area designation from sample area _____  <div style="border: 1px solid black; width: 100%; height: 100%; margin-bottom: 5px;"></div> Shade in composite sample locations  <table border="1" style="width: 100%; border-collapse: collapse; font-size: x-small;"> <thead> <tr> <th style="width: 50%;">Location Number</th> <th style="width: 50%;">MGRS</th> </tr> </thead> <tbody> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> </tbody> </table>		Location Number	MGRS																
Location Number	MGRS																				
* Required Fields		12-Jan-03																			
** Graphic required if sample is part of systematic area samplin																					

Figure F-2. Soil Sampling Field Data Sheet

CHPPM-DESP

*Bold Items are required entries*

## SOIL SAMPLING FIELD DATA SHEET INSTRUCTIONS

## -----SECTION I - ADMINISTRATIVE DATA-----

1. **Sample ID** - Sample ID number CCC\_LLL\_MMM\_YYDDD  
Where: CCC – Country 3 letter abbreviation code  
LLL - Camp abbreviation (i.e. first three letters of camp name)  
MMM - Soil sample number for that camp on that particular day (e.g. 01S, 02S, 03S, etc)  
YYDDD - jday code, last two digits of the year & three digit julian day of the year [e.g 03015 for 15-Jan-2003].
2. Location – Camp or location of sample
3. Country – Country in which location or camp is located.
4. Operation – Name of operation ongoing in the area of the sample [e.g. Operation Allied Force (OAF), etc] if applicable
5. **Collecting Unit** - Unit collecting the sample (e.g. TAML, 71<sup>st</sup> MEDDET, etc).
6. **Sampling Date** – Date sample was collected (e.g. 15-Jan-2003)
7. **Sampling Time** – Time sample was taken (e.g. 16:00)
8. **Length of Stay** – How long are troops expected to stay at the location where the sampling was conducted?
9. **Percent of Personnel Exposed** – What percentage of troop at the site could be exposed to the water source?
10. **Exposure Notes** – Any notes or comments associated with troop exposure to the sample.

## -----SECTION II - FIELD DATA-----

*Note: The Sample ID, Sampling Date, Sampling Time, Collectors Name, and MGRS (if applicable) should also be recorded on the sample label.*

11. **Collectors Name** – The name of the person collecting the sample.
12. **Collectors Phone No** - The phone number of the person collecting the sample.
13. **Temperature** – Temperature of soil, if known in degrees Celsius.
14. **Soil Sample Type:**  
Surface – Soil sample taken within 6 inches of the surface  
Sub-surface – Soil sample taken below 6 inches of surface
15. **Collection Type:**  
Composite – Soil sample taken from several locations and consolidated into one sample  
Discrete – Soil sample taken from one unique location.
16. **Weather Conditions** – weather conditions at the time of sampling.
17. **Field Notes** - Notes relating to sampling episode (e.g. Location description, current uses, potential contamination)
18. **Potential Exposure to Soil** – Troops potential exposure to soil; High, Medium or Low. (Check One)  
HIGH: fighting position, maintenance area, PT area, excavating, filling sandbags, etc  
MEDIUM: walking area, common areas, grassy athletic fields, etc  
LOW: non traffic areas, restricted areas, etc
19. **Sampling Site Graphic and MGRS Corners** –  
Record location of sampling site corners and graphic showing site grid with sub-area numbers.  
If site is a discrete sample site of contamination, show sketch of site and MGRS location of sample
20. **Single Area of Grid Graphic** – Required if sample is part of an area site grid. Sub-area sketch with sub-grid and MGRS locations of composite sample locations.

\*MGRS – Location in Military Grid Reference System (MGRS) from GPS, ten-digit grid with grid square identifier (e.g. 34TEN1234567890)

12-Jan-03

Soil\_Datasheet\_instructions\_V2.0

Figure F-3. Soil Sampling Field Data Sheet Instructions

<i>USACHPPM-DESP</i>		<i>PW-FDS-V1.2</i>	
<b>Potable Water Sampling Field Data Sheet</b>			
<b>Section I - Administrative Data</b>			
1. Sample ID*:	6. Sampling Date*:	9. Percent of personnel exposed?*	
2. Location:	7. Sampling Time*:		
3. Country:	8. Length of Stay*: <2 weeks / <6 months / <1 year / >1 year <small>Select One</small>		
4. Operation:	10. Exposure Notes*		
5. Collecting Unit*:			
<b>Section II - Field Data</b>			
11. Collectors Name*:		15. Water Use*: (Select One, if non-drinking see 15a) Drinking / Non-Drinking	
12. Collectors Phone No*:		15a. Non-Drinking uses (Select all that apply, and/or add others.) Personal Hygeine, Cooking, _____, _____	
13. Water Source*: (Select One) Source / Treated / Distribution System		16. Is this the primary drinking water?* (Select One) Yes / No	
14. Water Type*: (Select One) RWW / RS / ROWPU / T/WC / WT / WB / DS / FD		17. Estimated Consumption Rate (liters per day)* (Select One) less than 5 / between 5 & 15 / greater than 15	
18. Initial pH:		21. Turbidity: <span style="float: right;"><i>NTU</i></span>	
19. Water Temperature: <span style="float: right;"><i>oC</i></span>		22. Free Available Chlorine <span style="float: right;"><i>mg/L</i></span>	
20. Conductivity: <span style="float: right;"><i>mV</i></span>		23. Total Dissolved Solids <span style="float: right;"><i>mg/L</i></span>	
<i>GEOLOCATION</i>	<i>Decimal Degrees</i>	<i>OR</i>	26. MGRS*:
24. Latitude*:			
25. Longitude*:			27. Datum*:
28. Field Notes*:			
29. Sampling Site Graphic			
* Required Fields			12-Jan-03

Figure F-4. Potable Water Sampling Field Data Sheet

*CHPPM-DESP* *Bold Items are required entries*

## POTABLE WATER SAMPLING FIELD DATA SHEET INSTRUCTIONS

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-----SECTION I - ADMINISTRATIVE DATA-----

1. **Sample ID** - Sample ID number CCC\_LLL\_MMM\_YYDDD  
 Where: CCC – Country 3 letter abbreviation code  
 LLL - Camp abbreviation (i.e. first three letters of camp name)  
 MMM - Water sample number for that camp on that particular day (e.g. 01W, 02W, 03W, etc)  
 YYDDD - jday code, last two digits of the year & three digit julian day of the year [e.g 03015 for 15-Jan-2003].
2. **Location** – Camp or location of sample
3. **Country** – Country in which location or camp is located.
4. **Operation** – Name of operation ongoing in the area of the sample [e.g. Operation Allied Force (OAF), etc] if applicable
5. **Collecting Unit** - Unit collecting the sample (e.g. TAML, 71<sup>st</sup> MEDDET, etc).
6. **Sampling Date** – Date sample was collected (e.g. 15-Jan-2003)
7. **Sampling Time** – Time sample was taken (e.g. 16:00)
8. **Length of Stay** – How long are troops expected to stay at the location where the sampling was conducted?
9. **Percent of Personnel Exposed** – What percentage of troop at the site could be exposed to the water source?
10. **Exposure Notes** – Any notes or comments associated with troop exposure to the sample.

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-----SECTION II - FIELD DATA-----

*Note: The Sample ID, Sampling Date, and Sampling Time at minimum should also be recorded on the sample label.*

11. **Collectors Name** – The name of the person collecting the sample.
12. **Collectors Phone No** - The phone number of the person collecting the sample.
13. **Water Source:**  
 Source Water - Raw water before treatment  
 Treated Water - Collected after the water passes through a typical type of treatment such as a ROWPU  
 Distribution System - Collected at representative points in the distribution system
14. **Water Type:**  

<b>RWW</b> - Raw Well Water	<b>RS</b> - Raw Surface	<b>ROWPU</b> – Reverse Osmosis Water Purification Unit
<b>T</b> – Tap	<b>WC</b> - Water Coolers	<b>WT</b> – Water Tanker
<b>WB</b> – Water Blivet	<b>DS</b> - Distribution System	<b>FD</b> - First Draw
15. **Water Use** – Is water used for drinking or non-drinking? (Select one, if non-drinking see 15a)  
 15a. Non-Drinking Uses – What are other uses of water? (e.g. Personal hygiene, Cooking, other)
16. **Is this the primary drinking water?** – Is the source tested the primary drinking water? Yes / No (Circle One)
17. **Estimated Consumption Rate (liters per day)** – Less than 5, Between 5 and 15, greater than 15? (Circle One)
18. **Initial pH** – The initial pH of the water before the sample is taken or before preservatives are added, if known
19. **Water Temperature** – The initial ambient temperature of the water being sampled, if known
20. **Conductivity** – The initial conductivity of the water being sampled, if known
21. **Turbidity** – The initial turbidity of the water being sampled, if known
22. **Free available chlorine** – The initial free-available chlorine (FAC) of the water being sample, if known
23. **Total dissolved solids** – The initial total-dissolved-solids (TDS) of the water being sampled, if known
24. **Latitude** – Sample latitude location in decimal degrees [from GPS]
25. **Longitude** – Sample longitude location in decimal degrees [from GPS]
26. **MGRS** – Location in Military Grid Reference System (MGRS) from GPS, ten digit grid with grid square identifier (e.g. 34TEN1234567890)
27. **Datum:** Datum from map or GPS used (e.g. WGS84, etc)
28. **Field Notes** - Notes relating to sampling episode (e.g. unusual circumstance, weather, potential pollution sources, etc)
29. **Sampling Site Graphic** – Any graphical or pictorial description of the sampling site. May include a digital picture of the sampling site once sample is processed.

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*12-Jan-03* *Water\_Datasheet\_instructions\_V2.0*

Figure F-5. Potable Water Sampling Field Data Sheet Instruction

## Air - PM10 Low Volume Field Data Sheet

### Section I - Administrative Data

1. Sample ID*:	6. Sampling Date*:	9. Percent of personnel exposed?*
2. Location:	7. Sampling Time*:	
3. Country:	8. Length of Stay*: < 2 weeks / < 6 months / < 1 year / > 1 year <small>(Select One)</small>	
4. Operation:	10. Exposure Notes*	
5. Collecting Unit*:		

### Section II - Field Data

11. Filter No*:	15. Collectors Name*	18. Battery ID*:
12. Filter Type:	16. Collectors Phone*:	19. Blank?: No / FB / TB / LB <small>(Select One)</small>
13. Holder ID*:	17. Unit Type:	20. Invalid Sample?:
14. Sampler ID*:	21. Flow Meter Used*: Unit Flow Meter / Gilibrator / Calibration Manometer <small>(Select One)</small>	
22. Flow Calibrator ID*:	25. Calibration Target Flow (H): inches of H2O	
23. Slope (m):	$\Delta H = \left( \frac{5.0 - b}{m} \right)^2 * \left( \frac{P_{amb}}{T_{amb}} \right)$ Where: Pamb = Ambient pressure in mm of Hg (1 inch Hg = 25.4 mm Hg) Tamb = Ambient temp in degrees K (oK = oC + 273)	
24. Intercept (b):		

SAMPLER DATA	Start/Pre	End/Post	Average
26. Date*:			
27. Time*:			
28. Ambient Temperature (oC)*:			
29. Ambient Pressure (inHg)*:			
30. Flow Calibration (in H2O)*:			
31. Elapsed Time Reading (hrs)*:			

32. Is industry surrounding location?* <small>(Select One)</small> Yes / No / Not Known	34. Type of industry, if present*?
33. If industry is present is it active?* <small>(Select One)</small> Yes / No / Not Known	

<b>GEOLOCATION</b>	<b>Decimal Degrees</b>	<b>OR</b>	37. MGRS*:
35. Latitude*:			
36. Longitude*:			38. Datum*:

39. Field Notes\*:

\* Required Fields

**Figure F-6. PM<sub>10</sub> Low Volume Field Data Sheet**

<i>CHPPM-DESP</i>	<i>Bold Items are required entries</i>
<b>AIR – PM10 LOW-VOLUME SAMPLING FIELD DATA SHEET INSTRUCTIONS</b>	
-----SECTION I - ADMINISTRATIVE DATA -----	
1. <b>Sample ID</b> - Sample ID number CCC_LLL_MMMM_YYDDD_ZZ Where: CCC – Country 3 letter abbreviation code LLL - Camp abbreviation (i.e. first three letters of camp name) MMMM - Method type (e.g. PM10) YYDDD - jday code, last two digits of the year & three digit julian day of the year [e.g 03015 for 15-Jan-2003]. ZZ – Sample type: <b>P</b> – Primary sample; <b>C</b> – Collocated sample; <b>FB</b> – Field Blank	
2. <b>Location</b> – Name of camp or location of sample.	
3. <b>Country</b> – Name of country in which location or camp is located.	
4. <b>Operation</b> – Name of operation ongoing in the area of the sample [e.g. Operation Allied Force (OAF), etc] if applicable	
5. <b>Collecting Unit</b> - Unit collecting the sample (e.g. TAML, 71 <sup>st</sup> MEDDET, etc).	
6. <b>Sampling Date</b> – Date sample was collected (e.g. 15-Jan-2003)	
7. <b>Sampling Time</b> – Time sample was taken (e.g. 16:00)	
8. <b>Length of Stay</b> – How long are troops expected to stay at the location where the sampling was conducted?	
9. <b>Percent of Personnel Exposed</b> – What percentage of troop at the site could be exposed to the water source?	
10. <b>Exposure Notes</b> – Any notes or comments associated with troop exposure to the sample.	
----- SECTION II - FIELD DATA -----	
11. <b>Filter No</b> - The filter ID number that will be on the filter cassette. (e.g. 47-03-001)	
12. <b>Filter Type</b> - <b>TF</b> – Teflon; <b>QM</b> – Quartz; <b>GF</b> – Glass fiber; <b>CE</b> – Cellulose ester	
13. <b>Holder ID</b> - The ID associated with the filter holder assembly	
14. <b>Sampler ID</b> - The serial number off the top of the sampler (e.g. 1884) or "FB if filter is a field blank	
15. <b>PM Type</b> – PM10 - Particulate matter less than 10 microns (DEFAULT CHOICE) TSP - Total Suspended Particulate PM25 - Particulate matter less than 2.5 microns	
16. <b>Collectors Name</b> - Name of the person operating the sampler.	
17. <b>Unit Type</b> – Type of sampling unit (e.g. Airmetrics, etc )	
18. <b>Battery ID</b> - The battery number (BATT #) off the top of the battery used (e.g. 97-421) or "FB" if filter is a field blank	
19. <b>Blank</b> - Is the sample a QA/QC blank, if it is what type? (Circle appropriate one) <b>NO</b> – not a blank (DEFAULT CHOICE) <b>WB</b> – weighing blank <b>FB</b> – field blank <b>LB</b> – lab blank	
20. <b>Invalid Sample</b> - Is the sample invalid, if so why? (Select appropriate code) NO - Sample is valid (DEFAULT CHOICE) M – Missing Field Data – e.g. sample time, flow rates, etc B – Battery Failure – battery failed during sampling episode. F – Flow Differential –pre and post flow calibrations deviation was greater than 10% T – Timer Malfunction –pump timer failed. S – Sample Malfunction –other part of sampler failed, e.g. tubing, etc D – Damage Sampling Media – filter was damage during shipment or sampling episode	
21. <b>Flow Meter Used</b> - Indicate which meter was used to determine flow. (Circle One)	
22. <b>Flow Calibrator ID</b> – ID of Mini-Flow calibrator (e.g. MNF 0023) or Gilibrator SN if used to obtain flow rate	
23. <b>Slope (m)</b> – Slope from Mini-Flow Calibrator.	
24. <b>Intercept (b)</b> – Intercept from Mini-Flow Calibrator	
25. <b>Calibration Target Flow (ΔH)</b> – Target flow for Mini-Flow Calibrator Manometer in inches of water calculated using the associated equation.	
26. <b>Date</b> - Date which the sampling episode was started and ended - DD MON YR - (e.g. 15 Jan 03)	
27. <b>Time</b> - Time which the sampling episode was started and ended in a 24 hour standard format	
28. <b>Ambient Temperature</b> - Ambient Temp in degrees Celsius from thermometer at the start and end of the sampling episode	
29. <b>Ambient Pressure</b> - Ambient Pressure in inches Hg from barometer at the start and end of the sampling episode	
30. <b>Flow Calibration (in H2O)</b> – Mini-Flow calibration reading off of digital manometer attached to calibration office in inches of water.	
31. <b>Elapsed Time reading</b> –Elapsed Time Reading in hours from sampler at the start and end of the sampling episode	
32. <b>Is Industry around sampling location?</b> Yes, No, Not Know (Select One) if yes, go to 33 and 34.	
33. <b>If Industry is present is it active?</b> Yes, No, Not Know (Select One)	
34. <b>Type of industry present.</b> (e.g. petroleum, manufacturing, power production, etc)	
35. <b>Latitude</b> – Sample latitude location in decimal degrees [from GPS]	
36. <b>Longitude</b> – Sample longitude location in decimal degrees [from GPS]	
37. <b>MGRS</b> – Location in MGRS from GPS, ten digit grid with grid square identifier (e.g. 34TEN1234567890)	
38. <b>Datum:</b> Datum from map or GPS used (e.g. WGS84, etc)	
39. <b>Field Notes</b> - Notes relating to sampling episode (e.g. unusual circumstance, weather, potential pollution sources, etc)	
<i>12-Jan-03</i>	<i>Air_PM_LV_Datasheet_instructions_V2.0</i>

Figure F-7. PM<sub>10</sub> Low Volume Sampling Field Data Sheet Instructions



## Air - TO-17 Field Data Sheet

<i>Section I - Administrative Data</i>		
1. Sample ID*:	7. Collecting Unit*:	11. Lab ID:
2. Location:	8. Unit Spec ID:	12. Job No:
3. Country:	9. Mission ID:	13. Project No:
4. Operation:	10. Shipping ID:	14. Europe ID:
5. Sampling Date*:	15. Sample Notes:	
6. Sampling Time*:		
<i>Section II - Calibration Data</i>		
16. Calibration Location*:	20. Pump ID*:	
17. Calibrator ID*:	21. Flow Rate Pre*:	cc/min
18. Calibration Operator*:	22. Flow Rate Post*:	cc/min
19. Calibration Date*:	23. Flow Rate Average:	cc/min
25. Calibration Notes:	24. Range: $\text{Range} = \frac{\text{Flow Rate Pre} - \text{Flow Rate Post}}{\text{Flow Rate Post}} \times 100$	
<i>Section III - Field Data</i>		
26. Collectors Name*:	29. VOC Type: S / FB / TB <small>(Circle One)</small>	32. Invalid Sample?:
27. Collectors Phone No*:	30. VOC Method:	33. Rain (Yes/No)?:
28. Field Blank ID*:	31. Tube ID*:	
<i>SAMPLER DATA</i>	<i>Start</i>	<i>End</i>
34. Date*:		
35. Time*:		
36. Sample Time: <i>min</i>	37. Sample Volume : <i>Liters</i> <small>[=(Sample Time * Flow Rate Average) / 1000]</small>	
<i>GEOLOCATION</i>	<i>Decimal Degrees</i>	<i>OR</i>
38. Latitude*:		
39. Longitude*:		
40. MGRS*:		
41. Field Notes*:		

\* Required Fields

22-Oct-02

Figure F-8. TO-17 Field Data Sheet

<i>CHPPM-DESP</i>	<b><i>Bold Items are required entries</i></b>
<b>AIR – TO17 SAMPLING FIELD DATA SHEET INSTRUCTIONS</b>	
-----SECTION I - ADMINISTRATIVE DATA-----	
<p>1. <b>Sample ID</b> - Sample ID number CCC_LLL_MMMM_YYDDD_ZZ  Where: CCC – Country 3 letter abbreviation code  LLL - Camp abbreviation (i.e. first three letters of camp name)  MMMM - Method type (e.g. TO17)  YYDDD - jday code, last two digits of the year &amp; three digit julian day of the year [e.g 02001 for 1-Jan-2002].  ZZ – Sample type: <b>P</b> – Primary sample; <b>C</b> – Collocated sample; <b>FB</b> – Field Blank; <b>TB</b> – Trip Blank</p> <p>2. Location – Camp or location of sample.  3. Country – Country in which location or camp is located.  4. Operation – Name of operation ongoing in the area of the sample [e.g. Operation Allied Force (OAF), etc] if applicable  5. <b>Sampling Date</b> – Date sample was collected (e.g. 01-Jan-2002)  6. <b>Sampling Time</b> – Time sample was taken (e.g. 16:00)  7. <b>Collecting Unit</b> - Unit collecting the sample (e.g. TAML, 71<sup>st</sup> MEDDET, etc).  8. Unit Spec ID – Unit specific ID associated with the sample if any.  9. Mission ID – Unit mission ID associated with the sample if any.  10. Shipping ID – Shipping ID associated with sample (e.g. Fedex tracking number)  11. Lab ID – Unique ID number assigned at CHPPM-Main laboratory, if applicable.  12. Job No. – Job number assigned at laboratory.  13. Project No. – Project number assigned by laboratory or project officer.  14. Europe ID - Unique ID number assigned at CHPPM-Europe laboratory, if applicable.  15. <b>Sampling Notes</b> – Any notes or comments associated with the sample (e.g. short holding time, unusual circumstances, etc).</p>	
-----SECTION II - CALIBRATION DATA-----	
<p>16. <b>Calibration Location</b> - Camp or location samplers were calibrated.  17. <b>Calibrator ID</b> - Identification number of calibrator (e.g. serial number).  18. <b>Calibration Operator</b> - Operator of calibration equipment.  19. <b>Calibration Date</b> – Date of calibration  20. <b>Pump ID</b> - Pump ID number, either MMCN number or serial number.  21. <b>Flow Rate Pre (cc/min)</b> – Pre-sampling calibration sampler flow rate.  22. <b>Flow Rate Post (cc/min)</b> – Post-sampling calibration sampler flow rate.  23. Average Flow Rate (cc/min) (<i>Calculated</i>) - [Average = (Flow Rate Pre + Flow Rate Post)/2]  24. Range (<i>Calculated</i>) – [Range = (Flow Rate Pre - Flow Rate Post) / Flow Rate Post]*100]  25. Calibration Notes – Notes relating to calibration (e.g. unusual circumstance, etc)</p>	
-----SECTION III - FIELD DATA-----	
<p>[Note: The Sample ID, Pump ID, Start Date and Tube ID (if present on tube) should also be recorded on the sample label.]</p> <p>26. <b>Collectors Name</b> – The name of the person collecting the sample.  27. <b>Collectors Phone No</b> - The phone number of the person collecting the sample.  28. <b>Field Blank ID</b> – ID of field blank associated with the particular sample. For a field blank sample this entry would be blank.  29. VOC Type: <b>S</b> – Sample; <b>FB</b> – Field Blank; <b>TB</b> – Trip Blank  30. VOC Method - Method (e.g. TO1, TO17, DAAMS)  31. Tube ID – Unique ID on tube, or tube ID (e.g. C3025) on shipping container.  32. <b>Invalid Sample</b> – Was the sample determined to be invalid? If so, why?  No – Sample is valid (<i>default if entry is left blank</i>)  M – Missing Field Data – e.g. sample time, flow rates, etc  B – Battery Failure – battery failed during sampling episode.  F – Flow Differential –pre and post flow calibrations deviation was greater than 10%  T – Timer Malfunction –pump timer failed.  S – Sample Malfunction –other part of sampler failed, e.g. tubing, etc  D – Damage Sampling Media – sampling media was damage during shipment or sampling episode.  33. Rain (Yes/No)? - Indicate whether or not it rained at the sample location during the sampling episode.  34. <b>Date</b> - Date which the sampling episode was started and ended - DD MON YR - (e.g. 01 Jan 99)  35. <b>Time</b> - Time which the sampling episode was started and ended in military time  36. <b>Sample Time</b> – Time pump ran in minutes, from the pump's LCD at the end of the sampling episode.  37. Sample Volume (liters) (<i>Calculated</i>) – [Volume = (Sample Time * Average Flow Rate) / 1000]  38. <b>Latitude</b> – Sample latitude location in decimal degrees [from GPS]  39. <b>Longitude</b> – Sample longitude location in decimal degrees [from GPS]  40. <b>MGRS</b> – Location in MGRS from GPS, eight to ten digit grid with grid square identifier (e.g. 34TEN1234567890)  41. <b>Field Notes</b> - Notes relating to sampling episode (e.g. unusual circumstance, weather, potential pollution sources, etc)</p>	
<i>15-Oct-02</i>	<i>Air_TO17_Datasheet_instructions_V1.2.doc</i>

Figure F-9. TO17 Sampling Field Data Sheet

**TOXIC SUBSTANCE CONTROL ACT (TSCA)  
CERTIFICATION**

DATE

POSITIVE CERTIFICATION:

XXX "I certify that all chemical substances in this shipment comply with all applicable rules or orders under TSCA and that I am not offering a chemical substance for entry in violation of TSCA or any applicable rule or order thereunder."

NEGATIVE CERTIFICATION:

           "I certify that all chemicals in this shipment are not subject to TSCA."

**Figure F-10. Toxic Substance Control Act Certification**

**Instructions:**

Block 1. Date. Enter the date of the shipment.

Block 2. Company Name and Address. Print the unit name and unit address of the unit **shipping** the samples.

Block 3. Name. Print the name of the individual making the shipment.

Block 4. Signature. Signature of the shipper.

Block 5. Title. Put your job title or MOS of the shipper (e.g. Preventive Medicine Technician, Industrial Hygienist, etc.)

Block 6. Method of Shipment. Indicate whether the samples are being sent by Federal Express, Military Airlift, or some other method is being used.

Block 7. The Airway Bill Number (Federal Express) or shipping manifest number.

**Figure F-11. Toxic Substance Control Act Certification Instructions**

## Appendix G

### Screening for Potential Sources of Potable Water

This appendix focuses on determining the suitability of raw waters as potential sources for drinking water. In addition, it provides procedures for certifying the potability of drinking water sources. It is not intended to outline procedures for establishing a routine drinking water surveillance program, as these procedures are clearly defined in other publications and organic units more appropriately perform this function. Primary references for this appendix include Department of the Army Technical Bulletin MED 577, *Sanitary Control and Surveillance of Field Water Supplies*; and USACHPPM Technical Guide 230.

#### SCREENING RAW WATER SOURCES

G-1. When choosing a potential raw-water source, quantity, quality, accessibility, security and proximity to supported units must be taken into account. Once engineering personnel have identified a potential water source, basic reconnaissance and screening of the proposed water source and surrounding area must be performed to detect evidence of contamination and/or identify potential sources of pollution. This reconnaissance should, as a minimum, include the expertise of engineer, quartermaster water, and preventive medicine personnel, in addition to any other reconnaissance or security forces that may be required. Sources of water contamination may include accidental or deliberate chemical or biological spills or industrial pollution and agricultural discharges. Table G-1 (page G-3) lists examples of pollution sources and contaminants associated with them.

#### SURFACE WATER SOURCES

G-2. Surface water sources (lakes, rivers, streams, etc.) are generally more vulnerable to pollution and chemical agent contamination than are groundwater sources (wells). For rivers and streams, an area two miles upstream from the proposed water point should be checked for sources of pollution and/or evidence of contamination (see Department of the Army Technical Bulletin Medical 577). For lakes and/or saltwater sources, all potential sources of pollution within a two-mile radius of the water point should be identified. This defines the **source area**. The **protection zone** within the source area generally includes the area within 400 feet from the banks of the reservoir, or primary stream, 200 feet from tributaries and 2,500 feet from any raw water intake. Pollution sources within the protection zone represent a greater risk of contaminating the surface water source.

## GROUNDWATER SOURCES

G-3. The minimally acceptable protection zone radii for groundwater sources, except wells in fractured rock, is 600 feet for potential sources of microbial contamination and 1500 feet for chemical contamination. For sources located in fractured rock the size of the protection zone radii should be increased by 50% to 900 feet and 2250 feet respectively. If the direction of groundwater flow is known, the radii shifts the location of each circle upgradient by one half of the radius.

## RAW WATER SAMPLING

G-4. Samples of each potential drinking water source should be obtained for chemical analysis to evaluate its treatability characteristics. Knowing what contaminants are present in the raw water and comparing that to the relative effectiveness of the ROWPU, will allow you to estimate how effective treatment will be in removing those contaminants and in performing a preliminary risk assessment for the drinking water source. Quartermaster water personnel conduct a field analysis to determine the source treatability by ROWPU processes with preventive medicine personnel focused on the overall field analysis (in conjunction with the engineer) to identify health hazards. Samples may be collected and shipped for more complete analysis by a higher level of preventive medicine support (typically the USACHPPM) for definitive chemical analysis. See Appendix F.

G-5. In the unlikely event that a selected potential water point has several point sources of pollution within the protection zone or the water point is subject to heavy runoff from rain, it may be necessary to obtain several samples over time to adequately characterize raw water quality. Another alternative would be to monitor the individual point sources to determine their contribution to the degradation of water quality.

## PROCEDURES FOR SCREENING POTENTIAL WATER SOURCES

G-6. The steps of this procedure are as follows:

- Determine the location (latitude, longitude) of the surface water intake preferably by using a GPS.
- Delineate the source area and protection zones based on the search criteria outlined above for specific water source.
- Compile an inventory of possible contamination activities (PCAs) within the source area and protection zone (document the PCAs with photographs if possible), and the potential contaminants associated with those PCAs.
- Prepare a prioritized listing that identifies the PCAs to which the source is most vulnerable, including those associated with contaminants detected in the water supply. Tables G-2 through G-5 (pages G-4 to G-7) list the relative risk to the drinking water source associated with PCAs. These are listed by relative levels of risk.
- Prepare an assessment map that shows:
  - Location of the drinking water source.
  - Source area and protection zones.

- Location of all potential “very high risk” and “high risk” contaminant sources (Tables G-2 and G-3).
- Perform preliminary risk assessment and communicate risk based on the treatability characteristics of the raw water.

**POTABLE WATER CERTIFICATION**

G-7. Preventive medicine personnel must certify treated water as potable water for consumption after conducting microbiological and chemical analyses. Certification is granted after completion of bacteriological analysis and field chemical analyses using field analytical equipment, and comparing the results to the tri-service field water standards, as described in TB MED 577. However, if the ROWPU equipment is operating properly, issuing water to units should not be delayed while microbiological analyses are being completed. Additional samples should be collected for more complete laboratory analysis (typically at the USACHPPM) as described in TB MED 577.

**Table G-1. Sources of Pollution and Potential Contaminants**

Activity	Potential Contaminants
Agricultural Activities: spraying, fertilizing, and livestock management	Pesticides and herbicides, nitrates, nitrites, bacteria, <i>Cryptosporidium</i> , <i>Giardia</i> , other microbiological contaminants
Wastewater Treatment Plant Discharge	Nitrates, nitrites, bacteria, viruses, protozoans, heavy metals, other chemicals (organic and inorganic)
Improper Household Waste Disposal	Cleaning fluids, degreasers, used motor oil, paints and paint thinners, soaps and detergents
Leaking Storage Tanks (Above or Underground)*	Petroleum products, acids, bases, other organic chemicals
Landfills	Various organic and inorganic chemicals
Injection Wells	Arsenic, heavy metals, cyanide, various organic and inorganic chemicals
Mining Operations	Arsenic, heavy metals, oxidation by-products, acids
Drilling Operations	Petroleum products, chloride, sodium, barium, strontium, radionuclides
*Examples of activities/industries associated with use/handling of listed hazardous materials or materials which may contaminate drinking water include: gas stations, dry cleaners, distribution centers, chemical manufactures, water and wastewater treatment facilities, car-care centers, airports, golf courses, electroplaters, metal finishers, laboratories, machine shops, railroads, highway maintenance storage areas (salts), military bases, oil/gas production facilities, printers, photo finishers, refineries, wood shops, leather tanning facilities, textile production.	

## RISKS ASSOCIATED WITH POSSIBLE CONTAMINATING ACTIVITIES (PCAs)

G-8. Very high risk PCAs are considered to have the highest potential for drinking water contamination, greater than those designated high risk (Table G-3), moderate risk (Table G-4), or low risk (Table G-5). The risk rankings are based on the general nature of activities and the contaminants associated with them. An asterisk [\*] indicates PCAs that may be associated with microbiological contamination.

**Table G-2. Possible Contaminating Activities Associated With Very High Potential Risks**

<b>Commercial/ Industrial</b>	<b>Residential/ Municipal</b>	<b>Agricultural/ Rural</b>	<b>Other</b>
Automobile-related activities – gas stations	Airports – maintenance/ fueling areas	* Animal feeding operations	Underground injection of commercial/ industrial discharges
Chemical/ petroleum processing/ storage	Landfills/ dumps	* Concentrated aquatic animal production facilities	Historic gas stations
Dry cleaners	* Septic systems – high density (>1/ acre) (for groundwater sources otherwise medium)	Managed forests (very high for surface water, otherwise high)	Historic waste dumps/ landfills
Metal plating/ finishing/ fabricating	* Wastewater treatment plants		Injection wells/ dry wells/ sumps
Plastics/ synthetics producers			Known contaminant plumes
			Military installations
			Mining operations – historic or active
			Underground storage tanks
			Confirmed leaking tanks



**Table G-3. Possible Contaminating Activities Associated With High Potential Risks**

<b>Commercial/ Industrial</b>	<b>Residential/ Municipal</b>	<b>Agricultural/ Rural</b>	<b>Other</b>
Automobile-related activities – body shops and repair shops	Railroad yards/ maintenance/ fueling areas	* Grazing (>5 animals/ acre)	Industrial discharges
Boat services/ repair/ refinishing	* Sewer collection systems	* Animal feeding operations	Illegal activities/ unauthorized dumping
Chemical/ petroleum pipelines	Utility stations – maintenance areas	Other animal operations	Mining – sand/ gravel
Electrical/ electronic manufacturing	* Wastewater treatment plants	Concentrated aquatic animal production facilities	Wells – oil, gas, or geothermal
Fleet/ trucking/ bus terminals		Other aquatic animal operations	Salt water intrusion
Furniture repair/ manufacturing		Farm chemical distributor/ application service	* Recreational area - surface water source
Home manufacturing		Farm machinery repair	Underground storage tanks: non-regulated tanks (tanks smaller than regulatory limit) or tanks not yet upgraded or registered
Junk/ scrap/ salvage yards		* Septic systems – low density (<1/ acre)	Snow ski areas
Machine shops		* Lagoons/ liquid wastes	Recent (<10 years) burn area
Photo processing/ printing		Machine shops	Dredging
Research laboratories		Pesticide/ fertilizer/ petroleum storage and transfer areas	
Wood preserving/ treating		Managed forests (very high for surface water, otherwise high)	
Lumber processing and manufacturing		Agricultural drainage	
Wood/ pulp/ paper processing and mills		Wells – agricultural and irrigation	
* Sewer collection systems			

**Table G-4. Possible Contaminating Activities Associated With Moderate Potential Risks**

<b>Commercial/ Industrial</b>	<b>Residential/ Municipal</b>	<b>Agricultural/ Rural</b>	<b>Other</b>
Car washes	* Septic systems – high density (>1/ acre) (very high in zone A, otherwise medium)	* Other animal operations	Above ground storage tanks
Parking lots/ malls (>50 spaces)	Drinking water treatment plants	Other aquatic animal operations (high in zones for surface water, otherwise medium)	Wells – water supply
Cement/ concrete plants	Golf courses	Crops, irrigated (berries, hops, wine, orchards, sod, greenhouses, vineyards, nurseries, vegetables) Note: Drip-irrigated crops are considered low risk	Construction/ demolition staging areas
* Food processing	Housing – high density (>1 house/ 0.5 acres)	* Sewage sludge (biosolids) land application	Contractor or government agency equipment storage yards
Funeral services/ graveyards	Motor pools	Fertilizer, pesticide/ herbicide application	Managed forests
Hardware/ lumber/ parts stores	Parks	Managed forests (medium for ground water)	Transportation corridors: freeways/ state highways, railroads, historic railroad right-of-ways, road right-of-ways (herbicide use areas)
	Waste transfer/ recycling stations	Agricultural drainage	Hospitals
			Storm drain discharge points
			Storm water detention facilities
			Artificial recharge projects – non-potable water (includes recycled, storm, and untreated imported water)
			Injection wells
			Spreading basins
			Snow ski areas (high in zones for surface water, otherwise medium)
			Recent (<10 years) burn areas (high in zones for surface water otherwise medium)
			Dredging (high in zones for surface water, otherwise medium)

**Table G-5. Possible Contaminating Activities Associated With Low Potential Risks.**

<b>Commercial/ Industrial</b>	<b>Residential/ Municipal</b>	<b>Agricultural/ Rural</b>	<b>Other</b>
* Sewer collection systems	* Sewer collection systems	Crops, non-irrigated (e.g. Christmas trees, grains, grass, seeds, hay) (or drip-irrigated crops)	Underground storage: decommissioned – inactive, upgradated and/or registered – active
Appliance/ electronic repair	Apartments and condominiums	* Septic systems – low density (<1/ acre)	Roads/ streets
Office buildings/ complexes	Campgrounds/ recreational areas		Artificial recharge projects: potable water, injection wells, or spreading basins
Rental yards	Fire stations		Medical/ dental offices/ clinics
RV/ mini storage	RV parks		Veterinary offices/ clinics
	Schools		* Surface water – streams/ lakes/ rivers
	Hotels, motels		Wells – monitoring, test holes, borings

## Glossary

The glossary lists acronyms/abbreviations and terms with Army or joint definitions, and other selected terms. Where Army and joint definitions are different, (Army) follows the term. Terms or acronyms for which FM 3-34.500 is the proponent manual (the authority) are marked with an asterisk (\*).

<b>A2C2</b>	Army airspace command and control
<b>AA</b>	assembly area; avenue of approach; TOE numbering system variation number
<b>AAP</b>	Allied administrative publication
<b>AAR</b>	after-action review; after-action report
<b>AAV</b>	assault amphibious vehicle
<b>ABCA</b>	American, British, Canadian, Australia (Armies Standardization Program)
<b>ABCS</b>	Army Battle Command System
<b>ABO</b>	air base operability
<b>AC</b>	active component
<b>accident risk</b>	all operational risk considerations other than tactical risks. Includes risk to friendly forces, risk posed to civilians by an operation, as well as the impact of operations on the environment
<b>ACCP</b>	Army Correspondence Course Program
<b>ACHP</b>	Advisory Council on Historic Preservation
<b>ACofS</b>	assistant chief of staff
<b>ACS</b>	assistant chief of staff
<b>ADC</b>	area damage control
<b>ADCON</b>	administrative control
<b>ADE</b>	assistant division engineer
<b>ADP</b>	automatic data processing
<b>AE</b>	Army Europe
<b>AECA</b>	Arms Export Control Act
<b>AEF</b>	aerospace expeditionary force
<b>AETMP</b>	Army Environmental Training Master Plan
<b>AFCAP</b>	Air Force contract augmentation program
<b>AFCESA</b>	Air Force civil engineering support agency
<b>AFDC</b>	Air Force Doctrine Center
<b>AFDD</b>	Air Force Doctrine Document
<b>AFFOR</b>	Air Force forces
<b>AFI</b>	Air Force Instruction
<b>AFIOH</b>	Air Force Institute for Operational Health
<b>AFMIC</b>	Armed Forces Medical Intelligence Center
<b>AFSOC</b>	Air Force Special Operations Command; Air Force special operations component
<b>AIGIS</b>	Army imagery and geospatial information systems
<b>AIRFA</b>	American Indian Religious Freedom Act
<b>AISI</b>	automated integrated survey instrument

<b>ALMC</b>	Army Logistics Management College
<b>ALSA</b>	Air Land Sea Application (Center)
<b>ALSS</b>	advanced logistics support site
<b>AMC</b>	Air Mobility Command; Army Materiel Command
<b>AMETL</b>	agency mission essential task list
<b>AML</b>	Theater Army medical laboratory
<b>AMOPES</b>	Army Mobilization and Operations Planning and Execution System
<b>AO</b>	area of operations
<b>AOAP</b>	Army Oil Analysis Program
<b>AOI</b>	area of interest
<b>AOR</b>	area of responsibility
<b>APC</b>	armored personnel carrier
<b>APLA</b>	antipersonnel land mine alternatives
<b>APO</b>	Army post office
<b>APOD</b>	aerial port of debarkation
<b>APOE</b>	aerial port of embarkation
<b>AR</b>	Army regulation; Army reserve
<b>ARC</b>	American Red Cross
<b>ARCENT</b>	US Army Forces, Central Command [Third US Army]
<b>ARFOR</b>	Army forces
<b>ARNG</b>	Army National Guard
<b>ARPA</b>	Archeological Resources Preservation Act
<b>ARSOF</b>	Army special operations forces
<b>ART</b>	Army tactical task
<b>ARTEP</b>	Army Training and Evaluation Program
<b>ASAS</b>	All-Source Analysis System
<b>asbestos</b>	a group of natural minerals that tend to separate into strong, heat-resistant fibers. Used as an insulator, it is a suspected carcinogen
<b>ASCC</b>	Army service component command (JP 1-02), Army service component commander (FM 1-02)
<b>ASG</b>	area support group
<b>ASL</b>	authorized stockage list
<b>ASMB</b>	Area Support Medical Battalion
<b>ASP</b>	ammunition supply (or storage) point
<b>AT</b>	antiterrorism
<b>attn</b>	attention
<b>AUTL</b>	Army universal task list—a comprehensive listing of Army tactical-level task, missions, and operations; the AUTL complements CJCSM 3500.04B by providing tactical-level Army-specific tasks (FM 7-15)
<b>Auto ignition temperature</b>	Temperature at which a chemical can spontaneously ignite
<b>AWE</b>	Army warfighting experiment
<b>bare base</b>	(Joint) A base having minimum essential facilities to house, sustain, and support operations to include, if required, a stabilized runway, taxiways, and aircraft parking areas. A bare base must have a source of water that can be made potable. Other requirements to operate under bare base conditions form a necessary part of the force package deployed to the bare base. (JP 3-05.3/JP 1-02)

<b>base development (less force beddown)</b>	(Joint)—acquisition, development, expansion, improvement, and construction, and/or replacement of the facilities and resources of an area or location to support forces employed in military operations or deployed according to the strategic plans (JP 4-04/JP 1-02)
<b>BASOPS</b>	base operations
<b>battlespace</b>	(Joint)—the environment, factors, and conditions that must be understood to successfully apply combat power, protect the force, or complete the mission. Included is the air, land, sea, space, enemy and friendly forces, facilities, weather, terrain, electromagnetic spectrum, and the information environment within the operation areas and AOIs. (JP 1-02)
<b>BCAT</b>	base camp assistance team
<b>BCCA</b>	base camp coordination agency
<b>BDP</b>	base development plan
<b>BCDP</b>	base camp development plan
<b>BCT</b>	brigade combat team
<b>BDA</b>	battle damage assessment
<b>BDOC</b>	base defense operations center
<b>BDP</b>	base development plan
<b>BDSP</b>	base camp development site plan
<b>BDT</b>	base development team—nondeployable team that can quickly provide base development engineering and planning and facilities design for staging bases, base camps, FOBs, displaced persons camps, and any similar requirement (FM 3-34)
<b>BESC</b>	Basic Environmental Staff Course
<b>BFT</b>	battle-focused training
<b>BII</b>	basic issue inventory
<b>bn</b>	battalion
<b>boiling point</b>	the temperature at which a compound will go from the liquid state to the vapor state
<b>BOM</b>	bill of materials
<b>BOS</b>	Battlefield Operating Systems—the physical means (soldiers, organizations, and equipment) that tactical commanders use to execute operations and accomplish missions assigned by superior tactical- and operational-level commanders. The seven BOS are (1) intelligence system—the activity to generate knowledge of and products portraying the enemy and the environmental features required by a command planning, preparing, executing, and assessing operations; (2) maneuver system—the movement of forces to achieve a position of advantage with respect to enemy forces. This system includes employing forces in combination with direct fire or fire potential. It also includes the conduct of tactical tasks associated with force protection; (3) fire support system—collective and coordinated use of target-acquisition; data, indirect-fire weapons, fixed-wing aircraft, offensive information operations, and other lethal and nonlethal means against targets located throughout an AO; (4) air defense system—employment of all active measures to nullify or reduce the effectiveness of attack by hostile aircraft and missiles after they are airborne; (5) M/CM/S system—mobility operations preserve the freedom of

maneuver of friendly forces, countermobility operations deny mobility to enemy forces, and survivability operations protect friendly forces from the effects of enemy weapon systems; (6) CSS system—the support and services provided to sustain forces during war and MOOTW; (7) C2 system—all collective tasks associated with supporting the exercise of authority and direction by a properly designated commander over assigned and available forces in the accomplishment of the mission. (FM 7-15/FM 1-02) **The Navy uses this acronym for base operating services.**

<b>BRAC</b>	base realignment and closure
<b>BSB</b>	Base Support Battalion
<b>BTRA</b>	battlespace terrain reasoning and awareness
<b>C<sup>2</sup></b>	command and control
<b>C2PC</b>	command and control personal computer
<b>C3</b>	command, control and communications
<b>C4I</b>	command, control, communications, computers, and intelligence
<b>C4ISR</b>	command, control, communications, computers and intelligence, intelligence, surveillance, and reconnaissance
<b>CA</b>	civil affairs
<b>CAA</b>	Clean Air Act
<b>CALL</b>	Center for Army Lessons Learned
<b>camouflage</b>	(Joint)—use of natural or artificial material on personnel, objects, or tactical positions with the aim of confusing, misleading, or evading the enemy (JP 1-02)
<b>CAO</b>	chief administrative officer; customer assistance office
<b>CAP</b>	crisis action plan(ning)
<b>CARC</b>	chemical agent resistant coating
<b>carcinogen</b>	a substance known to cause or help the growth of cancerous cells
<b>CAS</b>	(chemical abstract service number) A unique number given to a chemical compound when it has been thoroughly identified. Information can be tracked by that number even when a different trade name or synonym is given for the chemical
<b>CBMU</b>	construction battalion maintenance unit
<b>CBR</b>	chemical, biological, and radiological
<b>CBRN</b>	chemical, biological, radiological, and nuclear
<b>CBRNE</b>	chemical, biological, radiological, nuclear, and high-yield explosive
<b>CBRNE-CM</b>	chemical, biological, radiological, nuclear and high-yield explosives consequence management
<b>CBT</b>	combat; combating terrorism
<b>CBU</b>	cluster bomb unit; construction battalion unit
<b>CCA</b>	contract construction agent
<b>CCD</b>	camouflage, concealment and deception
<b>CCIR</b>	commander's critical information requirements
<b>CD</b>	compact disc
<b>CDMP</b>	combat decision making process
<b>cdr's</b>	commander's
<b>CEB</b>	combat engineer battalion
<b>CEIHOT</b>	Center for Environmental Initiatives and Hands On Training
<b>ceiling</b>	the maximum concentration that is allowed for any exposure. Area must be vacated at once if this level is reached

<b>CENTCOM</b>	Central Command
<b>CEQ</b>	council on environmental quality
<b>CERCLA</b>	Comprehensive Environmental Response, Compensation and Liability Act; regulates clean up of HW sites. Also known as "Superfund." Amended by SARA of 1986
<b>CERL</b>	Construction Engineering Research Laboratory
<b>CESE</b>	civilian engineer support equipment
<b>CESOS</b>	Civil Engineer Corps Officer School
<b>CESP</b>	civil engineering support plan—(Joint)—an appendix to the logistics annex or separate annex of an OPLAN that identifies the minimum essential engineering services and construction requirements required to support the commitment of military forces (JP 4-04/JP 1-02)
<b>CESPG</b>	civil engineering support plan group; civil engineering support planning generator
<b>CETEP</b>	comprehensive environmental training and education program
<b>CFC</b>	Chlorofluorocarbons; a family of fully halogenated hydrocarbons containing fluorine and chlorine. These substances are environmentally harmful because they deplete the earth's stratospheric ozone layer
<b>CFR</b>	Code of Federal Regulations
<b>CG</b>	commanding general
<b>characteristics of HW</b>	physical/chemical properties of an HW. The EPA has defined four characteristics that can be determined by tests: <ol style="list-style-type: none"> <li>1. <u>Ignitability</u>: the ability to catch fire</li> <li>2. <u>Corrosivity</u>: the ability to corrode other materials</li> <li>3. <u>Reactivity</u>: the ability to enter into a violent chemical reaction, which may involve explosions or fumes</li> <li>4. <u>Toxicity</u>: the ability to release certain toxic constituents when leached with mild acid</li> </ol>
<b>chemical</b>	a substance that is produced by or used in a chemical process
<b>chlorine</b>	a chemical used in water purification for removal of bacteria
<b>civil action</b>	a lawsuit filed in court against a person who has either failed to comply with statutory or regulatory requirements or an administrative order, or has contributed to a release of hazardous wastes or constituents. There are four types of civil actions: compliance, corrective, monitoring and analysis, and imminent hazard
<b>civil augmentation program</b>	(Joint)—standing, long-term contracts designed to augment service logistic capabilities with contract support in both preplanned and short notice contingencies; examples include US Army LOGCAP, US Air Force Contract augmentation Program, and US Navy Construction Capabilities Contract. (JP 4-07/JP 1-02)
<b>civil engineering</b>	(Joint)—those CS and CSS activities that identify, design, construct, lease, or provide facilities and which operate, maintain,



	and perform war damage repair and other engineering functions in support of military operations (JP 4-04/JP 1-02)
<b>CJCS</b>	Chairman of the Joint Chiefs of Staff
<b>CJCSI</b>	Chairman of the Joint Chiefs of Staff instruction
<b>CJCSM</b>	Chairman of the Joint Chiefs of Staff manual
<b>CJTF</b>	commander, joint task force
<b>clear</b>	(1) the total elimination or neutralization of an obstacle that is usually performed by follow-on engineers and is not done under fire (FM 3-34/FM 1-02); (2) a tactical mission task that requires the commander to remove all enemy forces and eliminate organized resistance in an assigned area (FM 3-90/FM 1-02)
<b>clearing operation</b>	(Joint)—operation designed to clear or neutralize all mines and obstacles from a route or area (FM 3-34.2/FM 1-02/JP 3-15/JP 1-02)
<b>CM</b>	consequence management—(Joint)—those measures taken to protect public health and safety, restore essential government services, and provide emergency relief to governments, businesses, and individuals affected by the consequences of an NBC and/or high-yield explosive situation; for domestic consequence management, the primary authority rest with the States to respond and the Federal Government to provide assistance as required. (JP 3-0/JP 1-02)
<b>CMO</b>	civil-military operations
<b>CMOC</b>	civil-military operations center
<b>CO</b>	commanding officer
<b>COA</b>	course of action
<b>COB</b>	collocated operating base
<b>COCOM</b>	combatant command (command authority)
<b>COE</b>	contemporary operational environment—(Joint)—automation services that support the development of the common reusable software modules which enable interoperability across multiple CS application; includes segmentation of common software modules from existing applications, integration of commercial products, development of a common architecture, and development of common tools for application developers. (JP 4-0/JP 1-02)
<b>CofS</b>	Chief of Staff
<b>COLISEUM</b>	Community On-line Intelligence System for End Users and Managers
<b>combat engineering</b>	(Joint) those engineering task that assist the tactical and/or operational commander to “shape” the battlespace by enhancing mobility, creating the space or time necessary to generate mass and speed while protecting the force, and denying mobility and key terrain to the enemy; these tasks include breaching, bridging and emplacement of obstacles to deny mobility to the enemy. (JP 3-34/JP 1-02); one of the engineer battlespace functions that includes mobility, countermobility and survivability (FM 3-34)
<b>Commander's Guide to Environmental Management</b>	this reference provides commanders with basic information concerning their responsibilities in managing the Army's environmental program at the installation or activity level. It is

intended as a primer on the environmental program. The guide is currently published by USAEC; it will be converted to an official Army publication.

<b>COMMZ</b>	communications zone
<b>compliance</b>	the Army's expectation that soldiers obey local, state, federal and HN environmental requirements
<b>COMSEC</b>	communications-security
<b>CONCAP</b>	construction capabilities contract (Navy)
<b>conexes</b>	container express
<b>CONPLAN</b>	concept or contingency plan
<b>conservation</b>	the act of conserving and preserving natural and cultural resources so they will be available for present and future generations
<b>contingency engineering management organization</b>	(Joint)—an organization that may be formed by the combatant commander, or subordinate joint force commander, to augment the engineering expertise to support both deliberate and crisis action planning and to provide construction management in contingency and wartime operations; the combatant commander may form a theater contingency engineering management cell, and similar organizations may be formed at subordinated levels of command (RCEM cell and/or JTFCEM cell). These organizations should be staffed with expertise in combat engineering, general engineering and topographic (geospatial) engineering. (JP 3-34/JP 1-02)
<b>CONUS</b>	continental United States; from an environmental standpoint, CONUS refers to any land over which the EPA has jurisdiction. Included are Alaska, Hawaii, Puerto Rico, Guam and the Virgin Islands
<b>convoy</b>	a group of vehicles organized for the purpose of control and orderly movement with or without escort protection
<b>coolants</b>	substances used to reduce the temperature of systems
<b>COP</b>	common operational picture—(Joint)—an operational picture tailored to the user's requirements, based on common data and information shared by more than one command (JP 3-0/JP 1-02)
<b>COR</b>	contracting officer's representative
<b>COS</b>	chief of staff
<b>COSCOM</b>	corps support command
<b>countermine</b>	(NATO, Joint)—to explode the main charge in a mine by the shock of a nearby explosion of another mine or independent explosive charge; the explosion of the main charge may be caused either by sympathetic detonation or through the explosive train and/or firing mechanism of the mine. (JP 1-02); (Army)—the actions taken to detect, bypass, breach, mark, report, record, and eliminate enemy mines or minefields (FM 3-24.32/FM 1-02)
<b>countermine operations</b>	(Joint)—in land warfare, an operation to reduce or eliminate the effects of mines or minefields (JP 1-02) See CJCSI 3207.01.
<b>countermining</b>	(Joint)—(1) land mine warfare—tactics and techniques used to detect, avoid, breach, and/or neutralize enemy mines and the use of available resources to deny the enemy the opportunity to

	employ mines; (2) naval mine warfare—the detonation of mines by nearby explosions, either accidental or deliberate (JP 1-02)
<b>countermobility</b>	a component of combat engineering and one of the five engineer battlespace functions. It augments natural terrain with obstacle systems according to the commander’s concept. This adds depth to the battle in space and time by attacking the enemy’s ability to maneuver his forces. (FM 3-34/FM 1-02)
<b>countermobility operations</b>	(Joint)—the construction of obstacles and emplacement of minefields to delay, disrupt, and destroy the enemy by reinforcement of the terrain; the primary purpose of countermobility operations is to slow or divert the enemy, to increase time for target acquisition, and to increase weapons effectiveness. (FM 3-34/FM 1-02/JP 3-34/JP 1-02)
<b>CP</b>	check point; collection point; command post; contact point; control point
<b>CPG</b>	Commandant’s Planning Guidance
<b>CPW</b>	Center for Public Works
<b>CREST</b>	contingency real estate support team
<b>criminal action</b>	a prosecutorial action taken by the US Government or a state towards any person(s) who has knowingly and willfully not complied with the law. Such an action can result in the imposition of fines or imprisonment
<b>critical habitat</b>	a designated area declared essential for the survival of a protected species under authority of the ESA
<b>CRMP</b>	Cultural Resources Management Plan
<b>crossing site(s)</b>	the location along a water obstacle where the crossing can be made using amphibious vehicles, assault boats, rafts, bridges, or fording vehicles
<b>CRREL</b>	Cold Regions Research and Engineering Laboratory
<b>CS</b>	civil support—DOD support to US civil authorities for domestic emergencies and for designated law enforcement and other activities (FM 3-07/JP 3-07.7); combat support; The riot control chemical agent called chlorobenzalmalononitrile (tear gas)
<b>CSA</b>	Chief of Staff, United States Army
<b>CSE</b>	combat support equipment
<b>CSM</b>	conceptual site model
<b>CSR</b>	controlled supply rate
<b>CSS</b>	combat service support
<b>CSS-BOS</b>	the support and service provided to sustain forces during war and MOOTW; contains the subordinate Army Task (ART) of <i>Provide General Engineering Support</i> . (FM 7-15)
<b>CSSE</b>	combat service support element—(Joint)—those elements whose primary missions are to provide service support to combat forces and which are a part, or prepared to become a part, of a theater, command, or task force formed for combat operations; the core element of a MAGTF that is task-organized to provide the CSS necessary to accomplish the MAGTF mission. The CSSE varies in size from a small detachment to one or more force service support groups. It provides supply, maintenance, transportation, general engineering, health services, and a variety of other services to the

	MAGTF. The CSSE itself is not a formal command. (FM 1-02/JP 1-02)
<b>CT</b>	counterterrorism
<b>CTC</b>	combat training center
<b>CTIS</b>	combat terrain information system
<b>cultural resource</b>	monuments, nationally identifiable or distinctive buildings and structures, archives and libraries, ancient artifacts and structures, archaeologically important sites, historically important sites or structures, mosques, cathedrals, temples, other churches or sacred structures, sacred sites or areas, museums, and works of art (FM 3-57/FM 1-02)
<b>CWA</b>	Clean Water Act
<b>CWD</b>	civil works directorate
<b>CZ</b>	combat zone
<b>DA</b>	Department of the Army
<b>datum</b>	(NATO, Joint) Any numerical or geometrical quantity or set of such quantities which may serve as reference or base for other quantities. Where the concept is geometric, the plural form is “datums” in contrast to the normal plural “data”. (JP 1-02)
<b>datum (geodetic)</b>	(Joint)—(1) a reference surface consisting of five quantities: the latitude and longitude of an initial point, the azimuth of a line from that point, and the parameters of the reference ellipsoid; (2) the mathematical model of the earth used to calculate the coordinates on any map; different nations use different datums for printing coordinates on their maps. The datum is usually referenced in the marginal information of each map (JP 1-02)
<b>DC</b>	District of Columbia
<b>DCD</b>	directorate of combat developments
<b>DCSBOS</b>	Deputy Chief of Staff for Base Operations and Support
<b>DCSENG</b>	deputy chief of staff for engineering
<b>DCSINT</b>	deputy chief of staff for intelligence
<b>DD</b>	defense document (generally used with form numbers: DD Form 1348-1)
<b>DEET</b>	N,N-diethyl-meta-toluamide (a type of insect repellent)
<b>delegation of authority</b>	(Joint)—action by which a commander assigns part of his authority commensurate with the assigned task to a subordinate commander; while ultimate responsibility cannot be relinquished, delegation of authority carries with it the imposition of a measure of responsibility; the extent of the authority delegated must be clearly stated (JP 1-02)
<b>demining</b>	activities to remove the hazard of all mines and other unexploded explosive munitions for a defined area. (FM 3-34.24)
<b>DENIX</b>	Defense Environmental Network and Information Exchange
<b>DEQ</b>	Directorate of Environmental Quality. This is another name for the EMO when it is not under the DPW
<b>DERA</b>	Defense Environmental Restoration Account
<b>DERP</b>	Defense Environmental Restoration Program
<b>detergents</b>	Synthetic water soluble cleaning agents that act like soap.
<b>DHL</b>	a shipping company created by Adrian Dalsey, Larry Hillblom and Robert Lynn (D, H, and L)
<b>DIA</b>	Defense Intelligence Agency

<b>discharge</b>	includes, but is not limited to, the accidental or intentional spilling, leaking, pumping, emitting, emptying, or dumping of a substance on any land or into water
<b>DISCOM</b>	division support command
<b>disposal</b>	The discharge, deposit, dumping, spilling, leaking, or placing of any solid waste or HW into or on any land or water.
<b>div/DIV</b>	division
<b>DIVENG</b>	division engineer
<b>DLA</b>	Defense Logistics Agency
<b>DLEA</b>	Drug Law Enforcement Agency
<b>DNBI</b>	disease and non-battle injury
<b>DMC</b>	distribution management center
<b>doctrine</b>	fundamental principles by which the military forces or elements thereof guide their actions in support of national objectives; authoritative but requires judgment in application (FM 3-0/FM 1-02/JP 1-02)
<b>DOD</b>	Department of Defense
<b>DOD construction agent</b>	(Joint)—USAES, NAVFACENCOM, or other such approved DOD activity that is assigned design or execution responsibilities associated with military construction programs, facilities support, or civil engineering support to the combatant commanders in contingency operations (JP 3-34/JP 1-02)
<b>DODD</b>	Department of Defense directive
<b>DODI</b>	Department of Defense instruction
<b>DOE</b>	Department of Energy
<b>DOJ</b>	Department of Justice
<b>DOL</b>	Directorate of Logistics
<b>DOMS</b>	Directorate of Military Support
<b>DON</b>	Department of the Navy
<b>DOS</b>	Department of State
<b>DOT</b>	Department of Transportation
<b>DOTMLPF</b>	doctrine, organization, training, materiel, leadership and education, personnel, and facilities
<b>DPMIAC</b>	Defense Pest Management Information Analysis Center
<b>DPG</b>	defense planning guidance
<b>DPPDB</b>	digital point-positioning database
<b>DPTM</b>	Directorate of Plans, Training, and Mobilization
<b>DPW</b>	director of public works
<b>DRMO</b>	Defense Reutilization and Marketing Office
<b>DS</b>	direct support
<b>DS2</b>	Decontaminant solution 2; incompatible with most metals, DS2 is procured exclusively by DOD to decontaminate machinery after a chemical weapons attack. DS2 is not authorized for training due to the hazards it presents to humans who are exposed to it. It can cause severe burns, stricture of the esophagus, and damage to the central nervous system, liver, and reproductive system.
<b>DSES</b>	division staff engineer section
<b>dsgn</b>	design
<b>DSN</b>	Defense System Telecommunications Network
<b>DSO</b>	domestic support operations
<b>DST</b>	decision support template

<b>DTED</b>	digital terrain elevation data
<b>DTG</b>	date-time group
<b>DTLOMS</b>	doctrine, training, leader development, organizational design, material development, soldier support
<b>DTRA</b>	Defense Threat Reduction Agency
<b>DTSS</b>	digital topographic support system
<b>DU</b>	depleted uranium
<b>DVECC</b>	Defense Vector Ecology and Control Center
<b>DVEP</b>	disease vector ecology profile
<b>EA</b>	engagement area; environmental assessment — required by NEPA, a study to determine if significant environmental impacts are expected from a proposed action
<b>*EAI</b>	environmental area of interest
<b>EARC</b>	Environmental Awareness Resource Center
<b>EBA</b>	engineer battlefield assessment
<b>*EBS</b>	environmental baseline survey — is a multi-discipline site survey. It is conducted during the initial stage of any service, or joint operational deployment, as an initial EBS and as a close-out EBS when a site is returned to the host nation, or when joint forces depart the site. The initial EBS documents existing deployment area environmental conditions (to include cultural), determines the likelihood for present and past site contamination (e.g., hazardous substances, petroleum products, and derivatives), and identifies potential vulnerabilities (to include occupational and environmental health risks). The closeout EBS defines the conditions existing at the time of departure from a site and documents any changes/variations in conditions from the initial EBS. Surveys accomplished in conjunction with operational deployments that do not involve training or exercises (contingency/expeditionary operations) should be completed to the extent practicable consistent with operational requirements for all occupations exceeding 30 days. The EBS is generally performed in conjunction with an environmental health site assessment (EHSA) (needs to be changed in JP 1-02)
<b>EC</b>	environmental coordinator
<b>ECAS</b>	Environmental Compliance Assessment System; this system involves the use of the environmental compliance assessment. Also referred to as an environmental audit or environmental program review, it involves an examination of an installation's environmental program to identify possible compliance deficiencies. It also includes designing corrective action plans and implementing fixes for identified deficiencies.
<b>ECE</b>	environmental compliance evaluation
<b>*ECR</b>	environmental conditions report — concise summary of environmental conditions at a base camp site, based on the environmental baseline survey, supported by maps and backup documents, prepared by base camp commanders for each base camp; the ECR documents conditions at the site it claims or other legal challenges arise against the government. (FM 3-34.500)
<b>ECRB</b>	environmental compliance review board

<b>ecology</b>	the science concerned with the relationship between organisms and their environment and the interrelationships and interdependence of these organisms; that is, the study of living things in relation to the environment and to each other
<b>ecosystem</b>	a system formed by the interaction of a community of organisms with its environment
<b>EEA</b>	environmental executive agent
<b>EEFI</b>	essential elements of friendly information
<b>EEM</b>	early entry module
<b>EHSA</b>	environmental health site assessment
<b>EIRB</b>	environmental impact review board
<b>EIS</b>	Environmental impact statement; a document prepared by EPA or under EPA guidance, which identifies and analyzes in detail the environmental impacts of a proposed action
<b>EMO</b>	environmental management office
<b>EMS</b>	Environmental Management System
<b>*EMST</b>	essential mobility/survivability task—specified or implied BOS-specific tasks that are critical to mission success; although ultimately executed by a combined-arms element, the staff (typically MANSPT elements such as engineer, chemical, MP, EOD) identifies the EMSTs. A fully developed EMST has four components including <i>effect</i> (the qualitative or quantitative impact desired by the higher commander on the friendly or adversary caused by the completion of the task); <i>purpose</i> (the desired or intended result of the task stated in terms relating to the purpose of the supported unit); <i>tasks</i> (one or more clearly defined and measurable tasks accomplished by individuals or organizations required to achieve the desired effects); and <i>method</i> (how the task and purpose will be achieved, described by a quantifiable use of assets or capabilities and communicates their priority) (FM 3-34)
<b>ENCOM</b>	engineer command
<b>ENCOORD</b>	engineer coordinator—special staff officer who coordinates engineer assets and operations for the command, usually the senior engineer officer in the force (FM 6-0 and FM 3-34)
<b>endangered species</b>	Those species designated by the Secretary of the Interior which are in danger of extinction throughout all or a significant portion of their range.
<b>engineer battlespace functions</b>	the three battlespace functions include combat (M/CM/S grouped under combat engineering), geospatial and general engineering. (FM 3-34)
<b>ENMOD</b>	environmental modification
<b>ENRD</b>	Environmental and Natural Resources Division
<b>*environmental area of interest</b>	an assessment or study done on an area of interest (a property) to define the environmental state or condition of that property prior to use by US forces; survey is used to determine the environmental impact of property use by US forces and the level of environmental restoration needed before returning the property upon US departure. (FM 3-34.500)

<b>environmental audit</b>	a compliance review of facility operations, practices, and records to assess and verify compliance with federal, state, and local environmental laws and regulations
<b>*environmental compliance</b>	the unconditional obeying of international, foreign nation, federal, state and local environmental rules, regulation and guidelines that affect current operations. (FM 3-34.500)
<b>environmental considerations</b>	(Joint)—the spectrum of environmental media, resources or programs that may impact on, or are affected by, the planning and execution of military operations; factors may include, but are not limited to, environmental compliance, pollution prevention, conservation, protection of historical and cultural sites and protection of flora and fauna (JP 3-34/JP 1-02)
<b>environmental ethic</b>	taking care of the environment because it is the right thing to do. This ethic is the operating principle and value that governs individual soldiers, units, and the Army
<b>*environmental hazard</b>	all activities that may pollute, create negative noise related effects, degrade archaeological/cultural resources, or negatively affect threatened or endangered species habitats; also included are environmental health-related hazards. (FM 3-34.500)
<b>environmental noise</b>	the outdoor noise environment consisting of all noise (including ambient noise) from all sources that extend beyond, but do not include, the workplace
<b>environmental planning</b>	efforts that consider the impact of operation, training, exercises, or weapon system introduction on the environment, and where necessary, allow decision makers to take early action to eliminate or mitigate those impacts. Additionally, environmental planning may require consultation or submission of documentation to demonstrate that environmental considerations have been taken
<b>environmental pollution</b>	the condition resulting from the presence of chemical, mineral, radioactive, or biological substances that alter the natural environment or that adversely affect human health or the quality of life, biosystems, the environment, structures and equipment, recreational opportunities, aesthetics, or natural beauty
<b>*environmental protection</b>	the application of human ingenuity and resources, through the disciplines of science and engineering, as required by environmental protection laws, regulations, and policies to protect the natural environment (FM 3-34.500)
<b>*environmental protection level</b>	the varying level of environmental protection that can reasonably be afforded at any particular time during warfare of battlefield conditions, given the absolute requirement that such a diversion of resources away from the mission at hand does not adversely affect that mission, or any friendly personnel, or indigenous or refugee populations (FM 3-34.500)
<b>*environmental reconnaissance</b>	the systematic observation and recording of site or area data collected by visual or physical means, dealing specifically with



	environmental conditions as they exist, and identifying areas that are environmentally sensitive or of relative environmental concern, for information and decision-making purposes (FM 3-34.500/FM 1-02)
<b>environmental services</b>	(Joint)—various combinations of scientific, technical and advisory activities (including modification processes, that is, the influence of man-made and natural factors) required to acquire, produce, and supply information on the past, present, and future states of space, atmospheric, oceanographic, and terrestrial surrounding for use in military planning and decisionmaking processes, or to modify those surroundings to enhance military operations (JP 1-02)
<b>environmental stewardship</b>	(Joint)—the integration and application of environmental values into the military mission to sustain readiness, improve quality of life, strengthen civil relations, and preserve valuable natural resources (JP 1-02).
<b>environmental stewardship</b>	the care and management of the property of another, the environment. Army objective is to plan, initiate, and carry out its actions and programs in a manner that minimizes adverse effects on the environment without impairing the mission. (FM 3-34.500).
<b>ENVST</b>	environmental support team
<b>EO</b>	executive order
<b>EOD</b>	explosive ordnance disposal—(Joint)—detection, identification, on-site evaluation, rendering safe, recovery, and final disposal of UXO; may also include explosive ordnance which has become hazardous by damage or deterioration (FM 3-34.214/FM 1-02/JP 1-02)
<b>EPA</b>	Environmental Protection Agency; established in 1970, the EPA is charged with protecting and enhancing the environment today and for future generations to the fullest extent possible
<b>EPCRA</b>	Emergency Planning and Community Right-to-Know Act
<b>EQCC</b>	Environmental Quality Control Committee
<b>equip</b>	equipment
<b>ER</b>	environmental report
<b>ERC</b>	exercise related construction
<b>ERDC</b>	Engineer Research and Development Center
<b>ERP</b>	engineer regulating point—checkpoint to ensure that vehicles do not exceed the capacity of the crossing means and to give drivers final instructions on site-specific procedures and information, such as speed and vehicle interval (FM 3-34)
<b>ERT</b>	engineer reconnaissance team
<b>ES</b>	environmental statement
<b>ESA</b>	Endangered Species Act
<b>ESB</b>	engineer support battalion
<b>ESF</b>	emergency support function
<b>ESP</b>	engineer supply points
<b>evaporation rate</b>	how rapidly compound evaporates based on a reference compound. The higher the number the faster the material will evaporate.
<b>EW</b>	electronic warfare

<b>executive agent</b>	(Joint)—term used to indicate a delegation of authority by the SECDEF to a subordinate to act on the Secretary’s behalf; an agreement between equals does not create an executive agent. For example, a service cannot become a DOD executive agent for a particular matter with simply the agreement of the other services; such authority must be delegated by the SECDEF. Designation as executive agent, in and of itself, confers no authority. The exact nature and scope of the authority delegated must be stated in the document designating the executive agent. An executive agent may be limited to providing only administration and support or coordinating common functions, or it may be delegated authority, direction, and control over specified resources for specified purposes (JP 0-2/JP 1-02)
<b>explosive ordnance</b>	(Joint)—all munitions containing explosives, nuclear fission or fusion materials, and biological and chemical agents; this includes bombs and warheads; guided and ballistic missiles; artillery, mortar, rocket, and small arms ammunition; all mine, torpedoes, and depth charges; demotion charges; pyrotechnics; clusters and dispensers; cartridge and propellant actuated devices; electro-explosive devices; clandestine and improvised explosive devices; and all similar or related items or components explosive in nature (JP 1-02)
<b>explosive ordnance disposal unit</b>	(Joint)—personnel with special training and equipment who render explosive ordnance safe (such as bobs, mines, projectiles, and booby traps), make intelligence reports on such ordnance, and supervise the safe removal thereof (JP 1-02)
<b>FARP</b>	forward area refueling point
<b>FBCB2</b>	Force XXI Battle Command—Brigade and Below
<b>FE</b>	facilities engineer(ing)
<b>FEC</b>	facility engineer center
<b>FED</b>	facilities engineer detachment
<b>FEDLOG</b>	federal logistics
<b>FEG</b>	facility engineer group
<b>Fed Ex</b>	Federal Express
<b>FEMA</b>	Federal Emergency Management Agency
<b>FEST</b>	forward engineer support team—deployable USACE organization that executes the USACE mission in the AO; it is usually subordinate to the senior engineer commander in the AO. (FM 3-34)
<b>FEST-A</b>	forward engineer support team-advance (FM 3-34)
<b>FEST-M</b>	forward engineer support team-main (FM 3-34)
<b>FET</b>	facility engineer team
<b>FFCA</b>	Federal Facilities Compliance Act
<b>FFE</b>	field force engineering—the application of all of the Engineer Regiment’s capabilities (to include TeleEngineering) across the range of engineer battlespace functions (although primarily general engineering intensive) and in all phases and types of operations (offense, defense, stability, support) through both reach and forward presence.) (FM 3-34)
<b>FFIR</b>	friendly forces information requirements

<b>FGS</b>	final governing standards
<b>FHA</b>	foreign humanitarian assistance
<b>FID</b>	foreign internal defense
<b>FIFO</b>	first-in-first-out
<b>FIFRA</b>	Federal Insecticide, Fungicide, and Rodenticide Act
<b>flash point</b>	temperature at which there is enough vapor of a chemical to ignite if a spark is present
<b>FLOT</b>	forward line of own troops
<b>ft</b>	flat
<b>FM</b>	field manual; frequency modulation
<b>FMO</b>	facilities management office
<b>FMTV</b>	family of tactical vehicles
<b>FOB</b>	forward operating base
<b>FOIA</b>	Freedom of Information Act
<b>FOL</b>	forward operating location
<b>FONSI</b>	finding of no significant impact
<b>force beddown</b>	the provision of expedient facilities for troop support to provide a platform for the projection of force; these facilities may include modular or kit-type facility substitutes (JP 4-04/JP 1-02)
<b>force health protection</b>	all services performed, provided, or arranged by the services to promote, improve, conserve, or restore the mental or physical well being of personnel. These services include, but are not limited to, the management of health services resources such as manpower, monies, and facilities; preventive and curative health measure; evacuation of the wounded, injured, or sick; selection of the medically fit and disposition of the medically unfit; blood management; medical supply, equipment, and maintenance thereof; combat stress control; and medical, dental, veterinary, laboratory, optometry, medical food, and medical intelligence services
<b>FP</b>	force protection—(Joint)—security program designed to protect service members, civilian employees, family members, facilities, and equipment, in all locations and situations, accomplished through planned and integrated application of combating terrorism, physical security, operations security, personal protective service, and support by intelligence, counterintelligence, and other security programs. (Army) —those actions taken to prevent or mitigate hostile actions against DOD personnel (to include family members), resources, facilities, and critical information; these actions conserve the forces’s fighting potential so it can be applied at a decisive time and place and incorporates the coordinated and synchronized offensive and defensive measures to enable the effective employment of the joint force while degrading opportunities for the enemy. Force protection does not include actions to defeat the enemy or protect against accidents, weather, or disease (FM 3-0/FM 1-02/JP 3-0/JP 1-02)
<b>FPOL</b>	forward passage of lines
<b>fps</b>	foot(feet) per second
<b>FRAGO(RD)</b>	fragmentary order

<b>freezing point</b>	the temperature at which a compound will change from a liquid to a solid
<b>FRP</b>	Federal Response Plan
<b>FSB</b>	forward support base; forward support battalion
<b>FSCOORD</b>	fire support coordinator
<b>FSE</b>	fire support element
<b>FSOP</b>	field standing operating procedures
<b>FSSG</b>	force service support group (USMC)
<b>FTEE</b>	forward theater engineer element (FM 3-34)
<b>FTX</b>	field training exercise
<b>FUDS</b>	formerly used defense sites
<b>functions</b>	(Joint)—the appropriate or assigned duties, responsibilities, missions or tasks of an individual, office or organization; as defined in <i>National Security Act of 1947</i> , as amended, the term <i>function</i> includes functions, powers and duties (JP 1-02)
<b>fwd</b>	forward
<b>G1</b>	Assistant Chief of Staff, Personnel, General Staff (Division or higher staff)
<b>G2</b>	assistant chief of staff, intelligence, general staff (division or higher staff)
<b>G3</b>	assistant chief of staff, operations, general staff (division or higher staff)
<b>G4</b>	assistant chief of staff, logistics, general staff (division or higher staff)
<b>G5</b>	assistant chief of staff, civil affairs, general staff (division or higher staff)
<b>G6</b>	assistant chief of staff, command, control, communications and computer systems, general staff (division or higher staff)
<b>GAO</b>	General Accounting Office
<b>GE</b>	general engineering—(Joint)—encompasses the construction and repair of LOCs, MSRs, airfields, and logistic facilities to support joint military operations and may be performed in DS of combat operations, such as battle damage repair; these operations include both horizontal and vertical construction, and may include use of both expedient repair methods and more deliberate construction methods characterized by the application of design criteria, advanced planning, and preparation, depending on the mission requirements. (JP 3-34/JP 1-02); one of the engineer battlespace functions (FM 3-34)
<b>GEMINI</b>	<b>Appendix E</b>
<b>geospatial engineering</b>	provides commanders with terrain visualization, operational and tactical terrain analysis, digitized terrain products, nonstandard map products, and baseline survey data; one of the engineer battlespace functions (FM 3-34)
<b>geospatial information</b>	foundation information upon which all other battlespace information is referenced to form the COP (FM 3-34.230/FM 1-02)
<b>graywater</b>	any nontilet water (nonsewage) that is nonpotable because it was used in some way (for example, water from sinks, bathtubs, showers, or laundry operation)
<b>GS</b>	general support
<b>GSA</b>	General Services Administration

<b>GTA</b>	graphics training aid
<b>H&amp;S</b>	headquarters & service
<b>halons</b>	a family of fully halogenated hydrocarbons containing bromines. These substances are environmentally harmful because they deplete the earth's stratospheric ozone layer.
<b>Harvest Eagle</b>	a US-owned facility substitute of flexible tempered tents with insulation and environmental control units; the structures can be used to house more than 500 people and include a dining facility, showers and latrines
<b>Harvest Falcon</b>	a US-owned facility substitute used to accommodate USAF personnel and required operational facilities when deployed in off-shore environments; this system includes living accommodations, aircraft flight line facilities, air-contingency hospital operations, specialized clinics, and administrative support functions
<b>*hazard</b>	(DOD)—condition with the potential to cause injury, illness, or death of personnel; or damage to or loss of equipment or property; or mission degradation (FM 3-34.500/FM 100-14)
<b>hazardous substance</b>	under CERCLA, any element, compound, mixture, solution, or substance which, when released into the environment, on land or in water, may present an imminent and substantial danger to public health/welfare or the environment. The definition is broader than the definition of hazardous waste under RCRA
<b>HAZCOM</b>	hazard communication; the responsibility of leaders and supervisors concerning possible hazards in the workplace and notification of hazards and necessary precautions to their soldiers.
<b>HAZMAT</b>	hazardous material
<b>HAZMIN</b>	hazardous waste minimization
<b>HCA</b>	humanitarian and civic assistance
<b>HD</b>	humanitarian demining—(Joint)—DOD and DOS program to promote the foreign policy interests of the US by assisting other nations in protecting their populations from landmines and clearing land of the threat posed by landmines remaining after conflict has ended; the HD program includes training of HN deminers, establishment of national demining organizations, provision of demining equipment, mine awareness training, and research development (JP 3-07/JP 1-02)
<b>HDO</b>	humanitarian demining operations
<b>health hazards</b>	those hazards that can cause injury or illness when a person is exposed to hazardous chemicals by inhalation, ingestion, swallowing, skin contact, or eye contact
<b>HHC</b>	headquarters and headquarters company
<b>HHH</b>	headquarters and headquarters detachment
<b>historic artifacts</b>	something created by humans usually for a practical purpose especially an object remaining from a particular period (prehistoric caves, burial sites)
<b>HLD</b>	homeland defense—the protection of US territory, sovereignty, domestic population, and critical infrastructure against external threats and aggression (JP 3-26)

<b>HLS</b>	homeland security—the preparation for, prevention of, deterrence of, preemption of, defense against, and response to threats and aggression directed toward US infrastructure; as well as crisis management, consequence management, and other domestic civil support. Homeland Defense and Civil Support are sub elements of HLS (JP 3-26)
<b>HM</b>	hazardous material; any material, including waste, that may pose an unreasonable risk to health, safety, property, or the environment, when they exist in specific quantities and forms. Chemicals that have been determined by the Secretary of Transportation to present risks to safety, health, and property during transportation
<b>HMCC</b>	Hazardous Material Control Center
<b>HMTA</b>	Hazardous Materials Transportation Act
<b>HN</b>	host nation, a nation which receives the forces and/or supplies of Allied nations and/or North Atlantic Treaty Organization organizations to be located on, or to operate in or to transit through its territory
<b>HNS</b>	host nation support—(Joint)—civil and/or military assistance rendered by a nation to foreign forces within its territory during peacetime, crisis or emergencies or war, based upon agreements mutually concluded between nations. (FM 3-07/JP 4-0/JP 1-02)
<b>HPTL</b>	high payoff target list
<b>HQ</b>	headquarters
<b>HQMC</b>	Headquarters, Marine Corps
<b>humanitarian demining (HD)</b>	(Joint)—Department of Defense and Department of State program to promote the foreign policy interests of the United States by assisting other nations in protecting their populations from landmines and clearing land of the threat posed by landmines remaining after conflict has ended. The humanitarian demining program includes training of host nation deminers, establishment of national demining organizations, provision of demining equipment, mine awareness training, and research development. Also called <b>HD</b> (JP 3-07/JP 1-02)
<b>HSMS</b>	Hazardous Substance Management System
<b>HVT</b>	high-value target
<b>HW</b>	hazardous waste; waste which, if improperly managed, can create a risk to the safety or health of people or to the environment. EPA considers hazardous waste a subset of both solid waste and hazardous materials. Technically, those wastes that are regulated under RCRA 40 CFR, part 261 either because they are "listed" or because they are ignitable, corrosive, reactive, or toxic
<b>HWAS</b>	hazardous waste accumulation site
<b>I&amp;L</b>	installations and logistics
<b>IAT</b>	infrastructure assessment team—nondeployable team that provides engineering infrastructure assessments for military deployments and civil military operations in forward areas; focus areas for the IAT are infrastructure-related to USACE missions and aspects of the AO impacting contract construction, to include roads, utilities, water resources, and HN support. (FM 3-34)
<b>IAW</b>	in accordance with

<b>ICUZ</b>	installation compatibility use zone; a land use planning procedure employed to control environmental noise
<b>ID</b>	identification
<b>IED</b>	improvised explosive device—(Joint)—a device placed or fabricated in an improvised manner incorporating destructive, lethal, noxious, pyrotechnic, or incendiary chemicals and designed to destroy, incapacitate, harass, or distract; it may incorporate military stores, but is normally devised from nonmilitary components (JP 1-02)
<b>IET</b>	installation environmental trainer
<b>IG</b>	inspector general
<b>IHA</b>	industrial hazard assessment
<b>IMO</b>	installation management office
<b>incineration</b>	disposal of waste materials through controlled burning
<b>info</b>	information
<b>infrastructure</b>	(Joint)—all building and permanent installations necessary for the support, redeployment, and military forces operations (for example., barracks, HQ, airfields, communications, facilities, stores, port installations, and maintenance stations) (JP 4-01.8/JP 1-02)
<b>INRMP</b>	Integrated Natural Resource Management Plan
<b>intel</b>	intelligence
<b>intelligence</b>	(Joint)—product that results from collecting, processing, integrating, analyzing, evaluating, and interpreting available information concerning foreign countries or areas (JP 1-02)
<b>intelligence requirement</b>	(Joint)—(1) any subject, general or specific, for which there is a need to collect information or produce intelligence; (2) a requirement for intelligence to fill a gap in the command's knowledge or understanding of the battlespace or threat forces (JP 1-02)
<b>interoperability</b>	(Joint)—the ability of systems, units, or forces to provide services to and accept services from other systems, units, or forces and to use the services so exchanged to enable them to operate effectively together (JP 1-02)
<b>IOSC</b>	Installation On-Scene Coordinator
<b>IPB</b>	intelligence preparation of the battlefield/battlespace—an analytical methodology employed as part of intelligence planning to reduce uncertainties concerning the enemy, environment, and terrain or all types of operation; IPB is conducted during mission planning to support the commander's decision making and to form the basis for the direction of intelligence operation in support of current and future missions. It utilizes existing databases and identifies gaps in intelligence needed to determine the impact of the enemy, environment, and terrain on operations and presents this in an appropriate form to facilitate operational planning. It forms the basis for situation development. (FM 2-01.3); (Joint)—an analytical methodology employed to reduce uncertainties concerning the enemy, environment, and terrain for all types of operations; IPB builds an extensive database for each potential area in which a unit may be required to operate. The database is then analyzed in detail to determine the impact of the

	enemy, environment, and terrain on operations and presents it in graphic form. IPB is a continuing process (JP 2-02/JP 1-02)
<b>IPDS</b>	inland petroleum distribution system
<b>IPM</b>	integrated pest management
<b>IPMP</b>	integrated Pest Management Plan; the management of actual and potential pest problems using a combination of available preventive and corrective control measures. The biological effectiveness, environmental acceptability, and cost effectiveness of pest control measures must be considered before such measures can be approved for use on Army-controlled property.
<b>IR</b>	information requirement
<b>IRP</b>	Installation restoration program; the military's program to address environmental contamination at its facilities
<b>IRT</b>	installation response team. Those collective persons designated to act in an emergency to perform functions directed by the installation on-scene coordinator
<b>ISB</b>	intermediate staging base
<b>ISCP</b>	Installation Spill Contingency Plan; document detailing resources and procedures for cleanup of oil and hazardous substances spills
<b>ISD</b>	installation supply division
<b>ISR</b>	intelligence, surveillance, and reconnaissance—integrating and synchronizing of all BOS to collect and process information about the enemy and the environment to produce relevant information to facilitate the commander's decision making (FM 3-55)
<b>ISR assets</b>	those organizations, systems, sensors, and equipment dedicated to or directed toward the collection of information and the analysis and production of intelligence from the collected information in response to the commander's PIRs (FM 2-0)
<b>ISR plan</b>	integrated plan for collecting information from all available sources and analysis of that information to produce intelligence to meet requirements; specifically, a logical plan for transforming PIRs into orders or requests to reconnaissance and surveillance assets to collect pertinent information within a required time (FM 2-33.4)
<b>ISYSCON</b>	integrated systems control
<b>ITAM</b>	integrated training area management
<b>ITS</b>	individual training standard
<b>J2</b>	intelligence directorate, joint staff
<b>J3</b>	operations directorate, joint staff
<b>J4</b>	logistics directorate, joint staff
<b>J7</b>	development directorate, joint staff
<b>JAG</b>	Judge Advocate General
<b>JCMB</b>	joint civil-military coordination board
<b>JCMEB</b>	Joint Civil-Military Engineering Board
<b>JCS</b>	joint chiefs of staff
<b>JDWP</b>	joint doctrine working party—(Joint)—a forum to include representatives of the services, combatant command, and joint staff (represented by the operational plans and joint force development directorate, J7) which meets semiannually to address and vote on project proposals; discuss key joint doctrinal or operational issues; keep up to date on the status of the joint



publication projects and emerging publications; and keep abreast of other initiatives of interest to the members. The JDWP meets under the sponsorship of the J7 (JP 1-01/JP 1-02)

<b>JEMB</b>	Joint Environmental Management Board
<b>JEPES</b>	Joint Engineering Planning and Execution System
<b>JFACC</b>	joint force air component commander—(Joint)—derives authority from the JFC, who has the authority to exercise OPCON, assign missions, direct coordination among subordinate commanders, redirect and organize forces to ensure unity of effort in the accomplishment of the overall mission; normally designated by the JFC; responsibilities are assigned by the joint force commander (normally these include, but are not limited to, planning, coordination, allocation, and tasking, based on the JFC's apportionment decision); using the JFC's guidance and authority, and in coordination with other service component commanders and other assigned or supporting commanders, recommends to the JFC apportionment of air sorties to various missions or geographic areas (JP 3-0/JP 1-02)
<b>JFC</b>	joint force commander
<b>JFCOM</b>	Joint Forces Command
<b>JFLCC</b>	joint force land component commander—(Joint)—the commander within a unified command, subordinate unified command, or joint task force who is responsible to the establishing commander for making recommendations on the proper employment of land forces, planning and coordinating land operations, or accomplishing such operational missions as may be assigned; JFLCC is given the authority necessary to accomplish missions and tasks assigned by the establishing commander. JFLCC is normally the commander with the preponderance of land forces and the requisite C2 capabilities (JP 3-0/JP 1-02)
<b>JFLSC</b>	joint force logistic support command
<b>JFUB</b>	Joint Facilities Utilization Board—(Joint)—joint board that evaluates and reconciles component requests for real estate use of existing facilities, interservice support, and construction to ensure compliance with JCMEB priorities (JP 4-04/JP 1-02)
<b>JIC</b>	joint implementation committee; joint information center
<b>JIM</b>	joint, interagency and multinational
<b>JIMP</b>	Joint Vision Implementation Master Plan
<b>JIP</b>	joint implementation plan
<b>JLOTS</b>	joint logistics over-the-shore
<b>JLP</b>	joint logistics plan
<b>JLSP</b>	joint logistics support plan
<b>JMC</b>	joint movement center
<b>JMETL</b>	joint mission-essential task list
<b>JMMO</b>	joint material management office
<b>JOA</b>	joint operations area
<b>JOC</b>	joint operations center
<b>joint doctrine</b>	(Joint)—fundamental principles that guide the employment of forces of two or more military departments in coordinated action toward a common objective, it is authoritative; as such. Joint doctrine will be followed except when, in the judgment of the

	commander, exceptional circumstances dictate otherwise. It will be promulgated by or for the Chairman of the Joint Chiefs of Staff, in coordination with the combatant commands and services. (JP 1-01/1-02)
<b>JOPES</b>	Joint Operation Planning and Execution System
<b>JP</b>	joint publication; jet petroleum
<b>JPEC</b>	Joint Planning and Execution Community
<b>JRSOI</b>	joint reception, staging, onward movement and integration
<b>JSI</b>	joint staff instruction
<b>JTB</b>	joint transportation board or joint targeting board
<b>JTF</b>	joint task force
<b>JTFCEM</b>	joint task force contingency engineering management
<b>JTIMS</b>	joint training information management system
<b>JTS</b>	joint training system
<b>JTTP</b>	joint tactics, techniques, and procedures
<b>JRTEC</b>	Joint Regional Environment Training Center
<b>landfill</b>	an in-ground disposal site for wastes that were designed to reduce air pollution and unsightly trash that resulted from open dumping and burning. Older landfills leak contaminants into the soil and groundwater, although many new ones are built with elaborate leak prevention systems
<b>LCTA</b>	land condition trend analysis
<b>LE</b>	light equipment
<b>LEPC</b>	local emergency planning committee
<b>LFT</b>	lead federal agency
<b>LNO</b>	liaison officer
<b>LO</b>	logistics order; lubrication order
<b>LOAC</b>	law of armed conflict
<b>LOC</b>	line of communications
<b>LOCTDA</b>	line of communication tactical decision aid
<b>LOGCAP</b>	Logistics Contract Augmentation Program (Army); Logistics Civil Augmentation Program
<b>logistics preparation of the battlefield</b>	all actions taken by combat service support to maximize the means of supporting the commander's plans. (FM 4-0/FM 1-02)
<b>LOGPAC</b>	logistics package
<b>LOS</b>	line of sight
<b>LOTS</b>	logistics-over-the-shore
<b>LOW</b>	law of warfare
<b>LRAM</b>	land rehabilitation and maintenance
<b>LRP</b>	logistics resupply point
<b>LSA</b>	life support area
<b>LSE</b>	logistics support element
<b>lubricants</b>	Substances (such as grease) capable of reducing friction, heat, and wear when introduced as a film between solid surfaces
<b>LZ</b>	landing zone
<b>MACA</b>	military assistance to civil authorities
<b>MACOM</b>	major Army command
<b>MAGTF</b>	Marine air-ground task force
<b>maintenance engineering</b>	(Joint)—application of technique, engineering skills, and effort, organized to ensure that the design and development of weapon

	systems and equipment provide adequately for their effective and economical maintenance (JP 1-02)
<b>MAJ</b>	major
<b>MANSPT</b>	maneuver support—includes all of the functions identified in the M/CM/S BOS. (FM 3-34)
<b>MARFOR</b>	Marine Corps forces
<b>MCC</b>	movement control center
<b>MCCDC</b>	Marine Corps Combat Development Command
<b>MCL</b>	maximum contaminant level
<b>MCMOPS</b>	mine countermeasures operations
<b>MCO</b>	major contingency operation; Marine Corps order
<b>MCOO</b>	modified combined obstacle overlay—(Joint)—a joint IPB product used to portray the effects of each battlespace dimension on military operations; it normally depicts militarily significant aspects of the battlespace environment, such as obstacles restricting military movement, key geography, and military objectives (JP 2-01.3/JP 1-02)
<b>MCRP</b>	Marine Corps reference publication
<b>MCS</b>	maneuver control system; modular causeway system
<b>MCS-ENG</b>	maneuver control system-engineer
<b>MCWP</b>	Marine Corps warfare publication
<b>MDMP</b>	military decision making process
<b>MDRD</b>	mobilization, deployment, redeployment, and demobilization
<b>MECH</b>	mechanized
<b>MEDCOM</b>	medical command
<b>MEDIC</b>	medical diseases and countermeasures
<b>MEDEVAC</b>	medical evacuation
<b>medical waste</b>	any waste that is generated in the diagnosis, treatment, or immunization of human beings or animals
<b>MEF</b>	Marine Expeditionary Force
<b>MEG</b>	medical exposure guide
<b>melting point</b>	the temperature at which a compound will change from a solid to a liquid
<b>MEP</b>	mobile electric power; military environmental protection—application and integration of all aspects of natural environmental considerations, as they apply to the conduct of military operations (FM 3-34.500)
<b>METL</b>	mission-essential task list—compilation of collective mission-essential tasks an organization must perform successfully to accomplish its wartime mission(s) (FM 7-0/FM 1-02)
<b>METT-TC</b>	mission, enemy, terrain and weather, troops and support available, time available, and civil considerations.
<b>MFO</b>	multinational force and observers
<b>MFPF</b>	minefield planning folder
<b>MGRS</b>	military grid reference system
<b>MHE</b>	materials handling equipment
<b>MICC</b>	mine information coordination cell
<b>MILCON</b>	military construction—(Joint)—any construction, alteration, development, conversion, or extension of any kind carried out with respect to a military installation (JP 4-04/JP 1-02)

<b>mine</b>	(NATO, Joint)—(1) in land mine warfare, an explosive or material, normally encased, designed to destroy or damage ground vehicles, boats, or aircraft or designed to wound, kill, or otherwise incapacitate personnel; it may be detonated by the action of its victim, by the passage of time, or by controlled means; (2) in naval mine warfare, an explosive device laid in the water with the intention of damaging or sinking ships or of deterring shipping from entering an area; the term does not include devices attached to the bottoms of ships or to harbor installations by personnel operating underwater, nor does it include devices which explode immediately on expiration of a predetermined tie after laying (FM 3-34.32/FM 1-02/JP 3-15/JP 1-02)
<b>minehunting</b>	(Joint)—employment of sensor and neutralization systems, whether air, surface, or subsurface, to locate and dispose of individual mines; minehunting is conducted to eliminate mines in a known field when sweeping is not feasible or desirable, or to verify the presence or absence of mines in a given area (JP 3-15/JP 1-02)
<b>MINEOPS</b>	joint minelaying operations
<b>minesweeping</b>	(Joint)—technique of clearing mines using either mechanical, explosive, or influence seep equipment; mechanical sweeping removes, disturbs, or otherwise neutralizes the mine. Explosive sweeping causes sympathetic detonation in, damages, or displaces the mine; influence sweeping produces either the acoustic and/or magnetic influence required to detonate the mine (JP 3-15/JP 1-02)
<b>MISCAP</b>	mission capability (Air Force)
<b>MISP</b>	multispectral imagery processor
<b>MIW</b>	mine warfare—(Joint)—strategic, operational, and tactical use of mines and mine countermeasures; mine warfare is divided into two basic subdivisions: the laying of the mines to degrade the enemy’s capabilities to wage land, air, and maritime warfare; and the countering of enemy-laid mines to permit friendly maneuver or use selected land or sea areas (FM 3-24.32/FM 1-02/JP 3-15/JP 1-02)
<b>MMC</b>	materiel management center
<b>MMPA</b>	Marine Mammal Protection Act
<b>MO</b>	Missouri
<b>MOA</b>	memorandum of agreement
<b>MOB</b>	military operating base
<b>mobility</b>	(NATO, Joint)—quality or capability of military forces which permits them to move from place to place while retaining the ability to fulfill their primary mission; (Army)—those activities that enable a force to move personnel and equipment on the battlefield without delays due to terrain or obstacles (FM 1-02)
<b>mobility analysis</b>	(Joint)—in-depth examination of all aspects of transportation planning in support of OPLAN and OPORD development. (JP 1-02)
<b>*mobility operations</b>	obstacle reduction by maneuvering and engineer units to reduce or negate the effects of existing or reinforcing obstacles; the

	objectives are to maintain freedom of movement for maneuver units, weapon systems and critical supplies. (FM 3-34)
<b>MOGAS</b>	motor gas
<b>MOMs</b>	measures of merit
<b>monitoring</b>	the assessment of emissions and ambient air quality conditions. Monitoring techniques used are emission estimates, visible emission readings, diffusion or dispersion estimates, and sampling or measurement with analytical instruments.
<b>MOOTW</b>	military operations other than war
<b>MOPMS</b>	modular pack mine system
<b>MOS</b>	military occupational specialty
<b>MP</b>	military police
<b>MPF</b>	maritime pre-positioning force
<b>MPS</b>	maritime pre-positioning ship
<b>MPSC</b>	mobilization planning support cell
<b>MPSPRON</b>	maritime pre-positioning force squadrons
<b>MRB</b>	multirole bridge
<b>MSC</b>	major subordinate command
<b>MSDS</b>	mission specific data sets—(Joint)—further densification of global geospatial foundation data; information created to support specific operations, OPLANs, training or system development. Information conforms to established DOD data specifications. (JP 2-03/JP 1-02)
	material safety data sheet
<b>MSR</b>	main supply route
<b>MSB</b>	main support battalion
<b>MSC</b>	Military Sealift Command
<b>MTOE</b>	modified table of organization and equipment
<b>MTP</b>	mission training plan
<b>MTT</b>	mobile training team
<b>MTW</b>	major theater war
<b>MWR</b>	morale, welfare, and recreation
<b>MWRS</b>	morale, welfare, recreation and services
<b>NAAQS</b>	national ambient air quality standards
<b>NAGPRA</b>	Native American Graves Protection and Repatriation Act
<b>NAI</b>	named area of interest
<b>NATO</b>	North Atlantic Treaty Organization
<b>*natural environment</b>	the human ecosystem, including the physical and biological systems that provide resources (clean air, clean water, healthy surroundings, sufficient food) necessary to sustain productive human life; included in the natural environment are man-made structures, such as water and wastewater treatment facilities and natural/cultural resources. (FM 3-34.500)
<b>NAVAID</b>	navigational aid
<b>NAVFAC</b>	naval facilities
<b>NAVFACENGCOM</b>	Naval facilities engineering command
<b>NAVFOR</b>	Navy forces
<b>NAVSTAR</b>	navigation satellite timing and ranging
<b>NBG</b>	naval beach group
<b>NCA</b>	National Command Authority; Noise Control Act
<b>NCB</b>	naval construction brigade

<b>NCF</b>	naval construction force
<b>NCFSU</b>	naval construction force support unit
<b>NCO</b>	noncommissioned officer
<b>NCOIC</b>	noncommissioned officer in charge
<b>NCP</b>	National Contingency Plan
<b>NCR</b>	naval construction regiment
<b>NCS</b>	National Communications System
<b>NDP</b>	naval doctrine publication
<b>NEPA</b>	National Environmental Policy Act
<b>NEO</b>	noncombatant evacuation operations
<b>NEPA</b>	National Environmental Policy Act
<b>neutralization</b>	(NATO, Joint)—in mine warfare, a mine is said to be neutralized when it has been rendered, by external means, incapable of firing on passage of a target, although it may remain dangerous to handle (FM 3-34.32/FM 1-02/JP 1-02)
<b>neutralize</b>	(Joint)—(1) as pertains to military operations, to render ineffective or unusable; (2) a tactical mission task that results in rendering enemy personnel or material incapable of interfering with a particular operation (FM 3-90); (3) to render safe mines, bombs, missiles, and booby traps (FM 3-34.214); (4) to render harmless (FM 3-11.9) (FM 1-02/JP 1-02)
<b>NFESC</b>	Naval Facilities Engineering Service Center
<b>NG</b>	National Guard
<b>NGO</b>	nongovernmental organization
<b>NHPA</b>	National Historic Preservation Act
<b>NIMA</b>	National Imagery and Mapping Agency
<b>NMCB</b>	naval mobile construction battalion
<b>NOAA</b>	National Oceanic and Atmospheric Administration
<b>NORTHCOM</b>	Northern Command
<b>NOV</b>	notice of violation; formal written document provided to an installation by a regulatory agency as a result of environmental noncompliance
<b>NOX</b>	nitrogen oxide
<b>NPDES</b>	National Pollutant Discharge Elimination System
<b>NSE</b>	Navy support element
<b>NSN</b>	national stock number
<b>NTC</b>	national training center
<b>NWP</b>	naval warfare publication
<b>OAKOC</b>	observation, avenues of approach, key terrain, obstacles and cover and concealment
<b>O&amp;M</b>	operation and maintenance
<b>OAS</b>	offensive air support; Organization of American States
<b>OASD</b>	Office of the Assistant Secretary of Defense
<b>obstacle</b>	(Joint)—any obstruction designed or employed to disrupt, fix, turn, or block the movement of an opposing force and to impose additional losses in personnel, time, and equipment on the opposing force; obstacles can be natural, man-made, or a combination of both. (FM 3-34.1/FM 1-02/JP 3-15/JP 1-02)
<b>OBSTINTEL</b>	obstacle intelligence—the first breach tenet; an IR prior to conducting combined-arms breaching operations. Obstacle intelligence includes a broad range of information to include

	location, composition, and orientation of exiting obstacles. (FM 3-34.2)
<b>OCONUS</b>	outside the continental United States
<b>ODSS</b>	offense, defense, stability, and support
<b>OE</b>	operational environment—(Joint)—A composite of the conditions, circumstances, and influences that affect the employment of military forces and bear on the decisions of the unit commander. Some examples are as follows. a. permissive environment—Operational environment in which host country military and law enforcement agencies have control as well as the intent and capability to assist operations that a unit intends to conduct. b. uncertain environment—Operational environment in which host government forces, whether opposed to or receptive to operations that a unit intends to conduct, do not have totally effective control of the territory and population in the intended operational area. c. hostile environment—Operational environment in which hostile forces have control as well as the intent and capability to effectively oppose or react to the operations a unit intends to conduct.
<b>OEBGD</b>	overseas environmental baseline guidance document—(Joint)—set of objective criteria and management practices developed by DOD to protect human health and the environment (JP 4-04/JP 1-02)
<b>OEHS</b>	occupational and environmental health surveillance—(Joint)—the regular or repeated collection, analysis, archiving, interpretation, and dissemination of occupational and environmental related health data for monitoring the health of a population and of individual personnel, and for intervening in a timely manner to prevent, treat, or control the occurrence of disease or injury when determined necessary. It is closely integrated with the timely dissemination of data to allow mitigation of health hazards and consequences. (JP 4-02)
<b>OFDA</b>	Office of Foreign Disaster Assistance
<b>OIC</b>	officer in charge
<b>OICC</b>	officer in charge of construction
<b>OJE</b>	Operation Joint Endeavor
<b>OODA</b>	observe, orient, decide and act
<b>OPA</b>	Oil Pollution Act
<b>OPCOM</b>	(NATO)—operational command
<b>OPCON</b>	operational control
<b>OPDS</b>	offshore petroleum discharge system
<b>operational areas</b>	subareas defined by the commander and designated within the AO that bounds the specific areas the commander will maneuver through and therefore can focus ISR capabilities to achieve the assured mobility imperative to select, establish, and maintain operating areas (JP 3-05.3/JP 1-02)
<b>operational environment</b>	(Joint)—a composite of all conditions, circumstances, and influences which affect the employment of military forces and bear on the decisions of the unit commander (JP 3-05.3/JP 1-02)
<b>OPFOR</b>	opposing forces
<b>OPG</b>	Operational Planning Group

<b>OPLAN</b>	operation plan
<b>OPNAVINST</b>	operational naval instruction
<b>opns</b>	operations
<b>OPORD</b>	operation order
<b>OPP</b>	offload preparation party
<b>ops</b>	operations
<b>Ops Det</b>	operations detachment
<b>OPSEC</b>	operations security
<b>OPTEMPO</b>	operations tempo
<b>ORM</b>	Operational Risk Management
<b>OSCE</b>	Organization for Security and Cooperation in Europe
<b>OSD</b>	Office of the Secretary of Defense
<b>OSHA</b>	Occupational Safety and Health Act or Occupational Safety and Health Administration
<b>OTSG</b>	Office of the Surgeon General
<b>OVE</b>	on-vehicle equipment
<b>P&amp;A</b>	production and analysis
<b>PACOM</b>	Pacific Command
<b>PAH</b>	polycyclic aromatic hydrocarbon
<b>PAM</b>	pamphlet
<b>PAO</b>	public affairs office(r)
<b>PARC</b>	principal assistant responsible for contracting
<b>PBO</b>	property book officer
<b>PCB/Polychlorinated biphenyls</b>	A family of chemicals that are probable carcinogens, once widely used in electrical insulation. Banned in the US in 1979, PCB contamination has occurred on US bases where abandoned electrical transformers have leaked into the environment.
<b>PCN</b>	product control number
<b>PDD</b>	Presidential Decision Directive
<b>penalties</b>	the legal punishment (fines, jail) for having violated a law.
<b>pers</b>	personnel
<b>pesticides</b>	a chemical or other substance used to destroy plants and animal pests.
<b>physical hazards</b>	those hazards that can cause explosions, fires, violent chemical reactions, or other hazardous situations
<b>PIR</b>	priority intelligence requirements
<b>PL</b>	phase line; public law
<b>PLL/ASL</b>	prescribed load list/authorized stock list
<b>PLS</b>	palletized load system
<b>PM</b>	pest management
<b>PMCS</b>	preventive maintenance checks and services
<b>PME</b>	peacetime military engagement
<b>PMO</b>	provost marshal office
<b>PMP</b>	Pest Management Plan
<b>POC</b>	point of contact
<b>POD</b>	port of debarkation
<b>POE</b>	port of embarkation
<b>POL</b>	petroleum, oils and lubricants
<b>PPE</b>	personal protective equipment



<b>PPM</b>	Parts per million; molecules of chemical per one million molecules of air.
<b>PQS</b>	personnel qualifications standards (Navy)
<b>prestock point</b>	location where mines, explosives, and materials for use in preparation of a planned obstacle are stored. (FM 3-34.32/FM 1-02)
<b>prevention</b>	the process of reducing or eliminating pollution
<b>primacy</b>	a legal situation which allows the states to have environmental and worker protection standards more stringent than the federal standards
<b>proactive mine countermeasures</b>	(Joint)—measures intended to prevent the enemy from successfully laying mines (JP 3-15/JP 1-02)
<b>PSS</b>	personnel service support
<b>PSYOP</b>	psychological operations
<b>Prime BEEF</b>	Prime base engineer emergency force
<b>Prime RIBS</b>	Prime readiness in base support
<b>Pub</b>	publication
<b>QA</b>	quality assurance
<b>QC</b>	quality control
<b>QCA</b>	Quiet Communities Act
<b>QDR</b>	Quadrennial Defense Review
<b>QM</b>	quartermaster
<b>QOL</b>	quality of life
<b>radon</b>	a colorless, odorless, radioactive by-product from the natural degradation of uranium
<b>R&amp;S</b>	reconnaissance and surveillance
<b>RC</b>	Reserve component
<b>RCEM</b>	regional contingency engineering manager
<b>RCRA</b>	Resource Conservation and Recovery Act
<b>reach</b>	to communicate and access the Engineer Regiment's capabilities via means such as TeleEngineering; reach may occur from forward units to the rear or laterally (FM 3-34) (The Air Force and Navy have similar capabilities in their services)
<b>real property</b>	(Joint)—lands, buildings, structures, utilities systems, improvements, and appurtenances; includes equipment attached to and made part of buildings and structures (such as heating systems) but not movable equipment (such as plant equipment). (JP 1-02)
<b>rearming</b>	(Joint)—(1) an operation that replenishes the prescribed stores of ammunition, bombs, and other armament items for an aircraft, naval ship, tank, or armored vehicle (including replacement of defective ordnance equipment) to make it ready for combat service; (2) resetting the fuze on a bomb, or on an artillery, mortar, or rocket projectile so that it will detonate at the desired time (FM 3-34/FM 1-02/JP 1-02)
<b>REC</b>	record of environmental consideration (related to NEPA)
<b>reclamation</b>	regeneration of a material, or processing a material to recover a usable product. Examples include the recovery of lead from spent batteries or the regeneration of spent solvents

<b>recovered materials</b>	waste materials and by-products that have been recovered or diverted from solid waste, but this term does not include those materials and by-products generated from, and commonly reused within, an original manufacturing process
<b>recyclability</b>	the ability of a product or material to be recovered from, or otherwise diverted from, the solid waste stream for the purpose of recycling
<b>recycling</b>	the process by which recovered materials are transformed into new or usable products
<b>RED HORSE</b>	Rapid Engineer Deployable Heavy Operations Repair Squadron Engineer—(Joint)—Air Force units wartime-structured to provide a heavy engineer capability; they have a responsibility across the operational area, are not tied to a specific base, and are not responsible for base operation and maintenance. These units are mobile, rapidly deployable, and largely self-sufficient for limited periods of time (JP 3-34/JP 1-02)
<b>reduction</b>	(Joint)—creation of lanes through a minefield or obstacle to allow passage of the attacking ground force (JP 3-15/JP 1-02)
<b>reserved obstacles</b>	(Joint)—those demolition obstacles that are deemed critical to the plan for which the authority to detonate is reserved by the designating commander; (Army)—obstacles of any type, for which the commander restricts execution authority (FM 3-34.1/FM 1-02/JP 3-15/JP 1-02)
<b>restoration</b>	the process of cleaning up contaminated sites
<b>risk</b>	the probability of exposure, coupled with the severity of the consequences. Risk is often used in a more general way than danger, in that risk is used to describe potential financial loss or property damage in addition to environmental damage or personal injury
<b>ROD</b>	record of decision
<b>ROE</b>	rules of engagement
<b>ROICC</b>	resident officer in charge of construction
<b>ROWPU</b>	reverse osmosis water purification unit
<b>RPE</b>	rapid port enhancement
<b>RPMA</b>	real property maintenance activities
<b>RPOL</b>	rearward passage of lines
<b>RRR</b>	rapid runway repair
<b>RSOI</b>	reception, staging, onward movement and integration
<b>RSP</b>	render-safe procedures
<b>RSTA</b>	reconnaissance, surveillance, and target acquisition
<b>RSR</b>	required supply rate
<b>rte</b>	route
<b>S1</b>	personnel staff officer, adjutant (brigade and battalion)
<b>S2</b>	intelligence staff officer (brigade and battalion)
<b>S3</b>	operations and training officer (brigade and battalion)
<b>S4</b>	logistics staff officer, supply officer (brigade and battalion)
<b>S5</b>	civil military operations staff officer (brigade and battalion)
<b>SA</b>	security assistance; Sikes Act
<b>SARA</b>	Superfund Amendments and Reauthorization Act
<b>SCATMINE</b>	scatterable mine—(NATO, Joint)—in land mine warfare, a mine laid without regard to classical pattern and which is designated to

	be delivered by aircraft, artillery, missile, ground dispenser, or by hand; once laid, it normally has a limited life. (FM 3-34.32/FM 1-02)
<b>SD</b>	self-destruct
<b>SDWA</b>	Safe Drinking Water Act
<b>SEABEE</b>	Navy construction engineer
<b>SECDEF</b>	Secretary of Defense
<b>SECSTATE</b>	Secretary of State
<b>secure</b>	(NATO, Joint)—in an operational context, to gain possession of a position or terrain feature with or without force, and to make such disposition as will prevent, as far as possible, its destruction of loss by enemy action. [Note: Army classifies this as a tactical mission task]. (FM 3-90); (Army)—one of the five breaching fundamental; those actions which eliminate the enemy's ability to interfere with the reduction and passage of combat power through a lane. Secure may be accomplished by maneuver or by fires. (FM 3-34.2/FM 1-02/JP 1-02)
<b>SERC</b>	state emergency response commission
<b>SES</b>	staff engineer section
<b>SET</b>	state environmental trainer
<b>SF</b>	standard form
<b>SIC</b>	survey information center
<b>SIGINT</b>	signal intelligence
<b>SITREP</b>	situation report
<b>SIP</b>	state implementation plan
<b>SIPRNET</b>	Secret Internet Protocol Router Network
<b>SITEMP</b>	situation template
<b>SJA</b>	Staff Judge Advocate
<b>SLRP</b>	survey, liaison and reconnaissance party
<b>SMART</b>	special medical augmentation response team
<b>SME</b>	subject matter expert
<b>SOF</b>	special operations forces
<b>SOFA</b>	status-of-forces agreement. An agreement on the stationing of forces to which the US is a party, such as a multilateral or bilateral stationing or base rights agreement, or an arrangement or understanding concluded thereunder.
<b>solid waste</b>	any material or substance (solid or liquid) which is inherently waste-like by being no longer suitable for its originally intended purpose
<b>solubility</b>	the quality or state of being able to dissolve in water. The amount of substance that will dissolve in a given amount of another substance
<b>solvents</b>	volatile organic compounds (trichloroethylene and so forth) used as powerful cleaners, degreasers, and paint strippers. At one time solvents were widely used in the military's industrial production and maintenance operations and routinely dumped untreated into the ground
<b>SOP</b>	standing operating procedure
<b>source reduction</b>	the DOD has set the goal of reducing HW generation at its sources. This reduction is to be achieved through product substitution, recycling, and inventory control, and by developing

	new industrial processes that use less hazardous materials, such as bead blasting rather than solvents to remove paint
<b>sovereign immunity</b>	a doctrine precluding the institution of a suit against the sovereign (for example, the federal government) without its consent
<b>SPCE</b>	survey planning and coordination element
<b>spill</b>	a generic term that encompasses the accidental and the deliberate but unpermitted discharge or release of a pollutant
<b>SPILLREP</b>	spill report
<b>SPOD</b>	seaport of debarkation
<b>SPOE</b>	seaport of embarkation
<b>SPRP</b>	spill prevention response plan
<b>spt</b>	support
<b>SSC</b>	smaller-scale contingency
<b>STANAG</b>	standardization agreement (NATO)
<b>STARC</b>	State Area Command
<b>STB</b>	super tropical bleach
<b>STP</b>	soldier training publication
<b>SU</b>	situational understanding
<b>SUPCOM</b>	support command
<b>Superfund</b>	See CERCLA
<b>surface water</b>	water contained in rivers, streams, and so forth
<b>survivability</b>	(Joint)—concept which includes all aspects of protecting personnel, weapons, and supplies while simultaneously deceiving the enemy; survivability tactics include building a good defense; employing frequent movement; using concealment, deception, and camouflage; and constructing fighting and protective positions for both individuals and equipment. (JP 3-34/JP 1-02) [ <b>Note:</b> Army adds, “Encompasses planning and locating position sites, designing adequate overhead cover, analyzing terrain conditions and construction materials, selecting excavation methods, and countering the effects of direct and indirect fire weapons”] (FM 3-34.1)
<b>survivability operations</b>	development and construction of protective positions, such as earth berms, dug-in positions, overhead protection, and countersurveillance means, to reduce the effectiveness of enemy weapon systems. (FM 3-34.112/FM 1-02)
<b>sustaining operations</b>	operations at any echelon that enable shaping and decisive operations by providing CSS, rear area and base security, movement control, terrain management, and infrastructure development (FM 3-0)
<b>TA</b>	theater army
<b>TAA</b>	tactical assembly areas
<b>TAACOM</b>	Theater Army Area Command
<b>TAC</b>	Transatlantic Programs Center
<b>TACCP</b>	tactical command post
<b>TACON</b>	tactical control
<b>TACSOP</b>	tactical standing operating procedures
<b>tactical risk</b>	the risk concerned with hazards that exist because of the presence of either the enemy or an adversary
<b>TAI</b>	targeted area of interest

<b>TB</b>	technical bulletin
<b>TBP</b>	to be published
<b>TC</b>	training circular
<b>TCEM</b>	theater contingency engineering management
<b>TCF</b>	tactical combat force
<b>TCMS</b>	theater construction management system
<b>TCN</b>	third country national, tracking control number
<b>TDA</b>	table of distribution and allowance; tactical decision aid
<b>TEC</b>	Topographic Engineering Center
<b>TeleEngineering</b>	reflects an engineering telepresence to the force under the proponency of USAES; this capability is focused on assisting engineers and the commanders they support in planning and executing their operational and tactical missions. It is a piece of the capabilities inherent in FFE. The overarching concept is the exploitation of the Army's C3 architectures to provide a linkage between engineers and the appropriate nondeployed SMEs for resolution of engineer challenges (FM 3-34)
<b>tempo</b>	the rate of military action (FM 3-0/FM 1-02)
<b>terrain analysis</b>	(NATO, Joint)—collection, analysis, evaluation, and interpretation of geographic information on the natural and man-made features of the terrain, combined with other relevant factors, to predict the effect of the terrain on military operations (FM 2-01.3/FM 1-02/JP 1-02)
<b>terrain expert</b>	person who demonstrates skills and knowledge in rendering geospatial engineering to the tactical and operational situation to leverage the battlespace; experts understand the limits/capabilities of GI&S and can integrate them into MDMP. (FM 3-34)
<b>terrain intelligence</b>	(Joint)—intelligence on the military significance of natural and man-made characteristics of an area. (JP 1-02)
<b>terrain reinforcement</b>	the development of terrain using obstacles to degrade enemy mobility or to enhance friendly survivability through the construction of fighting positions and cover (FM 3-34)
<b>terrain study</b>	(Joint)—an analysis and interpretation of natural and man-made features of an area, their effects on military operations, and the effect of weather and climate on these features (JP 1-02)
<b>TF</b>	task force
<b>TG</b>	trainer's guide; technical guide
<b>theater support contractors</b>	(Joint)—contract personnel hire in, and operating in, a specific operational are. (JP 4-07/JP 1-02)
<b>threatened species</b>	those species that are likely to become endangered within the foreseeable future throughout all or a significant portion of their range
<b>threshold limit value (time weighted average)</b>	the recommended limit for worker exposure over an 8-hour work day
<b>TID</b>	turn-in document
<b>*TIH</b>	toxic industrial hazard—(NATO)—the hazards resulting from the release, by any means, of toxic industrial materials, resulting in

	contamination or irradiation of personnel or the environment area or any particular object (FM 3-34.500)
<b>TLP</b>	troop leading procedure
<b>TM</b>	technical manual
<b>TO</b>	theater of operation; table of organization
<b>TOA</b>	table of allowances
<b>TOC</b>	tactical operations center
<b>TOE</b>	table of organization and equipment
<b>topographic map</b>	(Joint)—a map that presents the vertical position of features in measurable form, as well as their horizontal position (FM 3-25.26/FM 1-02/JP 1-02)
<b>toxic</b>	capable of producing injury, illness, or damage to humans, domestic livestock, wildlife, or other organisms through ingestion, inhalation, or absorption through any body surface
<b>TPA</b>	training proficiency assessment
<b>TPFDD</b>	time-phased force and deployment data
<b>TRADOC</b>	United States Army Training and Doctrine Command
<b>TRANSCOM</b>	Transportation Command
<b>TSC</b>	theater support command; Training Support Center
<b>TSCA</b>	Toxic Substances Control Act
<b>TSDF</b>	treatment, storage, disposal facility
<b>TTP</b>	tactics, techniques and procedures
<b>UCT</b>	underwater construction team
<b>UG</b>	user's guide
<b>UI</b>	unit of issue
<b>UJTL</b>	universal joint task list—(Joint)—a menu of capabilities (mission-derived tasks with associated conditions and standards, such as the tools) that may be selected by a joint force commander to accomplish the assigned mission; once identified as essential to mission accomplishment, the tasks are reflected with the command joint METL (JP 3-33/JP 1-02)
<b>ULV</b>	ultra low volume
<b>UMT</b>	unit maintenance team
<b>UN</b>	United Nations
<b>UO</b>	urban operations—offense, defense, stability, and support operations conducted in a topographical complex and adjacent natural terrain where man-made construction and high population density are the dominant features. (FM 3-0)
<b>US</b>	United States
<b>USACE</b>	United States Army Corps of Engineers
<b>USACHPPM</b>	United States Army Center for Health Promotion and Preventive Medicine
<b>USACOM</b>	United States Atlantic Command
<b>USAEC</b>	United States Army Environmental Center; provides oversight, coordination, and execution support for Army environmental programs and projects, and technical and related support.
<b>USAEHSC</b>	United States Army Engineering and Housing Support Center
<b>USAES</b>	United States Army Engineer School
<b>USAFEG</b>	United States Army Facility Engineer Group
<b>USAID</b>	United States Agency for International Development
<b>USAMC</b>	United States Army Materiel Command

<b>USAMEDCOM</b>	United States Army Medical Command
<b>USAR</b>	United States Army Reserve
<b>USARC</b>	United States Army Reserve Center
<b>USAREUR</b>	United States Army Europe
<b>USARPAC</b>	United States Army Pacific Command
<b>USC</b>	United States code
<b>USDA</b>	United States Department of Agriculture
<b>USE</b>	Used Solvent Elimination Program
<b>USEPA</b>	United States Environmental Protection Agency
<b>USFK</b>	United States Forces Korea
<b>USFWS</b>	United States Fish and Wildlife Service
<b>USG</b>	United States Government
<b>USGS</b>	United States Geological Survey
<b>USJFCOM</b>	United States Joint Forces Command
<b>USMC</b>	United States Marine Corps
<b>USSOUTHCOM</b>	United States Southern Command
<b>UST</b>	underground storage tank. Below- or in-ground tank, storing oil or hazardous substances, regulated under RCRA
<b>USTRANSCOM</b>	United States Transportation Command
<b>UTM</b>	universal traverse mercator
<b>UXO</b>	unexploded ordnance—(NATO, Joint)—explosive ordnance which has been primed, fused, armed, or otherwise prepared for action, and which has been fired, dropped, launched, projected, or placed in such a manner as to constitute a hazard to operations, installations, personnel, or materiel, and remains unexploded either by malfunction or design or for any other cause. (FM 4-30.11/FM 1-02/JP 3-15/JP 1-02)
<b>vapor density</b>	how heavy vapor is relative to air. Air is assigned a vapor density of 1. If the number is less than 1, the vapor from the compound will rise. If the number is greater than 1, the vapor will tend to sink to the ground
<b>vapor pressure</b>	Pressure of a compound in the vapor state. The higher the number the more readily the compound will evaporate. Compounds with high vapor pressures are often flammable and if contained in a sealed container may burst.
<b>VECTRAP</b>	vector assessment profile
<b>viscosity</b>	measure of how “thick” a liquid or semi-solid material is at room temperature
<b>VOC</b>	volatile organic compound
<b>WAN</b>	wide-area network
<b>WARNO</b>	warning order
<b>waste</b>	any discarded material
<b>WES</b>	Waterways Experiment Station
<b>wetlands</b>	generally includes marshes, swaps, bogs, and similar areas. Areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support a prevalence of vegetation typically adapted for saturated soil conditions
<b>WHO</b>	World Health Organization
<b>WMD</b>	weapons of mass destruction
<b>WO</b>	warning order
<b>XO</b>	executive officer

**ZOC** zone of control



# Bibliography

## SOURCES USED

These are the sources quoted or paraphrased (or are expected to be) in this publication.

## JOINT AND MULTISERVICE PUBLICATIONS

CJCSI 3500.01C. *Joint Training Policy and Guidance for the Armed Forces of the United States*. 31 July 2004.

CJCSM 3122.01. *Joint Operational Planning and Execution System (JOPES), Volume I (Planning Policies and Procedures)*. 25 May 2001.

CJCSM 3122.02C. *Joint Operational Planning and Execution System (Crisis Action Time-Phased Force and Deployment Data Development and Deployment Execution), Volume III (Planning Policies and Procedures)*. 23 March 2004.

CJCSM 3122.03A. *Joint Operational Planning and Execution System, Volume II (Planning Formats and Guidance)*. 01 September 2002.

CJCSM 3141.01A. *Joint Procedures for the Review of Operation Plans*. 15 September 1998.

CJCSM 3500.03A. *Joint Training Manual for the Armed Forces of the United States*. 01 July 2002.

CJCSM 3500.04C. *Universal Joint Task List (UJTL)*. 01 July 2002.

JP 3-34. *Engineer Doctrine for Joint Operations*. 05 July 2000.

JP 3-57. *Joint Doctrine for Civil-Military Operations*. 08 February 2001.

JP 3-57.1. *Joint Doctrine for Civil Affairs*. 14 April 2003.

JP 4-02. *Doctrine for health Service Support in Joint Operations*. 30 July 2001.

JP 4-02.1. *Joint Tactics, Techniques, and Procedures for Health Service Logistics Support in Joint Operations*. 06 October 1997.

JP 4-04. *Joint Doctrine for Civil Engineering Support*. 26 September 1995.

JP 5-0. *Doctrine for planning Joint Operations*. 13 April 1995.

JP 5-00.1. *Joint Doctrine for Campaign Planning*. 25 January 2002.

JP 5-00.2. *Joint Force Planning Guidance and Procedures*. 13 January 1999.

- JSI 3820.01A. *Environmental Engineering Effects of DOD Actions*. 16 January 1996.
- FM 3-05.401/MCRP 3-33.1A. *Civil Affairs Tactics, Techniques, and Procedures*. 23 September 2003.
- FM 3-100.12/MCRP 5-12.1C/NTTP 5-03.5/AFTTP(I) 3-2.34. *Risk Management*. 15 February 2001.
- FM 90-13/FM 7-26. *River-Crossing Operations*. 26 January 1998.
- FM 100-19/FM 7-10. *Domestic Support Operations*. 1 July 1993.
- CD. Joint Service Pollution Technical Library (version 1.3). 1 August 1997.
- NWP 4-04.1/MCWP 4-11.5. *Naval Seabee Operations in the MAGTF*. November 1997.

## DEPARTMENT OF DEFENSE PUBLICATIONS

- DLA Booklet (with accompanying CD). *Environmental Products*. October 1997.
- DOD Document. *Overseas Environmental Baseline Guidance Document*. October 1992.
- DOD Regulation 4145.19-R-1. *Hazardous Materials Storage and Handling Criteria*. date
- DODD 4120.14. *Environmental Pollution, Prevention, Control, and Abatement*. date
- DODD 4700.4. *Natural Resource Management Programs*. 24 January 1989.
- DODD 6050.7. *Environmental Effects Abroad of Major Department of Defense Actions*. 31 March 1979.
- DODD 6490.2. *Joint Medical Surveillance*. 30 August 1997.
- DODI 4150.7. *DOD Pest Management Program*. 22 April 1996.
- DODI 4270.5. *Military Construction Responsibilities*. 02 March 1982.
- DODI 4715.5. *Management of Environmental Compliance at Overseas Installations*. 22 April 1996.
- DODI 4715.8. *Environmental Remediation Policy for DOD Activities Overseas*. 22 April 1996.
- DODI 6490.3. *Implementation and Application of Joint Medical Surveillance for Deployment*. 7 August 1997. (being rewritten, check this data)
- DODI 6055.1. *DOD Safety and Occupational Health (SOH) Program*. 19 August 1998.

## OTHER FEDERAL GOVERNMENT PUBLICATIONS

- EO 11987. *Exotic Organisms*. 24 May 1977.

- EO 11988. *Floodplain Management*. 24 May 1977.
- EO 11989. *Off-Road Vehicles on Public Lands*. 24 May 1977.
- EO 11990. *Protection of Wetlands*. 24 May 1977.
- EO 12088. *Federal Compliance With Pollution Control Standards*. 13 October 1978.
- EO 12114. *Environmental Effects Abroad of Major Federal Actions*. 4 January 1979.
- EO 12580. *Superfund Implementation*. 23 January 1987.
- EO 12856. *Federal Compliance With Right-to-Know Laws and Pollution Prevention Requirements*. 3 August 1993.
- EO 12898. Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. 11 February 1994.
- EO 12948. Amendment to Executive Order No. 12898. 30 January 1995.
- EO 13101. *Greening the Government Through Waste Prevention, Recycling, and Federal Acquisition*. 18 September 1998.
- EPA 816-R-97-009. *State Source Water Assessment and Protection Programs Guidance*. August 1997.
- Federal Facilities Compliance Act (FFCA). 1992.
- PDD 56. *Managing Complex Contingency Operations*. Date.
- Title 29, CFR, part 1910. *Occupational Safety and Health Administration (OSHA)*. December 1970.
- Title 40, CFR, parts 259-355 and 761. *Resource Conservation and Recovery Act (RCRA)*. 1976 Amended 1984.
- Title 49, CFR, parts 106-178. *Hazardous Material Transportation and Uniform Safety Act (HMTUSA)*. 1990.

## ARMY PUBLICATIONS

- Army Environmental Policy Institute. *Environmental Trends – Policy Implications for the US Army*. March 1992.
- Army Environmental Policy Institute. *US Army Environmental Strategy into the 21st Century*. 1992.
- AR 40-3. Medical Dental and Veterinary Care. 30 July 1999.
- AR 40-5. Preventive Medicine. 15 October 1990.
- AR-40-66. *Medical Record Administration and Health Care Documentation*. 3 May 1999.

- AR 40-216. *Neuropsychiatry and Mental Health*. 10 August 1984.
- AR 200-1. *Environmental Protection and Enhancement*. Date 2005.
- AR 350-4. *Integrated Training Area Management*. 1 November 1998.
- AR 385-10. *The Army Safety Program*. 23 May 1988.
- AR 420-49. *Utilities Services*. 28 April 1997.
- ARTEP 5-145-32-MTP. *Mission Training Plan for the Headquarters and Headquarters Company, Engineer Battalion, Heavy Division/Corps*. 19 July 1991.
- CALL Newsletter 99-9. *Integrating Military Environmental Protection*. August 1999.
- DA Form 2028. *Recommended Changes to Publications and Blank Forms*. February 1974.
- DA PAM 200-1. *Environmental Protection and Enhancement*. 17 January 2002
- DA PAM 200-4. *Cultural Resources Management*. 1 October 1996.
- DA PAM 351-20. *Army Correspondence Course Program*. Date.
- DA Technical Bulletin 577. *Sanitary Control and Surveillance of Field Water Supplies*. March 1986.
- Environmental Decision Support Capabilities and Implications for Army Geographic Information Systems*, U.S. Army Engineer School Directorate of Environmental Integration, April 2004.
- FM 1. *The Army*. 14 June 2001.
- FM 1-02. *Operational Terms and Military Symbols*. TBP 2004.
- FM 3-0. *Operations*. 14 June 2001.
- FM 3-05.40 (41-10). *Civil Affairs Operations*. TBP 2005.
- FM 3-34. *Engineer Operations*. 2 January 2004.
- FM 3-34.250. *General Engineering*. TBP 2005.
- FM 3-50. *Smoke Operations*. 4 December 1990.
- FM 4-0. *Combat Service Support*. 29 August 2003.
- FM 4-02. *Force Health Protection in a Global Environment*. 13 February 2003.
- FM 4-02.17. *Preventive Medicine Services*. 28 August 2000.
- FM 4-02.7. *Health Service Support In A Nuclear, Biological, And Chemical Environment Tactics, Techniques And Procedures*, October 2002.
- FM 4-25.12. *Unit Field Sanitation Team*. 25 January 2002.

- FM 5-0. *Army Planning and Orders Production*. TBP 2004.
- FM 5-34. *Engineer Field Data*. 30 August 1999.
- FM 5-116. *Engineer Operations: Echelons Above Corp (EAC)*. 9 February 1999.
- FM 5-170. *Engineer Reconnaissance*. 5 May 1998.
- FM 6-0. *Mission Command: Command and Control of Army Forces*. 11 August 2003.
- FM 7-0. *Training the Force*. 22 October 2002.
- FM 7-1. *Battle Focused Training*. 15 September 2003.
- FM 8-9/NAVMED P-5059/AFJMAN 44-151, *NATO Handbook on the Medical Aspects of NBC Defensive Operations*, AMED P-6 (B). 1 February 1996.
- FM 8-10-7. *Health Service Support in a Nuclear, Biological, and Chemical Environment*. 22 April 1993, Change 1, 26 November 1996.
- FM 8-10-18, *Veterinary Service – Tactics, Techniques, and Procedures*. 22 August 1997.
- FM 8-33, *Control of Communicable Diseases Manual*. 9 April 1996.
- FM 8-55. *Planning for Health Service Support*. 9 September 1994.
- FM 8-284. *Treatment of Biological Warfare Agent Casualties*. To be published within 6 months.
- FM 8-285, *Treatment of Chemical Agent Casualties and Conventional Military Chemical Injuries*. 2 December 1995.
- FM 10-23. *Basic Doctrine for Army Field Feeding and Class I Operations Management*. 18 April 1996.
- FM 10-71. *Petroleum Tank Vehicle Operations*. 12 May 1978.
- FM 20-32. *Mine/Countermine Operations*. 29 May 1998.
- FM 21-10. *Field Hygiene and Sanitation*. 25 January 2002.
- FM 21-11. *First Aid for the Soldier (with changes)*. 4 December 1991.
- FM 22-100. *Military Leadership*. 31 July 1990.
- FM 27-10. *The Law of Land Warfare*. 18 July 1956.
- FM 34-130. *Intelligence Preparation of the Battlefield*. 08 July 1994.
- FM 43-5. *Unit Maintenance Operations*. 25 September 1988.
- FM 71-1. *Tank and Mechanized Infantry Company Team*. 22 November 1988.
- FM 100-14. *Risk Management*. 23 April 1998.

- FM 100-17. *Mobilization, Deployment, Redeployment, Demobilization*. 28 October 1992.
- FM 100-22. *Installation Management*. 11 October 1994.
- FM 101-5-2. *US Army Reports and Message Formats*. 29 June 1999.
- GTA 5-8-3. *Hazardous Material Spill Procedures*. April 1998.
- TB MED 561. *Pest Surveillance*. 1 June 1992.
- TB MED 577. *Sanitary Control and Surveillance of Field Water Supplies*. Date.
- TC 3-34.510. *Command Environmental Program*. TBP 2004.
- TC 5-400. *Unit Leader's Handbook for Environmental Stewardship*. 25 July 1997.
- TM 5-1940-277-10. *Operator's Manual for Boat, Bridge Erection, Twin Set, Aluminum Hull, Model USC 80MK-1 and USC 80MK-2*. December 1981.
- TM 5-5420-209-12. *Operator's and Organizational Maintenance Manual for Improved Float Bridge (Ribbon Bridge)*. May 1980.
- TM 5-803-2. *Environmental Protection: Planning in the Noise Environment*. 15 June 1978.
- TM 38-410. *Storage and Handling of Hazardous Materials*. 13 January 1999.
- USACHPPM TG 230. *Chemical Exposure Guidelines for Deployed Military Personnel*. Version 1.3 May 2003, with Jan 2004 addendum. (This and other TGs may be downloaded at <http://chppm-www.apgea.army.mil/tg.htm>)
- USACHPPM TG 236A, *Basic Radiological Dose Estimation – A Field Guide (Draft)*, June 2000.
- USACHPPM TG 248. *Guide for Deployed Preventive Medical Personnel on Health Risk Management*. August 2001.
- USACHPPM TG 251. *A Soldier's Guide to Environmental and Occupational Health Field Sampling During Military Deployment*. November 2001.
- USACHPPM TG 288. *Entomological Operational Risk Management: How to Perform an Entomological Risk Assessment*. September 2003.
- USACE Toxic and Hazardous Materials Agency. *Directory of Environmental Training Courses*. May 1993.
- USAEC. *Commander's Guide to Environmental Management*. March 1998.
- US Army Environmental Center. *US Army Environmental Training Master Plan (AETMP)*. 17 December 1992.
- US Army Environmental Training Support Center. *Defense Services Directory of Environmental Courses*. July 1996.

## **AIR FORCE PUBLICATIONS**

- AFDD 2-4.2. *Health Services*. 11 December 2002.
- AFDD 2-4.3. *Education and Training*. 9 September 1998.
- AFDD 2-4.4. *Bases, Infrastructure, and Facilities*. 13 November 1999.
- AFI 32-7006. *Environmental Program in Foreign Countries*. 29 April 1994.
- AFI 32-7061. *The Environmental Impact Analysis Process*. 24 January 1995.
- Air Force Environmental Handbook for Contingency Operations*. August 1996.
- AFI 90-901, *Operational Risk Management*, April 2000.

## **NAVY PUBLICATIONS**

- NDP 5. *Naval Planning*. 15 January 1996.
- NWP 4-04. *Naval Civil Engineering Operations*. September 1997.
- NWP 4-04.2. *Naval Civil Engineer Operations for Component Commanders*.  
August 1998.
- NWP 4-11. *Environmental Protection*. 01 March 1999.
- NWP 5-01 (Rev. A). *Naval Operational Plans*. May 1998.
- OPNAVINST 3500.39A/MCO 3500.27A. *Operational Risk Management (ORM)*. 26  
September 2000.
- OPNAVINST 5090.1B. *Environmental and Natural Resources Program Manual*.  
1 November 1994 (change 4 dated 4 June 2003).

## **MARINE CORPS PUBLICATIONS**

- Commanders Guide to Environmental Compliance and Prevention.
- FM 3-1. *Commander and Staff Operations*. August 1988.
- MCDP 5, *Planning*. 21 July 1997.
- MCO 6200.1E, *Marine Corps Heat Injury Prevention Program*. 6 June 2002.
- MCO P1200.7Y. *MOS Manual*. 07 April 2003.
- MCO P5090.2A. *Environmental Compliance and Protection Manual*. July 1998.
- MCRP 3-0A. *Unit Training Management Guide*. 25 November 1996.
- MCRP 3-0B. *How to Conduct Training*. 25 November 1996.
- MCWP 5-1. *Marine Corps Planning Process*. 24 September 2001.
- PCN 50100380600. *USMC Environmental Awareness Guide*. 1997.
- PCN 5000380700. *USMC Environmental Campaign Plan*. 1997

## **INTERNATIONAL PUBLICATIONS**

1989 Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, with Amendments. 22 September 1995.

Article 54 of the Geneva Convention. 12 August 1949.

Article 55 of the Geneva Convention. 12 August 1949.

ENMOD Convention. 18 May 1977.

Protocol I Addition to the 1949 Geneva Convention. 1977.

## **OTHER PUBLICATIONS**

NATO Handbook for Sampling and Identification of Radiological Agents (SIRA), Volumes 1 and 2, August 2000.

Office of the Chairman, The Joint Chiefs of Staff Memorandum MCM-0006-02, *Updated Procedures for Deployment Health Surveillance and Readiness*, February 2002.

Presidential Review Directive 5, *Planning for Health Preparedness and Readjustment of the Military, Veterans, and Their Families After Future Deployments*. August 1998.

Schumaker, Aileen. *A Guide to Hazardous Materials Management: Physical Characteristics, Federal Regulations, and Response Alternatives*. New York: Quorum Books. 1988.

U.S. Agency for International Development, Bureau for Humanitarian Response, Office of Foreign Disaster Assistance, *Field Operations Guide for Disaster Response*. **Date**.