FM 3-100.4
MCRP 4-11B

# Environmental Considerations in Military Operations

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**MCRP 4-11B**
**15 JUNE 2000**

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# Environmental Considerations in Military Operations

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# PREFACE

## PURPOSE

This field manual (FM) guides the United States (US) Army and the US Marine Corps (USMC) in applying appropriate environmental protection procedures during all types of operations. It also provides basic techniques and procedures for units at the company, battalion, and brigade/regiment levels. This manual states the purposes of *military environmental protection*, a description of legal requirements, and a summary of current military programs. It also describes the growing strategic significance of environmental factors in the twenty-first century. As a unit procedures manual, it describes how to apply risk management methods to identify actions that may harm the environment and appropriate steps to prevent or mitigate damage. Appendixes provide references, formats, practical applications, checklists for self-assessment, and sources of assistance.

## SCOPE AND APPLICABILITY

This doctrine applies to all Army and Marine Corps commanders and staffs (and other Department of Defense (DOD) units/staffs operating under their command authority) responsible for planning and executing operations. It applies to all soldiers and Marines as well-disciplined stewards of the natural resources of this country and protects, within mission requirements, the environment in every area of operations (AOs). For overseas theaters, this doctrine applies to 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).

## USER INFORMATION

The US Army Training and Doctrine Command (TRADOC), developed this publication with the participation of the Installations and Logistics Department, Headquarters Marine Corps (HQMC) and the Marine Corps Combat Development Command (MCCDC). HQTRADOC will review and update this publication as necessary. Send comments and recommendations directly to the address below:

| | | |
|---|---|---|
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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.

This publication is intended only to improve internal management of the Army and USMC and is not intended to create any right or benefit, substantive or procedural, enforceable at law by any party against the US, its agencies, its officers, or any person.

The proponent of this publication is HQTRADOC. Send comments and recommendations on Department of the Army (DA) Form 2028 (Recommended Changes to Publications and Blank Forms) and forward it directly to Commander, US Army Training and Doctrine Command, ATTN: ATBO-GE, Fort Monroe, Virginia 23651-5000.

# 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 destructive to humans and their natural environment. Environmental damage is a consequence of combat. However, the commander in the field is often required to restrict the application of force. He must conform to the law of land warfare: those written and unwritten conventions and customs that protect against unnecessary suffering and facilitate the restoration of peace. He is, with increasing frequency, constrained by mission requirements that may restrict the use of much of the combat power inherent in his organization.

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 into the next century, and even today, military units 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. The Army and USMC must be able to identify ways to protect the natural environment while executing the full range of their missions by doing the following:

- Considering the environment in planning and decision-making in conjunction with other essential considerations of national policy.
- Protecting the environment of home stations and training areas as a means of retaining resources for mission purposes.
- Using environmental risk assessment and environmental management principles to integrate environmental considerations into mission performance.
- Instilling an environmental ethic in soldiers and Marines.
- Understanding the linkages between environmental protection issues and their associated impact on safety, force protection, and force health protection.

*Military environmental protection* is the application and integration of all aspects of natural environmental considerations, as they apply to the conduct of military operations.

The above actions identify environmental protection as an important undertaking to be considered in conjunction with mission planning and execution. Through planning and execution, the Army and Marine Corps include environmental considerations and address them appropriately 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. Soldiers and Marines 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 environmental protection requirements of the theater commander without impairing combat effectiveness.

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 they 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 (FM 100-5) 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.

United States land forces 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 appropriate to the situation.

National recognition of environmental threats to the population's safety and well-being has inspired laws, regulations, and international agreements.

American citizens value and demand a clean and healthy environment. 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 programs for environmental protection.

Integration between civilian and military application of environmental protection is essential. This manual devotes itself to demonstrating how this integration can be relatively seamless as it melds into the existing processes within the Army and Marine Corps. Integration of *military environmental protection* is an evolutionary, rather than a revolutionary adaptation of our current military processes. The concept must become second nature for each soldier and Marine. 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. *Military environmental protection* is tied directly to risk management and the safety of soldiers and Marines. 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 sequence of chapters in the manual are set up to help you understand what *military environmental protection* is and how to apply it by providing:

- General knowledge.
- Planning guidance.
- Training guidance.
- Operations guidance.
- Guidance on how to interface with the installation and respective staff positions.
- Guidance on establishing and assessing a unit program.
- Guidance on the impact of environmental conditions on the health of service members.

The appendixes 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 products that soldiers and Marines will require as they build their unit program and operate during planning, training, and all operations across the spectrum of conflict.

Chapter 1

# Environmental Protection and Military Operations

*"An emerging class of transnational environmental issues are increasingly affecting international stability and consequently will present new challenges to US strategy."*

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. End states include environmental components. Additionally, the American people expect the Army and Marine Corps to manage the financial, human, and natural resources entrusted to them in a responsible manner. The policy and vision of the Army and Marine Corps on these issues, as well as your responsibilities as leaders, are critical to understanding how to address *military environmental protection*.

## BACKGROUND

1-1. 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. *Operational Terms and Graphics* (FM 101-5-1/MCRP 5-2A) defines the natural environment as "the human ecosystem, including both the physical and biological systems that provide resources (i.e., clean air, clean water, healthy surroundings, 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".

## CONTEXT OF ENVIRONMENTAL PROTECTION

1-2. 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.

## ENVIRONMENTAL RESOURCES AS A CAUSE OF CONFLICT

1-3. 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.

1-4. Environmental degradation, natural disasters, famines, health epidemics, and changes in climate can threaten a nation's economy and send populations across borders as refugees. For example, construction of a series of dams on the Senegal River made river-bottom farmland suitable for high intensity agriculture. Mauritian Moors abandoned cattle production in their degraded grazing areas to migrate to the river valley where a struggle ensued over the farmland. In a similar situation, soil degradation and population growth in Chiapas, Mexico generated peasant migrations to upland hillsides. Population overload, combined with the lack of capital to protect the local ecosystem, caused severe environmental resource scarcity.

1-5. In both examples, environmental resource scarcity, caused by degradation or depletion of renewable resources, encouraged 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

1-6. Environmental threats intensify regional instability. In Haiti, dwindling resources were central to the social collapse of the island nation. Almost totally deforested, its poor croplands were divided into smaller and less productive parcels with each generation. Haiti's population of seven million, already unsustainable by every measure, is expected to double in the next 18 years.

1-7. Environmental 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.

1-8. 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.

1-9. Security from these environmental threats includes protective measures for natural resources; safety measures for soldiers/Marines 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

1-10. 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. The importance of resources was certainly demonstrated in the actions that the US and other nations took to form a coalition and conduct the actions associated with Desert Shield and, subsequently, Desert Storm.

1-11. 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.

1-12. In the West Bank, population growth in the Jordan River basin increased demand for the scarce supply of freshwater. Overpumping the aquifers depleted the water supply and degraded some aquifers by causing saltwater intrusion from the Mediterranean. Because 40 percent of Israel's groundwater originates in the former occupied territories, Israel sought to protect its water supply by limiting water use during the occupation of the West Bank. The stringent restrictions on water use imposed upon Jordan, Syria, and Lebanon became another point of tension in the conflict during the 1960s to 1970s. Although the intensity of that issue has been moderated, it continues to be a major concern.

1-13. 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

1-14. As outlined in FM 100-1, 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.

1-15. As environmental protection becomes increasingly important to Americans, it assumes a growing significance to operational readiness. US military forces must maximize environmental compliance and restoration efficiency to preserve funds for force structure, modernization, and training.

1-16. Operational readiness depends on sufficient land for training individuals and units. The Army and the Marine Corps manage 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 PROTECTION AS AN IMPACT ON SAFETY, FORCE PROTECTION, AND ENVIRONMENTAL HEALTH

1-17. Environmental protection tends to be viewed according to its effect on the natural environment. While this focus is appropriate, it is essential to understand the linkages between the effect on the environment and their associated impacts on safety, force protection, and force health protection as these effect soldiers and Marines. These linkages are identified in FM 100-10, FM 100-14, medical doctrine (FM 8-10, FM 8-55, FM 21-10, FM 21-10-1, see Chapter 7), and an increasing number of other doctrinal manuals. The term *military environmental protection* includes the understanding of this linkage.

## ENVIRONMENTAL COMPLIANCE AS A REGULATORY REQUIREMENT

1-18. Heightened environmental concern has led all federal agencies, including the DOD, to consider the environmental consequences of proposed actions to avoid costly litigation and remediation requirements. Compliance with environmental laws and regulations is now a necessary cost of doing business. The Army and the Marine Corps comply with all environmental laws and regulations applying to installations or theaters of operation (TOs).

1-19. The sources of environmental laws influencing the actions of US military forces include federal, state, local, and HN laws, as well as international treaties. Appendix A provides an overview of the key environmental laws, regulations and treaties applicable to unit level operations. These come from a variety of sources to include federal, state, local host nation, executive order, Department of Defense policies and directives, and international agreements.

## ETHICAL IMPLICATIONS AS A FUNCTION OF ARMY VALUES

1-20. From every philosophical or moral perspective, environmental stewardship is the right thing to do. As more demands are made on the shrinking resource base, the ethical issues become clearer. 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. FM 22-100 defines ethics as principles or standards that guide professionals to do the moral or right thing. To help subordinates live according to Army values, leaders enforce rules, policies, and regulations. This ethical climate is the same climate that guides the decisions to be made in areas such as the law of land warfare. Ethical behavior is not restricted to merely following the letter of the law when it comes to specific written laws, regulations, and treaties. 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.

1-21. Considering the environmental effects of training, operations, and logistics activities reduces environmental damage and costs. Habitually protecting the environment ensures that land will continue to be available to conduct realistic training and that environmental problems will not disrupt operations. Environmental protection must be recognized in material acquisition procedures,

training, and facilities operations. In short, it must be an institutional and personal ethic. To be successful, soldiers and Marines 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" (FM 22-100).

> "*Everyone must protect and conserve the natural environment as an individual responsibility. Seemingly minor infractions by individuals, particularly in cumulative effect, can have major effects on human health and natural habitat—or upon operating budgets. Leaders must set the example as well as to strictly enforce environmental policy and regulations. Environmental responsibility involves all of us. The environmental ethic must be part of how we live and how we train.*"
>
> General Dennis Reimer, 1995, Chief of Staff, US Army

## THE ARMY AND MARINE CORPS ENVIRONMENTAL STRATEGIES

1-22. Governmental rules and regulations do in fact influence the strategies of the Army and Marine Corps. Therefore it is important for subordinate commanders to understand the commander's guidance from his respective chain of command. Success will be achieved through the commitment of the chain of command, as well as organizing for success, spreading the environmental ethic, training and educating the force, prioritizing resources, and harnessing market forces by purchasing environmentally benign materials whenever possible. A discussion of the rules and regulations is provided in Appendix A.

### MISSION STATEMENTS

1-23. "The Army will develop and implement cost-effective measures to protect and sustain the environment in support of military operations, installation management, and materiel development."

1-24. "The two most important national functions of the Marine Corps are to make Marines and win battles. Training is integral to the performance of these functions. By respecting and maintaining the natural resources entrusted to the Marine Corps, the training opportunities enjoyed by today's Marines will be available to future generations of Marines."

### VISION STATEMENTS

1-25. "The Army will integrate environmental values into its mission to sustain readiness, improve the soldier's quality of life, strengthen community relationships, and provide sound stewardship of resources."

1-26. "Marine Corps environmental programs enhance military readiness, protect the health of military and civilian personnel living and working abroad Marine corps installations, and protect the environmental quality of the installation and adjacent communities to support future activities."

*"The Marine Corps shall actively protect and enhance the quality of the environment through strict compliance with all applicable regulatory requirements."*

MCO P5090.2A

*"The Army is committed to environmental stewardship in all actions as an integral part of the Army mission."*

AR 200-1

## ENVIRONMENTAL STEWARDSHIP GOALS

1-27. Environmental protection is no longer the province of a few technical experts. It requires soldiers and Marines to prevent environmental problems by caring for those resources entrusted to them by the American people. This responsibility includes financial, material, and environmental stewardship. Environmental stewardship, the wise use and management of environmental resources, is a natural outgrowth of the military's role as protector of US national security. The following are goals for responsible environmental stewardship:

- Demonstrating leadership in environmental protection and improvement, including pollution prevention.
- Ensuring that consideration of the natural and cultural environment is an integral part of decision-making.
- Minimizing adverse natural environment and human health impacts while maximizing readiness and strategic preparedness.
- Initiating aggressive action to comply with all applicable federal, state, local, and HN environmental laws.
- Supporting pollution prevention programs, which includes periodically reassessing products and processes that generate pollution, reusing and recycling materials, and avoiding hazardous waste (HW) generation.
- Managing all military controlled lands, natural and cultural resources, and remediate areas contaminated by past activities.
- Enhancing outreach activities with local communities by openly addressing environmental quality issues.

1-28. Everyone, from the commander in chief to the newest recruit and every civilian employee, must apply stewardship to his area of responsibility. However, implementing service-wide stewardship requires an environmental protection strategy. The strategy's goals and objectives focus on four pillars:

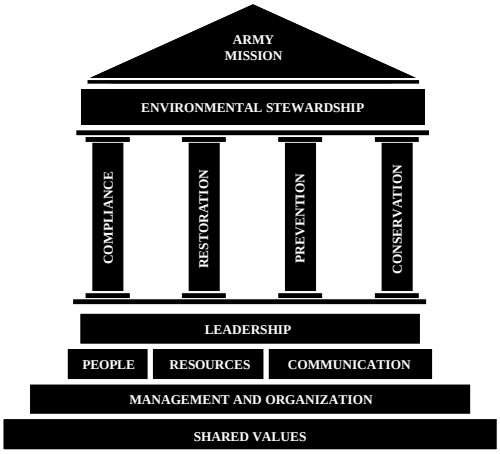
- Compliance - Give immediate priority to sustained compliance with environmental laws.
- Prevention - Focus efforts on pollution prevention to reduce or eliminate pollution at the source.

- Conservation - Conserve and protect natural and cultural resources so they will be available for present and future generations to use.

- Restoration - Simultaneously continue to restore previously contaminated sites as quickly as funds permit.

## ENVIRONMENTAL PILLARS

1-29. The principal duty of soldiers and Marines is not protecting the environment. However, they accomplish this requirement as part of their other duties. In those rare instances where real or perceived conflict exists between environmental protection and mission accomplishment, commanders and individuals must make informed decisions. Unit commanders, leaders at all levels, and individual soldiers/Marines must understand the pillars for environmental protection.




### Compliance: Taking Care of Today's Problems

1-30. The essence of compliance is obeying the law. Compliance includes all activities that ensure operations and activities meet federal, state, local, and applicable HN environmental requirements. These requirements include laws and regulations for waste water discharge, noise abatement, air quality attainment, and solid waste and HW management.

### Prevention: Minimizing Problems for Tomorrow

1-31. Eliminating pollution at the source is usually much easier and less costly than dealing with hazardous materials (HM) or their aftermath. Pollution is a liability, and clean up is an overhead cost that must be controlled. Avoiding or reducing pollution saves the military resources that will enhance readiness. Pollution prevention includes all phases of the material management life cycle from concept development to final disposition. Prevention is generally achieved through the following:

- Reducing the amount of waste produced. This may include using smaller amounts of toxic materials or replacing them with less toxic substitutes. On a larger scale, it may include changing operating methods by

increasing efficiency or preventing accidents that generate waste and residue.

- Reusing materials whenever possible. Reusing items is more cost efficient than recycling. Reuse entails using an item in its current form. Refilling containers, filtering solvents, or reusing subassemblies reduces the amount of waste that must be treated and disposed.

- Recycling products. This entails changing the physical composition of the item by melting it down or shredding it for use in other processes. Recycling, while less efficient than reuse, may be the only alternative for several types of waste. Many installations sponsor recycling programs to support morale, welfare, and recreation activities.

### Conservation: Sustaining Resources for the Next Generation

1-32. Conservation includes two types of resource management: controlled use and preservation. Controlled use focuses on managing military land to ensure long-term natural resource productivity. Preservation focuses on protecting natural and cultural resources (to include endangered species) by maintaining them in their current state. Renewable resources, such as timber or training land, require controlled 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: Taking Care of Yesterday's Problems

1-33. Restoration includes all activities necessary to clean up contaminated military sites. Most military units do not perform restoration; normally, environmental staffs and contractors perform this function. However, to make installations safer and healthier places for soldiers, Marines, and their families, the services are cleaning up contaminated sites. By following the principles of the other three environmental strategies, soldiers and Marines help minimize the need 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

### Program Area Integration

1-34. The four environmental program areas—compliance, prevention, conservation, and restoration—**apply to all military activities**. During peacetime, they ensure that military lands are available for mission training; during contingency operations or combat, they support strategic goals and desired endstates. At all times, these program areas protect the safety and health of soldiers/Marines, and their families.

# ENVIRONMENTAL RESPONSIBILITIES

1-35. Commanders, staffs, subordinate leaders, and soldiers/Marines must understand their individual duties and responsibilities for environmental protection and become environmental stewards. To practice stewardship, US military personnel must understand the basic environmental management responsibilities that apply to their work area or assigned duties.

## UNIT RESPONSIBILITIES

1-36. Installation regulations or operational directives, such as operation plans (OPLANs), operation orders (OPORDs), or contingency plans (CONPLANs), generally define a unit's environmental program. (See Appendix B for an example of the Environmental Considerations Appendix to an Army plan). Standing operating procedures (SOPs) usually establish a unit's environmental plan. (See Appendix C 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, soldiers, and Marines.

### Commanders

1-37. The commander's role in environmental stewardship centers on instilling an environmental ethic in their soldiers, Marines, 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 and regulations. Sources of environmental assistance available to commanders are identified in Appendix D.

1-38. 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.

1-39. The primary point of contact should be located at the installation's environmental office. This office is normally part of the Directorate of Public Works (DPW) at Army installations, the facilities or base engineer office on Marine Corps installations, or the State Area Command (STARC) for the National Guard.

> *"All Marine commanders should emphasize environmental awareness and incorporate environmental compliance into every aspect of how they conduct business, taking affirmative steps to make compliance happen."*
>
> General J.L. Jones, Commandant, 1999
>
> White Letter 03-99

*"In my Commandant's Planning Guidance (CPG), I presented a road map that describes where I am leading the Marine Corps…*

*These Marine Corps principles are basic to our nature and critical to our existence. These realities are not relative or subject to compromise. They are inalterable and universally applicable.*

*Expressions of these principles may be found in the way we maintain our installations, utilize our resources, and comply with our Nation's laws concerning the environment. Instituting good management practices, conserving resources, and obeying the law have always been a part of our moral character. Marines are good neighbors. Marines are efficient. Marines are informed. Marines take care of their own. Marines are disciplined.*

*In these days of public concern for the environment and diminishing resources, we are afforded new opportunities to apply our Marine Corps principles to new avenues of excellence. We will meet our responsibilities by being exemplary world citizens as we maintain and improve our position as the world's premiere fighting force. That's what's expected of us – we're Marines."*

General C. C. Krulak, Commandant of the Marine Corps, 1997

1-40. The Directorate of Logistics (DOL) (Army) or the G-4 (Marine Corps), the safety office, and the supporting Defense Reutilization and Marketing Office (DRMO) may also provide commanders with environmental information.

1-41. 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 mayor (often the headquarters, headquarters company [HHC] commander) assists the base camp commander with control of base operations. A Base Camp Coordination Agency (BCCA) will provide expertise and support to the commander, largely through its subordinate Base Camp Assistance/Assessment Team (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 recently published Center for Army Lessons Learned (CALL) Newsletter 99-9, *Integrating Military Environmental Protection*.

1-42. Army Regulation (AR) 200-1, Marine Corps Order (MCO) P5090.2A, the Army's *Commander's Guide to Environmental Management*, and the Marine Corp's *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 final governing standards (FGS) if outside the continental United States (OCONUS).

- 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 after-action reviews (AARs). (See Appendix E.)
- Understand the requirements of Army/Marine Corps environmental programs. (See Chapter 5.)
- Identify and assess the environmental risks of proposed programs and activities. (See Chapter 2 and Appendixes F and G.)
- Coordinate unit activities with higher headquarters' (HQs) environmental elements.
- Appoint and train an environmental compliance officer (ECO) and an HW coordinator for the unit.
- Ensure that SOPs contain all environmental considerations and regulatory requirements appropriate for the level of command. (See Appendix C.)
- Conduct environmental self-assessment or internal environmental compliance assessments. (See Chapter 5 and Appendix H.)
- Understand the linkages between environmental considerations and their associated impact on safety, force protection, and force health protection. (See Chapter 7.)

**Unit Staffs**

1-43. Whether developing the staff estimate, protection levels, or environmental baseline survey (EBS), environmental protection requires active participation from each staff member. Environmental factors may affect or influence a wide range of activities or require a significant expenditure of resources. A single point of contact (POC) for all environmental considerations is neither effective or efficient.

1-44. Unit staffs have inherent responsibilities within their areas of expertise that require environmental actions. While some of these responsibilities may

depend on the command or commander, all staffs undertake many of them. Unit SOPs at battalion and company levels incorporate specific responsibilities. Of particular importance at the unit level is the Army ECO, and the Marine Corps military occupational specialties (MOS) 9631 and 9954, addressed on page 1-16.

1-45. The unit staff also integrates environmental considerations into the planning and execution processes. These staff officers have specific environmental protection responsibilities. Common staff duties provide the basis for some environmental responsibilities, while FM 101-5 provides a basis for others. Additional staff officer environmental responsibilities are as follow:

### *Chief of Staff (CofS), Executive Officer (XO)*

1-46. 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 operational effects on the environment and assess the environmental status as the G3 integrates environmental planning and execution into operations in the same manner as safety is integrated.

## Coordinating Staff

1-47. 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 described in FM 101-5, the coordinating responsibility of special staff officers. The following are the principal environmental responsibilities of coordinating staff officers:

### *Assistant Chief of Staff, G1 (S1), Personnel*

1-48. As the principal staff officer for all matters concerning human resources and personnel, the G1 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 staff judge advocate (SJA), and the public affairs officer (PAO), the G1 coordinates environmental issues between them and across the staff.

### *Assistant Chief of Staff, G2 (S2), Intelligence*

1-49. As the staff officer responsible for conducting intelligence preparation of the battlefield (IPB) and defining and characterizing the area of operation (AO), the G2 is responsible for incorporating significant environmental factors. These environmental factors are provided by the engineer coordinator (ENCOORD) and other staff elements.

### *Assistant Chief of Staff, G3 (S3), Operations*

1-50. The G3 is the principal staff officer for all matters concerning training, operations, and plans. It the G3's responsibility to ensure that any significant collateral environmental damage caused by command directed operations is understood and approved by the commander in the military decision-making process (MDMP).

1-51. The G3 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 G3 understands and considers environmental vulnerabilities during operations.

1-52. The G3 may assign special missions to tactical units to secure and safeguard critical environmental resources, such as wastewater treatment plants in urban areas. When appropriate, the G3 prepares counterterrorism and security plans to combat possible environmental sabotage. The G3 exercises coordination staff responsibility over the ENCOORD, the leading special staff officer for many environmental protection actions.

### *Assistant Chief of Staff, G4 (S4), Logistics*

1-53. As the principal staff officer for coordinating the logistic integration of supply, maintenance, and services for the command, the G4 oversees many functions with a potential for generating HW. The G4 establishes procedures for reducing and controlling HM. He recommends command policies for solid waste and HW/HM disposal. The G4 also recommends command policies for pollution prevention and, in coordination with the G3, oversees the preparation of spill prevention and response plans.

1-54. In the exercise of staff planning and supervision of food, bath, and laundry services, the G4 ensures that the staff exercises and implements appropriate controls over wastes and effluents. The G4 is responsible for constructing facilities and installations and for controlling real property, including EBSs, upon occupation and redeployment.

1-55. The G4 coordinates property disposal actions such as disposal of HM and HW (to include medical waste). The G4'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 G4 coordinates with appropriate DOD activities—defense reutilization and marketing office (DRMO), defense logistics agency (DLA), or the LOGCAP.

### *Assistant Chief of Staff, G5 (S5), Civil-Military Operations*

1-56. As the principal staff officer for all matters concerning civil affairs, the G5 is familiar with the relationships between the local populace and their environment. These relationships include elements of the underlying causes of the conflict, threats to public health, and critical vulnerabilities to disruption of environmental services such as clean water or useable croplands.

1-57. In conjunction with the SJA, the G5 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 G5 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

1-58. Special staff officers have functional environmental responsibilities. The following are the key special staff officers with environmental protection expertise and responsibilities:

### *Surgeon*

1-59. The surgeon advises the commander and the staff on regional health matters within the commander's area of interest. 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 to support the commander's risk management decision-making process. The surgeon relates the effects of environmental hazards to the environmental health of soldiers and Marines. In more demanding situations, he can rely on the capabilities of the Theater Army Medical Laboratory (TAML) and the US Army Center for Health Promotion and Preventive Medicine (USACHPPM) to assist him in providing recommendations to the commander. 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. See Chapter 7 for additional information on health and the environment.

### Chemical Officer

1-60. The chemical officer (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*

1-61. 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 on environmental issues. Working with other staff officers he determines the impact of operations on the environment and integrating environmental considerations into the decision-making process. The ENCOORD works with the G4 in performing site assessments for installations and facilities. He and the SJA advise the commander on the

necessity for environmental assessments to meet HN or executive order (EO) 12114 requirements. The ENCOORD is also responsible for advising the G2/S2 of significant environmental factors and ensuring these impacts are integrated into the IPB process.

### *Transportation Officer*

1-62. 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*

1-63. 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

1-64. 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*

1-65. The SJA advises the commander on compliance with environmental laws, regulations, treaties, and conventions. He also writes or interprets status of forces agreements (SOFAs). The SJA helps determine environmental assessment requirements and manages civilian claims resulting from environmental damage. He helps other staff officers to understand the legal aspects involved in their respective specialties.

### *Public Affairs Officer*

1-66. Public perceptions of environmental threats may be more significant to mission accomplishment than the threat itself. The PAO advises the commander 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.

## Additional Duties

### *Environmental Compliance Officer (Army)*

1-67. The key to fulfilling environmental requirements successfully at the unit level is the ECO. AR 200-1 directs all Army unit commanders to "appoint and train ECOs 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 ECO 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 to clarify requirements and obtain assistance.

1-68. The ECO accomplishes environmental compliance requirements on behalf of the commander. He also coordinates with supporting installation environmental staff to clarify requirements and obtain assistance. While this position of responsibility is not a formal staff position, the ECO is critical to the commander's environmental program. The ECO 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)*

1-69. 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.

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

1-70. The HW/HM Marine is the Marine Corps equivalent of the Army ECO. 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 HW/HM.

- Providing a link between unit commanders and installation-level environmental staff.

- Providing advice to unit commanders regarding HW/HM.

1-71. Specific duties for both Marine Corps MOSs are fully outlined in the current version of MCO P1200.7.

**Subordinate Leaders**

1-72. The role of leaders in environmental stewardship centers on building an environmental ethic in their soldiers and Marines by training and counseling subordinates on environmental stewardship, leading by example, and enforcing compliance with laws and regulations. Leaders do the following:

- Communicate the Army/USMC environmental ethic to soldiers and Marines 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 mission essential task list (METL) task performance. (See Chapter 2.)

- Plan and conduct environmentally sustainable actions and training.

- Protect the environment during training and other activities.

- Analyze the influence of environmental factors on mission accomplishment.

- Integrate environmental considerations into unit activities.

- Train peers and subordinates to identify the environmental effects of plans, actions, and missions.

- Counsel soldiers and Marines on the importance of protecting the environment and the possible consequences of not complying with environmental laws and regulations.

- Ensure that soldiers and Marines 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, force protection, and force health protection. (See Chapter 7.)

### Soldiers and Marines

1-73. Soldiers and Marines 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.
- Identify the environmental risks 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.

## SUMMARY

1-74. National security strategy now includes specific environmental security concerns. Environmental resources can and do contribute to the potential for conflict when they become environmental threats or strategic goals. Environmental protection and military operations go hand in hand. Strategic and operational end states support lasting victories. End states include environmental components. While locations and conditions will vary, the guiding principles remain constant.

1-75. The Army environmental vision states, "The Army will develop and implement cost effective measures to protect and sustain the environment in support of military operations, installation management, and materiel development." The American people expect the Army and Marine Corps to manage the financial, human, and natural resources entrusted to them in a responsible manner. Compliance with environmental laws and regulations is now critical to the future availability of environmental and training resources. The Army and the Marine Corps comply with all environmental laws, regulations and policies, and commander's guidance applying to installations or TOs. Considering the environmental effects of training, operations, and logistics activities reduces environmental damage and costs. Commanders, staffs,

subordinate leaders, and soldiers/Marines must understand their individual duties and responsibilities for environmental protection and become environmental stewards. They must also understand the linkages between environmental considerations and their associated impact on safety, force protection, and force health protection.

1-76. With the conditions now established to allow us to look at integrating environmental considerations into planning, we will apply this information to the planning process for the MDMP and the associated application of risk management as discussed in Chapter 2.

Chapter 2

# 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

The integration of environmental considerations into planning is very similar to the integration of safety and force protection issues. Whether using the MDMP, or building a training plan, the requirement to integrate environmental considerations into the planning process is critical. This chapter discusses environmental planning and focuses on how and where the Army integrates environmental considerations into the MDMP, as specified in FM 101-5. While this process is Army specific, it is similar to the process employed by the USMC. Each day leaders make decisions affecting the environment. These decisions effect natural and cultural resources entrusted to the Army and the USMC. These decisions also have serious environmental and legal consequences for decision-makers. The military's inherent responsibility to the nation is to protect and preserve its environmental resources—a responsibility that resides at all levels. Risk management is an effective process to assist in preserving these resources. Unit leaders identify actions that may negatively impact the environment and take appropriate steps to prevent or mitigate damage. This chapter illustrates how to use the risk management process to assess and manage environmental-related risk during planning, training, and operations.

## THE MILITARY DECISION-MAKING PROCESS

2-1. The MDMP (see Figure 2-1, page 2-2) is defined in FM 101-5. It relies on doctrine, especially the terms and symbols (graphics) found in *Operational Terms and Graphics*. The MDMP helps 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 uses the entire staff during the MDMP to explore the full range of probable and likely enemy and friendly courses of action (COAs), and analyze and compare his own organization's capabilities

with the enemy's. This staff effort has one objective—to integrate information 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 MDMP.

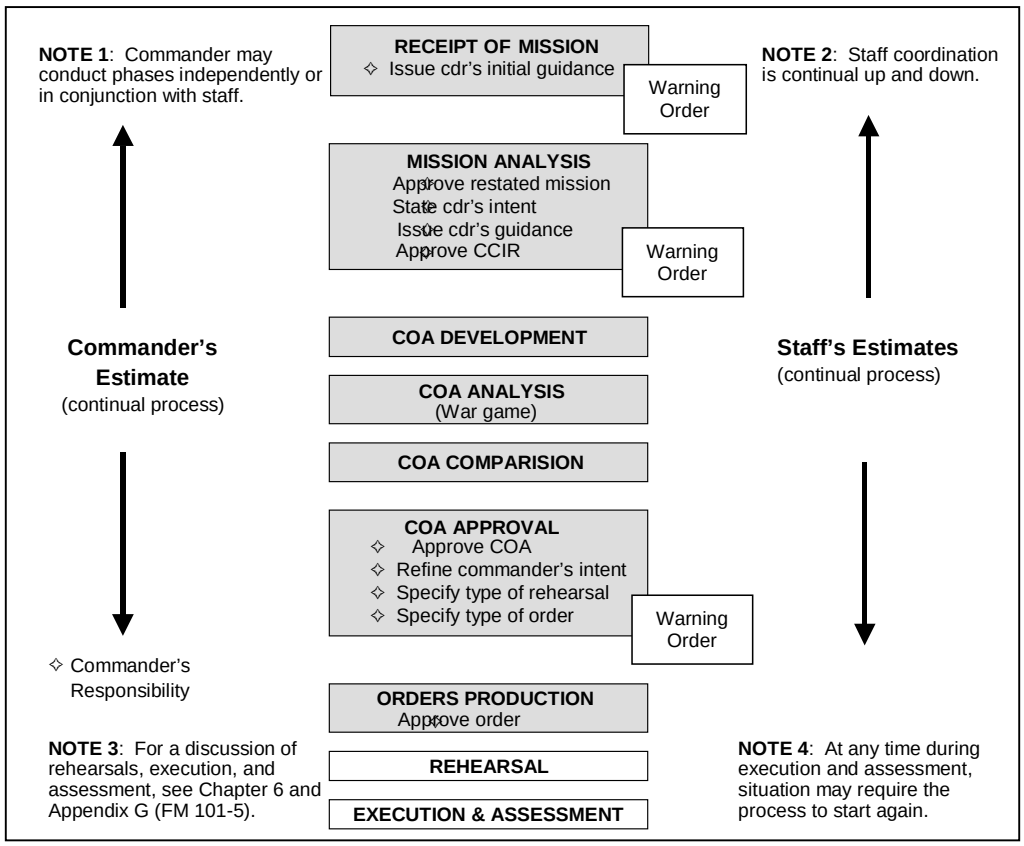



**Figure 2-1. The MDMP**

2-2. This manual does not attempt to teach this process, but rather uses the framework provided in FM 101-5 to discuss the application of environmental considerations throughout the MDMP and highlight the critical steps for environmental input. Environmental considerations are generally addressed as functions of risk, much like the application of safety considerations. Risk is expected. As with all other types of risk, leaders can effectively minimize environmental-related risk while optimizing the unit's capacity to remain responsive and agile. When the command and control ($C^2$) system places timely, comprehensive, quality information in front of the decision-maker, leaders are able to mitigate risk and maximize performance. The MDMP model contains seven steps (see Figure 2-2, page 2-3), each of which incorporate environmental considerations.

| | |
|---|---|
| Step 1. | Receipt of Mission. |
| Step 2. | Mission Analysis. |
| Step 3. | COA Development. |
| Step 4. | COA Analysis. |
| Step 5. | COA Comparison. |
| Step 6. | COA Approval. |
| Step 7. | Orders Production. |

**Figure 2-2. Steps in the MDMP**

## RECEIPT OF MISSION

2-3. 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 his intent rapidly. The preparation for mission analysis focuses on gathering the necessary tools for the analysis. These tools include:

- The environmental appendix or annex from the higher headquarters' order or plan (see Appendix B). The commander can 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 area to help the commander assess likely areas for significant environmental consideration.

- The commander's or higher headquarters' SOPs (see Appendix C).

- Appropriate documents and references (such as this field manual), applicable HN agreements, DOD overseas environmental baseline guidance document (OEBGD), or similar instructions or guidance.

- Any existing 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.

2-4. 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 101-5, Appendix A. Staff inputs and outputs during the MDMP are highlighted in Figure 2-3, page 2-4.

| Input | | Output |
|---|---|---|
| • Mission received from higher HQ or deduced by the commander/staff | **RECEIPT OF MISSION** | ✧ Cdr's initial guidance<br>• Warning order 1 |
| • Higher HQ order/plan/IPB<br>• Staff estimates<br>• Facts and assumptions | **MISSION ANALYSIS** | • Initial IPB products<br>✧ Restated mission Cdr's intent✧<br>✧ Cdr's guidance<br>• Warning order 2<br>• Staff products<br>• Battlefield framework<br>• Preliminary movement |
| • Restated mission<br>• Cdr's guidance<br>• Cdr's intent<br>• Staff estimates and products<br>• Enemy COAs | **COA DEVELOPMENT** | • COA statements and sketches |
| • Enemy COA<br>• COA statements and sketches | **COA ANALYSIS** (War game) | • War game results<br>• Task organization<br>• Mission to subordinate units<br>• CCIR |
| • Staff COA<br>• War game results<br>• Establish criteria | **COA COMPARISON** | • Decision matrix |
| • Decision matrix | **COA APPROVAL** | ✧ Approved COA<br>✧ Refined cdr's intent<br>✧ Specified type of order<br>✧ Specified type of rehearsal<br>✧ High pay-off target list |
| • Approved COA | **ORDERS PRODUCTION** | ✧ OPLAN/OPORD |

**NOTE 1**: ✧ Denotes commander's responsibility.

**NOTE 2**: Underlying the entire process are continuing commander and staff estimates.

**Figure 2-3. Staff inputs and outputs**

## MISSION ANALYSIS

2-5. Mission analysis has 17 subordinate steps. While this process results in the staff formally briefing the commander, there may be items of such importance to the commander and the formulation of his commander's guidance that they need to be brought to the commander immediately rather than waiting until the formal briefing. If a staff officer has developed good tools to facilitate mission analysis, he dramatically increase his ability to be effective.

2-6. The 17 subordinate steps of mission analysis provide the framework for success in the MDMP. It is essential to perform effective work at this point in the process. Some steps will prove to be more vital than others in the application of environmental considerations. The steps in mission analysis are included in Figure 2-4, page 2-5.

| | |
|---|---|
| Step 1. | Analyze the higher headquarters' order. |
| Step 2. | Conduct initial IPB. |
| Step 3. | Determine specified, implied, and essential tasks. |
| Step 4. | Review available assets. |
| Step 5. | Determine constraints. |
| Step 6. | Identify critical facts and assumptions. |
| Step 7. | Conduct risk assessment. |
| Step 8. | Determine initial commander's critical information requirements (CCIR). |
| Step 9. | Determine the initial reconnaissance annex. |
| Step 10. | Plan use of available time. |
| Step 11. | Write the restated mission. |
| Step 12. | Conduct a mission analysis briefing. |
| Step 13. | Approve the restated mission. |
| Step 14. | Develop the initial commander's intent. |
| Step 15. | Issue the commander's guidance. |
| Step 16. | Issue a warning order (W0). |
| Step 17. | Review facts and assumptions. |

**Figure 2-4. Steps in the mission analysis**

### Step 1. Analyze the Higher Headquarters' Order

2-7. The commander and his staff thoroughly analyze the higher headquarters' order and identify guidance on environmental consideration. The level of the CINC is the logical echelon for civil-military interface, and is the echelon that typically initiates military environmental guidance. If confused by the higher headquarters' order or guidance, the staff **must immediately seek clarification**. 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 and others may also contain information critical to environmental considerations.

### Step 2. Conduct Initial IPB

2-8. The IPB is a systematic, continuous process of analyzing the threat and the effects of the environment on the unit. It identifies facts and assumptions that determine likely threat COAs. The IPB supports the commander and staff and is essential to developing estimates and performing decision-making. It is a dynamic, commander driven, staff process, that continually integrates new information.

2-9. The IPB is the commander's and each staff officer's responsibility; the G2 does not conduct the entire IPB himself. Staff officers must assist the G2 in developing the situation template (SITTEMP) within their own areas of expertise. Environmental considerations may make it prudent to focus some of the IPB support to assist in site selection for units moving into an operational area. Environmentally sensitive areas are defined in FM 101-5-1 as environmental areas of interest. Environmental areas of interest include natural and manmade structures such as waste treatment plants and dams.

### Step 3. Determine Specified, Implied, and Essential Tasks

2-10. The staff analyzes higher headquarters' orders to determine which environmental considerations should be specified, implied, and essential tasks. The mission determines if environmental considerations are essential tasks. If, for example, the mission is focused on response to a natural or manmade emergency, it is more likely that environmental considerations will be important.

### Step 4. Review Available Assets

2-11. 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 the relationship between specified and implied tasks and available assets. From this information, they determine whether they have the assets to perform all specified and implied tasks. If there are shortages, they identify additional resources needed for mission success. The staff pays particular attention to deviations from what the commander considers to be his normal task organization. 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 his subordinate units, it is critical that those issues are raised. As an example, a unit may require specialized assistance (to include corps real estate support teams [CREST], environmental law expertise, and engineer command [ENCOM] support) to perform effective EBSs of support locations or areas within the deployment location itself.

### Step 5. Determine Constraints

2-12. A higher commander normally places some constraints on his subordinate commanders that restrict their freedom of action. Environmental considerations may also cause constraints on an operation. The commander and his staff must identify and understand these constraints. These will normally be found in the scheme of maneuver, concept of operations, and the coordinating instructions. The commander ensures that critical environmental constraints are up front in the body of the order and not merely relegated to an annex or appendix.

### Step 6. Identify Critical Facts and Assumptions

2-13. The staff gathers two categories of information concerning assigned tasks: facts and assumptions. Facts are statements of known data concerning the situation, including enemy and friendly dispositions, available troops, unit strengths, and material readiness. Assumptions are suppositions about the current or future situation that are assumed to be true in the absence of facts. They take the place of necessary, but unavailable, facts and fill the gaps in what the commander and staff know about a situation. 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 options, would result in an invalid assumption. Necessity is whether or not the assumption is

essential for planning. If planning can continue without the assumption, it is not necessary and should be discarded. When possible, assumptions are cleared with the higher HQs to ensure they are consistent with the higher headquarters' plan. Assumptions are replaced with facts as soon as possible.

2-14. 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.

### Step 7. Conduct Risk Assessment

2-15. The commander and his staff identify accident risk hazards and make an initial assessment of the risk level for each hazard. The commander also makes an initial assessment of where he might take tactical risk. (See the risk section of this chapter and FM 101-5, Annex J.) While the focus of risk assessment is on tactical risk, significant issues for accident risk, with respect to the environment, are also considered.

### Step 8. Determine Initial Commander's Critical Information Requirements (CCIR)

2-16. 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. They help the commander filter information by defining what is important to mission accomplishment. They also focus the efforts of subordinates in the allocation of resources, and assist staff officers in making recommendations. Environmental considerations that may be part of the CCIR include protection of cultural/historical sites, water sources, HW/polluted industrial sites, or other significant safety considerations. The commander alone decides critical information based on his experience, the mission, the higher commander's intent, and input from the staff.

2-17. The CCIR directly effect the success or failure of the mission and are time sensitive, driving decisions at decision points.

### Step 9. Determine the Initial Reconnaissance Annex

2-18. Based on the IPB and CCIR, the staff, primarily the G2, identifies gaps in the intelligence and develops an initial reconnaissance and surveillance plan to acquire information based on available reconnaissance assets. The G3/S3 turns this reconnaissance plan into an initial reconnaissance annex to launch reconnaissance assets as soon as possible to begin the collection effort.

2-19. This may include acquiring the support of outside agencies and higher headquarters. Special requests for environmental information on environmental considerations critical to the operation are included in the initial IPB and CCIR. Environmental reconnaissance, as defined in FM 101-5-1, 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 with significant environmental considerations may be included.

### Step 10. Plan Use of Available Time

2-20. The commander and his staff refine their initial plan for the use of available time. They compare the time needed to accomplish essential tasks to the higher headquarters' timeline to ensure mission accomplishment in the allotted time. Whether or not time is available to conduct an EBS of the area(s) of deployment or support for an operation is of critical importance during this step.

### Step 11. Write the Restated Mission

2-21. The CofS/XO or G3/S3 prepares a restated mission for the unit based on the mission analysis. The restated mission includes on-order missions; be-prepared missions are in the concept of operations. 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.

### Step 12. Conduct a Mission Analysis Briefing

2-22. Time permitting, the staff briefs the commander on its mission analysis. This briefing is often the only time the entire staff is present and the only time to ensure that all staff members are starting from a common reference point. The relevant conclusions about environmental considerations, drawn from the mission analysis, help the commander and staff develop a shared vision of the requirements for the upcoming operation.

### Step 13. Approve the Restated Mission

2-23. 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.

### Step 14. Develop the Initial Commander's Intent

2-24. 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 effect the end state.

### Step 15. Issue the Commander's Guidance

2-25. 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. This guidance is essential for timely COA development and analysis. By stating his intent and the planning options he wants them to consider, he can save staff members' time and effort by allowing them to concentrate on developing COAs that meet his intent. His guidance may be written or oral and is perhaps the most likely location for guidance to be given on environmental considerations, especially when involved in combat operations. In the case of combat operations, most environmental considerations will take a relative back seat to other considerations, as greater environmental risk is likely to be taken.

### Step 16. Issue a Warning Order (WO)

2-26. Immediately after the commander provides his guidance, the staff sends subordinate and supporting units a WO. The staff ensures that risk guidance includes pertinent environmental considerations.

### Step 17. Review Facts and Assumptions

2-27. 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 are likely as the planning progresses and reconnaissance information is forthcoming.

## COA DEVELOPMENT

2-28. After receiving guidance, the staff develops COAs for analysis and comparison. The commander must involve the entire staff in COA development. His 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 (see the risk discussion in this chapter and FM 101-5, Appendix J).

2-29. 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.

## COA ANALYSIS

2-30. 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 (step 5) is probably the most important step 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 the COA. Step 5 is where criteria are assigned for the COA comparison. War gaming the battle and assessing the results (step 8) is also important in the evaluation of environmental considerations. It is a requirement for staff officers to conduct risk management for each COA. Every COA must clearly identify the level of risk that the commander is willing to accept to include those associated with environmental considerations.

## COA COMPARISON

2-31. Environmental considerations will normally be included in the general criterion of "residual risk," or if significant enough, may even be a separate criterion. Remember that criteria are assigned in step 5 of the war gaming process. If any environmental consideration was important enough to be in the commander's guidance or intent, it will be listed here as well.

## COMMANDER'S DECISION BRIEFING

2-32. After completing its analysis and comparison, the staff identifies its preferred COA and makes a recommendation. If the staff cannot reach a decision, the CofS (XO) decides which COA to recommend at the commander's decision briefing. The staff then briefs the commander. Critical environmental considerations have become one of the criteria in the decision matrix.

## COA APPROVAL

2-33. Again, critical environmental considerations listed in the commander's guidance or intent, will be a factor in the commander's approval of a particular COA.

## ORDERS PRODUCTION

2-34. Environmental concerns are addressed by every staff officer, as applicable, in respective annexes and appendixes. In the context of an order following the format in FM 101-5, the specified appendix is Appendix 2 to Annex F (Engineer). The specified annex to address environmental considerations for a Joint Operation Planning and Execution System (JOPES) format is Annex L. The ENCOORD, functioning in this role for the G3 (or potentially the G4) has the integrating responsibility for this appendix or annex in the same general fashion that the G2 is responsible for the integration of IPB. An example appendix is found in Appendix B of this manual.

## ENVIRONMENTAL-SPECIFIC PLANNING

2-35. 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 (discussed in depth in Chapter 4), whether for training, contingency operations, or combat, environmental planning focuses on the mission requirements of a military unit. This planning includes identifying environmental risks posed by an operation and considering ways to reduce those risks during long-, short-, and near-term planning. Units require facilities, training areas, and support systems that must be managed to secure long-term availability. Environmental support planning is, by nature, long-term. The elements of environmental planning are included in Figure 2-5. Additional considerations must include medical waste and unexploded ordnance.

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- 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.
  - Disposal of pesticides.
  - Disposal of human waste.
  - Disposal of HW.
- HM management, including the potential use of pesticides.
- Flora and fauna protection.
- Archaeological and historical preservation.
- Base field spill plan.

**Figure 2-5. Elements of environmental-specific planning**

### OPERATIONAL PLANNING

2-36. Operational planning usually begins with a formal staff estimate as a part of the MDMP. However, operational planning may entail a separate study on the characteristics of the AO or an informal review of the environmental considerations and issues contained in the higher headquarters' OPLAN or OPORD. In either situation, operational planning provides unit leaders with information they require for unit planning. If your operation will require the use of base camps, it is critical to begin the planning for them at this point.

2-37. Operational or tactical Army or Marine Corps units may operate in the theater or as part of a joint task force and be required to interface with the actions of a temporary board that the joint commander or his designated commander, joint task force (CJTF) may activate. This is called the joint environmental management board (JEMB). See Appendix D for more information on the JEMB.

## STAFF PLANNING

2-38. Staffs conduct environmental planning within the context of the mission. Their efforts produce information that helps units understand the mission's environmental requirements. Most often, staffs develop this information in the form of staff estimates, environmental protection levels, and an EBS.

### Staff Estimates

2-39. Each staff officer incorporates environmental considerations into his staff estimate (Paragraph 2 – Staff Estimate Format). The staff estimate may include the following:

- Significant environmental weaknesses and sensitivities in the AO.
- Potential enemy environmental targets.
- Critical or unique resources to the area.
- Environmental conditions related to the situation.
- Applicable laws and regulations.

2-40. Staffs identify environmental weaknesses and critical terrain that may be a factor to be avoided, actively protected, or exploited temporarily to accomplish the mission. They identify potential enemy environmental targets and plan contingency responses. The following environmental factors normally require consideration during staff estimates:

- Topography and soils.
- Vegetation, including crops.
- Air quality.
- Wildlife and livestock.
- Archaeological and historical sites.
- Safety and public health.
- Land and facility use, occupation, and return.
- Water quality, including surface water, groundwater, storm water, and wetlands.
- HM and HW disposal and potential cleanup requirements.
- Socioeconomic and political condition sensitivities and desired end states pertaining to or functions of environmental conditions.

## Protection Levels

2-41. The staff develops an OPORD, OPLAN, or CONPLAN. The staff may publish a full environmental annex/appendix only once. To facilitate changes in environmental requirements, the command may produce an environmental protection-level matrix similar to the example in Figure 2-6. This matrix ties directly into risk assessment, discussed later in this chapter and is applied in the MDMP during mission analysis (step 7).

| Environmental Protection Level | | | | |
|---|---|---|---|---|
| **Level 1** | | **Level 2** | **Level 3** | **Level 4** |
| 1. Waste Management | | | | |
| 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 |
| 2. Hazardous Materials | | | | |
| | Unit SOP | Spill response, report any water contamination | HM tracking, spill response, report spills over 50 gallons | Spill prevention plans, response teams |
| 3. Natural Resources | | | | |
| 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 |
| 4. Cultural and Historical Resources | | | | |
| | Unit SOP | Minimize damage if possible | Division-level approval required for operations in area | JTF approval required for operations in area |

**Figure 2-6. Notional environmental protection matrix**

2-42. Standard levels of environmental protection facilitate planning, communications, and flexibility. The notional array of protection levels in Figure 2-6 ranges from Level 1 to Level 4. Level 1 is less restrictive and more appropriate for tactical 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.

2-43. 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.

## Environmental Baseline Survey (EBS)

2-44. Many operations require fixed facilities, structures, or other real property as logistics, command and control, administration, communications, billeting, base camp, or other mission purposes. If the tactical situation permits, commanders conduct or direct an initial EBS before occupying the AO. An EBS is typically performed by or with support from, installations, corps, divisions, or higher HQs. However, brigades and even task forces may need to perform an initial EBS without much assistance from higher HQs. This situation would typically arise as a result of the initial reconnaissance of a proposed site. See Appendix B for additional EBS guidance and an example. See Chapter 5 for a discussion of base operations (BASOPS)-related information.

2-45. The initial EBS serves as a tool to assist in determining whether a parcel of land is acceptable for military use. The initial question should always be whether the site is healthy for soldiers and Marines. It documents the proposed site's existing environmental conditions and the likelihood of past or ongoing activities that may have created environmental, safety, or health problems. These problems include contamination of air, soil, groundwater, and surface water by toxic substances or POL.

2-46. Units conducting an initial EBS concern themselves with locating and documenting the presence or likely presence of any HM/HW or petroleum products on the property. An initial EBS will be focused on conditions indicating existing or past release, or possible release of toxic substances into structures, or the air, ground, groundwater, or surface water.

2-47. The person conducting the initial EBS will frequently be the unit's environmental officer, but the surveyor could be a member of a service's real estate team, preventive medicine personnel, a government or contract environmental engineer, quartering party personnel, or even a unit's reconnaissance element. Regardless, environmental knowledge and training will be key to the surveyor's success. He conducts and documents the initial EBS according to the tactical situation, mission, intended use of the facility, and time and personnel available.

2-48. EBS documentation becomes extremely important at the end of the mission or upon closure of a facility. See Figure 2-7. At that time, a closure EBS is done. The initial EBS and the closure EBS bracket the timeframe of use of the particular site/area.

An EBS should address the following areas:

- Property description and condition.
- Soil type and land cover.
- Water supply and source.
- Air quality.
- Signs of contamination.
- Presence of drums or containers.
- Biological and biomedical hazards (medical wastes).
- Lead-based paint.
- Unexploded ordnance.
- Other environmental and health hazards.
- Adjacent land use.
- Topographic, hydrologic, and geologic features.
- Sanitary waste disposal.
- Solid waste and HW presence.
- Presence of storage tanks.
- Heating and ventilation.
- Electrical-associated hazards.
- Fire-protection systems.
- Presence of asbestos-containing materials.
- Radiological hazards.

**Figure 2-7. Areas addressed in an EBS**

2-49. As soon as time and conditions permit, service real estate personnel may complete a more formal (or updated) EBS and site assessment. However, the initial assessment, conducted before occupation, is an important document that conducting units should safeguard. The surveying unit should retain a copy of the initial EBS and forward the original to higher HQs. The periodic use of environmental conditions reports (ECR) (see Appendix B) will assist the unit in both maintaining environmental standards and documenting their stay at a site/area. The electronic format report is also included in FM 101-5-2 and will prove helpful in writing the closure EBS.

## UNIT PLANNING

2.50. Staffs integrate environmental protection into planning for larger units. Unit leaders integrate environmental protection into unit planning for battalion- and company-level units. Unit planning includes:

- SOPs.
- OPORDs.
- Risk management plan (discussed later in this chapter).
- Training plans (see Chapter 3).

### Standing Operating Procedures

2-51. Unit leaders develop SOPs reflecting environmental protection considerations for routine tasks and activities. SOPs provide information to soldiers and Marines on how to accomplish routine tasks in an environmentally sound manner. SOPs incorporate local requirements. As local requirements change, unit leaders update their SOPs. SOPs also help define environmental protection requirements for all unit activities—facility operations, field operations, deployment, and combat. (See Appendix C for an example of a unit SOP.) Unit leaders ensure that SOPs comply with local requirements by coordinating with the higher headquarters' staff—usually the environmental office, the surgeon and his staff, preventive medicine personnel, and the SJA or ENCOORD.

2-52. Unit leaders conduct environmental risk assessments (see discussion later in this chapter and Appendixes F and G) when planning operations or activities. Risk assessment is a standard element of the MDMP. Unit leaders perform environmental risk assessments for activities not addressed in the SOP or when conditions differ significantly from those described in the SOP. A maintenance unit does not perform a risk assessment every time it performs a lubrication or service. Rather, the SOP describes the correct manner to perform these actions. Risk assessments apply to garrison operations as well as field operations.

### Orders/Plans

2-53. Unit leaders address environmental protection in their plans and orders including: WOs, OPORDs, OPLANs, CONPLANs, and fragmentary orders (FRAGOs). The higher headquarters' staff develops an environmental appendix/annex, to its OPORD/OPLAN/CONPLAN. Subordinate unit leaders draw environmental information from the environmental appendix (Appendix B of this manual) to the OPORD/OPLAN/CONPLAN, or from Annex L in a JOPES document. FM 101-5 directs the inclusion of Appendix 2 (Environmental Considerations) to Annex F (Engineer) of the OPLAN/OPORD/CONPLAN and specifies that lower-level unit leaders/staffs include environmental information in the coordinating instructions and service and support paragraphs.

## THE RISK MANAGEMENT PROCESS

2-54. FM 101-5 describes risk management as the process of detecting, assessing, and controlling risk arising from operational factors and balancing risk with mission benefits. Risk management is an integral part of the MDMP. FM 100-14 outlines the risk management process and provides the framework for making risk management a routine part of planning, preparing, and executing operational missions and everyday tasks. Assessing environmental-related risks is part of the total risk management process.

2-55. 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 and regulations. Unit leaders should conduct risk assessments before conducting any training, operations, or logistical activities.

## TACTICAL RISK AND ACCIDENT RISK

2-56. When assessing the risk of hazards in operations, the commander and staff must look at two types of risk:

- Tactical risk is risk concerned with hazards that exist because of the presence of either the enemy or an adversary, thus involving the considerations of force protection. It applies to all levels of war and across the spectrum of operations. For example, during the Gulf War, the enemy's demolition of oil fields created a significant health and environmental hazard to the surrounding countryside and to those units maneuvering through the area. (See Chapter 7.)

- Accident risk includes all operational risk considerations other than tactical risk. It includes risk to friendly forces and risk posed to civilians by an operation, as well as the impact of operations on the environment. It can include activities associated with hazards concerning friendly personnel, civilians, equipment readiness, and environmental conditions. Examples of environmental-related accident risk are improper disposal of HW, personnel that are not properly trained to clean up a spill, and units maneuvering in ecologically sensitive terrain. Preventive medicine considerations also fall into this area of risk.

2-57. Tactical risk and accident risk may be diametrically opposed. The commander may choose to accept a high level of environmental-related accident risk to reduce the overall tactical risk. For example, a commander may decide to destroy an enemy's petroleum storage area to reduce his overall tactical risk.

## LEGAL AND REGULATORY RESPONSIBILITIES

2-58. Risk management does not convey authority to deliberately disobey local, state, national, or HN laws and regulations. It neither justifies ignoring regulatory restrictions and applicable standards nor bypassing risk controls required by law. Examples of risk controls include the provisions applicable to the transportation of HM and HW, life safety and fire protection codes, or the storage of classified material and physical security.

2-59. As described in AR 200-2 and MCO P5090.2A, the National Environmental Policy Act (NEPA) requires federal agencies, including the military, to consider the environmental consequences of their proposed actions before making decisions. The level of environmental consideration exercised depends on the scope of the action, the extent of public interest, and the potential for environmental impacts. NEPA requirements are discussed in Chapter 5 and Appendix A. Leaders should consult installation and operational staff on NEPA-related issues. NEPA concerns are generally installation or operational level unit considerations. For most unit-level (tactical) environmental decisions, leaders will conduct a risk assessment and identify environmental-related hazards as part of the process.

## ENVIRONMENTAL BENEFITS OF RISK MANAGEMENT

2-60. Risk management assists commanders in complying with environmental regulatory and legal requirements, and operating within the higher commander's intent. Risk management provides leaders a tool to do the following:

- Identify applicable environmental standards, laws, and rules of engagement (ROE) that effect the mission.
- Identify alternate COAs or alternate standards that meet the intent of the law and the operational requirements.
- Identify feasible and effective control measures where specific standards do not exist.
- Ensure better use of limited resources, such as training areas and ranges.
- Ensure the health and welfare of soldiers/Marines and other effected personnel. (See Chapter 7).
- Minimize or eliminate damage to natural and cultural resources.

## RISK MANAGEMENT PRINCIPLES

2-61. To guide environmental risk decision-making, commanders use the three risk management principles, described in FM 100-14:

- Integrate risk management into mission planning, preparation, and execution.
- Make risk decisions at the appropriate level in the chain of command.
- Accept no unnecessary risk.

## THE FIVE STEP PROCESS

2-62. FM 100-14 describes the five risk management steps. Leaders may use the document worksheets found in Appendix F to assist them in tracking these steps. Figure 2-8, page 2-18, shows the relationship of environmental hazards to the total risk management process.

2-63. The following steps identify specific environmental considerations that the commander and his staff must consider:

- Step 1. Identify (environmental) hazards.
- Step 2. Assess (environmental) hazards to determine risk.
- Step 3. Develop controls and make risk decisions.

- Step 4. Implement controls.
- Step 5. Supervise and evaluate.

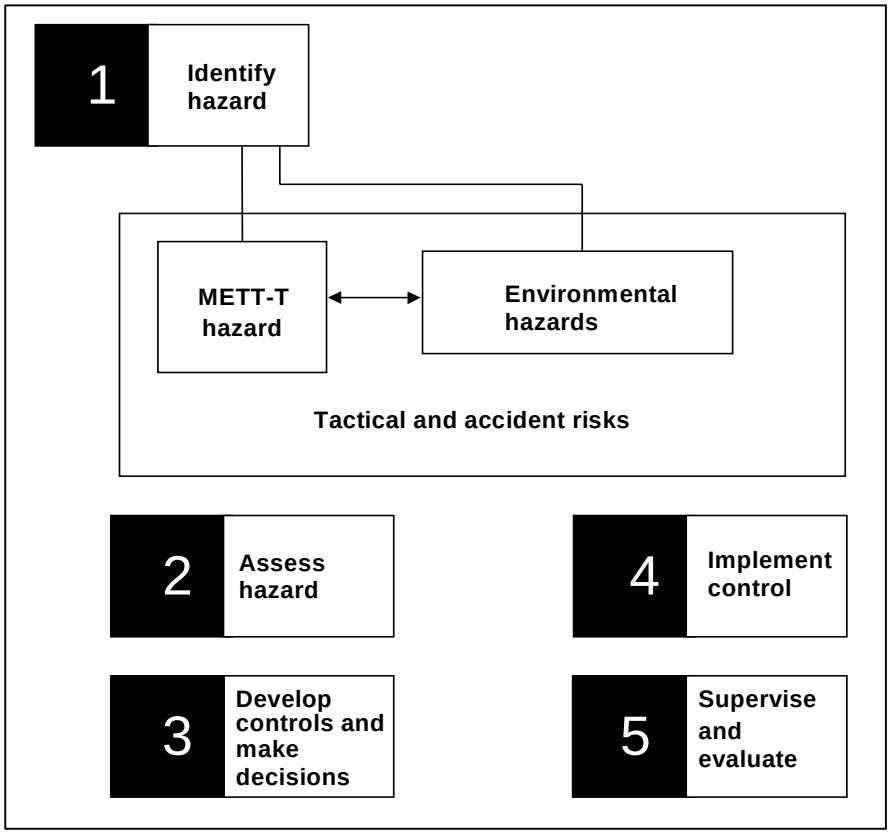


**Figure 2-8. Environmental hazard relationship to the risk management process**

### Identify (Environmental) Hazards

2-64. Commanders and staffs identify environmental hazards during mission analysis. FM 100-14 defines hazards as any actual or potential condition that can cause injury, or illness to, or the death of personnel; damage to or loss of equipment or property; or mission degradation. Environmental hazards include all activities that may pollute, create negative noise-related effects, degrade archaeological/cultural resources, or negatively affect threatened or endangered species' habitats. They also include environmental health-related hazards as further defined in Chapter 7. Figure 2-9, page 2-19 provides common environmental hazards identified by environmental media areas.

### Assess (Environmental) Hazards to Determine Risk

2-65. Risk assessment is a three-stage process to determine the risk of potential harm to the environment:

- Stage 1. Assess the probability of each hazard.

- Stage 2. Assess the severity of each hazard.
- Stage 3. Determine the risk level of each hazard.

2-66. Assessments include two factors: probability and severity. Probability is how often a hazard (environmental) is likely to occur. Severity is the effect a hazard will have expressed in terms of the degree of injury or illness, loss of or damage to equipment or property, environmental damage, and other mission-impairing factors, such as loss of combat power.

2-67. Probability and severity are estimates that require individual judgment and a working knowledge of the risk management process and its terminology. Figure 2-10, page 2-21, defines the four degrees of severity, and Figure 2-11, pages 2-21 to 2-22, the five degrees of probability for a hazard. Refer to Chapter 2 of FM 100-14 for a more in-depth discussion of these substeps as they relate to assessing environmental hazards to determine risk.

2-68. Leaders must assess the probability and the potential severity of environmental damage. Commanders use common sense, past evaluations, higher commander guidance, historical data, lessons learned, and any other useful sources to determine the probability of an event occurring. Severity, however, attempts to quantify the amount of potential damage created by an event. For example, the probability of a fuel spill occurring during an exercise might be remote. However, if the spill occurs in a body of water where the fuel will spread quickly, the potential severity could be catastrophic. In this example, the unit commander may choose to limit the potential severity by locating the fuels away from the body of water. While leaders must assess the probability of environmental damage, they must also determine how much damage the event would cause, regardless of the probability.

| Media Area | Common Environmental Hazards |
|---|---|
| Air | Equipment exhaust<br>Convoy dust<br>Range fires<br>Open air burning<br>Pyrotechnics/smoke pots/smoke grenades<br>Part-washer emissions<br>Paint emissions (to include CARC considerations)<br>Air conditioner/refrigeration chlorofluorocarbons (CFCs)<br>HM/HW release<br>Pesticides<br>Other toxic industrial chemicals/material |
| Archaeolog-ical/cultural | Maneuvering in sensitive areas<br>Digging in sensitive areas<br>Disturbing or removing artifacts<br>Demolition/munitions effects<br>HM/HW spills<br>Sonic booms/prop wash |

**Figure 2-9. Common environmental hazards**

| | |
|---|---|
| Noise | Low flying aircraft (helicopters)<br>Demolition/munitions effects<br>Night operations<br>Operations near post/camp boundaries and civilian populace<br>Vehicle convoys/maneuvers<br>Large scale exercises |
| Threatened/ endangered species | Maneuvering in sensitive areas<br>Demolition/munitions effects, especially during breeding seasons<br>Disturbing habitat or individual species<br>HM/HW spills or releases<br>Poor field sanitation<br>Improper cutting of vegetation<br>Damage to coral reefs |
| Soil (terrain) | Over-use of maneuver areas<br>Demolition/munitions effects<br>Munitions and munitions related wastes<br>Range fires<br>Poor field sanitation<br>Poor maneuver-damage control<br>Erosion<br>Troop construction effects<br>Refueling operations<br>HM/HW spills<br>Maneuver in ecologically sensitive areas such as wetlands and tundra<br>Industrial waste runoff<br>Pesticide accumulation in soil, vegetation, and terrestrial organisms |
| Water | Refueling operations near water sources<br>HM/HW spills<br>Erosion and unchecked drainage<br>Amphibious/water crossing operations<br>Troop construction effects<br>Poor field sanitation<br>Washing vehicles at unapproved sites |

**Figure 2-9. Common environmental hazards (continued)**

2-69. It is usually easier to determine probability than severity. Definitions for the degrees of severity are not absolutes; they are more conditional and related to mission, enemy, terrain, troops, time available, and civilian considerations (METT-TC). Leaders must use their experience, judgment, lessons learned, and subject matter experts to assist them in determining degrees of severity. The following examples of severity for archaeological, historical, or cultural sites provide leaders a frame of reference for what may be included when estimating degrees of severity.

- **Catastrophic** - irreparable damage, total loss of the site, complete destruction, irreplaceable, and anticipate widespread public concern. Will require notification of higher HQs, public affairs, and outside agencies.

- **Critical** - major physical damage to historical/cultural structure. Restoration is difficult, long-term, costly, and will require assistance and notification of higher HQs, public affairs, and outside agencies.

- **Marginal** - minor physical damage to historical/cultural structures which can be restored with outside assistance. Unit must report damage to higher HQs.

- **Negligible** - surrounding site damage from individual and vehicular activities easily repaired or restored by the unit; no physical damage to structures; unit must report damage to higher HQs.

| Severity Rating | Definition |
|---|---|
| **Catastrophic (I)** | Loss of ability to accomplish the mission or near mission failure, death or permanent total disability (accident risk), loss of major or mission-critical system or equipment, major property (facility) damage, severe (strategic) environmental damage, mission-critical security failure, unacceptable collateral damage |
| **Critical (II)** | Significantly (severely) degraded mission capability or unit readiness, permanent partial disability, temporary total disability exceeding 3 months time (accident risk), extensive (major) damage to equipment or systems, significant damage to property or the environment, security failure, significant collateral damage |
| **Marginal (III)** | Degraded mission capability or unit readiness, minor damage to equipment or systems, property, or the environment; lost days due to injury or illness not exceeding 3 months (accident risk); minor damage to property or the environment |
| **Negligible (IV)** | Little or no adverse impact on mission capability, first aid or minor medical treatment (accident risk), slight equipment or system damage but fully functional and serviceable, little or no property or environmental damage |

**Figure 2-10. Hazard severity**

| Frequent (A) occurs very often, continuously experienced | |
|---|---|
| Single item | Occurs very often in service life, expected to occur several times over duration of a specific mission or operation, always occurs |
| Fleet or inventory of items | Occurs continuously during a specific mission or operation or over a service life |
| Individual soldier | Occurs very often in career, expected to occur several times during mission or operation, always occurs |
| All soldiers exposed | Occurs continuously during a specific mission or operation |
| **Likely (B) occurs several times** | |
| Single item | Occurs several times in service life, expected to occur during a specific mission or operation |
| Fleet or inventory of items | Occurs at a high rate, but experienced intermittently (regular intervals, generally often) |
| Individual soldier | Occurs several times in career, expected to occur during a specific mission or operation |
| All soldiers exposed | Occurs at a high rate, but experienced intermittently |

**Figure 2-11. Hazard probability**

| Occasional (C) occurs sporadically | |
|---|---|
| Single item | Occurs some time in service life, may occur about as often not during a specific mission or operation |
| Fleet or inventory of items | Occurs several times in service life |
| Individual soldier | Occurs some time in career, may occur during a specific mission or operation, but not often |
| All soldiers exposed | Occurs sporadically (irregularly, sparsely, or sometimes) |
| **Seldom (D) remotely possible; could occur at sometime** | |
| Single item | Occurs in service life but only remotely possible, not expected to occur during a specific mission or operation |
| Fleet or inventory of items | Occurs as isolated incidents, possible to occur some time in service life but rarely, usually does not occur |
| Individual soldier | Occurs as isolated incident during a career, remotely possible, but not expected to occur during a specific mission or operation |
| All soldiers exposed | Occurs rarely within exposed population as isolated incidents |
| **Unlikely (E) can assume will not occur, but not impossible** | |
| Single item | Occurrence not impossible, but may assume will almost never occur in service life, may assume will not occur during a specific mission or operation |
| Fleet or inventory of items | Occurs very rarely (almost never or improbable), incidents may occur over service life |
| Individual soldier | Occurrence not impossible, but may assume will not occur in career or during a specific mission or operation |
| All soldiers exposed | Occurs very rarely, but not impossible |

**Figure 2-11. Hazard probability (continued)**

2-70. Using the defined degrees of probability and severity, an individual can determine the overall environmental-related risk level from the intersection of the two in the risk assessment matrix shown in Figure 2-12.

| Risk Assessment Matrix | | | | | |
|---|---|---|---|---|---|
| | **Probability** | | | | |
| **SEVERITY** | Frequent (A) | Likely (B) | Occasional (C) | Seldom (D) | Unlikely (E) |
| **Catastrophic (I)** | E | E | H | H | M |
| **Critical (II)** | E | H | H | M | L |
| **Marginal (III)** | H | M | M | L | L |
| **Negligible (IV)** | M | L | L | L | L |

**Figure 2-12. Risk assessment matrix**

**Risk Category**

**Extremely High (E)**

Mission failure if hazardous incidents occur during mission. A frequent or likely probability of catastrophic loss (IA or IB) or frequent probability of critical loss (IIA) occurs.

**High (H)**

Significantly degraded mission capabilities in terms of required mission standard or not accomplishing all parts of the mission, not completing the mission to standard (if hazards occur during mission). Occasional to seldom probability of catastrophic loss (IC or ID). A likely to occasional probability of a critical loss occurring (IIB or IIC) with material and soldier system. Frequent probability of marginal (IIIA) losses.

**Moderate (M)**

Expected degraded mission capabilities in terms of required mission standard. Will have reduced mission capability (if hazards occur during mission). Unlikely probability of catastrophic loss (IE). The probability of a critical loss occurring is seldom (IID). Marginal losses occur with a probability of no more often than likely (IIIB or IIIC). Frequent probability of negligible (IVA) losses.

**Low (L)**

Expected losses have little or no impact on accomplishing the mission. The probability of critical loss is unlikely (IIE), while that of marginal loss is no more often than seldom (IIIB through IIIE).

**Figure 2-12. Risk assessment matrix (continued)**

2-71. A practical example of assessing environmental-related risk is provided in Appendix G.

## Develop Controls and Make a Decision

2-72. Develop controls to eliminate or reduce the probability or severity of each hazard, to lower the overall risk. Controls include of one of the following categories:

- Educational.
- Physical.
- Avoidance.

2-73. Figure 2-13, page 2-24, provides environmental-related control examples. The checklist in Appendix E provides additional means for addressing and reducing environmental risk through the use of effective controls.

| Control Type | Environmental-Related Examples |
|---|---|
| Educational | • Conducting unit environmental awareness training<br>• Conducting an environmental briefing before deployment<br>• Performing tasks to environmental standards<br>• Reviewing environmental considerations in AARs<br>• Reading unit's environmental SOPs and policies<br>• Conducting spill prevention training<br>• Publishing an environmental annex/appendix to the OPORD/OPLAN |
| Physical | • Providing spill prevention equipment<br>• Establishing field trash collection point and procedures<br>• Establishing field satellite accumulation site and procedures<br>• Policing field locations<br>• Practicing good field sanitation<br>• Filling in fighting positions<br>• Posting signs and warnings for off-limit areas |
| Avoidance | • Maneuvering around historical/cultural sites<br>• Establishing refueling and maintenance areas away from wetlands and drainage areas<br>• Crossing streams at approved sites<br>• Preventing pollution<br>• Limiting noise in endangered and threatened species habitats<br>• Avoiding refueling over water sources<br>• Curtailing live vegetation use for camouflage |

**Figure 2-13. Environmental-related controls**

2-74. Many environmental risk controls are simply extensions of good management, housekeeping, operations security (OPSEC), and leadership practices. Risk reduction controls include conducting rehearsals, changing locations, establishing procedures, and increasing supervision.

2-75. Once all feasible risk control measures are in place, some risk will always remain. This residual risk requires leaders' attention. Unit leaders inform their chain of command of the residual risk and its implications on the operation. Unit leaders also inform their subordinates and focus $C^2$ efforts on those portions of the operation. The commander alone decides whether or not to accept the level of risk. He may also direct his staff to consider additional controls or a change in the COA based on environmental risk.

## Implement Controls

2-76. Inform subordinates, down to individual soldiers/Marines, of risk control measures. State how each control will be implemented, and assign responsibility. For example, if the control measures for a fuel spill hazard are to ensure that operators are properly trained to dispense fuel and appropriate spill equipment is available, then leaders must ensure that these controls are in

place before the operation begins. This preparation requires leaders to anticipate environmental requirements and incorporate them into long-, short-, and near-term planning as described in Chapter 3. The key to success is identifying the "who, what, where, when, and how" aspects of each control.

### Supervise and Evaluate

2-77. Leaders and staffs continuously monitor controls throughout the operation to ensure their effectiveness and to modify controls as required. They also make on-the-spot corrections, evaluate individual and collective performance, hold those in charge accountable, and require that all tasks be performed to applicable environmental standards. Leaders ensure that the AAR process includes an evaluation of environmental-related hazards, controls, soldier/Marine performance, and leader supervision. Finally they ensure the development of environmental lessons learned for use in future operations.

## SUMMARY

2-78. It is essential to include environmental considerations early and throughout the planning cycle. The integration of environmental considerations is an easy fit and causes no functional change in the MDMP process. Like safety, it is another consideration to apply during these processes. Many leaders and soldiers/Marines have already been performing in a manner that takes environmental considerations into account. Leaders may build on this existing environmental awareness as they responsibly integrate environmental considerations into all military planning, training, and operations. Chapter 6 and Appendix E describe how to both establish and assess an environmental program.

2-79. Unit leaders use risk assessment to estimate the impact of their unit activities on the natural environment and to identify environmentally-related safety issues for their soldiers or Marines. Environmental-related risk is part of the risk management process as detailed in FM 100-14. Knowledge of environmental factors is key to planning and decision-making. Risk management does not convey authority to deliberately disobey local, state, national, HN laws and regulations, or the environmental laws of war (ELOW). Risk management assists commanders in complying with environmental regulatory and legal requirements, and operating within the higher commanders' intent. Unit leaders should complete risk assessments before conducting training, operations, or logistical activities. Risk assessments assist leaders and their staffs in identifying potential environmental hazards, develop controls, make risk decisions, implement those controls, and ensure proper supervision and evaluation. Unit staffs consolidate environmental risks, as well as all other risk, into the overall unit risk management plan for an operation.

Chapter 3

# Training: Integrating Environmental Considerations

*"Environmental protection must be treated as you would any other mission. Make environmental considerations integral to all operations and decisions. Commit sound stewardship of Army lands and protect the environment."*

General William Hartzog

The integration of environmental considerations into training is very similar to the integration of safety and force protection issues. Training is the key to accomplishing the mission. Environmental considerations should meld into the planning and implementation of the training process. The discussion of battle-focused training highlights the integration of environmental considerations throughout the training cycle, as specified in FM 25-101. While this process is Army-specific, it is similar to the process employed by the Marine Corps.

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 the ongoing unit training programs.

## BATTLE-FOCUSED TRAINING

3-1. Battle-focused training is addressed in FM 25-101. Training is the cornerstone of readiness and the basis for credible deterrence and capable defense. It is essential to "train as you fight", but in the case of environmental considerations, it is also true that the closer the military is to fighting, the less preeminent environmental considerations are likely to be. This shift in emphasis does not imply that environmental considerations go away! In fact, they are applicable in every situation—it's their level of immediate importance that varies. Despite the fact that the military trains for combat, most of the missions performed as a unit will not occur during combat. Units must plan for environmental considerations prior to conducting training. A good leader will not take his soldiers or Marines into a training situation without providing them the essential preparation for success. Soldier/Marine welfare is based on the training and application of sound environmental considerations, so it is well worth the effort and attention. Just as failure to apply considerations of supply accountability or other legal matters, failure to pay attention to environmental considerations can hinder mission success and increase personal liability.

3-2. This section focuses on how environmental considerations fit into the planning cycle as discussed in FM 25-101. The discussion of a particular environmental program assessment is covered in Chapter 6. The planning cycle helps identify where specific actions take place. Figure 3-1 below highlights the parallel environmental protection actions that unit leaders must integrate into the planning, execution, and evaluation portions of a unit training cycle.

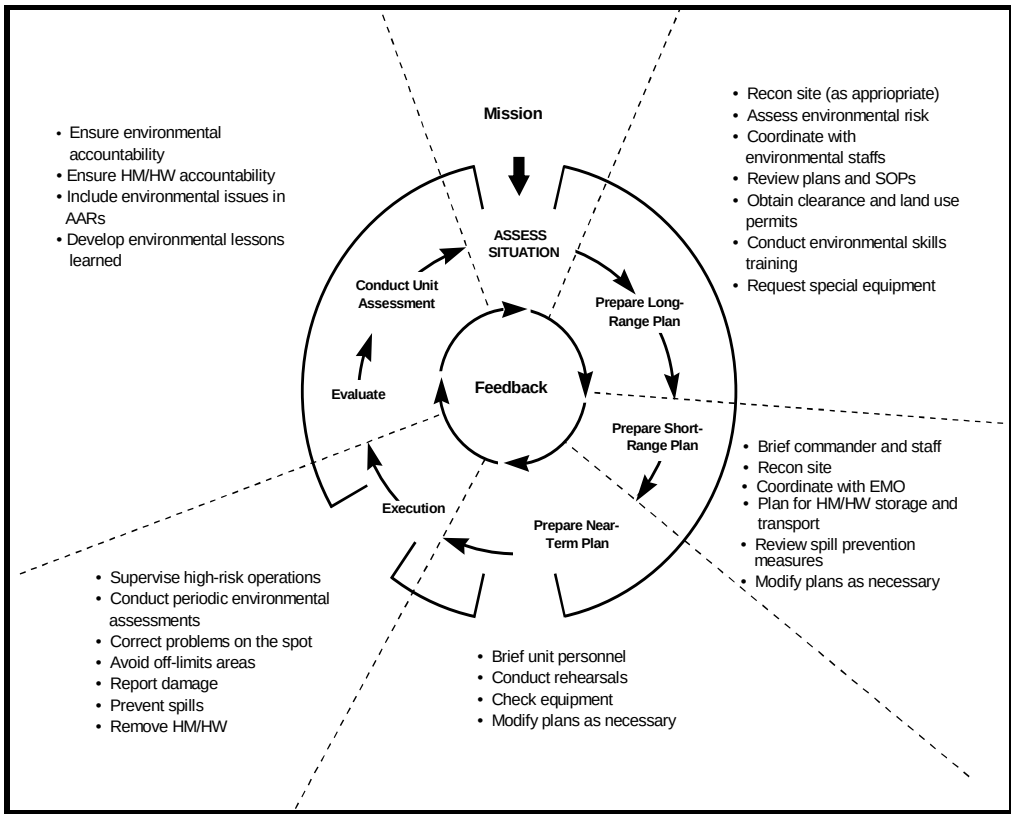


**Figure 3-1. Integrating environmental considerations into unit planning/training**

## ASSESSMENT

3-3. 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. Commanders must assess the unit's internal and overall status of environmental training program and unit proficiency. Before effective planning can occur, it is essential to perform an assessment of the current status of a unit.

## LONG-RANGE PLANNING

3-4. At the battalion level, long-range planning starts with unit assessment and is the basis for the long-range calendar. Resources, such as major training

areas, ammunition, and fuel, are allocated, and shortfalls are identified. The long-range plan synchronizes supporting units and agencies so that effective training events can be properly executed. This generally translates into annual training guidance.

3-5. Leaders use risk management, review SOPs, and ensure that personnel receive the correct tools to avoid/prevent/mitigate environmental damage. They address environmental considerations and develop methods to overcome them so that effective training can be accomplished. Items that have an environmental focus during this phase include the following:

- Conducting reconnaissance of the training site (as appropriate).
- Assessing the environmental risk.
- Coordinating with installation environmental staffs.
- Reviewing plans and SOPs.
- Obtaining clearance and land use permits.
- Conducting environmental skills training.
- Requesting special equipment or support.
- Coordinating with preventive medicine personnel.

## SHORT-RANGE PLANNING

3-6. Short-range planning refines the long-range calendar. It defines in greater detail the broad guidance on training events and other activities in long-range planning calendar and command training guidance. This generally translates into quarterly training guidance.

3-7. During short-range planning leaders review existing procedures, issue specific environmental guidance, update risk assessment matrices and unit SOPs, and train their soldiers/Marines on new environmental protection procedures. They determine specific methods to incorporate environmental considerations into the training mission to protect the environment without lowering standards or readiness. Activities that have an environmental focus during this phase include:

- Briefing the commander and staff.
- Conducting reconnaissance of the training site.
- Obtaining maps or overlays indicating environmentally sensitive areas.
- Coordinating with the environmental management office to identify recent changes in environmental conditions.

- Planning for HM/HW storage and transport.
- Reviewing spill prevention measures.
- Modifying plans as necessary.

## NEAR-TERM PLANNING

3-8. Near-term planning defines specific actions required to execute the short-range-plan. It is the final phase of planning before the execution of training. Near-term planning covers a six- to eight-week period before the execution of training for active component (AC) units and a four-month period before execution of training for reserve component (RC) units.

3-9. Key leaders inspect equipment and ensure that soldiers/Marines perform maintenance and preventive maintenance checks and services (PMCS) before the field exercise. Leaders brief their soldiers/Marines on the environmental and safety considerations of the exercise. The checklists in Appendix E help leaders plan and conduct mission activities that minimize adverse impacts on the environment. During this phase, leaders exercise an environmental focus through:

- Briefing unit personnel on environmental constraints and issues.
- Conducting rehearsals that include environmental considerations.
- Conducting final reconnaissance of training sites to confirm environmental conditions prior to the execution of training.
- Checking equipment.
- Ensuring unit SOPs are up-to-date and meet the requirements for the specific training sites where the training will be performed.
- Checking spill response equipment.
- Modifying plans as necessary.

### Preexecution Checks

3-10. Preexecution checks are developed, and responsibility for them is fixed during the short-range planning phase. These checks become increasingly detailed during the near-term phase. Preexecution checks provide the attention to detail needed to use resources efficiently. The three major environmental considerations are:

- Has a risk assessment (environmental) been completed and safety considerations incorporated?
- Has reconnaissance of the training ranges, sites, or facilities been conducted?

- Have leaders been briefed on environmental considerations?

## PREPARATION FOR THE EXECUTION OF TRAINING

3-11. Formal planning for training culminates with the publication of the training schedule. Informal planning and coordination (preexecution checks) continue until the training is performed. During rehearsals, leaders ensure all safety and environmental considerations are met.

3-12. To conduct effective, meaningful training for soldiers, leaders, and units, thorough preparation is essential. Well prepared trainers, soldiers, and support personnel are ready to participate, and their facilities, equipment, and materials are ready to use.

## EXECUTION

3-13. 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 practices and preventive measures are being employed. Once soldiers/Marines understand what is expected of them, these practices become merely another measure of unit proficiency and the level of unit discipline.

### Precombat Checks

3-14. Preexecution and precombat checks are key to ensuring that trainers and soldiers/Marines are adequately prepared to execute training to Army/Marine Corps standards. Precombat checks are the bridge between preexecution checks and execution of training. Leaders ensure the execute of precombat checks by:

- Briefing environmental considerations in the OPORD. Leaders and soldiers/Marines know what is expected of them.
- Including environmental considerations in the safety checks and briefings.
- Verifying completion of precombat (before operations) PMCS completed on vehicles, weapons, communications, and nuclear, biological, and chemical (NBC) equipment to include environmental considerations.
- Checking and confirming vehicle load plans, and securing cargo (especially HM).

### Presentation of Training

3-15. Through the presentation of training, leaders provide soldiers/Marines with the specific training objectives (tasks, conditions, standards), and the evaluation methods to be used. Environmental constraints may alter the conditions under which the task is performed, but should never alter the task standards. Leaders ensure an environmental focus during this phase by:

- Conducting environmental awareness training.
- Supervising high risk operations.
- Conducting periodic environmental assessments.
- Correcting problems on the spot.
- Avoiding off-limits areas.
- Preventing spills.
- Reporting damage accurately and in a timely manner.
- Removing HM/HW in a timely and appropriate manner.

### EVALUATION

3-16. The evaluation process is continuous and integral to training management. Leaders at every level conduct training evaluation. Discussing both the environmentally correct and incorrect actions enhances environmental stewardship in unit personnel and helps soldiers/Marines learn from each other. The AAR process includes environmental performance and should address all environmental considerations listed in the training evaluation plan as well as any others discovered during the course of the training. The evaluation and AAR should cover the following:

- Ensuring environmental accountability.
- Ensuring HM/HW accountability.
- Including environmental issues in AARs.
- Developing environmental lessons learned.

### UNIT ASSESSMENT

3-17. Leaders use evaluations and other feedback measures to assess soldier/Marine, leader, and unit proficiency. Commanders use the analysis of the information provided through evaluations for their assessment. Based on evaluations, commanders adjust priorities and resources as necessary to synchronize all unit functions. Leaders can also use portions of the self-assessment guide in Appendix H to assist in their unit assessment.

## ENVIRONMENTAL-SPECIFIC TRAINING AND RESOURCES

### ENVIRONMENTAL SPECIFIC TRAINING REQUIREMENTS

3-18. 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 soldiers/Marines. Awareness training occurs as early as possible

following assignment to a unit, and ECOs reinforce environmental awareness training annually.

3-19. In addition to general environmental awareness training, individuals with certain duties and responsibilities 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.

3-20. Unit leaders address HM/HW training separately from routine environmental training requirements. Federal law may require 40 hours of HW handler training for soldiers and Marines who handle specific HW. Units schedule this training as soon as possible following the assignment of personnel to positions dealing with HM. Those who handle HM/HW may also require eight-hour refresher courses annually. 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. ECOs should check with the installation's environmental office to determine training requirements and availability.

## SUMMARY

3-21. It is essential to include environmental considerations early and throughout the training cycle. The integration of environmental considerations is an easy fit that causes no functional change in battle-focused training. Like safety, it is another important consideration to apply during training planning and execution. Many of us have already been performing in a manner that takes some environmental considerations into account. Use that as a foundation on which to build as we accept the responsibility to integrate environmental considerations into everything we do. Review Chapter 2 for a more in-depth discussion of risk management as it applies to environmental considerations.

3-22. Unit commanders are required to implement environmental-specific training to include environmental awareness, spill prevention and response, HM/HW transportation, storage and turn-in procedures/accountability/ management. Commanders must address these requirements in accordance with their installation environmental management office.

3-23. Read Chapter 6 for a discussion of how to both establish and assess a unit environmental program. The unit self-assessment in Appendix H provides a generic checklist for units to assess compliance with environmental laws and regulations in their daily operations and activities. Unit leaders should supplement the checklist with applicable state, local, or HN environmental requirements. Although this checklist serves as a primary tool for unit environmental self-assessments, the self-assessment is only a guide and does not provide a final determination of compliance and should be supplemented based on local requirements. Environmental compliance assessment system (ECAS) or environmental compliance evaluation (ECE) checklists provide more comprehensive assessments.

3-24. The Army and Marine Corps train as they fight. Incorporating the environmental considerations into training should not change the standard procedures or considerations that a unit and its leaders apply to an operation. Chapter 4 shows how including environmental considerations in training occurs in a nearly seamless fashion.

Chapter 4

# Operations: Integrating Environmental Considerations

*"The Army faces a unique set of challenges as it adapts to a world that has changed more broadly and fundamentally than any time since the end of WW II. The Army must continue to adapt to ensure success in a rapidly changing strategic environment. Now more than ever, it serves as a strategic Army, a land force on which the United States and its allies rely to meet global challenges."*

FM 100-5, Army Operations

Integrating environmental considerations into operations is the logical progression after having effectively integrated environmental considerations in both planning (Chapter 2) and training (Chapter 3). The commander is, with increasing frequency, constrained by mission requirements 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 environmental considerations as less important or more critical than other considerations. Protection of the environment may very well have to take a backseat to other tactical considerations as the commander weighs matters of force protection. However, protecting soldiers and Marines will always be high on the commander's list and environmental considerations that impact force protection and the health and safety of his personnel will cause them to become one of his highest priorities.

## IMPLICATIONS FOR MILITARY FORCES

4-1. Environmental protection has several implications for military operations that affect all levels of war. When a commander orders an action that will 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. A commander considering a military action that would have the effect of polluting the drinking water of a region, for example, must estimate the effect of the pollution to make a judgment on the proportionality of the action to the damage it may cause. Additionally, the effects of environmental factors on the strategic end state or mission success must be identified and assessed. The law of war

specifically forbids poisoning of water sources. Commanders and their staffs must understand the strategic, operational, tactical, and ethical implications of environmental protection.

## STRATEGIC IMPLICATIONS

4-2. 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.

4-3. 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.

4-4. 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.

4-5. The implications of large-scale environmental warfare became apparent 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.

4-6. It is critical to articulate the appropriate level(s) of *military environmental protection* given the particular nature of any operation. This will not be a constant. Application of environmental protection in a given contingency will almost certainly differ from its application in the midst of close combat during a war. The higher commander's guidance is essential and is rarely initiated by commanders at the operational or tactical levels without initial guidance from the strategic level. Given the linkage between political and military considerations at the commander in chief (CINC) level, this will likely be the vital echelon for initiating and defining the driving guidance on military environmental protection for any given operation.

## OPERATIONAL AND TACTICAL IMPLICATIONS

4-7. Environmental protection skills and procedures are required for all military operations. As environmental factors become more important during the next century, the military services and the unified commands will develop additional intelligence and operational capabilities and specific environmental procedures to match mission categories and constraints. In addition to practicing routine

environmental protection measures, commanders and their staffs face new environmental challenges and responsibilities including:

- Conducting humanitarian (stability or support) operations after environmental disasters.
- 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.
- Remedying adverse environmental impacts as a part of the exit strategy.

4-8. The MDMP integrates environmental considerations into mission accomplishment. Staffs, at the appropriate echelons, must identify and analyze environmental effects of military actions, as well as characteristics of the environment influencing friendly or threat operations. Staff consideration of environmental impact starts with the mission analysis and the initial IPB and continues through the orders production process.

4-9. During missions, environmental protection should be, to the extent possible, a matter of standard procedures. Both the Army and the Marine Corps have established policies on environmental protection. Basic environmental protection policy is contained in service regulations and special publications. Joint doctrine for environmental annexes to OPORDs and OPLANs is a part of the 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 101-5, 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 101-5 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.

4-10. None of the methods for decision-making in a time-constrained situation, discussed in FM 101-5, 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

4-11. Protecting the environment is always difficult, and protecting the environment while conducting operations against a hostile force is not always possible. Military forces must deploy and operate with a minimal environmental

damage. They must initiate environmental control measures and establish appropriate protection levels without detracting from mission accomplishment.

4-12. 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 standards for environmental considerations. We have developed initial concepts base camps that have become the norm for many operations in which US forces are currently involved. 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 (soldiers and Marines) from environmental hazards. CALL Newsletter 99-9, *Integrating Military Environmental Considerations*, provides insights on the emerging doctrine for base camp operations.

4-13. 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

4-14. 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 Convention which requires belligerents to safeguard real property and forbids its destruction unless absolutely necessary for military purposes. Some legal commentators have argued that Iraq had military reasons for these actions (oil fires to provide smoke/mask retreat and oil release to deter amphibious landings) but that the advantage gained was not proportional to the environmental damage caused.

## COLLATERAL DAMAGE

4-15. Collateral damage results from military actions used to achieve strategic, operational, or tactical objectives during armed conflict. Concentration of fire or maneuver can have serious environmental consequences.

4-16. Damaging enemy targets (such as ammunition stockpiles or 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 2.

### MODIFICATION OF THE ENVIRONMENT

4-17. 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.

4-18. 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

4-19. The notional curve, Figure 4-1, depicts the significance/priority afforded environmental protection for given missions.

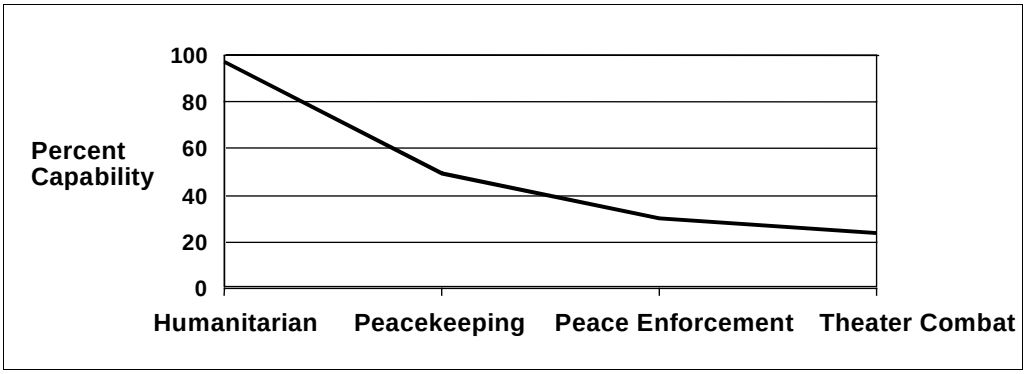


**Figure 4-1. Environmental protection considerations relative to mission type**

4-20. During combat, commanders will generally weigh concerns such as desired strategic end state and force protection more heavily than 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.

4-21. 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.

4-22. 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.

4-23. Environmental protection principles do not necessarily override other operational factors. They are a standard part of the MDMP, in which a

commander makes decisions based on the facts and recommendations presented by the staff in the context of mission priorities. These decisions include the three 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.
- Analyze environmental considerations and impacts in concert with mission requirements and force protection.
- Incorporate environmental considerations into planning procedures.

### AVOID UNNECESSARY ENVIRONMENTAL IMPACTS

4-24. The first principle of environmental protection in a theater of operation is to avoid unnecessary damage and limit collateral damage. This principle is essential to meet the provisions of the requirements of Articles 54 and 55 of the Geneva Convention of 12 August 1949, which protected objects indispensable for the survival of the civilian population and the natural environment, respectively. 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

4-25. 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 NEPA and the related EO 12114, discussed in Chapter 5, are **especially critical**. Commanders make judgments in the context of 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 in the MDMP, as discussed in Chapter 2. Remember that most environmental considerations directly enhance the health and safety of soldiers and Marines. (See Chapter 7.)

### INCORPORATE ENVIRONMENTAL PROTECTION INTO OPERATIONAL PLANNING

4-26. The third principle is to incorporate environmental protection considerations into operational planning procedures. The notional curve depicted in Figure 4-2, page 4-7, approximates a deploying unit's level of environmental protection management during various phases of an operation. Although all missions require environmental planning and protection as a part of the MDMP, different missions require different levels of environmental planning. During training, environmental considerations typically receive higher priority than

during operations. The integration of environmental considerations into the planning process is covered in Chapter 2.

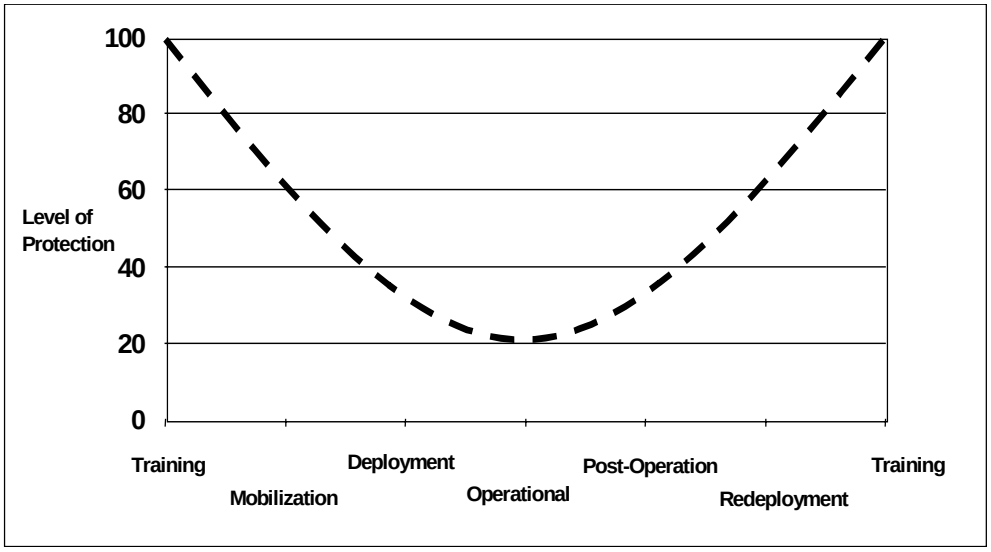


**Figure 4-2. Levels of environmental consideration**

4-27. During World War II, General Dwight D. Eisenhower struggled with the issue of balance as it applied to ancient monuments and priceless historical structures.

> *"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

## SUMMARY

4-28. Integrating environmental considerations into operations is a requirement that commanders have accepted. As with other 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 many operations.

4-29. The Army and Marine Corps have procedures that enable units to function effectively while minimizing environmental damage. These generic procedures are valid for all operations. The environmental protection principles assist the commander in weighing the importance of various environmental considerations and ensuring their soldiers and Marines are protected.

## Chapter 5

# Base Support Operations

*"The installation/Garrison Commander has enormous responsibilities as he guides the installation to support the National Strategy and the movement of our installations to power projection platforms. To execute this successfully, the commander must understand the core installation management functions and understand the responsibilities of an installation commander."*

FM 100-22, Installation Management

This chapter focuses on explaining the environmental program areas and introducing the BASOPS functions and their role in *military environmental protection*. It explains how installations/bases support units to allow them to meet installation/base specific programs. This support is critical to units that are assigned to, or will train or mobilize at an installation. Installation/base and garrison staffs provide services and support to maneuver units. They are vital to the daily lives of units and in the preparation to go to war or perform other assigned missions. The support provided in the area of training is of tremendous importance. Perhaps the most critical program in this arena from the standpoint of *military environmental protection* is the ITAM program. The Army and Marine Corps must both maintain an effective level of combat readiness and promote good stewardship of the land on which it trains. Additionally, installations/bases and BASOPS function as the platforms from which both units and individuals go through mobilization, deployment, redeployment and demobilization (MDRD). In exchange for the critical support that installations/BASOPS provide, units must reciprocate by exercising responsibility in their interface with the installation/base. This chapter identifies the partnership and provides insights on how to make it work for the commander and his unit. A great deal of help is available from environmental personnel at the installation level, and it is here that a person may find or gain access to many of the technical experts on environmental matters. For insights into additional help available to the commander see Appendix D.

# ENVIRONMENTAL PROGRAM AREAS

5-1. Environmental program areas provide the framework for all of the programs that are in place on an installation to support *military environmental protection*.

## FOCAL POINTS OF ENVIRONMENTAL PROTECTION

5-2. The four broad areas to which environmental protection strategies apply are: hazardous substance control, natural habitat and wildlife protection, resource conservation, and cultural resource protection.

### Hazardous Substance Control

5-3. The laws and policies that control hazardous substances protect water, soil, and air from harmful levels of contamination. The military uses large quantities of hazardous substances, such as fuels, paints, batteries, and solvents. Often these compounds contain pesticides, acids, metals, and other toxins. The military work environment, whether training or combat, is more conducive to HM/HW spills than the normal workplace. Given these conditions, US military forces must take extra precautions to ensure they minimize environmental contamination by hazardous substances.

### Natural Habitat and Wildlife Protection

5-4. The last 50 years of population and industrial growth have caused a significant loss of natural habitat—forests, croplands, waterways, fisheries—and a growing list of endangered and threatened species. Consequently, most nations have laws protecting natural habitat and wildlife and have signed international wildlife protection treaties. US laws and parallel international treaties recognize that the loss of a single species can indicate damage to an entire ecosystem's health.

5-5. Many of these threatened or endangered species reside on installations and training areas operated by the Army and the Marine Corps. Installation commanders, their staffs, and tenant units assume responsibility for safeguarding these species while performing their vital training missions. Theater commanders must consider these species and their habitat when they select bivouac areas, base camps, transportation corridors, harbors, logistics support areas, and airfields.

### Resource Conservation

5-6. Some resources, such as metal ores and petroleum products, are limited in availability and are nonrenewable. However, many nonrenewable resources can often be conserved or reused. Conserving these resources reduces waste generation and associated disposal problems. Otherwise, these wastes require incineration, treatment, or burial.

5-7. These options are costly and may contribute to pollution. Pollution prevention efforts are focused on reducing the initial generation of such wastes to avoid the need for treatment and disposal whenever possible.

Resource conservation efforts, such as energy efficiency and recycling, reduce operating costs and the burden of waste disposal.

### Cultural Resource Protection

5-8. Resources such as buildings, religious structures, monuments, and archaeological sites represent a clear link to the past. Since they are nonrenewable, US military forces respect and preserve them whenever possible.

5-9. Many Army and Marine Corps facilities include historic monuments, buildings, battlefields, archaeological sites, and cemeteries. Likewise, many operational theaters contain similar resources, some of which have cultural or religious significance. US military forces respect these resources by avoiding cultural and religious centers whenever possible. However, when all other options have been exhausted, US forces will act decisively when the enemy uses cultural resources to gain a tactical/operational/strategic advantage. The attacks on Monte Casino during World War II and at Hue in Vietnam are examples of such uses of cultural resources.

5-10. On military installations, several environmental protection programs support cultural preservation. Each program has a specific objective intended to meet legal and strategic environmental requirements. The requirements of these programs are simply extensions of good management and leadership practices.

## ENVIRONMENTAL PROGRAM AREAS

5-11. Military programs that protect the environment correspond to legal requirements to protect air, land, water, human health, and natural and cultural resources. Figure 5-1, page 5-3, summarizes program goals.

5-12. In general, at battalion level or below, these program requirements are integrated into existing unit programs and procedures. They need not be addressed as separate environmental programs. However, commanders should coordinate with appropriate installation environmental staff to determine whether unit-specific circumstances such as mission, active or reserve status, or location dictate other requirements. Certain units, such as explosive ordnance disposal (EOD) units, higher level maintenance activities, or maritime units, may have additional environmental requirements. These units should coordinate closely with their supporting installations and proponent school.

| 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 |

**Figure 5-1. Typical environmental program areas and their goals/impact**

## INSTALLATION AND FACILITY RESPONSIBILITIES

5-13. Installations and other facilities provide industrial, acquisition, and training area support to their assigned units. Installation facilities and services support mission requirements for training, mobilization, and deployment. Efficient operations in these areas minimize the environmental impact of pollution and resource consumption. The primary resources available to assist a unit with environmental problems and issues are the chain of command and installation specialists (in the EMO). The chain of command communicates environmental directives. The environmental responsibilities of the installation/base staff is addressed in this chapter. By understanding organizational relationships, unit leaders can work as a team with those that support them and operate more efficiently and effectively. Refer to FM 100-22 for a focused discussion of Army installation management.

## GARRISON/INSTALLATION ORGANIZATIONS AND STAFF

5-14. On a divisional installation/base, the division commander is also typically the installation/base commander. As such, he will have a Garrison Commander to perform the installation portion of his responsibilities. The Garrison Commander's role in environmental stewardship centers on monitoring, coordinating, and ensuring that all staff and support personnel meet the compliance guidance set forth by federal, state, and local agencies. Additionally, he orchestrates environmental support to the units assigned to or training on his installation/base. In some locations, such as Europe area support group (ASG)/base support battalion (BSB) commanders tie together the garrison/installation responsibilities for multiple sites.

5-15. The Army's environmental program identifies the offices available to assist commanders and their chain of command in solving environmental problems and making soldiers aware of environmental requirements. A basic review of key installation POCs will help determine who can provide assistance. Figure 5-2, shows a typical installation staff/offices that have environmental responsibilities. The Marine Corps has a similar organization shown in Figure 5-3, page 5-5. For more information see the latest version of MCO 5090.2. Due to mission, magnitude of installation/base, environmental responsibilities, and manning, not all installations/bases are organized as depicted.

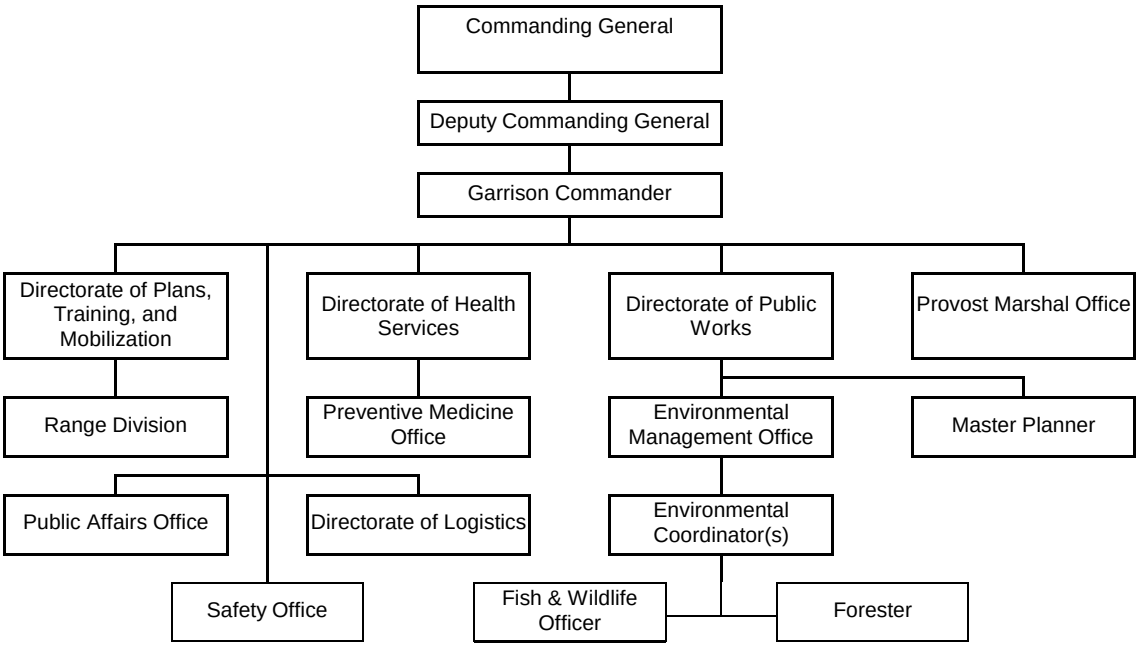


**Figure 5-2. Typical Army installation/garrison organization**

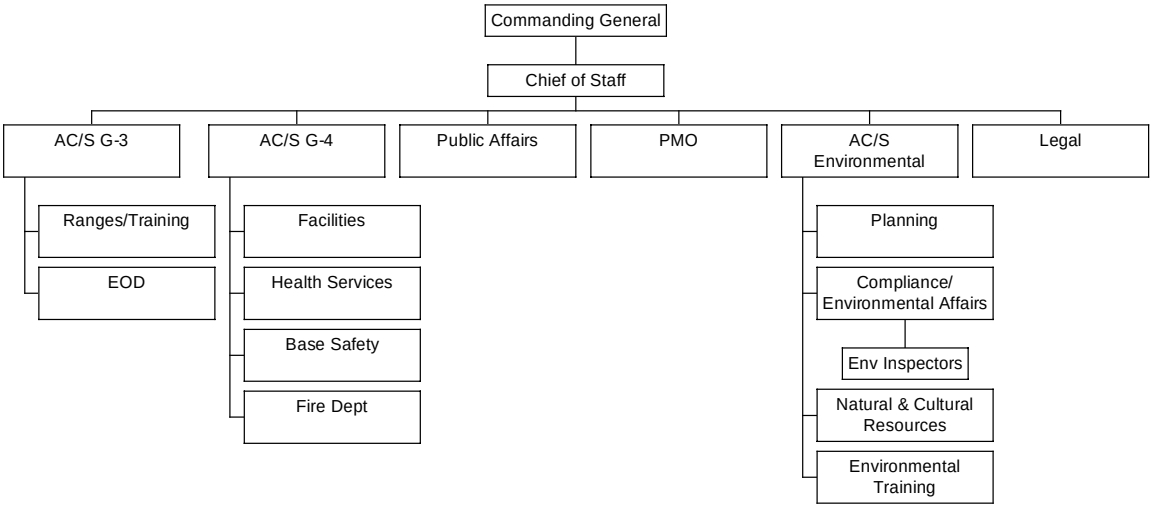


**Figure 5-3. Typical Marine Corps large installation organization**

## Directorate of Public Works (DPW)

5-16. The DPW usually manages the environmental program at the installation level. It is responsible for overall program management and provides input into budget planning, the annual work plan, compliance monitoring, natural resources, hazardous waste documentation, and processing notices of violations (NOVs) from the state and federal government regulatory agencies to the major Army command (MACOM) to which the installation reports.

- Environmental Management Office (EMO). This office/division is sometimes separate but is generally a subordinate element of the DPW. (When it is separate, it is usually referred to as the Directorate of Environmental Quality [DEQ]). It exists to support the military training mission and advises commanders and staff personnel on environmental protection, compliance, and regulations. The office also monitors environmental compliance and promotes stewardship through education, customer assistance, and the environmental compliance inspection program. Its activities require coordination with federal, state, and local regulatory agencies on issues that impact installation environmental management programs. The environmental divisions, headed by environmental coordinator(s), are located within this office.

  - Installation Environmental Coordinator (EC). The EC monitors activities to ensure they remain in compliance with environmental laws and regulations. The EC works in the EMO/ Environmental and Natural Resources Division (ENRD) or the DPW. The EC also develops management plans for environmental control aspects of facilities and operations, recommends appropriate training (including unit HW

coordinators), and provides in-house guidance to operators. The coordinator may or may not have technical and support staff, depending on the size of the installation and the magnitude of its environmental problems.

- Forester and Fish and Wildlife Officer. These officers are normally assigned to the environmental office. The installation forester is responsible for the forestry program on the installation. Most of an installation's forests are normally in training areas; therefore, any training activities that effect the forestry program and regulations are the concern of this office. The fish and wildlife officer is responsible for the fish and wildlife management programs on an installation.

- Master Planner. The installation master planner is responsible for planning facilities for the installation according to missions, force structures, and technological advancements for the next 20 years. The master planner maintains maps, records, and reports for this planning process. He has current information on the installation's training areas and plans for their future development.

**Directorate of Plans, Training, and Mobilization (DPTM)**

5-17. The DPTM is the installation's operations and training office. It coordinates all training activities, including budgeting, development and maintenance of training areas, and mission priorities. It has primary responsibility for ITAM on the installation/base.

5-18. The range officer is the chief of the range division and has overall responsibility for developing and managing the installation's training ranges. The range control officer is in charge of range operations, to include maintaining and enforcing range regulations, coordinating and scheduling daily range operations, and providing range data to using units. The range manager is responsible for range maintenance and construction.

**Directorate of Logistics (DOL)**

5-19. The DOL is responsible for compliance and quality assurance (QA). The DOL is also responsible for oversight of the Hazardous Materials Control Center (HMCC), the used-solvent elimination (USE) program, POL management, hazardous materials tracking (to include MSDSs), and oversight for transportation, maintenance and ammunition storage. The DOL works closely with the Safety Office and the Occupational Safety and Health Administration (OSHA).

**Defense Reutilization and Marketing Office (DRMO)**

5-20. The DRMO program was established by a DOD directive. Typically, DRMOs are located at all MACOMs as a tenant activity (not depicted in Figure 5-2). They work closely with the installation's DOL and environmental offices to store, sell, or dispose of excess real property (to include HW). The DRMO is usually the designated storage facility for all HW

generated at the installation. Whether or not a DRMO is on an installation, you must first coordinate your disposal requirements with your environmental office.

### Safety Office

5-21. This office is responsible for the HAZCOM program and training that includes leaders' and supervisors' responsibility of hazards in the workplace, notification of hazards, and necessary precautions to protect soldiers/Marines. It interfaces with OSHA on safety-related issues and is responsible for installation/base-wide OSHA compliance. It provides support for managing HM, to include worker-protection guidance and inspection assistance.

### Public Affairs Office (PAO)

5-22. The PAO is the official spokesperson for the installation and manages public involvement activities and responses (particularly in public controversy situations) in close coordination with key installation leaders. The PAO advises the commander on methods of conveying information to the public.

### Directorate of Health Services/Preventive Medicine Office

5-23. This office is responsible for a variety of health-related areas such as field sanitation, asbestos screening, health and safety inspections, occupational health services and compliance with OSHA regulations. This office provides required respiratory and protective support and conducts and maintains baseline medical surveys. Preventive Medicine advises the commander and staff on regional health matters within the commander's area of interest. It assists in determining the public health implications of damages to critical environmental resources. (See Chapter 7.)

### Provost Marshal Office (PMO)

5-24. The PMO personnel are responsible for evacuating and securing designated hazardous sites. They are often involved in cases where hazardous spills pose imminent health and safety problems. They may also oversee the game warden.

### Fire and Emergency Services

5-25. This department provides fire fighting support to the installation/base and conducts and maintains safety surveys. The Fire Chief is generally the designated Emergency Coordinator and maintains the Installation Spill Contingency Plan (ISCP). He is also generally the Installation On-Scene Coordinator (IOSC) who coordinates all types of emergency response efforts. Normally organized under the DPW for the Army, or the G4 for the Marines.

### Environmental Quality Control Committee (EQCC)

5-26. Each installation except satellite installations has an EQCC as directed by AR 200-1. In oversea areas, the EQCC may be organized at the military community level and includes major and satellite installations and tenant activities. The EQCC advises the installation commander concerning environmental issues and assists in formulating installation environmental policy. It consists of the installation commander, who chairs the committee; the DPW, who acts as the executive secretary; and representatives of each directorate and staff section. Tenant units are encouraged to have representatives attend the EQCC meetings.

## SUPPORT PLANNING AND EXECUTION

5-27. Environmental support planning projects long-term requirements to sustain and support a large concentration of military units within a specified area for an indefinite period. This support necessitates extensive planning for environmental impact assessment, natural and cultural resources management, and restoration. Most often, this planning applies to installations in the US; however, many bases in foreign countries have similar requirements. This planning is conducted primarily though the lead of the garrison staff in support of the installation commander and the units assigned to or training at the installation.

### NEPA/EO 12114 ANALYSIS

5-28. The NEPA defines a process of environmental analysis that presents an opportunity for leaders to reduce environmental-related risk. However, given the technical requirements for a NEPA analysis and documentation, it is difficult to execute below division level. Deployments for actual military operations do not require compliance with NEPA when these activities fall under category number one, emergencies. However, deployments for nonemergency operations, such as construction projects or major training exercises within CONUS, may require a NEPA analysis. Deployments and operations OCONUS may also require analysis under the provisions of EO 12114 (see Appendix A). The level of environmental consideration depends on the scope of the action, the extent of public interest, and the potential for environmental impacts. In the first phase of the NEPA process, the commander reviews the proposed action to determine the significant environmental impacts he can anticipate and the changes that may eliminate these impacts.

5-29. AR 200-2 (MCO P5090.2A provides similar information) defines the five categories of action as:

- Emergencies (these do not require NEPA analysis).
- Actions exempted from NEPA analysis by law.
- Actions categorically excluded from NEPA analysis.
- Actions requiring analysis.

- Actions requiring analysis and possible mitigation.

5-30. As described in AR 200-2 and MCO P5090.2A, a NEPA requires the analysis of all federal agency actions, including military actions, to determine potential environmental impacts. Commanders must know the results of this analysis before they make a final decision to proceed with the action. In other words, the analysis' outcome becomes a factor in decision making. Examples of actions requiring environmental analysis under NEPA include the following: training exercises, maneuvers, and deployments in the air, on land, and on the water; flight operations, overall operation of permanent or temporary facilities; construction projects; and more.

5-31. An environmental review determines if the commander can exempt the proposed action from the environmental analysis and documentation process or if he must prepare an environmental assessment (EA) or environmental impact statement (EIS). If the commander cannot exempt the action, it requires an EA. This short analysis determines the extent of environmental impacts in a proposed action. If the proposed action will result in significant impacts, the commander prepares an EIS. (An EA is not always required before preparing an EIS.) If the EA shows the proposed action will not result in a significant impact, the commander prepares a finding of no significant impact (FONSI) and has it distributes it for public comment.

5-32. Unit training exercises on installations may also require environmental analysis. Units may obtain support from the installation/base facilities engineer, DPW, or the Installation Environmental Coordinator or his staff to determine if an EA is required.

5-33. The unit commander is the action proponent for NEPA requirements and is responsible for completing of the NEPA analysis. If the action falls within categories four and five, the analysis must also be published for public review and comment. If significant impact is possible, the commander prepares an EIS and forwards it for service HQ approval. After approval, the service HQ distributes the draft EIS to appropriate regulatory agencies. The draft EIS provides decision makers and the public with a complete and objective evaluation of the significant environmental impacts—both beneficial and adverse—resulting from the proposed action and all reasonable alternatives.

5-34. Preparation is often time consuming and costly. After the commander distributes the draft EIS for public and agency comment, he prepares the final EIS and a concise public record of decision (ROD), which explains the rationale for the decision. In any case, the commander must complete the analysis before making a final determination as to whether or not to carry out the action. Installation commanders should ensure that installation/base facilities engineers, DPW, and the Installation Environmental Coordinator have systems in place to expedite and simplify this process. These systems should include baseline data to enable the unit commander to reach a decision.

## INTEGRATED NATURAL AND CULTURAL RESOURCES MANAGEMENT PLANNING (INRMP)

5-35. Federal law requires all installations within the US and its territories to manage natural and cultural resources entrusted to them. Installations must provide optimum public benefit and support the military mission. Installation commanders accomplish this requirement through INRMP and their Cultural Resources Management Plan (CRMP). Both INRMP and the CRMP pertain to those installations located in the US or its overseas possessions. The OEBGD and the final governing standards (FGS) include the natural resource management requirements of installations located in foreign countries.

5-36. The INRMP integrates natural resource planning in three ways. First, it consolidates all natural resources management requirements into a single planning document. Second, it integrates natural resources management with the installation's military mission. Finally, the INRMP coordinates natural resources planning for installation ecosystem features consistent with those of the surrounding area. INRMP addresses forestry, fish and wildlife, wetlands, outdoor recreation, soil resources management, training and testing requirements, and agricultural and grazing lease management. It also incorporates aspects of the CRMP, the Army's ITAM plan, the integrated pest management plan (IPMP), storm water management plans, and other plans that effect or are effected by natural resources management.

5-37. The CRMP is the installation's framework for managing cultural resources, including prehistoric sites, historic buildings, structures, and districts, traditional cultural properties, and Native American sacred sites on Army-controlled properties. It also outlines procedures for integrating cultural resources management responsibilities with mission requirements.

5-38. Both of these plans specify how installations meet specific legal requirements for natural and cultural resources management, including requirements applicable to military units and soldiers.

## INTEGRATED TRAINING AREA MANAGEMENT (ITAM)

5-39. Installations in the US and overseas manage ranges, training areas, and facilities that are critical to unit training. DOD regulations require installations to protect the forests, wildlife, wetlands, and shorelines associated with these areas and facilities. Installations must also manage these training areas to ensure their continued availability for training. Without this ongoing effort, training opportunities would be rapidly decline with a corresponding reduction in the ability to be properly trained to perform our primary mission.

5-40. To manage these resources, installations use the ITAM program. Within ITAM, the Land Rehabilitation and Maintenance (LRAM) program conducts revegetation and erosion control to repair damaged lands and prevent soil erosion, site degradation and water pollution. The Land Condition Trend Analysis (LCTA) program conducts monitoring and biological inventories. The focus of LCTA is to monitor the effects of training on threatened and endangered species, soils, vegetation, wildlife and

wetlands. ITAM provides a management and decision-making process to integrate military training and other mission requirements for land use with sound natural resource management of land. For a more focused discussion on ITAM, see AR 350-4. ITAM responsibility at installation/base level generally resides with the DPTM. However, in USAREUR, these DPTM functions may be located in the ASG or the BSB.

## INSTALLATION RESTORATION PLANNING (IRP)

5-41. The IRP is a comprehensive program that identifies, investigates, and cleans up contamination at Army installations within CONUS. The IRP focuses on cleaning up contamination associated with past Army activities.

5-42. Restoration activities on an installation do not normally involve tenant units unless the area requiring remediation is in the unit's area. The unit is responsible, however, for avoiding the creation of future HW contamination sites by employing proper environmental protection practices.

## MOBILIZATION, DEPLOYMENT, REDEPLOYMENT AND DEMOBILIZATION (MDRD) PLANNING

5-43. Industrial operations, acquisition services, and training area management support the installation's routine missions. They also provide significant support to operations during mobilization/demobilization and deployments/redeployments. Unanticipated costs and delays can be avoided with proper environmental consideration and integrated planning functions. Installation personnel responsible for environmental protection, should inform force projection planners when coordination efforts reveal the possibility of shortfalls and limiting factors such as:

- Exceeding the installation's carrying capacity in billeting space, utilities, and training areas. Large numbers of troop units may cause an installation to exceed its air, wastewater, and HM permit levels.

- Requirements for additional natural resource or special use permits as the operations tempo (OPTEMPO) in the training area increases.

- Establishing marshalling areas at aerial points of departure (APODs) or railheads to relieve overcrowded transportation facilities. Units establishing temporary motor pools in runoff areas may threaten surface water or watersheds.

- Off-loading fuel from vehicles at APODs and railheads to reach permissible fuel tank limits increases the likelihood of POL or HM/HW spills. Off-loading fuel also places additional temporary storage requirements on the installation's industrial operations.

5-44. Many of these environmental issues can be resolved during the planning stages of mobilization and demobilization. After a major deployment/ redeployment, installations may have significant clean up requirements. Since the first priority of the installation during mobilization/ demobilization and deployment/redeployment missions is to provide for smooth deployment of active and reserve component units, installations must

consider these environmental costs as routine operating expenses. However, installation planners should make every attempt to minimize environmental damage to avoid costs and potential legal disruptions to the mission (as well as preserving the environment).

5-45. Installation and unit planners incorporate environmental requirements into mobilization/demobilization and deployment/redeployment plans. While some federal laws have national emergency or national defense clauses that provide relief from or alternative methods; many do not. State and local regulations are less likely to contain such clauses. Planners must know which regulations contain special clauses, as well as the procedures for obtaining necessary variances or waivers.

5-46. Mobilization/demobilization plans list potential environmental problems and provide procedures to minimize their cost and impact. Additionally, units establish environmental protection measures as part of their deployment/redeployment SOPs and as training objectives in readiness exercises.

5-47. Personnel who perform cost-estimates for mobilization/demobilization and deployment/redeployment consider the constantly changing set of environmental regulations and permits. These personnel also recognize that costs will be inversely proportional to the state of deployment/redeployment training of the mobilization/demobilization units.

## PLANNING FOR UNITS STATIONED OCONUS

5-48. Many units stationed in foreign countries (i.e., Germany, Korea, or Japan) must meet similar planning requirements. Furthermore, the planning guidelines of US environmental laws and requirements seldom apply. Units stationed in foreign country follow the guidance provided in the overseas environmental baseline guidance document (OEBGD) unless a FGS is available for that specific HN; if available, takes precedence. Units performing contingency operations or combat operations follow the environmental guidance provided in the OPLAN. Early planning for base camps and their environmental considerations are essential to ensure success.

5-49. A unified command nominates service components to DOD for appointment as environmental executive agents (EEA), and DOD appoints an executive agent to prepare the FGS (may be a unified command). The executive agent normally delegates that responsibility to a major command who drafts the FGS by comparing HN environmental criteria to those contained in the DOD OEBGD. This comparison includes a review of applicable HN laws, base rights or status of forces agreements, other international agreements, and current procedures.

5-50. In foreign countries where HN environmental standards do not exist, are not applicable, or provide less protection to human health and the natural environment than the baseline guidance, US military forces follow the OEBGD standards.

5-51. Although NEPA does not apply overseas, units stationed in foreign countries must still consider the environmental impacts of major actions. EO 12114 establishes internal procedures for federal agencies, including the armed forces, to consider the significant environmental effects of their actions OCONUS. (DOD guidance associated with EO 12114 is DOD Directive [DODD] 6050.7, soon to be republished as DOD Instruction [DODI] 4715.xx). Exemptions to this requirement include armed conflict, specified contingency operations, intelligence activities, and arms transfers. Overseas theaters have published regulations to guide units regarding specific procedures in each of the countries or regions where US installations or forces are located.

## UNIT AND INSTALLATION ENVIRONMENTAL ASSISTANCE

5-52. Both the higher unit staff and the installation/garrison/base staff provide expertise and assistance for environmental assistance. One of the primary keys to a successful unit environmental program is to ask questions and know where to go for help. A directory of key environmental topics and corresponding POCs at both the unit and the installation/base is provided at Figure 5-4. Environmental information hotlines are also provided in Appendix G.

5-53. Refer to Chapter 6 for a discussion of how to establish a unit program and understand how the installation/garrison/base organizations support the commander in both establishing and assessing a unit program.

| 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 |

**Figure 5-4. Environmental assistance**

## SUMMARY

5-54. BASOPS are critical to the success of the unit in its day-to-day operations and especially in support of training on, or in the proximity of, the installation. Whenever possible, leaders must actively seek and use this expertise and assistance. Although the chain-of-command and unit staffs also provide support in an installation setting, the garrison staff is specifically designed to provide the required expertise to support units. When deployed in an operational status, the assistance and assets of installations may not be available to the unit. In these cases units may draw support from the organization that supports their base camp or some similar site. The higher unit staffs will increase their focus on their environmental consideration roles given the absence of an installation/ garrison/base staff. Base camps are operational facilities and not installations, although many of the same environmental requirements will exist. Refer to Appendix D for additional sources of environmental assistance.

5-55. This chapter provides the basic information, or references leaders will need to establish and assess a unit environmental program as identified in Chapter 6.

Chapter 6

# Establishing and Assessing a Unit Program

"The unit does well what the commander checks."

General Bruce C. Clarke

Chapter 5 introduced the installation/garrison/base organizations, responsibilities and support to units stationed at, or performing training on an installation/base. Chapter 6 illustrates how that structure supports leaders in establishing and assessing a unit program. Unit-level environmental programs require guidance and support from the chain of command. Army major Army commands (MACOMs) and Marine Corps higher HQs conduct environmental assistance visits to ensure that installations comply with appropriate environmental laws. Unit leaders coordinate with the installation's environmental office and their higher HQ for assistance visits and compliance audits within the unit area. Additionally, unit leaders or their designated representatives, conduct self-assessments to determine how well their unit is following environmental protection measures at the unit level. Unit leaders incorporate certain environmental protection measures into the unit's SOP to ensure their soldiers and Marines use appropriate environmental protection measures.

## ENVIRONMENTAL COMPLIANCE

6-1. The Army and Marine Corps determine environmental compliance status in two ways. Federal, state, and local regulatory agencies conduct formal compliance audits and spot checks on installations and report their findings to the military chain of command. Additionally, each service provides installation inspections under the Army's ECAS or Marine Corp's ECE. Installations conduct internal evaluations, while Army MACOMs or Marine Corps higher HQs conduct external evaluations. Federal, state, or local inspections may result in civil and criminal penalties for noncompliance with environmental laws and regulations. Self-assessment can be conducted using the installation status report software (Part II – Environmental). When afloat or under Naval authority, commanders should become familiar with Naval Warfare Publication (NWP) 4-11 for further guidance to incorporate environmental considerations into naval force operations.

### FEDERAL AND STATE REGULATORY INSPECTIONS

6-2. Regulatory agencies, such as the Environmental Protection Agency (EPA), have the legal right and responsibility to inspect units and facilities to

ensure compliance with environmental laws and regulations. These agencies usually coordinate inspections through the installation's environmental office. The agencies may, however, conduct inspections without notice.

6-3. The EPA and Federal Facilities Compliance Act (FFCA) set inspection frequency guidelines. For example, inspections for HW facilities under the RCRA generally occur annually.

6-4. Inspections in other programs may occur at different frequencies. Installations and units with specific major problems can expect frequent follow-up inspections that may include checks of training records and documentation, permit reviews, and storage facilities.

## ENVIRONMENTAL COMPLIANCE ASSESSMENT SYSTEM/ENVIRONMENTAL COMPLIANCE EVALUATION

6-5. In the US, regulatory agencies (i.e., state agencies, the EPA, or the US Fish and Wildlife Service [USFWS]) conclusively determine installation compliance with environmental laws and regulations. However, many environmental regulations require self-regulation in which case the installation monitors its own programs and notifies the regulatory agency when problems occur.

6-6. Military services conduct internal compliance assessments for their installations. Units participate in these assessments, which review all aspects of the installation's environmental status to include the following:

- Training.
- Planning and programming.
- Resourcing.
- Correcting past deficiencies.
- Preventing pollution.
- Managing natural and cultural resources.
- Complying with emissions standards.
- Maintaining records and reports.

6-7. The Army established the ECAS, and the Marines established the ECE, as a means of achieving, maintaining, and monitoring compliance with applicable environmental laws. In addition, the Army and Marine Corps use compliance assessments as a vehicle to attain environmental program goals.

6-8. Service regulations require units with HW and HM to conduct internal inspections. HW coordinators for larger units can request a copy of the ECAS/ECE protocol to assist in developing inspections and record-keeping plans. The installation's HW management plan should contain sufficient

information to develop an inspection plan for a unit's HW generation points and accumulation sites. Units should contact the environmental office for ECAS/ECE protocol or for ECAS/ECE checklists to conduct an internal self-assessment.

6-9. OCONUS MACOM commanders determine the scope of compliance assessment within their commands based on the SOFA and FGS requirements for the country in which they are located. In the absence of an FGS, OCONUS MACOM commanders use the OEBGD. These requirements govern the activities of the supporting installation, and installation requirements direct unit assessment activities.

6-10. Unit leaders set the tone for environmental compliance within their units. They bring focus, direction, and commitment to environmental protection. Their role requires them to demonstrate commitment, organize for success, train their units, resource the effort, and build the unit's environmental ethic. The success of the unit-level environmental program depends on: receiving adequate guidance and support from the chain of command and installation environmental office, increasing communication at all levels, and establishing an effective management structure. Environmental protection must be incorporated into command policy and guidance and enhanced through the chain of command.

6-11. Leadership direction and support are needed to implement improvements in all facets of environmental stewardship. To that end, unit leaders must ensure that units have active and strong environmental programs that support the installation's environmental program. This chapter addressed typical programs that the unit leader ensures are in place or supported.

## ESTABLISHING A UNIT-LEVEL PROGRAM

6-12. To establish an effective unit environmental program, the unit leader should:

- Ensure all unit personnel have had environmental awareness training. Environmental training sources are identified in Chapter 3. Sources of assistance at the installation/garrison/ base are provided in Chapter 5. Appendix D provides sources of environmental assistance for all operations. Units should use sources that are closest to them before they seek additional/ outside assistance.

- Designate an ECO or a HM/HW Marine who is properly trained and qualified. This individual will interface with appropriate environmental personnel and ensure that the unit is in compliance with environmental laws and regulations.

- Meet with key higher unit staff counterparts (battalion S3/S4 for a company-sized organization) and installation personnel who deal with environmental issues. Find out what their requirements are concerning environmental training, qualifications, and certification of

unit personnel, ECAS inspections that may effect the unit, and common environmental problem areas and how to avoid them.

- Ensure the unit has a well-written SOP that addresses environmental issues and procedures that apply to the unit (coordinate environmental requirements with appropriate installation/chain of command personnel). An example is provided at Appendix C.

6-13. The following are unit or installation environmental programs that units develop or adopt:

- HM management.
- HW management.
- HAZCOM.
- Pollution prevention and hazardous waste minimization (HAZMIN).
- Recycling program.
- Spill prevention/response plan.

## HAZARDOUS MATERIALS

6-14. The Army's objective is to minimize health hazards and environmental damage caused by the use and misuse of HM. A hazardous material is one that, because of its quantity, concentration, physical, chemical, or infectious characteristics, may do the following:

- Cause, or significantly contribute to, an increase in mortality or an increase in serious, irreversible, or incapacitating reversible illness.
- Pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, disposed of, or otherwise managed.

6-15. If a unit deals with HM, leaders should do the following:

- Ensure the best management practices for all HM.
- Comply with all applicable regulations, policies, and procedures.
- Order and use only what is required; do not stockpile HM.
- Use nonhazardous substitutes to the maximum extent practicable.
- Conserve resources through recovery, recycling, and reuse.
- Establish procedures to identify and correct management deficiencies.

- Establish a training program and ensure that required personnel are properly trained.
- Ensure adequate spill prevention and control equipment are on hand.
- Coordinate training requirements with the chain of command and the installation EMO/safety officer.
- Comply with the chain of command and installation HM requirements.
- Ensure compliance with special disposal/turn-in procedure for batteries.
- Establish HM spill procedures.
- Establish HM fire/explosion procedures.
- Establish emergency first aid procedures.
- Ensure that adequate protective equipment is available.
- Refer to applicable HM references.
  - AR 200-1.
  - AR 700-141.
  - Title 40, CFR, part 761.
  - TM 38-410.

## HAZARDOUS WASTE

6-16. The presence of HW is a cause for concern among installation personnel and nearby residential populations. Yet, hazardous substances are an unavoidable part of Army and Marine Corps activities and ultimately result in some waste generation. The proper handling and disposal of these wastes will minimize danger and ensure the safety of people and the environment. If a unit deals with HW, leaders should do the following:

- Establish an HW management program to comply with HW regulations.
- Ensure HW is properly identified. Label stored waste and the containers that hold HW with the correct danger and warning signs.
- Ensure wastes do not accumulate beyond allowable quantity and time limits.
- Maintain proper HW records, and report periodically, as required by EPA.

- Employ waste minimization techniques as a part of pollution prevention efforts.
- Ensure compliance with on-post HW transportation requirements. Contact the installation DRMO or DOL for details.
- Ensure compliance with off-post HW transportation requirements. Public road use increases transportation requirements. Contact installation DOL/FMO for movement approval.
- Ensure drivers transporting HW are qualified. Transporters of HM must be trained by law, according to DOT HM 181 and 126F.
- Establish an HW training program, and ensure proper personnel training occurs. Most installations conduct HW train-the-trainer programs.
- Maintain a liaison with key chain of command and installation personnel.
- Appoint an ECO/(HW/HM) Marine to the unit.
- Ensure the unit ECO/(HM/HW) Marine has sufficient support to carry out his duties.
- Ensure unit personnel use their PPE when handling HW.
- Ensure adequate spill prevention and control equipment is on hand.
- Establish HW fire/explosion procedures.
- Establish HW spill/leak procedures.
- Establish emergency first aid procedures.
- Ensure that unauthorized storage or disposal of HW does not occur. HW must be stored only in authorized containers and disposed of as directed by the EMO/DRMO.
- Refer to applicable HW references.
  - AR 200-1.
  - AR 420-47.
  - RCRA.
  - Title 29, CFR, part 1910.
  - Title 40, CFR, parts 259, 260-281, 300-302, 761.
  - Title 49, CFR, parts 106-178.

– TM 38-410.

## HAZARDOUS COMMUNICATIONS

6-17. An effective HAZCOM program will assist leaders to determine what hazardous chemicals are present in their units, how to protect their soldiers from hazards those chemicals present, and how to properly store and use those chemicals. The installation safety officer is the POC for most HAZCOM matters, the MSDS program, and the HAZCOM training program.

On 13 April 1994, 1SG Smith became the First Sergeant of Company C, 3/151st Infantry, Fort Yukon. One of his first actions was to conduct a walk through the unit area with the platoon sergeants. While in the 2nd platoon's area, the 1SG found a locked room, which the platoon sergeant unlocked. Inside was a collection of cans, bottles, and other containers filled with various solvents and cleaning products. The 1SG told the platoon sergeant to clean up the room. The platoon sergeant passed on the order to the squad leader responsible for the room. The squad leader and his squad quickly removed the room's contents, placing the various containers in the dumpster behind the dining facility. Shortly thereafter, mess personnel placed lunch meal waste into the same dumpster. Almost immediately, the dumpster began to burn and let off large amounts of strange looking smoke. The Fort Yukon Fire Department was called. Upon arrival, the fire chief noticed the smoke's strange color and odor, and determined that it was a chemical fire. Subsequent inquiry determined that the unit's personnel needed training on identifying, storing, and disposing of hazardous material and hazardous waste. The unit's leaders learned that precise orders needed to be given and that those receiving them should seek clarification for unclear matters.

Would this incident have happened in the first place had this unit had effective unit-level environmental programs?

6-18. In support of HAZCOM, unit leaders should do the following:

- Ensure their subordinates receive adequate training on HM to which they are exposed, in accordance with the OSHA requirement.
- Maintain an up-to-date list of all HM/HW known to be present in their area.
- Ensure containers of hazardous substances are labeled, tagged, or otherwise marked to identify the material and warn soldiers of hazards.
- Maintain a MSDS for every HM in their unit (see Appendix C).
- Ensure soldiers/Marines are trained to recognize, understand, and use the MSDS and labels for the HM to which they are exposed.
- Ensure soldiers/Marines use proper procedures when working with hazardous substances.
- Refer to applicable HAZCOM references.

- AR 40-5.
- AR 385-10.
- AR 700-141.
- Title 29, CFR, part 1910.

## POLLUTION PREVENTION AND HAZARDOUS WASTE MINIMIZATION (HAZMIN)

6-19. This program compliments the HM/HW/HAZCOM programs. HAZMIN means reducing the amount and toxicity of the HW generated or produced. Pollution prevention means reducing the amount of material, whether it is hazardous or not. For example, recycle to reduce the amount of trash that goes into landfills.

6-20. Unit leaders should ensure their units conduct inventory control. A unit should not stockpile HM. If a HM has an expired shelf life, it can cost much more to dispose of the item than it did to obtain it, since the HM will have to be handled as an HW.

6-21. Product substitution is an easy way to reduce HW generation. Unit personnel should review the HM inventory in their areas and check if there are nonhazardous or less hazardous substitutes available. Examples are using solvents or replacing the sand used in sandblasting operations with plastic beads, which last longer and can be recycled.

6-22. A process change can reduce the amount of HW generated. A vapor degreaser could be replaced by a soap-and-hot-water parts cleaner. Changing processes in painting operations can reduce overspray and pollution; however, the waste water still needs to be treated as HW, since paint particles can become waste material.

- Refer to applicable pollution prevention and HAZMIN references.
  - AR 200-1.
  - EPA/625/7-88/003.
  - EO 12856.
  - Title III, Clean Air Act Amendments of 1990 (PL101-549).
  - Title 40, CFR, part 262.41.
  - United States Army Environmental Hygiene Agency (USAEHA), Trainer's Guide (TG) No. 178.
  - Environmental Product Guide.

## RECYCLING PROGRAM

6-23. The Army and Marine Corps are promoting separating products, substituting materials, and changing procedures to avoid the use of hazardous substances (source reduction), and recycling to reduce the volume of solid waste. Most installations have a recycling program. To support that program, personnel should do the following:

- Recycle all recyclable materials. Recyclable materials include computer printouts, corrugated cardboard, computer punch cards, newspaper, high grade white paper, aluminum cans, plastics, oil, solvents, glass, steel, and brass. Check with the installation environmental office to verify the material being recycled locally.

- Separate the recycling material source is separated. Contaminated material must be removed from recyclables.

- Refer to applicable recycling references.

  – AR 200-1.

  – EO 13101.

## SPILL PREVENTION AND RESPONSE PLAN

6-24. It is Army and Marine Corps policy and a Clean Water Act requirement to prevent oil and hazardous substance spills and to provide prompt response to contain and clean up spills. The discharge of oil or hazardous substance from installations, vehicles, aircraft, and watercraft into the environment without a discharge permit is prohibited. Exceptions will be made in cases of extreme emergency, in which where the discharge is:

- Considered essential to protect human life.

- Authorized by a discharge permit or installation on-scene coordinator (IOSC) during a spill incident response.

6-25. Every reasonable precaution should be taken to prevent spills of oil and hazardous substances. The unit leader should:

- Provide facilities to store, handle, or use oils and hazardous substances and implement proper safety and security measures.

- Appoint a spill coordinator and members of the unit spill response team; this designation should be in writing.

- Maintain an up-to-date spill response plan. This requirement is generated by the installation.

- Conduct periodic spill response drills.

- Ensure sufficient equipment and supplies (absorbent materials) for spill responses are on hand and pre-positioned in the unit. See Appendix C for a sample list.

- Locate all drains, drainage ditches, streams, ponds, and other water sources/outlets in the area, and plan how to prevent a spill from reaching them.

- Coordinate with the installation safety office, preventive medicine office, and EMO to determine the proper PPE. Know when to attempt to clean up a spill and when to leave the area and contact the installation spill response team for cleanup. This determination will be made by the installation EMO and/or spill response team.

- Maintain a copy of the Installation Spill Contingency Plan (ISCP). Critical/necessary information is contained in this plan, available from the environmental management office.

- Maintain a current list of names and phone numbers of those who may need to be contacted in case of an emergency (i.e., fire department, safety office, provost marshal, and preventive medicine, EMO).

- Maintain an up-to-date inventory of all HM/HW; provide a copy to the post fire department for use in case of a chemical fire.

- Ensure pollutants are not discharged into storm or washrack drains or poured on the ground.

- Ensure small spills are properly attended to, cleaned up, and collected. Contaminated soil needs to be disposed of properly. Contact the installation EMO for additional information.

- Strictly control the discharge of ballast water from watercraft.

- Ensure the treatment of waste oil complies with all applicable federal, state, and local requirements.

- Ensure wastes produced during the cleaning of fuel storage tanks and combustion engine components are collected and treated as required before discharge.

- Monitor wastewater discharges containing oil or hazardous substances to comply with permit limits.

- Report oil, fuel, or other hazardous pollutant spills are reported to the EMO and higher headquarters. The S4/G4 and the post EMO can provide information on reportable spill quantities.

- Establish HM/HW fire/explosion procedures.

- Establish emergency first aid procedures.

- Refer to applicable spill prevention references.
  - AR 200-1 (general).
  - Title 40, CFR, part 110 (oil), 302 (hazardous substances), 355 (extremely hazardous substance).

## PROGRAM ASSESSMENT

6-26. Environmental compliance status can be determined through a formal inspection by a regulatory agency. It can also be determined through self inspections using ECAS checklists as a guide. Non-Army or Marine Corps regulatory agencies have the legal right and responsibility to inspect units and individual facilities and actions to ensure compliance. Often the first indication that federal, state, or other inspectors are on post is when they visit the installation environmental coordinator's office, or the provost marshal's office, asking for directions to a specific site on the installation.

6-27. Once a year, EPA inspectors conduct spot inspections of installations, often without notice. Local and state inspectors also conduct frequent inspections. Regulatory inspections often concentrate on a particular area, such as HW management. Inspection frequency guidelines have been established under the EPA Federal Facility Compliance Strategy. For example, inspections for HW facilities under the RCRA generally occur annually. Inspections in other programs may occur at different frequencies. Installations and units with specific major problems can expect more frequent follow-up inspections.

6-28. The Army established the ECAS as a means of achieving and monitoring compliance with applicable federal, state, regional, and local environmental laws and regulations. In addition, the Army uses compliance assessment as a vehicle for attaining Army environmental program goals and improving program visibility. If a unit deals with HW and HM, leaders are required to conduct internal inspections. HW coordinators for larger units can request a copy of the ECAS protocol to assist in developing inspections and recordkeeping plans. However, the installation HW management plan should normally contain information sufficient to develop an inspection plan for HW generation points and accumulation sites at the unit level. Contact the environmental office for an ECAS protocol to conduct an internal/self-compliance assessment.

6-29. OCONUS commanders determine the scope for the ECAS within their commands. They often implement procedures to ensure compliance with applicable host nation, SOFA, and FGS requirements, as well as the requirements of AR 200-1 and AR 200-2.

6-30. G3/S3 and G4/S4 personnel can help to ensure compliance. Appendix H has a generic aid that can be used to assess unit environmental compliance status. The battalion staff or installation environmental office may have similar aids specific to a unit or location. Key installation and personnel for compliance assistance are discussed in Chapter 5.

## UNIT SELF-ASSESSMENT

6-31. Unit leaders use the general checklist in Appendix H to assess unit environmental compliance status. Higher level staffs within the chain of command or the installation's environmental office may have similar aids specific to a unit or location. Units also use ECAS/ECE checklists as a supplement to the self-assessment guide in Appendix H. Unit leaders, with the assistance of the installation's environmental staff, determine the frequency of self-assessment checks. The commander ensures that the unit's environmental program management system is effective through self-assessment.

### UNIT MANAGEMENT PRACTICES

6-32. Many environmental requirements at the unit level are simply an extension of existing unit management practices. The most basic is ordering only enough supplies to do the job. The presence of HM makes this practice even more important. HM disposal is expensive and carries with it a significant administrative burden.

#### Hazardous Substance Management System (HSMS)

6-33. The Army's HSMS is applys centralized management and strict inventory control to reduce the use and disposal requirements for hazardous substances by tracking HM.

#### Good Housekeeping

6-34. Good housekeeping is another basic management practice. It involves a number of activities in areas such as maintenance, operations, and training. For instance, preventing spills is a good housekeeping practice for both safety and environmental reasons. Keeping noise to a minimum is good OPSEC, and it also reduces noise pollution. Recycling diminishes solid waste and helps eliminate unauthorized disposal of some types of HW.

#### SOP

6-35. Effective management practices require rules that soldiers and Marines understand and follow. Unit leaders ensure that the unit has a well-written SOP addressing environmental issues and procedures. (See Appendix C for a sample of a unit environmental SOP.)

#### ECO and HW/HM Marine

6-36. Commanders, down to the company, troop, and battery levels, must designate an ECO. AR 200-1 now requires Army unit commanders to appoint the ECO in writing and provide training for the ECO. The ECO coordinates with the installation's environmental staff and ensures the unit complies with environmental laws and regulations. MCO P1200.7S identifies the specific duties for the Marine version of the ECO, the HW/HM (MOS 9954) Marine. This MOS is assigned as a secondary MOS for a Marine.

6-37. Unit commanders must consider unit missions and environmental requirements when designating the ECO and selecting appropriate training. Once appointed and trained, the ECO becomes the commander's "eyes and ears" on environmental matters.

### Training

6-38. Training is another important management practice. Commanders ensure that all unit personnel complete environmental awareness training. The environmental training resources addressed in Chapter 5 and Appendix D provide information/POCs available for training support. Additionally, commanders must identify those soldiers and Marines who require special environmental training (RCRA- or OSHA-mandated training). Installation environmental offices and environmental staffs assist subordinate commanders to determine specific environmental training requirements. Commanders check training records quarterly to ensure that environmental training status is current. See Chapter 3 for a discussion of environmental-specific training opportunities.

### Container Labeling

6-39. Container labeling is a basic management practice often overlooked. Installation or shipping environmental guidelines specify labeling requirements. Labeling HM and HW is a legal requirement. Materials not technically classified as hazardous—cleaning supplies, lubricants, and paints must also be labeled. Labeling these materials with dates allows supply personnel to rotate stocks and issue older items first, a procedure called "first-in-first-out" (FIFO) rotation. FIFO rotation reduces the quantity of out-of-date materials requiring disposal.

6-40. Finally, each unit must develop and enforce procedures to maintain complete records of the environmental actions and activities they perform. For example, DOD has requires each of the component services to record and archive pesticide use during military applications. This information is important to document potential risks to human health and the environment from such practices (and to help establish or eliminate causes of unusual incidents). An example of this is the continuing investigation to decipher the causes of many of the ailments associated with Operations Desert Shield/Desert Storm.

## MAINTENANCE

6-41. Unit maintenance activities have significant potential for environmental impact. Most Army and Marine Corps environmental programs affect maintenance operations in some way. Some specific areas of concern are as follow:

### Spill Prevention and Response

6-42. Army and Marine Corps policy, as well as federal law, requires units to prevent spills of oil and hazardous substances and to provide prompt response to contain and clean up such spills. These laws, regulations, and

policies prohibit any discharge of oil or hazardous substance from installations, vehicles, aircraft, and watercraft into the environment without a discharge permit.

6-43. Installation requirements shape spill prevention and response plans for units within their jurisdiction/command. During deployments, the deployment order directs spill prevention and response procedures. During contingency operations or combat, spill prevention and response procedures are defined by HN or theater guidance and the unit SOP (see Tabs A and B, Appendix C). Typical unit-level responsibilities include the following:

- Ensuring that the unit SOP complies with the Installation Spill Contingency Plan (ISCP).
- Providing adequate facilities for storing and handling POL products and hazardous substances.
- Implementing safety and security measures in areas where spills are likely (i.e., maintenance areas, fuel points, supply facilities, and accumulation points.
- Appointing a trained spill coordinator and spill response team.
- Conducting periodic spill response drills.
- Maintaining adequate equipment and supplies for spill response.
- Posting telephone numbers of the installation's spill response agencies.

**HM/HW Storage and Handling**

6-44. Motor pool personnel work with a variety of HM/HW. The unit's prescribed load list (PLL) section controls requisitions and receipts for HM and prepares documentation for turn-in of HW. Mechanics generate HW by lubricating, servicing, and repairing equipment. Motor pool personnel must:

- Requisition only the minimum amount of HM needed. When possible, substitute nonhazardous materials.
- Practice inventory control of all HM/HW (to include monitoring HM shelf life and HW accumulation dates).
- Store HM/HW in approved containers and locations.
- Maintain an MSDS for each HM used.
- Obtain any necessary/applicable permits.

### Refueling

6-45. Refueling operations create significant potential for POL spills and fire hazards. Units must ensure their SOP includes adequate procedures to prevent and respond to spills. Fuel handlers require spill response training. Unit leaders provide all fuel points and refueling vehicles with spill response kits. Since small spills occur often, fuel handlers must remove contaminated soil, absorbents, and rags from the refueling site and dispose of them according to installation guidelines.

### SUPPLY

6-46. Unit supply personnel account for all materials during HM/HW requisition, transportation, storage, and disposal. Unit leaders ensure their supply personnel observe stringent HM supply economy measures. Units order only the very minimum amount of HM needed. When possible, supply personnel order biodegradable, environmentally safe materials.

6-47. When storing products, supply personnel ensure first-in-first-out (FIFO) stock rotation to minimize the turn-in of out-of-date material. They also follow installation storage guidelines for marking materials, maintaining MSDSs, and turning in excess materials to the installation's "pharmacy" points. Finally, unit leaders ensure that supply personnel turn-in or dispose of HM/HW according to local regulations. Compliance includes coordinating with the local environmental office and DRMO.

### NUCLEAR, BIOLOGICAL, CHEMICAL

6-48. HM are used in NBC defense and training. Unit NBC specialists exercise caution when storing these materials. As with other HM/HW, unit NBC personnel dispose of materials according to local regulations. Unit leaders ensure that the unit's spill response program addresses NBC activities. Unit NBC specialists also monitor turn-in procedures for:

- Batteries for NBC-related equipment.
- Expired NBC supplies.
- Decontaminants.
- Sampling kits.
- Used NBC filters.
- Decontamination solutions.
- Fog oil and its additives.

### UNIT MISSION TRAINING

6-49. Unit mission training is a difficult environmental challenge. Unit leaders must exercise caution with noise pollution, air pollution, waste

disposal, spill protection, water pollution, and cultural and natural resource protection. Units check with the installation's training staff concerning training area restrictions. During training deployments, unit leaders and ECOs coordinate, in advance, for environmental guidance due to differing local, state, or HN regulations. Upon completion of the unit training, units conduct police of training areas in compliance with installation SOPs.

### COMMUNICATIONS

6-50. Modern communication systems use many types of batteries. Used batteries are considered a HW in most states and therefore, unit personnel ensure that SOPs specify storage and disposal procedures for each type of battery in the unit.

### OPERATIONS

6-51. Operations at any level of the spectrum of conflict do not automatically suspend environmental considerations. Higher commanders' guidance is critical to determine the risk that will be applied to any operation. Decisions on risk are a normal part of the MDMP. See Chapters 3, 4, and 5 for more information about environmental considerations during planning, training, and operations.

### SPECIAL REQUIREMENTS

6-52. In addition to meeting the previously stated requirements, some military units, such as the National Guard (NG) and Reserve Component (RC) units and units stationed in foreign countries, must follow additional environmental guidelines.

## NG and RC Component Considerations

6-53. Since NG and RC units are seldom co-located with their supporting HQs, their requirements may differ. NG units routinely operate under environmental regulations and laws of a particular state. NG units coordinate through their STARC for environmental guidance when deploying to installations in other states.

6-54. RC units' where subordinate units may reside in different states and comply with substantially different environmental laws. The supporting HQ develops policies that account for differences in state and local laws and regulations. Units separated from their supporting installation must ensure that SOPs and contingency plans adequately address local laws and regulations.

6-55. Given the distances between NG and RC units and their supporting HQ, HM/HW turn-in may require alternative methods such as line haul or contractor removal. The cost of HM/HW turn-in may warrant pollution prevention initiatives to reduce, reuse, or recycle HM/HW on-site. Solvent distillation, for example, may provide significant cost savings over conventional disposal.

6-56. Disaster relief missions present units with challenging environmental protection requirements. Units must not add their own HM/HW to the existing environmental problem. ECOs in NG units coordinate with their STARC HQ for HM/HW support. Unit ECOs also coordinate regularly with disaster relief HQ to determine threats from HM/HW exposure—polychlorinated biphenyls (PCBs) from transformers, POL, or decaying bodies. Unit leaders ensure their soldiers have appropriate PPE when exposed to HM/HW in the disaster area.

### Units Stationed in Foreign Countries

6-57. Since military units stationed in foreign countries must consider local environmental policies, the FGS for each country incorporates, and thus takes precedence over, US federal and state regulations. OCONUS installations develop programs based on the FGS. Units continue to follow installation guidelines but may find them very different from US requirements.

## SUMMARY

6-58. Unit commanders are responsible for building and implementing a unit environmental program. They use the assistance that is available to them on the installation/garrison/base staffs as well as from unit higher headquarters. Items to assist that program include such tools as the sample SOP in Appendix C and the unit self-assessment in Appendix H, which provides a generic checklist for units to assess compliance with environmental laws and regulations in their daily operations and activities. Unit leaders should supplement the checklist with applicable state, local, or HN environmental requirements. Once supplemented, this checklist serves as the primary tool for unit environmental assessments. However, self-assessment is only a guide and does not provide a final determination of compliance. ECAS or ECE checklists provide a more comprehensive assessment.

Chapter 7

# Health and the Environment

Threats from environmental hazards are not new to the military. To some extent they have always existed in the work place and other areas of operation. They may be man-made or occur naturally and may pose a health threat to personnel. Historically, military preventive medicine personnel have focused on reducing or eliminating the risks of food-, water-, waste-, insect-, and rodent-borne illnesses, occupational and environmental injuries, and heat and cold injuries. Recent deployments, however, have demonstrated the need to reduce risks from occupational and environmental exposures to toxic chemicals from industrial facilities, discarded HM, and common military chemical compounds. This chapter focuses on the impact environmental conditions have on the health of service members, rather than how actions taken by service members impact on the environment.

## BACKGROUND

7-1. The medical disciplines that are concerned with preventing disease and injury and maintaining service members health include:

- Preventive medicine (including environmental sciences and sanitary engineering).
- Veterinary services.
- Medical laboratory services.
- Medical NBC defense.

Specialists in these disciplines provide commanders and leaders with advice and develop programs to provide the techniques and procedures that can protect service members from environmental hazards. These actions conserve combat power and sustainment resources. The command surgeon and/or supporting medical activity or command identify the potential hazards, assess the risks, and recommend courses of action to the commander. Commanders must decide how they will use this advice and ensure their units take preventive measures. Medical personnel provide ongoing support by:

- Monitoring the area of operations (AO) to determine whether the hazards have changed.
- Identifying new hazards.
- Ensuring that personnel are applying the command-directed countermeasures.

7-2. Commanders must ensure that they remain abreast of health hazard changes in the operational environment. Medical personnel support this responsibility by recommending medical threat considerations for inclusion as CCIRs during the IPB process. At the national level, the Armed Forces Medical Intelligence Center (AFMIC) produces medical intelligence regarding operations in foreign areas.

### CONCEPT OF OPERATIONS

7-3. Medical personnel obtain background information about the AO to identify health hazards, assess health risks, develop courses of action, and advise commanders of the risks. They provide the commanders/leaders with critical information on the risks from identified health hazards. They then assess these risks, and provide commanders/leaders with recommended protective/preventive measures for consideration as part of the overall operational risk management program. Medical personnel continue to monitor the AO for changes in the level of risk or the identifications of new hazards. When they detect increases in their risk levels or identify new health hazards, medical personnel update databases and provide commanders/leaders with the new information guidance regarding protective and preventive measures. See DOD Directive (DODD) 6490.2, Joint Medical Surveillance; DOD Instructions (DODI) 6490.3, Implementation and Application of Joint Medical Surveillance for Deployments; and 6055.1, DOD Safety and Occupational Health (SOH) Program; AR 40-3, Medical, Dental, and Veterinary Care; AR 40-5, Preventive Medicine; and AR 40-216, Neuropsychiatry and Mental Health; for information about preventive medicine measures and policies.

7-4. Baseline health status is recorded in the individual health record for all personnel when they enter military service and, at time of deployment, a field health record is established. Following exposure to hazardous agents or materials, individuals receive appropriate medical follow-up, and their health records are updated. Health records are maintained for the term of service/employment. See DODD 6490.2 and AR 40-66, Medical Record Administration and Health Care Documentation.

## ENVIRONMENTAL AND OCCUPATIONAL HEALTH HAZARDS

7-5. Environmental and occupational health hazards can be classified by the methods of occurrence or origin and include:

- Occupational. Occupational health hazards occur in the duty area and are caused by specific activities such as exposure to HM (i.e., spraying CARC paint without use of respiratory protection), or

dispensing fuels without proper gloves and eye protection. Exposure may result when HM is used or produced in the duty area, or it may be the result of accidental HM spillage. Exposure is typically restricted to those personnel directly involved in the activity or located closely to the activity site. Typical countermeasures include substituting a less hazardous material for a more hazardous material; improving ventilation at the duty site to reduce hazardous pollutant levels; requiring personnel to use appropriate PPE such as respiratory protection or safety glasses; or discontinuing the operation until proper procedures can be used.

NOTE: Each chemical has a MSDS provided by the manufacturer to the user that lists the characteristics of the chemicals and other information needed to use the chemicals safely.

For information on protective/preventive measures, see FM 8-10-7, Health Service Support in a Nuclear Biological and Chemical Environment; FM 8-10-17, Preventive Medicine Services; FM 8-500, Hazardous Materials Injuries, FM 21-10, Field Hygiene and Sanitation; and FM 21-10-1, Unit Field Sanitation Team.

- Environmental. Environmental hazards are present in the environment (from either naturally occurring or man-made sources) prior to the arrival of US forces. They include endemic insect- or rodent-borne diseases, such as malaria or dengue fever; polluted air, water, or soil from local industrial, agricultural, or mining operations; and climatic and topographic hazards such as extreme heat, cold, or altitude. Environmental hazards may also arise from these sources during the time forces are deployed in an area and military personnel must respond appropriately. For example, if an insect infestation is found in the bivouac area, it may be necessary to use pesticides to eliminate the infestation. Preventive medicine personnel executing the pest management program would be required to apply the appropriate amount of pesticide in safe manner to ensure that service members are not inadvertently exposed to the pesticide. For protective/preventive measures see FM 8-33, Control of Communicable Disease Manual; FM 8-10-17, FM 8-10-18, Veterinary Services - Tactics, Techniques, and Procedures; FM 21-10, and FM 21-10-1.

- Directed (imposed). Imposed health hazards comprise those used by an adversary against US Forces. These hazards include traditional threats such as NBC warfare agents, as well as toxic industrial materials that are released into the atmosphere by enemy forces, terrorists, or belligerents to cause injury or death. For information on protective/preventive measures see FM 8-9/NAVMED P-5059/AFJMAN 44-151, NATO Handbook on the Medical Aspects of NBC Defensive Operations, AMED P-6 (B); FM 8-284/NAVMED P-5042/AFMAN (I) 44-156/MCRP 4-11.1C, Treatment of Biological Warfare Agent Casualties; FM 8-285/NAVMED P-5041/AFJMAN 44-149/FMFM 11-11, Treatment of Chemical Agent Casualties and

Conventional Military Chemical Injuries; FM 8-10-7, FM 8-10-17, FM 21-10, and FM 21-10-1.

## RISK MANAGEMENT

7-6. Effective risk management always begins with the collection of baseline information and threat reports. Using available data, commanders, with the assistance of the surgeon, review and identify the hazards within the AO and assess the risks from these hazards in accordance with risk management guidance. The level of risk is based upon an assessment of the level or severity of the hazard and the probability of occurrence. The effects of available countermeasures upon the threat are incorporated into the assessment. Command policies and directives establish acceptable risk levels. For risk management guidance, see Chapter 2 of this manual and FM 100-14, Risk Management. For example, during Operation Desert Storm, commanders had to determine what effect the emissions from the burning oil wells had on the accomplishment of the mission and the risk posed to the health of their soldiers. Limited health effect studies were conducted during the Persian Gulf War with more extensive studies beginning in May 1991.

> *"The concentrations of VOCs (volatile organic compounds), PAHs (polycyclic aromatic hydrocarbons), metals, and criteria pollutants in the Gulf region were much lower than initially presumed, considering the magnitude of the fires. The measurements of the mean concentrations of these pollutants are consistent across studies. The maximum concentrations due to the oil well fire emissions measured in the Gulf region are comparable to levels found in suburban locations in the US, lower than those found in large urban centers in the US, and much lower than the US-recommended occupational levels...Particulate matter, however was found to be extremely high at all monitoring sites compared with values in the US."*

Dalia M. Spektor
A Review of the Scientific Literature As It Pertains to Gulf War Illnesses,
Volume 6:Oil Well Fires
National Defense Research Institute
RAND 1998

### CONTROL AND COUNTERMEASURES

7-7. Controls and countermeasures may include reconnaissance to determine/confirm the quantity, quality, or confirmation of the hazard/threat; employment avoidance techniques, providing protective materials/equipment to personnel; providing decontamination capabilities for exposed personnel; and publishing treatment protocols and provisioning medical treatment personnel with appropriate medications, antidotes, and antitoxins

7-8. When deciding whether or not to employ controls/countermeasures, the commander must consider the impact that these measures will have on the health of personnel, the operation, and logistics support. The commander must make risk acceptance decisions based upon the analyses.

Controls/countermeasures are then applied, based upon the commander's decisions.

7-9. Limitations and uncertainties impact on application of controls and countermeasures. Leaders must consider operational requirements and METT-TC trade-offs as part of applying controls and countermeasures

## SURVEILLANCE

7-10. Medical surveillance is the routine, standardized tracking of disease and injury rates, occupational and environmental exposures, and countermeasure usage and effectiveness. Medical surveillance is incomplete until these results are reported to commanders and decision-makers for use in the overall command operational risk management effort. For specific policy on medical surveillance, see DODD 6490.2 and DODI 6490.3.

7-11. Forward positioned medical units are limited in their medical surveillance capabilities but can provide vital information, such as reporting disease and non-battle injury (DNBI) cases. More robust medical elements supporting in a reachback or technical chain manner perform more sophisticated medical surveillance and analysis on the information provided. At higher echelons, the medical capabilities and medical surveillance capabilities also increase. See DODD 6490.2 and AR 40-5.

7-12. Regardless of the source of medical surveillance, important health incidents or findings are recorded and reported. Within the operational area, the command surgeon and preventive medicine staff advise the commander of significant surveillance results. As the reports are transmitted to higher headquarters, they are consolidated and reported to the next higher headquarters. When the reports reach the repository agency (i.e., US Army Center for Health Promotion and Preventive Medicine for DNBI reports) they are entered into the appropriate database. Statistical rates and reports are then produced that are used to update assessments and policies and to develop technical guides and doctrine for future operations. Commanders and leaders should have access to this information to evaluate the health of their force and to establish preventive/protective guidelines for countering medical threats and maintaining the health of their command.

## ADVICE TO THE COMMANDER ON ACCEPTANCE OF RISK

7-13. Medical personnel provide advice to the commander on possible outcomes from acceptance of risk. The advice provides details on the level of risk, protective/preventive measures, and the potential consequences when these measures are not applied. For example, a unit moved into a field site to conduct operations. Preventive medicine personnel conducted a survey of the area and found that the soil in a small area was contaminated with a toxic industrial chemical. The commander was advised to select an alternate location for occupancy or only use areas of the site that were contamination free by restricting access to hazardous areas. The commander opted to use the recommended portion to establish operations but permitted one platoon to setup their billeting immediately adjacent to the contaminated area. After a few days, several personnel reported on sick call with severe skin irritation

from exposure to the toxic material; some personnel required hospitalization for treatment. Had the commander enforced the recommended preventive measures, these personnel would have been available for duty rather than receiving treatment. Ultimately the commander's decisions regarding the use of medical advice will impact on the health of the force and on accomplishment of the mission.

## SUMMARY

7-14. To accomplish the mission of the US armed forces, it is essential that military forces remain healthy and fit. Environmental and occupational health hazards must be identified and measures taken to mitigate their effects on the health of military personnel. Through command-sponsored preventive medicine programs and continual surveillance of emerging hazards, the commander can be better advised to more accurately assess the risks to unit readiness.

Appendix A

# Environmental Regulations, Laws, and Treaties

Environmental issues are a major concern for the Army and the Marine Corps, and with emerging new laws and regulations, environmental protection will continue to have a growing impact on Army and Marine Corps 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 Army or Marine Corps regulations, 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 Army and Marine Corps environmental regulations and the principal environmental laws applicable to military activities. Military facilities are subject to federal, state, local and HN environmental laws; when the requirements differ, the most stringent applies. Environmental laws affect almost every military operation. Services do not expect commanders to be legal experts, yet they must understand 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 and in Appendix D, 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, soldiers/Marines, or the military services from civil and criminal liability.

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

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 by the public and the federal government has led agencies to develop policies to support regulatory compliance and stewardship. The four primary sources of environmental law that influence Army and Marine Corps actions are federal, state, local, and host nation. The President also directs the federal government through the use of EOs and the DOD complies with those

directives as it does with any other federal law. DOD/Army/Marine Corps regulations, orders, and pamphlets, identified in this appendix, provide additional guidance for commanders. The Army and Marine Corps will comply with these laws and regulations as they pertain to individual localities or installations, deployments, or operations.

Full compliance with applicable environmental laws and regulations is a necessary cost of doing business. To that end, the Army and Marine Corps 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, the Army and Marine Corps are making a concerted effort to integrate environmental considerations into all Army and Marine Corps activities.

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 (DPW/environmental officer, SJA attorneys, range officers, and so forth). Installation support personnel are addressed in more detail in Chapter 5. Consult with installation environmental agencies on specific requirements for each location. Given the state and local differences on environmental laws, soldiers/Marines need to understand that what is environmentally permissible on one installation may not be permissible on another.

## ARMY/MARINE CORPS REGULATIONS, ORDERS, AND PAMPHLETS

### AR 200-1

AR 200-1 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 ECOs. 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**

AR 200-2 implements 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, or if an EA or EIS is required.

**AR 200-3**

AR 200-3 addresses land management and maintenance. This regulation provides guidelines for installation staff members having land management responsibilities (DPW, game management, range control, and the environmental office). Land management regulation includes guidelines for the following:

- Soil.
- Vegetation.
- Fish.
- Wildlife.
- Endangered species.
- Forests.
- Timber production.
- Agricultural leasing.
- Other land use purposes that are in the Army's or public's interest.

**AR 200-4**

AR 200-4 is the Army's policy for managing cultural resources to meet legal compliance requirements and support the military mission. It provides guidance for the treatment of cultural resources, including prehistoric sites, historic buildings and structures, traditional cultural properties, and Indian sacred sites on Army-controlled properties.

This regulation replaces AR 420-40 and has been revised to update the Army's policy for managing cultural resources to meet legal compliance requirements and to support the military mission. Cultural resources are: historic properties as defined in the National Historic Preservation Act (NHPA), cultural items as defined in the Native American Graves Protection and Repatriation Act (NAGPRA); archaeological resources as defined in the Archaeological Resources Protection Act (ARPA), sacred sites as defined in

EO 13007 to which access is provided under the American Indian Religious Freedom Act (AIRFA), and collections as defined in 36 Code of Federal Regulation (CFR) 79 Curation of Federally Owned and Administered Collections. Requirements set forth in NEPA, NHPA, ARPA, NAGPRA, AIRFA, 36 CFR 79, EO 13007, and Presidential Memorandum on Government to Government Relations with Native American Tribal Governments define the basis of the Army's compliance responsibilities for managing cultural resources. Regulations applicable to the Army's management of cultural resources include those promulgated by the Advisory Council on Historic Preservation (ACHP) and the National Park Service (NPS). It also requires that installations develop and integrate CRMP to outline procedures for integrating cultural resources management responsibilities and mission requirements.

**AR 350-4**

This regulation sets forth the objectives, responsibilities, and policies for the ITAM Program. ITAM establishes 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**

This regulation rescinds AR 420-47. It specifies responsibilities, regulatory requirements, and procedures for HW and solid waste management. 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.

**AR 420-76**

This regulation provides policies, standards, and procedures for pest control activities on Army installations. It requires each installation's DPW to prepare and annually update an IPMP. The IPMP lists all program objectives in priority according to the potential or actual impact on health, morale, structures, or property.

Generally, installations limit pest control to the least destructive means by avoiding mass spraying, baiting, and poisoning where possible.

AR 420-76 will be replaced by AR 200-5, which is currently in draft format. AR 200-5 will also incorporate the DOD's 3 measures of merits (MOMs) for pest management, as articulated in Department of Defense Instruction (DODI) 4150.7.

### DA PAM 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

This pamphlet is a companion to AR 200-4. It provides guidance for implementing cultural resources management, and includes applicable statutory and regulatory requirements for cultural resource and Native American programs.

### MCO P5090.2A

This regulation (currently dated July 1998) provides guidance and instruction to Marine Corps forces to meet federal, state, and local environmental legislative and regulatory requirements. It is focused on environmental compliance and protection and identifies Marine Corps policy and responsibilities. MCO P5090.2A addresses the following major areas:

- Program management.
- Environmental compliance and protection requirements.
- Environmental media areas.
- Education and training.

The regulation 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 specific Operational Naval Instruction (OPNAVINST) for guidance/regulations.

## FEDERAL LAWS

These laws provide states and federal agencies a legal framework within which to operate. These laws include acts and executive orders. For example, the Federal Facilities Compliance Act (FFCA) allows regulatory agencies to impose civil fines on other federal agencies, like the DA, for violations of the Resource Conservation and Recovery Act (RCRA).

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

The ARPA stipulates that anyone excavating archaeological resources on federal lands must have a permit or be subject to civil or criminal penalties. 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 soldiers/Marines 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 (CAA) OF 1970

The CAA, with amendments, requires the prevention, control, and abatement of air pollution from stationary sources (power plants) and mobile sources (vehicles). It controls the 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.

The CAA implementing regulations concerning emission requirements do not apply to tactical vehicles. However, increasingly, stringent requirements for civilian vehicles do 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 effects military activities. The CAA also regulates asbestos removal and disposal. Recent amendments include provisions for control of air toxins (hazardous air pollutants), acid rain, and ozone depleting compounds, such as 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, parts washer emissions, and so forth).
- Using riot control and smoke agents only in approved training areas.

## CLEAN WATER ACT (CWA) OF 1972

The CWA, amended in 1977, regulates point source discharges into US waters. This law applies most often to industrial facilities, sewage treatment facilities, and ships. Requirements for oil and HM spill reporting and waterways clean up affect military operations, including river crossings and amphibious actions. The CWA requires spill prevention plans for sites that store significant quantities of petroleum products.

The CWA also regulates storm water runoff from certain industrial sources and requires permits for activities that affect wetlands. There is also an inherent requirement to prevent soil erosion during construction and earth moving activities. Units must ensure that ground disturbed during tactical operations and training is preserved from future soil erosion.

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 to avoid surface and groundwater areas where possible.
- Crossing streams and ditches only at designated vehicle crossing locations.
- Ensuring soldiers 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 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 soldiers/Marines do not pour chemicals into sinks or storm drains.

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 soldiers/Marines 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 soldiers/Marines 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.
- Ensuring permits are obtained before any operations resulting in dredging or filling of wetlands.

For erosion control and its associated considerations, unit leader actions include:

- Verifying restrictions with range control.
- Briefing soldiers/Marines 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 (CERCLA) OF 1980

The CERCLA, known as Superfund since its enactment in 1980, regulates past releases of HM into the environment. 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 HW sites. The corresponding DOD program is the 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 soldiers/Marines 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 (EPCRA) OF 1986

The EPCRA provides a mechanism for informing local populations about possible chemical hazards in the community. Also known as SARA Title III, the EPCRA 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.

The EPCRA also requires local governments to prepare for the emergency release of HM by appointing a local emergency planning committee (LEPC). 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 soldiers/Marines 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 EMO.
- Complying with the ISCP.

## ENDANGERED SPECIES ACT (ESA) OF 1973

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.

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.

The ESA prohibits the destruction, capture, trading, selling, or buying of listed species. The DOD consults with the National Marine Fisheries and the USFWS before taking any action that may effect, 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.
- Avoiding damage to marked wildlife food plots and watering areas.
- Complying with the installation endangered species management plan.

### FEDERAL FACILITIES COMPLIANCE ACT (FFCA) OF 1992

The FFCA applies only to HW and solid waste requirements of the RCRA. This act represents, however, a growing consensus that federal facilities should comply with environmental laws in the same manner as private, nongovernmental civilian agencies.

Originally passed in 1992, the FFCA subjects DOD employees at all levels to personal criminal liability for environmental violations of any federal or state solid waste or HW law. Criminal sanctions under the federal HW law (RCRA) include a maximum fine of up to $250,000, a jail sentence of up to 15 years, or both. The FFCA also allows regulatory agencies to issue 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 soldiers/Marines to ensure compliance with environmental guidelines.
- Informing the chain of command when environmental problems are discovered.

### FEDERAL INSECTICIDE FUNGICIDE, AND RODENTICIDE ACT (FIFRA) OF 1972

The 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. 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 21-10-1.

- 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

Formerly known as the Hazardous Materials Transportation Act (HMTA), this law authorizes the US DOT to issue interstate and intrastate regulations related to transportation of HM. DOT oversight applies to; packing and repacking; handling; labeling, marking, and placarding; routing.

In addition, the HMTA establishes record keeping requirements and a registration program for shippers, carriers, and container manufacturers. Units most commonly haul HM in the form of 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 soldiers/Marines 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 (MMPA) OF 1972

The MMPA provides protection for marine mammals. The MMPA also prohibits hunting or harvesting these animals except by permit. As defined by the MMPA, marine mammals include the following:

- Whales.
- Dolphins (porpoises).
- Sea otters.
- Polar bears.
- Any mammal morphologically adapted to the marine environment.

Unit leader actions include:

- Ensuring soldiers/Marines 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

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.

Unused munitions become waste when abandoned (i.e., buried, 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 waste by an authorized military official.

Military munitions are not 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 of 1998.)

Unit leader actions include:

- Training soldiers/Marines 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 (NEPA) OF 1969

The NEPA 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.

Installations document these considerations, while ensuring public involvement in the planning process. Only those actions categorically excluded from NEPA documentation requirements are exempt. (See Chapter 4 and 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 (NHPA) OF 1966

The NHPA 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 Army and Marine Corps 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 soldiers/Marines 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 REPARATION ACT (NAGPRA) OF 1990

The intent of this act is to ensure the protection and rightful disposition of Native American cultural items, including human remains, from federal lands. It establishes a consultation process for the intentional excavation or inadvertent discovery of NAGPRA cultural items. Soldiers and Marines 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 soldiers/Marines 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 (NCA) OF 1972

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 (OPA) OF 1990

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.

Additionally, it emphasizes federal direction of public and private efforts both of the response to avert the threat of an oil spill and of removal of oil that has been spilled. The act specifies federal preeminence in undertaking and directing response actions but 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 (QCA) 1978

The QCA amended the NCA to allow local communities to develop ordinances controlling unnecessarily loud noises. To minimize contention between installations and surrounding communities, the DOD established the installation compatible use zone (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.

Unit leader actions include:

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

### RESOURCE CONSERVATION AND RECOVERY ACT (RCRA) OF 1976

The RCRA (originally the Solid Waste Disposal Act), with amendments, establishes guidelines and standards for HW generation, transportation, treatment, storage, and 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.

RCRA regulations require training for soldiers and Marines 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 soldiers/ Marines 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 HW/HM according to local and installation procedures, both in garrison and in the field.
- 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 soldiers/Marines have been properly trained.
- Ensuring the unit ECO 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 (SDWA) OF 1974

The SDWA regulates drinking water quality. 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. The Army's program objectives are 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 soldiers/Marines on the impact of polluting water sources.
- Employing pollution prevention practices.
- Reporting all concerns about water quality through the chain of command.

### SIKES ACT (SA) OF 1985

The SA, as amended in November 1989, allows each military department to provide services for fish and wildlife management. The military also prioritizes work with federal and state fish and wildlife conservation agencies. An installation's fish and wildlife management program operates under a cooperative plan mutually agreed to by the installation commander, the regional office of the USFWS, and the state agency designated by the host state.

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 (TSCA) OF 1976

The TSCA places restrictions on certain chemical substances. These restrictions 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 soldiers/Marines (mechanics) that perform maintenance on any air conditioning system on proper procedures for the use, recovery, recycling, or disposal of refrigerants.

## EXECUTIVE ORDERS

### EO 11987

Dated 24 May 1977, this order directs all federal agencies to prevent the introduction of exotic species (all plants and animals not occurring, either presently or historically, in any ecosystem of the US) into the natural ecosystems of the US. ("US" means all of the fifty states, the District of Columbia, the Commonwealth of Puerto Rico, American Samoa, the Virgin Islands, Guam, and the Trust Territory of the Pacific Islands.) This order is of special importance when addressing redeployments to the US from areas outside the US.

### EO 11988

Dated 24 May 1977, this order (Floodplain Management) addresses the actions federal agencies must take to identify and protect floodplains. Additionally, it directs agencies to take into consideration the effects of actions in a floodplain. The intent is to seek to preserve and enhance the natural value of floodplains. This intent includes minimizing the risk of losses from flooding.

### EO 11990

Dated 24 May 1977, this order (Protection of Wetlands) addresses the actions federal agencies must take to identify and protect wetlands. Additionally, it directs agencies to take into consideration the effects of actions in wetlands. The intent is to preserve and enhance the natural values of wetlands and to minimize the risk of wetland destruction.

### EO 12088

Dated 13 October 1978, this order (Federal Compliance with Pollution Control Standards) links federal environmental regulations and federal facilities. It directs all federal facilities to control and monitor environmental pollution in compliance with federal environmental regulations.

This order also established the A-106 (1383) reporting process, now referred to as environmental program requirements. In November 1988, the EPA issued the Federal Facilities Compliance Strategy, also known as the EPA Yellow Book, which establishes a comprehensive and proactive approach by which federal facilities may comply with federal regulations.

**EO 12114**

Dated 4 January 1979, this order (Environmental Effects Abroad of Major Federal Actions) addresses environmental effects of major federal actions abroad. It establishes procedures for federal agencies in foreign countries and global communities to consider the effects of their actions on the environment. The Department of State supervises and coordinates these efforts overseas. The objective of this program is to provide information to decision-makers, increase awareness and interest in environmental concerns, and encourage environmental cooperation with foreign nations.

**EO 12580**

Signed on 23 January 1987, this order (Superfund Implementation) amended EO 12088, which delegates CERCLA duties and powers (as amended by the SARA). It provides for a National Contingency Plan (NCP) to provide national and regional response teams to plan and coordinate HM/HW preparedness and response actions. The response teams may include representatives from state and local governments.

**EO 12856**

Dated 6 August 1993, this order (Federal Compliance With Right-To-Know Laws and Pollution Prevention Requirements) challenges the federal government to publicly lead by example by applying source reduction in the management of its facilities and in its acquisition practices. It commits federal agencies to publicly report toxic wastes and emissions and to reduce toxic releases by at least fifty percent by 1999. By preventing pollution, the federal government not only protects the environment, but it also saves the taxpayers money by reducing waste management costs and long-term liability for expensive clean up. This order requires that all federal facilities comply with the provisions of the EPCRA, which previously applied only to industry.

**EO 12898**

Dated 11 February 1994, this order (Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations) directs each federal agency to conduct its programs, policies, and activities that substantially effect human health or environment in an appropriate manner. This manner ensures that such programs, policies, and activities do not exclude persons (including populations) from participating, denying persons (including populations) the benefits of, or subjecting persons (including populations) to discrimination under such programs, policies, and activities because of their race, color, or national origin.

**EO 13007**

Dated 24 May 1996, this order (Indian Sacred Sites), provides direction to federal agencies on managing Native American sacred sites. It requires that federal agencies allow Native Americans reasonable access to lands that contain sacred sites. Further, federal agencies must avoid adversely effecting

the "physical integrity" of sacred sites and ensure reasonable notice is provided to Indian tribes when land management policies may restrict future access or adversely effect sacred sites.

### EO 13101

Dated 14 September 1998, this order (Greening the Government Through Waste Prevention, Recycling, and Federal Acquisition) replaces EO 12995 and EO 12873. It requires federal agencies to incorporate waste prevention and recycling into their daily operations and implement cost effective procurement preference programs for recycled and environmentally preferable products and services. It is the national policy to prefer pollution prevention, whenever feasible. Pollution that cannot be prevented should be recycled; pollution that cannot be prevented or recycled should be treated in an environmentally safe manner. Disposal should be employed only as a last resort. Federal agencies shall comply with executive branch policies for the acquisition and use of environmentally preferable products and services and implement cost-effective procurement preference programs favoring the purchase of these products and services.

### OTHER EO INFORMATION

For information on other environmentally related EOs, or the exact text of a particular EO, you may want to 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

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

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).

## HOST NATION LAW/FINAL GOVERNING STANDARDS

The Army and Marine Corps 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 and 200-2. In countries where there are HN laws, the FGS will be used according to the executive agent of that country.

## INTERNATIONAL LAWS AND TREATIES

- 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).

US armed forces are obligated to abide by the provisions of treaties and conventions to which the US is bound. These treaties can impact military operations in several ways. The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, for example, could limit HW disposal options available to a deployed force. While this treaty has not been ratified by the Senate at this time, the US is still a signatory to it. Whether bound by a treaty or not, its mere existence may affect operations. Recent examples from Bosnia-Herzegovina have confirmed this situation. See CALL Newsletter 99-9 for more information on this recent example.

Another body of laws that effect US military forces are international treaties that govern armed conflict, known collectively as Environmental Laws of War (ELOW). One such treaty is the Convention on the Prohibition of Military or any Other Hostile Use of ENMOD. This treaty prohibits any military use of ENMOD, any technique for changing, through the deliberate manipulation of natural processes, the dynamics, composition, or structure of the environment. The terms in the ENMOD Convention are broadly defined and subject to interpretation by each nation.

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

Under the FFCA, federal and state environmental regulatory agencies can impose civil fines on federal agencies, including the Army and Marine Corps, for RCRA violations. For the Army and Marine Corps, 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.

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 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, 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 101-5 and is an example of Appendix 2 (Environmental Considerations) to Annex F (Engineer). FM 101-5 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 implements the requirement of EO 12114 to conduct environmental assessments before taking actions that significantly harm the environment of a foreign nation or the global commons. It is applicable during certain support operations and stability operations. Actions taken during combat are excluded. DODD 6050.7, which implements EO 12114, defines the EIS, ES, and ER directed in this tab.

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**Copy ___ of ___ copies**
**Issuing Headquarters**
**Place of Issue**
**Date-Time Group of Signature**
**Message Reference Number**

**APPENDIX 2 (ENVIRONMENTAL CONSIDERATIONS) TO ANNEX F (ENGINEER) TO 54th MECH DIV OPLAN 99-7 (U)**

**References:**

a. JP 3-34, "Engineer Doctrine for Joint Operations," November 1997.

b. JP 4-04, "Joint Doctrine for Civil Engineer Support," 26 September 1995.

c. JSI 3820.01A, "Environmental Engineering Effects of DODA," 16 January 1996.

d. DODI 4715.5, "Management of Environmental Compliance at Overseas Installations," 22 April 1996.

e. DODI 4715.8, "Environmental Remediation Policy for DOD Activities Overseas."

f. Applicable country-specific FGS.

g. DOD OEBGD, or in-theater equivalent, October 1992.

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.

i. Unit SOPs.

**Time Zone Used Throughout the Order:**

**1. SITUATION.**

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. (*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…)*

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

**CLASSIFICATION**

(1) Terrain. List all critical terrain aspects that impact functional areas operations.

(2) Weather. List all critical weather aspects that impact functional areas operations.

(3) Enemy functional area capability and/or activity:

(a) List known and templated significant environmental hazards. If the information is large and specific enough, this list may become an overlay.

(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 effected 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 54th 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, chemical, biological, and radiological [CBR] 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 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.

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

**CLASSIFICATION**

**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, legal, 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:

(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 our 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 and the logistics officer may be included here if not incorporated in their respective annexes.

**CLASSIFICATION**

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

**CLASSIFICATION**

(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 rear assembly areas. *(Occupation of base camps or rear assembly areas, 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 perform a final EBS (see Tab A) to document the condition of the site to include water sources, soil, flora, archaeological/historical facilities, air quality, and other environmental conditions. 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.)*

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

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**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 reverse osmosis water purification unit (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 54th MECH DIV field standing operating procedures (FSOP). 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*

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

**CLASSIFICATION**

*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.

(a) HW management. This section includes procedures and locations for the storage and disposal of HW under normal and emergency conditions, operations of the DRMO or approved contractor facilities, and the recording of abandoned HW sites. *(HW will be collected, packaged, and transferred to the 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 54th MECH DIV FSOP. 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.)*

**CLASSIFICATION**

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

**CLASSIFICATION**

(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 54th MECH DIV FSOP…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 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 can be signed by either the commander or primary staff officer.)

RANK

**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 September1993.

c. JCS Pub 4-04, “Joint Doctrine for Civil Engineering Support,” 26 September 1995.

d. DODD 6050.16, “Policy for Establishing and Implementing Environmental Standards at Overseas Installations,” 20 September 1991.

e. Applicable country-specific FGS.

f. DOD OEBGD, or in-theater equivalent, October 1992.

g. Civil Engineering Support Plan (CESP), in AOR.

1. Purpose. State the regulatory, legal, 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: environmental impact statement (EIS), environmental statement (ES), or environmental report (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.

**CLASSIFICATION**

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

**CLASSIFICATION**

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.

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. Joint staff instruction (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 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.

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.

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, 31 March 1979, "Environmental Effects Abroad of Major DOD Actions."

b. JSI 3820.01, 28 September 1993, "Environmental Engineering Effects of DOD Actions."

c. DODD 6050.16, 20 September 1991, "Policy for Establishing and Implementing Environmental Standards at Overseas Installations."

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.

**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**

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.

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.

**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**

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.

(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 HW/HM 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.

**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: 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.

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)**

**CLASSIFICATION**

2. ( ) Electronic Spill Report Message Format.

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. **NOTE:** 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)

**CLASSIFICATION**

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

Appendix C

# Unit Environmental SOP

This SOP is an example of a unit environmental SOP. Because each installation has different local, state, or HN requirements, this SOP **must** be modified based on consultation with the installation's environmental staff. The SOP is divided into six sections (maintenance, supply, NBC, communication, field-mess operations, and operations/training) which correspond to the typical unit organization (see Figure C-1, pages C-2 to C-20). Units should extract these sections and incorporate them into the appropriate section of its own SOP. Alternatively, a unit may use this sample as a guide in developing a stand-alone environmental SOP. While this approach elevates the visibility and importance of environmental issues and procedures, unit personnel in specific functional areas may overlook the information. A sample spill-response plan, list of recommended equipment that should be maintained in the unit/activity spill kit, and instructions for using the electronic spill report message formats can be found in Tab A (see Figure C-2, page C-21), Tab B (see Figure C-3, page C-24), and Tab C (see Figure C-4, page C-26), respectively.

**APPENDIX ____ TO ANNEX___**
**ENVIRONMENTAL STANDING OPERATING PROCEDURES**

Unit Designation

Mailing Address

Date

**1. References.**

Installation Environmental SOP, Higher HQ Environmental SOP, and AR 200-1.

**2. Purpose.**

a. This appendix standardizes procedures for environmental compliance with federal, state, local, and HN laws and regulations. Failure to comply may result in the following:

(1) Endangerment of personnel health and safety.

(2) Citations by federal and state regulating agencies.

(3) Civil or military penalties against offenders.

(4) Delay or halt in mission accomplishment.

b. This appendix is applicable to all assigned or attached personnel and governs the environmental aspects of all unit activities.

**3. Responsibilities.**

a. Commander.

(1) Establishes unit HM and HW management policy.

(2) Ensures that personnel comply with the provisions of referenced SOPs, regulations, and public law.

(3) Ensures that the ECO, the HM/HW coordinator, and senior personnel have received the proper training, and that they, in turn, train their subordinates.

(4) Ensures that all personnel who are exposed to HM in the course of their work receive initial training within 90 days of assignment concerning the hazards to which they are exposed and the precautions required to protect themselves in the work environment. These personnel must also receive annual refresher training.

**Figure C-1. Unit environmental SOP**

(5) Ensures that all unit personnel receive initial environmental awareness training within 90 days of assignment and refresher training annually thereafter.

(6) Ensures all unit personnel have received hazard communication training (OSHA requirement).

(7) Ensures that all environmental training is properly documented, and records are filed in the unit operations/training office.

(8) Ensures that a self-inspection program is in effect for the unit.

b. Executive Officer.

(1) Serves as the commander's eyes and ears for environmental matters.

(2) Conducts periodic unit self-assessment surveys.

(3) Overses environmental integration into staff operations.

c. ECO and HW/HM (MOS 9954) Marine.

(1) Provides advice on environmental compliance to the commander.

(2) Serves as a link between the unit commander and higher/installation headquarters' environmental staff.

(3) Performs other duties as outlined in Chapter 1 of this manual.

d. Maintenance Officer.

(1) Serves as the unit's HM/HW coordinator.

(2) Serves as the unit's spill response coordinator.

(3) Ensures accountability for all HM and HW.

(4) Ensures that HM and HW are stored and disposed of properly.

(5) Ensures that HM and HW spills are immediately contained and reported to the fire department and the installation's environmental office.

(6) Reports nonfunctional/inoperative treatment/collection facilities (oil/grease interceptors, floor drains, catch basins, waste tanks) to the installation's environmental office via the unit's ECO.

e. Motor Sergeant.

(1) Establishes and maintains an HW accumulation (HW less than 55 gallons) area with proper separation of incompatible products.

**Figure C-1. Unit environmental SOP (continued)**

(2) Inspects HW accumulation areas weekly and documents results.

(3) Ensures that leaking containers are overpacked and/or the uncontaminated contents containerized in functional containers.

(4) Ensures that only waste oil is placed in the waste oil tank or drums.

(5) Ensures that the waste oil tank or drums are pumped out when full or 90 days after previous pumping, whichever occurs first (check with installation EC).

(6) Ensures that the washrack oil/water separator is clean and serviceable.

(7) Maintains an inventory log of all stored waste products, to include exact location of each container.

(8) Labels all HW containers properly as they are put in service and ensures turn-in and delivery to the DRMO or contractor and pick up within 90 days of accumulation start date (coordinate with the EMO).

f. Unit Supply Sergeant.

(1) Initiates and processes turn-in documents (TIDs) for the turn-in of HM and HW.

(2) Maintains a suspense file and validates receipt copies of TIDs for all scrap, HM, and HW shipped to the DRMO.

g. PLL Clerk. Requisitions mercury and lithium batteries with recoverability code "A" only upon turn-in of a like item and quantity.

h. NBC NCO.

(1) Inspects all possible decontaminant solution 2 (DS2) and super tropical bleach (STB) accumulation sites (connexes, wall lockers, POL accumulation area, and so forth) to ensure that these products have been properly turned over to DOL/supply for consolidated storage.

(2) If the unit is temporarily in possession of decontamination agents DS2 or STB:

(a) Ensures that DS2 and STB are stored in separate locations.

(b) Inspects containers monthly for leakage, and records results. Arranges for leakers to be overpacked and turned in to the DRMO.

(3) Properly disposes of nuclear, biological, and chemical (NBC) related training material that is classified as hazardous according to installation directives and DRMO policies.

**Figure C-1. Unit environmental SOP (continued)**

i. Mechanics.

(1) Place HW in properly designated containers.

(2) Never place HW in a dumpster; this is an **illegal** disposal.

(3) Promptly report leaks/spills to the motor sergeant and/or maintenance officer. Report spills directly to the fire department and installation's environmental office, if necessary, to ensure prompt response.

(4) Wear proper protective clothing when handling HM or HW.

(5) Keep HM and HW accumulation containers closed except to add or remove product.

j. Medics.

(1) Segregate medical waste from non-medical waste at the point of generation.

(2) Place medical waste in designated containers.

(3) Wear proper protective clothing when handling medical waste.

(4) Store collected medical waste in a secure manner/area.

k. Individual Soldiers.

(1) Comply with the unit's environmental requirements and the installation's SOP.

(2) Maintain environmental awareness throughout daily activities.

(3) Provide recommendations to the chain of command on techniques to ensure compliance with environmental regulatory requirements.

(4) Identify the environmental risks associated with individual and team tasks.

(5) Support recycling programs.

(6) Report HM and HW spills **immediately** to (phone number for spill reporting).

(7) Make sound environmental decisions in the absence of a supervisor or specific command guidance by considering the following:

(a) Prior training.

(b) General guidance from the chain of command.

(c) Concept of right and wrong.

**Figure C-1. Unit environmental SOP (continued)**

(d) Common sense.

(e) Environmental ethic.

**4. Safety**.

a. Material Safety Data Sheet. MSDSs provide critical information for safeguarding human health and protecting the environment. This information includes the hazardous characteristics of the substance, the appropriate personal protective equipment (PPE), spill-response procedures, signs and symptoms of overexposure, and first aid procedures. MSDSs can be obtained through unit supply channels and should be maintained at each location where HM is being used. It is important to note that MSDSs are material- and manufacturer- specific, which means that each brand name of a chemical has a different MSDS.

b. Personal Protective Equipment. PPE is the primary means of safeguarding human health when handling HM/HW. The most important aspect when choosing the appropriate PPE for a given operation is the hazardous characteristics of the substance. Always refer to the manufacturer's MSDS before choosing the appropriate PPE. If the prescribed PPE cannot be obtained during a field or contingency operation, field-expedient PPE should be used to help protect soldiers when handling HM/HW or in the event of a spill. Leaders ensure that their soldiers and Marines have the appropriate PPE when exposed to HM/HW during handling. Recommended field-expedient PPE is listed below:

| HM/HW stream | Field-expedient PPE |
|---|---|
| 1. Fuel products | 1. Field gloves, goggles, wet-weather gear |
| 2. Oil products/lubricants | 2. Field gloves, goggles |
| 3. Antifreeze | 3. Field gloves, goggles |
| 4. Acid batteries | 4. Double-lined field gloves, goggles, wet-weather gear |
| 5. Medical waste | 5. Field gloves, goggles, wet-weather gear |
| 6. Pesticides | 6. Consult the MSDS and Preventive Medicine |

**NOTE: Field-expedient PPE should only be used when the required PPE is not available since it does not provide the level of protection recommended by the manufacturer. Additionally, field-expedient PPE that is used to handle HM/HW should not be used for normal operations after being used as PPE.**

**Figure C-1. Unit environmental SOP (continued)**

**SECTION 1 - MAINTENANCE**

**1. General.**

a. Select maintenance activity sites so that POL-contaminated water will not enter a storm drain.

b. Conduct the following activities daily:

(1) Check the level of used oil in storage tanks. Schedule for tanks to be picked up when 3/4 full.

(2) Clean all foreign material from drip pans and above-ground oil tank screens.

(3) Empty refuse barrels when 3/4 full to prevent overflows.

c. Procure, store, and use only those chemical products specifically authorized by the appropriate technical manual (TM) or lubrication order (LO) for the level of maintenance performed.

d. Keep MSDSs for all chemicals/solvents/materials used in work areas in a file that is readily accessible to personnel who work there. Brief personnel on chemical hazards, protective clothing requirements, first aid, and spill response before they use hazardous chemicals.

e. Use products that are safe and biodegradable, when possible.

f. Comply with the Army's oil analysis program (AOAP) as a method of reducing the amount of waste oil produced.

g. Properly label, segregate, and store HM.

**2. Maintenance Bays**.

a. Conduct maintenance washing/steam cleaning at the motor pool's washrack—not in the maintenance bay. (Maintenance cleaning in the bays will be authorized only during extended, below freezing temperatures that interfere with the vehicle maintenance mission [applicable only if equipped with an oil/water separator].)

b. Do not wash heavily soiled and/or oily maintenance bay floors with solvent or other unauthorized material. Clean up oil and fuel with dry sweep or rags only. Collect dry sweep and dirt in nonleaking containers as HW for disposal through the DRMO.

c. Confine solvent use to solvent washing machines that meet the National Fire Prevention Association's safety regulation standards. Obtain approval for use of solvents, other than mineral spirits, from the installation's environmental office before use.

d. Ensure that all solvent washing machines have lids, which remain closed when not in use.

**Figure C-1. Unit environmental SOP (continued)**

e. Do not sweep or dump trash, garbage, nuts, bolts, and other solid waste into floor drains or mix with used dry sweep. Put such items into covered, leak-proof containers. Empty containers into dumpsters, as needed, to prevent spillover.

f. Place drip pans under points of leakage on vehicles with known seeps and leaks to preclude discharges into wastewater collection systems. Drain all water from drip pans daily and dispose into a sanitary sewer drain protected by an oil separator.

g. Use the exhaust ventilation system whenever a stationary vehicle is running inside the maintenance bay.

h. Keep catch buckets in all floor drains that are designed for them. Inspect and empty dry sweep and trash daily. In bays not equipped with oil-water separators should keep floor drains permanently closed if HM/HW are handled or stored there.

**3. Grease Racks/Pits.**

a. Use approved used oil tanks to collect and subsequently recycle used oil. (Grease racks and maintenance or inspection pits are designed for oil change and vehicle lubrication only.)

b. Introduce only uncontaminated used motor oil into the used oil tanks. Use separate containers for hydraulic, transmission and brake fluids. Do not place solvent, fuel, water, antifreeze, dirt, dry sweep, hardware, or trash in used oil tanks.

c. Dispose of used oil, transmission, and fuel filters in normal trash containers after draining for 24 hours and double bagging in plastic. (Units/installations should purchase equipment for pressing oil from filters and then recycling the metal.)

d. Mark and position containers for new and used dry sweep at the grease rack to clean up spills or leaks.

e. Keep floor of the grease rack and the immediate surrounding area free of POL buildup.

**4. Washracks.**

a. Use washracks for light exterior washing only. Wash extremely soiled vehicles at the installation's central vehicle wash facilities.

b. Obtain authorization from the installation's environmental office for cleaners used in washing activities, since cleaners will drain into the sanitary sewer. Post readable signs to indicate specific, authorized cleaners, solvents, or soaps.

c. Do not use portable steam cleaners or clean engines at washracks. These activities cause the oil to suspend in the water and the separator to function improperly. Only use steam cleaners in designated areas.

d. Do not pour POL products, solvents, antifreeze, or other regulated substances into washrack drains.

**Figure C-1. Unit environmental SOP (continued)**

e. Position trash containers at washracks for disposal of refuse generated during the washing process.

f. Do not sweep dirt and trash resulting from washing vehicles into the washrack or pile trash along the perimeter. Place trash in proper containers for disposal at the landfill. Report quantities of dirt in excess of what can reasonably be placed in a trash container to the installation for disposal.

g. To prevent pooling and possible discharge into storm drains, immediately discontinue washing if a washrack drain becomes clogged. Notify a supervisor to call in a work-order request immediately. Maintain washrack as “out-of-service” until all necessary repairs are made.

h. The motor sergeant will do the following on a daily basis:

(1) Check for leaking water hydrants and report leaks to the DPW or facility engineer work order desk.

(2) Check for proper policing of the washrack, and ensure that the area is free of trash, oil-soaked rags, and soil/sand.

(3) Inspect drains and sand traps to ensure proper operation of the washrack drainage system. Call the DPW work-order section if plugged.

(4) Inspect oil-water separator for proper operation.

**5. Parts/Material Requisitioning and Storage Areas.**

a. Requisition the minimum quantity required for mission accomplishment.

b. Ensure recoverability codes are used whenever applicable.

c. Keep a copy of the applicable MSDS for each HM on-hand in a binder in the parts storage area.

d. Label and segregate all HM from nonhazardous items.

e. Make special indications for any materials that have shelf life considerations.

f. Consider alternative, nonhazardous substitutes whenever processing a request for HM. Check with the installation’s environmental office for suggestions.

**6. POL Storage Areas.**

a. Store all POL products with secondary containment. Construct berms 1 1/2 times the volume of the largest container (“must contain the contents of the single largest tank plus sufficient freeboard for precipitation”) stored in the storage area to preclude spillage outside the immediate area. Obtain exceptions to this policy from the installation’s environmental office.

**Figure C-1. Unit environmental SOP (continued)**

b. Store all HM in a location protected from the elements to maintain container integrity (to prevent rusting, protect labels from fading, and so forth).

c. Inspect containers and labels weekly for leaks and incomplete/unreadable or out-of-date labels. Stop leaks in containers (overpack the container or place the contents in a nonleaking container.) Maintain legible labels to reflect actual container contents.

d. Maintain an inventory of POL products. Keep MSDSs on hand for any HM present.

e. Use POL and other HM stock on a FIFO basis.

f. Do not tip a drum on its side to issue POL products outside the POL storage area. Use transfer pumps (preferred method) for dispensing POL products.

g. Place a drip box or pan under the supply valve when drum is tipped on its side. Line boxes and pans with absorbent pads and maintain on a regular basis. Clean up spillage immediately using dry sweep in areas with concrete floors.

h. Immediately report to the unit's ECO and the appropriate installation officials spills of any quantity that enter the environment (soil, water, or drain). (See Tab A.)

i. Keep used oil free of contamination (water, dry sweep, hardware, trash, solvent, antifreeze), and store only in approved used oil above-ground storage tanks.

j. Use separate containers to store used brake fluid, solvents, hydraulic, and transmission oils. (Should mixing of waste streams occur, the product becomes "waste contaminated with an unknown substance" and will require analysis by the DRMO before disposal.)

k. Contact DRMO for pumping or turn-in, whichever applies, when used oil tanks/barrels are 3/4 full. (Units may be required to go through the installation's EMO which will, in turn, contact the DRMO.)

l. Discontinue accumulation of used oils if leaks in storage containers are detected. Immediately report leaks to the unit ECO and the installation EMO.

m. Obtain approved containers from the DRMO for proper disposal of contaminated dry sweep and other accumulated HW. Clearly mark containers for proper waste disposal.

n. Dispose of used filters for oil, transmission, and fuel as normal trash after draining for 24 hours and double bagging in plastic. (Units/installations should investigate equipment for pressing oil from filters and then recycling the metal.)

o. Permanently close all floor drains in maintenance areas where HM/HW are handled or stored and provide for secondary containment single wall containers. Do not store HM near sanitary or storm sewer drains. Immediately report any amount of POL spillage entering a floor or storm drain to the unit's ECO and the installation's EMO.

**Figure C-1. Unit environmental SOP (continued)**

p. Place each HM container of five gallons or more accumulation capacity in a POL shed or portable secondary containment device. (If these storage means are not available, the storage area will be bermed to contain 1 1/2 times the largest container volume in the event of a spill.)

**7. Fuel Dispensing and Storage Area.**

a. Two personnel perform the operation when filling any size container with fuel—one will run the pump, and the other will dispense the fuel. This procedure provides adequate manpower, to monitor the pump for leaks and shut off the pump in case of an emergency. It also prevents overfilling the container.

b. Handle fuel contaminated with dirt and water as HW, and dispose through the DRMO.

c. Dispose of oil-contaminated fuel as a result of fuel cell leaks or other mechanical system failure, as HW through DRMO.

d. Contact the direct support unit for assistance and guidance if tankers or fuel pods must be purged.

**8. Procedures for Accumulation Site.**

Provide accumulation sites for used petroleum products and HW. Place sites above ground on a nonpermeable, bermed hard stand, label them; and locate them 50 feet or more from any building. Leaking, corroded, or otherwise deteriorated containers must be overpacked in DOT approved drums. Coordinate with the installation EMO for assistance in determining the appropriate overpack containers, labeling/marking requirements, arranging for pick up of used oil, and other HW/HM collection issues.

a. Keep an accumulation log for each used oil or HW container in use. Specify as follows:

(1) Contents.

(2) Date the container was opened.

(3) Date and quantity of each addition to the container.

(4) Name of person adding to the container.

(5) Date container is filled or closed.

(6) Date the container is removed by DRMO.

b. Store used oil and HW according to installation guidelines.

(1) Place all accumulation of HW on a nonpermeable bermed hard stand.

(2) Label and locate the stand 50 feet or more from any building.

(3) Protect the accumulated HW from the elements, including heat and cold.

**Figure C-1. Unit environmental SOP (continued)**

(4) Provide an enclosure to keep containers free from obscuring snow cover to allow for routine visual inspections in areas prone to heavy snowfall.

(5) Store used greases, solvents, brake fluids, hydraulic fluid, motor oil, and antifreeze in separate containers.

(6) Keep containers (drums, cans, or tanks) closed, except when depositing waste, as a safeguard against spills and to prevent water from entering the containers.

(7) Obtain a replacement through the prescribed load list (PLL) section or the troop support office if 2 ½- or 2 ¾-inch threaded caps on 55-gallon drums are missing.

(8) Ensure that secondary containment is provided which is capable of containing 1½ times the volume of the largest container stored in the storage area.

(9) Do not accumulate HW in an open container; it is a serious violation of HW regulations.

c. Leave the following headspace to prevent overflow due to expansion:

55-gallon drum..... 3 to 4 inches.

5-gallon cans ..... 1.5 to 2 inches.

1-gallon can ..... 1 inch.

d. Dispose of used oil in an appropriate above-ground container.

(1) Label the storage tank(s) USED OIL ONLY (by type such as motor oil, transmission oil, or hydraulic oil), and make certain personnel are trained to place only used oil in the tanks. If a 55-gallon drum is needed, use national stock number (NSN) 8110-00-823-8121.

(2) Ensure that waste-oil tanks are pumped on a regular schedule. Notify the motor sergeant or the unit's HM/HW coordinator if the tank fills up before the scheduled pick up date or the tank is not pumped on schedule.

e. Use vermiculite (NSN 7930-00-269-1272) or absorbent pads to soak up puddles, and Safestep (NSN 7930-01-145-5797) or sawdust (NSN 7930-00-633-9849) to clean up hard stands if HM or HW is spilled. Place all contaminated soil and absorbent material in removable head drum(s) (NSN 8110-00-082-2626 or 8110-00-292-8121) and turn in to the DRMO. Notify the installation's environmental office (see Tab A).

f. Overpack chemical products and POL contained in leaking, corroded, or otherwise deteriorated containers in approved drums, and dispose of them as HW through the DRMO. Contact the installation's environmental office for assistance in determining the appropriate overpack containers.

(1) To be accepted for turn-in, waste material must be in a safe, nonleaking, durable container.

**Figure C-1. Unit environmental SOP (continued)**

(a) Overpack leaking containers in steel or plastic removable head overpack drums, available through the supply system.

(b) Pack leaking containers of liquids in absorbent material (NSN 7930-00-269-1272), available at the General Services Administration (GSA) store or through GSA or DLA catalogs.

(c) Overpack a leaking 55-gallon drum in an 85-gallon drum. Place an absorbent material all around a leaking, overpacked container, to include underneath the container and with the maximum amount possible placed in the space between the overpack container and leaking container. There must be 6 inches of absorbent on the bottom and top of the interior container, with at least 2 inches around the sides (adjust for different sized drums and overpacks).

(d) Overpack leaking containers of nonliquid HW in a serviceable container. Call the installation's environmental office or the DRMO when in doubt as to the type of container to use since many liquids such as battery acid cannot be packed in steel containers.

(2) Contact the installation's environmental office for a loaner if drums are not available for overpacking an emergency spill. Requisition a replacement drum for the installation's environmental office. Used drums are frequently available at the DRMO. Removable head 55-gallon drums (NSN 8110-00-082-2626) should be stocked by installation supply. Ensure that spill kits are procured for handling future spills.

(3) Request assistance from the installation's environmental office on compatibility of waste, packing, and labeling of containers. Maintain this information in the waste-stream file for each waste.

g. Inspect HW weekly. Document results of the inspection on a log and make accessible to state and federal inspectors. Identify description of waste, location, quantity, date accumulation started, end of 90-day period, date removed to the DRMO or by contractor, remarks (condition of storage area and containers), inspector's printed name, signature, and date of inspection. Coordinate this action with the installation's environmental office.

**9. Vehicle Parking Areas.**

a. Park vehicles only in designated parking areas.

b. Do not discharge any POL product or contaminated soil into or near a storm drain. This is forbidden. Vehicle parking areas drain into storm sewers; storm sewers drain into streams, which lead into the nearest surface-water body.

c. Place drip boxes/pans under all drip points of vehicles with potential for leaking POL.

d. Use dry sweep to clean up POL spills where vehicles are parked, and dispose as HW through the DRMO.

e. Do not wash vehicles on the vehicle parking line. Wash according to paragraph 4 of this SOP.

**Figure C-1. Unit environmental SOP (continued)**

f. Ensure that no vehicle leaves the motor pool if it leaves a visible, continuous, or intermittent trail of POL on the ground (Class 3 leak).

**10. Disposal of Empty Containers and Hazardous Items.** Include information on turn-in of mufflers and exhaust pipes, brake shoes and clutch plates, fuel tanks, aerosol cans, PCB capacitor and transformers, hydraulic rams and gas cylinders, shock absorbers, oil- saturated wood and pallets, paint and paint containers, solvents and thinners, oils and greases, antifreeze, oily rags, sweeping compound, oil and fuel filters, washrack soil/sand residue, spill clean up debris and residue, and products with expiration dates.

a. Turn-in procedures. The procedures for turning in HM varies widely due to differing state and local requirements. Seek the assistance of the supporting installation and DRMO, and should information on filling out and processing the turn-in document.

b. Transport. Transportation of HW is strictly controlled. Check with the supporting installation and DRMO to determine if transport by the unit is allowed.

**11. Refueling Operations.**

a. General.

(1) Conduct tactical refueling operations at a designated logistics resupply point (LRP).

(2) Avoid conducting refueling operations in a unit's AO due to the safety hazards associated with maneuvering a fuel tanker or heavy expanded mobile tactical truck (HEMTT) and conducting grounding operations at each vehicle.

(3) Ensure that POL section personnel conduct the actual refueling whenever possible.

b. Secondary containment.

(1) Place secondary containment (large drip pans) under the vehicle and under the fuel hoses during refueling operations.

(2) Place 5-gallon fuel cans inside drip pan when refueling, for secondary containment, preventing small volume fuel spills from accumulating and contaminating the soil.

(3) Transfer spilled fuel to a labeled 5-gallon waste-fuel container, and dispose as HW.

c. Emergency equipment.

(1) Fire fighting. Supply each refueling vehicle with a minimum of two fire extinguishers. Set up fire extinguishers on each side of the tanker or HEMTT during refuel operations to expedite emergency response measures. Ensure vehicles have their basic issue inventory (BII) items.

**Figure C-1. Unit environmental SOP (continued)**

(2) Emergency eyewash. Ensure that potable water is readily available for emergency eye washing to provide first aid measures on-site in the event a spill or leak occurs during refueling operations.

(3) Personal Protective Equipment. Ensure that each refueling vehicle has two sets of PPE. Reference the MSDS for required PPE, or reference paragraph 4 at the beginning of this SOP for field-expedient PPE. Wear gloves and goggles when conducting refueling operations. Use aprons or wet weather gear to respond to a spill or repair a leak. Ensure that this equipment is available.

(4) Spill response. Ensure that a copy of the spill response plan is readily available during all refueling operations.

**12. Spills.** (See Tab A for spill response plan. You should also refer to Graphic Training Aid [GTA] 5-8-3.)

a. Protect yourself and other personnel, stop the flow, and then contain the spill. Immediately contain and report all spills that have entered or threaten to enter floor or storm drains.

b. Report all spills according to the ISCP. Reporting procedures and reportable quantities may vary from installation to installation. The unit's spill response team conducts clean up. Allow light fuel to evaporate into the atmosphere; absorb oil with dry sweep or equivalent. (See Tab A.)

c. Report POL spills larger than one gallon of heavy oil or five gallons of fuel to the installation's fire department. (Check the ISCP for any differing local requirements.)

d. Conduct spill clean up per the spill response plan at Tab A. Additional cleanup guidance will be provided when the spill is reported.

e. Maintain (on-hand) supplies and equipment (absorbent materials) appropriate for initial containment of the types of spills possible in the unit. Refer to the MSDS associated with each product, or call the HW material section of the DRMO for guidance on the necessary spill response supplies to have on hand. Spill equipment and material will be similar to that contained in Tab B.

**SECTION 2 - SUPPLY**

**1. Requisitioning**. Check with the installation's environmental office for an up-to-date list of HM and guidance on the Army's HSMS. The HSMS, with its centralized management and strict inventory control, will reduce the use and disposal of hazardous substances.

a. Requisition the minimum quantity required for mission accomplishment.

b. When processing a request for an HM, consider alternative, nonhazardous substitutes. Check with the installation's environmental office for suggestions.

c. Ensure that recoverability codes are used whenever applicable.

d. Special indications will be made for any materials that have shelf life considerations.

**Figure C-1. Unit environmental SOP (continued)**

**2. Storage.**

a. Label and segregate all HM from nonhazardous items.

b. Keep a copy of the applicable MSDS for each HM on hand in a binder in the HM supply storage area.

**3. Turn-In/Disposal**. Check with the supporting installation and DRMO for local requirements for turn-in of HW and unused HM.

a. Keep an accumulation log for each HW that is awaiting turn-in to DRMO. Identify the date each container was opened, date and quantity of each addition to the container, name of the person adding to the container, date container is filled or closed, and date of turn-in to DRMO.

b. Keep turn-in documents for HM and HW on file for two years. Keep HW manifests on file for fifty years.

**4. Paint.**

a. Do not open more than one can of each color of paint at any time.

b. Store paints indoors in a non-flammable material locker or in a POL shed. Store paints by compatibility.

c. Keep paint in original, labeled containers.

d. Maintain an MSDS in the paint locker for each type of paint stored.

e. Turn in any unopened, reusable, excess, or no longer needed paint products to the appropriate material management support activity, for redistribution or sale.

f. Store all waste paint and thinners/solvents separate from unused or good paint products.

g. Consult the installation EMO and chain of command for proper disposal of all paint.

h. Store and dispose of paint thinners (HM) as directed by the environmental office and the DRMO.

**5. Batteries.**

a. Exchange batteries on a one-for-one basis.

b. Store used batteries separately by type while awaiting turn-in; accompany with an accumulation log. Coordinate with your local installation EMO to confirm proper labeling requirements.

c. Ensure that there are no leaking batteries; handle carefully, and place leaking batteries in appropriate containers.

d. Keep turn-in documents on file for a period of two years.

**Figure C-1. Unit environmental SOP (continued)**

**SECTION 3 - NBC**

**1. Requisitioning, Storage, and Disposal/Turn-In.** (See Section 2.)

a. Process all requisitions and turn-ins through unit supply.

b. Keep a copy of the applicable MSDS for each HM on hand in a binder in the storage area.

c. Store DS2 and STB containers in dry and well-ventilated separate locations.

d. Check daily DS2 and STB containers for leaks or corrosion.

e. Overpack and turn in to DRMO any DS2 or STB container found to be leaking.

f. Properly dispose of out-of-date chemical agent testing kits as HW.

**SECTION 4 - COMMUNICATION**

**1. Requisitioning, Storage, and Disposal/Turn-In.** (See Section 2.)

**2. Batteries.**

a. Issue batteries by exchanging them with used batteries on a one-for-one basis.

b. Immediately turn in used batteries to unit supply for storage while awaiting turn-in to DRMO.

**SECTION 5 - FIELD-MESS OPERATIONS**

Field-mess personnel use M-2 burners that operate on motor gasoline (MOGAS) during field and contingency operations. The major safety and environmental issues are fuel storage, filling, and lighting operations.

**1. Fuel Storage.**

a. Store 5-gallon fuel cans closed at all times.

b. Do not attach open funnels or tubes to the containers. Maintain containers in good condition.

c. Do not use rusty or residue-covered containers. They are unsafe and unacceptable.

**2. Filling operations.**

a. Conduct filling operations on a tarp or plastic liner with a soil berm or sandbag perimeter for secondary containment in the event of a spill.

b. Immediately collect spilled fuel using an absorbent material.

**Figure C-1. Unit environmental SOP (continued)**

c. Place used absorbent material in DOT-approved containers, and dispose of as HW.

**3. Lighting operations.**

a. Conduct lighting operations at least 50 feet away from fuel storage and M-2 burner filling operations.

b. Conduct lighting operations on open soil so that any residual fuel will freely burn during the operation.

**SECTION 6 - OPERATIONS/TRAINING**

**1. Training.**

a. Provide initial environmental-awareness training to all personnel within 90 days of assignment and annually thereafter.

b. Train all personnel to accomplish their tasks according to laws and regulations and to respond properly in emergencies.

c. Train all personnel that have contact with HM or HW within 90 days of assignment and annually thereafter. Ensure that personnel who have not yet received initial environmental training are properly supervised when they work with materials potentially hazardous to themselves or the environment.

d. Document all environmental training and keep on file in the operations/training office.

e. Identify quarterly requirements for ECO training. Request training allocations from the installation's EMO for two personnel (primary and alternate) in the installation's ECO course. Request an additional training allocation when either ECO is within 90 days of departure.

**2. Risk Assessment.**

a. Complete an environmental-related risk assessment for all field training of platoon size or larger. (See Chapter 2 and Appendixes F and G.)

b. Use checklists, found in Appendix E, for long-range, short-range and near-term planning, training execution, and training evaluation as an aid in minimizing negative environmental impacts for those areas found to have high risk.

**3. Maneuver Damage.**

a. Designate a maneuver damage control officer for each field training exercise (FTX).

b. Incorporate maneuver damage considerations into the OPORD for each FTX.

c. Brief unit personnel on maneuver damage considerations and minimization measures before each exercise.

d. Include maneuver damage as a discussion topic at all AARs.

**Figure C-1. Unit environmental SOP (continued)**

**Tabs:**

A. Spill Response Plan.

B. Spill Equipment and Materials.

C. Electronic Message Report Formats.

D. Field Procedures.

E. POCs for Assistance.

**Figure C-1. Unit environmental SOP (continued)**

**TAB A – SPILL RESPONSE PLAN**

**1. Immediate Action.** A spill is defined as any quantity of petroleum product over five gallons (or according to local laws since some states are more stringent than five gallons) or any quantity of any other HW. Should a spill occur, the immediate actions are as follows:

a. Protect yourself and other personnel.

(1) Evacuate the area, if necessary, due to the type of spill.

(2) Take personal precautions as detailed on the MSDS for the material spilled.

(3) Use the proper PPE.

(4) Extinguish smoking materials and all sources of ignition.

(5) Turn off power if there is the possibility of fire.

(6) Ventilate the area.

b. Stop the flow (do it **safely**).

(1) Shut off valves, turn drums upright, and other procedures that will stop the flow, if possible.

(2) Do not take unnecessary chances, but stop the flow if it is possible without injury or contamination.

(3) Shower and change clothes as soon as possible if HW contamination occurs.

c. Contain the spill (**quickly** and **safely**).

(1) Contain the spill by throwing absorbent, floor sweep, or dirt on it.

(2) Make dams to keep the spill from spreading further, and do not let it enter storm or sewer drains, or other water ways.

(3) Divert the flow to prevent the spill from entering any water source, including drains, if containment is not possible.

d. Report the spill immediately.

(1) Report the spill to the supervisor/superior.

(2) Sound the alarm or give verbal warning.

(3) Have another person call the installation's fire department while you continuing to assess the size and severity of the spill.

(4) Immediately report to the unit ECO or the installation's environmental office spills of any HM other than a petroleum product, regardless of quantity.

**Figure C-2. Tab A – Spill-response plan to unit environmental SOP**

(5) The senior person in charge makes a copy of the pertinent MSDS for emergency response personnel in the event of a reportable spill.

e. Clean up the spill.

(1) Scoop up contaminated material and put it in a container. Mark the container with "Hazardous Waste, Contaminated Absorbent (Dirt)" if the spill occurred on concrete or asphalt and the spill was cleaned up with absorbent or dirt.

(2) Check with unit supply sergeant or the DRMO for proper disposal.

f. Replace spill equipment.

(1) Immediately after a spill is cleaned up, the spill response team's noncommissioned officer in charge (NCOIC) will account for all tools and supplies. The NCOIC will order replacement consumables (sweeping compound and rags) from unit supply. He will also identify missing property and initiate appropriate action (statement of charges or report of survey) to maintain accountability.

(2) The spill response team's NCOIC will ensure that spill kit inventories are complete before resealing the drums.

g. Maintain POC list for assistance (listed by office, name, telephone number, and building).

(1) Fire department.

(2) Installation's EMO.

(3) Unit's ECO.

**2. Response and Clean Up Instructions**.

a. Take the immediate actions in paragraph 1 above.

b. Ensure that any PPE specified in the MSDS is properly used.

c. Transfer the fluid to a serviceable container if the container is still leaking fluid.

d. Absorb the remaining spilled liquid with absorbent material. Use only the amount necessary to absorb the spill. Take remedial action if the spill is too large while waiting for the fire department.

e. Clean up the material with a nonsparking shovel or broom and place the residue in a serviceable container with a secure lid.

f. Label the container.

(1) Label the container—"POL SPILL RESIDUE"—for fuel, oil, or hydraulic fluid spills.

**Figure C-2. Tab A – Spill-response plan to unit environmental SOP (continued)**

(2) Label the container—“(Name of Chemical) SPILL RESIDUE - FLAMMABLE”—for flammable liquid spills (including solvents, paints, paint thinners, and alcohol).

(3) Label the container—“(Name of Acid) SPILL RESIDUE - ACID”—for acid spills.

g. Store the container in the HW storage area while awaiting turn-in.

h. Turn in the residue container to the DRMO.

**Figure C-2. Tab A – Spill-response plan to unit environmental SOP (continued)**

**TAB B – SPILL EQUIPMENT AND MATERIALS**

Each unit/activity should maintain a spill kit to respond to accidental releases and spills of HM. Below is a list of recommended equipment that should be maintained in the unit/activity spill kit. This list is not all-inclusive and should be expanded depending on the mission of the unit/activity. It is the responsibility of the unit/activity to purchase replacement or additional items to keep the contents of the kit stocked with necessary equipment. Additional kits must be purchased by the unit/activity that needs them, and additional quantities will be based on the likely size or frequency of potential spills.

**Hazardous Material/Hazardous Waste Supplies**

Containers (DOT or equivalent)

| NSN | ITEM |
|---|---|
| 8105-00-848-9631 | Bag, polyolefin, 5 millimeters, 36 x 54 inch |
| 8125-00-174-0852 | Bottle, plastic, 1 gallon (polyethylene) |
| 8125-00-731-6016 | 13 gallon |
| 8125-00-888-7069 | 5 gallon |
| 8110-00-254-5719 | Drum, steel, 1 gallon* |
| 8100-00-128-6819 | 1-gallon steel drum (17C)* |
| 8110-00-254-5722 | 4-gallon steel drum* |
| 8110-00-282-2520 | 5-gallon steel drum (17C)* |
| 8110-00-254-5713 | Drum, steel, 6 gallon (w/ring)* |
| 8110-01-204-8967 | Pail, shipping, steel, 5 gallon (DOT 17C)* |
| 8110-00-519-5618 | Drum, steel, 10 gallon (DOT 17C)* |
| 8110-00-753-4643 | 19-gallon steel drum (17C)* |
| 8110-00-366-6809 | 30-gallon steel drum (17C)* |
| 8110-00-030-7779 | 30-gallon steel drum* |
| 8110-00-030-7780 | 50-gallon steel drum (17C)* |
| 8110-00-823-8121 | 55-gallon steel drum (17M)* |
| 8110-00-030-9783 | Drum, steel 55 gallon (bung & vent) (DOT 17E)* |
| 8110-01-282-7615 | Drum, polyethylene, 55 gallon* |
| 8110-01-101-4055 | 85-gallon steel disposal drum (no lining)* |
| 8110-01-101-4056 | 85-gallon steel recovery drum (epoxy phenolic lining)* |
| 8110-01-101-4055 | Drum, hazardous material* |

* Refers to open top containers
For bung container refer to federal logistics (FEDLOG) or contract the G-4

**Figure C-3. Tab B – Spill equipment and materials to unit environmental SOP**

Absorbent

| NSN | ITEM |
|---|---|
| 7930-00-269-1272 | Clay, ground unit of issue (UI-bag) |
| 1939-01-154-7001 | Nonskid absorbent (UI-40 bag skid) |
| 5640-00-801-4176 | Insulation, thermal, vermiculite (UI-bag) (packing material) |
| 4235-01-423-1466 | 4 each 1 cubic foot bag |
| 4235-01-423-0711 | 1 each 1 cubic foot bag |
| 4235-01-423-1463 | 30 each 18 x 18 inch pillows |
| 4235-01-423-1467 | 20 each 2 inch x 10 foot sock |
| 4235-01-423-1465 | 10 each 4 inch x 8 foot booms |
| 4235-01-423-2787 | 10 inch x 10 foot booms |

Spill Prevention

| NSN | ITEM |
|---|---|
| 8135-00-579-6491 | Plastic sheet, clear |
| 8135-00-579-6492 | Plastic sheet, black |
| 4235-01-423-7214 | Spill kit |
| 4235-01-423-7221 | Spill kit |

**Figure C-3. Tab B – Spill equipment and materials to unit environmental SOP (continued)**

**TAB C – ELECTRONIC MESSAGE REPORT FORMATS**

**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 _____ | (DTG) |
| LINE 2—UNIT _____ | (Unit making report) |
| LINE 3—LOCATION _____ | (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) |

**Figure C-4. Tab C – Electronic message report formats to unit environmental SOP**

2. ( ) Electronic Spill Report Message Format.

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. NOTE: 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) |

**Figure C-4. Tab C – Electronic message report formats to unit environmental SOP (continued)**

Appendix D

# Sources of Environmental Assistance

Trained professionals are available within each unit, organization, or installation. Should soldiers, Marines, or their leaders require additional information or assistance, they must seek help immediately. In general, a POC should be located at the installation's environmental office, normally a part of the DPW at Army installations, the facilities or base engineer office on Marine Corps installations, or the STARC for the NG. Additional assistance is available from the DOL (Army) or the G4 (Marine Corps), the safety office, and the supporting DRMO. Within the chain of command, the key personnel are the ECO and the HW coordinator. These personnel are found at company level and above. Since these duties are performed as an additional duty at company and battalion levels, the responsible personnel may be in any of a variety of offices. This appendix contains additional POCs that may be useful.

## BASOPS/SUPPORTING INSTALLATION STAFF ASSISTANCE

### ENVIRONMENTAL MANAGEMENT OFFICE

The EMO is staffed with scientists and engineers responsible for developing and implementing the installation's environmental programs. This office is usually a division within the installation DPW for the Army, the Directorate of Engineering for the USMC, or the Facilities Management Office (FMO) of the STARC for the NG. The installation's environmental program includes the following five general components, and many EMOs are organized accordingly:

- Compliance elements monitor current operations, and ensure that units follow environmental guidelines.
- Pollution prevention elements manage installation initiatives such as source reduction, HW minimization, recycling, and materials substitution.
- Natural and cultural resources management elements manage installation conservation initiatives for forests, wildlife, wetlands, and historical resources.
- Restoration elements manage clean up of contamination sites on the installation.

- Planning and documentation elements address possible environmental impacts of future operations and activities.

### DIRECTORATE OF LOGISTICS/G4

Responsibilities of Army DOLs/G4s, or Marine Corps G4s, include management of POL and HM. The directorate/staff section also exercises environmental control and oversight of HM (including ammunition) maintenance, transportation, and storage activities.

### DIRECTORATE OF PLANS, TRAINING, AND MOBILIZATION/G3

Responsibilities of Army DPTMs/G3s, or Marine Corps G3s, include installation/unit operations and training. These offices coordinate all training activities, including budgeting, development and maintenance of training areas, the ITAM program, and mission priorities. The DPTM also coordinates the range division and has overall responsibility for range operations, maintenance, and construction.

### STAFF JUDGE ADVOCATE

The SJA provides legal advice and assistance in the interpretation and application of environmental laws and rules to installation activities. This process/serviceis particularly important when assessing the environmental impact of a new initiative (such as construction).

### PUBLIC AFFAIRS OFFICER/G5

The PAO is the official spokesperson for the installation/unit and manages public involvement activities and responses (particularly during public controversy) in close coordination with other key installation/unit members. This is particularly important when assessing the environmental impact of a new initiative (such as construction).

### OCCUPATIONAL AND SAFETY HEALTH OFFICE

OSHA works closely with the environmental staff on programs to help prevent accidents that could threaten or damage human health and the environment. Hazard communication, MSDSs, and OSHA-mandated training are the purview of the safety office.

### PREVENTIVE MEDICINE OFFICE/SURGEON

The preventive medicine office is the POC for the medical monitoring program and work-related health problems. This office, often co-located with medical units or hospitals, can provide critical information concerning public health issues, such as the use of pesticides.

### FIRE DEPARTMENT

The fire department provides fire fighting and spill response support to the installation. In many instances, the fire department will have highly trained spill response personnel who provide expert advice on spill reaction measures.

### DEFENSE REUTILIZATION AND MARKETING OFFICE

The DRMO works closely with DPW and DOL to store and provide for disposal of solid waste, including HW generated at the installation.

This DOD organization becomes critical to units attempting to turn in potentially hazardous substances or HM. Unit personnel having questions on turn-in procedures for potentially hazardous substances or HM should check with the receiving DRMO facility to determine documentation and packaging requirements.

## SOURCES OF ASSISTANCE DURING TACTICAL OPERATIONS

While units may be able to benefit from the assistance of standard installation or BASOPS support during tactical operations, the likelihood is that they will only be minor, perhaps supporting players to provide assistance. Tactical operations will shift more support requirements to operational staffs rather than installation staff support. Identified below are some of those likely/potential sources of assistance.

### OPERATIONAL/DEPLOYMENT STAFF ASSISTANCE

The unit staff takes on a much larger role in environmental assistance when a unit is deployed or in an operational status. The load will tend to rest on these staffs (see Chapter 1 for a discussion of unit staff responsibilities) in the cases of deployment to relatively remote, OCONUS locations. As time goes on and the duration of stay increases, it is very likely that the command will establish organizations like the BCCA and its subordinate BCAT. These organizations will provide tactical/operational commanders with the military environmental protection support they need.

### BCCA AND BCAT

These two organizations have become de facto doctrinal organizations to support the needs of the commander when units are deployed outside of established locations throughout the world. The concept was developed and successfully tested by United States Army Europe (USAREUR). These organizations perform an important and vital role that essentially replaces the roles performed by installation staffs, but in a tactical/operational arena. They may draw on resources from either home base or theater installation sources, but they are tactical/operational locations such as base camps (which they typically support) and are not installations, but tactical/operational sites. See CALL Newsletter 99-9, *Integrating Military Environmental Protection*, for insights into how these organizations provide assistance in a tactical/operational setting.

### JOINT ENVIRONMENTAL MANAGEMENT BOARD (JEMB)

Operational or tactical Army or Marine Corps units may operate in the theater or as part of a joint task force and be required to interface with the actions of a temporary board, the JEMB, that the joint commander or his designated CJTF may activate. The JEMB establishes policies, procedures, priorities, and the overall direction for environmental management requirements in the theater according to overseas baseline environmental guidance and/or the final governing standards in effect for the countries within the AOR. If appropriate, the board may assume responsibility for the preparation of the environmental management support plan. The JEMB is spelled out in JP 3-34.

### HOST NATION (HN)

Depending on the capabilities of the HN and agreements that have been made, HN support to the tactical/operational commander is possible. Senior level staffs will typically be the ones to initiate and secure this type of support.

### CONTRACTOR SUPPORT

Environmental support assistance for the tactical/operational commander may be provided by a contractor. This type of contracting has already occurred in places like Bosnia. Coordination for this support will likely come through the BCCA, the US Army Corps of Engineers, or a similar agency with contracting capability.

### CENTER FOR ARMY LESSONS LEARNED (CALL) DATABASE

The database at the CALL is beginning to add data that supports the needs of the commander in the area of military environmental protection. A host of lessons learned and examples of other units' actions/experiences are becoming available for use.

Web site: http://call.army.mil/call.html.

## OTHER SOURCES OF ASSISTANCE

Regardless of your location there are a series of sources of assistance that are available to you if you have the ability to phone or contact them by e-mail, or other electronic means. Others can be easily identified through the use of the Defense Environmental Network and Information Exchange (DENIX) website.

### MARINE ENVIRONMENTAL HOME PAGE

Web site: http://www.usmc.mil/environmental.

## DEFENSE ENVIRONMENTAL NETWORK AND INFORMATION EXCHANGE (DENIX)

Operated by DOD, this website is sponsored by the Department of Environmental Security Corporate Information Management.

It provides timely access to environmental legislative compliance, restoration, clean up and DOD guidance information.

- Web site: http://ww.denix.osd.mil/

Appendix E

# Environmental Planning Guidelines

This appendix provides guidelines for units to integrate environmental concerns into all phases of operations planning and activities. Unit leaders must consider the environmental impact of unit actions and plan to eliminate or minimize negative effects. These guidelines should be reviewed with installation environmental offices and operational staffs. Once supplemented with state, local, federal, or HN environmental requirements, these guidelines serve as a tool to assist unit leaders in integrating environmental considerations into unit operations.

## PRE-OPERATIONS GUIDELINES

### GENERAL

- Include environment considerations in the METT-TC process.
- Include forecasted weather considerations in planned training.
- Include alternative missions in case environmental conditions or considerations change.

### OPERATIONS PREPARATION

- Review the OPLAN/OPORD for environmental requirements and/or considerations.
- Ensure a recent environmental risk assessment has been performed.
- Confirm coordination with the installation and operational staffs concerning applicable environmental laws, regulations, and considerations.
- Determine whether a recent site reconnaissance has been performed.
- Conduct rehearsals to ensure that all safety and environmental considerations are satisfied.
- Review the environmental protection portion of the unit's SOP, especially the areas concerning spill response and reporting.
- Make provisions for handling medical wastes.

**OPERATIONS PREPARATION (CONTINUED)**

- Make provisions for handling human and solid wastes.
- Check to ensure HM (explosives/POL) are properly labeled and that an MSDS is on hand for each substance before transporting.
- Have tools, equipment, and materials available to respond to environmental emergencies.
- Ensure personnel designated for the spill response team(s) are properly trained and aware of their assignment.
- Ensure team members are aware of the procedure for requesting additional spill assistance, if required.

**AREA OF OPERATION**

- Review previous AARs for environmental lessons learned concerning the AOs and mission type. Plan preventive measures.
- Obtain land use permits, range clearances, and any other unique requirements.
- During the site reconnaissance verify areas of environmental concern.
- Ensure coordination has been made to perform an EBS.

**PERSONNEL PREPARATION**

- Ensure soldiers/Marines understand their responsibilities in reducing generation of HW and minimizing damage to the environment.
- Brief all soldiers/Marines on range or maneuver restrictions; endangered species; vegetation use; and archaeological, cultural, and historic resources considerations.
- During planning discuss the identified environmental risks.

**CHAIN OF COMMAND**

- Appoint and train an ECO and an alternate, and involve them in planning.
- Brief the plan to the next higher commander and the operations officer.
- Review the risk assessment and have it approved by the appropriate commander.

## GUIDELINES DURING OPERATIONS

### GENERAL

- Forward the EBS to higher HQ after it has been performed.
- Ensure all unit personnel comply with "off-limits" area restrictions.
- Verify units dig (fighting positions, tank ditches) only in approved areas.
- Ensure all soldiers/Marines know and comply with special environmental requirements.
- Use downtime for conducting opportunity training on environmental concerns.
- Ensure leaders monitor high risk operations and activities.
- Report spills and maneuver damage to the appropriate HQ immediately.
- Verify leaders are making on-the-spot corrections.
- Conduct periodic ECRs as necessary and pass them to the appropriate HQ in a timely fashion.

### NOISE REDUCTION

- Ensure leaders are explaining and marking noise restricted areas.
- Ensure units are complying with community/installation noise abatement hours.

### MINIMIZING VEHICLE MOVEMENT DAMAGE

- Ensure personnel drive vehicles on secondary roads and bypasses whenever possible to minimize off-road damage.
- Ensure personnel move vehicles into bivouac or assembly areas in columns.
- Designate personnel to remove mud and debris from roadways.
- Drive carefully in wooded areas to avoid vehicle damage to vegetation.
- Stay on marked trails and routes when driving off-road, minimizing cross-country movement.
- Cross streams and ditches only at approved crossings.

### WETLANDS (MARSHES, SWAMPS, BOGS)

- Obtain a special permit (if required) to train in wetland areas.

- Ensure sensitive and “off-limits” areas are designated, well marked, and avoided.
- Limit the use of vehicles and other destructive activities whenever possible.
- Ensure drivers use designated bridges and crossing sites.
- Ensure units observe prohibitions against discharging wastewater into wetlands or waterways.
- Prohibit refueling or field maintenance operations near or in wetlands or surface waters.
- Ensure units are observe prohibition against filling any wetlands areas.

**THREATENED/ENDANGERED SPECIES AND OTHER PROTECTED WILDLIFE, VEGETATION AND HABITAT**

- Ensure soldiers/Marines exercise due care to avoid disturbing threatened and endangered species, habitats, and sensitive areas.
- Verify sensitive areas are marked.

**CULTURAL RESOURCES**

- Ensure units avoid digging in or near sites or structures designated as cultural resources.
- Verify soldiers/Marines follow instructions not to modify or destroy these sites in any way.
- Confirm soldiers/Marines understand that destroying or defacing archaeological sites, including collection of artifacts, is a violation of the law.
- Ensure soldiers/Marines immediately report the discovery of any artifacts and wait for clearance to resume training.

**CAMOUFLAGE**

- Ensure units exercise care to prevent ground covering from being stripped of vegetation.
- Verify units are using camouflage nets instead of live vegetation, whenever possible.
- Brief soldiers/Marines concerning the local guidance on the use of vegetation for camouflage.

### WASTE DISPOSAL

- Ensure each unit polices its area.
- Establish designated collection points for proper trash disposal.
- Dispose of field kitchen wastes only as authorized.
- Dispose of medical and human wastes in an approved manner.
- Verify units are disposing of liquid waste from kitchens, showers, and baths correctly.
- Ensure units properly dispose of reverse osmosis water purification unit (ROWPU) discharges.

### HM AND HW HANDLING

- Comply with the installation EMO procedures for the turn-in and disposal of HW.
- Obtain approval before using CS and smoke.
- Properly mark and report unexploded munitions.
- Minimize the use of hazardous chemicals.
- Place HW and POL waste products in separate containers.
- Deliver HW and POL waste products to a designated waste collection point.
- Do not dump POL and vehicle maintenance waste products into sewers, ditches, or streams.
- Have spill teams available on site.
- Confirm adequate spill response equipment and material is available.
- Ensure spill teams are responding immediately to reported spill locations.
- Report spills as required by local regulations and unit SOP.

### REFUELING AND MAINTENANCE

- Refuel vehicles only at designated sites.
- Protect ground surfaces by using POL-drip pans.
- Use POL-absorbing compounds during refueling operations.

### RECOVERY OPERATIONS

- Use only designated vehicle wash facilities and equipment.
- Confirm fighting positions, gun emplacements, and other excavated areas are properly refilled.
- Collect communications and obstacle wires.
- Properly police and remove all wastes and recyclables (litter, ammo brass).
- Mark and report unexploded munitions.
- Report, contain, and clean up hazardous spills according to directives.
- Inspect all sites before departing the AO.
- Perform a closure EBS to document the condition of the AO before departure.

## POST-OPERATIONS GUIDELINES

### GENERAL

- Conduct AARs following each phase of the operation.
- Evaluate performance of environmental tasks.
- Identify weaknesses in performance of environmental tasks.
- Discuss compliance with environmental policies.
- Evaluate soldiers/Marines individual proficiency in following environmental requirements.
- Develop a plan to train identified shortfalls.

**Appendix F**

# Risk Management Worksheet

This risk management worksheet is a tool that leaders may use to track and document risk. The worksheet (Figure F-1) provides a logical starting point to track the process. Figure F-2, page F-2, provides instructions for the worksheet. Planners use the worksheet to document risk management steps taken during planning, preparation, and execution of all training and combat missions and tasks. It is important to remember that this form can be used to track all risk, not just environmental-related risk. Appendix G provides a practical application of documenting and tracking risk during an operation. Figure F-3, page F-3, is a reproducible risk management worksheet.

| A. Mission or Task: | B. Date/Time Group<br>Begin:<br>End: | C. Date Prepared: |
|---|---|---|
| D. Prepared By: (Rank, Last Name, Duty Position) | | |

| E. Task: | F. Identify Hazards: | G. Assess Hazards: | H. Develop Controls: | I. Determine Residual Risk: | J. Implement Controls ("How To"): |
|---|---|---|---|---|---|
| | | | | | |

K. Determine overall mission/task risk level after controls are implemented (circle

LOW (L) MODERATE (M) HIGH (H) EXTREMELY HIGH (E)

**Figure F-1. Sample risk management worksheet**

| Worksheet Instructions | |
|---|---|
| Block | |
| A - E | Self-explanatory. |
| F | Identify Hazards - identify hazards by reviewing METT-TC factors for the mission or task. Additional factors include historical lessons learned, experience, judgment, equipment characteristics and warnings, and environmental considerations. |
| G | Assess Hazards - assessment includes historical lessons learned, intuitive analyses, experience, judgment, equipment characteristics and warnings, and environmental considerations. Determine initial risk for each hazard by applying the risk assessment matrix Figure 2-12, page 2-25. Enter the risk level for each hazard. |
| H | Develop Controls - develop one or more controls for each hazard to either eliminate the hazard or reduce the risk (probability and/or severity) of a hazardous incident. Specify who, what, where, when, and how for each control. Enter controls. |
| I | Determine Residual Risk - determine the residual risk for each hazard by applying the risk assessment matrix Figure 2-12, page 2-25. Enter the residual risk level for each hazard. |
| J | Implement Controls - decide how each control will be put into effect or communicated to the personnel who will make it happen (written or verbal instruction: tactical, safety, garrison SOPs, rehearsals). Enter controls. |
| K | Determine Overall Mission/Task Risk - select the highest residual risk level and circle it. This level becomes the overall mission or task risk level. The commander decides whether the controls are sufficient to accept the residual risk. If the risk is too great to continue the mission or task, the commander directs development of additional controls or modifies, changes, or rejects the COA. |
| | Supervise and Evaluate - this last step is not on the worksheet. Plan how each control will be monitored for implementation (continuous supervision, spot checks), and reassess hazards as the situation changes. Determine if the controls worked and if they can be improved. Communicate lessons learned. |

**Figure F-2. Instructions for risk management worksheet**

| A. Mission or Task: | B. Date/Time Group<br>Begin:<br>End: | C. Date Prepared: |
|---|---|---|
| D. Prepared By: (Rank, Last Name, Duty Position) | | |

| E. Task: | F. Identify Hazards: | G. Assess Hazards: | H. Develop Controls: | I. Determine Residual Risk: | J. Implement Controls ("How To"): |
|---|---|---|---|---|---|
| | | | | | |

K. Determine overall mission/task risk level after controls are implemented (circle one):

**LOW (L)** **MODERATE (M)** **HIGH (H)** **EXTREMELY HIGH (E)**

Figure F-3. Risk management worksheet

Appendix G

# Practical Application of Assessing Environmental-Related Risk

This appendix provides a practical application of assessing environmental -related risk. This exercise uses the five-step process of risk management described in Chapter 4. This exercise also employs the risk management worksheet to document and track risk. Although the following scenario depicts a field training exercise (FTX), units use these procedures to assess environmental-related risk during all operations. This scenario concentrates specifically on environmental-related risk; however, these risks are incorporated into the company's overall risk management plan.

The 586th Assault Float Bridge (AFB) Company will conduct a five-day FTX in Anatuvak training area of Camp Yukon. The unit will depart Fort Chilly and convoy 120 miles on limited access highways. The commander has designated rest areas and tactical refueling points along the route. The trip is expected to take 8 hours. Upon arrival at Camp Yukon, the unit will move into the Anatuvak training area and set up a bivouac site, preceeded by their quartering party. During the FTX, the company will conduct tactical bridging operations on the Yukon River. The FTX will involve normal operations (12 to 16 hours a day), with some night and limited visibility operations. The operations will include the use of pyrotechnics and blank ammunition, but no live fire will be conducted. The area has hills, wetlands, several winding streams, and one large river. The wetlands are identified and marked. The forecasted weather will not adversely affect operations. The soldiers are somewhat familiar with the terrain, which contains some identified and marked off archaeological sites. The training area contains the habitat for two endangered species, which are marked and posted. The unit will conduct unit maintenance, refueling, messing, shower, and field sanitation operations within the bivouac site.

## STEP 1. IDENTIFY (ENVIRONMENTAL) HAZARDS

To ensure risk management throughout the operation, the unit's XO (Lieutenant Young) conducted an operational analysis to break down the exercise into events, allowing him to manage the risks for the various tasks. He also identified particular tasks for the operation using the company's mission training plan (MTP). Figure G-1, page G-1 illustrates the unit's prepared operational analysis.

Leaders developed the hazard list using their experience, lessons learned, unit SOPs, applicable references, and guidance from the chain of command. The unit consulted Fort Chilly's and Camp Yukon's installation and operational staffs to obtain more information on the environmental considerations for the area of operations. They identified applicable environmental standards, laws, and ROE that effected the mission.

Company leaders annotated each task and associated environmental hazards on the risk management worksheet in Figure G-2, page G-4, sections E and F. For the purposes of this practical example, only the high profile tasks (2, 3, and 4) are detailed in the worksheet.

1. Conduct preexecution checks.
2. Conduct convoy operations to Camp Yukon.
3. Establish a bivouac:
    - Conduct quartering party operations.
    - Establish a defensive perimeter.
    - Conduct refueling operations.
    - Conduct mess operations.
    - Establish field latrines.
    - Establish field maintenance operations.
4. Plan and direct assault float bridge (AFB) construction.
5. Prepare for redeployment.
6. Conduct convoy operations to Ft. Chilly.
7. Conduct recovery operations.
8. Conduct AAR.

**Figure G-1. Operational analysis**

## STEP 2. ASSESS (ENVIRONMENTAL) HAZARDS

Unit leaders assessed each hazard to determine the risk for potential harm to the environment. Their assessment was based upon how often the environmental hazard occurred during the operation (probability) and what effect the hazard had on the environment (severity). They used the probability and severity definitions from Figures 2-10 and 2-11, page 2-21 and 2-22. Leaders determined the initial risk of each hazard by applying the risk assessment matrix in Figure 2-12, page 2-22 and 2-23. The unit commander informed his staff to be sensitive to tactical bridging operations and their effects on the Yukon River and surrounding areas. Each hazard assessment was annotated in section G, (Figure G-2, page G-2). See Figures G-2 through G-7, pages G-3 to G-8, for samples of a completed worksheet.

## STEP 3. DEVELOP CONTROLS AND MAKE A DECISION

Unit leaders developed controls to eliminate or reduce the probability or severity of each hazard. They identified a mix of educational-, physical-, and avoidance-type controls and annotated them in section H (Figure G-2). Once all risk control measures were in place, some risk remained. This residual risk was annotated in section I (Figure G-2). Unit leaders informed the chain of command and appropriate commander of the residual risk and its implications for the operation. The commander was concerned about the environmental hazards associated with the bridging operations and directed his staff to consider additional controls. The staff developed additional controls and presented the revised risk assessment to the commander, thereby further reducing the residual risk. The commander agreed that the new controls were sufficient and decided the residual risk was acceptable.

## STEP 4. IMPLEMENT CONTROLS

Leaders identified how each control would be implemented and assigned responsibility to unit personnel. The "how to" for each control was annotated in section J (Figure G-2). For example, fueling bridge boats during bridging operations was a major concern for the company. Leaders identified several control measures to include ensuring that operators were properly trained to dispense fuel, appropriate spill equipment was available, and all fueling of boats was completed while the boats were still on the trucks before launch. This step required leaders to anticipate environmental requirements and incorporate them as part long-range, short-range, and near-term planning. The residual risk determination was annotated in section K (Figure G-2).

## STEP 5. SUPERVISE AND EVALUATE

Leaders and staff continuously monitored controls throughout the operation to ensure their effectiveness and modified controls as required. Leaders made on-the-spot corrections and evaluated individual and collective performances. They held those in charge accountable and ensured that all tasks were performed to applicable standards. Leaders discussed the evaluation of environmental-related hazards, controls, soldier performance, and leader supervision during AARs to ensure the development of environmental lessons learned, for use in future operations.

## SUMMARY

The 586th AFB Company leadership properly managed environmental-related risk during their operation by accurately identifying potential environmental hazards, developing controls, making risk decisions, implementing controls, and ensuring proper supervision and evaluation. Due to effective risk management, the company successfully completed the mission and minimized their company's impact on the environment.

Remember to look at the linkage of the environmental hazard assessment and its associated impact on safety, force protection, and force health protection as part of your overall risk management plan.

| A. Mission or Task: | B. Date/Time Group | C. Date Prepared: |
|---|---|---|
| 586th Engineer Company FTX | Begin: 010600RJunXX<br>End: 061200RJunXX | 22 May XX |

**D. Prepared By:** (Rank, Last Name, Duty Position) 1LT Young, XO

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| E. Task: | F. Identify Hazards: | G. Assess Hazards: | H. Develop Controls: | I. Determine Residual Risk: | J. Implement Controls ("How To"): |
|---|---|---|---|---|---|
| Conduct convoy operations from Fort Chilly to Camp Yukon | Vehicle accidents and breakdowns causing spill of fuel and HM | Moderate (M) | 1. Train all drivers on proper actions to take during a spill.<br>• Protect yourself and other personnel.<br>• Stop the flow.<br>• Notify chain of command.<br>• Confine the spill.<br>2. Provide vehicle spill equipment. | Low (L) | TACSOP, para 8(a), OPORD - train all drivers before the exercise. Supply NCO will order and issue vehicle spill equipment. Platoon leaders will brief all soldiers before the convoy. (ARTEP 5-145-32. MTP 05-2-1030). |
| | Spills during refueling stops | Moderate (M) | 1. Train all fuel handlers on proper refueling procedures.<br>2. Provide spill equipment.<br>3. Ensure that only fuel handlers will dispense fuel.<br>4. Locate refueling sites away from bodies of water and wetland areas. | Low (L) | TACSOP, para 11(a), OPORD - support platoon leader will check status of spill equipment and brief all soldiers before the convoy on refueling procedures. (FM 10-71, FM 3-100.4, ARTEP 5-145-32, MTP 05-2-1024). |
| | Maneuver damage from off-road movement | Moderate (M) | 1. Brief all drivers to stay on primary and secondary roads.<br>2. Identify all sensitive areas and habitat along the route.<br>3. Conduct prior route recon. | Low (L) | TACSOP, para 9(a), OPORD - provide all drivers with strip map marking route and sensitive areas; leaders account for all vehicles at halts. (ARTEP 5-145-32, MTP 05-2-1030). |

**K. Determine overall mission/task risk level after controls are implemented (circle one):**

**LOW (L)  MODERATE (M)  HIGH (H)  EXTREMELY HIGH (E)**

Figure G-2. Sample of completed worksheet for tactical bivouac

| A. Mission or Task: | B. Date/Time Group | C. Date Prepared: |
|---|---|---|
| 586th Engineer Company FTX | Begin: 010600RJunXX<br>End: 061200RJunXX | 22 May XX |

D. Prepared By: (Rank, Last Name, Duty Position) 1LT Young, XO

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| E. Task: | F. Identify Hazards: | G. Assess Hazards: | H. Develop Controls: | I. Determine Residual Risk: | J. Implement Controls ("How To"): |
|---|---|---|---|---|---|
| Establish a tactical bivouac | Maneuver damage from off-road movement | Moderate (M) | 1. Use quartering party to direct vehicles and equipment into the bivouac site.<br>2. Identify and mark all sensitive areas within the bivouac area.<br>3. Avoid using areas with endangered and threatened species.<br>4. Provide maneuver-damage control team. | Low (L) | TACSOP, para 11a), OPORD - XO will lead quartering party, Camp Yukon range control map. (ARTEP 5-145-32, MTP 05-2-0908, FM 71-1, FM 20-400). |
| | Spills from tactical refueling operations | Moderate (M) | 1. Train all fuel handlers on proper refueling procedures.<br>2. Provide spill equipment.<br>3. Ensure that only fuel handlers will dispense fuel.<br>4. Locate refueling sites away from bodies of water and wetland areas. | Low (L) | TACSOP, para 11(a), OPORD - support platoon leader will check status of spill equipment and brief all soldiers before the convoy on refueling procedures. (FM 10-71, FM 3-100.4, ARTEP 5-145-32, MTP 05-2-1024). |
| | HM spills from vehicle-maintenance operations | Moderate (M) | 1. Brief all personnel on proper waste-accumulation site and field PMCS procedures.<br>2. Provide spill equipment.<br>3. Provide secondary containment for all drums and containers. | Low (L) | TACSOP, para 12(a), OPORD - TM 38-410, Camp Yukon Environmental and Range regulations. (FM 43-5, ARTEP 5-145-32, MTP 05-2-1131, ARTEP 5-145-32, MTP 05-2-1005). |

K. Determine overall mission/task risk level after controls are implemented (circle one):

LOW (L) MODERATE (M) HIGH (H) EXTREMELY HIGH (E)

Figure G-3. Sample of completed worksheet for tactical bivouac (continued)

| A. Mission or Task: | B. Date/Time Group | C. Date Prepared: |
|---|---|---|
| 586th Engineer Company FTX | Begin: 010600RJunXX<br>End: 061200JunXX | 22 May XX |

D. Prepared By: (Rank, Last name, Duty Position)
1 LT Young, XO

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| E. Task: | F. Identify Hazards: | G. Assess Hazards: | H. Develop Controls: | I. Determine Residual Risk: | J. Implement Controls ("How To"): |
|---|---|---|---|---|---|
| Establish a tactical bivouac (continued) | Digging in sensitive and restriced areas | Moderate (M) | 1. Dig only in approved areas confirmed by range control.<br>2. Identify and mark all sensitive areas and habitats within the AO.<br>3. Site all fighting positions to avoid sensitive areas.<br>4. Fill in all excavations upon departure. | Low (L) | TACSOP, para 7(a), OPORD – FM 7-10, Camp Yukon Environmental and Range Regulations (ARTEP 5-145-32, MTP 05-2-0913). |
| | Starting range and training area fires | Moderate (M) | 1. Inform soldiers that no open fires are allowed.<br>2. Provide fire-prevention equipment at refueling, messing, maintenance, and other specified locations in OPORD.<br>3. Brief soldiers on the proper use of pytotechnics, smoke pots, and grenades. | Low (L) | TACSOP, para 7(a), OPORD – FM 7-10, Camp Yukon Environmental and Range Regulations (ARTEP 5-145-32, MTP 05-2-0917). |
| | Polluting water sources form field latrines and mess operations | Moderate (M) | 1. Coordinate for "port-a-potty" units from range control.<br>2. Recover all mess operations waste (grease, trash).<br>3. Inform soldiers of proper field sanitation techniques.<br>4. Train field sanitation teams.<br>5. Establish trash collection points. | Low (L) | TACSOP, para 7(a), OPORD – FM 7-10, Camp Yukon Environmental and Range Regulations (FM 21-10, FM 10-23, ARTEP 5-145-32, MTP 05-2-1031, ARTEP 5-145-32, MTP 05-2-1009). |

K. Determine overall mission/task risk level after controls are implemented (circle one):

LOW (L) MODERATE (M) HIGH (H) EXTREMELY HIGH (E)

Figure G-4. Sample of complete worksheet for tactical bivouac (continued)

| A. Mission or Task: | B. Date/Time Group | C. Date Prepared: |
|---|---|---|
| 586th Engineer Company FTX | Begin: 010600RJunXX<br>End: 061200RJunXX | 22 May XX |

D. Prepared By: (Rank, Last Name, Duty Position) 1LT Young, XO

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| E. Task: | F. Identify Hazards: | G. Assess Hazards: | H. Develop Controls: | I. Determine Residual Risk: | J. Implement Controls ("How To"): |
|---|---|---|---|---|---|
| Establish a tactical bivouac (continued) | Leaving litter and debris in training areas | Moderate (M) | 1. Ensure that leaders conduct daily inspections of the bivouac area.<br>2. Brief soldiers on trash-collection points and procedures.<br>3. Conduct periodic police calls of area.<br>4. Ensure that leaders account for all equipment, supplies, wire, trash, and wastes before departing an area. | Low (L) | TACSOP, para 7(a), OPORD - FM 7-10, Camp Yukon Environmental and Range Regulations - First Sergeant will coordinate training area final inspection with range control. |

K. Determine overall mission/task risk level after controls are implemented (circle one):

LOW (L) MODERATE (M) HIGH (H) EXTREMELY HIGH (E)

Figure G-5. Sample of completed worksheet for tactical bivouac (continued)

| A. Mission or Task: | B. Date/Time Group | C. Date Prepared: |
|---|---|---|
| 586th Engineer Company FTX | Begin: 010600RJunXX<br>End: 061200RJunXX | 22 May XX |

D. Prepared By: (Rank, Last Name, Duty Position) 1LT Young, XO

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| E. Task: | F. Identify Hazards: | G. Assess Hazards: | H. Develop Controls: | I. Determine Residual Risk: | J. Implement Controls ("How To"): |
|---|---|---|---|---|---|
| Plan and direct assault float-bridge construction | Maneuver damage and erosion to entry and exit banks | High (H) | 1. Conduct operations only in approved areas.<br>2. Use recon party to identify and mark all sensitive areas and routes within the AO.<br>3. Use vehicle guides to direct vehicles and equipment into the AO.<br>4. Control vehicle speeds and movements.<br>5. Harden and stabilize entry and exit points to minimize erosion and maximize mobility. | Moderate (M) | TACSOP, para 13(a), OPORD - FM 90-13, Camp Yukon Environmental and Range Regulations (TM 5-5420-209-12, TM 5-1940-277-10, ARTEP 5-145-32, MTP 05-2-0605). |
| | Spill into river from over-the-water boat refueling and fueling of tactical vehicles near river | High (H) | 1. Train all fuel handlers on proper refueling procedures.<br>2. Provide spill equipment.<br>3. Ensure that only fuel handlers will dispense fuel.<br>4. Locate refueling site away from bodies of water and wetland areas.<br>5. Ensure that there will be no over-the-water refueling. | Moderate (M) | TACSOP, para 13(a), OPORD - FM 90-13, Camp Yukon Environmental and Range Regulations (FM 10-71, TM 5-5420-209-12, TM 5-1940-277-10, ARTEP 5-145-32, MTP 05-2-0605). |
| | Oil and greasy water bilged from bridge-erection boats into river | High (H) | 1. Brief all boat operators concerning proper bilging procedures.<br>2. Provide spill equipment for each boat.<br>3. Steam clean each engine compartment before FTX. | Moderate (M) | TACSOP, para 13(a), OPORD - FM 90-13, Camp Yukon Environmental and Range Regulations (TM 5-5420-209-12). |

K. Determine overall mission/task risk level after controls are implemented (circle one):

LOW (L) MODERATE (M) HIGH (H) EXTREMELY HIGH (E)

Figure G-6. Sample of completed worksheet for float-bridge construction

| A. Mission or Task: | B. Date/Time Group | C. Date Prepared: |
|---|---|---|
| 586th Engineer Company FTX | Begin: 010600RJunXX<br>End: 061200RJunXX | 22 May XX |

**D. Prepared By:** (Rank, Last Name, Duty Position) 1LT Young, XO

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| E. Task: | F. Identify Hazards: | G. Assess Hazards: | H. Develop Controls: | I. Determine Residual Risk: | J. Implement Controls ("How To"): |
|---|---|---|---|---|---|
| Plan and direct assault float-bridge construction (continued) | Maneuvering in threatened and endangered species habitat and archaeological sites | High (H) | 1. Conduct operations only in approved areas.<br>2. Use recon party to identify and mark all sensitive areas and routes within the AO.<br>3. Use vehicle guides to direct vehicles and equipment into the AO.<br>4. Control vehicle speeds and movements. | Moderate (M) | TACSOP, para 10(a), OPORD - Camp Yukon Range Control Map, Camp Yukon Environmental and Range regulations. (ARTEP 5-145-32, MTP 05-2-0410, FM 5-36, FM 3-100.4. |
| | Use of smoke pots and grenades in sensitive habitat areas and civilian population areas | High (H) | 1. Brief all leaders on proper use and deployment of smoke pots and grenades.<br>2. Use smoke only in approved areas.<br>3. Coordinate with range control before smoke operations.<br>4. Observe and calculate atmospheric effects on the dispersion and direction of the smoke areas.<br>5. Stop smoke operations immediately if atmospheric conditions change, or when notified by range control. | Moderate (M) | TACSOP, para 13(a), OPORD - Camp Yukon Environmental and Range Regulations. (FM 3-50, ARTEP 5-145-32, MTP 05-2-0917). |
| | Washing vehicles and equipment in or around water sources | Moderate (M) | 1. Inform all leaders to conduct vehicle and equipment cleaning only at approved washracks before departure from Camp Yukon.<br>2. Ensure that leaders will inform and supervise soldiers. | Low (L) | TACSOP, para 14(a), OPORD - Camp Yukon Environmental and Range Regulations. |

**K. Determine overall mission/task risk level after controls are implemented (circle one):**

LOW (L) MODERATE (M) HIGH (H) EXTREMELY HIGH (E)

Figure G-7. Sample of completed worksheet for float-bridge construction(continued)

**Appendix H**

# Unit Environmental Self-Assessment

This appendix provides a generic checklist for leaders to assess the state of their unit's environmental program and the unit's compliance with environmental laws and regulations. Leaders should check with their installation/operational staffs to incorporate applicable state, local, or HN environmental regulations. Once supplemented, this list serves as a tool to conduct a unit's environmental self-assessment. All "no" responses will require corrective action. A more comprehensive assessment (if desired) can be conducted using ECAS or ECE checklists available from the installation or by requesting a courtesy visit from the installation environmental office.

| YES | NO | I. Management |
|---|---|---|
| | | 1. Is an ECO appointed in writing? |
| | | 2. Is the ECO properly trained as soon as possible after the duty assignment? |
| | | 3. Does the ECO maintain a file containing applicable references, appointing orders, inspection records, and training documents for the last 24 months? |
| | | 4. Have all soldiers/Marines received the required environmental training? Is that training documented? |
| | | 5. Does the unit's SOP cover spill prevention and response? |
| | | 6. Does the unit's SOP cover the use of the MSDS? |
| | | 7. Does the unit SOP cover pollution prevention? |

| YES | NO | | I. Management (continued) |
|---|---|---|---|
| | | 8. | Does the unit have a recycling program? |
| | | 9. | Is good housekeeping evident in POL, HM, and HW storage areas? |
| | | 10. | Does the unit have appropriate references (ARs, FMs, TMs, installation regulations, command policies, SOPs) on hand? |

| YES | NO | | II. Accumulation Sites |
|---|---|---|---|
| | | 1. | Are there adequate dikes or catchment areas around accumulation sites? |
| | | 2. | Are HW, used oil, or other possible pollutants stored in authorized containers? |
| | | 3. | Are used oil tanks pumped out when full? |
| | | 4. | Are containers properly labeled? |
| | | 5. | Are containers secured to prevent contamination by rainwater or any other potential contaminant? |

| YES | NO | | III. Hazardous Material/Hazardous Wastes |
|---|---|---|---|
| | | 1. | Are amounts of HM on hand limited to the minimum needed (no stockpiling of HM)? |
| | | 2. | Is the unit's HM/HW inventory (quantity and location) up to date? |
| | | 3. | Do HW containers have drum logs to account for all additions and to specify personnel authorized to make additions to the containers? |
| | | 4. | Are MSDSs on hand for all HM? Are MSDSs readily available to all workers exposed to HM? |

| YES | NO | III. | Hazardous Material/Hazardous Wastes (continued) |
|---|---|---|---|
| | | 5. | Is HW accumulated in authorized containers? |
| | | 6. | Are containers labeled according to directives? |
| | | 7. | Are containers in good condition and closed when not in use? |
| | | 8. | Are contents of containers compatible with the container? |
| | | 9. | Are accumulation start dates and HW labels on each HW container? |
| | | 10. | Are container storage areas inspected at required intervals? |
| | | 11. | Is HM/HW managed for prompt pick up and transportation to disposal facility according to directives? |
| | | 12. | Are used oil accumulation tanks only used for collection of used oil? |
| | | 13. | Are danger and warning signs conspicuously placed? |
| | | 14. | Is spill prevention and control equipment adequate? |
| | | 15. | Are personnel trained in the proper handling, collection, storage, or transportation of HM/HW? |
| | | 16. | Are dumpsters free of HM/HW items? |
| | | 17. | Are used POL cans and drums disposed of properly? |
| | | 18. | Are asbestos-containing parts (brake shoes, clutch plates, and equipment insulation) removed, collected, and disposed of properly? |
| | | 19. | Are batteries stored/disposed of properly? |

| YES | NO | III. | Hazardous Material/Hazardous Wastes (continued) |
|---|---|---|---|
| | | 20. | Is equipment containing radioactive sources (i.e., gun/mortar sights, M8A1 alarms) properly stored to prevent breakage and release of radioactive materials? Are incidents reported properly? |
| | | 21. | Is ammunition stored properly? |

| YES | NO | IV. | Solid Waste Management |
|---|---|---|---|
| | | 1. | Are procedures to reduce production of waste enforced? |
| | | 2. | Are product separation and recycling efforts in effect? |
| | | 3. | Are source reduction practices enforced? |
| | | 4. | Is the unit requisitioning only supplies needed (not stockpiling excessive materials)? |
| | | 5. | While washing waste containers, are water, soap, kitchen grease, or garbage kept from entering the street, storm drainage system, or groundwater source? |
| | | 6. | Are solid waste containers kept closed? |

| YES | NO | V. | Spill Prevention |
|---|---|---|---|
| | | 1. | Is the unit spill prevention plan present? Is it understood and being followed? |
| | | 2. | Are oil, fuel, battery acid, hydraulic oil, or other HM spills properly reported? |
| | | 3. | Does the unit enforce prohibitions against discharging pollutants into storm or washrack drains or pouring pollutants on the ground or along fence lines? |
| | | 4. | Are small oil spills cleaned up promptly and effectively? |

| YES | NO | | V. Spill Prevention (continued) |
|---|---|---|---|
| | | 5. | Are drip pans used under vehicles/equipment and spigots of POL product barrels where spills are likely to occur? |
| | | 6. | Is contaminated soil properly disposed of at a designated authorized disposal area? |

| YES | NO | | VI. Recycling Program |
|---|---|---|---|
| | | 1. | Is all material recycled according to directives? |
| | | 2. | Is the unit delivering material to the installation's recycling center? |
| | | 3. | Are recyclable materials source-separated? |
| | | 4. | Is contaminated material separated from recyclables? |
| | | 5. | Is the unit recycling all materials accepted by the installation's recycling center? |
| | | 6. | Are dumpsters free of recyclable items? |
| | | 7. | Are used cleaning solvents recycled/collected properly? |

| YES | NO | | VII. Washracks |
|---|---|---|---|
| | | 1. | Are vehicles and/or equipment washed only in authorized washracks? |
| | | 2. | Is steam cleaning equipment used only in authorized washracks? |
| | | 3. | Are washracks and vicinity free of contaminated soil, sand, and silt? |

| YES | NO | VII. | Washracks (continued) |
|---|---|---|---|
| | | 4. | Are readable signs prominently posted to indicate which solvents or soap may be used, where appropriate? |
| | | 5. | Are metal gratings or baffles present and in good condition at washrack oil interceptor, catch basins, and floor drains? |
| | | 6. | Are washrack areas free of oil and/or fuel spills? Are the washrack areas free of oily rags and trash? |
| | | 7. | Are treatment devices (oil and grease interceptors, catch basins, collection ponds, drains, and tanks) properly maintained and serviced? |
| | | 8. | Does the SOP indicate how to request maintenance for and pumping of oil/water separators? |
| | | 9. | Are faucets and/or backflow preventors in good operating condition? |
| | | 10. | Are only authorized soap, solvent, or chemicals used with steam cleaning equipment? |
| | | 11. | Are oil/water separators in good working condition? |
| | | 12. | Are vehicle/equipment/aircraft wastewater discharges tied into a treatment system? |

| YES | NO | VIII. | Land Management |
|---|---|---|---|
| | | 1. | Are vehicles maneuvered only in authorized areas? |
| | | 2. | Are surface areas and curbs free of vehicular damage? |
| | | 3. | Is the area free of litter? |
| | | 4. | Is gravel used only in authorized areas and in an authorized manner? |

| YES | NO | VIII. | Land Management (continued) |
|---|---|---|---|
| | | 5. | Are archaeological, cultural, and historical resources safeguarded? |
| | | 6. | Are vegetation/trees only being cut, removed, or used with appropriate approval (range control/forester)? |
| | | 7. | Are personnel ensuring that garbage, refuse, and rubbish are never burned or buried on ranges or training areas without appropriate approval? |
| | | 8. | Are storm water ditches in the vicinity of motor pools free of POL or other HM/HW? |
| | | 9. | Are detention ponds and sump collection points functional and properly serviced? |
| | | 10. | Are paint sprays and battery and radiation repair operations conducted properly and coordinated with the EMO, safety, and preventive medicine offices? |
| | | 11. | Are collection points established with proper containers and servicing for all maintenance-generated wastes? |
| | | 12. | Does the unit fill in fighting positions and all other excavations upon exercise completion and redeployment? |
| | | 13. | Does the unit have a maneuver damage control element for each operation? Are all damages properly reported and corrected according to command guidance? |
| | | 14. | Are refueling sites located away from sensitive areas such as wetlands, water sources, drainage areas, and endangered species habitats? |
| | | 15. | Does the unit have appropriate spill prevention equipment at high risk locations (refueling, maintenance, messing) and is it available to spill prevention personnel? |
| | | 16. | Does the unit use track turning pads where appropriate? |
| | | 17. | Does the unit confirm and mark sensitive areas to prevent damage to endangered species habitat and archaeological/cultural areas? |
| | | 18. | Does the unit conduct soldier/Marine environmental awareness briefings before an operation? |

| YES | NO | VIII. | Land Management (continued) |
|---|---|---|---|
| | | 19. | Does the unit conduct smoke operations and the proper use of pyrotechnics according to local regulations and policies? |
| | | 20. | Does the unit coordinate with the installation/operational staff before an exercise to obtain information on the AO in regard to environmental issues? |
| | | 21. | Does the unit cross or ford streams/rivers at authorized areas? |
| | | 22. | Is the unit aware of noise restrictions (limited hours, rotary wing operations, demolitions, proximity to civilian population, endangered species habitat) and comply with them? |

| YES | NO | IX. | Local Supplemental Requirements (coordinate with installation EMO/operational staff) |
|---|---|---|---|
| | | 1. | |
| | | 2. | |
| | | 3. | |
| | | 4. | |
| | | 5. | |
| | | 6. | |
| | | 7. | |
| | | 8. | |
| | | 9. | |

# Glossary

**1SG** first sergeant

**AAR** after-action review; after-action report

**AC** active component

**accident risk** 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.

**ACCP** Army Correspondence Course Program

**ACHP** Advisory Council on Historic Preservation

**AE** Army Europe

**AETMP** Army Environmental Training Master Plan

**AFB** assault float bridge

**AFI** Air Force Instruction

**AIRFA** American Indian Religious Freedom Act

**ALMC** Army Logistics Management College

**AO** area of operations

**AOAP** Army Oil Analysis Program

**AOR** area of responsibility

**APO** Army post office

**APOD** aerial point of departure

**AR** Army regulation

**ARPA** Archeological Resources Preservation Act

**ARTEP** Army Training and Evaluation Program

**asbestos** A group of natural minerals that tend to separate into strong, heat-resistant fibers. Used as an insulator, it is a suspected carcinogen.

**ASG** Area Support Group

**attn** attention

**autoignition temperature** Temperature at which a chemical can spontaneously ignite.

**BASOPS** base operations

**BCAT** base camp assistance/assessment team

**BCCA** base camp coordination agency

**BESC** Basic Environmental Staff Course

**BII** basic issue inventory

**bn** battalion

**boiling point** The temperature at which a compound will go from the liquid state to the vapor state.

**BRAC** base realignment and closure

**BSB** Base Support Battalion

**$C^2$** command and control

**CAA** Clean Air Act

**CALL** Center for Army Lessons Learned

**CAO** customer assistance office

**CARC** chemical agent resistant coating

**carcinogen** A substance known to cause or help the growth of cancerous cells.

**CAS** (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.

**CBR** chemical, biological, and radiological

**CCIR** commander's critical information requirements

**CD** compact disc

**cdr's** commander's

**CEIHOT** Center for Environmental Initiatives and Hands On Training

**ceiling** The maximum concentration that is allowed for any exposure. Area must be vacated at once if this level is reached.

**CESOS** Civil Engineer Corps Officer School

**CESP** civil engineering support plan

**CETEP** comprehensive environmental training and education program

**CEQ** council on environmental quality

**CERCLA** Comprehensive Environmental Response, Compensation and Liability Act; regulates clean up of HW sites. Also known as "Superfund." Amended by SARA of 1986.

**CERL** US Army Construction Engineering Laboratories

**CFC** 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.

**CFR** Code of Federal Regulations

**characteristics of HW** Physical/chemical properties of an HW. The EPA has defined four characteristics that can be determined by tests:

1. Ignitability: the ability to catch fire.

2. Corrosivity: the ability to corrode other materials.

3. Reactivity: the ability to enter into a violent chemical reaction, which may involve explosions or fumes.

4. Toxicity: the ability to release certain toxic constituents when leaded with mild acid.

**chemical** A substance that is produced by or used in a chemical process.

**Chemical agent resistant coding**

**chlorine** A chemical used in water purification for removal of bacteria.

**CINC** commander in chief; commander of a combatant command.

**civil action** 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.

**CJTF** commander, joint task force

**CO** commanding officer

**COA** course of action

**CofS** Chief of Staff

**Commander's Guide to Environmental Management** 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.

**compliance** The Army's expectation that soldiers obey local, state, federal and HN environmental requirements.

**conexes** container express

**CONPLAN** contingency plan

**conservation** The act of conserving and preserving natural and cultural resources so they will be available for present and future generations.

**CONUS** 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.

**convoy** A group of vehicles organized for the purpose of control and orderly movement with or without escort protection.

**coolants** Substances used to reduce the temperature of systems.

**CPG** Commandant's Planning Guidance

**CREST** corps real estate support team

**criminal action** 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.

**critical habitat** A designated area declared essential for the survival of a protected species under authority of the ESA.

**CRMP** Cultural Resources Management Plan

**crossing site(s)** The location along a water obstacle where the crossing can be made using amphibious vehicles, assault boats, rafts, bridges, or fording vehicles.

**CRREL** US Army Cold Regions Research Engineering Laboratory

**CS** The riot control chemical agent called chlorobenzalmalononitrile (tear gas).

**CWA** Clean Water Act

**CZ** combat zone

**DA** Department of the Army

**DC** District of Columbia

**DCSBOS** Deputy Chief of Staff for Base Operations and Support

**DD** defense document (generally used with form numbers: DD Form 1348-1)

**DENIX** Defense Environmental Network and Information Exchange

**DEQ** Directorate of Environmental Quality. This is another name for the EMO when it is not under the DPW.

**DERA** Defense Environmental Restoration Account

**DERP** Defense Environmental Restoration Program

**detergents** Synthetic water soluble cleaning agents that act like soap.

**discharge** 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.

**disposal** The discharge, deposit, dumping, spilling, leaking, or placing of any solid waste or HW into or on any land or water.

**div** division

**DIV** division

**DLA** Defense Logistics Agency

**DNBI** disease and non-battle injury

**DOD** Department of Defense

**DODD** Department of Defense Directive

**DODI** Department of Defense Instruction

**DOL** Directorate of Logistics

**DOT** Department of Transportation

**DPTM** Directorate of Plans, Training, and Mobilization

**DPW** Directorate of Public Works

**DRMO** Defense Reutilization and Marketing Office

**DS2** 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.

**DSN** Defense System Telecommunications Network

**DTG** date-time group

**DTLOMS** doctrine, training, leader development, organizational design, material development, soldier support

**EA** Environmental assessment; required by NEPA; a study to determine if significant environmental impacts are expected from a proposed action.

**EARC** US Army Environmental Awareness Resource Center

**EBS** environmental baseline survey

**EC** environmental coordinator

**ECAS** 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.

**ECE** environmental compliance evaluation

**ECO** environmental compliance officer

**ECR** environmental conditions report

**ECRB** environmental compliance review board

**ecology** 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.

**ecosystem** A system formed by the interaction of a community of organisms with its environment.

**EEA** environmental executive agent

**EIRB** environmental impact review board

**EIS** 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.

**ELOW** environmental laws of war

**EMO** environmental management office

**ENCOM** engineer command

**ENCOORD** engineer coordinator

**endangered species** Those species designated by the Secretary of the Interior which are in danger of extinction throughout all or a significant portion of their range.

**ENMOD** environmental modification

**ENRD** Environmental and Natural Resources Division

**evaporation rate** How rapidly compound evaporates based on a reference compound. The higher the number the faster the material will evaporate.

**environmental audit** A compliance review of facility operations, practices, and records to assess and verify compliance with federal, state, and local environmental laws and regulations.

**environmental ethic** 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.

**environmental noise** The outdoor noise environment consisting of all noise (including ambient noise) from all sources that extend beyond, but do not include, the workplace.

**environmental planning** 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.

**environmental pollution** 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.

**environmental reconnaissance** 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.

**environmental stewardship** 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.

**EO** executive order

**EOD** explosive ordnance disposal

**EPA** 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.

**EPCRA** Emergency Planning and Community Right-to-Know Act

**EQCC** Environmental Quality Control Committee

**ER** environmental report

**ES** environmental statement

**ESA** Endangered Species Act

**FEDLOG** federal logistics

**FFCA** Federal Facilities Compliance Act

**FGS** final governing standards

**FIFO** first-in-first-out

**FIFRA** Federal Insecticide, Fungicide, and Rodenticide Act

**flash point** Temperature at which there is enough vapor of a chemical to ignite if a spark is present.

**FM** field manual

**FMO** facilities management office

**FOIA** Freedom of Information Act

**FONSI** finding of no significant impact

**force health protection** 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.

**force protection** Actions taken to prevent or mitigate hostile actions against Department of Defense personnel (to include family members), resources, facilities, and critical information. These actions conserve the force's fighting potential so it can be applied at the decisive time and place. It coordinates and synchronizes offensive and defensive measures to enable the effective employment of the force while degrading opportunities for the enemy. Force protection does not include actions to defeat the enemy or protect against accidents, weather, or disease.

**FRAGO** fragmentary order

**freezing point** The temperature at which a compound will change from a liquid to a solid.

**FSOP** field standing operating procedures

**FTX** field training exercise

**FUDS** formerly used defense sites

**FY** fiscal year

**G1** Assistant Chief of Staff, Personnel, General Staff

**G2** Assistant Chief of Staff, Intelligence, General Staff

**G3** Assistant Chief of Staff, Operations, General Staff

**G4** Assistant Chief of Staff, Logistics, General Staff

**G5** Assistant Chief of Staff, Civil Affairs, General Staff

**gray water** Any nontoilet water (nonsewage) that is nonpotable because it was used in some way (for example, water from sinks, bathtubs, showers, or laundry operation).

**groundwater** A body of water, generally within the boundaries of a watershed, that exists in the internal passageways of porous geological formations (aquifers) and which flows in response to gravitational forces. Nearly half of the US population uses groundwater as its primary water source.

**GSA** General Services Administration

**GTA** graphics training aid

**halons** A family of fully halogenated hydrocarbons containing bromines. These substances are environmentally harmful because they deplete the earth's stratospheric ozone layer.

**hazard** A condition that can be expected to cause damages including injury or death to exposed individuals.

**hazardous substance** 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.

**HAZCOM** Hazard communication; the responsibility of leaders and supervisors concerning possible hazards in the workplace and notification of hazards and necessary precautions to their soldiers.

**HAZMIN** hazardous waste minimization

**health hazards** 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.

**HEMTT** heavy expanded mobility tactical truck

**HHC** headquarters, headquarter company

**historic artifacts** Something created by humans usually for a practical purpose especially an object remaining from a particular period (prehistoric caves, burial sites).

**HM** 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.

**HMCC** Hazardous Material Control Center

**HMTA** Hazardous Materials Transportation Act

**HN** 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.

**HQ** headquarters

**HQMC** Headquarters, Marine Corps

**HSMS** Hazardous Substance Management System

**HW** 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.

**HWAS** hazardous waste accumulation site

**IAW** in accordance with

**ICUZ** Installation compatibility use zone; a land use planning procedure employed to control environmental noise.

**ID** identification

**IET** installation environmental trainer

**I&L** installations and logistics

**IMO** installation management office

**incineration** Disposal of waste materials through controlled burning.

**INRMP** Integrated Natural Resource Management Plan

**IOSC** Installation On-Scene Coordinator

**IPB** intelligence preparation of the battlefield

**IPM** integrated pest management

**IPMP** 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.

**IRP** Installation restoration program; the military's program to address environmental contamination at its facilities.

**IRT** installation response team. Those collective persons designated to act in an emergency to perform functions directed by the installation on-scene coordinator.

**ISCP** Installation Spill Contingency Plan; document detailing resources and procedures for cleanup of oil and hazardous substances spills.

**ISD** installation supply division

**ITAM** integrated training area management

**ITS** individual training standard

**JCMB** joint civil-military coordination board

**JEMB** joint environmental management board

**JIC** joint information center

**JMMO** joint material management office

**JOC** joint operations center

**JOPES** Joint Operation Planning and Execution System

**JP** joint publication

**JP** jet petroleum

**JSI** joint staff instruction

**JTB** joint transportation board or joint targeting board

**JTF** joint task force

**JTFCEM** joint task force contingency engineering management

**JRETC** Joint Regional Environment Training Center

**landfill** 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.

**LCTA** land condition trend analysis

**LEPC** local emergency planning committee

**LO** lubrication order

**LOGCAP** Logistics Civil Augmentation Program

**LRAM** land rehabilitation and maintenance

**LRP** logistics resupply point

**lubricants** Substances (such as grease) capable of reducing friction, heat, and wear when introduced as a film between solid surfaces.

**MACOM** major Army command

**MAJ** major

**MCCDC** Marine Corps Combat Development Command

**MCL** maximum contaminant level

**MCO** Marine Corps order

**MCRP** Marine Corps reference publication

**MDMP** military decision-making process

**MDRD** mobilization, deployment, redeployment, and demobilization

**MECH** mechanized

**medical waste** Any waste that is generated in the diagnosis, treatment, or immunization of human beings or animals.

**melting point** The temperature at which a compound will change from a solid to a liquid.

**METL** mission essential task list

**METT-TC** mission, enemy, terrain, troops, time available, and considerations.

**MGRS** military grid reference system

**military environmental protection** The application and integration of all aspects of natural environmental considerations, as they apply to the conduct of military operations.

**MMPA** Marine Mammal Protection Act

**MO** Missouri

**MOGAS** motor gas

**MOMs** measures of merit

**monitoring** 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.

**MOS** military occupational specialty

**MP** military police

**MSC** major subordinate command

**MSDS** material safety data sheet

**MTP** mission training plan

**NAAQS** national ambient air quality standards

**NAGPRA** Native American Graves Protection and Repatriation Act

**NBC** nuclear, biological, chemical

**NCA** Noise Control Act

**NCO** noncommissioned officer

**NCOIC** noncommissioned officer in charge

**NCP** National Contingency Plan

**NEPA** National Environmental Policy Act

**NG** National Guard

**NHPA** National Historic Preservation Act

**NOV** Notice of violation; formal written document provided to an installation by a regulatory agency as a result of environmental noncompliance.

**NOX** nitrogen oxide

**NPDES** National Pollutant Discharge Elimination System

**NPS** National Park Service

**NSN** national stock number

**NTC** national training center

**NWP** Naval warfare publication

**OCONUS** outside the continental United States

**OEBGD** overseas environmental baseline guidance document

**OIC** officer in charge

**OJE** Operation Joint Endeavor

**OPA** Oil Pollution Act

**OPFOR** opposing forces

**OPG** Operational Planning Group

**OPNAVIST** Operational Naval Instruction

**OPLAN** operation plan

**OPORD** operation order

**OPSEC** operations security

**OPTEMPO** operations tempo

**OSD** Office of the Secretary of Defense

**OSHA** Occupational Safety and Health Act or Occupational Safety and Health Administration

**PAM** pamphlet

**PAO** public affairs office(r)

**PAH** polycyclic aromatic hydrocarbon

**PCB/Polychlorinated biphenyls** 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.

**PCN** product control number

**penalties** The legal punishment (fines, jail) for having violated a law.

**pesticides** A chemical or other substance used to destroy plants and animal pests.

**physical hazards** Those hazards that can cause explosions, fires, violent chemical reactions, or other hazardous situations.

**PLL** prescribed load list

**PMCS** preventive maintenance checks and services

**PMO** provost marshal office

**PMP** Pest Management Plan

**POC** point of contact

**POL** petroleum, oils, and lubricants

**PPE** personal protective equipment

**PPM** Parts per million; molecules of chemical per one million molecules of air.

**prevention** The process of reducing or eliminating pollution.

**primacy** A legal situation which allows the states to have environmental and worker protection standards more stringent than the federal standards.

**Pub** publication

**QA** quality assurance

**QCA** Quiet Communities Act

**QM** quartermaster

**radon** A colorless, odorless, radioactive by-product from the natural degradation of uranium.

**RC** Reserve component

**RCRA** Resource Conservation and Recovery Act

**REC** record of environmental consideration (related to NEPA)

**reclamation** 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.

**recovered materials** 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.

**recyclability** The ability of a product or material to be recovered from, or otherwise diverted from, the solid waste stream for the purpose of recycling.

**recycling** The process by which recovered materials are transformed into new or usable products.

**restoration** The process of cleaning up contaminated sites.

**risk** 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.

**ROD** record of decision

**ROE** rules of engagement

**ROK** Republic of Korea

**ROWPU** reverse osmosis water purification unit

**S1** Personnel Staff Officer, Adjutant, Brigade and Battalion

**S2** Intelligence Staff Officer, Brigade and Battalion

**S3** Operations and Training Officer, Brigade and Battalion

**S4** Logistics Staff Officer, Supply Officer, Brigade and Battalion

**S5** Civil-Military Operations Staff Officer, Brigade and Battalion

**SA** Sikes Act

**SARA** Superfund Amendments and Reauthorization Act

**SDWA** Safe Drinking Water Act

**SET** state environmental trainer

**SF** standard form

**SITREP** situation report

**SITTEMP** situation template

**SJA** staff judge advocate

**SOFA** 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.

**solid waste** Any material or substance (solid or liquid) which is inherently waste-like by being no longer suitable for its originally intended purpose.

**solubility** 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.

**solvents** 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.

**SOP** standing operating procedure

**source reduction** 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.

**sovereign immunity** A legal situation in which the sovereign (for example, federal government) cannot be held legally liable for what it does or does not do.

**spill** A generic term that encompasses the accidental and the deliberate but unpermitted discharge or release of a pollutant.

**SPILLREP** spill report

**SPRP** spill prevention response plan

**STARC** State Area Command

**STB** super tropical bleach

**STP** soldier training publication

**Superfund** See CERCLA.

**surface water** Water contained in rivers, streams, and so forth.

**TACSOP** tactical standing operating procedures

**tactical risk** The risk concerned with hazards that exist because of the presence of either the enemy or an adversary.

**TAML** Theater Army medical laboratory

**TBP** to be published

**TC** training circular

**TEL** telephone

**TG** trainer's guide

**threatened species** Those species that are likely to become endangered within the foreseeable future throughout all or a significant portion of their range.

**threshold limit value (time weighted average)** The recommended limit for worker exposure over an 8-hour work day.

**TID** turn-in document

**TM** technical manual

**TO** table of organization

**TO** theater of operation

**toxic** Capable of producing injury, illness, or damage to humans, domestic livestock, wildlife, or other organisms through ingestion, inhalation, or absorption through any body surface.

**TRADOC** United States Army Training and Doctrine Command

**TSC** Training Support Center

**TSCA** Toxic Substances Control Act

**TSDF** treatment, storage, disposal facility

**TTP** tactics, techniques, and procedures

**UECO** unit environmental compliance officer

**UI** unit of issue

**US** United States

**USACE** United States Army Corps of Engineers

**USACHPPM** United States Army Center for Health Promotion and Preventive Medicine (formerly USAEHA)

**USAEC** United States Army Environmental Center; provides oversight, coordination, and execution support for Army environmental programs and projects, and technical and related support. Formerly the US Army Toxic and Hazardous Materials Agency.

**USAEHA** United States Army Environmental Hygiene Agency (now USACHPPM)

**USAES** United States Army Engineer School

**USAREUR** United States Army Europe

**USC** United States Code

**USE** Used Solvent Elimination Program

**USEPA** United States Environmental Protection Agency

**USFWS** United States Fish and Wildlife Service

**USMC** United States Marine Corps

**US-ROK** United States – Republic of Korea

**UST** Underground storage tank. Below- or in-ground tank, storing oil or hazardous substances, regulated under RCRA.

**UTM** universal traverse mercator

**UXO** unexploded ordnance

**VA** Virginia

**vapor density** 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.

**vapor pressure** 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.

**viscosity** Measure of how “thick” a liquid or semi-solid material is at room temperature.

**VOC** volatile organic compound

**waste** Any discarded material.

**wetlands** 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.

**WO** warning order

**XO** executive officer

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