

THE LESSONS OF MASSACHUSETTS MILITARY RESERVATION

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April 2001

AEPI-IFP-1001B

Army Environmental Policy Institute

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ABSTRACT

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Environmental awareness and stewardship were not priorities in Army installations and operations until the 1990s. Today's public environmental awareness and growing concern for public health and natural resources have called into question some past training practices as potential sources of environmental contamination at military installations. One such installation with a legacy of environmental contamination is Massachusetts Military Reservation (MMR). Located on Cape Cod, Massachusetts, MMR has served as a military training facility for over ninety years. Analysis of the MMR legacy is critical for two reasons: (1) past training and safety procedures caused contamination that spread beyond installation boundaries via an underlying sole-source aquifer; and (2) Army handling of this legacy ultimately resulted in an EPA Administrative Order that indefinitely suspended artillery, mortar, and demolition training at MMR. The ultimate lesson of MMR is that it is impossible to sustain a well-prepared Army without environmental stewardship.

ACKNOWLEDGMENTS

I would like to thank my project advisors, Colonel David M. Cole, AWC, and Dr. Rosemarie Szostak, AEPI. I would also like to thank the staff of AEPI, especially Dr. Donata Renfrow, for their assistance and insight. Their expertise, advice, and humor were invaluable throughout the research process.

Thanks are also extended to the following individuals for generously sharing their time and knowledge with me in meetings and telephone interviews: LTC Richard Crivello, Construction and Facilities Management Officer, Massachusetts Army National Guard; Ms. Janice Drake, Impact Area Technical Project Manager, Massachusetts Department of Environmental Protection; Mr. Ben Gregson, Program Manager, Impact Area Groundwater Study Program; Mr. Kent Gonsler, Environmental Program Coordinator, Joint Program Office, Massachusetts Military Reservation; Colonel John Jenner, Retired, Massachusetts Army National Guard; and Dr. Clif Youmans, Unexploded Ordnance (UXO) Remediation Project Leader, Environmental Division, Montana National Guard.

ACRONYMS

AEPI	Army Environmental Policy Institute
AFCEE	Air Force Center for Environmental Excellence
AO	Administrative Order
AWC	Army War College
BOMARC	Boeing Michigan Aeronautical Research Center
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act (Superfund)
DA	Department of the Army
DAF	Department of the Air Force
DoD	Department of Defense
DOT	Department of Transportation
EIR	Environmental Impact Report
ENF	Environmental Notification Form
EPA	Environmental Protection Agency
IRP	Installation Restoration Program
ITAM	Integrated Training Area Management
MADEP	Massachusetts Department of Environmental Protection
MEPA	Massachusetts Environmental Policy Act
MMR	Massachusetts Military Reservation
NEPA	National Environmental Policy Act
NGB	National Guard Bureau
NMS	National Military Strategy
RCRA	Resource Conservation Recovery Act
RDX	Royal Dutch Explosive
RRA	Rapid Response Action
SDWA	Safe Drinking Water Act
TNT	Trinitrotoluene
UXO	Unexploded Ordnance
VOCs	Volatile Organic Compounds

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PREFACE

This paper is a result of the author's experience at Massachusetts Military Reservation (MMR) and an Army War College Fellowship at the Army Environmental Policy Institute (AEPI). My observations are based on thirteen years as a Field Artillery Officer in the Massachusetts Army National Guard, thirteen years living on Cape Cod in the Mashpee community bordering MMR, and work in the Impact Area Groundwater Office at MMR. As a Division Artillery Staff Officer and Field Artillery Battalion Commander, I have witnessed first-hand the impacts of the training restrictions at MMR. Since 1992 the Army has had a formal Environmental Strategy that provides guidelines for the establishment of a successful environmental program. The strategy stresses the importance of community involvement and partnership with all stakeholders.

Unfortunately, over the last twenty years, the process at MMR has been viewed with mistrust by the stakeholders, including the military. This mistrust continues today as some MMR community stakeholders interact with the military. There is controversy over the Department of the Air Force's upgrade at MMR of an early warning radar system that is part of this nation's national missile defense program. There is also controversy over military training at MMR.

The purpose of this paper is to provide an overview of what occurred at MMR and to identify applicable lessons for other installations. It is not intended to assign blame to or support any individual or group associated with MMR.

THE LESSONS OF MASSACHUSETTS MILITARY RESERVATION

“We have met the enemy and it is us.”

Walt Kelly

1. INTRODUCTION

Massachusetts Military Reservation (MMR), located on Cape Cod, Massachusetts, has served as a training site for active and reserve components of the military, primarily Army and Air Force units, for over ninety years. It is also an active training facility for the United States Coast Guard and was formerly home to a local Marine Reserve battalion as well as a major mobilization area for World War II.

Since the 1950s, the Army and the Air Force have designated their respective areas of MMR as Camp Edwards and Otis Airfield. As the two names imply, each service has treated its area as a separate site within the installation boundaries. The significance of this separation, especially for environmental stewardship, would not manifest itself until the 1990s.

During the 1990s, Army attempts to implement environmental stewardship at MMR were unsuccessful. This failure resulted in precedent-setting training restrictions imposed on the facility by the Environmental Protection Agency (EPA) Region 1.

This paper explores past actions at MMR to determine why implementation of environmental stewardship was unsuccessful and to identify lessons that can be applied to other installations to prevent future problems of this type.

2. MILITARY OBJECTIVES AND ENVIRONMENTAL PROTECTION

The past twenty to thirty years have been characterized by increased public awareness of the environment. This awareness has influenced the introduction and implementation of numerous environmental protection laws to safeguard natural resources and public health. The public has also begun to look to the military to improve its environmental stewardship.

In 1992, the Army responded to this growing awareness by developing a strategy entitled *U.S. Army Environmental Strategy into the 21st Century*.¹ This document expressed the Army's environmental awareness, established guidelines for environmental stewardship, and made a commitment to developing an eight-year plan for implementation.

Throughout the Department of Defense (DoD) there is widespread acceptance of the fact that environmental protection is essential to sustaining a well prepared, state-of-the-art military force.² This acceptance is implied in the three objectives of America's National Military Strategy (NMS): (1) shape the international environment; (2) respond to the full spectrum of crises; and (3) prepare now for an uncertain future.³

The NMS and the Army Environmental Strategy have a common goal: "Like our national military strategy, our environmental strategy will promote national stability and protect our citizens."⁴ But as these two strategies prepare the military for an *uncertain future*, they must also address past environmental issues to fully protect our citizens. MMR is a prime example of an installation where the military *prepared* for the past ninety years, yet did not envision an environmental threat resulting from that *preparedness*.

In the past, the military viewed the environment in the same way that most industrial complexes and homeowners did and disposed of potentially hazardous waste directly into the environment. This practice occurred before there was a full understanding of envi-

ronmental consequences; it was not the result of any deliberate or flagrant disregard for the environment.

As recently as thirty years ago, there were very few environmental laws. Further, because of national security, the military was not subject to state and federal laws. MMR was no exception. Waste was disposed of in unlined landfills and drywells, burned at fire-fighting training areas, or eliminated by any convenient method.⁵ These past actions unintentionally increased the contamination risk to human health and the environment.

As the public became more aware of the contamination risk, it began to demand action. With the end of the Cold War and the perception of a reduced threat to national security, the old argument that the environment must be sacrificed for training in the interests of national security was no longer acceptable.

The Army's 1992 Environmental Strategy identified why the Army needed to be an effective environmental steward to ensure successful implementation of the NMS. The strategy focused on the areas of Compliance, Restoration, Prevention, and Conservation.⁶ It outlined a program which, based on a partnership of military leadership and the community, would effectively manage the twenty million acres where the Army lives and trains. This partnership of shared common values would influence the natural, cultural, and public resources that affect the ecosystems on both sides of the fence line.⁷

Unfortunately, because the Army and the Air Force have always treated MMR as two separate sites, the total integration of environmental stewardship for the installation did not occur. Furthermore, the separation of physical areas and responsibilities hindered the National Guard's ability to effectively address environmental issues by building an effective partnership with stakeholders at MMR. Stakeholders include civilian and military personnel, their families, the public, elected officials, public interest groups, and all levels of environmental regulatory agencies.⁸

The failure to successfully implement environmental stewardship ultimately resulted in an Environmental Protection Agency (EPA) Administrative Order indefinitely suspending artillery, mor-

tar, and demolition training at MMR. There is no question now that, without clear leadership and true community partnership, the Army will not be able to sustain, restore, or maintain access to the land it needs for training.

3. OVERVIEW OF MASSACHUSETTS MILITARY RESERVATION

3.1 History of the Facility

The following information is a brief synopsis of the history of MMR provided by the installation's public affairs section.

MMR was established in 1911 as a Massachusetts Guard site for conducting field artillery firing and field training. In 1935, MMR, then named Camp Edwards, was acquired by the state legislature. In 1940, MMR was leased to the Department of the Army (DA) and became a critical World War II training facility. This leasing action would significantly influence later decisions on how MMR would be controlled.

In 1946, MMR was deactivated and placed back into the hands of the Massachusetts Guard only to be reactivated as an Army training facility during the Korean War. Then, in 1954, Congress authorized the transfer from the DA to the Department of the Air Force (DAF). However the DA continued to control the ranges and maneuver areas. At this point MMR actually consisted of two facilities with two names: Camp Edwards for the Army and Otis Airfield for the Air Force; each managed its own area independently.

As part of the Air Force's strategic national defense during the Cold War, the Boeing Michigan Aeronautical Research Center (BOMARC) missile complex was built at MMR in the early 1960s. This site conducted classified testing in support of nuclear missiles. In the late 1970s, the Air Force built an early warning radar system, PAVE PAWS, as part of its missile defense upgrade.

In 1972, the DA planned to remove its active duty garrison, and the DAF planned to turn the airfield over to the Massachusetts Air National Guard but retain control over what was to become the PAVE PAWS site. However, both the DA and the National Guard Bureau (NGB)-Army recognized the importance of Camp Edwards

as a Reserve/Guard training facility and agreed to provide financial support.

In 1975 the Massachusetts National Guard assumed operational responsibility for most of MMR.⁹ The DA also signed for an area known as the J-ranges where classified government contracted munitions testing occurred until the mid-1990s.

From 1975 until the spring of 1997, MMR served New England as an active training facility for regional Guard and Reserve forces of the Army, the Air Force, the Marines, and the Coast Guard. Today MMR still supports reduced training activities of the National Guard, the PAVE PAWS site, and the Coast Guard.

Over the past ninety years, MMR grew from a small camp to a garrison where thousands of personnel trained. The Air Guard fighter wings stationed at Otis Airfield were part of the strategic defense of North America during the Cold War. Army training included infantry tactics of fire and maneuver; artillery tactics of shoot, move, and communicate; and engineer training in demolition and screening smoke. Army and Air Guard units cycled through the ranges utilizing the MMR impact area every two weeks during the annual peak training periods occurring from late April through September. In addition, weekend training was scheduled throughout the year. Thus, three out of four weekends each month, training, live fire, and military aircraft could be seen and heard by the growing population surrounding MMR.

3.2 Demographics of the Surrounding Area

MMR covers thirty-four square miles of upper Cape Cod and is surrounded by the towns of Mashpee, Sandwich, Bourne, and Falmouth, Massachusetts.

When MMR was established as a small training camp in 1911, the military was an accepted member of the community. In the early 1900s, the area's permanent population was small. As the population of the country grew during the twentieth century, so did the popula-

tion of Cape Cod. Growth from 1920 to 1990 was 700 percent.¹⁰ During the 1980s and 1990s, Mashpee's population more than doubled to approximately 7,900 residents.¹¹

The result has been an increase of year-round residents, businesses, and the infrastructure needed to support the livelihood of a population of over 200,000 people. This infrastructure must also support an additional 300,000 people who visit during the summer tourist season.¹²

With the population explosion of the eighties and nineties, homes and schools were built adjacent to the installation fence line and within sight of the training ranges. At the time there was little understanding of the environmental risks posed by MMR or of how this type of encroachment could potentially affect the health of many thousands of people.

3.3 Threat to a Critical Environmental Resource: Water

The Cape Cod region is rich in military history, but it has a legacy of incomplete environmental stewardship. The legacy was first documented in 1950 when a Master Plan highlighted a potential environmental problem by stating, "The drainage facilities for Camp Edwards are inadequate."¹³

In 1982, in response to a petition from local citizens, the EPA designated the Cape Cod Aquifer as a sole-source aquifer for Cape Cod. This aquifer provides over 50 percent of the drinking water for the entire Cape. If contaminated, it would create a significant hazard to public health.¹⁴

One Cape Cod Commission hydrologist, Mr. Tom Cambareri, has estimated that the Upper Cape aquifer, the Sagamore Lens, contains as much as 2.3 trillion gallons of water.¹⁵ The Sagamore Lens supports the estimated 200,000 year-round and the additional 300,000 seasonal residents of the four Upper Cape towns and MMR.¹⁶

The aquifer matrix and the ground surface of the Upper Cape consist of very permeable sandy soils. The aquifer is recharged only

from rainwater that percolates through the lens. The soil characteristics that allow for the rapid infiltration of rainwater and high-yield water supply wells also permit the migration of pollutants from the surface into the groundwater.¹⁷ Furthermore, the permeable sandy soil also permits rapid groundwater flow horizontally through the aquifer, spreading any possible contamination.¹⁸ What was not foreseen in 1911 or even during the early years of the Cold War was that MMR's position atop the Sagamore Lens could have a contaminating effect with significant environmental consequences.

The aquifer can yield millions of gallons of clean drinking water a day but it is a vulnerable resource. Continued use of this aquifer for drinking water depends on judicious land and water management, in terms of both quantity and quality.¹⁹ According to an 18 December 1998 article in the *Mashpee Enterprise* by Laura M. Reckford, quantity projections reflect a deficit of pristine water by 2020.²⁰ Some hydrologists project those deficits to be around one million gallons a day for Mashpee and as much as eight million gallons a day for the total Upper Cape.²¹ Thus, some area stakeholders were concerned that, with the increasing population and emerging evidence of contamination coming from MMR, there existed a serious threat to the aquifer.

The June 1994 Plume Response Report estimated that 53 billion gallons of the aquifer had been lost to contamination.²² Since 1994, some previously uncontaminated monitoring wells have tested positive for contaminants. Moreover, results from some of the monitoring wells installed since 1994 have shown levels of contamination in the groundwater. One of two factors could account for this. Either (a) the contamination source is diffusing outwards or (b) there are other unknown sources of contamination. Whether the contamination is a direct result of Army training (including artillery, mortar firing, and demolition training) remains unknown.

3.4 The Land, Command and Control, and History

Issues relating to land lease and license agreements and command and control relationships at MMR have exacerbated the confusion over responsibility for and appropriate response to environmental contamination at the installation.

Most of the land at MMR is state owned; only a small part is owned by the federal government. The portion owned by the state has been leased to the DA, the DAF, and the Department of Transportation (DOT) for the Coast Guard until 2026. The DA and the DAF, in turn, have licensed the property back to the Massachusetts Army Guard and the Massachusetts Air Guard respectively for use and operational control.

Regardless of leases and licenses, ownership of the land determines which environmental regulatory process needs to be followed, state or federal. The Massachusetts Guard conducts its training on state-owned land at MMR. Consequently, in considering any upgrades, it must first follow the requirements of the Massachusetts Environmental Policy Act (MEPA), not the National Environmental Policy Act (NEPA). Although MEPA in fact mirrors the requirements of NEPA, jurisdiction issues still develop between the two agencies.

Command and control relationships are also convoluted at MMR. The Massachusetts Guard controls both its Army and Air Guard units, but it does not have any command relationship with the DOT and the Coast Guard, nor does the DoD have a command relationship with the Coast Guard.

To further complicate matters, the Massachusetts Guard treats MMR as two sites, not as one installation, and there was minimal coordination between the Massachusetts Army and Air Guard units. Similarly, at NGB Headquarters in Virginia the National Army and Air Guard also treat MMR as two sites with two separate environmental programs. This separation of responsibility and scope has created confusion for the public. They have been told that NGB is

the senior headquarters for the Massachusetts Army and Air Guard, yet they see two different sets of leaders, cleanup programs, and oversight structures at MMR. Furthermore, when the DA and the DAF also view MMR as two separate installations and provide uncoordinated and/or conflicting guidance, local stakeholders feel they are being misled or misinformed.

The net result is an atmosphere in which no one knows who is in charge. The state has no control over the leases, yet it owns the property and must follow state environmental procedures. When reference is made to MMR, it is unclear whether that reference is to Camp Edwards or to Otis Airbase, each with its own leadership chain. Yet, for local stakeholders, MMR is one installation with one ecosystem that adversely affects their communities.

Finally, the early contamination history of MMR needs to be considered. It was ultimately the controversy caused by these three issues—ownership of the land, an unclear leadership chain, and the installation's contamination history—that set the stage for EPA Region 1 to issue to NGB-Army an Administrative Order restricting certain types of Army training.

4. ENVIRONMENTAL ISSUES TIED TO THE MILITARY

4.1 Massachusetts Air National Guard

Environmental issues at MMR came to a head in the 1980s, yet there had been earlier indications of potential problems. Most of the problems were primarily related to Air Force activities.

4.1.1 Contamination History

When the DAF took charge of MMR in the 1950s, an installation site plan was completed. It showed the total extent of the military complex and revealed insight into the fact that past activities at the installation could lead to environmental problems.

In 1962 MMR shut down a well after detecting phenol (carbolic acid) contamination from a coal storage site. In 1973 and 1974, another well started showing signs of chemical contamination, and some base personnel began to speculate about the potential for contaminated groundwater.²³ (This second well was finally shut down in 1985, when it was found to be contaminated tetrachloroethylene and trichloroethylene compounds, chemicals that are associated with degreasing machine parts.²⁴)

In 1978, the town of Falmouth detected detergents in municipal drinking water wells that were 7,500 feet south of MMR's wastewater treatment plant. The Massachusetts Department of Environmental Protection (MADEP) eventually ordered MMR to shut down the treatment plant in 1979.

By 1983 and 1984, the Air Force had begun detecting volatile organic compounds (VOCs) in on-site monitoring wells near the base landfill and the fire-fighting training area. Shortly thereafter, monitoring by the Air Force and MADEP detected VOCs in more than two hundred private drinking wells and in one town well.²⁵

Besides the contamination showing up in the ground and drinking water, there was another public health issue that concerned

the citizens of Cape Cod. Cancer rates in the Upper Cape were some of the highest in Massachusetts. Given the location of the BOMARC and PAVE PAWS sites, some in the community felt there was a relationship between the increased cancer rates and contamination caused by MMR.

On one hand, MMR was a facility that had been used to train personnel during the period from World War II to beyond the Cold War. The land and everything associated with it was viewed as relating to national security, and anything that happened inside the fence line—such as training, site upgrades, and munitions testing—was a military issue and would be prioritized in terms of war-fighting and national defense. Further, until recent times, environmental monitoring had not been federally regulated and fuel spills, oil products, and radar sites had not been considered either hazardous to the environment or potential sources of cancer.

On the other hand, the public considered both the land and especially the groundwater as belonging as to community as much as to the military. If something like training threatened the health of people in the community, they wanted the activity to stop and the contamination to be immediately cleaned up. In essence, the environment and its stewardship were coming to be seen as primarily the responsibility of the government, and national defense could not be used as an excuse for ignoring contamination.

4.1.2 Superfund Designation

During the decade of the 1980s, it was discovered that eleven areas of the aquifer had been contaminated by chlorinated solvents and fuel by-products primarily resulting from Air Force activities at Otis Airbase.²⁶ Plumes of contamination had been created in the aquifer and were moving laterally across MMR's boundaries. Sixty plus sites had been recorded as having had some sort of spill. The major source areas for the contamination were a small number of larger chemical and fuel spills, storm-drains, landfills, former fire-fighting training areas, and coal yards.²⁷ Several of the fuel spills were associated with ruptured pipelines that supplied jet fuel. These ruptures

were initially reported as having spilled 2,000 gallons or less, amounts that did not require immediate or major investigation, but would later prove to have been grossly underestimated.

Following the discovery of extensive contamination from past activities, MMR was designated a Superfund site in 1989. The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), commonly known as Superfund, is a law that was promulgated in 1980. This Act addresses hazardous waste resulting from practices that were discontinued prior to 1976.²⁸ Superfund is a risk-based process that requires an initial assessment and site inspection to define and locate contamination, a remedial investigation/feasibility study to determine the cause, and a remedial design and action for cleanup.

NGB-Air and the Massachusetts Air Guard managed this process under a program called the Installation Restoration Program (IRP). This program had been initiated in 1982 by the DoD to investigate and clean up environmental problems and the IRP essentially followed the Superfund process from investigation to cleanup.

Both the IRP and Superfund processes require that the community be informed and involved. True community involvement should include the community early in and throughout all discussions. This type of involvement not only elicits the best solutions but also increases stakeholder support, acceptance, and trust.

During this period, however, there was no real public involvement at MMR. Under the IRP, NGB-Air and the Massachusetts Air Guard had been providing information to the various groups through public affairs offices. This dissemination of information was seen by the military as fulfillment of the requirement for “community involvement.” At the time, the military considered community involvement successful when they (the military) provided information to the community on how they (the military) would conduct any cleanup.

From 1982 through 1989, the dialogue between the Guard and the thirty plus local environmental groups was conducted strictly through public affairs offices. Moreover, the Guard did not

initially accept the contamination as its responsibility and, consequently, the groups had to fight hard to get the Guard to address their concerns.

Once the site was designated a Superfund site, the environmental groups supporting the designation continued to interact with the Guard. From 1989 to 1996, stakeholders were provided with information and updates; they, in turn, provided feedback. Community involvement in the IRP program appeared to be occurring but would later be revealed to have been only a public affairs process, not true community involvement.

4.1.3 Remediation Plan

The first formal public presentation by the Massachusetts Air Guard and NGB-Air on remedial action did not take place until February 1996. Unfortunately, however, the recommended approach to remediation was environmentally flawed.

From the beginning, regulators and the environmental activists had insisted that all plumes of contamination emanating under MMR be treated.²⁹ The plan now being put forth by NGB-Air and the Massachusetts Air Guard proposed treating all seven plumes simultaneously. Implementation of this plan would draw down the water tables and change the ecosystem of the adjacent towns, creating a problem far worse for the environment than the current contamination.

Presentation of the plan caused a great deal of public outrage.³⁰ Stakeholders suddenly realized that there had been no true community involvement. Understandably, environmental groups asked what had happened to their input and their concerns for not changing the ecosystem. Where had the regulators, the politicians, the military leadership, and even scientists been during development of this plan?

From 1989 to 1996, the years following the designation of MMR as a Superfund site, community members had provided input on the assessment and investigation, at least from a public health perspective, and had been provided with information on progress

(although this information had been slow in coming). Ultimately, their input had not really been part of the actual assessment or the proposed solution to clean up the contamination. Seven years had gone by, hundreds of millions of dollars had been spent, and the solution finally presented only made things worse.³¹

NGB-Air had lost all credibility, as reflected in extensive and negative local media coverage.³² The environmental groups and local politicians who had been involved since the designation of the Cape Cod Aquifer as a sole-source aquifer in 1982 felt that the progress of the last fourteen years had been lost, and they pushed their outrage all the way to the Pentagon and Congress.

4.1.4 Turnover to the Air Force Center for Environmental Excellence

At this point, the Deputy Assistant Undersecretary of the Air Force for the Environment stepped in and placed his premier environmental office in charge of the MMR cleanup.³³ The Air Force Center for Environmental Excellence (AFCEE) assumed responsibility for NGB-Air, re-evaluated past information, and tried to convince the public and the politicians that things would no longer be business as usual. The Department of the Air Force made it clear that environmental stewardship was an integral part of its national defense strategy, that it valued the environment and the public health of the community, and that, in dealing with environmental problems, stakeholders would be included in the process of devising solutions.

Under a new management team, deadlines and milestones were established. The public affairs process was transformed into more of a real community involvement process. Meetings were to be moderated by a facilitator, which would improve dialogue among attendees. Although the AFCEE was to have the final say on any decisions made,³⁴ the community would be engaged in process of seeking out solutions for environmental remediation. It was understood that, while total treatment was still the ultimate goal, achievement of that goal might require several steps or a combination of various approaches.

Gradually, the AFCEE began to rebuild some of the lost trust and to move toward the construction of treatment systems to either reverse contamination or prevent its further spread into the groundwater.

4.2 Massachusetts Army National Guard

The stage was thus set for the Massachusetts Army Guard in 1996. It was at this point that the lack of a comprehensive environmental stewardship program at MMR became clearly evident. Although the Massachusetts Army Guard had been following proper environmental processes, this was not enough to satisfy the regulators and stakeholders who, in because of ongoing environmental problems at MMR, had placed the installation under heightened scrutiny.

4.2.1 Environmental Assessment Requirement

As noted earlier, MMR is state-owned property and thus subject to Massachusetts Environmental Policy Act (MEPA) requirements. The MEPA process mirrors the National Environmental Policy Act (NEPA) process.

NEPA, enacted in 1969, is the basic national charter for protection of the environment.³⁵ NEPA mandates that federal agencies must perform an environmental impact analysis prior to undertaking any action that may cause adverse impacts to the environment and consider alternatives for impact mitigation in making decisions.³⁶ For MEPA, the environmental assessment document is termed an Environmental Impact Report (EIR).

Both NEPA and MEPA require that stakeholders be involved in the assessment process. All stakeholders are to review the draft document and any comments must be taken into consideration in the final draft. The final draft must again be reviewed and all comments addressed before implementation can begin.³⁷

For the reasons mentioned above, however, the Massachusetts Army Guard continued to deal with the community in a public affairs context, saying, in effect, “Here is the information and here is our solution.”

4.2.2 Master Plan for Facility Upgrade

While NGB-Air and the Massachusetts Air Guard were grappling with issues relating to MMR as a Superfund site, the Massachusetts Army Guard was simultaneously considering an upgrade of the Camp Edwards training facilities. As early as 1984 the Massachusetts Army Guard had drafted a Master Plan identifying fifty-eight projects and filed an Environmental Notification Form with MADEP.

After reviewing the Environmental Notification Form, the Massachusetts State Secretary of Environmental Affairs issued a certificate requiring the Massachusetts Army Guard to prepare an EIR, which was in fact never completed because of ongoing changes.³⁸ By 1994, the Massachusetts Army Guard had revised the plan twice and reduced the number of projects to ten. It filed another Environmental Notification Form and received a new certificate. Based on the reissued certificate, a draft EIR was completed in December 1996.³⁹

The EIR addressed environmental impacts of the new construction projects and upgrades to existing training facilities. Because the focus was on improvements, the Massachusetts Army Guard limited its analysis to the ten proposed projects and determined that they posed no significant impact to the environment.

Furthermore, because training was not viewed as having any environmental implications, it was not evaluated as part of the EIR. The Massachusetts Army Guard was already practicing stewardship: hazardous materials were being handled according to regulations, recycling was in effect, and ranges were beginning to be managed under programs like Integrated Training Area Management (ITAM).

4.2.3 Turning Point: Environmental Explosion

When the Massachusetts Army Guard submitted its revised EIR to the regulators in 1996, it unwittingly walked onto center stage of the MMR environmental crisis. The Massachusetts Air Guard had just presented its unpopular remediation plan. Now the Massachusetts Army Guard was presenting an EIR with a finding of *no significant impact*. The Massachusetts Army Guard became the perfect target for an outraged public and an aggressive regulatory community.

As EPA Region 1 and MADEP officials began reviewing the draft EIR in early 1997, they had already read and digested a series of articles on MMR published by the *Cape Cod Times* newspaper from January 5th to January 10th. This six-part series, called “Broken Trust,” was a critique of the unpopular IRP solution.⁴⁰ The articles described the 1982–1989 efforts by stakeholders to get NGB-Air and the Massachusetts Air Guard to take responsibility for environmental contamination. They also reviewed what had happened during the period since MMR’s designation as a Superfund site in 1989. EPA Region 1, MADEP, and various citizen groups had spent another seven years listening to NGB-Air present information, seeing money spent, and waiting for a mitigation and treatment program to be started. Then, when the plan was finally presented, the public rejected it as totally impractical.

Media coverage focused everyone’s attention on the magnitude of the environmental problems and perceived mismanagement at MMR. Of particular concern were: (1) past military practices that had caused the contamination of the groundwater and of some public drinking water; (2) hundreds of millions of dollars spent with no practical result—treatment systems still not in place; and (3) confusion regarding who was really in charge or responsible for the investigation and for regulator oversight during this process.

The EPA and MADEP ultimately found the draft EIR inadequate with respect to groundwater impacts from past and present live-fire training. The IRP had already reported groundwater contamination with some residue chemicals from high explosives. Nev-

ertheless, the Massachusetts Army Guard's EIR did not identify any such threat to the groundwater as a possible environmental impact.

EPA Region 1 and MADEP requested that the Massachusetts Army Guard withdraw its EIR and conduct a more thorough investigation of how training and high explosives might affect the groundwater supply.⁴¹

But this was not enough for the MMR stakeholders. They knew that the ranges and impact area were located over the aquifer below and that Air Force contamination had already threatened public health. Frustrated with the IRP process, the stakeholders began to demand that NGB-Army and the Massachusetts Army Guard prove that past and present Army training (specifically high-explosive training) was *not* contaminating the groundwater.⁴²

Given the unsatisfactory results of the IRP/CERCLA process with the Massachusetts Air Guard and NGB-Air, and with very little patience left, the EPA decided to look for legal means to force NGB-Army to fully evaluate training effects, specifically the effects of munitions on ranges.

5. LEGAL MEASURES

Two other significant changes that occurred in the late 1990s would ultimately have a profound impact on the course of training at MMR. These changes were not as dramatic or as well-publicized as the IRP solution or the Master Plan/EIR, but both would prove instrumental in the legal options sought by EPA Region 1.

5.1 Legislative Changes

Two major pieces of environmental legislation—the Resource Conservation Recovery Act and the Safe Drinking Water Act—were amended in the last half of the 1990s. These two amendments provided a mechanism by which EPA Region 1 could regulate and protect the environment of MMR and affect Army training.

5.1.1 Resource Conservation Recovery Act

The Resource Conservation Recovery Act (RCRA), adopted in 1976, provides a basic framework for federal regulation of hazardous material. A comprehensive Act that covers hazardous waste from generation to proper disposal, it is designed to anticipate and prevent harm to human health. It is not a response program as is CERCLA/ Superfund.⁴³ In accordance with the Federal Facilities Compliance Act of 1992, the EPA is required to consult with the DoD and the states to issue rules identifying when conventional and chemical military munitions become hazardous waste under RCRA.⁴⁴

When RCRA was amended in early 1997, it was expanded to include a definition of when munitions are to be considered solid waste. Munitions including unexploded ordnance (UXO) fall under RCRA when:

- abandoned by being disposed of, burned, incinerated, or treated prior to disposal

- removed from storage for purposes of disposal or treatment prior to disposal
- deteriorated, leaking, or damaged to the point that they cannot reasonably be recycled or used for other purposes
- determined by an authorized military official to be solid waste⁴⁵

This definition allows the EPA to regulate military-generated munitions as waste. But the real source of legal redress for EPA Region 1 at MMR was the Safe Drinking Water Act.

5.1.2 Safe Drinking Water Act

The Safe Drinking Water Act (SDWA), established by Congress in 1974, allows the EPA to establish minimum drinking water standards.⁴⁶ Besides creating regulatory guidelines for drinking water systems, it stipulates measures to be taken in protecting sole-source aquifers.

The 1996 amendments to the SDWA law include drinking water standards and monitoring requirements that are more clearly focused on health protection, risk reduction, and the extension of source water protection programs to include surface water.⁴⁷ These amendments empower the EPA, in the interest of health protection, to legally address the potential risk to drinking water from any source.

5.1.3 RCRA and SDWA as Tools

According to the newly amended SDWA, the EPA did not have to prove there was a hazard at MMR; the EPA could order NGB-Army and the Massachusetts Army Guard to prove that the aquifer had *not* been contaminated. Public health was at stake, groundwater and was the issue, and Army training and high explosives were the suspected sources of the problem. Past Air Force and Air Guard practices had already contaminated large amounts of groundwater. Therefore, EPA Region 1 logically saw SDWA along with RCRA as its most power-

ful legal tools for protecting the groundwater and future drinking water supply of Cape Cod.

EPA Region 1 recommended that its regional administrator, Mr. John P. DeVillars, “[i]nvoke the broad emergency powers the EPA has with the Safe Drinking Water Act. Use those powers to shut down most military activities in the Impact Area.”⁴⁸

5.2 February 1997: Administrative Order #1

In February 1997, EPA Region 1 issued Administrative Order #1 (AO1) under SDWA to NGB-Army and the Massachusetts Army Guard. This Order required the Guard to modify the Master Plan and EIR, conduct a study on the effects of Army training, and provide all relevant information to the EPA and the public. “In short, the Guard had to prove that anything they wanted to do in the Impact Area would not harm the groundwater.”⁴⁹ This Order was the first of three Administrative Orders and set the precedent that the EPA could affect military training.

The Massachusetts State Secretary of Environmental Affairs responded in July 1997 by issuing a new certificate to the Massachusetts Army Guard establishing a Community Working Group that would assist in revising the Master Plan and the EIR, thus ensuring community involvement.⁵⁰ The Community Working Group consisted of the local stakeholders, the four adjacent towns, and the three services at MMR. The revised plan was to be completed by December 2000, but was given an extension to March 2001 and is currently under review.

AO1 required NGB-Army and the Massachusetts Army Guard to conduct a study of the effects on public health from past, present, and future activities associated with the ranges and impact area, and to ensure adequate public involvement in the total process. In addition, they were to provide the regulators and the public with any and all information of known or potential contaminants in the soil and groundwater on, near, or emanating from the ranges or impact area.⁵¹

AO1 also required that lead and two high-explosive compounds, trinitrotoluene (TNT) and Royal Dutch Explosive (RDX), be analyzed in the soil and groundwater on the ranges and the impact area of Camp Edwards. These explosive compounds have been classified by the EPA as possible human carcinogens (Group C carcinogens) and the possible effects of lead include damage to the brain and central nervous system, kidney damage, delayed physical development, and elevated blood levels.⁵² RDX and TNT had already been discovered in several areas of MMR by the IRP, and lead was in the berms surrounding the rifle ranges.⁵³

AO1 established a citizens' advisory committee to monitor progress and named EPA Region 1 as the sole authority to approve completion of work or to determine new project parameters. The committee would meet once a month and NGB-Army would provide updates. EPA Region 1 would moderate the meetings and would be free to use the SDWA to help enforce recommendations made by the environmental activists on the committee. Many of these were the same activists who had previously dealt with the Air Guard and the IRP process. Finally, lack of monies in the government budget cycle was not acceptable as a legal excuse for incomplete work or project delays.

The health effects study was labeled the Impact Area Groundwater Study. NGB-Army and the Massachusetts Army Guard established a project office at MMR. AO1 was later amended to include a Munitions Survey Plan to look for known or possible buried munitions sites.

5.2.1 Massachusetts Army Guard Response

The Massachusetts Army Guard and NGB-Army initially responded by stating that Army training had not affected the groundwater. As of 1996 and 1997, the preliminary technical evidence available indicated that explosives were not a public health risk. A confined detonation study called the Bang Box study had examined the products of various explosives and concluded that negligible amounts of explosive material remained after detonation.⁵⁴ This led to the assumption

that training with high explosives at MMR was a possible environmental risk but not a public health risk that could prevent high-explosive training.

However, when AO1 was issued, the Massachusetts Army Guard agreed to comply with the Order and initiated the mandated study. Moreover, the Massachusetts Army Guard announced that during the period of the study it would:

- voluntarily suspend live high-explosive artillery and mortar firing
- voluntarily suspend firing lead munitions at small arms ranges
- voluntarily cover berms to prevent leaching when not in use
- voluntarily research and implement methods to remove lead, use non-toxic bullets, and use bullet traps and other capture devices
- continue to fire low-cost indirect training round artillery
- continue to use blanks and pyrotechnics during training
- conduct an Archive Search Report on training at MMR
- participate in routine scheduled EPA-directed public meetings
- provide any material requested or material produced by the study⁵⁵

5.3 April 1997: Administrative Order #2

In April 1997, EPA Region 1 issued a second order, AO2, citing both SDWA and RCRA to prohibit any high-explosive training—including everything from small arms to artillery firing—at MMR.

In his book, *About Face*, Seth Roblein states that EPA Region 1 issued AO2 for several reasons. First, both MADEP and Region 1 perceived the Army Guard as slow in modifying its EIR in accordance with AO1. Second, EPA Region 1 wanted to maintain legal pressure and ensure that the Guard would comply with the require-

ment to demonstrate that Army training had not caused contamination of the groundwater.⁵⁶

According to Roblein, EPA Region 1's intent was to shut down the training ranges and oversee a complete and thorough investigation of the groundwater under MMR. Once this study was completed, EPA Region 1 would then reconsider whether high-explosive training was compatible with safe groundwater and public health and make a decision as to whether such training could be resumed.⁵⁷

Training prohibited at MMR by AO2 included:

- firing of all lead ammunition or other "live" ammunition at small arms ranges
- all artillery firing
- all mortar firing
- live demolition, unless for UXO clearance
- use of artillery and mortar propellants
- all pyrotechnics
- burning of propellant or propellant bags

To RCRA with its definition of hazardous wastes, EPA Region 1 added additional contaminants, including propellants, and tasked the Impact Area Groundwater Study with searching for and analyzing this expanded list of contaminants in the ranges and impact area. All berms on small arms ranges were to be covered to prevent any potential leaching of lead and a plan was to be developed within thirty days for the removal of lead from rifle ranges. In the ranges and impact area where soil and groundwater sampling were designated, periodic UXO sweeps were to be conducted to ensure safe access.⁵⁸ Furthermore, the language of AO2 included all aspects of AO1.

5.3.1 Senator Kennedy Steps In

The controversy surrounding AO2 escalated beyond Massachusetts and NGB-Army to the Pentagon and Washington D.C. Senator Edward Kennedy responded by convening a meeting in late April. At this meeting, the military and its supporting politicians argued that

available technical evidence did not exist to support EPA Region 1's contention that Army training was a threat to the environment. Further, they pointed out that the AO2 restrictions would prevent the training required to maintain military preparedness and would set a potentially dangerous precedent.⁵⁹ As Seth Roblein notes in *About Face*, however, Region 1's main emphasis at this point was not the environment but public health.⁶⁰ The groundwater in question is the Cape's public water supply for today and tomorrow.

Senator Kennedy accepted the argument for public health and agreed with the implementation of AO2. The environmental groups and EPA Region 1 had successfully confronted NGB's chain of command and gained the support of a key senator with the power to influence and direct the Guard.

5.3.2 Massachusetts Army National Guard, NGB, and DA Response

When AO2 was issued within two months of AO1, the Massachusetts Army Guard complied with the direction of its Governor and ceased firing high-explosive equipment, but it continued with other field training that did not involve live ammunition. Furthermore, the Massachusetts Army Guard responded to the Massachusetts State Secretary of Environmental Affairs' July 1997 formation of the Community Working Group by signing the issued certificate and beginning work with this group to revise the Master Plan and EIR.

Again, in *About Face*, Seth Roblein recounts actions taken by NGB-Army and the Pentagon to try and mitigate the damaging effects of restrictions imposed by the Administrative Orders. If military training could be stopped for public health reasons, national security could be put at risk. NGB-Army appealed to Ms. Carol Browner, the head of the EPA, but to no avail.

A year later (1998) the Pentagon, with pro-military congressional support, tried to add a provision to the DoD Authorization Act that would prevent such training restrictions. The provision required that a federal agency proposing to take any action that might restrict military training notify the Secretary of Defense immediately. The

action would then be delayed for thirty days.⁶¹ Politicians on both sides argued and the thirty-day delay was changed to five days. But most significant was the language added to the act, language that "...gave whichever agency involved (in this case the EPA) final say on what would happen at military bases if there was any question of public health being at risk."⁶²

5.4 February 1997–December 1999

Regardless of the efforts of NGB-Army, the Administrative Orders were legally binding. For almost three years, NGB-Army and the Massachusetts Army Guard complied with the requirements of AO1 and 2. An Archive Search Report on high explosive and chemical training sites was completed and submitted to Region 1. Numerous monitoring wells were installed and soil samples taken. Additionally, a Munitions Survey Plan mandated by EPA Region 1 to specifically look for buried munitions in the ranges and impact area was initiated.

The Impact Area Groundwater Study discovered various levels of contamination from explosives, propellants, metals, herbicides, volatile organic compounds, semi-volatile organic compounds, and UXO in soil and/or groundwater.⁶³ Results of some of the soil sampling showed that several areas were contaminated with residues from explosives. Over three hundred monitoring wells were installed. Throughout the investigation, numerous UXO were discovered and safe disposal methods were employed.

5.5 August 2000: Administrative Order #3

Based on the success of AO1 and 2, EPA Region 1 issued AO3 in January 2000 directing a cleanup of explosive-contaminated soil and groundwater and classifying UXO as an environmental contaminant. EPA Region 1 issued AO3 in spite of a previous understanding under the Federal Facilities Agreement that any identified contamination

sites would be turned over to the IRP for remediation under a CERCLA process.

AO3 directed NGB-Army to conduct Rapid Response Actions (RRAs) for cleanup. The RRA process included feasibility studies as well as design and remedial actions to abate the threat to public health presented by contamination from past *and* present activities and from sources emanating from the MMR training ranges and impact area.⁶⁴ Ten different sites were listed as needing action. Three of the sites would require a feasibility study, design, and remedial action, involving significant expenditures of money and time. Seven of the ten sites were known contaminated soil locations requiring remedial action that could be conducted immediately and at a relatively modest cost.

A separate requirement of this order dealt with UXO. NGB-Army was to conduct a feasibility study/remedial design/remedial action for surface and subsurface UXO.⁶⁵ The DoD has yet to determine how best to approach this, and the matter is still under negotiations with the regulatory agencies. As with the first two Administrative Orders, NGB-Army will be prepared to conduct additional response actions as dictated by EPA Region 1. The requirements of AO1 and AO2 still apply.

5.5.1 NGB-Army and DA Response

NGB-Army challenged EPA Region 1 with regard to the previous agreement to move identified contaminated areas to the IRP program. However, EPA Region 1 was able to enforce the cleanup under AO3 and NGB-Army is currently conducting RRAs on identified sites.

Also under contention was EPA Region 1's characterization of UXO as an environmental contaminant. Although that debate is still ongoing at the DA level, NGB-Army is in the process of conducting a feasibility study on how to remediate UXO on MMR ranges.

5.6 The Implications of Administrative Orders

The legal language of EPA Region 1's Administrative Orders ensured that the lack of government dollars would not become a roadblock to action. Past experiences with the IRP and the Superfund process had been less than satisfactory; to avoid similar problems in the future, EPA Region 1 made sure that it was now in full control. Armed with SDWA and with RCRA, the EPA had the legal power to direct the Guard to do the groundwater study, stop certain types of training, initiate Rapid Response Actions, and remediate UXO contamination on the ranges—whether programmed funds existed or not.

The Administrative Orders give EPA Region 1 approval authority for any completed work. A typical example is the Archive Search Report, the final draft of which NGB-Army turned in for review by EPA Region 1. As part of AO3, EPA Region 1 has directed NGB-Army to go back and rework the Archive Search Report, expanding its scope to include all impacts of Army training activities, not just those associated with explosives.

6. IMPACTS

6.1 Environment

There is no question that past military activities at MMR caused environmental contamination. The DAF and the Massachusetts Air Guard standard operating procedures for testing fuel valves prior to take-off and during routine maintenance dumped an unknown number of gallons of jet fuel into the soil and subsequently the groundwater. One of the piped-in jet fuel line ruptures reported prior to Superfund designation as being a 2,000-gallon spill was revised in 1990 to a 70,000-gallon spill.⁶⁶ Other prescribed practices and techniques as well as improper handling of chemicals and waste material caused contamination of public drinking water.

Explosives have been detected and confirmed at numerous locations in the soil around old targets and in groundwater radiating from underneath a target area. In other areas, explosive residues in groundwater were found to be above the established EPA health advisory limit. Lead, a known contaminant, was discovered in the berms surrounding the small arms ranges. According to Mr. Ben Gregson of the Impact Area Groundwater Study Program, one of the training areas, Demolition Area One, was classified in the spring of 2000 as a source area for groundwater contamination from explosives with an associated contamination plume.⁶⁷

Furthermore, as the study has progressed, the handling of UXO has become a serious concern to environmental activists, EPA Region 1, and residents in the surrounding neighborhoods. The normal or prescribed method of dealing with UXO has been to explosively detonate or blow in place the ordnance, which is the safest disposal method. However, the public perception was that any further detonations would violate the terms of AO2 and would cause additional contamination of the environment. Explosive residue deposited in the soil and chemical constituents blown into the air could migrate into neighboring homes and schools on the other side of the

MMR fence, potentially causing harm to residents, especially children. The military had only indirect evidence to the contrary.

An additional impact to the environment has occurred from both the IRP and Impact Area Groundwater Study programs. Attempts to remediate past contamination in order to clean up the environment and protect public health may adversely impact MMR's ecosystem. Remedial or investigative actions such as constructing remediation systems, building well pads for monitoring groundwater, and removing acres of vegetation at a time to search for UXO or buried munitions have eliminated entire portions of the pine forest on MMR. MMR has several endangered species; their habitats could be jeopardized as the Guard and EPA Region 1 try to resolve the potential threat to groundwater from Army training.

6.2 Training and Readiness

The mission of the Army National Guard is to train units to meet Army readiness goals and to fulfill its federal mission when called upon. The Guard's ability to attain this state of combat readiness is dependent on access to local training areas and facilities.

Because of AO2 restrictions on training at MMR, the readiness of the Army National Guard throughout New England has been affected. Utilization of Camp Edwards by units declined within the first six months after the issuance of AO2. Units that had scheduled annual training during 1997 suddenly had to find alternate locations. Relocating an annual training site within ninety days was difficult at best.

When EPA Region 1 imposed its restrictions, an artillery battalion made up of personnel who were originally trained as armor and signal soldiers had just been reactivated. Not only has the training of these soldiers been affected but, without the full use of the MMR training ranges, the effectiveness of all artillery sustainment training has been reduced. Previously, Massachusetts Army Guard units had a full day of artillery firing during a two-day weekend drill

at MMR. Now units must travel seven plus hours one way to reach an unrestricted artillery range. Realistically, a full day of firing has been reduced to four-to-six hours.

MMR does have Howitzer Crew Trainers that simulate live missions. The stationary trainer does everything except send a round down-range. However, an important part of the training experience—and a factor that contributes significantly to retaining artillery soldiers—is the actual firing of the howitzer. Personnel are opting for earlier retirement or are not re-enlisting, and the reason given has been “a lack of real training—can’t smell the gunpowder.” No matter how dynamic the leadership, when soldiers think that they cannot fully train in their designated/chosen specialty, their motivation to stay is greatly reduced.

From the beginning, the Impact Area Groundwater Study was an un-financed requirement. To support this requirement, NGB-Army had to divert funds from its operating and maintenance budget, thus impacting other planned and approved programs. Moreover, EPA Region 1 has kept adding investigation and remediation requirements that have pushed the cost of the groundwater study to tens of millions of dollars. The dollars that NGB-Army has taken from other programs have included funds from its own environmental budget, thus affecting other State Guard environmental stewardship programs.

An even greater impact on readiness and training at Army ranges will result from UXO disposal. There is no formal policy for UXO removal from active ranges, and the amount in time and dollars required for UXO remediation is unknown. Also unknown is how range utilization will be affected during removal of UXO. Furthermore, *who* will be in charge of the process? Will it be the military personnel who train there or the regulators who establish hazardous waste cleanup standards?

7. THE LESSONS

The Army Guard's environmental program at MMR was not totally successful. Its programs in Integrated Training Area Management and handling hazardous materials were effective. However, it did not succeed in fully implementing stewardship as outlined in the 1992 Army Environmental Strategy. This was largely due to failures in three critical areas: command and control, community involvement, and a comprehensive environmental assessment. However, there are two other factors that also influenced events at MMR.

First, the environmental activists and regulators treated MMR as *one* installation regardless of the color of the uniform. However, the Guard and the DoD treated MMR as two sites, each with separate service issues, not as a whole site with potentially compounded environmental or public health hazards. When the AFCEE took over the IRP program, it did not consider Army training impacts. Similarly, in preparing its Master Plan and EIR, the Massachusetts Army Guard dismissed the IRP data on the training ranges as irrelevant and focused only on its own proposed activities. Yet, the public clearly saw MMR as one site contaminating the groundwater.

Second, while the 1992 Army Environmental Strategy dealt with ways to improve environmental stewardship, it did not focus on public health as an environmental issue. Further, the Guard did not view military training as posing an environmental threat and recognized only safety issues like UXO as possibly posing a public health risk. The stakeholders, on the other hand, saw the environment as directly related to public health. As mentioned above, the regulators and the stakeholders used the threat to public health as the key to protecting the groundwater from the effects of training. This difference in approach combined with a confusing MMR command and control structure prevented effective leadership, communication, and compliance in accordance with environmental stewardship as outlined in the 1992 Environmental Strategy.

7.1 Lack of Centralized Command

Strong or weak leadership would not have had an effect on the contamination at MMR. Nevertheless, leadership is charged with integrating environmental responsibilities into military decision-making and operations. A central site command could have better demonstrated the commitment of the National Guard, the Army, and the DoD to safeguarding MMR's natural resources for all stakeholders, to protecting public health while ensuring access to facilities required for training.

Both the Massachusetts National Guard and NGB treated MMR as two sites, yet it was MMR as a whole that affected the surrounding communities. When the complexity of the command structure is combined with questions regarding who actually owns or controls MMR, the result is a situation in which regulators and the public have no idea of who is responsible and really in charge.

Furthermore, NGB and the Massachusetts National Guard do not have the technical or financial resources that the AFCEE or the DA could apply to handle a massive cleanup such as that needed at MMR. As history shows, it was only when the AFCEE stepped in to oversee and manage the IRP in 1996 that there was improved community involvement and progress on implementation of a remediation process.

Today the Impact Area Groundwater Study is still managed by NGB-Army, with little direct support from Army Headquarters. It was not until December 2000 that the DA met with the Massachusetts Army Guard and actively began participating in new meetings with the surrounding communities. Follow-up meetings have occurred in the first quarter of calendar year 2001 to discuss and decide on Army training compatible with MMR's environment.

7.2 Lack of True Community Involvement

If the Army is to be the national leader in environmental stewardship, then the Army needs to more effectively embrace public involvement. Open discussions on past, present, and future environmental issues need to take place if conflicts are to be reduced. These discussions should also address the issue of encroachment, which impacts communities on both sides of the installation fence.

The Army's commitment to environmental stewardship is based on common values that all stakeholders share. A fundamental value is the belief that it is possible to create a safe environment for today that will sustain tomorrow's livelihood. There may be many possible ways of achieving this goal, but with honest and open communication each stakeholder can contribute to improving the stewardship of our natural resources.

Communication has three key components: talking, listening, and understanding. Stressed throughout the Army's environmental strategy is the importance of communication with stakeholders and the community. Ensuring public involvement early and in every aspect reduces conflict, enhances cooperation, and expedites actions with the stakeholders.⁶⁸

From 1982 to 1996, the communication process at MMR was filled with conflict. To a certain extent, this is still the case today. Effective communication requires trust, which is a two-way street. Everyone associated with the problems at MMR has talked and some have listened, but very few have really understood or trusted one another. Decisions appear to have been influenced by perceptions (which were often actually misperceptions) more than by facts or science.

For over twenty years, MMR stakeholders have tried to convince NGB that Army and Air Force training or activities have caused contamination of the environment and created a threat to public health. The Guard's initial response was to assert that national defense takes priority over the environment and that, furthermore,

what occurs inside the installation's fence line is not the public's concern.

When the stakeholders started demanding not only information but also participation in decision-making, the Guard began to provide limited information to the public. Both sides have used the word *potential* to enhance their arguments. But when *potential* is linked to public health and true communication does not exist, smart or risked-based solutions are difficult to formulate, much less implement.

7.3 Environmental Assessment Omitted Relevant Issues

The environmental assessment at MMR was unsuccessful because it did not consider past contamination. The 1996 Master Plan/EIR essentially reported that the ten proposed projects posed no significant impact to the environment. In this document, the Massachusetts Army Guard focused only on new projects and did not take into consideration the findings of the Air Guard and the IRP program that had identified several sites of possible explosive contamination from past activities. The Master Plan/EIR was submitted for approval just after the public had vociferously rejected the IRP solution and the "Broken Trust" articles had appeared. The regulators could not accept the Massachusetts Army Guards' assessment of "no significant impact."

In hindsight, given the difficulties with stakeholders and the unknown extent of the contamination from past activities, the Master Plan should have included a comprehensive environmental assessment as outlined in the 1992 Army Environmental Strategy.⁶⁹ The revised Master Plan being prepared in conjunction with the Community Working Group includes such an assessment.

8. SUMMARY AND CONCLUSION

Massachusetts Military Reservation is an established military training facility where past military practices contaminated a sole-source aquifer. Like most Army installations, MMR has supported military operations for over ninety years. Inherent in such longevity is the potential to cause some type of contamination over time. MMR is an example of just one installation with not only an extensive military heritage but also a legacy of contamination.

The Army Environmental Strategy developed in 1992 provides a framework for the Army to become an effective environmental steward. Common themes throughout the strategy are coordination on and resolution of environmental issues, a holistic approach to site assessment, and minimization of risks to the environment. Environmental site assessments are important tools that enable Army leaders to become effective environmental stewards in their management of installation resources. Effective environmental stewardship is not incompatible with maintaining military training areas and ensuring combat readiness.

Environmental stewardship should be approached as one would approach combat operations: analyze the present situation, consider historical activities, and remain flexible for the unexpected. Because this was not the approach taken at MMR, the Army Guard environmental stewardship program was incomplete and uncoordinated.

Over the twelve years during which the Massachusetts Army Guard was preparing its Master Plan, the Massachusetts Air Guard and NGB-Air were dealing with stakeholders on the issue of groundwater contamination. The Army Guard did not consider prior activities relevant or current training as posing environmental problems nor was it flexible enough to interact with the Air Guard, the regulators, or the environmental activists. The Army Guard failed to correctly analyze the situation, consider historical activities, and remain flexible. The 1996 EIR with a finding of “no significant impact to the environment” never had a chance of being approved. The ul-

timate result was a series of EPA Region 1 Administrative Orders that indefinitely suspended high explosive training at MMR.

A review of the lessons of MMR suggests the following recommendations for Army installations implementing environmental stewardship programs:

- Read and apply the *1992 U.S. Army Environmental Strategy into the 21st Century*
- Ensure that there is one leadership team for each installation
- Understand that the environment includes public health issues
- Review past practices, especially with respect to changing environmental laws
- Engage the public openly, honestly, and aggressively
- Identify each stakeholder's agenda, for every situation

Incorporation of these recommendations will not reverse the contamination, eliminate lasting environmental effects, or necessarily satisfy a concerned public. It will, however, improve trust and understanding between Army installations and local communities. The critical decisions required for contamination remediation will have a more likely chance of acceptance. Had these recommendations been implemented during the 1996 Master Plan process, Region 1 may still have issued Administrative Orders, but all sides would have had a clearer understanding of the others' agendas.

The Army has an excellent environmental awareness and stewardship strategy and mature programs to integrate that strategy into military operations. As the Army redefines installation management in terms that incorporate ecosystem management, both environmental and public health systems will be protected.

The Army and the community together form one ecosystem. As a partner in this ecosystem, the Army faces the challenge of acknowledging community needs while achieving the objectives of the NMS. This is critical, because the ecosystem partners need to jointly assess the risks associated with protection. Stewardship of the environment ensures that we will always have a safe place to live; stew-

ardship of the country ensures our way of life. The Army has responsibilities in both areas.

An objective of the NMS is to “prepare now for an uncertain future.” To be able to *prepare* we must have the lands required for training. As the Army works with the stakeholders, public health and the environment should not be neglected, nor should the preparedness of the Army be compromised. This is a risk-based dilemma that can be resolved only when all stakeholders have an open and honest exchange of information.

Another objective of the NMS is to “respond to the full spectrum of crises.” As soldiers we swore to “protect against all enemies foreign and domestic.” The values that inspire us to be successful and win are the same values that inspire environmental activists. In fact, these common values are rooted in the foundation of our country, the Constitution. The Army does not exist in a vacuum; furthermore, soldiers often come from the neighboring communities. Wherever and whatever crises arise, our common values should shape our response. Stakeholders may have different methods, but when faced with a serious threat, the core motivation to resolve the problem is the same.

History has taught us how to be leaders. History has also shown us the errors of our ignorance. The events that have taken place at MMR exemplify our past ignorance. They also exemplify our willingness to rectify the effects of that ignorance. The 1992 Environmental Strategy demonstrates the Army’s awareness of environmental stewardship and commitment to it.

Only the future’s recounting of the present will show whether the environmental lessons of MMR and other installations were learned and implemented. It is hoped that the history of the years to come will demonstrate the Army’s environmental ethic in responsibly safeguarding neighboring communities without compromising execution of the National Military Strategy.

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³⁴ Ibid., 11-23.

³⁵ Council on Environmental Quality Executive Office of the President, *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act* (U.S. Government Printing Office, Reprint 40 CFR Parts 1500-1508 [1992]), 3.

³⁶ Logistics Management Institute, *The U.S. Army Environmental Program Requirements Project Catalog*, (Department of Defense Contract DASW01-95-c-0019, 1997), 8-1.

³⁷ *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act*, 17.

³⁸ Massachusetts National Guard, Cape Cod, *Draft Master Plan/Area-Wide Environmental Impact Report*, Appendix A, 2.

³⁹ Ibid.

⁴⁰ Brennan and Mills, “Broken Trust, Day One.”

⁴¹ Roblein, *About Face*, 127.

⁴² Ibid., 126.

⁴³ Touchstone Environmental Inc., *The Complete Guide to Environmental Law* (Specialty Technical Publishers, 1993, revised 2000), VI.

⁴⁴ Ibid., V A 14.

⁴⁵ United States Environmental Protection Agency, “Environmental Fact Sheet: EPA Finalizes Regulations under RCRA for Military Munitions,” February 1997; available from <http://www.epa.gov/epaoswer/hazwaste/military/muns_fs.txt>; Internet; accessed 21 March 2001.

⁴⁶ Logistics Management Institute, *The U.S. Army Environmental Program Requirements Project Catalog*, 13-1.

⁴⁷ Ibid., 13-2.

⁴⁸ Roblein, *About Face*, 127.

⁴⁹ Ibid., 128.

⁵⁰ Massachusetts National Guard, Cape Cod, *Draft Master Plan/Area-Wide Environmental Impact Report*, 3.

⁵¹ United States Environmental Protection Agency Region 1, *Administrative Order, EPA Docket No.: SDWA I-97-1019*, (EPA Region 1, 1997), 10.

⁵² Ibid., 9.

⁵³ Ibid., 7.

⁵⁴ R. Szostak and K. Cleare, "Emissions Related to Munitions Firing: A Case Study of Nitrogen Oxides, Volatile Organic Compounds, and Energetic Residue from Detonable Munitions," in *Federal Facilities Environmental Journal/Autumn 2000* (John Wiley and Sons, 2000), 89.

⁵⁵ United States Environmental Protection Agency Region 1, *Administrative Order, EPA Docket No.'s RCRA I-97-1031, SDWA I-97-1030, amended SDWA I-97-1030, 28 July 1997*, (EPA Region 1, 1997), 11.

⁵⁶ Roblein, *About Face*, 130-133.

⁵⁷ Ibid.

⁵⁸ United States Environmental Protection Agency Region 1, *Administrative Order, EPA Docket No.'s RCRA I-97-1031, SDWA I-97-1030, amended SDWA I-97-1030, 28 July 1997*, Appendix A.

⁵⁹ Roblein, *About Face*, 131.

⁶⁰ Ibid.

⁶¹ Ibid., 133.

⁶² Ibid.

⁶³ United States Environmental Protection Agency Region 1, *U.S. EPA Region 1, EPA Docket No.: SDWA-I-2000-0014*, (EPA Region 1, 2000), 4.

⁶⁴ Ibid., 9.

⁶⁵ Ibid., 22-23.

⁶⁶ Roblein, *The Enemy Within*, 46-48.

⁶⁷ Ben Gregson, program manager, Impact Area Groundwater Study Program, telephone interview by the author, 29 March 2001.

⁶⁸ *U.S. Army Environmental Strategy into the 21st Century*, 22.

⁶⁹ Ibid.

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