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ENVIRONMENTAL PROTECTION: IS THE ARMY PREPARED TO FIGHT?

Malcolm V. Meekison

Army War College
Carlisle Barracks, Pennsylvania

29 March 1973

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BY

LIEUTENANT COLONEL MALCOLM V. MEEKISON

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USAWC RESEARCH PAPER

ENVIRONMENTAL PROTECTION: IS THE ARMY PREPARED T FIGHT?

AN INDIVIDUAL RESEARCH REPORT

by

Lieutenant Colonel Malcolm V. Meekison
Ordnance

US Army War College
Carlisle Barracks, Pennsylvania
29 March 1973

ABSTRACT

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This paper reviews the nature of environmental hazards and the increasing levels of pollution found in the United States. Pertinent environmental related legislation, Executive Orders, and DOD directives, are analyzed to determine the National policy on environmental protection. The Army's Environmental Quality Program is addressed to determine its coincidence and responsiveness to the National policies. It is concluded that the Army is indeed "prepared to fight." In fact, the battle has been joined.

TABLE OF CONTENTS

		Page
ABSTRACT		ii
CHAPTER I.	INTRODUCTION	1
	Statement of the Problem	1
	Investigative Procedures	2
	Organization of the Paper	2
II.	THE ECOSYSTEM IN JEOPARDY	4
	Pollution	4
	Air Pollution	4
	Water Pollution	8
	Landform Change	12
	Causes of Increased Pollution Levels	14
	Reaction to Increased Pollution	15
	How the Army is Involved	17
	Summary	19
III.	NATIONAL ENVIRONMENTAL POLICY	23
	Historical Perspectives	23
	Statutes	24
	Executive Orders	27
	DOD Environmental Quality Program	29
	Summary	30
IV.	THE ARMY'S EFFORT	34
	Environmental Quality Actions	34
	Air Pollution Control	34
	Water Pollution Control	36
	Control of Other Hazards	38
	The Army's Policy	39
	The Army's Program	40
	The Army's Organization	41
	Summary	44
V.	AN ASSESSMENT	47
SELECTED BIBLIOGRAPHY		49

CHAPTER I

INTRODUCTION

There has been a steadily increasing concern during the past ten years over the quality of our environment. Apprehension regarding man's adverse impact on the ecosystem has been manifested in a number of ways. The results of this concern have already had direct and indirect effects upon the US Army, and more will follow. This paper will address the nature of environmental pollution, the attendant public and governmental reaction, and the Army's response at the highest levels to the challenge of protecting the quality of our environment.

STATEMENT OF THE PROBLEM

Specifically the paper examines the organization, charter, and functions of these higher army levels to determine their ability to satisfy the statuatory requirements and higher level directives relating to environmental protection. It was my intent in this research effort to gain a more objective insight into environmental problems, and to identify those which are being or should be addressed by the Army I was particularly interested in how effectively the Army is moving to promote environmental protection. The problem that I have addressed is "Has the Army committed sufficient resources at its highest level to insure efficient management and direction of those necessary programs to meet environmental quality requirements?"

INVESTIGATIVE PROCEDURES

The bulk of my research and analysis has been accomplished by reviewing books and periodicals on the subject of environmental protection. There has been a veritable outpouring of pertinent publications in the past five years, sufficient to allow me to affirm to myself, at least, that environmental protection is a necessary thing. From these readings, it has been my intent to accomplish two things: to extract and aggregate the more significant environmental hazards that have driven public reaction leading to legislative action, and to identify those major hazards that can reasonably be attacked to some extent by the Army.

In addition to the research of available documents, I have had several interviews at Department of the Army to gain a better appreciation for the current organizational considerations affecting that level which impact on the problem of environmental protection.

ORGANIZATION OF THE PAPER

The second chapter of this paper summarizes some of the more significant environmental protection problems and explains why they are getting to be bigger problems. From a review of these problems it is rather simple to see why the public has become more aware of the need for environmental protection and how this public awareness has been translated into congressional action. The chapter also identifies some direct and indirect reasons for the Army's involvement in environmental protection.

Several significant reasons for the Army's involvements are examined more fully in the third chapter. They are the statuatory requirements derived from Congressional action, Executive Orders, and directives from the Department of Defense. Some of the more important are summarized.

The fourth chapter identifies the resources, essentially in personnel, the Army has committed to provide top level management of the Army's environmental projects. Along with this assessment is a review of the organizational structures and functional charters as they exist at these levels.

The final chapter presents the conclusions of the author as to where the Army stands on this rather new battlefield.

No significant assumptions have been made at the outse . Rather, facts and scientific opinions are presented from which conclusions have been drawn.

CHAPTER II

THE ECOSYSTEM IN JEOPARDY

"The earth's ecosystem is a giant thermodynamic machine which--driven by sunlight--slowly evolved over a billion years or so."[1] Man-made contaminants and technology's assault upon the earth are causing a deterioration of our environment affecting the balance of the earth's ecological system.[2] There are many ways to categorize the perils to the ecosystem; however, in the following paragraphs I shall isolate these hazards into two groups: pollution and man-made landform changes.

POLLUTION

One author defines pollution ". . . as the process of contaminating a medium with impurities to a less desirable level of quality."[3] Pollution can take many forms and affect different mediums. That is, pollution may be solid, liquid, or gaseous contamination of the air, water, or earth. It may be thermal, audible, or radiological. This paper will be concerned primarily with that pollution resulting from the contamination of air, water, and earth by solid, liquid, and gaseous pollutants.

AIR POLLUTION

"Air is man's most vital resource."[4] As to whether or not it is our most vital resource could be debated; however, that it is indeed vital is beyond argument. And yet, each day in the United States we contaminate the quality of our air by introducing

noxious gases and harmful solid pollutants. For the most part the contaminants result as man burns fuel to convert energy from one form to another.[5]

What are the pollutants that affect air and how are they introduced? Among the more common contaminating gases that are produced in massive amounts are carbon dioxide and carbon monoxide. The former is the product of complete combustion of organic fuels, while the latter results from incomplete combustion. Carbon dioxide is a natural constituent of air and man has adapted to living under widely varying amounts of its presence. It is known that the level of carbon dioxide concentration in the air is one of many factors influencing the earth's temperature balance. It is also known that there has been a significant increase in the level of its concentration.[6] This has led to concern by some that continued increases will bring instability to the earth's temperature balance and result in a "world warming trend."[7] That such will happen has not been scientifically proven and remains a topic of "intense scientific discussion."[8] Humans are less tolerant to carbon monoxide; exposure to 100 parts per million for several hours can be hazardous. The greatest contributor of this pollutant is the motor vehicle.[9] In 1966 the Department of Health, Education and Welfare estimated that 64.5 million tons of carbon monoxide were produced by motor vehicles in the United States. The applicable government standards at that time allowed car manufacturers to produce a vehicle that generated up to 79 grams of carbon monoxide per vehicle mile. These standards had been

tightened in 1971 to no more than 23 grams per mile, a 70.9% reduction. Such restrictions would, on the surface, reduce the problem; however, the steadily increasing inventory of automobiles and trucks tends to offset the gain. In fact, the rising numbers of vehicles are forcing more restrictive standards on the manufacturer.[10] In recent weeks all major car manufacturers in the United States have indicated their inability to meet the requirements set for 1975.

Of a more toxic nature, but produced in less massive proportions than the two gases just described, are sulfur dioxide and hydrogen sulfide. The former is produced primarily by the combustion of fossil fuels such as coal and oil, both of which contain sulfur in varying but substantial amounts. The latter results primarily from industrial processes and the decay of industrial wastes in stagnant waters. Sulfur dioxide in its gaseous form is highly irritating to man's respiratory system and is the leading suspect in recent air pollution disasters. Because it is readily converted in the atmosphere to sulfuric acid, it has a double potential for trouble. Hydrogen sulfide in high concentrations is a particularly deadly gas. Fortunately, such concentrations are rare.[11] In 1967 the Department of Health, Education, and Welfare estimated that 2.9 million tons of sulfur oxides were generated as a result of fuel combustion in a stationary source. About 18 millions of those tons resulted from the operation of power generating plants.[12] A number of techniques to reduce the sulfur content of fossil

fuels are under consideration. Most recent estimates indicate that even the more economical techniques still result in an increased cost of the basic fuel by about $.75 per ton for coal and $.50 per barrel for oil. Additionally, the extent of reduction is generally insufficient to reduce the pollution characteristics substantially.[13] Other techniques are being incorporated in power plant stacks that desulfurize the stack gases; however, the expense of the necessary equipment to accomplish this also increases the cost of the product.[14]

There are two oxides of nitrogen which are normally classified as pollutants: nitric oxide and nitrogen dioxide. Nitric oxide is created by the chemical combination of nitrogen and oxygen that occurs when the two gases are concurrently exposed to the high temperatures associated with efficient combustion processes such as internal combustion engines. In the atmosphere a complex reaction occurs, converting it into nitrogen dioxide, a more toxic product.[15] In its latter form an acceptable exposure level for brief periods is two parts per million. Of interest is that earlier pollution control devices incorporated in automobiles concentrated on other pollution by-products and successfully reduced their levels while increasing the amount of nitric oxide generated. Efforts are underway to bring the latter in line with ever tightening standards.[16]

In addition to the gases described, particulate matter also serves as an air pollutant. Dust, soot, suspended herbicides and pesticides, radioactive material, and minute particles of other

matter are included in this category. Not only do these particles reduce local visibility, many are harmful both to humans and other living things.[17]

Air pollution is indeed a significant environmental problem in the United States. In 1965 it was estimated that our national cost for air pollution was $11 billion, resulting from damaged crops and livestock, corroded metals and masonry, delays in airline schedules, etc.[18] It is no wonder that public opinion was aroused and legislative actions were taken to address the problem.

WATER POLLUTION

Water is another vital resource that is highly susceptible to pollution. It is vital not simply for drinking but for agricultural and industrial purposes. It has been estimated that 97.1% of the earth's total supply of water is found in the oceans. The remaining water is located in lakes, rivers, beneath the ground, and in the atmosphere and it is that water which is most critical to man.[19] Pollution of our water resources most commonly results from the disposal of untreated human and industrial wastes, oil spillage, use of nitrogen fertilizers, and through thermal discharges.

The use of the word "eutrophication" has grown more common during the past decade. It refers to the aging of a body of water; a natural process that can be hastened by man.[20] Eutrophication occurs as water becomes overly enriched with nutrients in the form of organic debris. As this debris decomposes, the

bacteria fostering the decomposition consume dissolved oxygen in the water. When bacterial demands for oxygen to support decomposition exceed the natural supply, anaerobic areas develop. In these areas the oxygen-poor water will not support normal marine life. Further decomposition in such waters is accomplished by microorganisms that can function in an oxygenless environment, resulting in putrefication with attendant foul odors.[21]

Scientists have been aware for sometime of the demands for free oxygen dissolved in water to support decomposition of organic wastes. Sewage treatment plants are a very direct result of this awareness. At such plants, organic wastes are converted into inorganic salts by using microbial decay organisms and artificially supplied oxygen. The inorganic salts resulting from this treatment, basically nitrates and phosphates, can be released into natural water systems without causing an immediate or direct requirement for the free oxygen dissolved in the water. If we stopped there we could be pleased with the result; however, the inorganic salts serve as vital nutrients to support algae growths. These growths demand oxygen, and we again find ourselves, indirectly, supporting eutrophication.[22]

In addition to pollution that speeds the process of eutrophication, there are many other pollutants released into our water. Non-degradable inorganic and synthetic organic chemicals resulting from industrial processes fall into this category. About two--thirds of our water pollution problems are caused by manufacturing, transportation, and agricultural activities. The remaining third result from untreated municipal sewage.[23]

It has been demonstrated by the British ". . . that 15 tons of oil--a neglible amount-dropped into a calm sea can cover 8 square miles in less than a week, and that oil slicks can be traced for many hundreds of miles."[24] Fifteen tons does indeed seem a negligible amount when you consider that super tankers will carry about 800,000 tons of crude.[25] Although existing naturally in the sea there are bacteria which can decompose petroleum base products into harmless components, they are inadequate to cope with massive demands created by large oil spills.[26] Crude oil is an extremely complex mixture of natural products, with a diverse potential for damaging marine ecology.[27] We have all seen on television the effects of crude oil on marine birds. These effects have been well documented. Lesser documentation exists in the longer range effects of oil on marine life - and on the transition of affected marine life to human food. There are indications that even low concentrations of certain of the hydrocarbon constituents of oil products can produce dramatic and devastating effects on marine species and to other species dependent upon the marine food chain.[28] At a time when the world is looking more and more to the sea for sustenance, it would seem prudent to explore more fully the effects of oil spills on marine life and to develop safe countermeasures to combat spills quickly. This seems particularly important now as ever greater quantities of oil are being produced off-shore and are being transported by large tankers from producing country to consumer.

Most knowing Americans are impressed with the abilities and efficiencies of our agricultural sector. So much is produced to feed so many--and with such a small amount of arable land and minimum impact on the labor base. Although a great deal of the success can be attributed to advances in farm machinery and development of more productive strains, a portion of the success can be directly linked to the development of inexpensive commercial fertilizers. There are indications that over-application of these inorganic nitrogen fertilizers produces a surplus of nitrates in the soil which drain into adjacent streams and rivers. The nitrate levels of ground water near farms where heavy fertilizer applications have been made also tends to rise. In the latter case, this has been cause for some alarm in the Corn Belt. For nitrates, when ingested by humans, are converted by intestinal bacteria into nitrites--a poisonous form. Nitrites affect the osygen transport capability of the blood, and can cause asphyxiation or death, particularly in infants.[29] Another suspected subsidiary effect of inorganic nitrogen fertilizers is potential damage to the natural nitrogen fixation bacteria in the soil.[30] Fertilizer manufacturers have challenged both charges, indicating that there is no conclusive evidence that synthetic fertilizers affect either the ground water or the soil bacteria.[31] Certainly there appears a reasonable need for additional research in this area.

A final significant pollution hazard for water is heat. Thermal discharges from industry and power production facilities contribute to this hazard, with power plants being the larger of the two contributors. In late 1969 it was estimated in the United States that some 60 trillion gallons of water were used for cooling purposes alone in industry and power plants.[32] When you consider that we have an estimated available supply of water in this country of about 438 trillion gallons each year, you can see the significance of the amount of water being used for heat dissipation.[33] In most bodies of water, the natural temperature changes that take place do so in a gradual manner, over a range of from 28°F to a normal maximum of 100°F.[34] Higher forms of marine life generally cannot live in water with temperatures above 95°F.[35] Rapid changes in water temperatures can provoke devastating effects in marine life. It is not uncommon for thermally operated power plants to raise the temperature of their coolant waters by as much as 30°F. Discharges in quantity at this higher level can produce adverse effects in the immediate marine community. Higher ambient temperatures in water also increase the speed of eutrophication, as described earlier in this chapter.[37]

LANDFORM CHANGES

With the advent of the bulldozer and other modern earth moving equipment, man has the wherewithal to make marked changes in the earth's face. Some changes have undoubtedly done grievous

harm to nature, while others have aided not just nature, but also man. It should be pointed out that nature herself makes topographical changes without any help from man. Among some of the more significant landform changes brought about by man are: the encroachment into the marshy areas along the national seaboard, strip and open-pit mining for minerals, and canal and dam construction. In the case of man's impact on marshes, we are gobbling them up to reclaim them for construction of houses, airports, and factories. Since a substantial number of marine animals are directly dependent on marshes for their existence and an even larger number is indirectly dependent, there is reasonable concern about the need for protecting marshes.[38]

As of 1 January 1965, there were an estimated 3.2 million acres of land in the United States directly disturbed by surface mining. It was estimated that this amount would increase by approximately 153,000 acres per year.[39] No matter how you look at it, these are impressive figures.

A final pollution problem worthy of note is man-made solid waste. In the United States last year there were more than five billion tons of cans, bottles, cars, paper, etc., that ended in the garbage pile. The pile is growing percentage-wise twice as rapidly as our gross national product. It was estimated that in 1972 it would cost US municipalities about $6.4 billion to dispose of solid wastes. Although a number of approaches are being taken to solve this particular problem, none of the apparent solutions are inexpensive. It still remains less expensive to dispose of this waste conventionally than recycle it.[40]

CAUSES FOR INCREASED POLLUTION LEVELS

There are three basic reasons for pollution levels in the United States to be on the increase. Our population has been steadily increasing, certainly not as rapidly as in the many lesser developed countries, but rapidly enough so that in combination with other factors, population growth is a contributor. A second factor is the increasing affluence of this increasing population. We have more cars, more televisions, more air conditioners, more of everything. To satisfy the demands of an affluent population can lead to many environmental problems.[41] The third, and final, basic reason for pollution increase is the explosion of technology which has occurred since the end of World War II.[42]

Although the experts might disagree as to which of these factors was the leading cause for pollution increases, they all generally cite the three. There are some indications in the United States that our population growth rate is on the decline and that the campaign for zero population growth is making progress.[43] Nevertheless, the life style of those that are here is such that we consume materials and energy more voraciously than anywhere else in the world.[44]

Doctor Barry Commoner, one of our country's more active environmentalists, argues strongly that our expanding technology far outshadows population and affluence as the force behind our current dilemma. This has occurred as we have shifted dramatically to the use of synthetic products rather than natural ones. Our increasing

use of synthetic materials in textiles rather than cotton and wool has led to higher pollution levels. The manufacturing process to make these synthetic fabrics requires considerable heat and energy, and many of the chemicals and catalysts used in the process eventually end up in waste water or exhaust gases from the plants.[45] Our switch from natural soaps to detergents, with the latter's non bio-degradable properties, led to problems such as foamy discharge waters finding their way to our natural water systems. The phosphates in the detergents also served as nutrients to support algae blooms in our lakes and streams.[46] Virtually all man-made synthetics are not degradable in nature. They simply do not disappear rapidly.[47] They are only a few of the indicators cited by Mr. Commoner.

REACTION TO INCREASED POLLUTION

The authors of It's Not Too Late have said that:

> We have reached a point as human beings where we realize that man's existence on earth depends not only on his ability to adapt to his environment, but on his ability to change it. Man has applied his accumulated knowledge to compress time and distance, to convert resources and to alter and divert the flow of nature toward more convenient or suitable patterns. This enormous capability differentiates man from all other animals and has inflated his sense of superiority to the point of ecological arrogance.[48]

And now it appears that the arrogance is beginning to yield to a new awareness of the dangers that I have just described. Frank M. Potter, Jr., recented noted that:

> It is difficult to find a newspaper today that doesn't have at least one story on environmental problems. People who read these stories react to them and, with increasing frequency, their reaction is sympathetic. Environmental concerns are no longer the private preserve of the bird-watchers: the same bell tolls for us all.[49]

Polls conducted in 1969 by two different organizations commissioned by the National Wildlife Federation confirmed an active concern on the part of the public, varying directly with income and indirectly with age.[50] A more recent poll conducted by the Army War College of four thousand officers indicated that pollution of our environment was perceived as one of the ten greatest dangers to the country.[51]

Individual interest and concern has led to group interest and action. Coalitions of citizens have brought pressure on utilities, local politicians, national legislators, private corporations -- all out of environmental concern. Power plants planned for construction have been delayed. Airports under construction have been stopped completely. Greater amounts of federal funds are being made available for environmental projects.[52] Many of these actions have been taken as a direct result of concerned citizens.

A number of national environmental organizations have been formed. Among the more significant are the Sierra Club, the Defenders of Wildlife, the Audubon Society, Nature Conservancy, the Friends of the Earth, and the American Conservation Association. There are many others, some twenty in all. They represent a diverse range of interests and are not truly united in their efforts.[53] Nonetheless, some are developing increasing potency, such as the Sierra Club and Audubon Society.[54]

All of this public concern has been felt in government. A number of significant bills have been passed by Congress. A number of Executive Orders have been issued by the President. Both will be discussed more fully in the next chapter.

Additionally, a "troika" has been formed in Washington to address environmental problems. Members include the Council of Environmental Quality (concerned with policy), the Environmental Protection Agency (concerned with regulation of pollution), and the National Oceanic and Atmospheric Administration (concerned with long range research). Their composite budget for fiscal year 1973 runs slightly over $2.7 billion.[55]

Certainly there has been a reaction to the increased pollution hazards facing the country. What has been the impact on the Army of all this reaction?

HOW THE ARMY IS INVOLVED

Receipt of criticism on environmental matters is one way the Army is involved. Deputy Under Secretary of the Army R.L.T. Koren has said, "The Army, as an organization, has been charged in several quarters as being environmental Public Enemy No. 1. These charges stemmed from activities such as nerve gas leaks and Corps of Engineer construction projects."[56] Some critics have broadened the target to level the same charge at the entire defense establishment.[57]

The Army also becomes involved as it prepares excess real property for return to civil authorities for disposal and sale.

Charges of "litterbug" have been lodged against the Army in past transactions of this kind. Some evidence exists that damage is inflicted upon buildings at the Army's own hand as it departs from excess installations. Specific examples have been cited at discontinued air defense missile sites where the extent of damage was such that the renovation costs to restore structures to a useful condition prevented their reuse. Time Magazine has gone so far as to suggest that, "A lot of military leftovers that now litter the American landscape could well be picked up--by the idle hands of thousands of GI's or gobs."[58]

The Army, institutionally, must operate under the constraints imposed by the statutes discussed in the next chapter. As the responsible governmental agent for considerable Federal acreage and facilities, the Army must meet the environmental quality standards of these statutes. Exhaust gas hazards from power plants have to be eliminated. Sewage must be treated. Industrial facilities, such as ammunition plants, which are owned by the Army but operated by contractors, are also an Army responsibility.

The Corps of Engineers, as the government's principal engineering and construction agency, also has a vital role to play in environmental matters. Harbor construction and maintenance, flood control efforts, dam and canal construction, and navigable waterway projects are but a few of the reasons the Corps is involved. The nature of these efforts requires the Army to consider and solve complex ecological problems.[59]

SUMMARY

Certainly there are many environmental hazards facing the nation today. Some of the more significant have been addressed to this chapter. Because of the magnitude of the many environmental problems there has developed a growing ecological awareness. This awareness has led to Congressional action that imposed constraints on all sectors in the United States to assist in the abatement of pollution. The Army has found itself involved in the fight.

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CHAPTER III

NATIONAL ENVIRONMENTAL POLICY

The purpose of this chapter is to summarize the broad framework of prevailing policy established at the national level that affects the US Army. To do this I shall describe some of the significant features of the more important public laws, along with some of the pertinent Executive Orders issued by the President. Additionally, prevailing Department of Defense policy relative to environmental quality will be reviewed. There are certain controversial issues not fully resolved that will be discussed also, as they have the potential of influencing the Army's involvement in the future.

HISTORICAL PERSPECTIVE

Although some of the most meaningful legislation regarding environmental quality has been recent, Federal legislation on the subject can be traced back to an 1899 law which prohibited the dumping of garbage in navigable waters.[1] However, until the early 1950's the burden of environmental clean-up was on the state and municipal governments. There has been a growing recognition of the limited capability of local governments to cope with complex environmental problems.[2] This has led to an increasing amount of power and responsibility being absorbed by the Federal government. As Mr. J.C. Davies, III, puts it, "There is every indication that this trend will continue."[3]

STATUTES

Certainly one of the most important pieces of legislation in recent years to influence environmental quality is the National Environmental Policy Act of 1969 (NEPA). The purposes of NEPA are:

> To declare a national policy which will encourage productive and enjoyable harmony between man and his environment; to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man; to enrich the understanding of the ecological systems and natural resources important to the Nation; and to establish a Council on Environmental Quality.[4]

Among its other features is the explicit requirement for what has become known as the "Environmental Impact Statement." This particular requirement specifies that detailed statements on environmental impact must be included in proposed legislation affecting human environment. This requirement grew out of recognition that the environment's complexity is such that inter-agency coordination and multidisciplinary reviews are necessary to insure that ecologically sound results can be insured.[5]

In the Water and Environmental Quality Improvement Act of 1970, two additional significant steps are taken. Title I of the Act addresses water quality, establishing guidelines for control of pollution from oil, hazardous substances and chemicals, and sewage from vessels. Additionally, Congress charges in this act that:

> Each Federal agency (which term is used in this section includes Federal departments, agencies, and instrumentalities) having jurisdiction over any real property or facility, or engaged in any Federal public works activity of any kind, shall, consistent with the paramount interests of the United States as determined by the President, insure compliance with applicable water quality standards and the purposes of this act in the administration of such property, facility, or activity.[6]

In Title II of this same act an Office of Environmental Quality was established to provide a professional and administrative staff to support the Council on Environmental Quality.[7]

The Federal Water Pollution Control Act Amendments of 1972 were the next major set of rules developed by the Congress. The objective of the Act was "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters."[8] This particular Act tightened even further the standards included in Public Law 91-224, and established target dates for attaining pollution free natural waters. Certainly this has been the most comprehensive environmental legislation to date. The Act authorized $24.6 billion to be expended to clean up the nation's lakes and rivers. Because of Presidential concern over the potential cost of this legislation there was a veto which was overridden by Congress.[9] Subsequent to the veto the President ordered that certain of the money authorized for expenditure be impounded by the Environmental Protection Agency, allowing only $2 billion of the $5 billion authorized to be allotted. This move by the President has drawn some sharp Congressional criticism.[10] It remains a contested issue at the present.

The Clean Air Amendments of 1970 (Public Law 91-604) directed the Environmental Protection Agency to conduct research programs on techniques to reduce air pollution and to develop National ambient air quality standards. The Act also pressed for control of air pollution from federal facilities, comparable to water pollution controls as described in conjunction with Public Law 91-224.[11]

Title IV of Public Law 91-604 addressed the problem of noise abatement. It directed the conduct of research and studies by the Environmental Protection Agency on noise and its effects on public health and welfare. It also required that any Federal Agency involved in any activity that produces noise sufficient to be a public nuisance must consult with the Environmental Protection Agency to determine a means for noise abatement.[12]

Before discussing the Executive Orders that grew from these statutes, it would be appropriate to point out that there are controversial issues o r than the Presidential impounding of funds discussed earlier. The National Environmental Policy Act of 1969 was invoked to stop the $3 billion trans-Alaska pipeline and $400 million Tennessee-Tombigbee Waterway. This Act plus others are causing delays in other major efforts. Congressmen whose districts have been hit by the delays are beginning to have some second thoughts.[13] In mid-1970, an estimate was made as to the total cost of the required pollution clean-up in the United States. The price tag was $71.3 billion, over the next five years. This represented the total required investment from the public and private sectors.[14]

Mr. Andrew F. Brimmer, a member of the Board of Governors of the Federal Reserve System, has estimated that the cost to industry over the same period will run $45 billion of the $71.3 billion total.[15] It is reasonable to expect some initiatives on the part of some Congressmen to relax the existing standards, because of pressure they feel from their influential constituents that may be affected by the laws.

Another pressure has developed recently because of the so-called "energy crisis." This has brought about review and relaxation of air pollution standards in some parts of the United States. The relaxation has made it possible to burn fuels with higher than acceptable sulfur content.[16]

Notwithstanding this resistance and backlash it is unlikely that any substantial changes in direction of the National effort will occur. The statutes will remain virtually unchanged, and will serve as a basic force for improved environmental quality.

EXECUTIVE ORDERS

In Executive Order 11507, President Nixon directed that ". . . the Federal Government in the design, operation, and maintenance of its facilities shall provide leadership in the nationwide effort to protect and enhance the quality of our air and water resources."[17] This order translated Public Law 91-190 as well as the Clean Air Act and Federal Water Pollution Control Act into directives for all governmental agencies and was signed on 5 February 1970. The Executive

Order required that air and water pollution be reduced to existing statuatory standards by 31 December 1972, or that efforts be underway by that time to meet the standards.

A month later Executive Order 11514 was issued which defined additional responsibilities for the Council on Environmental Quality. It also directed that other Federal agencies would coordinate as necessary on all actions affecting the quality of the environment.[18]

In December 1970, the President issued Executive Order 11574, directing the implementation of a permit program to "regulate the discharge of pollutants and other refuse matter into the navigable waters of the United States or their tributaries and the placing of such matter upon their banks."[14] This particular order places very specific responsibilities upon the Secretary of the Army, authorizing him to grant, deny, condition, revoke, or suspend permits depending upon the circumstances surrounding the applicant's request.[20]

Executive Order 11602, signed on 1 July 1971, directed that the Environmental Protection Agency maintain, publish, and circulate a listing of offenders of the Clean Air Act. The Order further directed that no government contract be awarded to any firm whose name appears on a current list. The significance of the Order is obvious.[21]

DOD ENVIRONMENTAL QUALITY PROGRAM

With the increasing emphasis on environmental matters a position for a Deputy Assistant Secretary of Defense for Environmental Quality was created under the Assistant Secretary of Defense (Health and Environment). This move, in October 1971, allowed the consolidation of all DOD environmental quality policy formulation and established a single point of contact within the Department of Defense for coordinating with the Council of Environmental Quality and the Environmental Protection Agency. This DOD office is responsible for implementing Executive Branch guidance concerning environmental quality and providing management control of the DOD Environmental Pollution Control Committee.[22] This committee was formed with representation from the Office, Secretary of Defense, and from the military departments, to insure "rapid coordination of requirements levied on the DOD by nonmilitary agencies and for developing and reviewing pollution abatement programs."[23]

Environmental quality policy has been established by the Department of Defense. The policy requires the services:

1. To control pollution from DOD controlled facilities.

2. To demonstrate leadership in pollution abatement within the DOD components.

3. To cooperate with local communities as well as Federal Agencies.

4. To incorporate environmental pollution prevention measures in design of weapon systems, military materiel, etc.[24] Additionally, the policy requires:

> Where resources to accomplish pollution control are limited, priority of effort will be afforded in accordance with the following order: (1) those situations which constitute a direct hazard to the health of man; (2) those having economic implications; and (3) those which affect the recreational and esthetic value of our natural resources.[25]

In August 1971, DOD issued directive 6050.1 which delineated responsibilities for the preparation of environmental impact statements. The directive implemented the guidelines originally established in the NEPA (Public Law 91-190) which were further refined by the Council of Environmental Quality.[26] This directive specifically required the inclusion of environmental considerations in the decision-making process, to insure minimal adverse environmental impact of any action. Under this directive, when it appears that the action may significantly affect the environment or be controversial because of the potential impact, it is required that detailed statements be prepared and submitted.[27] The only obvious exception to this requirement is:

> Combat or combat-related activities in a combat zone, riot control activities, and other emergency activities do not require environmental statements. However, the intentional disposal of hazardous substances or of other materials in the oceans shall not be construed to be combat or combat-related activities.[28]

SUMMARY

The Public Laws and Executive Orders described herein have brought considerable emphasis and impetus to environmental quality.

The Department of Defense, based upon the statuatory and executive requirements, has developed a comprehensive environmental quality program applicable to all services. The effects of these influences upon the Army will be addressed in the next chapter.

CHAPTER III

FOOTNOTES

1. J. Clarence Davies, III. The Politics of Pollution, p. 38.

2. Ibid., p. 203.

3. Ibid.

4. Public Law 91-190.

5. Ibid.

6. Public Law 91-224.

7. Ibid.

8. Public Law 92-500.

9. "Congress Quits after Overriding Water Bill Veto," New York Times, 19 October 1972, p. 1.

10. "President Orders $6 Billion Slash in Pollution Aid," New York Times, 29 November 1972, p. 1.

11. Public Law 91-604.

12. Ibid.

13. Gillette, "National Environmental Policy Act: Signs of Backlash are Evident," Science, April 1972, pp. 30-31.

14. "Pollution Price Tag: 71 Billion Dollars," U.S. News and World Report, 17 August 1970, pp. 38-39.

15. "No More Golden Eggs," Nations Business, October 1971, p. 72.

16. "Fuel Shortage: Outlook for Homes, Industry, Transport," U.S. News and World Report, 5 February 1973, p. 24.

17. "Executive Order 11507," United States Code Congressional and Administrative News, 1970, Vol. 3., p. 6218.

18. "Executive Order 11514," United States Code Congressional and Administrative News, 1970, Vol. 3., pp. 6228-6229.

19. "Executive Order 11574," United States Code Congressional and Administrative News, 1970, Vol. 3, pp. 6305-6306.

20. Ibid.

21. "Executive Order 11602," United States Code Congressional and Administrative News, 1971, Vol. 2., pp. 2554-2555.

22. U.S. Department of Defense, Deputy Assistant Secretary of Defense for Environmental Quality, Environmental Quality Program, Status, 1 January 1972, p. 1.

23. Ibid.

24. Ibid., p. 3.

25. Ibid.

26. Ibid., p. A-1.

27. Ibid., p. A-2.

28. Ibid., p. A-9.

CHAPTER IV

THE ARMY'S EFFORT

This chapter addresses the Army's environmental quality program. Existing national policy and Department of Defense guidance were described in the previous chapter. The actions taken by the Army to translate these guidelines and directions into achievements that enhance man's environment are many, and some of the more important will be described. How these efforts are being directed and how they mesh with the goals and priorities of the national policymakers will also be addressed in the following paragraphs.

ENVIRONMENTAL QUALITY ACTIONS

The actions taken by the Army thus far can be generally divided into two groups: those conducted by military activities and those conducted or directed by the Corps of Engineers as a part of the Civil Works program. The actions taken by both are generally parallel and reinforcing, oriented against the types of pollution described in Chapter II.

AIR POLLUTION CONTROL

During the period FY 1968 through FY 1972 the Army expended $28.4 million toward the elimination of air pollutant emissions at its installations. Another $32.1 million is included in the FY 1973 Army budget for the current fiscal year. This is indicative of the growing emphasis being placed on meeting environmental standards.[1]

In addition to addressing the clean-up of air at its installations, there are a number of other efforts being taken in the fight against air pollution by the Army.

The Environmental Hygiene Agency, located at Edgewood Arsenal, Maryland, maintains special monitoring teams in each CONUS army area. These teams are equipped to take air and water emission baseline measurements, conduct analytical studies, and assist in the development of revised criteria to meet the necessary environmental quality standards. The analytical effort by this agency supports the design effort by the Office, Chief of Engineers, assisting the Corps in the design of improved pollution abatement equipment.[2]

Army specifications prescribing sulfur content of fuel oils have been revised to an even lower level. This was done to reduce the sulfur dioxide emissions from boiler plant stacks.[3] Unleaded gasoline is now available at all Army installations for use in all equipment where tests have shown that it would not be harmful to equipment. Retail outlets at all installations, as well, have low-lead or no-lead gasoline available for resale to their customers. The Army is currently conducting tests to determine the capability of its tactical vehicle fleet to perform on unleaded gasoline.[4]

Army Regulation 11-21 directs that environmental pollution prevention measures must be incorporated into the basic design of military material. The characteristics of the pollution control devices are to be addressed in appropriate requirements documentation for material. This requirement applies to tactical and administrative

vehicles and to tactical construction equipment. The Army follows the lead of the US Air Force for most aircraft air pollution reduction measures; however, there are several programs related to aircraft peculiar to the Army. Most of the Army's aircraft programs result from desires to reduce the aircraft's signature or noise for tactical rather than environmental reasons.[5]

WATER POLLUTION CONTROL

The Army has been engaged in reducing water pollution for a number of years at its installations. Executive Order 11258 in November 1965, required the development of a five-year plan for improvement of installation waste treatment facilities. During the period FY 1968 - FY 1971 the Army expended $55.8 million for the installations' water clean-up efforts. Another $36.5 million is in the FY 1973 budget. It appears that the Army has met the target date of 31 December 1972, specified in Executive Order 11507, for actions to be underway with respect to water pollution abatement.[6]

From a materiel standpoint, the Army has certain equipment such as small vessels, that have a high water pollution potential. The Navy is the lead agency for developing abatement techniques for much of this equipment, and the Army monitors and follows their lead. The Army Materiel Command is responsible for implementing requirements in Army vessels and small craft to minimize the threat of oil spills. The masters of these vessels are prohibited from pumping bilges containing oil or other pollutants into bays, harbors, lakes, or rivers.[7]

There are several active research projects being conducted by the Army to reduce pollutant levels reaching natural waterways. One of these projects is being conducted by the Army's Mobility Equipment Research and Developmental Center (MERDC) in conjunction with the Office of the Surgeon General. The goal is to develop a prototype water and waste management system to treat the effluents (less human waste) from a 400-bed field hospital and return them to drinkable quality. Another MERDC project is the development of a multipurpose, mobile, package sewage treatment plant for use on-shore or on Army vessels.[8] The Army Materiel Command through the Munitions Command has also been pressing to reduce pollution associated with the Army's ammunition production facilities. Two solutions have been developed by the Munitions Command for the "red-water" pollution associated with TNT production, which remains as the most heavily used explosive in military munitions.[9]

At Hunter Liggett Military Reservation in California, a spray irrigation project was completed in June 1972, that has interesting potential. The facility disperses treated effluent from an on-post sewage disposal facility. The nitrates and phosphates in this disinfected effluent provide nutrients to the soil. Additionally, the water in which the nutrients are dispersed increases the moisture level of the soil above its normal. The result has been improved foliage in the treated area and a zero discharge of pollutants into the near-by river, which previously received the treated sewage.[10]

As indicated in Chapter III, Executive Order 11574 directed that the Secretary of the Army establish a Federal discharge permit system to regulate polluting effluents reaching navigable waters of the United States. The Corps of Engineers has the responsibility for implementing this requirement and is conducting an investigation of industrial plants to determine their status. Federal agencies involved in manufacturing are not exempt from this permit requirement.[11]

CONTROL OF OTHER HAZARDS

There is Army involvement in other than the programs and projects just described. The involvement ranges from re-writing Army Regulations so that they coincide with new environmental protection guidelines to research and study requiring considerable commitment. Some of the more significant efforts are described below:

1. Research relating to noise pollution is being conducted by the Surgeon General, the Chief of Engineers, and the Army Material Command. Medical and mechanical aspects are being considered.[12]

2. The Army, through contractors, operates a number of manufacturing plants. In addition to disposal of toxic substances, such as those described earlier, the manufacturing plants also produce sizeable amounts of other solid wastes. In the Army's plant modernization program, efforts are being made to minimize this type waste. The Army is also conducting research in advanced incinerators to burn certain of the more difficult solid wastes without polluting the air.[13]

3. The Army is exploring the potential of recycling wastes on an Army-wide basis. At present some of the manufacturing processes mentioned in the preceding paragraph take advantage of recycling some of the wastes. The bulk of the Army's accomplishments in this area have been more "reclamation" than recycling. Nevertheless, the investigations to broaden the recycling potential of the Army, may lead to other important gains. The Army's lack of success in this problem area is not unreasonable.[14] Breakthroughs will require considerable Federal investment in research which is being sponsored through the Environmental Protection Agency.[15]

4. The Corps of Engineers is conducting research in a number of areas relating to their Civil Works activities. Among some of the more interesting are: (1) the development of air diffusion techniques to mechanically aerate lakes and reservoirs, thereby improving oxygen quality of the water; (2) the development of a mathematical model to optimize spillway geometry, reducing nitrogen supersaturation that occurs as a result of less than optimal design, thereby reducing the impact of nitrogen-rich waters on fish life along rivers where dams are operated.[16]

THE ARMY'S POLICY

The Army's policy on environmental protection is enunciated in Army Regulation 11-21. It coincides identically with the policy of Department of Defense as described in Chapter III of this paper.[17]

Policy formulation in the past has been performed by the Deputy Chief of Staff for Logistics, the designee for principal staff responsibility within the Department of the Army Staff. It appears that a change will soon come, transferring this policy formulation responsibility to a newly formed Army Environmental Council.[18]

THE ARMY'S PROGRAM

There exists no single document in the Army that defines the totality of the Army's Environmental Quality Program. Yet, a program exists as evidenced by the numerous Army directed actions that were just discussed. Deputy Under Secretary of the Army Henry L.T. Koren has described the conceptual framework within which all of these efforts fall. This framework recognizes that:

> The environment is a single system, with air, land, and water interacting and affecting -- and being affected by -- the human development placed in the system. The environmental system, for planning purposes, is closed; nothing can be "thrown away." Thus, unwanted materials or wastes (pollutants) must be either recycled and reclaimed or confined and contained so that they do not migrate to cause other environmental pollution. Pollutants are potential resources out of place which, if relocated, can take on renewed value; for example, the nutrients discharged into our lakes, which cause accelerated aging, are valuable when used as fertilizers, and stimulate crop growth when relocated on farm land.[19]

More than falling within this framework, they each satisfy program objectives which Mr. Koren identified when addressing an Environmental Workshop in Atlanta, Georgia on 12 January 1973. As Mr. Koren indicated, these objectives are: (1) The assumption of a leadership

position for the Army in environmental matters; (2) the attainment of "zero" pollution from Army installations; (3) the encouragement of waste recycling; (4) the use of installation facilities to support local communities in the solution of their environmental problems; and (5) the encouragement of individual and unit participation in on-post, as well as off-post environmental improvement efforts.[20]

THE ARMY'S ORGANIZATION

In late May of 1972, Mr. Kenneth BeLieu, the Under Secretary of the Army, signed a memorandum as Acting Secretary of the Army, appointing Mr. Henry L.T. Koren, the Deputy Under Secretary of the Army, as the principal Army official responsible for the Army's environmental programs and policies. Among the responsibilities specifically assigned to Mr. Koren are the requirements to:

1. Review current environmental policies and establish new policies as appropriate.

2. Insure Army compliance with national and Department of Defense policy directives.

3. Review environmental quality considerations of continuing and future Army actions.

4. Maintain appropriate liaison with Department of Defense and other Service officials on environmental matters.

5. Develop educational programs to promote an environmental consciousness in the Army.[21]

Shortly after Mr. Koren was named as the responsible official for the Environmental Quality Program, a new position was established in the Army Secretariat, calling for a Special Assistant to the Deputy Under Secretary of the Army for Environmental Affairs. The office of the Special Assistant for Environmental Affairs is indeed small, consisting of the Special Assistant and one officer. The office serves as the focal point for environmental matters within the Secretariat. It is concerned with the review of current programs and policy, as well as the review of proposed policy as developed by the Army Staff.[22]

To augment this office, an Army Environmental Council has been established. The regular membership of this council is broad. In addition to the Deputy Under Secretary of the Army, membership includes a representative from the:

1. General Counsel.
2. Assistant Secretary of the Army (Installations and Logistics).
3. Assistant Secretary of the Army (Research and Development).
4. Office of Civil Functions.
5. Secretary of the General Staff.
6. Deputy Chief of Staff for Logistics.
7. Deputy Chief of Staff for Operations.
8. Deputy Chief of Staff for Personnel.
9. Chief of Research and Development.
10. Chief of Reserve Components.
11. Chief of Engineers.

12. The Surgeon General.

13. The Judge Advocate General.

14. Chief of Information.*

Each of the representatives is to be of general officer or equivalent rank except for those indicated by the asterisk.[23]

The Army Environmental Council has a mission of:

1. Establishing policy and programs to meet the Army's responsibility in environmental protection.

2. Considering appropriate realignments or reorientation of existing policy and programs.

3. Rendering policy guidance on environmental matters.[24]

To support the Council an Army Environmental Committee has also been established, with its membership composed of action officers from the same agencies as the Council. As indicated in Department of the Army memoranda 15-25, the Committee:

> . . . will assist the Council by:
>
> (1) Formulating new environmental policies and programs as directed by the Army Environmental Council.
>
> (2) Serving as a forum for the exchange of information and ideas related to the formulation of the Army Environmental Program.
>
> (3) Assisting in the resolution of interagency problems on environmental matters.
>
> (4) Assisting in the formulation of Army-wide implementing instructions for the Army Environmental Program.
>
> (5) Maintaining surveillance over the ongoing Army Environmental Program and activities.

(6) Reviewing Army Environmental Impact Statements and requests for exemption from Federal and state pollution control standards prior to formal approval by ODUSA.

(7) Providing reports and information as directed by the Army Environmental Council.[25]

This same Department of Army Memorandum establishes a new set of responsibilities for the Army Staff, and its implementation will undoubtedly require a rather complete re-write of AR 11-21. It expands the involvement of the Army Staff considerably in environmental matters.[26]

SUMMARY

Although the Army has no single document defining its Environmental Quality program, an active program exists. The major efforts being made fall within the broad framework of existing policy guidance. The Army has reacted to the increasing environmental awareness organizationally by:

1. Designating a senior member of the Secretariat to be responsible for environmental matters.

2. Forming a new office at Secretariat level for Environmental Affairs.

3. Creating an Environmental Council and Committee to develop guidance, monitor, and direct the Army's efforts.

CHAPTER IV

FOOTNOTES

1. U.S. Department of Defense, Deputy Assistant Secretary of Defense for Environmental Quality, Environmental Quality Program - Status, 1 January 1972, p. 15.

2. Ibid.

3. Ibid.

4. Ibid., p. 18.

5. Ibid., pp. 16-17.

6. Ibid., pp. 17-18.

7. Ibid., pp. 19-20.

8. R.B. Dillaway, "Army Outlines Advances in Safe Water Research," Defense Management Journal, January 1973, p. 59.

9. Erwin M. Graham, Jr., MG, "Army Munitions Command Attacks In-House Pollution," Defense Management Journal, April 1972, p. 61.

10. Henry L.T. Koren, "Ecological Revolution Affects U.S. Army," Commander's Digest, 4 January 1973, pp. 4-5.

11. US Department of Defense, pp. 42-43.

12. Ibid., p. 22.

13. Ibid., p. 24.

14. Ibid., p. 25.

15. "U.S. Know-How is on the Move Once More," Newsweek, 22 January 1973, pp. 36-37.

16. US Department of Defense, pp. 36-39.

17. US Department of the Army, Army Regulations 11-21, pp. 1-1 - 1-2 (hereafter referred to as "AR 11-21")

18. US Department of the Army, Army Memorandum 15-25, p. 1.

19. Koren, p. 2.

20. Henry L.T. Koren, Putting Principles into Environmental Assessment Statements, p. 3.

21. Kenneth E. BeLieu, US Department of the Army, Memorandum to Chief of Staff, U.S. Army, and to the Assistant Secretaries of the Army, 23 May 1972.

22. Interview with Thomas Sands, LTC, Office of the Special Assistant for Environmental Affairs, Deputy Under Secretary of the Army, Washington, 31 January 1973.

23. DA Memo 15-25, pp. 2-3.

24. Ibid., p. 2.

25. Ibid., pp. 3-4.

26. Ibid., pp. 5-8.

CHAPTER V

AN ASSESSMENT

Pollution is complex and multidisciplinary. What may start as a local over-application of synthetic nitrogen fertilizers to the soil may end as an infant death resulting from the drinking of unsafe nitrate-rich water - or less dramatically, in more rapid eutrophication of lakes and streams. What may begin as a gaseous pollutant in the air, through nature's own cleaning action, may result in the precipitation of liquid acids that attack masonry or human tissue. What may start as local water pollution of a stream can be multiplied into a polluted river that affects several states - or countries. Solutions to environmental problems require an integrated and well coordinated approach. Solutions are not merely technical. They have social, political, and economic overtones, as well.

The nation has awakened to the pollution threat that faces the country. The Army, too, has awakened. In the past year the Army has made significant changes in the management of its efforts to support improved environmental quality. The recognition at the highest levels in the Army of the complexity of the environmental problem has led to the establishment of an Environmental Council with broad representation of senior civilian and military members from the Army Secretariat and Army Staff.

An alternative to the establishment of a Council to cope with the problem would have been to establish a new Army Staff element to direct the effort, or to increase the responsibility of an existing element. In my opinion, the Council approach that has been taken will be a more effective and efficient means to accomplish the task. To adequately staff a new office with the many scientific, political, and social skills required would be not only expensive, but at this time where staff reductions are being attempted, not too reasonable. The Council can assure that in-depth analyses will be accomplished concurrently with other staff actions more efficiently. Environmental problems are not easily compartmentalized. Such problems can best be addressed as the Army is doing.

The Army, from its many actions and accomplishments in environmental matters, has demonstrated that it has a policy that is responsive to, and coincident with, national policy. The Army appears to have developed a program of actions that is based on respect for basic environmental principles.

From the Army's progress and efforts it is most obvious to the author that the Army is not only ready and willing to join in the National fight to protect our environment, but has already begun. The resources being committed at the Army's highest level are indeed adequate and reasonable.

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LTC OrdC

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