

Abstract

Controlling DOD Environmental Security Costs

or

Do Prevention Programs Pay?

by

Colonel Steven J. Stone
Senior Service College Fellow
Army Environmental Policy Institute
Georgia Institute of Technology

Author's note: This paper has been written in partial fulfillment of requirements established by the US Army War College for completion of the Senior Service College Fellows program. Any other use or further dissemination of the paper must be preceded by review and clearance procedures in accordance with military regulations. Please do not cite or quote passages contained herein without permission of the author.

The purpose of this paper is to assist Department of Defense policy makers and US military commanders in their efforts to promote force readiness through the use of cost effect prevention programs. Prevention programs are defined as Environment Security and Preventive Medicine programs.

Prevention programs are facing the same pressures to show a return on investment as all other government and defense programs in this era of deficit financing of the government. The fundamental question all decision makers should ask themselves is: Is this effort worth borrowing money from my grandchildren to pay for it?

Conclusions include: Prevention programs are the key to controlling DOD Environmental Security costs. Prevention programs are a good investment, but more management emphasis is needed to showing it. Risk Assessment, Risk Management, and Risk Communication are the key tools. Additional policy analyses are needed in an ongoing effort to understand: DOD Environmental Security Program decisionmaking; the use of risk analysis in setting budget priorities; and the process for using health risk assessments in making cost effective decisions in all the areas discussed.

Acknowledgments:

I wish to thank Dr. Edward W. Novak, Director, Army Environmental Policy Institute, for his support and understanding during this fellowship and in the preparation of this paper.

The rest of the AEPI staff have contributed immeasurable to my education during this fellowship. All the fellows have helped at one time or another. Dr. Steve Shelton, Dr. Tim Ross, Dr. Francisco Tomei, Dr. Brenda Miller, Dr. Prakash Temkar, Ms Carol Foley, Ms Claire Miller, Mr Bob Jarrett, Mr John Fittipaldi, Mr Hoge Green have all been good friends and colleagues this academic year. The other visiting fellows and students at Georgia Tech and Clark Atlanta University have been great to work with and learn from.

I especially want to thank Mr. Marty Lulofs, Executive Assistant and “Chief Master Sergeant” of AEPI for all the administrative help. It has been a true pleasure working with Pam Howell and Dorethea Nelson through out the year, and recently Deborah Pyy.

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The purpose of this paper is to assist Department of Defense policy makers and US military commanders in their efforts to promote force readiness through the use of cost effect prevention programs. Prevention programs are defined as those Environment Security and Preventive Medicine programs that directly relate to environmental compliance, cleanup, conservation and pollution prevention. Safety programs are not addressed, but are an equally important part of risk prevention. These programs, that work to reduce risk to the military personnel and increase readiness, will be the focus of this paper.

Prevention programs are facing the same pressures to show a return on investment as all other government and defense programs in this era of deficit financing of the government. The fundamental question all decision makers should ask themselves is: Is this effort worth borrowing money from my grandchildren to pay for it?

With all "soft" defense missions - i.e. non direct war fighting or war fighting training, the question of how much to invest in prevention is one of the toughest. One can argue that the entire effort to stabilize governments around the world is a prevention program. Economist can not show a real return on our efforts to stop spread of nuclear weapons from the Former Soviet Union. But, most of us will agree that an effort should be made and that the prevention of a nuclear accident or intentional detonation would cost far more than the approximately \$1 Billion that the Western powers are spending annually.

Another key question is: Who gets the money saved? or more correctly: How do we prove to decision makers that investment of X millions or X% of the DOD budget in prevention or risk reduction actually saves money in the long term for the Nation? We must also look at the larger balancing of risk in society and how we as a vastly diverse people allocate our resources.

It could be argued, and currently is part of the Congressional debate, that all programs must pass an economic based risk-benefit analysis. All decision makers do some form of mental, if not detailed paper, analysis of risk versus benefit in every thing done. From the squad leader to the CINC, military leaders balance mission accomplishment with risk to the troops and cost to the nation. Political leaders constantly weigh the risk of accomplishing the most good for the people versus cost of the program, and inturn the risk of being replaced, if the people do not agree with the decision.

This paper addresses how the Department of Defense and the Army justifies investing in prevention programs in Environmental Security. Nearly everyone agrees that such programs as health, safety and environmental protection programs are good for individuals and society. Key to this discussion is the changing role of risk management.

Defense Budget Issues

Inorder to look at the relative value we place on prevention of risk, lets first look at the overall Defense Budget. There is a very serious and long running debate about the value of Environmental Security and other prevention programs. Decision makers at all levels are fighting desperately to protect cherished weapons systems, ships, planes and personnel. The Environmental Security community is no different. The question is who is

right and from what view point. Investment decisions daily are made on personal feelings and the subjective evaluation of programs. Most decisions are made based on the effectiveness of the presentation and the ability of the spokesperson to argue the relative benefit of the investment in their program.

The issues are very complex and in some cases not well understood. The fundamental decisions the Congress makes on appropriations and authorizations dictate for years the direction our Nation will go in all ways. Defense remains a critical element of national interest.

One unusual part of the DOD program is that the Assistant Secretary of Defense (Health Affairs) budgets for a significant part of the prevention programs to protect health of soldiers, dependents and defense workers, while the Deputy Under Secretary of Defense (Environmental Security), sets policy for much of the effort. This has worked reasonably well, but as budget pressures increase and efforts to evaluate risk - benefit are expanded, the preventive health side may have trouble competing for resources against patient care.

Looking at the budget aspects of environmental security programs in the FY 1996-97 Defense Budget submission to Congress shows the relative size of the program. The Fiscal Year (FY) 1996-97 defense budget request ask for

\$246.0 billion in budget authority and \$250.0 billion in outlays for the Department of Defense (DOD). It begins implementation of DOD's FY 1996-2001 Future Years Defense Program (FYDP) and reflects the results of a year-long DOD assessment of defense strategy, force structure, priorities, and programs. The assessment validated the primary recommendations of the Department's 1993 Bottom-Up Review (BUR).

	BUDGET AUTHORITY (Current \$ Billions)						
	1995	1996	1997	1998	1999	2000	2001
DOD military -	252.6	246.0	242.8	249.7	256.3	266.2	276.6
DoE \$ other	10.9	11.8	10.6	9.9	9.9	9.9	9.9
Total national defense	263.5	257.8	253.4	259.6	266.3	276.0	286.5
% Real change	-1.9	-5.3	-4.1	-0.1	-0.2	+1.1	+1.2
	OUTLAYS						
	1995	1996	1997	1998	1999	2000	2001
DOD military - 051	260.2	250.0	246.1	244.2	249.6	257.9	261.6
DoE & other	11.4	11.4	10.9	10.3	10.0	9.9	9.9
Total national defense	271.6	261.4	257.0	254.5	259.7	267.8	271.5
% Real change	-5.4	-6.6	-4.4	-3.6	-0.6	+0.6	-1.2

The BUR-based defense plans and funding projected in the President's budget support a defense posture sufficient to protect US interests worldwide and preserve America's crucial global leadership role.

The drawdown of forces to the level called for by the new defense strategy will be nearly complete by the end of FY 1996. At that time, DOD will have reduced active military personnel and force levels by over 30 percent since the beginning of FY 1990, the fiscal year in which the Berlin Wall fell. Highlights of force structure changes by fiscal year, and the DOD goal are:

Force Structure Changes

	1990	1995	1996	1997	Goal
Army—active divisions	18	12	10	10	10
Reserve Component brigades	57	48	47	42	42
Marine Corps divisions (3 active/1 reserve)	4	4	4	4	4
Battle forces ships	546	373	365	358	346
Aircraft carriers-active	15	11	11	11	11
Training/reserve carriers	1	1	1	1	1
Carrier air wings-active	13	10	10	10	10
Reserve air wings	2	1	1	1	1
Fighter wing equivalents- active	24	13	13	13	13
Reserve	12	7	7	7	7

Reflecting cuts in forces and infrastructure, personnel end strength will fall well below FY 1987 post-Vietnam peaks:

1987-96

	FY 1987	FY 1995	FY 1996	Change
Active military	2,174,200	1,523,300	1,485,200	-32%
Guard and Reserve	1,150,900	965,000	927,100	-19%
DOD civilians	1,133,100	866,900	828,600	-27%

By FY 1999 active military end strength will level off at about 1,445,000. DOD civilian end strength will continue its sharp decline--to 729,000 in FY 2001, 32 percent below FY 1990. This drawdown of civilian and military personnel is directly effecting the ability of DOD to manage Environmental

Security efforts. The budget pressures have forced Commanders to choose staff carefully and in some cases, environmental security personnel have been cut, even though program requirements have stayed the same or grown.

The budget gives the highest priority to preserving force readiness and the quality of life of military personnel and their families. Readiness essentials like training and maintenance are funded primarily in Operation and Maintenance (O&M) accounts. The O&M budget authority in FY 1996 is about the same as FY 1995, and declines slightly in FY 1997. Environmental Security funding is part of O&M and therefore is viewed by many as a drain on readiness funding.

In the last quarter of FY 1994, readiness suffered because already strained O&M funds had to be diverted to pay DOD costs for unbudgeted contingency operations in Rwanda, Haiti, and elsewhere. Part of the O&M funds diverted were from Environmental Security programs, such as the cleanup program.

Environmental Program Budget

With \$5.0 billion requested for FY 1996, DOD environmental programs support the readiness of US forces by protecting military personnel and their families from environmental, safety, and health hazards. The programs

ensure the usefulness and long-term viability of DOD lands and facilities. Major environmental priorities include actions to achieve compliance with existing laws and regulations, pollution prevention, and cleanup of past contamination. [Clinton, 1995]. This represents an investment of 1.94 % of the Defense Budget and is receiving intense review in the Congress. The largest increase in the cleanup and compliance programs in the Department occurred between 1990 - 1994, from \$1.4 billion to \$4.4 billion.

The \$5.0 billion request is down approximately \$650 million from the FY95 request. The FY96 request includes roughly: \$451 million for BRAC (base closure and realignment) cleanup and compliance; \$1.622 billion for the Defense Environmental Restoration Account (DERA); \$2 billion for compliance; \$148 million for conservation; \$356 million for pollution prevention; and \$229 for research and development of environmental technologies.

The demands for cleaning up DOD facilities are small when compared to Energy Department (DOE) facilities contaminated with radioactive or hazardous waste. The DOE has the most complex and costly problems from over 40 years of nuclear weapons work. The DOE will not be able to return all former nuclear sites to "green field sites" or their pre-World War II conditions, because the country cannot afford the \$500 billion it would cost to do so. [Grumbly]

The DOD environmental problems include hazardous wastes similar to those found in the industrial and commercial sectors. In addition, DOD is evaluating the safety and health implications of unexploded ordnance at bombing and test ranges. Range cleanup at closing facilities is expensive and depending on land use planning, possible not necessary. This should be a key policy issue in the discussion of risk management in DOD. Unless a true risk to the public can be shown, most old ranges should be left fenced off and maintained as conservation areas. This would allow for potential reuse by DOD in the event of a future need to expand military ranges.

The Federal goal for cleanup and compliance is to protect public health and the environment by spending Federal dollars wisely, reducing the risks posed by radioactive and hazardous wastes. Remediation will take many decades to complete.

Environmental programs rank high on the list of so-called "non-defense" items that DOD regards as vital to its overall mission. Environment programs, namely pollution prevention and cleanup, are part of "inherent management responsibility," that the DOD is required to request adequate funds to meet its environmental obligations.

The DOD Budget has five categories called:

First tier "core military activities," including intelligence activities and peacekeeping.

Second tier "inherent/prescribed management responsibilities," includes pollution prevention and environmental "reclamation." The official stressed that such efforts are mandated by law.

Third tier "dual use activities" for example, the Technology Reinvestment Program.

Fourth tier "broader citizenship responsibilities," with disaster and humanitarian assistance activities as examples.

Fifth tier "other," described as programs having merit but which should be the responsibility of other agencies.

Health Program Budget

Looking at how Preventive Medicine (PVNT MED) support to the Environmental Security mission is funded in the Defense Health Program Budget for the Three Service shows:

FY	94	95	96	97	98	99	00	01
Total O&M (\$B)	9.3	9.6	10.4	10.5	10.9	11.4	11.9	12.5
Total PVNT MED (\$B)	.187	.188	.189	.190	.201	.213	.227	.242
PVNT MED % Total	2.01	1.96	1.82	1.82	1.84	1.87	1.91	1.94

[Yasalonis, 1995]

At less than 2 % of the budget, it would appear somewhat inconsistent with the Joint Health Service Strategy that has two basic functions:

- Improve health status & restore health status

and three pillars:

- Deliver a Healthy & Fit Force

(Health Promotion/Wellness)

- Keep the Force Healthy

(Preventive Medicine Imbedded & Deployable)

- Care & Management of Casualties

(Lessen demand/stabilize and evacuation to CONUS)

The health budget supports most of the health risk assessment efforts of the Army. This is important work that provides the scientific basis for much of the management decisions that are made in Environmental Security. Relating budget request to policy is a somewhat difficult task. While leadership will support measures to prevent damage to health and environment, the relative priority can be debated.

Environmental Security Programs

The DOD Environmental Security Program is made up of four main elements and is one of the most diverse environmental programs in the nation. DOD is America's largest industrial organization, with over 400 industrial plants across the country. Also, it is the nation's second largest land manager, as steward for 25 million acres of land including broad

diversity of ecosystems. There are more than 14,000 contaminated sites in all 50 states. At least 107 military bases are on the Superfund National Priorities List. DOD is committed to protect the health and safety of its people and the vulnerable communities around our installations.

Ms. Goodman, Deputy Undersecretary of Defense for Environmental Security, DUSD(ES) has explained why environmental security is critical to the defense mission and should be fully supported by the Congress in recent testimony. “Environmental Security is an essential and critical part of the Defense Mission. It focuses on protecting the people, equipment, facilities and natural and cultural resources which are necessary to conduct the Defense Mission.”

The DOD is a major leader in progressive, risk based, efficient and cost effective efforts for pollution prevention, technology, safety and occupational health, fire and emergency services, explosive safety, pest management, conservation, compliance and cleanup.

The program’s main emphasis is to:

- Support readiness by protecting DOD and national assets from accidental losses, occupational illnesses, and physical, chemical and biological threats.

- Promote quality of life by providing safe, healthful and environmentally sound places for work, living and leisure.
- Enhance modernization by integrating Environmental Security into all phases of the research, development, acquisition, logistics and maintenance processes; by identifying and implementing high Return on Investment projects in pollution prevention and Environmental Security technology; and by implementing the Fast Track Cleanup Process at our installations scheduled for closure. [Goodman]

Environmental Security Objectives for FY 96:

- prevent pollution at the source whenever possible;
- promote development of dual-use environmental technologies; and
- conserve resources DOD holds in public trust;
- ensure DOD operations comply with environmental, safety and health laws;
- clean up and reduce risk from contaminated sites;
- protect the safety and health of our military and civilians.

During a March 24, 1995, hearing, Members of the National Security subcommittees on Military Installations and Facilities and Military Readiness

questioned the officials from the Army, Navy, and Air Force to explain a link between environmental programs and the defense budget, in order to qualify the rising cleanup costs at contaminated DOD sites. Rep. Joel Hefley (R-Colo), commented: "We have heard . . . that any reduction in funding for the various environmental programs of the department will have dire consequences," "we do not have a clear sense that funding appropriated in previous years has yielded expected results and it is unclear that the department has a complete understanding of what ultimately will be required in the area of cleanup," This is shows the mood of the Congress and the pressure that is being exerted to show value for all funds invested in Environmental Security programs. Effective risk management and communication is the key to "selling" the need for investment in prevention programs.

Cleanup Program

Most of the Congressional and public interest questions regarding the DOD Environmental Security program center on the DOD cleanup program. The need to control potential risk from contaminated sites at military bases is required by law. The Nation has spent \$11 billion to clean up contaminated DOD sites since 1984 and expects to spend \$30 billion more to complete the job. [CBO Report] The \$1.62 billion request for FY96 will help DOD meet its

cleanup commitments in regulatory agreements. The amount of public health risk reduction and ecosystem improve it buys is not quantifiable.

The Cleanup mission has been stated as: Restore Department of Defense facilities and reduce risk from contaminated sites; Make use of innovative cleanup technologies; Develop and enhance new partnerships with stakeholders, especially affected communities, federal and state regulators; and Use "lessons learned" from completed sites to (1) design generic remedies and technologies for solving common cleanup problems and (2) shorten the time for completion of studies and design.

Recent congressional proposals to require cost-benefit analyses prior to environmental cleanup may reduce the numbers of cleanup projects and ease the levels to which specific management units must be cleaned. There is a move within DOD to push cleanup funding into each service's operating funds. If this were to happen, cleanup requirements could impact training and readiness by competing for Service O&M funding for other parts of the environmental security program, such as land conservation efforts.

Risk assessment and analysis are key to defining appropriate public policy for this program. Without a Nationally applicable and acceptable risk level, then the cost of cleanup will continue to climb.

Compliance Program

DOD's environmental compliance goal is to achieve full and sustained compliance with all legal requirements. DOD's operations must comply with all the environmental, safety, and occupational health laws and regulations. The new risk analysis requirements moving through Congress, will no doubt make this a more challenging area. Commander's that now face fines and penalties for failing to comply with environmental laws, will have to invest additional effort in understanding the risk benefit process.

The Safety and Occupational Health mission is to enhance the readiness of the Department of Defense and the Quality of Life of its people through the prevention of accidents, occupational injuries/illnesses, and fire losses. Risk analysis and prioritization has been used effectively in the Safety and Occupational Health programs to correct the major problems that require capital investment over the last 15 years. These programs have not been challenged as strongly as the environmental side, because they are recognized as value added by most line commanders and the public.

Environmental requirements impact training most significantly, although indirectly, through the constantly increasing cost of compliance,

primarily with hazardous materials and waste laws. Installations report that training was constrained more by the lack of operational funds than any other single cause. Operational funds pay the majority of the costs of environmental compliance, in particular, immediate requirements as well as fines and penalties. [Conrad]

The Defense Department is pushing a new approach to environmental compliance that would give the military increased autonomy in determining how it meets federal and state standards. Under DOD's proposed approach, environmental regulators would "put a bubble" over an installation, stating what standard the base should reach and allowing the military to decide the most cost-effective way to reach that level. This approach would be like the initiative in acquisition reform underway, in which the military is turning away from prescriptive specifications and standards and toward performance-based specifications. This will increase the installation level environmental staff work required to effect proof of compliance.

Risk analysis and assessment are used in establishing all standards for compliance. The problem or argument is on how "safe" levels are determined and what is acceptable level of risk when a population has no control over the exposure.

Conservation Programs

Long term viability of training lands depends on effective and efficient land management to protect and sustain training areas. In the past, land was considered a free resource. We now invest \$148 million for conservation in DOD. The natural habitat on installations was once exploited in many ways because there was plenty of it; and, it was assumed that whatever was damaged would self-repair with time. As a result, training was scheduled with limited, if any, concern for resource damage. Each installation developed its own, unique methods for land management, but a common attribute was the separation of authority to schedule training areas from the responsibility to maintain them. [Conrad]

Risk assessment and management will be a key tool in determining the best use of training resources and effective land management to sustain the training base. The Ecosystem management initiatives taking place around the country will also require additional resources be used in conservation.

Senior Army officials now understand that land (and other natural resources) requires care and maintenance. Installation land use schedulers, maintainers, and the training community recognize the long-term impact of

training on natural resources and the need for investment in conservation to protect the land.

There is however, a large backlog in maintenance and repair of training lands. The Army has not formally expressed a goal of long-term sustainable use of training areas. Integrated natural resource management plans are usually out-of-date and rarely known to the trainers. [Conrad]

Increased development of lands surrounding Army installations and a long-term trend toward incorporating public concerns into operational decisions is causing increased interactions between installation commanders (and their environmental staffs) and the surrounding civilian communities. Again aggressive preventive action is the key to long term sustainable training. Failure to invest time and money in land planning issues will hurt the Army's ability to train in the future.

Ecosystem management is an accepted concept for the future, however, what that means in terms of procedures and policies is unclear. Cooperation with other land managers and detailed surveys will surely be a part of training land management in the 21st century.

DOD lands are home to many important species and habitats. More than 300 listed and candidate threatened and endangered species are found on

DOD's 25 million acres of land. DOD has taken pride in its stewardship responsibility and has had policies in place to protect natural and cultural resources for many years. This early commitment has evolved into well-defined, formalized, and integrated conservation policies. [Walsh]

Protection of natural and cultural resources has become a high priority on all our military installations. DOD has been active on various interagency groups, including White House-led efforts focusing on Ecosystem Management, Biodiversity, and the Endangered Species Act. On Earth Day 1994, a collaborative effort with the Department of the Interior to enhance ecosystem management in the Mojave Desert was announced. The Army's interest in this was protection of training land at Fort Irwin.

The military testing and training mission is compatible with the goals of environmental agencies. The fact that threatened and endangered species have continued to thrive on military installations is proof of their protection does not have to hurt military readiness, and in some cases, may in fact have enhanced it by improving training areas.

Risk benefit analysis will be an important tool for managing DOD's 25 million acres in an environmentally responsible manner, making sure DOD activities do not harm threatened or endangered species, and protecting readiness training.

Pollution Prevention

The cost of pollution control and cleanup is extremely high and continuing to escalate. There is a growing realization, manifested primarily in the private sector, that it is much less costly to prevent pollution at the beginning of the process than to pay the huge costs at the end. The \$356 million for pollution prevention in DOD reflects the realization that there is a positive return on the investment.

Federal agencies, recognize, in theory, that pollution prevention is the best long-term solution, but, organizational structures and procedures often block implementation. The Army procurement community has made good progress but still can do more. The project manager of a new system has little budgetary incentive to thoroughly explore pollution prevention options because cleanup costs do not come out of his budget but, environmental analyses do. Policy and procurement procedures that look at life cycle costs must include risk - cost analysis for Environmental Security concerns.

Hazardous waste disposal costs have increased four-fold over the last 10 years, from \$600 per ton to \$2,500 per ton. During that time, the Army reduced its hazardous waste generation by 70 percent, thus saving millions of

dollars. This is an example of how investing in pollution prevention by reducing the use of hazardous material makes economic as well as environmental program sense.

The DOD and Service environmental chiefs have expressed the concept that pollution prevention must become a major part of their programmatic efforts. Future funding programs show the effects of this realization by increasing funding for prevention efforts.

Risk Assessment, Communication and Management

Risk reform legislation that could provide significant savings in Defense Department cleanups is one of the leading topics in Congress 1995. As a complement to regulatory reform measures, the bill would require that environmental restoration be based on "sound science," risk assessment, and cost-benefit analysis.

"Congress needs to require agencies to use sound science, risk process,.."
"We hope to have the risk assessment and cost-benefit analysis debate cover all agencies' activities." [Murkowski]

This controversy will no doubt continue as the EPA Administrator has said. "The risk bill purports to be an application of sound science; in truth, it

perverts not just science but also common sense. It mandates a costly, procedural maze that will delay or stop the public-health protections traditionally enjoyed by all Americans. Under the provisions of the bill recently marked up by the House, EPA could not have banned lead from gasoline or dangerous pesticides like DDT. The House Committee actions to date dictate new, costly procedures that would supersede all existing laws. This means 20 years of protections for our children and our air, our land and our water are being rolled back in the dead of night without even a thoughtful debate in Congress. Risk analysis is an important tool that is already used to assure all major rules are scientifically justified. Requiring it for every single action is neither fair, effective nor affordable. We strongly urge Congress to rethink this hastily drafted and potentially detrimental measure.” [Browner]

The debate on this issue will continue and its results will have a direct impact on the DOD Environmental Security programs. The “Risk Assessment and Communication Act of 1995” has as its purpose:

- (1) to present the public and executive branch with the most scientifically objective and unbiased information concerning the nature and magnitude of health, safety, and environmental risks in order to provide for sound regulatory decisions and public education;

(2) to provide for full consideration and discussion of relevant data and potential methodologies;

(3) to require explanation of significant choices in the risk assessment process which will allow for better peer review and public understanding; and

(4) to improve consistency within the executive branch in preparing risk assessments and risk characterizations.

The legislative process will no doubt give the Congress time to address this important topic, but until the Congress is willing to establish a legally defensible standard risk level for all cleanup sites and Americans, it will only add to the delays and court actions on controversial actions.

One of the most interesting studies is the draft report by the Agency for Toxic Substances & Disease Registry (ATSDR) that found "No apparent public health hazard" at the Army's Rocky Mountain Arsenal. The report on the health risks at the Army's most expensive cleanup site (estimated up to \$ 2 Billion) finds "no apparent health hazard" on the base itself, and only inconclusive evidence of risks in residential areas adjoining the facility.

The ATSDR Researchers found "No apparent public health hazard" at the Army's Rocky Mountain Arsenal onpost area, due to land use controls,

visitation restrictions, interim response actions, and groundwater intercept and treatment systems. The ATSDR found that because people residing in the "Offpost Study Area" to the north experienced past exposures to arsenal contaminants via groundwater and air, the area may be considered as having posed a "Public Health Hazard" in the past. ATSDR writes that "public health concerns have been expressed about the possible effects of arsenal remediation and about specific health conditions and diseases, including cancer." However, they report that studies and investigations on this have been inconclusive. [Weber]

ATSDR reports that over 20 private wells offpost contain levels of lead and/or nitrate that are considered a public health hazard, though these do not come from arsenal pollution.

This results brings into question all the cleanup work being done in the Nation. If the supposedly number one problem for the Army, is really no longer, a public health threat, how can the DOD/Congress and State of Colorado justify continuing efforts to do expensive cleanups. Again we must invest vigorously in the prevention of future cleanup problems by funding the pollution prevention and conservation. This coupled with more effective, scientifically based risk assessment and management will save taxpayer funds in the long term.

Conclusions:

Prevention programs are the key to controlling DOD Environmental Security costs. Prevention programs are a good investment, but more management emphasis is needed to showing it. Risk Assessment, Risk Management, and Risk Communication are the key tools.

The DOD is doing a good job, but authority and accountability are not the best. DOD Environmental Security is at risk of being cut more than needed due to lack of clearly defined return on investment for cleanup and compliance efforts.

Environmental Security program managers must be trained in the management skills necessary to use program and risk analysis in decision making and program planning. Finding a better way to communicate prevention program return on investment to decisionmakers should be a priority for future policy studies.

Additional policy analyses are needed and ongoing effort to understand: DOD Environmental Security Program decisionmaking; the use of risk analysis in setting budget priorities; and the process for using health risk assessments in making cost effective decisions in all the areas discussed.

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