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CONSISTENCY IN DEPARTMENT OF DEFENSE ENVIRONMENTAL CONTRACTING

by

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CONSISTENCY IN DEPARTMENT OF DEFENSE ENVIRONMENTAL CONTRACTING

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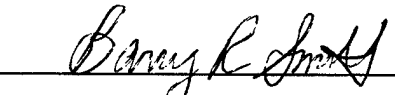
Author: 
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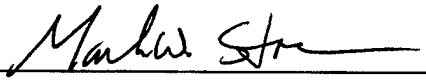
Approved by: 
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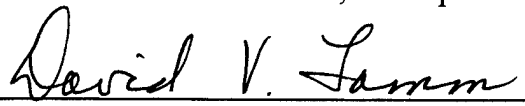
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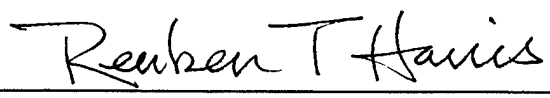
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ABSTRACT

This thesis examines and analyzes the unique aspects of environmental remediation and the different contracting methods used by the DoD to outsource its environmental contracting needs. The analysis was conducted using archival and opinion research to define the unique qualities associated with environmental remediation and the individual Service's contracting methods. The research revealed that legislative requirements are numerous and a majority of the environmental remediation requirements are unclear in nature. The Navy's choice of the Comprehensive Long-Term Environmental Action Navy (CLEAN) and the Remedial Action Contract (RAC) and the Army's choice of the Total Environmental Remediation Contract (TERC) are compared and evaluated. This evaluation looks at the advantages and disadvantages in their application. The researcher's analysis of the data determined that the Army's TERC contract is the more efficient environmental contracting method. With the ultimate objective of providing an environmental contracting method that would enhance an integrated single face to industry it is recommended that the Army's TERC contracting method be adopted for use throughout the DoD.

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I. INTRODUCTION

A. GENERAL

Without question, environmental considerations have become and will continue to be an area of growing concern for the Department of Defense (DoD). It is only within the recent past that people have developed a concern for the long term effects hazardous waste material has on the environment. No longer able to rely on sovereign immunity, DoD is now being mandated not only to stop the contamination of the environment but to cleanup all previously contaminated sites.

The present climate that the DoD operates in stresses jointness, integration, and a single face to industry. The present DoD environmental contracting atmosphere achieves none of the above objectives.

B. BACKGROUND

The contracting world is one of the most carefully watched and scrutinized processes in which the military is involved. One of the world's closest competitors for attention is environmental issues and concerns. Pair these two topics together and you have entered a highly sensitive area of environmental contracting. Environmental cleanup technology is as fast paced as the computer industry with new procedures popping up everywhere. [Ref. 1] Uncle Sam is usually left with the problem of which process will get the Government the most for its dollar. Considering the fiscal

constraint in which the military perennially operates, it is a small wonder this topic is so closely watched.

Not too long ago environmental concerns were almost nonexistent. Plastics disposal, ozone layer and toxic spills were not household words. Only in the recent past have communities been concerned about the long term effects of the way business was being conducted and the effect it was having on our environment. Even more recently Federal and state regulations have been able to hold the military Services' feet to the fire. For many years the military has hidden behind its sovereign immunity and has been able to avoid the countless number of Federal and state statues.

Environmental concerns have become and will continue to be a painful area of growing problems and growing pains for the DoD. The military is now feeling the effects and incurring the expense of having done business the wrong way for so many years. Some of the mistakes and misgivings are seeping into areas outside military bases and have gotten the attention of the residing communities. [Ref. 2] At a time when taxes are high and money is tight, the military is even more obligated to show the tax paying public that it is not causing more harm than good. The continuing reductions in the defense budget, coupled with the corresponding base closures and land turnovers, has focused attention on the importance of site remediation. This remediation needs to be done right the first time.

One would have difficulty finding anyone who would argue that the restoration costs are not and will not continue to be staggering. Environmental compliance is by far the largest and most expensive issue on most DoD installations. [Ref. 3] There is no current figure available to estimate the dollar value for the cleanup of these sites, although there have been estimates in the hundreds of billions. The environmental restoration mission has grown threefold between 1990 and 1994. [Ref. 4:p. 3]

As of 1994, the Defense Department has annually generated over 500,000 tons of hazardous waste and has over 20,000 contaminated sites on 2,000 DoD installations. [Ref. 5]

Environmental restoration on such a massive scale is not a simple task. Throwing money at restoration problems is not the only ingredient needed. As representative Richard Ray, chairman on the Environmental Restoration Panel of the House Armed Services Committee said, "DoD needs a balanced approach to waste cleanup and minimization." He suggests an approach for cleanup of environmental problems generated over the past several decades which should involve common sense, fiscal responsibility and accountability. [Ref. 6]

Environmental restoration encompasses much more than the actual cleanup of the site. The cleanup itself is often the quickest part of the process. The larger problem is defining the scope of work (SOW), designing the cleanup procedures and getting the design specifications through the immense regulatory process. The time

required to get some of the more complex projects completed can be up to five years. So it is obvious that there is much more involved in environmental restoration than simply contracting for the actual cleanup. [Ref. 7]

This thesis delves into the difficulties involved with environmental contracting. The rapidly changing environmental restoration world provides a manager many different scenarios and problems. One of the difficult problems with environmental contracting is matching the correct contract type with the environmental restoration task at hand. It is also often very difficult and/or expensive to accurately define the scope of work. It may be easy to identify that a site is contaminated but before an accurate scope of work can be written basic but often difficult questions must be answered, such as the identification of the contaminate and the amount to be removed. Often these questions cannot be answered without extensive preliminary research or until the task of the restoration is near completion.

In order to accurately define the scope of a cleanup, extensive soil sampling and analysis would have to be carried out. These tests will be both expensive and time consuming. Even after extensive testing, there is no guarantee that some new chemical will not be discovered once the remedial action commences. [Ref. 7]

Another problem or issue is the constantly changing legislation. Over the last decade, the Navy has gone from being able to rely on sovereign immunity to being under the jurisdiction of all Federal and state regulations. Even the military must now

comply with these regulations. Old regulations have been made more strict, and new regulations have put further constraints on how one can conduct environmental cleanups. This constantly changing environmental legislation and regulatory climate also make it difficult to accurately estimate cleanup cost during the restoration process. If regulations change halfway through a study or an actual cleanup, work may have to be stopped and redone in order to meet the new requirements.

Not only can the regulations themselves change but also the interpretation of the regulations. Many of the environmental regulatory personnel are constantly rotating. It is essential to get the state and local environmental regulatory personnels' approval prior to their departure because their replacement may interpret regulations differently. It is especially important to get approval if it is a prototype procedure where there was no previous use of this method. One could spend countless man-hours and energy developing a design specification or statement of work just to have it rejected. One may even run into the situation where one individual approved a procedure or project previously and someone else from the same office may have a different interpretation of the regulations as it goes up their chain of command. [Ref. 8]

Much of the change in regulatory requirements is the result of rapid improvement. Legislation becomes stricter as the improvements in the techniques of environmental restoration appear. Technological advancements in environmental

restoration cleanup procedures are continually developing and improving. Improved measuring techniques have enabled contractors to detect hydro-carbons for example, at previously unheard of lower levels. These improved measuring techniques have greatly enhanced the contractor's ability to address a problem. The contractor can now identify what it is and approximately how much there is to remove. As in any new area of research, the successful contractors will be those who are innovative and aggressive in implementing new information and technique into their restoration procedures.

As in any market, the choice of what type of contractual arrangement to execute is not always clear. There are circumstances where the proper contract type is easily identified. One example could be disposal of the bottom sludge of a fuel tank. If one knows what the material is that needs to be removed and there are no time constraints, the requirement can be accurately defined. There are plenty of responsive and responsible offerors who could perform this effort and price can be the determining factor for the source selection. This scenario would allow one to use the sealed-bid method resulting in either a Firm-Fixed-Price (FFP) or a fixed-price with economic price adjustment (FPE) contract. [Ref. 9:pp. 288-289]

Unfortunately the above simple scenario is relatively rare, as the uncertainties and possible contingencies in environmental restoration are numerous. The exact nature, extent of work required, regulatory requirements and technologies available,

often cannot be predicted at the time of contracting. There reaches a point when the cost of identifying and correcting uncertainties becomes too great and economically unfeasible. At this point, it is better to leave the contract less precise and reimburse the contractor for costs after the uncertainties are resolved. The above example is precisely what a cost-type or cost-reimbursement contract achieves and this is predominately what DoD has decided to use.

C. AREA OF RESEARCH

This thesis investigates the challenges faced by DoD in the field of Environmental Contracting. The title of the thesis is: Consistency in Department of Defense Environmental Contracting.

1. Primary Question

This thesis investigates why different branches of the Service within the DoD are using different contract methods for their environmental restoration contracts. The primary question this thesis will attempt to answer is: What is the most feasible contracting method for administering environmental contracting?

2. Subsidiary Questions

To answer the primary question listed above, it will be necessary to address the following subsidiary questions:

a. What contracting methods are actually being used by DoD?

b. What are the advantages and disadvantages of each of these contracting methods?

c. What are the possibilities that partnering should be or has been implemented in DoD environmental restoration contracting?

d. Is there a single established contract type that all branches of the Service can use to provide an integrated single face to industry?

e. To what extent should guidance regarding the contracting of environmental restoration be implemented into the Federal Acquisition Regulation (FAR)?

D. SCOPE

The unique nature of environmental contracting explains why less complex contracting mechanisms are not always suitable for environmental restoration. The methods of environmental contracting used by each DoD branch of Service are assessed in this research and each method's advantages and disadvantages are identified with a primary focus on the Navy's and Army's environmental programs. It may not be possible to determine if one method of environmental contracting can satisfy all circumstances. The correct answer may require a combination of present methods of environmental contracting.

Through these assessments of present DoD contracting methods, the development of a single best model is feasible. A policy or statuary limitation is recommended to provide the jointness and single face to industry strived for in acquisition reform.

E. METHODOLOGY

This thesis research was conducted through the use of interviews with Naval Facilities Engineering Command (NAVFAC) personnel and other Services' equivalent. The interviews were directed at what the present environmental contracting climate is like. What different contracting methods are used, and what are the advantages and disadvantages of these methods. Through the use of a variety of references and a review of the current and historical published legislation and doctrine, DoD instructions were used in an attempt to answer the above mentioned questions. No statistical or numerical data are used.

F. BENEFITS OF STUDY

Given the dollars involved and the sensitivity of environmental restoration, it should be obvious that an extremely effective plan of attack is needed. This thesis provides the justification and insight needed to make sound decisions concerning this plan and the actions required to achieve it.

Ultimately this thesis benefits DoD and possibly every Federal Government Department and Agency.

G. ORGANIZATION OF RESEARCH

This section briefly describes the organization and format of this thesis. Chapter II provides a picture of the unique problems affecting environmental

contracting. It begins by describing what contract types have previously been used by DoD in environmental restoration. This is followed by a brief description of the special idiosyncrasies of environmental cleanups. Next, the chapter concludes with the unique features and contract types involved with environmental cleanup.

Chapter III explores the methods presently employed by DoD. It begins by describing the various regulations and statues that have shaped the present climate that environmental contractors operate in. This is followed by the various stages of the remediation process. Next, the chapter provides a detailed explanation of the contracting methods used by the Navy and Army. The chapter concludes with a brief description on how the Air Force administers environmental contracts.

Chapter IV explains the advantages and disadvantages of the Navy's and Army's contracting methods. Chapter V analyzes the facts, opinions and associated interpretations of the material provided in the four previous chapters. The analysis examines the contracting methods used by the Navy and the Army.

Chapter VI furnishes independent conclusions drawn from the researcher's analysis. The researcher provides several recommendations that will allow the DoD to provide a "single face" to industry with regard to environmental contracting. This chapter also provides answers to the primary and subsidiary research questions. The thesis concludes by providing suggestions for further research related to environmental contracting.

II. ENVIRONMENTAL RESTORATION UNIQUE PROBLEMS

A. ENVIRONMENTAL AREA

Traditionally, firm-fixed-price (FFP) contracts have been used by DoD to accomplish most of the responsibilities it is assigned. Some of these responsibilities include the construction of new facilities through the Military Construction (MILCON) program and the maintenance of Naval installations and the facilities on them. Cost-reimbursement contracts are used but they comprised only a fraction of the contract types. [Ref. 10:p. 28]

The cleaning up of environmental problems has now been added to DoD's list of new responsibilities and requirements. This addition of the environmental restoration problem and its associated idiosyncrasies have required NAVFAC to look into contracting mechanisms different from those favored in the past. Many people have looked at the environmental remediation program as a simple construction problem. This would lead one to conclude that the best contracting mechanism would be the traditional FFP contract. While environmental contract cleanups include many activities which are similar to construction contracting, there are also several features which make environmental contracting very unique.

B. SPECIAL IDIOSYNCRASIES OF ENVIRONMENTAL CLEANUP

The difference between environmental contracting and standard construction projects with which DoD has historically dealt can be attributed to four unique

features: new technology, uncertainties in the scope of work, changes in regulations and different degrees of enforcement and areas emphasized. Each of these four unique features is investigated here.

1. New Technology

Remediation technology is continually developing and improving. As new information and techniques become available, the successful contractors will be those who are innovative and aggressive in implementing these items. Technological advancements can also greatly assist in the actual cleanup effort. [Ref. 7]

As the ability to measure smaller and smaller quantities of toxic materials increases, the standards within the regulations often change to make this the new requirement for cleanup. Much of the change in regulatory requirements is the result of the rapid improvement in measurement technology in the area of toxic waste.

2. Uncertainties in the Scope of Work

The inability to define the scope of work is one of the most difficult problems when dealing with environmental restoration. [Ref. 7] This is caused by the intrinsic uncertainties associated with toxic contamination. It is relatively easy to determine that a site is contaminated, but determining the extent of the contamination is another matter. Many toxic sites are either buried dumps or areas where some liquid contaminate has seeped or migrated through the ground. In these cases, the area requiring remedial action is at least partially underground. It is difficult to determine

the nature, concentration, and extent of this underground contamination until it is actually excavated. [Ref. 7] Also, a dump site may contain dozens of different toxic materials, each of which has to be cleaned up using different methods. To determine which of these materials exist is usually difficult and expensive until the contractor actually confronts them during the clean-up segment of the project. [Ref. 7]

Repeated and extensive soil sampling and analysis have to be carried out in order to accurately define the scope of a cleanup. [Ref. 7] These tests require considerable delays and are expensive. Even after extensive testing, there is no guarantee that some new material or migration path will not be discovered once the remedial action starts. The nature of the uncertainties in the environmental restoration area are unknown, but their presence is a common feature of environmental contracting. [Ref. 7]

The removal and cleanup of underground storage tanks are a good example of the uncertainties involved in environmental restoration. Thousands of these tanks, many over 50 years old, exist on Government installations. [Ref. 7] Often, it is difficult to determine if the tanks are leaking or even what was originally stored in them. Borings can be taken in the surrounding soil to see if it is contaminated, but the results of these borings can only give a very rough idea of the extent of the contamination. The problem is that the migration of leaking toxins from an underground tank will take an unpredictable path based on the makeup of the soil and

material under the surface. [Ref. 7] Another problem is that old underground tanks sometimes disintegrate as they are lifted out of the ground. There is no way to determine if disintegration will occur until the tank is actually removed. For these reasons, it is often impossible to define the exact scope of a tank cleanup until the job is well underway. [Ref. 7]

The underground tank problem is similar to most areas in environmental restoration in that it is impossible to define the scope and level-of-effort required until the job is actually complete. From above ground, sites can look very similar. What is of interest, however, is located underground. This points out the problem faced in defining the scope of environmental restoration projects. [Ref. 7]

3. Changes in Regulations

The changing regulations covering the execution of environmental contracting have been transforming at a rapid pace. Within this decade, the Navy has gone from being able to rely on sovereign immunity to being under the jurisdiction of all Federal, state, and local environmental regulations. [Ref. 11] Even as DoD has had to comply with these regulations, the regulations themselves have changed. Old regulations have been made more stringent, and new regulations have been implemented which put more constraints on when, how, and to what extent toxic sites must be cleaned up. [Ref. 11] If regulations change halfway through a study or an actual cleanup, work may have to be stopped and redone in order to meet the new

requirements. The constantly changing environmental legislation and regulatory climate also makes it difficult to accurately estimate costs during the restoration process. [Ref. 7]

4. Different Degrees of Enforcement and Areas Emphasized

Regulators may require two toxic sites, similar in many ways but located in different areas, to be cleaned up to different standards based on the location of the site. [Ref. 11] One would expect a populated site in Orange County or San Diego, to be cleaned up more completely than a similar site located in Fallon, NV. However, intangibles like this are impossible to be included in a contract. [Ref. 10:p. 32]

Within a local EPA office, certain individuals will have different backgrounds and different levels of expertise. One regulator might have a background in water quality and therefore stress that aspect of an environmental cleanup plan. This is the reason that even within the same organization and geographic area, individual regulators will have different personalities and emphasize and require different items. [Ref. 11] The regulator at the next desk may have a background in soils, and emphasize that area while almost ignoring the water quality aspects of the job. There is no way of predicting which regulator will review and approve any particular plan or design. Since these regulators have the authority to reject proposed alternatives or require unexpected revisions, it is important to recognize the uncertainty they introduce. This again, however, is an intangible which is difficult to predict and very hard to put in an environmental contract. [Ref. 7]

C. UNIQUE FEATURES AND CONTRACT TYPES

The four features raised above highlight some of the major differences between typical construction and environmental restoration work. All four represent some form of uncertainty which makes it very difficult to accurately estimate costs. It is even difficult to estimate the level-of-effort that will be required.

The possible contingencies and ambiguity in environmental contracting are many. The exact nature, extent of work required, regulatory requirements and technologies available cannot be predicted at the time of contracting. The cost of trying to anticipate each one of these items and including it in the contract would be prohibitive. There is a point where the uncertainties are so great, and the probability of any particular event so small, that it is better to leave the contract vague and agree to price after the uncertainties are resolved. [Ref. 12] This is precisely how a cost-reimbursement contract is designed to operate.

If a FFP contract was used, the contractor would assume the entire cost risk of performance. He would, therefore, base his estimate on a worst case scenario and bid accordingly. The bid price would reflect a huge risk premium to compensate the contractor for assuming the cost risk of performance. This would not be a problem if using a cost-reimbursement contract because the Government would pay for only the level-of-effort actually required. Only those uncertainties, contingencies, and regulations which are actually encountered or required will be included in the contract

price. This should result in lower costs under a cost-reimbursement contract, as compared to FFP, because possible contingencies will not be included in a bid, and will not be included in the contract price unless they are actually encountered.

It has already been established that occasionally uncertainties cannot be determined when writing an environmental contract, and would subsequently have to be left out. [Ref. 7] This would mean that a contract modification would have to be negotiated each time an uncertainty or changed condition was encountered. The large number of contract modifications is a significant drawback in using a FFP contract for environmental restoration. [Ref. 10:p. 35]

There are additional disadvantages associated with contract modification. Three additional prominent detriments are increased contract cost, extended contract schedule and the added contract administration costs. [Ref. 10:p. 35] These are extremely time consuming for both the Government and the contractor. Work is often stopped until the problem area can be investigated, the scope and price negotiated, and direction provided to the contractor. This takes administrative effort and can substantially delay a project until the contract is officially modified by someone with the proper authority.

Lack of competition, is another serious problem caused by contract modifications. Fixed-price contracts are more sensitive to modifications. When an unforseen site condition surfaces after contract award, the contractor is the sole source

for resolving the problem. This can lead to many concerns, one of the most serious being that the contractor no longer has any motivation to provide competitive prices for the work covered by the modification. The problems associated with contract modifications must be seriously considered, especially in the environmental restoration field, where there is little question there will be unforseen conditions encountered. [Ref. 10:p. 36]

One of the advantages of a cost-reimbursement contract is that if uncertainties do surface, the contractor can be given immediate direction on how to correct the problem. For this reason the administrative, financial, and time costs of a contract modification can be avoided and progress does not need to be stopped.

Of course one must keep in mind the preference for a FFP contract. If properly used the FFP contract is less of an administrative burden and the seller must deliver an end product vice a level-of-effort on the cost-reimbursement contracts. [Ref. 9:p. 289]

The courts are full of claims filed against the Government under FFP contracts. FFP contracts consistently comprise approximately 80 percent of all contract types submitted for claim with the Armed Services Board of Contract Appeals (ASBCA). [Ref. 13] One of the leading contract issues in these claims involves the Changes clause. This is the same clause that would most likely be used whenever uncertainties were encountered during the environmental restoration process. The use of a FFP

contract would not only increase the number of contract modifications, it would also increase the number of contractor claims.

Cost-reimbursement contracts, on the other hand, are less likely to result in litigation. Since the Government agrees from the start to pay all allowable costs incurred, there is no need for the contractor to make claims for payment. It is easy to see how an area as ambiguous as environmental restoration would generate an even greater number of claims if a FFP contract was used.

Flexibility is one of the attractive features of a cost-reimbursement contract. For example, if regulations changed, as they have been, a cost-reimbursement contract would allow the contractor to immediately, and with minimal cost, redirect his effort towards satisfying the new regulations as long as it is still within the scope of the work. In contrast, if a FFP contract were used, the Government would still pay for any new requirements, as well as the contract administrative costs of modifications. [Ref. 10:pp. 36-37]

With cost-type contracts the Government could encourage, or even direct, the contractor to be innovative with these new technologies. [Ref. 8] This is a definite advantages given the rapid improvement in remediation technology. If the entire cost risk of performance rests on the contractor, as with FFP contracts, he will be hesitant to experiment with new technologies until they actually have been proven. Lack of innovation will be detrimental to the Government in the long run.

There are disadvantages to using cost-type contracts. One disadvantage is the fact that a cost-reimbursement contract does not require the delivery of a product or service. [Ref. 9:p 289] Performance is based on level-of-effort vice a tangible product or service. The contractor is not a guarantor of successful performance of the requirement set forth in the statement of work. For this reason the level of accountability is significantly reduced and the Government assumes most of the financial risk of nonperformance. [Ref. 14:p. 319]

Cost-type contracts are more expensive to administer than a FFP because the audit requirements and oversight activities are increased. To accomplish these requirements, additional personnel are needed to perform cost and technical reviews. Adequate contractor accounting systems must also be in place to verify the costs incurred. [Ref. 15]

D. CONTRACT TYPE CONCLUSIONS

In situations with significant uncertainties, a FFP contract would not be appropriate. The use of some form of cost-reimbursement contract is clearly warranted, due to the uncertain scope and price conditions inherent in environmental restoration, especially through the design phase.

If a FFP contract was used in this situation, the scope of work could be written in one of two ways. It would have either a scope of work so broad that the contractor

would be responsible for all uncertainties, or a scope of work which ignored them entirely. If the broad scope of work was used, the bids submitted would reflect many, if not all, of the uncertainties which might be encountered. The contractors will submit bids based on the worst case scenario so all contingencies are covered. [Ref. 16] Since rarely would all these contingencies take place on one job, the Government inadvertently overpays for the amount of the contingencies that did not occur.

If the second option was used, the Government would have to pay for only those uncertainties which did actually surface. Each one, however, could possibly result in its own contract modification. This is an expensive and inefficient method of contracting, wasting scarce funds and precious man-hours on the additional contract administration.

The underground, regulatory, and technological uncertainties of the environmental area make it a perfect candidate for the cost-reimbursement contract. This is an area where the Government should assume the cost risk of performance. Use of a cost-reimbursement contract in this area would in the long run, speed up the cleanup effort and be more cost efficient.

E. SUMMARY

As will be evident in Chapter III, the cost-reimbursement contract type is the avenue both the Army and Navy have taken with their environmental restoration contracting. Chapter III explains, in detail, the make up of the Navy's Comprehensive Long-Term Environmental Action Navy (CLEAN) contracts, their Remedial Action Contracts (RAC) and the Army's Total Environmental Restoration Contracts (TERC).

III. PRESENT CONTRACTING METHODS EMPLOYED

A. GENERAL

This chapter provides the reader an overview of various environmental regulations and statues, as well as DoD programs for the investigation of hazardous waste sites. The chapter also provides the reader an explanation of the various contractual methods DoD uses to remediate these hazardous waste sites.

B. ENVIRONMENTAL REGULATIONS AND STATUTES

Heightened Governmental and public awareness of environmental hazards has contributed to the strengthened position on environmental issues. [Ref. 7] To support this position, the Government has enacted numerous laws and regulations. As a major contributor to hazardous waste, the DoD and its contractors are significantly affected by environmental legislation. This section provides a summary of pertinent legislation to show the complexities and magnitude of these regulations and statues.

1. Resource Conservation and Recovery Act

In 1976, the Resource Conservation and Recovery Act (RCRA) was signed and subsequently amended in 1978, 1980, 1984, and 1986. The Act established a national strategy for hazardous waste management of current and future operations. The RCRA was designed to establish a Federal program to regulate hazardous waste management. The amendments resulted in a disposal prohibition of untreated

hazardous waste at landfills. The Act also provided minimum standards on all facilities handling hazardous material and a permit system for all treatment, storage and disposal facilities. [Ref. 17]

2. Comprehensive Environmental Response, Compensation, and Liability Act

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) was signed in 1980. In contrast to the RCRA, which covered current and future operations, the CERCLA authorized Federal action in response to environmental cleanup at abandoned or closed waste sites. This Act, also known as the "Superfund Act", authorized a trust fund to be used by the Environmental Protection Agency (EPA) to cleanup emergency and long-term hazardous waste sites. The Act permits the Government to recover costs associated with the cleanup and damages to a site. The costs are than recovered from the responsible parties. Additional cleanup funds are drawn from a "superfund" created by taxes on chemicals and hazardous wastes. [Ref. 18:pp. 101-104]

The Superfund Act was amended under the Superfund Amendments and Reauthorization Act (SARA) in 1986. The amendment extended CERCLA and established funds for four additional years which provided strict schedules for various phases of remedial activities. The amendment also established detailed cleanup standards. SARA restated that Federal facilities must comply with CERCLA and state environmental laws. [Ref. 18:pp. 104-108]

In 1985, the National Contingency Plan (NCP) was written. The NCP provided the organizational structure and procedures for preparing and responding to discharges of oil and releases of hazardous substances, pollutants, and contaminants. [Ref. 19:p. 15] The NCP is also the basic regulation that implements CERCLA, establishing documentation such as the National Priorities List (NPL) of hazardous materials and a Hazardous Ranking System (HRS) for past waste sites. [Ref. 20]

3. Defense Environmental Restoration Program

In 1984, to promote and coordinate efforts for the evaluation and cleanup of contamination at DoD installations, the Defense Environmental Restoration Program (DERP) was established. The DERP created a fund similar to the superfund but was designed explicitly for DoD sites. [Ref. 21:p. 1] There are two programs under DERP: The Installation Restoration Program (IRP), which investigates potentially contaminated DoD installations and formerly used sites for cleanup; and Other Hazardous Waste (OHW) operations, which encourages research, development, and demonstration to improve remediation technologies and reduce DoD waste generation. [Ref. 21:p. 1]

DERP is managed centrally by the Office of the Secretary of Defense, with policy direction and oversight by the Deputy Assistant Secretary of Defense (Environment). Each DoD component is responsible for its own program implementation. [Ref. 21:p. 1]

4. Federal Facilities Compliance Act of 1992

In 1992, the Federal Facilities Compliance Act (FFCA) was signed. The Act clarifies that Federal facilities are subject to civil and administrative fines and penalties for violations of Federal, state, and local laws dealing with the handling of solid and hazardous wastes. The Act allows the EPA a new and powerful enforcement tool over the DoD; no longer could they rely on sovereign immunity. [Ref. 22]

C. INITIAL STEPS OF ENVIRONMENTAL CONTRACTING

All restoration programs are subject not only to Federal regulations but also state and local statues. Although all DoD components (Navy/Marine, Army, Air Force) have their own Installation Restoration Program (IRP) they are not a mirror image of each other. All basic concepts are the same but the terminology varies from Service to Service and even within Services. To better understand the process of environmental restoration, this section provides various stages of the remediation process. [Ref. 21:p. 2]

1. Pre-Remedial Activities

The first stage is the Preliminary Assessment (PA) which determines if there are any sites present that may be hazardous to public health or the environment. As

part of the PA stage all available background information is gathered in order to identify the extent of the potential hazard. [Ref. 23:p. 4]

The second stage is Site Inspection (SI), which consists of taking samples of media in question (e.g., soil, surface water, ground water) to determine the extent of contamination. The gathered data will be used to determine the proper corrective actions required. [Ref. 23:p. 5]

A Hazard Ranking System (HRS) score is calculated based on data provided from the PA/SI. The score is based on factors such as: the amount and toxicity of contaminants present, their potential mobility in the environment, the availability of pathways for human exposure, and the proximity of population centers to the site. A score of 28.5 or greater places a site on the National Priorities List (NPL). The ranking of the NPL is updated on an annual basis. [Ref. 21:p. 2]

2. Coordination With Public and Regulatory Agencies

Coordination with regulatory agencies is a critical requirement in the restoration process. [Ref. 7] CERCLA requires that all regulatory agencies and the public be given the opportunity to review and comment on the results of any assessment or study. This is a critical point in the process because CERCLA now allows any citizen to sue any Federal agency which "...is alleged to be in violation of any standard, regulation, condition, requirement, or order" enacted under CERCLA. [Ref. 23:p. 9] The Government can have these lawsuits dismissed if it acts to comply

with the CERCLA requirement in question within 60 days of being notified of the suit. This portion of CERCLA highlights the political and watchdog environment under which DoD has been forced to operate.

3. Evaluation of Remedial Alternatives

In the Remedial Investigation/Feasibility Study (RI/FS) stage, contaminated sites are fully studied. The RI may include further investigation of a site to determine more precisely the nature, extent, and significance of contamination. The evaluation also focuses on determining the risk to public health. The FS is conducted concurrently with the RI and evaluates the remedial alternatives for the site. The evaluation of remedial alternatives is based on the eight criteria established by the EPA, namely: [Ref. 20]

- Overall protection of human health and the environment;
- Long-term effectiveness and permanence;
- Reduction of toxicity, mobility, or volume through treatment;
- Short-term effectiveness;
- Implementability;
- Cost;
- State acceptance; and
- Community acceptance.

The Record of Decision (ROD) is a legal document that must be prepared for the proposed cleanup plan of a site. It shows the rationale and decision making process to support the technical and legal decision made for a site. [Ref. 19:p. 19]

If a site is NPL listed, the EPA must concur with the ROD. If the site in question is a non-NPL site, the remediation alternatives need only state approval. The ROD must be made available to the public.

4. Implementation of Remedial Action

The Remedial Design (RD) is prepared for a site once the remediation alternatives are agreed upon. The RD is based on RI/FS data and the ROD and is a detailed design for the cleanup of the site. [Ref. 19:p. 19]

The Remedial Action (RA) will identify the work that is to be performed by specialized contractors, and may include activities such as removal/disposal of contaminated media and alternative water supply treatment.

Once the remediation is complete, the site is closed out or deleted from the NPL. This is achieved if the site remediation is actually completed. DoD also considers a site "complete" if long-term remediation, such as a "pump and treat" system is in place and operational. A site can also be closed out during any phase if data deem that no further action is planned or required. [Ref. 19:p. 19]

5. Installation Restoration Program Priorities

This establishes the order in which DoD conducts IRP projects; the sites that represent the greatest potential public health and environmental hazards are assigned the highest priorities. DoD has developed the Defense Priority Model (DPM). The

model goes one step further than the HRS, by using RI data in addition to PA/SI data to assess the relative risk presented by a site. The model considers the following site characteristics: concentrations and mobility of the contaminants; the potential for contaminant transport via surface water, ground water, air/soil; and the presence of potential human and ecological receptors. [Ref. 21:p. 3]

This risk-based approach recognizes the importance of protecting public health and the environment, and objectively prioritizes sites for funding. In an austere funding environment, the DPM provides a method to determine which sites will be corrected first. This process takes a lengthy period of time because there is extensive regulatory involvement at each step. Every investigation, plan, study, and design is reviewed. A regulatory agency, Federal, state, or local, can reject any of these submissions if it does not satisfy their own requirements or regulations. Approval to move to the follow-on phase is not granted until all the regulatory agencies have approved the required documents. [Ref. 8]

D. NAVY ENVIRONMENTAL CONTRACTING

The Naval Facilities Engineering Command (NAVFAC) serves as the technical expert and provides centralized environmental funding through the Environmental Compliance Account and the Environmental Restoration Account. [Ref. 24:p. 1] The CLEAN (Comprehensive Long-Term Environmental Action,

Navy) and RAC (Remedial Action Contract) contracts are a central part of NAVFAC's strategy to deal with long-term, difficult to define environmental restoration and hazardous waste handling requirements. [Ref. 24:p. 1] The Cost-Plus-Award-Fee (CPAF) type of contract was selected for the CLEAN and RAC contracts in an attempt to increase the control of contract management and obtain the greatest performance value for a controlled amount of contractor profit. [Ref. 25] The CPAF contract is suitable for level-of-effort contracts for performance of services where mission feasibility is established but measurement of achievement must be by subjective evaluation rather than objective measurement. [Ref. 26]

A basic characteristic of environmental studies and remedial action is the inability to accurately determine the scope of work before the actual study is made. FFP contracts provide inadequate control because of the frequent need to modify them to account for the additional services found to be necessary during execution of the contract. An original FFP contract takes on the characteristics of a cost contract if continually modified to cover an expanding scope. Even when such modifications are carefully negotiated, there lacks the cost-type contract's ability to continually monitor actual costs and incentives efficiency through use of an Award Fee. [Ref. 24:p. 2]

1. Elements of the CPAF Contract

This section is broken down into the different elements of a CPAF contract. The subsections explain how award and base fees are established and explain about the evaluation requirements.

a. Award/Base Fee

The base fee is designed to compensate the contractor for profit evaluation factors such as risk, investment, and the nature of the work to be performed. [Ref. 14:p. 321] This fee is usually equal in amount to the minimum acceptable performance. The base fee is the minimum fee a contractor can earn and shall not exceed three percent. [Ref. 27:part 16.4]

The award fee represents the additional amount available to reward the contractor for performance above the minimum acceptable levels in those areas identified by the evaluation criteria. [Ref. 28:p. 12] The total fee (base fee plus award fee) for this type of contract may not exceed ten percent of the estimated cost of the contract, excluding fee. [Ref. 27:part 15.903 (d)]

The CLEAN and RAC contracts stay within these parameters but are always awarded without a base fee which is NAVFAC directed. [Ref. 16] Research indicates the reasoning behind the decision to negotiate a base fee of zero, is that the contractor is expected to perform the contract in a superior manner with a corresponding high award fee. NAVFAC believes use of the entire potential fee as an award fee provides maximum incentive for excellent performance in the critical environmental context. [Ref. 28:p. 12]

Of the interviews conducted with personnel at the seven conus Engineering Field Activities (EFAs)/Engineering Field Districts (EFAs), none had

experienced any problems with attracting offerors to bid on these zero base fee CPAF contracts. One interviewee indicated that it was not unusual to receive two dozen or more responsive and responsible potential offerors from a single request for proposal (RFP). [Ref. 29] Interviews with the contractors indicated that if they had their choice there would be a base fee but they accept the absence of one as the price of doing business with the Government. They did not indicate that the zero base fee had caused them to perform any better but admitted that it puts more emphasis on the award fee. [Refs. 30 and 31]

NAVFAC has nothing in writing that indicates the CLEAN/RAC contracts award and base fees must be negotiated at the full six/ten percent respectively but all the interviewees indicated that their going in position on fees is always six/ten percent. The reasoning for allowing that high of a fee is that after the grading of the evaluation criteria, the fee rarely remains at that high of a level. [Ref. 16] The average grade (fee) for RAC contracts over the seven EFAs/EFDs ranged from eight to eight and a half percent. With the strict non-inflated grading, the profits end up being lower than the going-in fee of ten percent.

b. Evaluation Requirements

As with all CPAF contracts, the contractor performance must be periodically assessed based on criteria expressed in the contract. NAVFAC provides guidance on how often the evaluations take place. Until recently, evaluation period

was four months for both the CLEAN and RAC contracts. The RAC and CLEAN contracts now have an evaluation period of four and six months respectively. Unable to determine for certain the reason for this change, a supervisor who was involved in one of the first CLEAN contracts over eight years ago, felt the change may have helped cut down on contract administration. He also commented that the time period required to complete the CLEAN contracts is longer but less dramatic than first anticipated. [Ref. 32]

2. Evaluation Criteria and Rating System

It is recommended that a detailed evaluation plan and approach for evaluating the contractor's actual performance against the evaluation criteria be used. [Ref. 33:p. 74] The plan should reflect the anticipated performance level and the conditions under which these levels are achieved. One must be cautious that the breakdown of the award pool over a large number of criteria can dilute emphasis. It also points out that emphasis can be shifted from one criterion to another by changing the weighting scheme if the Government wants more attention on one particular criterion. This must be done prior to the beginning of the evaluation period and the contractor must be notified. [Ref. 33:p. 91]

NAVFAC stays well within these guidelines but requires the EFD/EFA to use the same four criteria and the same weight for these criteria in each contract. Although one supervisor felt the weights could be changed, no one does because of

the vast categories under each criteria and the added administrative burden. He also pointed out that with only four criteria a poor grade in any category will substantially reduce the contractor's fee. [Ref. 15]

The four categories are technical compensation, cost and schedule control, program execution/quality management, and subcontractor and consultant management. All of these criteria have an equal weighting of 25%. At first appearance, these criteria seem somewhat nebulous, but each one has a list of subcategories which explains what makes up each criterion. Listed below are the different criteria and their subcategories. [Ref. 28:pp. 19-23]

a. Technical Compensation

- Adhere to contract scope of work regulations and guidelines.
- Provide complete and accurate submittal including implementation/ sampling/health and safety plans, work plans, shop drawings, product data, samples and administrative closeout submittal.
- Respond to Government comments effectively and in a timely manner.
- Minimize rework through effective daily inspections.
- Demonstrate creativity and ingenuity in approach that results in technically innovative and/or cost effective solutions.

b. Schedule and Cost Control

- Development and maintenance of planned budgets and schedules.
- Adjust schedules and prioritized requirements through innovation or other means.
- Timeliness, accuracy, and completeness of vouchers.
- Timeliness, accuracy and completeness of deliverables.

c. Program Execution/Quality Management

- Responsiveness to program requirements and effective communications.
- Plan and manage workload surges/many ongoing delivery orders (DOs).
- Effective use of resources suitability of staffing.
- Manage an effective quality assurance (QA)/ quality control (QC) and Health & Safety Program.
- Adequacy, reporting, and maintenance of Government Property record administration.
- Adequate compliance with FAR Part 30-Cost Accounting Standards Administration.
- Completion of all tasks subject to the timely submittal of costs and D.O. interim closeout information.
- Effectiveness of Contractor's purchasing system (DFARS Appendix "C" Contractor Purchasing System Reviews).

d. Subcontractor and Consultant Management

- Selection of appropriate subcontractors and/or consultants.
- Effective control of costs and resources.
- Timely and adequate schedule submission and management of actual performance.
- Effective communication resulting in efficient coordination.
- Adherence to subcontracting plan.
- Compliance with all applicable contract clauses and provisions

The grading system is broken down into four levels, each level is decided by the grade or percent awarded. The percentage/grade is multiplied by 25% and by adding the four criteria together one can determine what percent of the fee the

contractor will receive for that evaluation period. For example if the four criteria markings are 100%, 90%, 80% and 70% respectfully, by multiplying each mark by the 25% assigned to each criterion, and than by adding the four results together, it is than determined that the contractor will receive 85% of the assigned fee in that particular evaluation period (assuming everything scheduled in that rating period was completed). [Ref. 16] Below are the guidelines used for determining the grade assigned. [Ref. 28:pp. 24-25]

LEVEL I (90%-100% of available award fee)

- Technical performance which corrects the hazardous waste problem which may have innovative elements.
- Timely completion with minor corrections, or completion after increases due to additional requirements or regulatory changes.
- Highly effective management of the subcontracted effort.
- Control of cost yields some savings.
- Results recognized from continuous improvement. May include minor correctable weaknesses in products and services.

LEVEL II (60%-89% of available award fee)

- Reasonable technical quality and effective management.
- Timely deliverables and schedule control with some corrections and slippage.
- Successful management of subcontracted effort.
- How effective cost controls are.
- Strives to make continuous improvements. This may include some correctable weaknesses in products and services.

LEVEL III (30%-59% of available award fee)

- Quality only acceptable with Government input.
- Changes in delivery schedule which do not cause significant problems.
- Adequate management of subcontracted effort with some inefficiencies.
- Reasonable cost control with some increase in cost.
- No continuous improvement efforts visible. Some deficiencies in products and services which require Government input to correct.

LEVEL IV (0%-29% of available award fee)

- Technical performance does not follow the design of the Record of Decision, and does not correct the hazardous waste problem.
- Failure to meet delivery schedule without notice of plan for correction.
- Failure to monitor subcontractors and/or consultants.
- Significant cost increases due to inadequate performance.
- Deficiencies so pervasive as to require substantial rework.
- Ineffective relations with Navy, other Federal, and/or state regulators.

E. ARMY ENVIRONMENTAL CONTRACTING

1. General Features

The Army's TERC is a cradle-to-grave, Indefinite Delivery/Indefinite Quantity type of contract. A TERC is designed for the total remediation of sites/projects but it must first be determined whether the project is within the TERC parameters. In order for a TERC to be awarded, it must have an "anchor" installation designated where a portion of the remedial work is to be accomplished. The "anchor" installation maintains central control of the overall TERC. The TERC is not limited

to use at only the anchor site(s). Remediation projects that are deemed eligible to be performed under the TERC can be located anywhere within the awarding district's region of responsibility. For example, a Sacramento TERC may include remediation efforts at both Stead Air Force Base and Hunter Army Airfield, and both locations might not be listed as the anchor installation. [Ref. 34:p. 25]

The maximum anticipated allowable value of any TERC is $200 million. The longest period of performance allowed is ten years. The total length of ten years is based upon a base period of four years and two subsequent three-year options, if exercised. TERC contracts that exceed 125 percent of the maximum anticipated value require Department of the Army approval prior to award. However, the minimum amount guaranteed is only $200 thousand per period of contract issuance. The contract is performed in accordance with delivery orders which are negotiated and issued on a cost-reimbursement basis for each remediation project and its related tasks. The preferred methods of cost-reimbursement are via Cost-Plus-Fixed-Fee (CPFF) or Cost-Plus-Award-Fee (CPAF) contracts. Cost-Plus-Incentive-Fee (CPIF) contracts are also used but only on a case-by-case basis. [Ref. 35]

Funding for DoD remediation projects under the TERC comes from either the Defense Environmental Restoration Account (DERA) or the Base Realignment and Closure (BRAC) account. The DERA account covers both active installations and inactive defense sites, while the BRAC account solely covers remediation work at

BRAC installations. If any other agency (non-DoD) requires remediation under the TERC, it is performed by using either that agency's operations and maintenance funds or the Superfund.

2. Acquisition Planning

The TERC arrangement is not appropriate for all remediation projects. The ultimate use of a TERC is reviewed at each step of the decision process, it is tightly controlled both at the Corps' District level and then again at the Corps' Headquarters level.

The proposed project must go through an extensive screening process, prior to selecting the TERC method of contracting. As the proposed project flows through the process, it is screened by Corps representatives who determine if the project's requirements meet the criteria for TERC contract usage. If the remediation site is considered a valid candidate, it is then reviewed at the next higher echelon to determine if the responsible district office of the Corps has the available resources (e.g., trained staffing, funding, customer commitment) to execute a TERC contract. [Ref. 34:p. 26]

Ultimately, the Principal Assistant for Contracting (PARC) for the Corps retains contracting oversight responsibility for all TERC contracts and must approve all TERC acquisition plans, Commerce Business Daily (CBD) announcements, and RFPs prior to release. This level of oversight ensures that there will be no deviations

from the Corps' TERC acquisition plan, or that deviations are warranted and do not alter the integrity of the TERC contracting method.

At least one of the following elements, as dictated in the Corps Management Plan for TERC contracts, must exist at a remediation site and be included in the district's need statement, prior to the decision to use a TERC:

a. The project must exist at a remediation site and be included in the anchor installation's needs statement prior to the decision and approval to use a TERC.

b. Project funding is phased by site (operable unit).

c. Coordination of more than one contractor on an installation presents unacceptable administration problems in such areas as coordination and movement of workforces and equipment, separation and acceptance of contractor responsibility, and verification of performance and progress.

d. The project must be comprised of two or more sites.

e. Project conditions must indicate a high probability that interim remediation of point sources of contamination will be required.

f. Pre-remediation and remediation activity require significant interface and coordination.

g. Close coordination of cleanup efforts must be maintained between sites.

h. Pre-remediation activity between sites require critical interface.

i. The proposed project(s) for which a TERC contract will be considered must include both design and remedial action efforts. Once an installation is approved for remediation under a TERC contract, no remediation work, except that which is under existing contracts, should be performed outside the TERC contract.

j. Project conditions indicate there will be a need for the contractor to respond quickly to situations without interference from another contractor working in close proximity to the site. [Ref. 4:pp. 8-9]

Coupled with the tight control of TERC contract usage is the required training that must take place. Key administrative representatives of the Corps must undergo mandatory training on TERC background and its implementation prior to their involvement in the selection, award, and administration processes. Upon completion of this training, the TERC management plan calls for the assignment of a project manager for the life of the contract and for key members of the TERC team to retain their TERC responsibilities for extended periods. It is the Army's desire to maintain a consistent approach in the management of the TERC contracts. [Ref. 4:p. 11]

3. The TERC Request For Proposals (RFP)

The Army provides a standard TERC RFP format to ensure a consistent approach by each district as contracts are solicited for environmental remediation cleanup efforts. All of the districts with TERC contracting authority must adhere to this Corps' standard TERC RFP format. Any deviations from the standard RFP, must be pre-approved by the PARC. [Ref. 36]

Each RFP must provide every type of work effort that is anticipated to be required for successful contract performance. Work efforts can include site investigations, predesign and design efforts and remedial construction associated with a remedial solution. The solicitation must also address: the boundaries of the contract (generally the district's area of responsibility), the location of known project sites, and

the potential that the contractor may be required to perform remedial efforts at sites other than those listed in the solicitation. [Ref. 36]

A unique feature of the TERC solicitation is the requirement for the written performance of a sample project by any contractor who submits a bid. The project represents situations that may well be encountered while performing the actual contract, at the same time being unique to each new solicitation. For example, in the RFP for a Fort Ord TERC, a requirement was included to develop a plan to perform all remedial work, covering all remediation phases: site investigation through operations and maintenance at an Army NPL site in California. The sample site had requirements for both soil and water remediation. [Ref. 34:p. 31]

4. Source Selection

For the TERC contracting method, the goal of the source selection process is to select, via a competitive negotiation, the contractor's proposal who represents the best value to the Government. Best value is determined by the evaluation of each offeror's proposal on the basis of its technical approach and cost realism, reasonableness, affordability, and the previously mentioned hypothetical project. The hypothetical project itself is evaluated on all of the same criteria. The TERC RFP evaluation criteria are broken into six sections or volumes, which cover the following subject areas: Volume I, Business, Management and Technical Approach; Volume II, Experience, Organization and Personnel; Volume III, Operational Management

Plan; Volume IV; Acquisition Management Plan; Volume V, Cost; Volume VI, Sample Project. [Ref. 4:pp. 13-17] All volumes of the source selection criteria, other than cost, are point scored. Cost is evaluated as to its reasonableness and is used to assist the Army in determining the level of understanding that a given contractor has of projected work requirements. [Ref. 35]

5. Contract Type

With the use of a TERC contract, each delivery order must be negotiated individually. As dictated in the TERC Management Plan, the approved contractual agreements for delivery orders are either CPAF or CPFF. Fixed-price and time and materials contracts are not authorized for use in a TERC contract. However, the prime contractor is able to use any type of contract with its subcontractors. In many cases, subcontractors will perform under fixed-price arrangements, which are facilitated by the definition of their performance tasks. [Ref. 35]

The Army usually uses a CPFF arrangement, based on the degree of uncertainties associated with the tasks to be performed within the delivery orders. The uncertainties make it difficult to establish target incentives that the contractor can achieve and the incentive arrangement may not adequately reflect the quality of the contractor's performance. For this reason, the use of CPIF contracts require special approval and Fixed-Price-Incentive-Firm (FPIF) arrangements are not allowed. [Ref. 36]

The CPFF arrangement pays the contractor's fee that is fixed and negotiated at the conception of the delivery order, in addition to allowable costs incurred (costs that are reasonable, allocable, and those negotiated for the delivery order). The contractor's fee does not change with the cost of the work that is delivered/ performed, rather, it remains constant throughout performance. The fee amount may only change if the scope of work required under the delivery order changes. Under the CPFF arrangement, the fee cannot exceed ten percent of the agreed upon cost estimate that resulted from negotiations. There are no limitations on how low the fee percentages can go. [Ref. 27:part 15]

As previously mentioned, the most prominent feature to a cost-reimbursement contract is that it is based on a level-of-effort. Therefore, if the contractor does not perform the tasks required in the delivery order within the cost estimate, the contractor is still entitled to all of his fee. If this is the situation, the Government has two options, make more funds available to continue performance without an increase in fee or stop work. The Army has two modes of executing CPFF delivery orders. The first is the completion form which requires a scope of work that defines a specific goal or target and provides an end product and the second and less desirable is the term form which only requires a "level-of-effort". [Ref. 34:pp. 39-40]

6. Contract Administration

Upon the award of a TERC contract, the prime contractor is required to prepare a detailed management plan. The plan is developed with the guidance of the TERC's administering district. The management plan must includes a work plan that reflects costs and schedules; health, safety, and environmental protection; staffing numbers and qualifications; information systems and reports; and a plan for exercising quality control. The Army is responsible for assisting the contractor in the development of the management plan. It should incorporate the district's current administrative standard operating procedures (SOP) in the plan in order to minimize the development of new and special procedures for a specific TERC contract. [Ref. 4:pp. 20-21]

7. Work Plan Development

The contractor must prepare a work plan that responds in detail to the Army's directed statement of work. [Ref.4:p. 21] These statements of work must be done for each delivery order exercised by the Army under the TERC contracting method. The work plan must address a proposed schedule that differentiates the time requirements for each task within the statement of work, interrelationships between tasks, and a critical path. The work plan also includes site control measures that require permits and licenses; deliverables that will be performed within the delivery order, a site description and contaminate characterization; and key personnel, who will be used on the project and their responsibilities. [Ref. 4:p. 21]

The work plan must be approved by the administering district prior to the contractor's execution of it. The standard time line from the contractor's receipt of the delivery order through the approval of a final work plan is five weeks. The five week time period includes: preparation, review and modification, and finally, approval. [Ref. 4:p. 22]

Each delivery order work plan is broken down into individual actions. Each action reflects the specific detailed plans that cover how a given remediation project will be performed. The plan must also address how compliance with applicable regulatory requirements will be met. [Ref. 36]

8. On-Site Management

Responsibility for the administration of a TERC contract is placed on the Corps of Engineers resident engineer. He/she is responsible for the coordination, reporting and management of all remedial actions on-site. The resident engineer is responsible for keeping both the TERC Project Manager (PM) and the site technical manager informed concerning the current status of the projects. The resident engineer and the quality inspectors have the added responsibility of monitoring a contractor's costs, schedule compliance, and performance since, the TERC projects are based on cost-reimbursement agreements.

9. Partnering

One of the most important aspects of the TERC contract is its partnering requirement. The use of the TERC contracting method requires a partnering arrangement between the prime contractor, customer representative and the Army Corps of Engineers representatives. The partnering is enhanced and stabilized by the TERC contracting method and its requirements. One such requirement is a management plan for the contractor which is jointly developed. Without partnering, two of the TERC's most critical aspects, project concurrency and project flexibility, cannot be achieved. Partnering assists in the clear definition and interpretation of requirements, and subsequently, the development of methods of monitoring and evaluating the completion of requirements. [Ref. 35]

F. AIR FORCE ENVIRONMENTAL CONTRACTING

The Air Force environmental remediation has numerous similarities to the Navy and Army. Because of these similarities this will be the only mention of the Air Force. There are advantages and disadvantages associated with the Air Force environmental contracting that will be incorporated into the both the Navy and Army segments of this thesis.

As with the other Services, the Air Force uses the specific nature of the environmental remediation as a determining factor in choosing what contract type to

execute. The more complex or speculative the remediation, the greater the risk and the more difficulty in using a fixed-price type contract.

In similarity with the Navy and Army, the Air Force uses the scope of work and intensity of the competition to influence what type of contract to use. As with the other Services, lack of competition is a rarity and the scope of the work is the main factor in deciding what contract type to use. Some other factors the Air Force uses when considering what contract type to use is time available, experience with environmental remediation, the apparent soundness of the order price, and the technical and development state of the remediation method proposed to be used. In less common instances, the length of the performance time and economic information can play a large part in determining the best contract type.

The Air Force environmental infrastructure is built around the Air Force Center for Environmental Excellence (AFCEE). [Ref. 37] The dissimilarity between the Air Force and the other branches begins here. Decisions on the corrective action necessary is determined at the local level. The decision depends on the local working rapport with the state and local environmental regulators, the local Air Force environmental branches talent and the environmental branches present workload. If the local Air Force environmental branch has a strained working rapport with the local EPA, for example, the environmental remediation project is more apt to be deferred to the AFCEE. If this environmental branch enjoys a good working

relationship with the local EPA, the branch is more apt to put a project on their backlog vice deferring it to AFCEE.

The AFCEE is a centralized command broken down into regions, each with its own policies on how to administer environmental contracts. All AFCEEs interpret the Brooks Architect-Engineering (A/E) Act in the same light as the Navy. It should be noted that a substantial portion of the Air Force's environmental budget goes to TERC contracts (18% in FY 95) that are administered by the Army. Even though the Air Force does not administer their own TERC contracts, by transferring funds to the Army Corps of Engineers, the Army executes almost a fifth of the Air Force's environmental restoration budget. The decision to have the Army administer a TERC contract is at the discretion of the individual AFCEE. [Ref. 38]

The environmental remediation contract administered by the AFCEE are similar to the TERC in that the contracts are three to four years in length with two subsequent two or three year options. But as mentioned previously, all A/E contractors are not allowed to bid on the actual environmental remediation contracts for which they did the A/E portion of the project. [Ref. 39]

G. SUMMARY

Chapter III highlighted how the different DoD Services correct their individual hazardous sites. Both the Navy and the Army employ very different contracting

strategies to handle their respective hazardous site cleanups and each is convinced their method is the proper approach. [Ref. 40] Chapter IV provides the advantages and disadvantages of the Navy's CLEAN/RAC contracts and the Army's TERC contracts.

IV. ADVANTAGES AND DISADVANTAGES

A. GENERAL

This chapter focuses on the Navy-specific environmental restoration contracts (CLEAN/RAC) and Army-specific TERC contracts. All Services of the DoD use a wide array of contract types, from FFP to CPFF, Indefinite Delivery/Indefinite Quality (ID/IQ) and everything in between on the spectrum of contract types available. All contract types have their own advantages, disadvantages and situations for their use. Some branches of the Service tend to use more of one particular contract type than others but the purpose of this chapter is not to identify that a particular Service is making greater use of a certain contract type but to weigh the pros and cons of the CLEAN/RAC contracts and the TERC contracts.

B. NAVY'S ENVIRONMENTAL RESTORATION CONTRACTS

The Naval Facilities Engineering Command (NAVFAC) and its components have done well in the area of environmental restoration contracting. [Ref. 40] The Navy selected an appropriate contract organization, type and award method for environmental contracting. [Ref. 10:p. 57] The Navy has used lessons learned in a positive manner to help shape the present Navy CLEAN/RAC contracts. [Ref. 10:p. 49] One of the lessons learned was to limit the contract scope to geographical regions so the particular EFD/EFA has full control over the project. Another lesson was to

write the contracts so the contractors/subcontractors are capable of remediating all contaminants (except ordnance and nuclear waste). This is to increase the flexibility of the contract if unknown contaminants are identified. [Ref. 16]

1. Advantages

Determining if a particular aspect of a contract is an advantage or a disadvantage is often not clear cut. There will be incidents where a particular feature may be both an advantage and a disadvantage. One must keep in mind that just because an item is identified as a disadvantage, procedures, if properly applied, can neutralize this negative factor. Even though an item may be identified as a disadvantage in this chapter, there may be Commands that make it nonexistent because a counterbalancing mechanism is being be properly applied.

a. Award Fee

Some contracting personnel feel that while the CPAF contract provides a greater motivation to the contractor, these contracts bring with them increased administrative requirements and costs. Others state that the CPAF contract can work well if there is an experienced team for the Navy, who are able to negotiate well and provide strong oversight and monitoring. [Ref. 10:pp. 51-52]

The choice to use the CPAF contract shows the Navy considered the complexity of the work in environmental contracting, and determined it to be more than a "commodity". The Navy recognized that the contracts would be highly

complex in nature, and would require contractors with highly specialized and technical skills. The contractors would also need to be experienced and well-versed in environmental policies and regulations. As a result, the Navy choose a contract type that can provide greater emphasis on technical merit, rather than awarding a contract based on the lowest bid price. [Ref. 16]

NAVFAC determined the CPAF contract was more advantageous because it can provide greater motivation to the contractor by better controlling their remediation efforts. However, the EFD/EFA must provide adequate staffing and training to administer this type contract. Otherwise, the Navy may find this a disadvantage if they put themselves in a situation of awarding the entire fee to the contractor, instead of being burdened with the complex requirements of evaluating an award fee commensurate with contractor's performance. [Ref. 16]

b. Brooks Architect-Engineer Act

The Navy's interpretation of the Brooks A/E Act is that the environmental remediation contracts are of the construction type. The Act requires all construction contracts to have at least two contractors, one for the A/E (CLEAN) portion and one for the actual construction (RAC). In short, with the Navy's interpretation of the Brooks A/E Act, the RAC and CLEAN contractors for a particular project cannot be the same. In reality, this puts the RAC contractor in a position to reevaluate or double check what the CLEAN contractor had identified in

their A/E portion of the contract. The RAC contractor has a vested interest in getting as accurate a CLEAN contract as possible. [Ref. 41:pp. 8-9]

The Navy's more conservative interpretation of the Brooks A/E Act allows that at a later date there may be some clarification or the development of a single DoD interpretation of the Act. This clarification may allow the Navy to develop their own "cradle-to-grave" approach similar to the Army's. [Ref. 40]

c. Flexibility

Another advantage of the Navy's environmental contracting method is their decision to use the CPAF contract type which has flexibility built into it. The contractor's fee is based on the Navy's subjective evaluation of how well the contractor applies its efforts in meeting the Navy's needs. The contract provides a flexibility to the Navy to correct the unknowns that are inherent in the environmental remediation world.

The award fee also introduces an element of flexibility since the Navy can change the weighting that each evaluation element receives. These changes must be brought to the contractor's attention by providing advance guidance before the beginning of the evaluation period. The award fee gives the Navy a flexible tool with which to influence a contractor's performance. [Ref. 9:p. 286]

d. Risk Aversion

Contrasted with a fixed-price contract type, a conventional CPAF contract shifts the risk sharing towards the buyer because, primarily the contractor is

guaranteed all of his costs and the base fee. With the CLEAN/RAC contract there is no base fee thus all of the potential fee is included in the award fee pool. This puts the contractor in a position to possibly incur cost and not receive any fee if it is determined their performance is evaluated as unsatisfactory (level IV). [Ref. 16]

2. Disadvantages

The Navy and its contractors are continually learning from and improving the processes of their CLEAN/RAC contracts.

a. Timely

If time constraints are important to the site remediation, the CLEAN/ RAC arrangement may not be suitable. Several factors lead to time constraints being an important driver. Many sites have been contaminated for several years and the longer the contaminant is left in place, the higher the risk of it spreading. Timely site cleanup could play a key factor for an effective environmental remediation project. The CLEAN/RAC contract arrangement is not designed to allow RAC contracts to start before the CLEAN contractor has finished the A/E portion of the project. This leads to a lengthened contract period because of the inability of the two different contractors to work concurrently. [Ref. 16]

b. Administrative Costs

A significant administrative responsibility is assumed by the Government when using the award-fee contract. The requirements for additional monitoring

and auditing adds substantially to the cost of administering a contract. [Ref. 14:p. 321] The CLEAN/RAC contract arrangement doubles this disadvantage because the Navy must go through the administrative responsibility for the A/E portion and then again for the actual cleanup contract.

c. Redundancy

The Navy's interpretation of the Brooks A/E Act causes a certain degree of redundancy in the way it accomplishes environmental contracting. Because the CLEAN and RAC contractors cannot be the same there is a certain amount of redundancy of effort on the part of the RAC contractors. The RAC contractors often reconfirm the results of the CLEAN contractors. This is to ensure the A/E portion was done accurately because the RAC contractor does not want to rely on misinformation received from the CLEAN contractor. This reconfirming of results ends up raising the cost of the contract with little or no added value. [Ref. 16]

C. ARMY'S ENVIRONMENTAL RESTORATION CONTRACTS

The strength of the TERC contract and its application rests in that the Army is aware that this contracting technique is not a method to encompass all environmental remediation efforts. The TERC contract is a well-conceived and applied contracting method. The Army has carefully determined the uses for which this contracting method is applicable. The Army does not rule out other contracting methods as appropriate for use in particular situations. [Ref. 35]

The Army has strict guidelines for the application of the TERC contract which prevents any misapplication of its intended use. These guidelines include both the screening criteria which may lead to a site's nomination for remediation under a TERC contract and the approval process. As pointed out in Chapter III, the Army is constantly ensuring that TERC contracts are administered in situations intended for their use.

As with the Navy's CLEAN/RAC contracts, the TERC contract has evolved as the results of lessons learned. The TERC has developed principally as a result of contracting inefficiencies that caused both cost and schedule growth. The Corps' use of fixed-price contracts for remedial efforts, despite the effort's complexity, lead in many cases to the effort experiencing either cost growth, schedule growth or both. Cost and schedule growth have also been associated with the use of multiple contractors to accomplish restoration efforts in accordance with an inflexible sequence of remedial steps. This leads to the situation where a contractor is not able to start until the previous contractor is complete, similar to what the Navy is experiencing with their CLEAN/RAC contracts. [Ref. 35]

1. Advantages

Discussed below are the advantages of TERC contracts. As with the CLEAN/ RAC contracts, determining if a particular aspect of a contract is an advantage or a disadvantage is often subjective.

a. Sample Project

The sample project is one of the items that is required by each new TERC RFP and includes remediation tasks that are representative of the situations that will be encountered by the awardee once selected. The sample project is a unique vehicle within each offeror's proposal that allows the Corps to assess a given offeror's understanding of the contractual, technical, administrative and cost requirements associated with a given situation. [Ref. 36]

The sample project enables the Army to subjectively evaluate each offeror's approach to a remediation situation and plays a decisive role in contract award. The source selection board compares an offeror's sample project solution to the way it proposes to do business in the rest of its proposal. The board uses these comparisons to determine if there is consistency between the two. Accordingly, the Army is able to evaluate the offeror's approach to the stated requirements. The Army can then evaluate the technical approach to determine if it meets the requirement and whether or not it is an innovative or proven method of meeting the needs of the project. The sample project also provides the Army an insight into the cost estimates and realism of the offeror's approach and enables the firm to use any new technology that they may have developed. [Ref. 36]

No "textbook solution" is available that could be reused or improved upon for each subsequent TERC RFP because the sample project is tailored to each

new TERC solicitation. This allows the Army an opportunity to lessen its risk of selecting a contractor that does not understand the depth of effort and intricacies associated with environmental contracting. [Ref. 36]

b. Innovative

The design portion of the TERC contract does not give details on how to accomplish the remediation but only provides the potential contractor with a scope of work to be performed and its proposed method of remediation. This lack of specificity, particularly in the method of performance, allows the offeror to develop a remediation work plan that may well be more innovative and/or efficient than a statement of work that might have been prescribed by the Army's design engineers. The Corps reviews the offeror's proposed work plan along with Federal and state regulators (if they choose to be involved in the work plan process). The review process ensures that the proposed methods meet the stated regulatory requirements and that the work plan is efficient and supports the Government's best interests. This requires the offeror to ensure that the plan provides the best solution within the Government's means and also meets regulatory requirements. [Ref. 35]

The involvement of the Federal and state regulatory agencies as early as possible through the design approval stage allows all parties to address problems before the actual remediation commences. The up-front planning and involvement reduces cost and schedule growth. If deficiencies are identified later in the process,

their corrections are usually more expensive and time consuming. This innovative method of early involvement ensures that requirements are met on the front-end of project planning, rather than after the project has commenced. [Ref. 35]

c. Timely

The TERC contracting method allows the Government to save a significant amount of money and time relating to the solicitation process alone. If the contracts were executed with the use of conventional construction contracting methods, where individual segments were contracted separately, the Government runs the chance of incurring both a significant growth in costs and in the schedule required to perform the project. For example, if there were four distinct remediation projects separated individually and contracted for under traditional contracting methods, the Government would incur the cost of no less than eight separate solicitations. This is because each project would be broken down to at least a design contract and a construction contract. The Army would also incur a comparable growth in the procurement process and contract execution schedule that would be solely attributable to the time and administrative effort required to solicit, award and administer eight separate contracts. [Ref. 35]

d. Flexibility

Even though the Army provides a boilerplate acquisition plan and RFP, procedures are in place to allow the two to be flexible and conform to each particular

situation. Consistent with the tight controls placed on the TERC contracting method, is the use of a standard acquisition plan and RFP for its solicitations. The TERC is governed by a boilerplate Army acquisition plan and each District's individual acquisition plan must conform to the Army's plan. The plan may be modified only to meet the particular idiosyncrasies of that District and requires approval from higher authority. The standard RFP is only modified between each new TERC solicitation. This incorporates the tailoring required to meet the new stated requirements for the given remediation sites or to incorporate lessons-learned from previously issued solicitations. [Ref. 36]

e. Concurrency

The single contractor approach eliminates the additional time that would be required for a second contractor to learn the same lessons (those already learned by the preceding contractor) all over again, as well as the additional costs associated with that learning process. A single prime contractor for all phases of the remediation effort promotes knowledge retention throughout the project's lifecycle and reduces the potential for either schedule and/or cost growth, associated with changing a contractor between the design and cleanup phases. Additionally, the Government avoids the cost and schedule growth that may occur as the second contractor comes on board and defines the site conditions differently or more thoroughly than its predecessor. [Ref. 34:pp. 50-51]

The Army conducted a study that exhibited the schedule savings that can be achieved through the use of the TERC contracting method. The study was based on the work allocation document at an Army post for its water pumping and treatment plant. The study found that under traditional construction contracting methods, the performance of work from time of award would have taken 21 months. Under the TERC contracting method, the same project was determined to require only 15 months providing a six-month schedule savings on only one project of many. [Ref. 34:p. 51]

f. Administration

By using a single contractor for all phases of the remediation process, the TERC contract promotes contract administration cost and schedule savings via a single point of contact for all work. The ability of the contractor to perform work on different project segments concurrently, the inherent knowledge of projects, the requirement for only one solicitation and other contract administration related items, saves both time and money. [Ref. 35]

The Army's oversight ability is not diluted through the administration of multiple contracts and contractors. The single point of contact allows the Corps' residency offices and their respective managing districts to focus on a single contractual document and a single contractor. [Ref. 35]

g. Efficiency

The TERC contract's single delivery order allows both the Government and the contractor to work more efficiently within the budget of one contractual agreement that has several segments versus a budget for each contract. Thus, cost overruns on one project can be counterbalanced by a savings from another project or work allocation document and the project does not have to be rebaselined. The single delivery order still requires contract cost and budget management, but to a lesser degree than a delivery order for each remediation project. A single delivery order also promotes speed in contract closeout. A single delivery order for multiple projects facilitates a contract closeout which is easier and quicker than a multiple delivery order would. [Ref. 35]

With the single delivery order, all work must be accomplished prior to its closure. In other words, a project could have to remain open because a small segment has not been completed, therefore holding up final closeout and payment. This is added motivation for the contractor to complete the whole project. The single contractor remains focused on all work because they are aware that the contract cannot be closed out until all work is completed. [Ref. 35]

h. Training

An additional advantage of the TERC contract is the requirement for the district administering the proposed contract to have key personnel trained in TERC

applications and procedures. The majority of the training is designed to support those individuals at the TERC's second-tier, the program management level. The Army does provide some training to its first-tier, resident offices.

In the past the Corps' contracts, whether for remediation efforts or for normal design and construction efforts, have been performed under fixed-price type contracts. Because of this, field representatives in the residency offices may not have sufficient experience to administer cost-reimbursement contracts. The shift from a fixed-price type of contract to a cost-reimbursement contract, such as the TERC, make the required training for the Army representatives essential. [Ref. 35]

2. Disadvantages

The Army and its contractors are continually learning and improving the processes of their TERC contracts. As previously noted, some adjustments have taken place and the following disadvantages are not necessarily Army-wide. As the case with partnering and administration these disadvantages may not always exist if proper corrective measures are put in place.

a. Partnering

For a TERC contract to be successful, partnering must be taken seriously and viewed as a crucial element of the contract. The team should consist of the contractor, the Corps representative, the customer who represents the installation's interests and Federal and state regulators. [Ref. 35]

Ownership of the partnering program is critical to the TERC's success. The District's approach must facilitate ownership by naming specific key individuals who represent each of the partners as champions of the program. Therefore, the partnering program receives focused support and is not just a responsibility that is haphazardly delegated to each site. A partnership, in order to be effective, requires trust and openness, productive communications, informed decision making and a problem resolution process between team members. If any of these elements are not in place, the partnering effort will be reduced. One potential resulting problem is that there may be a less than arm's-length relationship between the customer and the contractor, or the Corps and the contractor. [Ref. 35]

b. Administration

The Army's District offices must guard against a conflict of interest stemming from the contractor's oversight of the complete project. Principally, the Army must guard against a design effort that is beyond that which is required causing an increased total cost to the Government. The Army employs two principal methods to control the potential for a conflict of interest. First, they employ their own design engineers who review the contractor's designs to ensure that they comply and do not exceed the scope of the design guidance provided by the Army. Second, under the TERC contracting method, the Army employs a cost-reimbursable contract for each work order. Thus the fee, whether fixed, award, or incentive, is associated with an

initial cost estimate proposed by the contractor and not their total costs ultimately incurred. Therefore, the contractor has no incentive to over-design and increase the amount of work required because it will not result in an increased fee. [Ref. 35]

c. Training

As pointed out previously, a critical point relating to the approval process is the requirement for the District administering the proposed TERC contract to have key personnel associated with the project management trained in TERC contract application. The Army must take this requirement seriously and has contracted with the Logistics Management Institute (LMI) to conduct all TERC contract training. The training ensures that the Army is administering TERC contracts in a consistent manner to prevent the misuse of this contracting method. [Ref. 4:p. 11]

The Army must ensure the TERC management plan calls for the assignment of the project manager for the life of the contract and for key members to retain their responsibilities for extended periods. If any of the training and consistency measures are not in place it can be detrimental to the successful execution of the TERC contract. [Ref. 4:p. 11]

D. SUMMARY

This chapter provided the advantages and disadvantages of the CLEAN/RAC and TERC contracting methods. With the use of these advantages and disadvantages

in addition to the information provided previously, the next chapter analyzes the various contracting methods used by both the Navy and Army.

V. ANALYSIS

A. INTRODUCTION

The previous chapters were devoted to identifying the unique problems associated with environmental contracting and documenting the positions taken by DoD in response to environmental cleanup costs facing them. Also provided were the advantages and disadvantages facing each Service as a result of their chosen method of contracting for environmental remediation. This chapter analyzes the facts, as well as the opinions and interpretation of the material presented in previous chapters.

B. COMPARISON OF NAVY AND ARMY ENVIRONMENTAL CONTRACTING

This section provides an analytical comparison of the Navy's CLEAN/RAC contracts and the Army's TERC contracts. The purpose of this section is to bring out some of the philosophical similarities and differences between the two contracting methods.

1. Contract Type

It is often difficult to determine what contract type to use for environmental restoration. All of Chapter II was dedicated to providing the reader with an idea about some of the difficulties encountered in the ever changing field of environmental contracting. From changing technology and regulations, to the inability to accurately

define the scope of work, environmental restoration requires a contract type that can quickly adapt to these circumstances.

As in any procurement, the determination of the best contract type for a given situation requires a careful analysis of all relevant factors. Even after careful consideration of all factors there will still be situations where the contract type is not readily apparent. The selection of a contract type is not an exact science, consequently this thesis will not attempt to determine a particular "silver bullet" contract type that should be used for all environmental contracting.

The Navy and Army have chosen contract types they believe will allow their respective contracting methods to adjust or remain flexible to the constantly changing arena of environmental restoration. Both the CPAF and CPFF contracts allow an activity to adjust and react to changes whether it be regulatory or in the scope of work. Attempting to apply a fixed-price type contract in the field of environmental contracting would not allow the flexibility required by the Government and contractors.

As indicated in Chapter III, the Navy and Army have chosen different cost-reimbursement contract types. Although the two Services did not select the same basic type contract they both realized the importance of a cost-reimbursement contract. One of the primary concerns when using cost-reimbursement contracts is

how to best encourage cost conscious behavior by the contractor, consequently it should be one of the primary considerations when picking a type of cost-plus contract.

The Navy determined that in the environmental restoration field, the relationship between actual and targeted cost may or may not reflect the quality of a contractor's performance. When dealing with uncertainties like the ones discussed earlier, a project could easily come in well over the initial estimates. An overrun of this type does not necessarily mean that the contractor did not do a good job. In fact, a project could overrun its budget as a result of unexpected problems even if a contractor was doing an outstanding job of controlling costs. Under an incentive type contract (e.g., CPIF) the contractor would actually be penalized for these overruns.

The Navy's CLEAN/RAC CPAF contract is designed to reward outstanding contractor performance based on subjective evaluation. Therefore, the Navy feels that the CPAF contract is the best suited contract to provide a real incentive for contractors working in the environmental cleanup arena. Since the contractor knows the fee he receives will be based on a subjective evaluation, he will endeavor to excel in those areas being evaluated. In this way the fee pool, none of which is guaranteed to the contractor, hopefully will act as a real incentive for excellence. For the reasons just discussed, the Navy believes the CPAF contract is best suited for environmental restoration. The Navy feels the CPAF contract both fits the unique nature of

problems environmental contracting is faced with and provides the best chance of maximizing the utility of the dollars spent in this area.

The Army on the other hand, combats the lack of cost consciousness by contractors, inherent in the cost-reimbursement contracts, through the use of partnering in their TERC CPFF contracts. The Army feels that through the use of partnering one of its major disadvantage, low motivation for cost efficiency, can be controlled. With the Army and the contractor team working side-by-side, the team is able to focus on meeting the remediation requirements of the customer in the most effective and efficient manner available.

The use of the TERC CPFF contract without partnering would make it more difficult to motivate the contractor to be cost conscious. The CPFF contract type was designed chiefly for use in research or exploratory development when the level of contractor effort required is unknown. Even though the requirements of an environmental remediation project often are not completely definable, the Government is going to have an approximate estimate of what the requirements are going to be and their costs. Without the use of partnering, the use of the CPFF contract would become much less efficient.

2. Contracting Methods

The Navy and Army have two different philosophical approaches in their environmental contracting methods. The Army uses a cradle-to-grave, one contractor

approach with the TERC contracts. In contrast, the Navy uses a two contractor approach with the CLEAN contractor doing the design portion of the project and the RAC contractor actually performing the remediation.

In the Navy's CLEAN/RAC contracts the focus is on an individual site, one contract for each restoration site. The Navy's contracting method is designed to be effective and efficient for one individual cleanup site. The Army on the other hand, directs their attention to providing the best contracting method possible for the environmental restoration problems as a whole. Rather than using the site-by-site approach the Navy uses, the Army views their environmental problems as one big environmental remediation site. A single TERC contract is designed to handle a multitude of sites simultaneously.

3. Contracting Method Application

The Navy and Army's contracting methods are well conceived and applied. Both Services realize their contracting methods are not designed to be the "one size fits all" method that encompasses all of their environmental remediation needs.

The Army has carefully delineated the use for which the TERC contract methods are applied. As pointed out in Chapter III, the Army has detailed strict guidelines for the application of the TERC which prevents any dilution of its intended use. The ten guidelines or screening criteria used by the Army determine whether the site is nominated for remediation under a TERC contract.

Both the Navy and Army do not rule out the fact that CLEAN/RAC and TERC contracts may not always be the appropriate contract type for all situations. The Navy, however, does not have strict guidelines that enable them to determine whether a remediation project should be cleaned up with the CLEAN/RAC contracts.

The Army has an extensive checklist that must be applied before a remediation project will be approved for cleanup via the TERC contracting method. The Navy on the other hand, has no checklist and all remediation sites are included for cleanup via the CLEAN/RAC contracting method, unless otherwise determined to be done by another contracting type. The Army cleanup site requires verification before a TERC contract can be used, as compared to the Navy, which specifies that there must be justification for a site not to be remediated through a CLEAN/RAC contract.

4. Training

The Navy and the Army both acknowledge the importance of training and education for personnel involved in their environmental contracting. The Army and Navy differ in their approaches for training their personnel.

The Army's training is very rigid. Training for the Army must be accomplished both on the TERC's applicability of use and its actual procedures for use. Both of these categories of training are considered cornerstones to the project. These categories are required to be in place prior to any Army District receiving

authority to use the TERC contracting method. This training, as previously addressed, is not conducted in-house but by a private contractor.

The Navy's training program is much more flexible. There is no prerequisite training or certification program that is required to be in place prior to the use of a CLEAN/RAC contract. The CLEAN/RAC contract training is incorporated into the command's professional training. The command's professional training is done periodically and varies from command to command on how much and how often environmental training is accomplished. As compared to the Army, where the TERC contracting method drives the training requirements, the Navy's CLEAN/RAC training requirements are determined by the individual commands.

5. Risk Mitigation

The cost-reimbursement contract types used by the Navy and Army both shift the risk from the contractor to the Government, as compared to the total risk being placed on the contractor with the use of a FFP contract. Both Services, however, have procedures in place to mitigate or reduce the risk placed on the Government with their environmental remediation contracting.

The Navy has managed the risks associated with their CLEAN/RAC contracts in a variety of ways. As pointed out in Chapters II and III, the scope of work required under CLEAN/RAC contracts is complex and has a degree of uncertainty due to the nature of environmental remediation work. The Navy's top priority is quality or the

effective remediation of the site. These contracts shift the financial risk of unexpected conditions from the contractor to the Navy. The Navy's risk is controlled on their environmental contracts by incorporating a sophisticated cost and contract oversight program.

The CLEAN/RAC contract provides the contractor with an incentive to complete the work in a quality, timely and cost effective manner. The contractor receives his profit entirely through a fee that is awarded based on an evaluation of their performance. Some evaluation criteria include areas such as cost control, timely execution, effective remediation techniques, and safety just to name a few. With the elimination of the base fee, the entire profit is based on the award fee increasing the contractor's risk of not receiving any profit. The exclusion of a base fee puts the contractor in a position such that a level IV performance would result in the contractor receiving only allowable costs incurred and no fee. Excluding a base fee does not mitigate the risk for the Government but increases the risk to the contractor of not receiving any fee.

The Army mitigates risk by various elements built into the TERC contracting method. Prior to its selection for use, the potential remediation project is thoroughly screened to ensure its validity as a TERC contracting method candidate. Both the screening process and the tiered approval process for use, helps to ensure the best contractual vehicle is being employed by the Army. The risk is further controlled

within the TERC contract via the Army's demand for standardized application and its means to ensure standardization.

The Army delineates remediation project requirements in a manner similar to a performance specification, where the contractor is told what must be performed, not how to perform. A performance type of specification allows the contractor the flexibility to develop the best-value alternative for the Government and the Government to take advantage of the contractor's innovations. Coupled with the advantages of a performance-based specification, is the involvement of both Federal and state regulators in the design development process. Regulator involvement early on and throughout the design and construction process, ensures environmental legal requirements are being met. Regulator involvement reduces the Army's risk for potential cost and schedule overruns that could otherwise be expected if the regulatory checks were performed after the project has commenced.

In the RFP, the Corps requests offerors to perform a sample project that represents similar conditions that may exist at the actual site involved. This sample project provides the Corps with unique insight into the respective offeror's understanding of the requirements, the cost-realism of the proposal and its unique approach to the remediation at hand. The sample project is also used as an indicator by the Army to identify where they may or may not be accepting risk with each offeror.

C. NAVY'S ENVIRONMENTAL CONTRACTS ADVANTAGES AND DISADVANTAGES

At first glance, one may think that NAVFAC is not using the CPAF contract to its fullest potential. The researcher believes that the practice of using a "zero" base fee and potentially denying the contractor a chance to receive any fee for costs incurred would restrict the number of contractors willing to bid on CLEAN and RAC contracts. Even though risk is increased for the contractor, more than on a conventional CPAF contract, all seven EFD/EFAs were satisfied with the number of contractors that bid on their contracts. The EFD/EFAs also indicated that there is always a sufficient number of responsible offerors. One indication that contractors are generally doing a good job is that they are usually evaluated above 80 percent on the four evaluation criteria.

It may also be thought that because the Navy uses the same four evaluation criteria and does not adjust their weighting, they would be unable to focus the contractor's attention on desired areas. Although there are only four evaluation criteria, the numerous subfactors under each encompasses almost any criterion a contracting officer would ever want to use. Because there are only four grades, a reduction in one will have a significant impact on the overall fee available. With only three remaining grades to absorb the affect of the low grade, the contractor's attention certainly can be focused on problem areas without adjusting the weights. The

researcher believes the evaluation criteria of the CPAF contract keeps the contract flexible by making all criteria important.

NAVFAC's predetermined award fee of ten percent would appear to be inconsistent with the proper formation of an award fee contract, as this portion of the contract is usually negotiated. In actuality, the average grades (fee) given over the seven EFD/EFAs ranged from 8 to 8.5 percent. Even with the strict non-inflated grading, final profits are lower than the going-in fee of ten percent.

The NAVFAC's CLEAN/RAC CPAF contracts may not be administered in a text book manner but for every unusual feature, the end results are similar to that of the conventional CPAF contract. The CLEAN/RAC contracts still provide the flexibility and motivational factors of a traditional CPAF contract.

The researcher believes that the Navy's current environmental contracting method adequately but inefficiently allows the contractors to complete site cleanups. The researcher further believes the full advantages of the contract's award criteria are underutilized by the current contract methods in place. A more efficient and cost saving approach could be realized through the use of a single face to industry method. This would involved the use of one contract for the entire remediation project.

It is felt by the researcher that the major areas of concern with the Navy's approach to environmental contracting stems from their interpretation of the Brooks A/E Act, which is covered next.

D. BROOKS ARCHITECT-ENGINEER ACT

The researcher is under the belief that the Brooks A/E Act has some useful and relevant features but the Act could be improved upon. A section of the Act that could be amended is the requirement for the A/E contractor to be different than the contractor who actually does the construction. Having two different contractors for the remediation contract appears to be costing the Navy time and money. The RAC contractor is reconfirming the results of the CLEAN contractor who does not want to rely on misinformation and ends up redoing portions of the CLEAN contract. Essentially, the Act costs the Navy time and money requiring DoD to pay for parts of the A/E portion of the contract to be done twice.

As mentioned in Chapter IV, the Army did a study comparing the time it took to complete a contract using two separate contractors as compared to their cradle-to-grave approach. It was determined that the performance of work from time of award was reduced by six months or almost 30 percent when using the TERC contracting method. The RAC contractors are responsible for the actual cleanup and cannot afford, schedule or cost wise, to come across numerous unknowns that were overlooked in the A/E portion of the contract. The work completed during the CLEAN contract appears to be an excessive expenditure of time and money because the RAC contractors typically do their own assessment of the remediation project.

Working with the same contractor throughout a project would allow a "cradle-to-grave" approach with one firm. Using one contractor would help pinpoint liability,

avoid the complications of work handoff between contractors and save considerable time and effort due to resolicitation between phases. With one contractor, there is only one learning curve whether it be in dealing with the local or state regulations for a particular site or in the actual remediation.

The proper application of partnering will help keep in check the possibility of the requirements being inflated during the design phase. With the partnering approach the Army uses, the opportunity for inflated requirements is reduced significantly.

On the other hand, one may have reason to support the Brooks A/E Act. The Navy, along with Congress, believes that two different contractors involved in the design and remediation of a site provides a needed check and balance system for the remediation project. The second contractor reviews the A/E portion of the contract helping to identify any mistakes or inaccuracies in the project. The earlier these inconsistencies are identified in the project, the easier and less expensive the corrections will be to make.

The Brooks A/E Act also supports a broad industrial base. Having two contractors for a project vice one, enables DoD to keep a broader supplier base. A broader supplier base enhances competition and increases the number of competent potential offerers. A broad supplier base also helps keep costs to a minimum by increasing competition.

Although there are some supporters of the Brooks A/E Act, the researcher believes that with the Government and contractor working side by side, it provides a system of checks and balances, eliminating the need for this portion of the Brooks A/E Act altogether. While partnering and the Brooks A/E Act do not agree on a specific contracting method, each side represents a position that would keep inflated design requirements to a minimum. One possible alternative to help keep design requirements to a minimum is to develop a contractor teaming approach. A teaming approach would still involve two separate contractors but the RAC contractor would be working side by side with the CLEAN contractor from the start of the A/E portion of the project. It could be argued that a teaming approach could reduce the cost required by the RAC contractor to reconfirm portions of the CLEAN contract and also ease the transitional difficulties experienced between the CLEAN/RAC contractors.

E. ARMY'S ENVIRONMENTAL CONTRACTS ADVANTAGES AND DISADVANTAGES

This section will analyze the Army's application of its environmental contracting methods. The Army has incorporated many of the key features identified in DoD's acquisition reform initiatives by encouraging innovation, performance specifications, partnering/IPTs, long term contractor/Government relationships, streamlining of the acquisition process, and training and education.

The TERC RFP requests offerors to perform a sample project that represents the conditions that may exist on the actual site at which remediation efforts are required. Each offeror's project provides the Army with unique insight into the respective offeror's understanding of the requirements of the situation, its unique approach to the remediation at hand and the cost-realism of the proposal.

Although the sample projects can provide the Army with useful information, as stated above, one may argue its actual benefits. Can one determine that just because a potential offeror accurately assessed the sample project, that they have the resources and trained personnel to follow through on the project? A clear drawback of the sample project is that it raises the potential contractor's bid and proposal costs, contradicting DoD's initiative to lower these costs.

As pointed out in Chapter IV, the Army's remediation project requirements are written in a manner similar to a performance specification, where the contractor is told what must be performed, not how to perform. This type of specification allows the contractor the flexibility to possibly develop a remediation alternative for the Government that has not previously been thought of by the Army.

Coupled with the advantages of a performance-based specification, is the involvement of both Federal and state regulators in the design and development process. Early regulator involvement ensures that environmental legal requirements are met early and not after remediation as already commenced. Early identification

of potential regulatory problems reduces the risk of possible cost and schedule over-runs that would be expected if the regulatory checks were performed after the actual cleanup has started.

It may be argued that early involvement from regulators could actually deter the use of innovative ideas or technology initiated by the potential offerers. Regulators may be more concerned about having a new innovative idea go awry, causing possible increased damage to the environment, than they are concerned about possible cost and schedule savings. Regulators are less apt to approve these new innovative ideas, with the belief that if a new idea does not work it may cause more harm to the environment than already exists.

It is the belief of this researcher that despite the potential for reduced support for new and innovative ideas by the regulators, it is better to confront problems early on in a project. Confronting problems early on, over the long run, will save the Government time and money.

The Army has established a sound partnering relationship with the customer, the contractor, and Federal and state regulators. The Army realizes that commitment is the key element to a partnering relationship. With the basic element of trust between the contractor and the Government, it is the researcher's belief that the results will be effective communication, demonstrated cost and schedule savings.

The TERC contracting method enable the Army to realize cost and schedule savings up-front in the contracting process during the solicitation and award phases.

The single contractual arrangement of the TERC provides the Army with one full-service contract for every remediation project versus traditional contracting methods which require two contracts (A/E and actual cleanup) per project. It appears that significant cost and schedule savings in the solicitation process alone may be realized by the Government as a result of TERC contracts.

The use of only one delivery order per project versus one delivery order per remediation site on each project, facilitates contract administration since all the work is at one site. The work can be coordinated through one contractor by using the same requirements instead of multiple contractors working under different contracting instruments. Also, the single delivery order facilitates contract closeout. By the use of a single delivery order, neither the contractor nor the Government is distracted by continuing efforts under other delivery orders once each project is complete. Under the single delivery order concept, once all projects are complete, no continued performance is required and the delivery order can be closed.

An argument against the use of a single contractor may also be presented. The use of a single contractor for a multiple site project keeps smaller contractors from successfully bidding on a project of this size. Eliminating small contractors from bidding on contracts decreases competition and may increase costs to the Government. The small contractor may not have enough competent personnel and resources that is required for a multiple sites project. The small contractor may be

unable to spread their resources to multiple sites, hindering them from meeting the requirements of a large project. In looking at the above suggestions, from the researcher's analysis, it is evident that the benefits of a single point of contact far outweigh its disadvantages.

Although the Army has boilerplate acquisition plans and RFPs, once a project is chosen to be a TERC, these controls are adjusted to conform to the requirements of the project. The adjustment of contracts allows the TERC contracting method to remain flexible prior to award and also maintains that the contractor has flexibility to adjust quickly to the possible unknowns that they may come across while executing the contract.

The mandatory training required by the Army helps ensure that the Government properly administers the TERC contracts. With the added administrative burden of a cost-reimbursement contract, it is essential that the Government have well-trained acquisition personnel. The added cost of the training may be more than returned if a TERC contract is properly administered.

On the other hand, it may be argued that training personnel to be innovative may be very difficult. Educating a person to be creative is a difficult task because there is no clear cut set of rules or guidelines to follow. It is also very expensive and time consuming to keep personnel current and up to date on the constantly changing innovations and regulations involved in environmental remediation.

Despite the concerns one may have over the costs of training personnel to be innovative, the researcher feels the benefits gained by training personnel far outweigh its drawbacks.

The Army appears to have done a superb job of incorporating several of the acquisition reform initiatives available today. The cost and schedule savings are apparent and should continue to grow as the contractor/Government adversarial atmosphere is reduced by the partnering relationship. It is the researcher's belief that cost and schedule savings will also be realized by the new and innovative approaches that will appear as the results of unrestrictive design approach which the Army has taken.

F. SUMMARY

The researcher's analysis discovered two very different philosophical approaches to environmental contracting. Several contrasting points of interest between the Navy's use of the CLEAN/RAC contract type can be compared to the Army's use of the cradle-to-grave approach.

The Navy uses a two-contractor approach called the CLEAN/RAC contract. In the CLEAN contract, the contractor will execute the design portion of the project and the RAC contractor actually performs the remediation of the contract.

In contrast, the Army uses the cradle-to-grave approach implementing a TERC contract. In the cradle-to-grave approach a single contractor completes all facets of

the environmental remediation which includes the A/E portion of the contract and the actual cleanup.

From the researcher's analysis, one may infer that when DoD is required to do more with less, the Army appears to be aggressively heading in the right direction. Through the use of innovative ideas, streamlined processes and long-term nonadversarial contractor relationships, the Army is taking environmental contracting into the next century.

This analysis has highlighted some of the contracting methods that the DoD uses to perform in its environmental remediation cleanup efforts. Chapter VI provides conclusions, recommendations, and answers to the primary and subsidiary research questions.

VI. CONCLUSIONS AND RECOMMENDATIONS

A. INTRODUCTION

The objective of this thesis was to determine what are the feasible contracting methods for administering environmental contracting and is it possible to have one method so DoD can provide a single face to industry. To explore this subject, the researcher reviewed environmental laws and regulation, DoD's environmental contracting guidance and interviewed personnel from both Government and industry. The researcher analyzed the two contracting methods presently in use by DoD. This chapter presents the conclusions of this thesis, offers recommendations, answers the primary and subsidiary research questions, and suggests areas for further research.

B. CONCLUSIONS

1. The Navy and Army realize the importance of flexibility in their choice of environmental contracting methods.

Changing technology and regulations coupled with the inability to accurately define requirements necessitate a contract type that can quickly adapt to change. The Navy and Army have chosen contract types that will allow their contracting methods to adjust or take form to the ever changing field of environmental remediation. Even though the Navy and Army have selected different types of cost-reimbursement contracts, both realize the flexibility built into contracts of this type.

The Navy's CPAF contract and the Army's CPFF contract both fit the unique nature of problems environmental restoration is confronted with.

2. The Navy and Army do not interpret all environmental regulations in the same manner.

The different interpretation of environmental regulations has caused the Navy and Army to take separate philosophical approaches in their environmental contracting methods. The Navy does not allow the design and the actual cleanup portion of an environmental remediation project to be done by the same contractor. In contrast, the Army employs a cradle-to-grave approach whereby a single contractor can do both, the design portion and the actual remediation. As pointed out in Chapter IV, the Navy's contracting method requires additional cost and time to administer two contracts vice the one contract required in the Army.

3. The Navy and Army employ different procedures for monitoring the contractor's performance.

The Navy oversees their environmental contractors in an evaluation or assessment like atmosphere as compared to the Army who monitors their contractor in a side-by-side or partnering manner. This difference is caused primarily by the nature of the different contract types. The Navy's CPAF contract is designed to provide initial guidance to the contractor and disengage until the end of the evaluation period. The Army's CPFF contract and the use of partnering allows the contractor

and Government to work through problems and decisions together. This eliminates the contractors having to wait until the end of an evaluation period to confirm whether their approach is satisfactory.

4. The Navy and the Army both understand that environmental contracting is an evolving field and improvements gained from new technology and past lessons learned are a must.

The Navy and Army have the right approach in that remedial contracting is an evolving process that must be continually improved. In order to improve on these contracting methods, the Army and Navy are in agreement that they must continue to facilitate its evolutionary process of adopting lessons learned from previously executed contracts into future generations of CLEAN/RAC and TERC contracts. As pointed out in Chapter IV, both Services have experienced time delays and cost increases through mistakes or less efficient methods in which they have administered environmental remediation contracts. This same evolutionary process can also be realized by incorporating new technology and remediation procedures into their respective contracting methods.

5. The Army appears to have effectively integrated some of the tools emphasized by acquisition reform in environmental remediation contracting.

As discussed in Chapter IV, the Army has streamlined the acquisition process through the use of only one contractor. They have encouraged innovation with the use of performance specifications (design) and the adoption of sample

projects. The Army also promotes long term contractor/Government relationships and stresses the importance of training/education. Incorporation of these initiatives appear to be saving DoD both time and money now and should continue to do so in the future.

6. The Navy and the Army have different approaches to training their personnel.

Though the Navy and Army have taken different approaches to training their environmental contracting workforce, they both agree that training and education are of the utmost importance. The Navy's training is very flexible and there is no certification program, prerequisite education or training that must be completed prior awarding and administering CLEAN/RAC contracts. The Navy's training is incorporated into the Command's professional development training. The Army's training on the other hand is very structured. Specific training must have already been accomplished before a remediation site can be considered eligible for a TERC contract.

C. RECOMMENDATIONS

1. The Army's TERC contracting method should be considered for adoption by all DoD Services.

The TERC contract represents a new and innovative method of remediation contracting. This contracting method provides a single face to industry

and provides some continuity between the different Services. The TERC contract provides the most streamlined and efficient method available for environmental contracting, which in turn yields the most time and cost savings. The Navy should consider this contracting method by organizing a steering committee to evaluate the facets of TERC contracting that could be adopted. The committee should be comprised of both Navy and Army technical and acquisition proficient personnel. All Government Services that are involved with environmental contracting should be afforded an opportunity to participate in this committee. Regulator activities should also be encouraged to attend.

2. To assist in the implementation of the above mentioned contracting method, the Brooks A/E Act should be amended to permit one contractor to complete both the A/E and remediation effort.

This recommendation would allow a "cradle-to-grave" approach. As apparent with the TERC contracts, the advances that have been made in partnering make this requirement of the Act no longer necessary. The above mentioned change should be incorporated into the FAR. The Army and Navy are not in agreement on the interpretation of this Act and therefore are not in agreement on the most beneficial contracting method to be used for environmental remediation. Interpretation of the Brooks A/E Act was made at the Secretarial level, however, if these changes are

incorporated into the FAR, greater flexibility in establishing a single face to industry for environmental contracting could be achieved.

3. DoD should develop a single environmental training program for use by all Services.

The development of a single environmental training program will ease some of the difficulties that will be experienced with the implementation of a single contracting method. Keeping a single training program accurately updated with current regulatory changes or technological advances will be made easier. The researcher suggests that DoD should formulate a single training certification program that will require an activity to be fully certified before any environmental contracting can be initiated.

D. ANSWERS TO RESEARCH QUESTIONS

1. Primary Question: <u>What are the feasible contracting methods for administering environmental contracting</u>?

There are two feasible contracting methods for administering environmental contracting. The first is a cradle-to-grave approach that has the same contractor doing the A/E portion of the project along with the actual cleanup segment of the project. The second method requires the A/E and the cleanup portions of the project to be executed by separate contractors. Each method is the result of an interpretation of the

Brooks A/E Act which requires the A/E portion of a construction contract to be completed by a contractor other than the contractor actually doing the construction.

2. Subsidiary Question 1: What contracting methods are actually being used by DoD?

The DoD presently uses the two methods mentioned in the primary question. The Army uses a TERC contract which is a cradle-to-grave approach. The Navy uses a two-contractor method with the CLEAN contractor doing the A/E portion and the RAC contractor actually doing the remediation portion of the project.

3. Subsidiary Question 2: What are the advantages and disadvantages of each of these contracting methods?

The award-fee part of the CLEAN/RAC CPAF contract provides greater motivation to the contractor by better controlling their remediation efforts. The CPAF contract allows flexibility to be built into CLEAN/RAC contracts by allowing the Navy to change the weighting of an evaluation criterion. As with the CPAF contracts there are administrative costs associated with this type contract.

The Navy's interpretation of the Brooks A/E Act makes the CLEAN/RAC contracts more lengthy, with a redundancy built into them. A lot of the work accomplished with the CLEAN contracts are repeated again in the respective RAC contract. The administrative work is considerably greater with the CLEAN/RAC contract as compared to the Army's TERC contract. Early studies indicate that the TERC contracts can be completed in almost two thirds the time of a CLEAN/RAC contract.

The Army's TERC contracts have a number of innovative factors built into them. The Army requires the potential awardee to explain how they would cleanup a sample project presented to them, similar to the project they were bidding on. The reply to the sample project allows the Army to assess the contractor's understanding of the requirements associated with a sample project.

As similar to a performance specification, another innovative feature of the Army's TERC contract is the design portion. The TERC does not give details on how to accomplish the remediation, it only provides what the scope of work entails.

As mentioned in the previous paragraph the TERC contract can be accomplished in two thirds of the time and with less administrative burden because there is only one prime contractor as compared to the two required in the CLEAN/RAC contracts. An additional benefit is that since there is only one contractor the additional time and effort required to bring the second contractor up to equal project knowledge of the first contractor is eliminated.

The training that is required before a TERC contract can be administered should significantly reduce the chance that it will be poorly administered. The TERC contract, as with all cost-plus contracts, requires more time and manpower to administrator than the contracts of the fixed-price type.

4. **Subsidiary Question 3: <u>What are the possibilities that partnering should or has been implemented in DoD environmental restoration contracting</u>?**

The Army has successfully implemented the use of partnering in their TERC contracts. Partnering is directly responsible for two of the most critical aspects of a TERC contract, project concurrency and project flexibility. Partnering assists in the clear definition and interpretation of requirements and subsequently the development of methods for monitoring and evaluating the completion of requirements.

5. **Subsidiary Question 4: <u>Is there a single established contract type that all branches of the Services can use to provide an integrated single face to industry</u>?**

Statements of work in environmental contracting vary from accurate detailed descriptions to the inability to define the scope of work. Because there is such a variance in how accurate the scope of work can be it is very difficult to pinpoint a particular contract type that will satisfy every situation covered in environmental contracting. The DoD needs to refrain from forcing a particular contract on the contractors. The lesson has already been learned with FFP contracts in the early 80's.

It is feasible though to have one contracting method to provide a single face to industry with the use of the Army's "cradle-to-grave" approach as in the TERC contracts.

6. **Subsidiary Question 5: <u>To what extent should guidance regarding the contracting of environmental restoration be implemented into the FAR</u>?**

The interpretation of the Brooks A/E Act for both the Navy and the Army was determined at the Secretarial level which normally would be a high enough level for a decision of this magnitude. Because the Act is interpreted differently it is the primary cause for each to have separate contracting methods. In today's acquisition world, the Government is often attempting to allow some flexibility of the interpretation of its regulations but in order to provide a single face to industry one DoD interpretation must be realized.

E. AREAS FOR FURTHER RESEARCH

During the course of this thesis, other areas which appeared to merit additional study were identified. Addressing these issues were beyond the scope of this thesis; they are presented for consideration and potential future research.

1. An in-depth comparative analysis of the CLEAN/RAC and TERC contracts to determine the time and cost savings between the two contracting methods.

2. Is it effective to have all DoD agencies contracting for environmental cleanup? Should just a few of the agencies administer contracts for all the sites? For example, the Defense Logistics Agency (DLA) could administer all environmental contracts for the Army, Navy and Air Force.

3. A cost/benefit analysis on the effects of the Brooks A/E Act. What additional cost (time or money) and benefits are being realized because of this Act?

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