

DAVE GIBBS'S  
COPY

# Region 4 Partnering Success Stories

"The Early Years"

---

---

---

Part 1 of 2

## **Marine Corps Air Station (MCAS) Cherry Point**

### **Elimination of Intermediate Documents**

#### **Original Conditions**

Originally, preliminary-draft, draft, draft-final, and final documents were prepared by the Navy contractor for the MCAS Cherry Point Installation Restoration program.

#### **Original Approach**

The preliminary-draft documents were reviewed by the MCAS and Atlantic Division engineering field division remedial project managers only. The intention was to provide the Navy and Marine Corps with additional time for review of the document and to ensure that the conclusions and recommendations cited were consistent with Navy and Marine Corps approach and direction prior to regulatory review.

#### **Results of Original Approach**

Results were both costly and time consuming.

#### **How Partnering Was Applied**

The Cherry Point Tier I team agreed to eliminate the preliminary-draft document. The Tier I members now meet (either by teleconferencing or team meetings) with the Navy contractor to discuss approach, conclusions, and recommendations prior to the distribution of the draft document. The Tier I team members agreed to perform the first time review of the draft documents recognizing that the Navy and Marine Corps may also have significant comments regarding the technical approach, recommendations, and conclusions. The team members also agreed to eliminate the draft-final documents and replace them with a response to comments letter to address all comments before distribution of the final report.

#### **Savings Realized**

An estimated \$18,000 to \$30,000 was saved for each operable unit (dependent on the complexity and size of the unit) by eliminating the preliminary-draft and draft-final documents. In addition, the 30-day review by the Navy and Marine Corps and the 30-day preparation of the draft by the Navy contractor was also eliminated, which resulted in a time saving of 60 days within the schedule per operable unit.

#### **Overall Results**

Beneficial results are identified by the cost and time savings. Technical merits of the document are also strengthened by evaluating all comments at once and developing responses to meet the needs of all team members.

## **Marine Corps Air Station (MCAS) Cherry Point**

### **RAB Community Member Selection**

#### **Original Condition**

Screening and selection of the community member nominees for the Restoration Advisory Board (RAB) had not previously involved Tier I team members.

#### **Results of Original Approach**

Selection of the community RAB member was not based on input from the Tier I team partners.

#### **How Partnering Was Applied**

Community relations and RAB topics are included as agenda items for Cherry Point Tier I team meetings. Tier I team partners were invited and encouraged to participate in the screening process for RAB community member nominees. This participation included discussing the RAB establishment process with team members, participating in the RAB prospective community member application review meeting, and nominee interviews.

#### **Savings Realized**

Specific cost and time savings are not quantifiable.

#### **Overall Results**

As a result of team member input and assistance into selection of the community representatives, the team members have adequately screened prospective community members who can best represent the surrounding community, thus achieving the goals of the RAB as well as enhancing the program.



## Naval Air Station Jacksonville, Jacksonville, Florida

### RCRA Procedures at Operable Unit 2

#### Original Condition

RCRA closure procedures underway at OU 2.

#### Original Approach

Standard RCRA steps would be followed, i.e., monitoring and cleanup criteria prior to closure of the site.

#### Results of Original Approach

Standard procedures would take years of negotiation and continued cleanup of the groundwater before reaching clean closure of the site.

#### How Partnering Was Applied

The partnering team worked together to negotiate interim records of decision and interim remedial actions to process these RCRA sites more expeditiously.

#### Savings Realized

In terms of time, approximately 2 years of actual cleanup activity plus 20 years of monitoring would be saved; also saved would be the associated costs of individual risk assessments and sampling at the three sites. Selecting presumptive remedies also helped save time and money that would have been spent for justification of methods.

#### Overall Results

Two sites have been clean-closed, with a third in process. Groundwater contamination will be addressed via remedial assessment and feasibility study procedures for the entire operable unit, thus satisfying the RCRA consent order and closure permit.



# Naval Station Mayport, Mayport, Florida

## Corrective Action Process

### Original Condition

The process from workplan initiation through all required approvals before actual cleanup could begin was too complicated and lengthy.

### Original Approach

- Investigation plan formulated and packaged as a workplan
- Draft workplan submitted for review
- Regulatory review process for comments and changes
- Revisions and resubmittal of workplan
- Second round of regulatory review of comments
- Revisions and resubmittal for approval
- Process repeated for other project reports

### Results of Original Approach

A lengthy, tedious process of letter writing and response to comments ensued without progressing to actual cleanup.

### How Partnership Was Applied

The partnering process began during the workplan initiation phase, allowing:

- walk-through of the plan and investigation rationale *before* submittal/review process,
- in-process adjustments during internal review, and
- input from team members during scoping phase, active field work, and report review.

### Savings Realized

- Reduction in process length by at least 50 percent, a savings of \$1.5 million
- Without partnering, original workplan review and approval took approximately 2 years
- With partnering, three of four phases in the corrective action program completed at 93 percent of sites under investigation in 3.5 years
- Investigations begun at six additional sites

### Overall Results

- Early team input into the process reduced revisions to the final package, allowing regulators to focus on other priority issues.
- Team efforts were focused on resolving issues rather than arguing about them.
- Interaction among team members was enhanced through improved communications
- Regulatory comments and questions are now focused on substantive issues rather than questions asked due to lack of information.

## **Naval Air Station Jacksonville, Jacksonville, Florida**

### **Baseline Risk Assessment Review for Operable Unit 1**

#### **Original Condition**

Review of the baseline risk assessment document for OU 1 was expected to proceed according to normal requirements and timelines.

#### **Original Approach**

The project called for a 60-day review cycle of the baseline risk assessment.

#### **Results of the Original Approach**

Results would be a longer review process than was actually necessary.

#### **How Partnering Was Applied**

The partnering team chose the novel approach of the on-board review of the document. This process called for assembling both remedial project managers and their technical support staff to review the document at a two to three-day meeting.

#### **Savings Realized**

By accomplishing the review of the document in such a short amount of time, schedules and their associated costs would be substantially reduced.

#### **Overall Results**

The process has moved toward the record of decision approximately 2 months earlier than anticipated.

## **Naval Air Station Mayport, Mayport, Florida**

### **Clean Closure Equivalency Demonstration**

#### **Original Condition**

The report had been stalled between regulatory agencies in a low-priority program while they discussed who should take the lead.

#### **Original Approach**

Prepare and submit the report, then wait for a response.

#### **Results of Original Approach**

No progress was being made, with no resolution in sight.

#### **How Partnering Was Applied**

The partnering process was used through regulatory intervention to identify how to proceed and bring the issue to the attention of the right people.

#### **Savings Realized**

In terms of time, a process that had been backlogged for 2 years was resolved and did not need to be revisited, thus saving approximately 2 more years in potential duplication of efforts.

#### **Overall Results**

Regulatory advocacy for resolution was established where none had previously existed. Also, Solid Waste Management Unit 12 was closed on the Hazardous and Solid Waste Amendment permit.



# Naval Air Station Jacksonville, Jacksonville, Florida

## Decision Model Processing Of Site 42

### Original Condition

Site 42 was available for remedial action consideration.

### Original Approach

Normal assessment and negotiation cycles would prevail.

### Results of Original Approach

- Additional funding would not have been available without rapid team decision making.
- Purchase of soil and grass cover for the site would have incurred 4 to 6 weeks in award delays due to lack of funds.
- Thermal treatment of soil was originally put on hold for 1 or 2 years.
- Actual treatment would have required 6 to 8 weeks to put into action.

### How Partnering Was Applied

Using the decision model, the partnering team identified needed resources among partners and streamlined decisions for how to proceed and use the available resources and funding. For example, instead of purchasing cover soil or grass not included in the original scope of work for the site, the resident officer in charge of construction was able to locate free soil on the base and resolve the issue into the current remedial action contract. The team's quick response agreement to the thermal soil treatment issue allowed them to take advantage of an available thermal unit located nearby.

### Savings Realized

The team's quick response provided the opportunity to receive additional funds not otherwise available, with potential savings ranging from \$2.5 to \$3.5 million. The quick decision to use free soil on-base rather than purchasing it saved approximately \$10,000. Thermal treatment of soil using available resources and technology saved approximately 6 to 8 weeks in terms of time, which translated into a cost savings of \$40,000 in operations and maintenance expenses.

### Overall Results

Using the decision model during the partnering meeting, the team was able to submit Site 42 as available for immediate remedial action. Also, the quick response to soil acquisition prevented rainwater from degrading stabilized soil that might otherwise need restabilization.

## **Naval Air Station Jacksonville, Jacksonville, Florida**

### **EE/CA Versus RI/FS at Operable Unit 3**

#### **Original Condition**

OU 3 is a complex industrial site with multiple contamination points. Originally, a full remedial investigation and feasibility study (RI/FS) was proposed for the entire operable unit as a means of addressing the individual contamination issues contained therein.

#### **Original Approach**

The original approach was to follow the RI/FS format, which relies on extensive review and "best guess" recommendations for remediation.

#### **Results of Original Approach**

The results would have been an engineering design for site remediation which would not have been beta-tested in the field under actual site conditions. In addition, this approach would not allow for the early entrance into remediation by the Navy contractor.

#### **How Partnering Was Applied**

The concept of the engineering evaluation and cost analysis (EE/CA) approach as opposed to the standard RI/FS process was presented to the partnering team for discussion and consensus.

#### **Savings Realized**

At this point, cost is expected to be less than that for the RI/FS approach, considering that various technologies can be employed at individual hot spots to evaluate their effectiveness for the RI/FS final consideration. In addition, site remediation can take place much earlier (1 to 1 1/2 years) than that allowed within the standard RI/FS format.



## Naval Air Station Pensacola, Pensacola, Florida

### Investigation to Support BRAC Construction

#### Original Condition

BRAC-mandated closure of the Naval Aviation Depot at Pensacola and subsequent decisions to relocate the NAS Memphis Naval Technical Training Center School at Naval Air Station (NAS) Pensacola required massive construction plans while taking into consideration site investigations already underway.

#### Original Approach

Installation restoration and investigation procedures under CERCLA and RCRA already were underway at NAS Pensacola:

- Six sites on or near the Naval Aviation Depot area had been identified for remediation.
- Preliminary tests revealing petroleum contamination had been conducted on the concrete, asphalt, and soil of a large portion of the southeastern field.
- Solvent contamination had been further documented at one of the sites.
- The industrial waste line was operating under a Part B permit, but the soil and groundwater potentially affected by the line was regulated under CERCLA.

#### Results of Original Approach

The BRAC training center construction time frame of completion by October 1996 was incompatible with the cleanup assessment and procedures underway through the CLEAN program.

#### How Partnering Was Applied

All entities involved first agreed that the bottom line was to reach cleanup goals in a time frame consistent with planned construction at Chevalier Field. Each team member provided mechanisms for reaching the necessary time frames, emphasizing open communication and expedited buy-in. This allowed for streamlined analyses of remediation alternative as well as swift agreements between the Navy and the State regulators for quick mobilization of remedial action contractors.

#### Savings Realized

- Approximately \$300,000 was saved as lengthy processes were shortened.
- Without partnering, 5 years would have been optimistic to reach concurrence on the environmental sites at Chevalier Field.
- With partnering, a time savings of approximately 3 years was realized.

#### Overall Results

For construction of the new \$230 million training center, soil remediation had to be completed by December 24, 1994, to avoid damages of \$120,000 a day. The team's efforts allowed contaminated soil to be successfully remediated before the deadline and under budget.



## Naval Air Station Mayport, Mayport, Florida

### Navy Environmental Leadership Program (NELP)

#### Original Condition

Approximately \$1 million had been invested in cleanup, oversight, and site preparation through NELP innovative technology contracts awarded to three contractors in the cleanup category.

#### Original Approach

The conventional corrective action process was expected, requiring the following steps:

- workplans
- review and revisions
- corrective measures studies
- permit modifications
- progress reports and reviews

#### Results of Original Approach

Lengthy turnaround on approvals resulted in delayed cleanup.

#### How Partnering Was Applied

The partnering approach allowed "fast track" review and approval of contractor submittals, thus taking advantage of available technology and funding of nonstandard corrective action approaches.

#### Savings Realized

- Time needed to implement actual cleanup reduced by 50 percent
- Quicker timetable enabled use of \$1 million that could have been lost through Termination of Convenience
- Government was not required to pay delay costs

#### Overall Results

Alternative sources of funding could be used, actual cleanup could begin quicker, and technologies complementing the corrective measures study in progress could be used.

## Naval Air Station Mayport, Mayport, Florida

### Notice of Violation Prevention

#### Original Condition

Removal of soil from a solid waste management unit was being investigated under the Hazardous and Solid Waste Amendment permit.

#### Original Approach

The action would have gone unnoticed or possibly identified by regulatory agencies at a later date.

#### Results of Original Approach

The Navy would have incurred significant fines upon discovery of the action by regulatory agencies.

#### How Partnering Was Applied

Through the partnering process, the Navy was able to bring the issue to the table for an open discussion and resolution.

#### Savings Realized

Fines of at least \$30,000 thousand were saved.

#### Overall Results

Through the team's collective decision-making process, the Navy received guidance on how to resolve the problem without incurring a fine.

## Naval Air Station Jacksonville, Jacksonville, Florida

### Program Redirection for Operable Unit 1

#### Original Condition

OU 1, located in the south-central part of Naval Air Station (NAS) Jacksonville, consists of potential sources of contamination known as the Old Main Registered Disposal Area and the Former Transformer Storage Area. NAS Jacksonville, including OU 1, was put on the National Priority List in 1989, and in 1990 a Federal Facility Agreement was signed by the U.S. Environmental Protection Agency, the Florida Department of Environmental Protection, and the Navy to coordinate installation restoration activities at the base.

#### Original Approach

Focus was on complete site characterization as the primary objective, following the Superfund structure of exhaustive study to support complete site characterization. The scope of work for OU 1 proposed multiple phases of data collection to completely characterize the site with respect to the extent of contamination in relation to background values.

#### Results of Original Approach

The work proposed, including following additional phases, was anticipated to take upward of 4 years and \$8.5 million.

#### How Partnering Was Applied

ABB-ES's proposed reduction in the field effort to focus on a "sufficient" rather than an exhaustive understanding of the contaminant extent was presented to State regulators through the partnering arena. Through the partnering process, schedule compression was gained by running three phases of the cleanup process in parallel: (1) remedial investigation evaluation and writeup, (2) risk assessments for both human health and ecological factors, and (3) the feasibility study. This was possible by effective reporting and communication among partner members and by teleconferencing to obtain real-time decisions without lengthy review cycles.

#### Savings Realized

Shifting task management and oversight to one person significantly reduced management costs. Along with the schedule reduction, an estimated \$1.5 million is expected to be saved from the approved and funded budget.

#### Overall Results

As a result of project restructuring through partnering, the record of decision for OU 1 is scheduled for completion nine months earlier than projected. Also, a more dynamic approach was possible that would support remedial action alternatives and contingencies if unanticipated deviations were encountered.



## **Naval Air Station Jacksonville, Jacksonville, Florida**

### **Soil Removal at Potential Source of Contamination (PSC) 13**

#### **Original Condition**

NAS Jacksonville needed to prepare the area at PSC 13 for construction of a new building. Radiation contamination was known to exist in the soil, with other possible contamination unknown.

#### **Original Approach**

The initial idea would have been to send the excavated soil to an offsite disposal location.

#### **Results of Original Approach**

Sending soil offsite to a low-level radiation disposal site would be very expensive.

#### **How Partnering Was Applied**

Partnering was applied to explore the issues that might arise regarding soil disposal:

- whether or not the material is a mixed waste
- what legal issues are involved
- what other entities must be kept informed about disposal of the material

#### **Savings Realized**

The partnering approach allowed the team to reach an agreement that was appropriate for disposal of the material at the OU 1 landfill. This resulted in a significant cost savings over the offsite disposal option.

#### **Overall Results**

Contaminated soil was removed from PSC 13 in an environmentally sound and cost-effective manner.

# Naval Air Station Pensacola, Pensacola, Florida

## Removal Actions

### Original Conditions<sup>1</sup>

- Site 39 was an area of stained soil located adjacent to the Oak Grove Campground.
- Site 30 encompassed a wetland area draining into Bayou Grande and included a waste-receiving metal structure where sediment was highly contaminated.
- Site 32 encompassed an abandoned waste water treatment plant.

### Original Approach

The original approach for these sites would follow the prescribed steps outlined in the National Oil and Hazardous Substances Contingency Plan (remedial investigation, feasibility study, proposed plan, record of decision), with actual remediation not beginning until 1997.

### Results of Original Approach

Lengthy assessment, recommendations, and approvals process would have delayed treatment of highly contaminated sites needing immediate attention.

### How Partnering Was Applied

In early 1994, the partnering team evaluated the situations at Sites 30, 32, and 39, and decided to streamline the process for all three sites.

- Site 39: the team decided to forego the feasibility study and expedite the normal proposed plan and record of decision for quick removal of contaminated soil close to the campground.
- Site 30: the team decided that this contamination source should be removed immediately, thus mitigating the highest risk area at the site.
- Site 32: the team agreed that the contamination should be removed immediately, and agreed to a remedial workplan submitted by the Navy's contractor.

### Savings Realized

The quick removal at Site 39 saved approximately \$60,000 and 2 years by eliminating the feasibility study. Site 32 removed the worst contamination at the site quickly, paving the way for a less complex remedial investigation and feasibility study. The quick action at Site 32 will allow a focused feasibility study to be performed instead of a full feasibility study, thus saving time and money.

### Overall Results

The willingness of the team partners to move these necessary actions forward through a streamlined process greatly reduced risk to human health and the environment as well as getting the job done cheaper, better, and faster. The PWC Pensacola Environmental Division that performed the removals benefitted by gaining remediation experience, and the Navy benefitted by expanding the options available for remediation work.

# **ORLANDO PARTNERING TEAM**

## **SUCCESS STORIES**



## **NAVAL TRAINING CENTER ORLANDO Disposal of Investigative Derived Waste (IDW)**

### **ORIGINAL CONDITIONS AND APPROACH**

During IR field activities, water and soil IDW was generated and stored on site. Some of the IDW exceeded minimum standards. The standard way to handle this would have been to follow RCRA requirements for disposal of IDW by transporting it offsite to a hazardous waste disposal facility. This alternative would have changed NTC Orlando's status from a small quantity generator of hazardous waste to a large capacity generator. Offsite disposal would have resulted in additional costs to the Installation Restoration Program and reduced the amount of funds available for further investigation and cleanup. The challenge was to determine if there were other ways to dispose of the drummed IDW.

### **HOW PARTNERING WAS APPLIED**

At the Orlando Partnering Team meeting in January 1996, the partners discussed the issue and decided that those drums with IDW which did not exceed MCLs or soil cleanup standards would be disposed onsite. For those which did exceed any standards, the OPT decided to meet with FDEP District RCRA Section to discuss possible disposal alternatives. At the meeting with the FDEP District, it was determined that the drums listed as hazardous waste could be pre-treated prior to discharge into the local wastewater treatment system in accordance with a pre-existing NPDES permit issued by the city. The local waste water authority concurred with this alternative.

### **SAVINGS**

Considering that current costs of offsite handling and disposal are approximately \$300 per drum, we have saved approximately \$90,000 as a result of our decisions. A savings of over \$200,000 is expected over the length of the project for disposal of IDW.

### **OVERALL RESULTS**

The team's approach shows how partnering produces results which are cost effective, save time, and provide better and innovative solutions. This process is critical considering the limited amount of funds available.

## NAVAL TRAINING CENTER ORLANDO Area "C" Investigation

### ORIGINAL CONDITIONS

The Area "C" Laundry site was screened as part of our Group II sites. PCE was detected in soil and groundwater at concentrations which exceeded standards. The findings were discussed at our November RAB Meeting where a concerned citizen asked if any contamination was found in Lake Druid, a small lake about 200 yards west of the site.

### ORIGINAL APPROACH

The original approach to a contaminated site would have been to investigate the site further under the Installation Restoration Program by doing an RI/FS. This could take 2 - 4 years.

### HOW PARTNERING WAS APPLIED

After the November RAB meeting, the OPT took sediment and surface water samples from Lake Druid. When the analytical results were received in December, 1995 the OPT immediately held a conference call to discuss the results. A Primeiminary Risk Evaluation (PRE) showed no immediate risk to human health but State surface water standards were exceeded requiring additional action and assessment. To stop the surface release to the lake, the OPT initiated an IRA. This information was presented to the RAB in January, 1996. The RAB agreed with our decision. The SOUTHDIV RPM located funding for the investigation, design and pilot study portions of the IRA and it was awarded on March 1, 1996.

### SAVINGS

Partnering helped accomplished in 3 months what would have normally taken 2-4 years. Speedy assessment of the contaminated site will reduce the cost to remediate the site.

### OVERALL RESULTS

A concern of the community was addressed and the Navy is working toward the rapid clean and transfer of the NTC Orlando property.



**NAVAL TRAINING CENTER ORLANDO**  
**Investigation of the Southwest Corner, Main Base**

**ORIGINAL CONDITION AND APPROACH**

To minimize disruption to current operations at NTC Orlando, site investigations were programmed in the order that the Navy vacated the facilities.

The Southwest Corner is located in the Naval Nuclear Power Training Command portion of the Main Base. It is largely undeveloped with areas for outdoor recreation and dumpster storage. The parcel was scheduled to transfer to the Local Redevelopment Authority (LRA) in 1999.

The LRA wants to attract developers and generate immediate cash flow in order to finance the redevelopment of other parcels. To accomplish this, the LRA requested that NTC transfer the Southwest Corner in 1996 instead of the initially planned parcel which has an initial \$10 million demolition cost.

**HOW PARTNERING WAS APPLIED**

The Southwest Corner was not scheduled for site screening until FY97 program and the FY96 program could not accommodate additional screening. However, a late FY95-awarded task order modification to screen 8 sites (intended for the McCoy Annex) could be adjusted to include three additional sites at the Main Base if a corresponding number were dropped from the McCoy Annex. Since both the McCoy Annex and the Southwest Corner were now targeted for early redevelopment, the Orlando Partnering Team consulted with the LRA which agreed to shift its priorities. The LRA identified the sites which could be dropped, and have since reprioritized the remaining ones in case a similar situation occurs.

**SAVINGS**

The savings which will accrue cannot be measured in dollars, but can be appreciated as intangibles. We have gained the trust and cooperation of the LRA, which will enhance the efforts of the OPT over the life of the program, and we are able to release the property to them as much as 2-1/2 years early. This action reduces the cost to the citizens of Orlando of financing the redevelopment of NTC and directly supports the President's 5-Part Plan for Fast Track Cleanup.

## NAVAL TRAINING CENTER ORLANDO Tank Management Program Contamination Assessment

### ORIGINAL CONDITION

The majority of all the petroleum tanks on NTC property are unregulated tanks. Because the Navy property is intended to be transferred to the public, significant resources were expected to be expended ensuring that all tank sites were "clean" prior to that transfer. Consequently, the State of Florida would require that regulated and unregulated tanks be addressed and investigated in the same manner. Additionally, per FDEP Regulations and Guidelines, all discovered petroleum contaminated sites require a Contamination Assessment Report (CAR). This report documents all regional, local, and site aspects including hydrology, lithology, background, history, sample methodology, and sample results. It also includes conclusions and recommendations for future actions at the site.

### ORIGINAL APPROACH

Each of the unregulated tanks would require the same effort as the regulated tanks. This would mean that over 200 tanks, some of which were USTs and some of which were ASTs would require at least five soil samples and at least one permanent monitoring well to be installed. And since each contaminated site would require a CAR, the potential existed as many as 200 individual CARs would be prepared. Each CAR, by regulation, would contain similar sections and identical data for common categories such as regional geology.

### HOW PARTNERING WAS APPLIED

In 1994, before NTC Orlando officially entered the Partnering program, but after the State and Southern Division had started to partner, the Navy approached FDEP to discuss the tentative approach to the unregulated tanks on the base. After a four hour meeting with the Navy, FDEP agreed to treat the unregulated tanks in such a way that possible contamination would be addressed in a prudent yet cost effective manner. Rather than installing five soil samples and a permanent well, between one and five samples would be collected and one temporary well may be installed depending on the size of the tank and other parameters. Since each of the expected contaminated sites were in the same general areas, the Partnering team also discussed how to consolidate the information that would be duplicated. The concept of a "Master" CAR was discussed. The resulting agreement provided the direction to produce a "Master" CAR for each of the four areas of the NTC Orlando property (if contamination was found) and each site within that area would be an addendum to the Master document.

### SAVINGS

Based on approximately \$1,000 per permanent well and \$500 for sample results applied to 200 tanks, a savings of over \$200,000 will be realized over the length of the Tank Management Program. Additionally, close to 1,000 hours of field labor time and document production efforts will also have been saved. By consolidating common information in a Master CAR, several types of savings will also be realized. Less paper will be used to produce each successive CAR addendum. Review time and the production efforts will be reduced. Navy and Regulator review time and effort will also be reduced.



# NAVAL TRAINING CENTER ORLANDO

## Storage Tank Removal Program

### ORIGINAL CONDITION

Naval Training Center (NTC) Orlando is scheduled to close under the Base Realignment and Closure program in phases from 1995 through 1999. Some 200 underground and above ground storage tanks must be removed in order to meet future land use requirements and to satisfy agreements between the Navy and State of Florida concerning potential sources of soil and groundwater contamination. The State's primary concern is that such sources be identified and inspected and, where contamination is found, that the sites be remediated.

### ORIGINAL APPROACH

Typically, a project of this type would begin with an extensive site investigation to determine tank conditions and the nature and extent of contamination. Actual tank removal and soil/groundwater remediation would follow the investigation. This approach would accurately define the scope of removal and remediation and allow the Navy to fix-price the work with a local tank removal contractor. This would be an expensive and time-consuming process, probably delaying cleanup and turnover milestones. Even with thorough site investigation, a fixed-price tank removal contract would likely be awash in changed site conditions and cost overruns.

### HOW PARTNERING WAS APPLIED

Six months before removals were scheduled to begin, the Navy, its contractors ABB-ES (investigative services) and Bechtel Environmental (tank removal) met to develop strategy. The first phase would be removal of tanks in the 1995 program (approximately 55). As overall program manager, SOUTHDIV faced a limited budget, a requirement to accelerate property transfer, and a frequently changing list of tanks.

The plan that emerged was to forego pre-construction site investigation. Bechtel would use its experience and best judgment to estimate what site conditions would be encountered and develop its work plan and budget around those assumptions. ABB-ES would investigate contamination during tank removal and insure that State requirements were met. State regulators agreed with this approach, and in fact helped simplify the process even further. SOUTHDIV and NTC supported the contractors' initiatives and coordinated changes to the removal list so that field work proceeded without delays. The partners also developed a Responsibility Assignment Matrix (RAM) which identified and sequenced all significant tasks and assigned primary and supporting responsibilities. ABB-ES and Bechtel updated the RAM as work plans developed to insure the efforts of all partners would be fully coordinated during the execution phase.

When field work began the Navy and its contractors met weekly to accomplish detailed planning and coordination for the work at each tank site. Sites were initially reviewed three weeks in advance, and plans became more specific as the removal date came nearer. Continuous communication among all partners kept the work moving rapidly and virtually eliminated coordination problems.

### SAVINGS

As a result of partnering and the strategy of expediting the work process, the job progressed more rapidly than anticipated. The result was completion of the 1995 tank removals one month ahead of schedule, which alone saved about \$100,000. Additionally, because of high productivity, cost efficiency, quality of work, and positive response from the State, the Navy was able to add the 28 tanks on the 1996 removal list and continue working. Although it appeared that the budget would fall short by about 10 tanks, good planning, innovation, and teamwork stretched the dollars so that the entire 1995 and 1996 tank programs were completed within budget.



# NAVAL AIR STATION CECIL FIELD

Jacksonville, Florida

## Site 17, Remedial Alternative

### Original Conditions

The groundwater at Site 17 is classified as G-II (potential potable aquifer). Contamination exceeds Federal maximum contaminant levels and State applicable or relevant and appropriate requirements.

### Original Approach

Restoration of the aquifer would have likely taken place by pumping and treating the groundwater contamination.

### Results of Original Approach

Pumping and treating of the groundwater at Site 17 would have cost approximately \$1,600,000 (from the feasibility study), or possibly as high as \$2,000,000, and would have taken approximately 6 years to complete.

### How Partnering Was Applied

The team recognized that natural processes were at work degrading the contamination because contaminant levels actually measured were much lower than those predicted from model results. Furthermore,

the remedial investigation concluded there were no direct pathways for the groundwater discharging to surface waters or wetlands. The team investigated the monitoring parameters utilized by the U.S. Environmental Protection Agency Kerr Labs and Air Force Center for Environmental Excellence to demonstrate the effectiveness of intrinsic bioremediation and determined this would be a cost-effective remedial alternative.

### Savings

The estimated cost for implementing the Record of Decision at Site 17 is \$116,000 and it will take approximately 15 years to remediate the site. Cost saving between intrinsic bioremediation and a typical pump-and-treat alternative is approximately \$1,484,000.

### Overall Results

The team was cognizant of cost-effective remediation technologies and strategies and used their knowledge and their partnering initiative to select a cleanup technology that is both protective of human health and the environment and more cost effective.

OPTIONAL FORM 10 (7-92)

### FAX TRANSMITTAL

# of pages = 2

To: Scott Rowden

From: Rick Davis

Dept./Agency

Phone #

803-820-5944

Fax # 404-235-2500

Fax #

NSN 7540-01-317-7399

5099-101

GENERAL SERVICES ADMINISTRATION

Rev 01 07/16/96

# NAVAL AIR STATION PENSACOLA

Pensacola, Florida

## Extended Remedial Investigation for Site 38

### **Original Condition**

Data gaps in the investigation of Site 38 (former Building 71 and a portion of the industrial wastewater sewer line) at the Naval Aviation Depot and the possible impact of activities performed at adjacent Building 604 (the Consolidated Plating Shop) required scoping and funding an expansion to the current remedial investigation.

### **Original Approach**

Lack of funding to drive the investigation due to decreasing Defense Environmental Restoration account funds could have delayed resolution of the problem for several years.

### **Results of Original Approach**

Data gaps regarding Site 38 would remain unresolved, and possible contamination from Building 604 would not be investigated.

### **How Partnering Was Applied**

The team (U.S. Environmental Protection Agency (USEPA), Florida Department of Environmental Protection, the Navy, Naval Air Station Pensacola, and the Comprehensive Long-term Environmental Action, Navy II contractor) rationalized a solution by expanding the investigation at nearby Site 38 (currently in the remedial investigation stage) to include the investigation and remediation ongoing at Building 604.

The solution was to use Region IV Engineering Services Division to perform data collection supporting remedial investigation oversight as well as filling key data gaps. The fieldwork would be a true partnering effort with USEPA and Navy personnel working together to accomplish the goal of better, faster, cheaper cleanups.

### **Saving Realized**

By the team determining the scope of fieldwork and combining Navy with USEPA assets, it is estimated that the \$200,000 investigation will be accomplished for \$15-20,000, within the next 3 to 6 months rather than 1 to 2 years.

### **Overall Results**

The team's approach to streamlining the remediation process and combining resources of all the partners resulted in getting to cleanup sooner and with less expense in Naval Air Station Pensacola's most contaminated area (the Naval Aviation Depot).

Rev 04 07: 6/96



# Success STORIES

U.S. Army Environmental Programs

## BIOENGINEERING SOIL EROSION CONTROLS

**S**oil erosion is a concern on military installations throughout America. Soil erosion particularly affects Fort Bragg, N.C., because of the unique geography of the area. Soil at Fort Bragg is classified as "coastal plains," which refers to the sandy quality of the soil, and the post's "piedmont" topography is characterized by rolling hills. This combination means erosion.

Fort Bragg's training mission compounds these erosion concerns. The open dropzones required for airborne training, tank trails and new construction contribute to soil erosion on Fort Bragg. This could limit the amount of land available for training.



### NEW SOLUTIONS

The traditional solution to soil erosion is "hard engineering" a structure, such as concrete or special drainage structures. Although these structures halt erosion, they disrupt the natural setting which can nega-

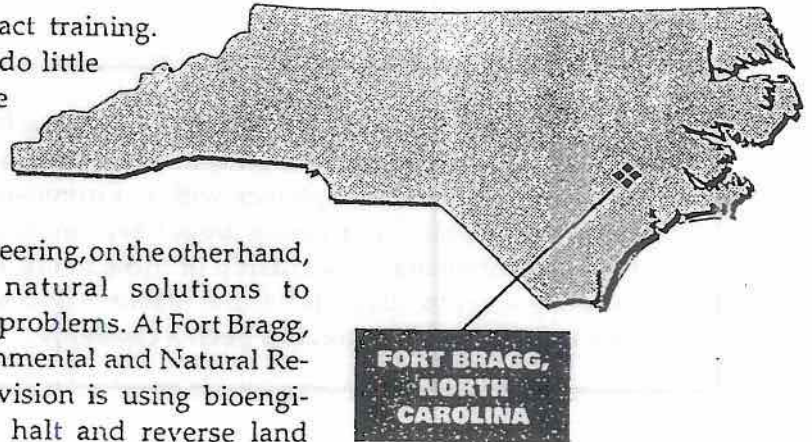
tively impact training. They also do little to repair the existing erosion damage.

Bioengineering, on the other hand, provides natural solutions to mankind's problems. At Fort Bragg, the Environmental and Natural Resources Division is using bioengineering to halt and reverse land damage caused by soil erosion.

### WORKING PLANTS

With the help of the U.S. Army Construction Engineering Research Laboratories (USACERL), Fort Bragg's Environmental and Natural Resources Division acquired and tested the erosion mitigation properties of several plant species. Fort Bragg has used three plant species in its soil erosion control efforts: black willow trees, vetiver grass and beech grass. Furthermore, these bioengineering efforts have been implemented post-wide, on sites ranging from 20 feet-by-40 feet to 150 acres. To implement, the systems cost about \$25 per 1,000 plants.

Bioengineered erosion controls are as effective as conventional erosion control methods and yield a better training environment.



### FOR MORE INFORMATION

Craig Lantz

Fort Bragg  
Soil Conservationist

(910) 396-8988  
DSN 236-8988



# SUCCESS STORIES

## INTEGRATION OF TRAINING AND ENVIRONMENT, UTAH ARMY NATIONAL GUARD

**W**

hile the training mission still holds the highest priority on military reservations, increased public environmental awareness, required compliance with environmental regulations and limited availability of training areas have emphasized the need for environmental stewardship of these lands. However, finding ways to integrate natural resource data with military training information has been a challenge.



### BETTER DATA

The Army National Guard, in partnership with Utah State University and the Utah Army National Guard, developed a program to facilitate military training and support environmental stewardship. The partners developed and refined field data collection methods and on-site management, and compiled a national, digital database that includes

a standardized data structure, data analysis package and graphical user interface. A Geographic Information System (GIS) links all parts of this program.

Development of an ecosystem-based management plan at Camp Williams, Utah, integrates training objectives with land resource capability, while minimizing environmental impact. Ecosystem knowledge provides habitat-specific information necessary for making land-based tactical and environmental decisions. By integrating spatial and temporal reports from biological and cultural surveys and ecosystem studies, a model system uniquely tailored for the demands of ecosystem-based education, tactical training and environmental planning has been developed.

Standard national and state data, satellite remote-sensing data and site-specific surveys are incorporated into a GIS with Army-standard natural resources and military training information (Integrated Training Area Management (ITAM) and Range Facility Management Scheduling System). Natural resources and military data can be compared directly to determine relationships between military activity and land condition. This program not only provides a tool for updating, querying, manipulating and displaying data, but for managing military and environmental activities.

**CAMP WILLIAMS,  
UTAH**

### FOR MORE INFORMATION

**Dr. John Crane**  
Utah Army National Guard

◆  
**(801) 576-3960**  
**DSN 766-3960**

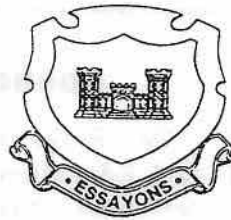


# Success STORIES

U.S. Army Environmental Programs

## ARCHEOLOGICAL COLLECTIONS MANAGEMENT

**T**he Mandatory Center of Expertise for the Curation and Management of Archaeological Collections (MCX-CMAC) in the St. Louis District of the U.S. Army Corps of Engineers provides expertise in curation and management of archaeological collections; design of curation facilities, and provision of field archaeologists to assist in the recovery of MIAs in Southeast Asia.



to facilitate and move the collections to one repository per state, so DoD can more effectively and economically manage these diverse resources.

### BETTER MANAGEMENT

Some of the most interesting and intact prehistoric archaeological sites in North America are located on military land. Since 1906, Department of Defense (DoD) installations have been accumulating archaeological collections from sites affected by military activities. Until four years ago, the Army and other services had no clear idea of the whereabouts of these collections or their condition. The MCX-CMAC is cooperating with DoD and the Army to locate and assess archaeological collections. The short-term goal is to identify all Army archaeological collections; the long-term goal is to reha-

### TRACKING COLLECTIONS

A challenge of using the Army's archaeological collections is devising a means to manage and manipulate them for various purposes, such as gathering information for compliance issues or providing access for researchers. The MCX-CMAC is helping Fort Carson, Colo., develop a prototype collections-management database that can display artifacts and compare digital imaging techniques for quality and cost effectiveness. Fort Carson's sizable archaeological collections include a variety of materials, which provides an excellent test for the range and capabilities of the system. The first version of the database was created with Legacy Resource Management Program

funding and is undergoing field tests. Upon completion, this database can be used to create an Armywide database that would help installations manage their collections and comply with various federal regulations and laws.

### RECOVERY EFFORTS

Using their diverse skills, MCX-CMAC staff archaeologists experienced in field excavation assist the U.S. Army Central Identification Laboratory, Hawaii (CILHI) in recovering remains and personal effects of American service members considered missing in action in Southeast Asia. Archaeologists spend six weeks in Vietnam, Laos or Cambodia, preparing reports that document the procedures and results of each mission for CILHI and the families of the MIAs. Sometimes additional missions are added to their schedules and archaeologists from other federal agencies augment the MCX-CMAC staff.

### FOR MORE INFORMATION

Dr. Michael K. Trimble  
Director, MCX-CMAC

◆  
(314) 331-8466  
DSN 555-8466



# Success STORIES

U.S. Army Environmental Programs

## INTEGRATED NATURAL RESOURCE MANAGEMENT PLAN, MISSOURI ARMY NATIONAL GUARD



**THE** Missouri Army National Guard (MOARNG) completed an Integrated Natural Resource Management Plan (INRMP) for the 1,287-acre Camp Clark Training Site. The plan is a benchmark document in the integration of ecosystem management and the military training mission.

### COORDINATION

Oak Ridge Institute for Science and Education (ORISE) support personnel with expertise in soil conservation and wildlife management helped develop the plan. The effort included extensive coordination among training and environmental staffs, as well as many federal and state natural resources agencies.

A thorough search of historical land surveys, soil surveys, and topographic maps identified the site's historic plant and animal communities. Researchers used the Land Condition Trend Analysis (LCTA) component of the Integrated Training Area Management (ITAM) program to identify and analyze current plant and animal communities. As a result of this work, overall training constraints were reduced and only specific training activities are restricted from a few sensitive areas. The plan has helped reduce costly Land Rehabilitation and Maintenance (LRAM) projects by tailoring mission requirements to land capabilities.

### TWO SECTIONS

The Camp Clark plan consists of two primary sections. One is an inventory and discussion of the natural resources of Camp Clark. The other provides straight forward instructions for management, assigns responsibility for actions, and provides a timeline for implementation. The plan also provides color maps of Camp Clark to clarify plan elements.

The plan's simple format and comprehensive data on site-specific natural resources have prompted at least 40 other installations to request copies, to use as a pattern for their Integrated Natural Resource Management Plans. The plan is a key component of the integrated approach the MOARNG has taken to expand training opportunities while protecting its installations' resources. The MOARNG received the 1995 Department of the Army Natural Resource, Conservation Award for small installations.

### FOR MORE INFORMATION

Donna Brandt or Bob Harms  
Missouri Army National Guard

(573) 526-9010  
DSN 555-9010

CAMP CLARK  
TRAINING SITE,  
MISSOURI



# Success STORIES

U.S. Army Environmental Programs

## RESTORATION ADVISORY BOARD U.S. ARMY SOLDIER SYSTEMS COMMAND

**T**he U.S. Army Soldier Systems Command (SSCOM) considers its relationship with the Restoration Advisory Board (RAB) a great success. In the year that the RAB has been in place, the Army has teamed with the community and the regulators to serve and protect local residents while environmentally restoring the facility.

### • ACTIVE PARTNER •

Since its establishment, the RAB has been an active participant in public outreach. During SSCOM's second annual "Environmental Open House," RAB members shared stories of their experiences with the public. The RAB has also been the subject of many local newspaper articles, drawing interest and questions from the local residents.

One community group, the Lakewood Association, recently received a Technical Assistance Grant (TAG) from the Environmental Protection Agency (EPA). The group's members are especially interested in SSCOM's activities since their neighborhood borders the installation. The Army helped the association earn the award by providing application procedures and EPA points of contact. The RAB not only encouraged such participation but fully supported it by naming a Lakewood member to the RAB. In addition, SSCOM produces a biannual news-



letter that highlights RAB activities, restoration updates, and offers the community easy access to restoration information.

### • GOOD RELATIONS •

The RAB has helped foster a solid partnership with local, state and federal regulators. Working side-by-side with these agencies and the community, a clearer understanding of each other's role in restoration has been accomplished. SSCOM demonstrated this cooperative spirit by changing a Treatability Study to accommodate the Lakewood



Association's concerns regarding a discharge point to a lake.

SSCOM has established a foundation of community involvement, communication and respect through this pivotal group. The command is dedicated to build on this foundation to accomplish its common goal: Team with the community, regulators and the Army to meet the inherent challenges of environmental restoration.

### FOR MORE INFORMATION

Constance A. Fitzgerald  
(508) 233-5989

[cfitzger@natick-EMH2.army.mil](mailto:cfitzger@natick-EMH2.army.mil)



# Success

U.S. Army Environmental Programs

## The 'Mock Laboratory' at Soldier Systems Command

**As**

a result of an unannounced multimedia inspection of the installation, the U.S. Army Soldier Systems Command (SSCOM) was fined \$117,000 by the Environmental Protection Agency. The EPA found inconsistencies between nomenclatures used in research laboratories. The challenge, therefore, was to bring the installation into compliance by developing a standardized program for laboratory procedures.

It was recognized that environmental and safety actions would have to play an integral part of laboratory personnel's daily activities. The command required that chemical sharing be promoted to reduce chemical procurement and hazardous waste and environmentally friendly substitutes be used whenever possible.



various deficiencies that were staged for their visit.

### REDUCED FINE

This program led the EPA to reduce the fine to \$49,700. Moreover, the EPA lauded SSCOM for its creative and innovative instructional approach to mandatory training. SSCOM was selected as the Army Material Command's nominee for the 1996 Environmental Quality

Award, highlighting this laboratory standardization policy. SSCOM plans to share this original approach to laboratory procedures

with the science department heads of local high schools, colleges and universities.

### SEVEN STEPS

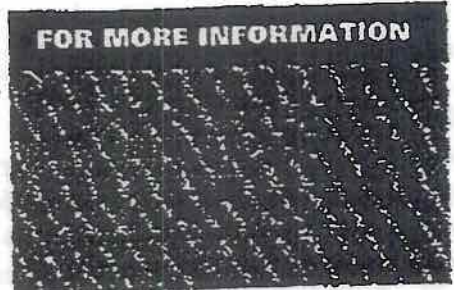
With management's support, command staff developed a "Seven Step Solution." SSCOM environmental staff teamed with researchers to produce a practical training manual for environmental and safety compliance. Training was provided in hazardous chemical handling, disposal and tracking, as well as chemical hygiene principles for industrial and scientific personnel. A lab manager and alternate were designated and labs were officially "permitted" to ensure compliance under the new guidelines. Quality assurance measures were initiated by conducting weekly, random laboratory

checks to support and help scientists maintain compliance.

### TEACHING TOOL

The "Mock Laboratory" was created to serve as a teaching model to reinforce proper laboratory procedures. Designated satellite areas and safety equipment were clearly identified and newly designed waste tags helped people identify chemicals. The trainees visited the mock lab as part of the curriculum, identifying

### FOR MORE INFORMATION

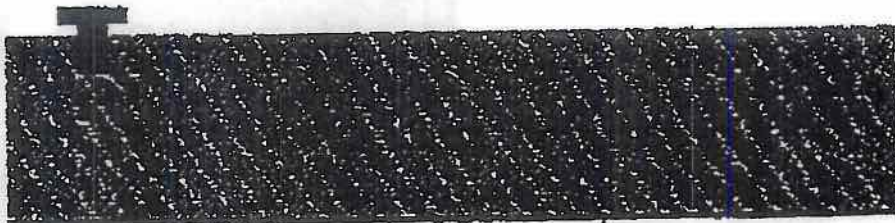




# Success

U.S. Army Environmental Programs

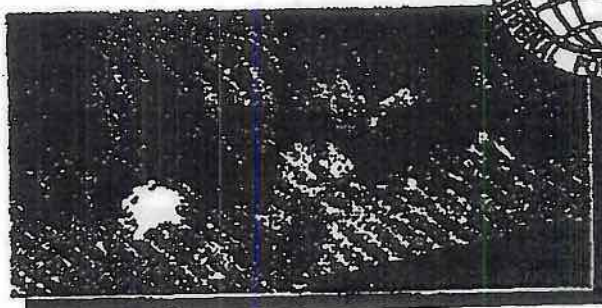
## RESTORATION ADVISORY BOARD U.S. ARMY SOLDIER SYSTEMS COMMAND



### ACTIVE PARTNER

Since its establishment, the RAB has been an active participant in public outreach. During SSCOM's second annual "Environmental Open House," RAB members shared stories of their experiences with the public. The RAB has also been the subject of many local newspaper articles, drawing interest and questions from the local residents.

One community group, the Lakewood Association, recently received a Technical Assistance Grant (TAG) from the Environmental Protection Agency (EPA). The group's members are especially interested in SSCOM's activities since their neighborhood borders the installation. The Army helped the association earn the award by providing application procedures and EPA points of contact. The RAB not only encouraged such participation but fully supported it by naming a Lakewood member to the RAB. In addition, SSCOM produces a biannual news-



Association's concerns regarding a discharge point to a lake.

SSCOM has established a foundation of community in-

letter that highlights RAB activities, restoration updates, and offers the community easy access to restoration information.

### GOOD RELATIONS

The RAB has helped foster a solid partnership with local, state and federal regulators. Working side-by-side with these agencies and the community, a clearer understanding of each other's role in restoration has been accomplished. SSCOM demonstrated this cooperative spirit by changing a Treatability Study to accommodate the Lakewood

volvement, communication and respect through this pivotal group. The command is dedicated to build on this foundation to accomplish its common goal: Team with the community, regulators and the Army to meet the inherent challenges of environmental restoration.

FOR MORE INFORMATION





# Success STORIES

U.S. Army Environmental Programs

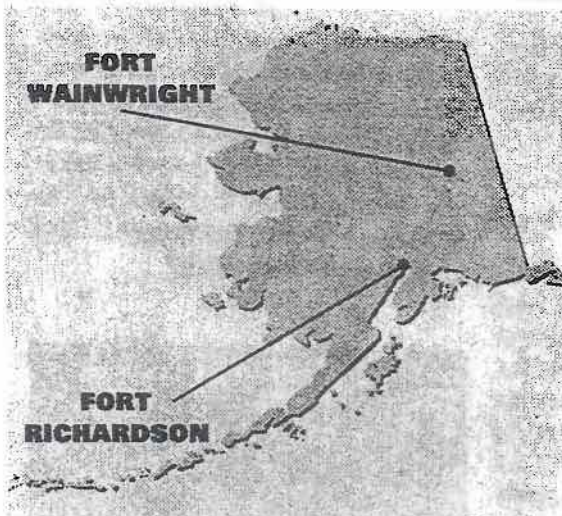
## WESTERN REGIONAL ENVIRONMENTAL OFFICE, REGION X

### FORT WAINWRIGHT, AK:

Fort Wainwright has substituted biodegradable parts washers known as "Smart Washers™" for hazardous-waste generating equipment in all tactical vehicle maintenance shops. The new equipment, which has its own built-in bioremediation system, replaces a system that used hazardous waste generating solvent. Hydrocarbon busting microbes in the filter pad efficiently "eat" oils and grease, converting them into harmless carbon dioxide and water. The nontoxic, nonflammable parts-washing solution cuts the surface tension of grease and leaves a nonoily residue on parts and equipment components. The system recirculates the like-new cleaning agent within the washer and requires only an occasional topping off. Best of all, Toxicity Characteristic Leaching Procedure (TCLP) analysis of the filter pads at recommended replacement intervals reveals no threshold levels of constituents that would require their disposal as hazardous waste.



Robert Gray, environmental protection specialist with the Fort Wainwright Hazardous Waste Section, explains how to operate the newly-installed Smart Washer™ to Staff Sgt. Terry Walker of the 46th Maintenance Battalion.



### FORT RICHARDSON, AK:

In late 1994, U.S. Army, Alaska, volunteered to host the development of the Joint Regional Environ-

mental Training Center (JRETC). The center grew out of a need to provide relevant, cost-effective environmental training for members of all the services and other federal agencies in the Pacific Rim. Significant progress has been made toward the goal of attaining a fully operational, jointly administered training facility. Members of the Alaska Statement of Cooperation, which include the service components of the Department of Defense, U.S. Coast Guard, Alaska Department of Environmental Conservation and the Environmental Protection Agency Region X, signed a Memorandum of Agreement for this project on 19 April 1996. The Center is contractor-operated, government-owned, and financed by tuition.





**SUCCESS STORIES FOR AVON PARK AFR TIER I TEAM**  
**DATE: NOVEMBER 15, 1996**

Listed below are several success stories that have resulted from decisions made and actions taken by the Avon Park AFR Tier I Team during the team's first three partnering meetings (June 1996, August 1996 and October 1996).

**Success No. 1 - Cost Savings from Scope Changes to Interim Removal Actions**

In March 1996, prior to the formation of the Avon Park AFR Tier I Team, Interim Removal Actions (IRAs) for five sites were scoped and funded. The five sites included: Tar Pits (OT-31), Pesticide Rinse Basin (LF-36), and Cattle Dipping Vats OT-59A, OT-59C and OT-59D. During the June 1996 team meeting, it was decided that some of the work originally scoped for the IRAs did not need to be performed. The decision to reduce the scope can be attributed to technical discussions held at the meeting and support of the reduction in scope by the FDEP team member. It is estimated that \$55,000.00 was saved by reducing the scope of the IRAs.

**Success No. 2 - Joint Scoping and Work Plan Development for IRP Sites**

During the first three Avon Park AFR Tier I Team meetings (June 1996, August 1996 and October 1996), the team jointly scoped future work activities and/or determined work plan structures/contents for seventeen (17) IRP sites. This work by the team expedites the work plan preparation, review and approval process as well as the funding allocation process. Because the team discusses work plans both prior to their development and after the draft work plan has been reviewed by team members, there is no need to prepare a draft-final work plan and typically, a final work plan can be prepared with only minor changes to the draft work plan. One team metric is to estimate both the number of labor hours and costs saved by the aforementioned team activity. The estimated average labor hours saved per IRP site from project initiation through the final work plan approval are 168 (hours). Assuming an average cost of \$60.00/labor hour and work plan reproduction cost savings of \$500.00/site, the estimated average cost savings per IRP site is \$10,580.00. Thus, the estimated total cost savings resulting from this team activity through the October 1996 meeting is \$179,860.00 (17 sites multiplied by \$10,580.00/site).



### Success No. 3 - Presentations on Relevant Topics

The Avon Park Tier I Team has invited guests to give presentations on topics that all team members need to more fully understand to make informed decisions about future environmental restoration activities at Avon Park AFR. A list of the presentations given through the October 1996 meeting is presented below.

<u>Meeting Date</u>	<u>Guest Presenter</u>	<u>Topic</u>
August 7, 1996	Col. Gene Hickman (MacDill AFB)	Starting and working with a Restoration Advisory Board
August 7, 1996	Peg Margosian (Avon Park AFR)	Avon Park AFR GIS capabilities
October 29, 1996	Anita Meyers (USACE-Omaha)	Rational National Standards Initiative and its application to sites at Avon Park AFR

**ADVANTAGES OF  
THE GUIDELINES FOR COPC IDENTIFICATION  
UTILIZATION  
EGLIN AIR FORCE BASE  
FLORIDA**

**APPROXIMATED  
COST SUMMARY  
-\$75,000**

**I. Development of the COPC Document**

Eglin Air Force Base (Eglin) has prepared the COPC Guidelines for Determining Contaminants of Potential Concern (COPCs) for Areas of Concern (AOCs) and Installation Restoration Program (IRP) sites at Eglin. These guidelines have been prepared in accordance with a letter received from Greg Brown of the Florida Department of Environmental Protection (FDEP) dated May 26, 1995. On May 10, 1995, Eglin IRP representatives risk assessment representatives from Region IV US EPA agreed to use a proposed two-tiered screening approach to identify chemicals of potential concern.

Tier I screening compares results to Applicable or Relevant and Appropriate Requirements (ARARs) and guidance concentrations where available. The most conservative of Federal or State criteria are used as the Tier I benchmark. Tier II screening compares data that exceed existing Tier I criteria with representative background concentrations. US EPA Region IV's "2-times arithmetic mean background rule" (censoring out non-detections) is used as the Tier II screening benchmark.

Fourteen applicable Federal and State Regulatory Standards, Cleanup goals, Guidance, and Risk Based Criteria documents were assembled and are included in the COPC document. The assembly of these documents within the COPC allows rapid access to accepted standards which are essential to the data evaluation process. Once the COPC document was approved by EPA and FDEP the Tier I and Tier II Screening Levels were incorporated into a computer program which automates the data evaluation process.

**II. Implementation of the COPC Document**

**Streamlined Data Review**

The *Guidelines For Contaminant of Potential Concern (COPC) Identification* (Herein *The Guidelines*) organizes the data evaluation process into a streamlined, two tiered screening system, which meets Federal and Florida State Regulatory Requirements. The time required to evaluate analytical data gathered during the Site Investigations (SIs) at Eglin was reduced by approximately fifty percent for each Area of Concern (AOC).

Cost Analysis Basis (\$600 to \$1,800 x 42 AOCs) \$25,200 to \$75,600

**+\$25,200**

**SUBTOTAL -\$49,800**

**Reduced Confirmation Round Sampling and Analyses**

Application of the two tiered screening system reduced the total number of monitoring wells requiring second round sampling by 82 wells. Soil confirmation sampling was similarly reduced from 112 down to 27 sampling locations. The second round sampling event parameter list for each sampling location were also reduced by all first round analytes which were not identified as potential COPCs by the two Tiered Screening process.



The total cost of the second round laboratory analyses for all forty-two AOCs was \$169,000 less than the cost for the first round laboratory analyses. Furthermore, due to the reduced sampling effort the total number of man-hours needed to complete the second round sampling were significantly lower and resulted in an additional labor savings of approximately \$29,500.

Cost Analysis Basis \$169,000 + \$29,500

+\$198,500

**SUBTOTAL +\$148,700**

#### **Increased Number of No Further Action Decisions**

*The Guidelines* incorporate a Tier II screening system which involves a comparison of analytical data to Basewide Background Concentrations. The comparison to Basewide Background Concentrations contributed to or was the determining factor in the recommendation for no further action (NFA) for 22 of the 32 AOCs which were recommended for NFA. Only ten of the 42 AOCs investigated required some form of additional investigation. The savings due to the 22 additional NFA decisions equals the cost of an extended SI or an RFI for each site.

Cost Analysis Basis (22 NFA Sites x \$32,000)

+\$704,000

**SUBTOTAL +\$852,700**

*The Guidelines* also facilitates the comparison of analytical data to EPA Region III Risk Based Concentrations and Florida Soil Screening Levels. This comparison also contributed significantly to the basis for NFA decisions at numerous AOCs.

#### **FUTURE/LONGTERM BENEFITS**

The Guidelines incorporate a systematic, streamlined, and cost effective approach to data evaluation. The Guidelines have been incorporated into a software package to automate the data evaluation process. The software produces report ready analytical summary tables by analytical suite for each matrix analyzed.

Utilization of the Guidelines eliminates the need and associated costs to repetitively develop ARARs at other Florida U.S. Air Force Facilities. The continued utilization of the COPC Guidelines to evaluate existing and future AOC and IRP Sites will multiply the cost savings realized by the streamlined evaluation process and the systematic reduction in confirmation samples and analyses.

Furthermore, as the GIS database grows for a given USAF facility the hydrogeologic and background data collection requirements and associated costs will be significantly reduced.

---

**TOTAL SAVINGS TO DATE +\$852,700**

MacDill AFB FL  
Tier I Partnering Team  
Success Stories

SITE 39 - FORMER FUEL STORAGE AREA

The remedial action originally proposed for this site involved the installation of a soil vapor extraction (SVE) system to clean up petroleum contaminated soils. Only a small portion of the surficial aquifer had been impacted at the site, and the site met the criteria for the state's "monitoring only" status for the groundwater. The findings of the Contamination Assessment Report (CAR) and the proposed remedial action were presented to the MacDill AFB Restoration Advisory Board (RAB). The RAB questioned the cost involved with the installation of the SVE system. They proposed using some method, to be determined by the Tier I team, to aerate the soils and allow the petroleum contamination to attenuate naturally. The Tier I team, using the input from the RAB, decided to aerate the soils by disking them, after first investigating a small area of contaminated soils that appeared to be saturated with product. A small area of contaminated soil was excavated, and the excavation remained open to determine whether free product was present floating on the groundwater. No free product was observed, the excavation was backfilled with clean soil (after proper disposal of the contaminated soil), and the larger area of contaminated soil was tilled, allowed to aerate for several days, and sodded. Monitoring of the groundwater is occurring at the site to determine the effectiveness of natural attenuation.

The successes of this site include the cost savings associated with aeration of the soils versus installation and operation of an SVE system (approximately \$250,000), a time savings of approximately two years to get from remediation to monitoring, and integration of the RAB's input into the decision-making process.



**MacDill AFB FL  
Tier I Partnering Team  
Success Stories**

**SITE 52 - HOSPITAL DORM UNDERGROUND STORAGE TANK AREA**

The proposed remediation for this site included the excavation and thermal treatment of excessively contaminated soils, performance of a pumping test, and monitoring of the groundwater in the surficial aquifer to evaluate the effectiveness of the natural attenuation process after removal of the source area of contamination. It was determined by the Tier I team that the pumping test would not remove a significant amount of contaminated groundwater, and that it's usefulness to the overall remedial process did not warrant the time and cost involved. The contaminated soil has been removed from the site, and the groundwater is being monitored to determine the effectiveness of the natural attenuation process.

The successes at this site include the cost savings associated with not performing the pumping test (approximately \$65,000) and the time savings of approximately one month to perform the test and evaluate the results.

**MacDill AFB FL  
Tier I Partnering Team  
Success Stories**

**COMBINED EFFORTS FOR SITES 39 AND 52**

Because of the level of commitment to the partnering process by the members of the Tier I team, it was possible to combine the remedial efforts for Sites 39 and 52, resulting in both cost and time savings. Tier I team members reviewed the proposed remedial actions on an accelerated schedule to allow the remedial work performed at Site 39 to occur concurrently with the work at Site 52. Contaminated soil from both sites was treated at the same time, resulting in reduced treatment costs.

The successes for this site include the time saved by performing the remedial actions concurrently (approximately one month saved on the schedule) and the costs saved by treating all of the soil at one time (approximately \$35,000).



**MacDill AFB FL  
Tier I Partnering Team  
Success Stories**

**APPROVAL OF CARs**

In an effort to promote the partnering spirit and enhanced communications between team members, the Remedial Project Manager (RPM) from the Florida Department of Environmental Protection (FDEP) proposed using preliminary data packages to evaluate the completeness of the data collected during the CAR investigations prior to report writing. In instances where additional data requirements were identified, the consultant was able to remobilize to the field to collect that information. Once the reports were written, eight of the nine reports were approved by the FDEP without requirements for the preparation of an addendum. Only one site requires the collection of a small amount of additional data to complete the CAR requirements.

The success stories for this process include the time savings by not having to prepare a CAR and a CAR Addendum (CARA), approximately six months per site. The cost savings do not reflect savings in the actual report preparation, but in the additional costs that would have accrued if CARAs had been required for these sites.

**MacDill AFB FL  
Tier I Partnering Team  
Success Stories**

**LIMITED SCOPE CAR (SITE 54) AND PRELIMINARY CAR (PCAR) (SITE 55)**

Two of the petroleum sites investigated were contaminated to a very limited extent. The Tier I team agreed that abbreviated letter report type CARs could be submitted for these sites. The report preparation time was shortened, and the FDEP was able to review the reports on an expedited schedule. The reports were approved, and the sites were closed under a "No Further Action" (NFA) order by FDEP.

The success story for these two sites is the accelerated schedule to achieve the NFA status. It is estimated that the NFAs were obtained about six months earlier for these sites than would have been possible if standard CARS were required and the review not expedited.



**MacDill AFB FL  
Tier I Partnering Team  
Success Stories**

**NFAS FOR PARTS OF SITE 57 - THE FLIGHTLINE FUELING SYSTEM**

The flightline refueling system at MacDill AFB consists of several components, including four pumphouses, six defueling pits, and thirty refueling pits. The site was divided into "zones" consisting of each of the pumphouses and their associated fueling/defueling pits. The site was further divided into areas of contaminated soil/groundwater and areas of clean soil/groundwater, primarily based on the geographic location of the fueling/defueling pits. By taking a zoned approach, it was possible to recommend different types of remedial actions for each zone, depending on the level of soil and/or groundwater contamination present at each.

Because the team, particularly the FDEP, was willing to accept the zoned approach, it was possible to close out three of the zones investigated as part of this site with NFA orders from FDEP. These zones will not be addressed during the preparation of the RAP.

**MacDill AFB FL  
Tier I Partnering Team  
Success Stories**

**INTERIM REMOVAL ACTIONS**

Interim removal actions (IRAs) were conducted at two pumphouses (Pumphouses 72 and 77, part of Site 57) to removed soils contaminated with PCBs. These soils were removed prior to any other remedial action to reduce the threat to human health and to decrease the overall level of risk associated with these sites. The Tier I team worked together to scope the IRA and to review the documents produced to support these actions.

The success story for this site is that the level of risk was reduced through the timely implementation of IRAs. Through joints scoping and document review efforts, the team was also able to reduce the time associated with the IRA process.



**MacDill AFB FL  
Tier I Partnering Team  
Success Stories**

**AREA OF CONCERN (AOC) 61-CHLORINATED SOLVENT PLUME**

AOC-61 was identified during the investigation of the flightline fueling system. Because the team was in place when the site was identified, the team was able to jointly scope the investigation activities required for this site. Since the investigation has begun, the team has participated in the review of two preliminary data packages which assisted in the further scoping of additional field activities. The field investigation has also been conducted on an accelerated schedule through the use of onsite screening, direct push technology (DPT) for sample collection, and a mobile laboratory for quick turnaround of analytical results allowing real time decision-making.

Although this site investigation is still underway, the success stories associated with AOC-61 to date include the time savings associated with joint scoping, use of preliminary data packages for decision-making, and an accelerated field schedule.

**MacDill AFB FL  
Tier I Partnering Team  
Success Stories**

**BASEWIDE DOCUMENTS**

As the restoration program moves from the investigation phase into remediation, the Tier I team has developed several documents in an effort to streamline the remedial process. A Basewide RAP is currently being prepared to address elements of the RAP that would be similar for all of the petroleum sites. These include a feasibility analysis of the possible technologies for remediation as well as decision criteria for selecting a particular remedial alternative. Site specific RAPs will be attached to the Basewide RAP. The site specific RAPs will be shorter documents that only address the proposed remedial alternative for a given site. A Basewide Remedial Action Work Plan (RAWP) and Quality Assurance Project Plan (QAPP) have also been prepared to present the standard operating procedures (SOPs) during the remedial process. These SOPs will be implemented at each site as appropriate for the selected remedial technology.

The success story is the cost and time savings associated with these basewide documents are reflected in the level of rework that is avoided by having to prepare individual work plans, QAPPs, and complete RAPs for each site.



**MacDill AFB FL  
Tier I Partnering Team  
Success Stories**

**ELIMINATION OF DUPLICATED EFFORTS BETWEEN CONSULTANTS**

Through partnering, the US Air Force (USAF) and the US Army Corps of Engineers (USACE) have been able to successfully integrate the efforts of three separate consultants with overlapping scopes of work at MacDill AFB. During the Installation Restoration Program (IRP) investigations, Foster Wheeler was tasked with long term monitoring at three sites, including former landfill areas situated along the southern portion of the base adjacent to Tampa Bay. Black & Veatch was tasked with performing RCRA Facilities Investigations (RFIs) for seven sites, including two former landfills located adjacent to the Foster Wheeler sites. As the work progressed, it was determined that Foster Wheeler would need to complete RFIs at the sites they were monitoring. The two consultants were able to work together to produce the RFI report and an addendum which were similar in format and content. Black & Veatch also performed a qualitative ecological risk assessment for all four of the landfill sites located next to Tampa Bay, using data collected by both consultants. Foster Wheeler will perform additional field investigation activities and utilize the information presented in the initial qualitative risk assessment to prepare a quantitative risk assessment for these sites in response to the need for more detailed information regarding the potential threat to the environment at these sites.

Following the completion of the CARS prepared by Black & Veatch to address petroleum contamination at eleven sites, Rust conducted a pilot test for a SVE and air sparging system at Site 26, one of the CAR sites, Black Veatch is currently in the process of preparing a Basewide RAP which will include a RAP Addendum for Site 26 using the data collected during the pilot test. Rust will then complete the detailed design documents based on the RAP Addendum and will implement the remedial action (RA). Working together, Black & Veatch and Rust have developed a standardized, basewide approach to restoration of petroleum release sites that will eliminate duplicated design efforts and utilize common resources at all sites.

Partnering has facilitated the communication between the consultants throughout the investigation and design processes. Government contracting requirements often result in multiple consultants being involved in the restoration process as a site is investigated, cleaned up, and closed out. The partnering process has expedited that process by not only encouraging communication between these three consultants at MacDill AFB, but also by requiring them to work as a team with a common goal. The result is that very data has been lost as one consultant's work is completed and another comes on board. Also, rework has been required by the incoming consultant because the ongoing work has been performed under the direction of the team and in accordance with regulations, regulatory guidance, and quality standards agreed to by the Tier I team.

DAVE BEARS'S  
COPY

# Region 4 Partnering Success Stories

"The Early Years"

---

---

Part 2 of 2



**45th Space Wing Partnering Team  
Success Stories**

**PROGRAM-WIDE GENERIC WORK PLANS**

**ORIGINAL APPROACH & RESULTS:**

Prior to partnering, individual contractor and delivery order specific work plans were required to complete corrective action activities at CCAS and PAFB. Each contractor would typically complete a delivery order specific work plan to address similar type investigations at CCAS and PAFB. In many cases different contractors would be conducting identical activities using two separate set of work plans. The use of multiple contractor specific work plans did not allow continuity from one contractor to another and did not define a clear process for the 45th Space Wing Corrective Action program under RCRA, the Florida Petroleum Program, and the IRP. Contractors used different approaches and documented similar activities and recommendations using different procedures. The production of multiple contractor and delivery order specific work plans required additional resources and costs from the contractors for development and production, the regulatory agencies for review and approval support, and the Base and contracting agencies (i.e. AFCEE) due to delays and costs associated with development and approval.

**HOW PARTNERING WAS APPLIED:**

The Team developed one set of Program-Wide Generic Work Plans for all contractors to follow at CCAS and PAFB. The use of one set of documents allowed for a common set of field procedures, QA/QC requirements, data quality objectives, corrective action procedures, risk assessment procedures, data assessment procedures, and documentation requirements. Only one set of documents required review and approval and all partnering team members were involved in the development to make sure the work plans met all team members needs during development, not after the review and comment period.

**OVERALL RESULTS:**

The Team produced the Program-Wide Generic Work plans to streamline the Florida Petroleum and RCRA Corrective Action procedures. The work plans have minimized costs, expedited review and approval times, streamlined field investigations, and documented a common set of procedures for all contractors to follow while conducting activities at CCAS and PAFB. The Work Plans were developed by the 45th Space Wing Tier I Partnering Team:

Volume I - Quality Assurance Program Plan (QAPP)

Volume II - Field Sampling Procedures (FSP)

Volume III - Health and Safety Plan

Volume IV - Decision Process Document

**SAVINGS REALIZED:**

Time and dollars were saved by: reducing the number of work plans produced; reducing approval time by having all team members involved in the development of the work plans; and reducing the resource requirements for developing, producing, reviewing, approving, and revising additional work plans. Historically, a typical fiscal year at the 45th Space Wing would generate up to 3 separate sets of work plans (FSP, QAPP, H&S Plan) by each of 3 primary contractors at costs ranging from \$10,000-\$60,000 each (up to \$540,000 per year). The total costs saving could be in excess of \$600,000 per year when individual team members costs are incorporated (i.e. EPA & FDEP review and support costs, Contractor revision costs, delays and program impacts, revisions due to improper/inconsistent procedures, etc.)



**45th Space Wing Partnering Team  
Success Stories**

**USE OF DIRECT PUSH TECHNOLOGY (DPT)**

**ORIGINAL APPROACH & RESULTS:**

Groundwater plumes exist at many of the RCRA and petroleum sites at Cape Canaveral Air Station and Patrick Air Force Base. A limited number of wells were installed in the assessment phase in hopes of fully delineating the horizontal and vertical extent of groundwater contamination. Groundwater plumes were rarely fully defined and additional monitoring wells were often required, requiring additional field mobilization costs and lost time.

**HOW PARTNERING WAS APPLIED:**

The Team incorporated the use of field screening technologies such as Direct Push (Hydropunch and KVA) at the Hangar K Area, Facility 1381, Launch Complexes 11, 12, 16, 19, and the FT-17 investigations to reduce the number of monitoring wells required and to better locate those that were actually installed. The results of the field screening were then used by the Partnering Team to make real-time decisions on final permanent monitoring wells during regular Team meetings and scheduled teleconferences. Without the Partnering initiative, the Team would not have been capable of implementing this technology without schedule impacts up to 3-6 months.

**OVERALL RESULTS:**

The Team used direct push technology to delineate the horizontal and vertical extent of groundwater plumes with fewer confirmatory monitoring wells than would have been required using the methods of the past. The Team established a protocol to pilot the new technology at one site, checked to ensure its validity and appropriateness, and then quickly expanded DPT use to other appropriate sites to reduce costs and investigation time.

**SAVINGS REALIZED:**

Time and dollars were saved by completing the field investigations rapidly and delineating the horizontal and vertical extent of plumes at these SWMUs. The footprints of the groundwater plumes at Hangar K and Facility 1381 are over 200 acres. Approximately 100 hydropunch (DPT) locations were installed at the two SWMUs during the RFI field activities. The cost savings realized from the Hangar K and Facility 1381 investigations can be approximated by comparing the costs of DPT borings and the installation of permanent monitoring well nests (shallow, intermediate, and deep). The direct cost savings from delineating the plume with DPT instead of well nests is approximately \$2,600 per location. This resulted in a cost savings of over \$260,000 for the two SWMUs alone. Additional savings projected for Launch Complexes 11, 12, 16, and 19 is over \$200,000.



**45th Space Wing Partnering Team  
Success Stories**

**PHASED-APPROACH WORK PLANS**

**ORIGINAL APPROACH & RESULTS:**

The horizontal and vertical extent of groundwater plumes and surface and subsurface soil needed to be defined during RCRA Facility Investigations and Contamination Assessments. Monitoring wells surface and subsurface soil locations were proposed in Draft Work Plans and FDEP, EPA, and the Air Force would comment on their locations. Locations were often changed and /or sampling locations were added. Delays in the investigation, report submittal, and ultimately site remediation were a normal part of the process. Much of the delay was due to the long review times (normally 90 plus days), and the need for additional data to fully define the contamination. Once the additional data was provided, the review process started all over again. This approval process typically resulted in multiple mobilization of field crews, report submittal dates were delayed, and the RCRA and petroleum programs saw little progress.

**HOW PARTNERING WAS APPLIED:**

Work Plans were developed as a phased approach so that Partnering Team members were involved in every step of the decision-making process. This was accomplished by submitting real-time data prior to team meetings for review to determine if contamination was fully delineated during the screening phase of our investigations. Confirmatory sample locations were then proposed and agreed upon during Team Meetings. Consequently, immediate decisions could be made at team meetings, allowing contractors the ability to be in the field the next day.

**OVERALL RESULTS:**

Ultimately the Phased Work Plans for Facilities 1381, 1798, 49835, 84920 Launch Complexes 11, 12, 16, 19, 20, 31/32, 41 and Hangars K, I and 800, stated that sampling locations will be determined and approved by the team based on real time data being collected in the field. By using this approach, lengthy document review and approval delays have been all but eliminated, resulting in substantial cost savings.

**SAVINGS REALIZED:**

Work Plan approval was achieved during teleconferences and team meetings in a matter of hours or days, instead of the normal months or years for a typical RFI Work Plan. The approach allowed the field crews to go straight from the screening phase to the confirmatory phase without demobilization. Ultimately this process has expedited our investigation and has reduced the time to complete an RFI from 36 months down to 12-18 months. Total savings are estimated to be at least \$425,000 based on 17 various work plans ranging from confirmation sampling to RFI work plans. Future savings are anticipated to be in the range of \$750,000 over the next few years if Partnering success continues.

**45th Space Wing Partnering Team  
Success Stories**

**REMEDIAL ALTERNATIVE AT PAFB LANDFILLS**

**ORIGINAL APPROACH & RESULTS:**

Five historical Landfills at Patrick Air Force Base, LF-23, 24, 25, 26, and 27, were investigated under RCRA. The results of the investigations determined that the landfills had impacted surface soils. The most conservative source control measure to eliminate the contaminant threat was site closure and capping. The total estimated cost for implementing this alternative was \$3,500,000.

**HOW PARTNERING WAS APPLIED:**

The Team concluded the detection of arsenic driving risk at the landfills was in the munitions area and an industrial risk scenario was more appropriate for that portion of the landfill. The Team also assimilated all of the surface soil data at Patrick AFB and determined a base-specific arsenic background level. These results allowed the Team to make appropriate risk-management decisions for the final remedy at the landfills.

**OVERALL RESULTS:**

The area where the maximum detection of arsenic was also resampled and that detection was within established background. Therefore, the Team determined that the maximum detection was extremely localized and the cost of a cap could not be justified. The final remedial alternative selected for the landfills was long-term monitoring with institutional controls, i.e. fencing, posting of signs, limiting access or a combination of these.

**SAVINGS REALIZED:**

The final remedial alternative was determined to cost \$350,000, therefore a significant cost avoidance of approximately \$3,150,000 was realized.



## 45th Space Wing Partnering Team Success Stories

### PARTNERING TEAM USED FOR PEER REVIEW

#### ORIGINAL APPROACH & RESULTS:

According to FY96/97 Air Force Environmental Restoration Program Guidance, Peer Reviews for FS, IRA, and RA projects exceeding \$250,000 must be conducted by an unbiased entity. Air Force project validation requires a peer review be completed prior to the programming and expenditure of funds. Peer Reviews require additional funds (approximately \$7000 per review according to HQ ACC) and additional time to schedule an outside source to conduct the review. Furthermore, projects ready for implementation would typically be delayed a full calendar year due to time required to conduct the review and to respond to review comments.

#### HOW PARTNERING WAS APPLIED:

The Partnering Team consists of 10 core team professionals representing the U.S. EPA, Florida DEP, HQ AFCEE, Base RPMs, Base Bioenvironmental Engineering, and three different contractors. The team members are all very familiar with the characteristics and dynamics of the sites on CCAS and PAFB. Continuous progressional review is conducted on every phase of a site's progress by the team. Therefore, each team member understands not only a specific site's characteristics, but also the surrounding conditions, as well as the entire installation's background. All ten members must achieve consensus in order to implement or validate a project; hence, Peer Review is inherent in Partnering.

#### OVERALL RESULTS:

The peer review conducted by the Partnering Team provides a consensus decision by 10 professional team members from eight different organizations. This review saves time and money by eliminating the need for an outside peer review. Additionally, HQ AFSPC reviews every project requiring funds to ensure its validity before briefing it to HQ USAF.

#### SAVINGS REALIZED:

Since Partnering began at the 45th Space Wing in August 1995, the Partnering Team has reviewed 17 projects that according to AF Guidance required peer review. Using HQ ACC's estimate of \$7,000 per review, this calculates to a \$119,000 savings to the Air Force alone. This cost savings does not include the potential cost impacts to the contractors due to impacted schedules, revised work plans, and additional evaluations required. As the 45th SW program moves from study to cleanup, the time and cost of peer reviews will increase as the complexity of interim measures and remedial alternatives evolve. Peer Review costs for these projects are anticipated to be in the range of \$10,000 to \$25,000. Therefore, future savings are anticipated to be in the range of \$500,000 over the next few years if Partnering success continues.

# ERMA PARTNERING SUCCESS STORIES

## *Executive Summary*

The success stories contained in this binder represent the accomplishments of the facilitated partnering initiative started in U.S. Environmental Protection Agency (USEPA) Region IV during 1993. This initiative has evolved into the Environmental Restoration Management Alliance (ERMA), composed of Federal (USEPA Region IV and the Department of the Navy) and State agency representatives, as well as installation and contractor representatives. Since 1993, installation-specific partnering teams (Tier I teams) have been established and trained and are now operating in a facilitated teaming manner for many installations. Each of the Tier I teams has established a charter of cooperation aimed at "better, cheaper, faster" cleanup of their installations. By allowing teams to operate in an empowered manner, many planning, analysis, and decision-making processes have been streamlined; some have been eliminated altogether. As various phases of each installation's program plan have been completed, the Tier I teams have documented their success, that is, their improvement over the old ways of doing business. Each story explains the original condition and approach as well as the results of that original approach. Additionally, it defines how partnering was applied for that phase of work, the savings realized, and the overall result achieved by the Tier I teams. As ERMA progresses, new Tier I teams will be added, and as they succeed, their stories will be added to this collection.



# MARINE CORPS BASE, CAMP LEJEUNE

Camp Lejeune, North Carolina

Five Well Site Assessments

## **Original Conditions**

The Underground Storage Tank (UST) program at Marine Corps Base (MCB), Camp Lejeune had more than 125 contaminated sites that were in some stage of remediation. Before corrective action could be put in place, a UST site had to be investigated to determine the extent of contamination and the appropriate remediation needed.

## **Original Approach**

Historically, a typical site assessment was composed of 12 Type II wells, 3 Type III wells, and 15 Hydropunch borings to delineate soil and groundwater contamination. Quite often, soil contamination was poorly delineated while a large number of monitoring wells were placed at the outer edges of the groundwater plume.

## **How Changes Were Applied**

To eliminate unneeded monitoring well costs, MCB, Camp Lejeune modified the previous investigation process to a five Type II well (shallow aquifer) and two Type III well (intermediate aquifer) site assessment. The decrease in monitoring wells was replaced by obtaining soil and groundwater data via 15 Geoprobe sampling points, which have replaced the Hydropunch sampling. The Geoprobe sampling was initially analyzed so that the monitoring wells could be strategically placed to ensure complete horizontal and vertical delineation of both soil and groundwater.

## **Savings**

Due to extensive cuts in the Department of Defense's Defense Environmental Restoration Account budget, it is important to save funds wherever possible. By cutting back the amount of monitoring wells used in a site assessment, more than \$20,000 per site has been saved, and a total of \$200,000 has been saved in Fiscal Year 1996.

## **Overall Results**

Spending more money at a UST site does not necessarily mean a better product. By strategically using fewer wells, a better quality site assessment was accomplished; thus, funding could be used in other areas of the remediation effort.



# MARINE CORPS BASE, CAMP LEJEUNE

Camp Lejeune, North Carolina

## Time-Critical Removal Actions

### **Purpose of the Actions**

Using guidance established in the National Oil and Hazardous Substances Pollution Contingency Plan, Marine Corps Base (MCB), Camp Lejeune has completed numerous Time-Critical Removal Actions (TCRAs). These TCRAs were employed to reduce risk to human health and the environment while continuing with the environmental investigation process.

### **How TCRAs Were Applied**

During the summer of 1994, MCB, Camp Lejeune employed a TCRA to remove pesticide-contaminated soil at Installation Restoration (IR) program Site 2, Former Nursery and Day Care Center. This site had been used as a pesticide mixing and storage facility prior to being converted to a nursery and day care center. Following the completion of the TCRA, MCB, Camp Lejeune was able to sign a Record of Decision (ROD) selecting an Institutional Controls remediation alternative with long-term monitoring of the groundwater.

In 1995, MCB, Camp Lejeune removed dangerous metallic debris from IR Site 43, the Agan Street Dump at Marine Corps Air Station, New River. IR Site 43 is located immediately adjacent to a nearby residential area, next to a Boy Scout meeting place. The debris scattered throughout the site included a military armored vehicle (tank) and numerous other pieces of rusted metal. By removing this metallic debris, the risk endangering residential children playing at the site was mitigated. This TCRA will

probably lead to the selection of a No Action remediation alternative in the ROD.

May through June 1996 found MCB, Camp Lejeune again employing a TCRA to remove pesticide-contaminated soil from an IR site. IR Site 80, the Paradise Point Golf Course Maintenance Area, underwent removal action to reduce the human health risk associated with soil contaminated with pesticides that were stored and mixed at the site. This TCRA will probably lead to the selection of a No Action remediation alternative in the ROD.

### **Overall Results**

When faced with soil contamination and minimal or no groundwater contamination, MCB, Camp Lejeune took the lead agency role and proactively initiated TCRAs. Through implementing TCRAs, MCB, Camp Lejeune has been able to remove risk to human health and the environment as well as expedite the IR process by removing contamination. This has enabled MCB, Camp Lejeune to sign RODs requiring remediation alternatives of No Action or Institutional Controls only.



# MARINE CORPS BASE, CAMP LEJEUNE

## Camp Lejeune, North Carolina

### Basewide Groundwater Remediation Study (BRAGS)

#### ***BRAGS Objectives***

The BRAGS is a comprehensive local and site-specific groundwater model (3-D flow model), which will provide the Atlantic Division, Naval Facilities Engineering Command and Marine Corps Base (MCB), Camp Lejeune with groundwater flow models. The objectives of BRAGS include description of groundwater flow, evaluation of contaminant transport, prediction of the effectiveness of various remediation schemes at individual sites, and demonstration of the effects of groundwater withdrawals on the Castle Hayne aquifer. It is envisioned that BRAGS will be utilized as a decisionmaking tool for groundwater management, protection, and restoration.

#### ***How BRAGS Was Applied***

The BRAGS model was designed to model both basewide and site-specific groundwater situations. The basewide model was constructed based on groundwater elevation data from more than 30 sites at the base and from U.S. Geological Survey data collected from the water supply wells at the base. Site-specific model data were constructed from Installation Restoration Sites 3, 6, 9, 82, Underground Storage Tank Sites 889-891, and from nearby water supply wells.

To date, a report has been completed that provides a comprehensive groundwater model for Site 82. The report provides an evaluation of the Site 82 pump-and-treat system, including the anticipated capture

zones and placement of shallow and deep extraction wells. A pump and recovery test at Hadnot Point Fuel Farm has recently been finished, and a report is due out soon.

#### ***Savings***

By modeling basewide and site-specific scenarios, BRAGS can be used as a forecasting tool to help planners make better decisions regarding groundwater resource management concerns. Pumping well locations and pumping rates at specific sites can be changed or modified in order to evaluate numerous remediation schemes and scenarios. With the aid of this tool, plume and groundwater modeling for some systems may be able to reduce long-term monitoring from 30 to 15, 10, or even 5 years. This, in the long term, will reduce operational and maintenance costs of these larger remediation systems.

#### ***Overall Results***

The focus of BRAGS is to develop a basewide groundwater flow model that can be used to evaluate the effects of various groundwater remediation projects that are active or planned for at MCB, Camp Lejeune. BRAGS will reduce operational and maintenance costs, model contaminant plumes, and forecast the various effects different remediation systems have on one another.



# MARINE CORPS BASE, CAMP LEJEUNE

## Camp Lejeune, North Carolina

### Remedial Action Goal Changes

#### **Original Conditions**

The remedial action level for Site 21, Transformer Storage Lot 140, was originally based on future residential use and set in the Record of Decision at 0.37 parts per million (ppm). At Site 80, Paradise Point Golf Course Maintenance Area, the original removal action level for pesticide-contaminated soil for a Time-Critical Removal Action was established for the pesticide Dieldrin at 37 parts per billion (ppb).

#### **Original Approach**

The initial remediation levels for removal of polychlorinated biphenyls and pesticide-contaminated soil at Installation Restoration (IR) Sites 21 and 80 were found to be much more stringent than required in order to protect human health and the environment.

#### **How Changes Were Applied**

Site-screening activities at the proposed area of excavation for Site 21 revealed that the use of the 0.37 ppm action level would result in additional cost, twice the original estimate. Using an industrial exposure scenario, the action level was revised to 10 ppm via an Explanation of Significant Differences.

Preexcavation site screening at Site 80 using the action level of 37 ppb showed an area twice as large as the original estimate. The original action level was based on a professional groundskeeper working all day everyday onsite. Using a more appropriate industrial exposure scenario, regulators agreed to the revised 360 ppb action level.

#### **Savings**

Marine Corps Base (MCB), Camp Lejeune has significantly reduced the need to remove contaminated soil from the base for treatment and disposal. A substantial cost savings has resulted through the change of remedial action goals while still maintaining protection of human health and the environment. Savings between the 0.37 ppm and the 0.10 ppm remedial action levels at Site 21 were more than \$500,000.

At 37 ppb, approximately 1,900 tons of contaminated soil would have been removed from Site 80 and sent offbase for treatment and disposal, at a cost of more than \$900,000. At the revised action level of 360 ppb, there were approximately 950 tons of soil, and the remedial action cost was \$633,000. This revised removal action level reduced the amount of soil requiring action by 50 percent and provided a cost savings of approximately \$300,000.

#### **Overall Results**

Thorough investigation of the remedial action goal at IR Sites 21 and 80, MCB, Camp Lejeune, altered the cleanup levels to more appropriate industrial exposure scenarios. This has resulted in the reduction of the amount of generated hazardous waste soil being removed from the base for treatment and disposal, as well as resulting in a cost savings of approximately \$800,000.



# MARINE CORPS BASE, CAMP LEJEUNE

## Camp Lejeune, North Carolina

### Underground Storage Tank (UST) Partnering

#### ***Original Conditions***

The UST program at Marine Corps Base (MCB), Camp Lejeune manages more than 125 sites that are in various states of remediation, ranging from Site Sensitivity Evaluations to operation and maintenance of remediation systems.

#### ***Original Approach***

The typical remedial process to reach cleanup goals set by the North Carolina Department of Environment, Health, and Natural Resources consists of a site assessment, pilot tests, corrective action plan, design, construction, and operation and maintenance.

#### ***Results of Original Approach***

This process requires extensive review and coordination between all parties involved.

#### ***How Partnering Was Applied***

MCB, Camp Lejeune, in collaboration with other Department of the Navy representatives, remedial investigation contractors, and remedial action contractors, initiated an informal partnering effort to bring together key people from each organization to work as a team. Each member was committed to working toward the common goal of achieving cleanup of the contaminated sites, while protecting human health and the environment, as expeditiously as possible. The partnering effort allowed

each member to express views and opinions so that final recommendations could be understood and agreed upon by all.

#### ***Savings***

Partnering meetings now occur bimonthly. As a result, review time of draft reports has decreased dramatically, innovative ways to assess contamination and cut costs have been implemented, and the transition from the remedial investigation contractor to the remedial action contractor is now a team effort.

#### ***Overall Results***

Due to the UST partnering initiative, better working relationships, higher quality work, site assessment savings of 25 percent, and an expedited remediation schedule have resulted.

# MARINE CORPS BASE, CAMP LEJEUNE

## Camp Lejeune, North Carolina

### Investigative-Derived Waste Disposal

#### **Original Conditions**

Marine Corps Base (MCB), Camp Lejeune has several sites that have not been completely investigated. These sites require further investigation of soil and groundwater contamination before the appropriate remediation technology can be implemented.

#### **Original Approach**

To delineate the existing contamination soil borings, soil samples, geoprobes, hydropunches, monitoring wells, and groundwater samples are analyzed. Gathering this information creates investigative-derived wastes that typically require treatment or disposal as contaminated material. Historically, MCB, Camp Lejeune had this material containerized, shipped offbase, and disposed of at permitted treatment facilities.

#### **How New Systems Were Applied**

Several remediation systems have been constructed at MCB, Camp Lejeune to remove free product and treat groundwater that is contaminated with petroleum or solvents. These systems can effectively treat investigative-derived wastes that contain petroleum or solvent contamination. The investigative-derived waste is sampled and analyzed to determine its constituents. If the investigative-derived waste can be treated by one of the existing remediation systems, it is transported to and treated on the base in lieu of shipping it offbase and disposing of it at a permitted treatment facility. Treating the

investigative-derived waste at the MCB, Camp Lejeune base reduces the associated transportation and disposal cost.

#### **Savings**

The Department of Defense has a limited budget to investigate and remediate contaminated sites. By saving funds associated with investigation, more remediation efforts can take place within the existing budget.

#### **Overall Results**

Investigative-derived waste can be treated by systems on the base, thus reducing associated costs and allowing funds to be spent on other remediation efforts.



## **Overall Results**

Through the use of partnering, MCB, Camp Lejeune has been able to experience tremendous success in its commitment to cost-effective and efficient environmental restoration. Within a period of 4 years, RODs for 13 of 33 sites at this National Priority List activity have been signed. Removal actions or construction of remedial action has been initiated at 9 sites, thereby exemplifying the significant time savings and ultimate reduction of government spending through the partnering process. The Underground Storage Tank (UST) program has shown similar accomplishments. Results achieved through the UST partnering initiative are better working relationships, higher quality work, site assessment savings of 25 percent, and an expedited remediation schedule.

# MARINE CORPS AIR STATION CHERRY POINT

Cherry Point, North Carolina

## Restoration Advisory Board Community Member Selection

### ***Original Condition***

Screening and selection of the community member nominees for the Restoration Advisory Board (RAB) had not previously involved Tier I team members.

### ***Results of Original Approach***

Selection of the community RAB member was not based on input from the Tier I team partners.

### ***How Partnering Was Applied***

Community relations and RAB topics are included as agenda items for Cherry Point Tier I team meetings. Tier I team partners were invited and encouraged to participate in the screening process for RAB community member nominees. This participation included discussing the RAB establishment process with team members, participating in the RAB prospective community member application review meeting, and interviewing nominees.

### ***Savings Realized***

The specific cost and time savings are not quantifiable.

### ***Overall Results***

As a result of team member input and assistance into selection of the community representatives, the team members have adequately screened prospective community members who can best represent the surrounding community, thus achieving the goals of the RAB as well as enhancing the program.



# MARINE CORPS AIR STATION CHERRY POINT

## Cherry Point, North Carolina

### Elimination of Intermediate Documents

#### ***Original Conditions***

Originally, preliminary draft, draft, draft final, and final documents were prepared by the Navy contractor for the Marine Corps Air Station (MCAS) Cherry Point Installation Restoration program.

#### ***Original Approach***

The preliminary draft documents were reviewed by the MCAS and Atlantic Division engineering field division remedial project managers only. The intention was to provide the Navy and Marine Corps with additional time for review of the document and to ensure that the conclusions and recommendations cited were consistent with Navy and Marine Corps approach and direction prior to the regulator review.

#### ***Results of Original Approach***

Results of the approach were both costly and time consuming.

#### ***How Partnering Was Applied***

The Cherry Point Tier I team agreed to eliminate the preliminary draft document. The Tier I members now meet (either by teleconferencing or team meetings) with the Navy contractor to discuss approach, conclusions, and recommendations prior to the distribution of the draft document. The Tier I team members agreed to perform the first-time review of the draft document, recognizing that the Navy and Marine Corps may also have significant comments regarding the technical approach, recommendations, and conclusions.

The team members also agreed to eliminate the draft final documents and replace them with a response to comments letter to address all comments before distribution of the final report.

#### ***Savings Realized***

An estimated \$18,000 to \$30,000 was saved for each operable unit (dependent on the complexity and size of the unit) by eliminating the preliminary draft and draft final documents. In addition, the 30-day review by the Navy and Marine Corps and the 30-day preparation of the draft by the Navy contractor were also eliminated, which resulted in a time saving of 60 days within the schedule per operable unit.

#### ***Overall Results***

Beneficial results are identified by the cost and time savings. Technical merits of the document are also strengthened by evaluating all comments at once and developing responses to meet the needs of all team members.

**MCLB Albany**  
**General Installation Restoration Program Information**

UNCLASSIFIED

LT George A. Frantz  
Code 505/x5637  
8 July 96

Point Paper

TOPIC:

General information regarding the Marine Corps Logistics Base (MCLB), Albany, GA Installation Restoration Program (IRP).

BACKGROUND:

Potential Sources of Contamination (PSCs) aboard MCLB are separated into two categories, Site Screening PSCs (SSPSCs) or Remedial Investigation/Feasibility Study (RI/FS) PSCs depending on the level of investigation that has already been performed at each site. The MCLB IR program manages 26 total PSCs, 14 of which are confirmed to have contaminated soil, groundwater, or both and are currently undergoing the RI/FS process. Sites where the potential for contamination has been identified, but little or no confirmation data is available are classified as SSPSCs. MCLB currently has 12 SSPSCs under investigation by the Navy CLEAN contract. The SSPSC Final Report is scheduled to come out in January 97 with closure of those found to be clean immediately following. Sites found to have contamination will be added to the list of RI/FS PSCs for further investigation.

RI/FS PSCs are further broken down into Operable Units according to similarity of contaminants or possible remediation methods, geographic proximity, or a combination of these. All reports, proposed actions, investigations and ultimately the closures will be based on actions completed on the OU as a whole. OUs and corresponding PSCs are listed below:

- Operable Unit 1 - PSCs 1, 2, 3, 26
- Operable Unit 2 - PSC 11
- Operable Unit 3 - PSCs 16,17
- Operable Unit 4 - PSCs 6, 10, 12, 13, 22
- Operable Unit 5 - PSCs 8, 14



STATUS:

A pump-and-treat system was installed in 1994 at PSC 3 to provide hydraulic containment of a contaminant plume that is suspected to have migrated off of the base. Two removal actions in 1993 and two more in 1996, all of the dig-and-haul variety, have been completed. Records of Decision (RODs) are expected to be signed this FY for OUs 1&2.

**MCLB Albany**  
**Combining Treatability Studies With Innovative Technology Testing**

UNCLASSIFIED

LT George A. Frantz  
Code 505/x5637  
8 July 96

Point Paper

TOPIC:

Combining Treatability Studies with Innovative Technology Testing at MCLB, Albany.

BACKGROUND:

MCLB is participating in the USEPA's Superfund Innovative Technology Evaluation (SITE) program. Using innovative technologies on a pilot scale, MCLB is performing several treatability studies at PSC 1 which was once, from 1958 to 1959, a one acre trench and fill landfill found to have elevated concentrations of volatile and semi-volatile organic compounds (VOCs/SVOCs). Three technologies, one of which is new, will be evaluated to determine the most efficient remedial alternative for the site. The three technologies, in order of implementation, are discussed briefly below:

*Phase I Ex-situ Chemical Treatment:* Contaminated groundwater is mixed with hydrogen peroxide and ozone gas in a plug-flow reactor to destroy the organics. This process, under development by the U. S. Army Corps of Engineers, is called the Peroxone Oxidation Pilot System or POPS.

*Phase II Ex-Situ Aerobic Bioremediation:* Degradation of chlorinated solvents will be achieved by native methanotrophic bacteria cultivated in a closed system bioreactor commonly known as a rotating biological contactor (RBC). This treatment relies upon bacteria that adhere to and grow on axle-mounted disks that rotate through the contaminated groundwater that then through the reactor headspace which supplies the bacteria with nutrients.

*Phase III In-Situ Enhanced Anaerobic Bioremediation:* Concentrations of existing nutrients and carbon sources required for bacterial growth are limited in the subsurface regions at PSC 1 thereby limiting the rate of natural degradation. The in-situ test system is designed to operate within a small, hydraulically contained area where repetitive addition of amendments (nutrients and carbon source) to the groundwater through injection wells will



stimulate growth of and degradation performed by indigenous microbial populations. Monitoring wells and an extraction well provide for testing and containment of the nutrient plume.

STATUS:

The SITE program is ongoing. Phase I is complete and the cleanup results were promising although, due to low achievable pumping rates, this method is now considered ineffective. For Phase II, the RBC unit has been fabricated, installed, and the cultured bacteria are now well established. It will be several months before data will be available to determine if this alternative is going to be both efficient and cost effective. Phase III will begin at completion of Phase II.

**MCLB Albany**  
**Establishment of a Basewide Groundwater Operable Unit**

UNCLASSIFIED

LT George A. Frantz  
Code 505/x5637  
8 July 96

Point Paper

TOPIC:

Establishment of a Basewide Groundwater (BWGW) Operable Unit (OU) at MCLB Albany which removes groundwater as a media from all PSCs.

BACKGROUND:

Prior to May 1996, groundwater was included as a media, along with surface soil, subsurface soil, and sediment, in most of the MCLB Albany PSCs. Groundwater contamination generally takes longer to remediate to the satisfaction of the Federal and State regulators and long-term monitoring is generally required before a site with contaminated groundwater can be closed out.

What does this mean to MCLB and the Marine Corps? If MCLB had continued to include groundwater as a media in all PSCs, it would be a long time before we "LOOK LIKE" we have done anything. Without intimate knowledge of our program, which the majority of the public, including politicians, do not have, it will look like we are marking time and going nowhere with the program. As a federal entity, and as military, we cannot afford to be labeled as loafers or slackers.

MCLB presented a proposal to the regulators who agreed to entertain a request to establish a new "Basewide Groundwater Operable Unit" and remove groundwater as a media from all existing PSCs. What this means for us is faster close-out of the bulk of our PSCs with only one "nagging" OU to manage in the long-term. Anticipate overhead cost and labor savings since only one unit will need further management. Perhaps the most significant boon to MCLB will be the positive public relations generated by the number of sites that will be officially closed out in the next two years.

STATUS:

MCLB, Southern Division, the CLEAN contractor and the regulators have now agreed on a plan of action which includes implementation of an established EPA



process called "Data Quality Assessment/Data Quality Objectives" wherein we will compile all groundwater data collected during previous investigations, assemble this data into a basewide database, contract the USGS to develop a "Basewide Groundwater Hydrogeologic Framework," identify additional data needs, furnish the additional data, and finally prepare the data for submission to Georgia regulators.

**MCLB Albany**  
**Navy's CLEAN Contractor Hires Out Investigative**  
**Work to U.S. Geological Survey**

UNCLASSIFIED

LT George A. Frantz  
Code 505/x5637  
8 July 96

Point Paper

TOPIC:

Navy's CLEAN contractor hires out investigative work to U. S. Geological Survey.

BACKGROUND:

Georgia regulators have made it clear that they do not intend to participate in any partnering initiatives with the Navy or Marine Corps and furthermore they are sometimes suspicious of our motives, mode of operation, and results of investigations which makes our job more difficult. Our newest and most significant achievement in the IR program was the extraction of groundwater as a media from all PSC sites with the intent to include them into a separate "Basewide Groundwater Operable Unit (BWGW OU)." This initiative will allow for rapid closure of many of our sites since most of the remedial action on other media is almost complete.

One of the core elements of the BWGW OU is production of a basewide hydrogeologic framework which will allow us to accurately define the extent and predict the fate of our contamination and to verify whether it has breached the aquatard that separates our contamination from producing zone of the Upper Floridan Aquifer.

Even though the Navy's CLEAN contractor could produce this hydrogeologic framework we decided to hire the U.S. Geological Survey (USGS) to complete the investigation. Since the USGS is the brain trust for the nations geologic and hydrogeologic information the Georgia regulators trust them implicitly and vigorously endorse this initiative.

STATUS:

The goals of the hydrogeologic study are to:

- Characterize aquifer physical properties
- Determine flow rates and directions



- Determine degree of aquifer heterogeneity
- Correlate regional and local geo/hydrogeologic data
- Estimate chemical transportation rates
- Estimate chemical concentration ranges
- Determine if producing zone has been impacted.

The USGS has already begun to research county well records and literature on the geologic/hydrogeologic makeup of the area, conduct well surveys, and plan to start drilling confirmation wells within the next two weeks.

**MCAS Beaufort  
Passive Bioremediation**

5090  
NREAO  
17 July 96

**POINT PAPER**

**SUBJECT: PASSIVE BIOREMEDIATION**

**PURPOSE OF POINT PAPER**

To discuss the successful implementation of passive bioremediation at POL-contaminated sites aboard MCAS Beaufort.

**BACKGROUND**

Where ground water velocity is large relative to natural biodegradation rates, dissolved degradable contaminants may migrate away from their source. Conversely, where the biodegradation rates are large relative to ground water velocity, contamination may be effectively confined near the source.

The Natural Resources and Environmental Affairs Office (NREAO) successfully partnered with the U. S. Geological Survey, Southern Division Naval Facilities Engineering Command, and the South Carolina Department of Health and Environmental Control (DHEC) to assess the effectiveness of passive bioremediation as a viable ground water cleanup strategy at three POL-contaminated sites aboard the Air Station.

The goals of this effort were two-fold:

1. To develop and apply in the field a methodology for assessing the effectiveness of passive bioremediation as a corrective action for dissolved-phase POL contamination of ground water.
2. To encourage the active participation of DHEC, thereby allowing for regulatory guidelines to develop along with the methodology.

Field events were conducted for the collection of aquifer sediments used to derive rates of indigenous microbial activity in the presence of dissolved-phase POL contaminants and to determine the sorptive properties of the aquifer material. Additional soil and ground water sampling was then conducted to better delineate the extent of contaminant plumes, and hydrogeological parameters, such as ground



water velocity and flow direction, were measured and considered in light of site demographics (potential points of contact).

These data were then incorporated into a two-dimensional digital solute transport model to better predict the development and migration of the contaminant plumes.

## DISCUSSION

Data analysis and interpretation revealed that ground water is being successfully remediated through passive bioremediation at the two sites where the project has been completed. The third site is currently being addressed. Estimated cleanup savings to date are approximately \$300,000 per site.

Passive bioremediation has been approved as the remedial strategy for the two sites, the first such approval for large-scale sites in South Carolina, and MCAS Beaufort is currently serving as the pilot program for DHEC to determine the effectiveness of passive bioremediation as an accepted ground water cleanup method in South Carolina.

## CONCLUSION

Where biodegradation is complete before contaminants reach an installation's property boundary or any other point of contact, passive bioremediation can be a viable, inexpensive, scientifically-valid remedial strategy.

**MCAS Beaufort  
Partnering with Regulators**

5090  
NREAO  
17 July 96

**POINT PAPER**

**SUBJECT: PARTNERING WITH REGULATORS**

**PURPOSE OF POINT PAPER**

To discuss lessons learned in partnering with state regulators to successfully implement passive bioremediation aboard MCAS Beaufort.

**BACKGROUND**

The Natural Resources and Environmental Affairs Office (NREAO) successfully partnered with the U. S. Geological Survey, Southern Division Naval Facilities Engineering Command, and the South Carolina Department of Health and Environmental Control (DHEC) to assess the effectiveness of passive bioremediation as a viable ground water cleanup strategy.

By encouraging the active participation of DHEC early and often in the process it was hoped that the tradition of regulatory inertia could be overcome and a more favorable regulatory environment developed for the implementation of this and other innovative technologies.

**DISCUSSION**

Passive bioremediation has been approved as the remedial strategy for two POL-contaminated sites and is presently being applied at a third site, the first such large-scale approvals in South Carolina. In addition, MCAS Beaufort is serving as the pilot program for DHEC to determine the effectiveness of passive bioremediation as an accepted ground water cleanup method in South Carolina.

The active partnering effort with DHEC served to demonstrating the scientific validity of the process, kept them apprised of all developments, involved them in technical input sessions, and allowed for the timely approval of the methodology. Additionally, involving DHEC at the beginning of process allowed for the regulatory guidelines to



develop along with the technology. South Carolina regulations on the large-scale use of passive bioremediation are now pending.

## CONCLUSION

Partnering with regulators should be initiated at the early in the process when attempting to implement or assess the effectiveness of new or innovative technologies.

MCB Camp Lejeune  
Investigation Derived Waste Disposal

UNCLASSIFIED

6286  
BEMD

POINT PAPER

Subj: INVESTIGATION DERIVED WASTE DISPOSAL

1. Marine Corps Base (MCB), Camp Lejeune has several sites that have not been completely investigated. These sites require further investigation of soil and groundwater contamination before the appropriate remediation technology can be implemented. To delineate the existing contamination soil borings, soil samples, geoprobos, hydropunches, monitoring wells and groundwater samples are analyzed. Gathering this information creates investigation derived wastes that typically require treatment or disposal as contaminated material. Historically, MCB, Camp Lejeune had this material containerized, shipped off Base and disposed of at properly permitted treatment facilities.
2. Several remediation systems have been constructed aboard MCB, Camp Lejeune to remove free product and treat groundwater that is contaminated with petroleum or solvents. These systems can effectively treat investigation derived waste that contain petroleum or solvent contamination. The investigation derived waste is sampled and analyzed to determine it's constituents. If the investigation derived waste can be treated by one of the existing remediation systems it is transported to and treated at the facility in lieu of shipping it off Base and disposing of it at a properly permitted treatment facility. Treating the investigation derived waste at MCB, Camp Lejeune reduces the associated transportation and disposal cost.
3. The Department of Defense has a limited budget to investigate and remediate contaminated sites. By saving funds associated with investigation, more remediation efforts can take place within the existing budget.



SUMMARY

Investigation derived waste can be treated by systems aboard the Base, therefore, reducing the associated costs and allowing funds to be spent on other remediation efforts.

**MCB Camp Lejeune  
Underground Storage Tank Partnering**

UNCLASSIFIED

6287  
BEMD

POINT PAPER

Subj: UNDERGROUND STORAGE TANK (UST) PARTNERING

1. The Underground Storage Tank Program at Camp Lejeune manages over 125 sites which are in various stages of remediation ranging from Site Sensitivity Evaluations to operation and maintenance of remediation systems. The typical remedial process to reach cleanup goals set by the North Carolina Department of Environment, Health, and Natural Resources consists of a site assessment, pilot tests, corrective action plan, design, construction, and operation and maintenance. This process requires extensive review and coordination between all involved parties.
2. Camp Lejeune, in collaboration with other Department of the Navy representatives, remedial investigation contractors, and remedial action contractors has initiated an informal partnering effort to bring together key people from each organization to work as a team. Each member is committed to working toward the common goal of achieving cleanup of the contaminated sites and protecting human health and the environment as expeditiously as possible. The partnering effort allows each member to express views and opinions so that final recommendations are understood and agreed upon by all.
3. Partnering meetings now occur bimonthly. As a result, review time of draft reports has decreased dramatically, innovative ways to assess contamination and cut costs have been implemented, and the transition from the remedial investigation contractor to the remedial action contractor is now a team effort.

SUMMARY

Due to the Underground Storage Tank Partnering initiative, better working relationships, higher quality work, site assessment savings of 25%, and an expedited remediation schedule has resulted.



MCB Camp Lejeune  
Five Well Site Assessments

UNCLASSIFIED

6287  
BEMD

POINT PAPER

Subj: FIVE WELL SITE ASSESSMENTS

1. The Underground Storage Tank Program at Camp Lejeune has over 125 contaminated sites which are in some stage of remediation. Before a corrective action can be put in place, a underground storage tank site must be investigated to determine the extent of contamination and appropriate remediation needed. Historically, a typical site assessment was composed of 12 Type II wells, three Type III wells, and 15 Hydropunch borings to delineate soil and groundwater contamination. Quite often, soil contamination was poorly delineated while a large number of monitoring wells were placed at the outer edges of the groundwater plume.
2. To eliminate unneeded monitoring well costs, Camp Lejeune has modified the previous investigation process to a five Type II well (shallow aquifer) and two Type III well (intermediate aquifer) site assessment. The decrease in monitoring wells has been replaced by obtaining soil and groundwater data via 15 Geoprobe sampling points, which have replaced the Hydropunch sampling. The Geoprobe sampling is analyzed initially so that the monitoring wells can be strategically placed to ensure complete horizontal and vertical delineation of both soil and groundwater.
3. Due to extensive cuts in the Department of Defense DERA budget, it is important to save funds wherever possible. By cutting back the amount of monitoring wells used in a site assessment, over \$20,000 per site has been saved and a total of \$200,000 has been saved in FY 96.

SUMMARY

Spending more money at a underground storage tank site does not necessarily mean a better product. By strategically using a smaller number of wells, a better quality site assessment can be accomplished and funding can be used in other areas of the remediation effort.

MCB Camp Lejeune  
Remedial Action Goal Changes

UNCLASSIFIED

6286  
BEMD

POINT PAPER

Subj: REMEDIAL ACTION GOAL CHANGES

1. Marine Corps Base, Camp Lejeune has been able to significantly reduce contaminated soil requiring removal from the Base for treatment/disposal. In addition, a substantial cost savings has resulted through the change of remedial action goals while still maintaining protection of human health and the environment. The initial remediation level for removal of PCB and pesticide contaminated soils at Installation Restoration (IR) Sites #21 and #80 respectively, were found to be much more stringent than required to be protective of human health and the environment.
2. The remedial action level established for Site #21, Transformer Storage Lot 140, was originally based on future residential use and set in the Record of Decision at 0.37 parts per million (ppm). Site screening using the established 0.37ppm action level resulted in the area needing excavation to be twice the original estimate. Using an industrial exposure scenario, the action level was revised via an Explanation of Significant Differences to 10ppm. The savings between the 0.37ppm and the 0.10ppm remedial action levels were over \$500,000.
3. At Site #80, the Paradise Point Golf Course Maintenance Area, the original removal action level for pesticide contaminated soil for a Time Critical Removal Action was established for the pesticide Dieldrin at 37 parts per billion (ppb). Pre-excavation site screening using the action level of 37ppb showed the area twice as large as the original estimate. The original action level was based on a professional groundskeeper working all day every day on site. This level was deemed not reasonable based on existing site use. Using a more appropriate industrial exposure scenario, regulators agreed to the revised 360ppb action level. At 37ppb, there would have been approximately 1900 tons of contaminated soil for removal and off-Base treatment/disposal at a cost of over \$900,000. At the revised action level of 360ppb, there were approximately 950 tons of soil at a cost of \$633,000. This revised removal action level reduced the



amount of soil requiring action by 50% and provided a cost savings of approximately \$300,000.

### SUMMARY

Thorough investigation of the remedial action goal at Installation Restoration Sites #21 and #80, Marine Corps Base, Camp Lejeune altered the cleanup levels to more appropriate industrial exposure scenarios. This has resulted in the reduction of the amount of generated hazardous waste soil being removed from the base for treatment/disposal, as well as, resulting in a substantial cost savings of approximately \$800,000.

MCB Camp Lejeune  
Time Critical Removal Actions

UNCLASSIFIED

6286  
BEMD

POINT PAPER

Subj: TIME CRITICAL REMOVAL ACTIONS

1. Using guidance established in the National Oil and Hazardous Substances Pollution Contingency Plan, Marine Corps Base (MCB), Camp Lejeune has completed numerous Time Critical Removal Actions (TCRAs). These TCRAs were employed to reduce risk to human health and the environment while continuing with the environmental investigation process.
2. A brief description of three of these TCRAs follows:
  - During the summer of 1994, MCB, Camp Lejeune employed a TCRA to removed pesticide contaminated soil at Installation Restoration (IR) Program Site #2, Former Nursery/Day Care Center. This site had been used as a pesticide mixing and storage facility prior to being converted to a nursery/day care center. Following the completion of the TCRA, MCB, Camp Lejeune was able to sign a Record of Decision (ROD) selecting an "Institutional Controls" remediation alternative with long term monitoring of the groundwater.
  - In 1995, MCB, Camp Lejeune removed dangerous metallic debris from IR Site #43, the Agan Street Dump at Marine Corps Air Station, New River. IR Site #43 is located immediately adjacent to a nearby residential area, next to a Boy Scout meeting place. The debris scattered throughout the site included a military armored vehicle (tank) and numerous other pieces of rusted metal. By removing this metallic debris, the risk endangering residential children playing at the site was mitigated. This TCRA will probably lead to the selection of a "no action" remediation alternative in the ROD.
  - May through June 1996 found MCB, Camp Lejeune again employing a TCRA to remove pesticide contaminated soil from an IR Site. IR Site #80, the Paradise Point Golf Course Maintenance Area underwent a removal action to reduce the human health risk associated with soil contaminated with pesticides that were



stored and mixed at the site. This TCRA will probably lead to the selection of a "no action" remediation alternative in the ROD.

### SUMMARY

When faced with soil contamination and minimal or no groundwater contamination, MCB, Camp Lejeune takes the lead agency role and proactively initiates Time Critical Removal Actions. Through implementing TCRA's, Camp Lejeune has been able to remove risk to human health and the environment as well as expedite the IR process by removing contamination. This has enabled Camp Lejeune to sign Records of Decision requiring "no action" or "institutional controls" only.

**MCB Camp Lejeune  
Base-Wide Groundwater Remediation Study**

UNCLASSIFIED

6286  
BEMD

POINT PAPER

Subj: BASE-WIDE GROUNDWATER REMEDIATION STUDY (BRAGS)

1. The Base-wide Groundwater Remediation Study (BRAGS) is a comprehensive local and site specific groundwater model (3-D flow model) which will provide the Atlantic Division, Naval Facilities Engineering Command and Marine Corps Base (MCB), Camp Lejeune with groundwater flow models. The objectives of BRAGS include: description of groundwater flow, evaluate contaminant transport, predict the effectiveness of various remediation schemes at individual sites, and demonstrate effects of groundwater withdrawals on the Castle Hayne aquifer. It is envisioned that BRAGS will be utilized as a decision-making tool for groundwater management, protection, and restoration.
2. The BRAGS model was designed to model both Base-wide and site specific groundwater situations. The Base-wide model was constructed based on groundwater elevation data from over 30 sites at the Base and from United States Geological Survey data collected from the water supply wells at the Base. Site-specific model data were constructed from Installation Restoration Sites 3, 6, 9, 82, Underground Storage Tank Sites 889-891, and from nearby water supply wells.
3. To date, a report has been completed which provides a comprehensive groundwater model for Site 82. The report provides an evaluation of the Site 82 pump and treat system including the anticipated capture zones and placement of shallow and deep extraction wells. A pump/recovery test at Hadnot Point Fuel Farm has recently been finished and a report is due out soon.
4. By modeling Base-wide and site specific scenarios, BRAGS can be used as a forecasting tool to help planners make better decisions regarding groundwater resource management concerns. Pumping well locations and pumping rates at specific sites can be changed or modified in order to evaluate numerous remediation schemes/scenarios. With the aid of this tool, plume and groundwater modeling for some systems may be able to reduce long term



monitoring from 30 to 15, ten, or even five years. This in the long term, will reduce Operational and Maintenance costs of these larger remediation systems.

## SUMMARY

The focus of BRAGS is to develop a Base-wide groundwater flow model which can be used to evaluate the effects of various groundwater remediation projects that are active or planned for MCB, Camp Lejeune. BRAGS will reduce Operational and Maintenance costs, model contaminant plumes, and forecast the various effects different remediation systems have on one another.

## **MCAS CHERRY POINT LESSON LEARNED IMPORTANCE OF BACKGROUND DATA**

**BACKGROUND:** MCAS Cherry Point is located in the Atlantic Coastal Plain physiographic province and covers an area of approximately 11,485 acres. The near surface geology consists of unconsolidated sediments of sand, silt and clay. Numerous metals have been historically detected at consistently high concentrations within groundwater at all IRP sites. Traditional groundwater sampling consisted of aggressive pumping or bailing of the well then analyzing filtered and nonfiltered (accepted by EPA) samples to identify dissolved metals vice suspended sediment within the groundwater sample. An analysis of the data indicated that some metals occurred at high concentrations naturally and that nonfiltered samples which included suspended sediment only increased the concentration to an unacceptable level.

**DISCUSSION:** The sampling method as well as suspect naturally occurring metals triggered the need to modify the sampling method as well as obtain reliable background metal data for the Air Station. Early in 1990, the groundwater sampling method was revised to utilize a low flow peristaltic pump for sampling groundwater. Filtered and unfiltered samples were analyzed for comparison. An analysis of the filtered and nonfiltered data, using the low flow technique, indicated that a close correlation existed between the filtered and nonfiltered samples thus indicating that suspended sediment was artificially increasing the metals concentration. Background groundwater sampling data were obtained from numerous, non-disturbed areas of the Air Station. Results of background sampling indicated that the concentrations of most metals were fairly consistent throughout the Air Station. Barium, calcium, iron, magnesium, and sodium were detected in almost all samples at roughly similar, elevated concentrations in the correlated filtered and unfiltered samples. In addition, there were some isolated detections of arsenic, chromium, lead, and aluminum.

**CONCLUSIONS:** During 1996, as a result of the background groundwater database, regulators were able to concur with a no action preferred alternative for Operable Unit 3 groundwater aboard MCAS Cherry Point. Operable Unit 3 consist of a former fly-ash pond (Site 6) and former incinerator and open burn area (Site 7). Both areas, because of their former uses, would have required groundwater remediation due to metals had the background data not been available. This has resulted in a significant cost savings for the government and provided a realistic clean-up decision. Additionally, the background data is proving useful for negotiating a remedial decision for Operable Unit 2 ( Site 10, a 40 acre sanitary landfill). Currently, revisions to the Feasibility Study are being made as a result of a review of background data and naturally occurring metals. The original preferred alternative was a pump and treat remedial system to pretreat organics and metals. However, discussions with regulators and the review of the background data has increased the pursuit of air sparging



as the preferred alternative since metals would not require treatment. It is anticipated that, construction cost could be reduced by \$0.9 million and, at a minimum, \$100,000 per year could be saved on operation and maintenance should air sparging vice pump and treat be selected as the remedial alternative.

**MCAS CHERRY POINT  
SUCCESS STORY  
RESTORATION ADVISORY BOARD**

**BACKGROUND:** In July of 1988, MCAS Cherry Point formed the Technical Review Committee (TRC) as part of the Installation Restoration (IR) Program. To comply with Department of Defense and Marine Corps policy, MCAS Cherry Point has now expanded its community participation by converting its existing TRC into a Restoration Advisory Board (RAB).

**DISCUSSION:** Public outreach efforts began by placing RAB community member solicitation application notices in local newspapers; next, RAB "fact sheets", as well as applications, were distributed and placed on Installation and community bulletin boards. Twenty-one RAB community member applications were received. On June 28, 1995, the existing TRC met to review and rank applications based on pre-established selection criteria. As part of the transition from the TRC to the RAB, the existing TRC members voted to add six additional community member positions to the board in order to adequately reflect the diversity of community interests regarding IR activities. To complete the RAB selection process, on September 12, 1995, the TRC conducted personal interviews with the top six ranked nominees. During the interviews, RAB member responsibilities and individual RAB community member responsibilities were emphasized to the nominees.

On October 20, 1995, the MCAS Cherry Point Commanding General approved the RAB community member nominees. The community members selected serve in various capacities within the local community. For instance, the RAB community members selected include: a local government official, small business owner, teacher, local environmentalist, retired military/ local resident, and a scientific researcher.

On April 13, 1996, the newly selected community members were given a presentation and site tour of the five high priority IR Operable Units. On June 17, 1996, the RAB charter, containing the board's mission statement and operating procedures, was signed and the RAB Community Co-chair was nominated and elected.

**CONCLUSION:** With the signing of the charter and the election of the RAB Community Co-chair, the transition from the TRC to the RAB is now complete for MCAS Cherry Point. This transition was a successful transition due to joint cooperation and participation of the existing TRC members, as well as, the Tier I partnering team members. Working together, the TRC members were able to carefully select community members who truly represent the diverse interests of the local area.



As a result, the RAB community members have contributed constructive suggestions and relayed valid community concerns regarding actions and proposed actions involving IR site cleanups. With the RAB's continued input and growing success, MCAS Cherry Point will steadily achieve it's IR cleanup goals.