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Center Team Wins Government Technology Leadership Award

by **Bob DiMichele**

A team from the Corps of Engineers' Huntsville Center has earned the Government Technology Leadership Award for the development of a cost-efficient methodology for conducting geophysical investigations.

"Meandering Path Geophysical Investigations" have cut costs, increased efficiency, and improved public safety during the process to cleanup unexploded ordnance on public and private lands, according to Roger Young, concept champion. Thirteen government and contractor support employees joined together to develop a new way to protect the public from the potential threat of unexploded ordnance.

The team is comprised of: Young; Lynn Helms, concept development of geophysics; Scott Millhouse, concept development of navigation; Arkie Fanning, concept development of statistics; John Potter, technology integration and science advisor; Alonzo Andrews, field implementation; Karl Blankinship, project management; Glenn Earhart, project management; Matt Gifford, software development at Gifford Integrated Sciences; George Ostracoth, contracted statistical analysis; Jack Foley, field implementation and navigation improvements for SC&A; Al Crandall, field implementation for GeoCenters; and Bob Menke, field implementation for Parsons.

The team used recent global positioning system technology advances to allow the investigative crews to simply meander randomly through a site instead of mapping grids at pre-determined locations. Young said the "Meandering Path" method eliminates the need for the creation of expensive sampling grids

that require surveying and vegetation clearance.

The Corps of Engineers' Huntsville Center team awarded the Government Technology Leadership Award included:

Alonzo Andrews
Karl Blankinship
Glenn Earhart
Arkie Fanning
Lynn Helms
Scott Millhouse
John Potter
Roger Young

Contractors on the team included:

Al Crandall
(GeoCenters)
Jack Foley
(SC&A)
Matt Gifford
(Gifford Integrated Sciences)
Bob Menke
(Parsons)
George Ostracoth

\$500 per acre in surveying costs not performed and \$3,500 per acre cost savings incurred due to the much reduced overall project mobilization and site analysis costs.

"These savings in the investigative phase of the cleanup work allow more money to be spent on the actual removal of unexploded ordnance. Therefore, more work can be completed within the same budget, and public safety is enhanced," Young emphasized.

More than 15 million acres of land in the United States are potentially contaminated with unexploded ordnance resulting from military activities. One hundred nominations from various agencies throughout the nation competed for recognition in the eighth annual award program sponsored by *Government Executive Magazine*.

The Huntsville Center team has documented cost avoidances of approximately \$256k at four field demonstration sites and anticipated additional savings of several hundred thousand dollars on recently planned projects.

"At each of these sites, even though the technology application is new, there has been immediate and significant cost saving over the traditional "grid" approach," said Young. He stated the cost savings is estimated to average \$2,500 per acre in vegetation clearance costs not performed,

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Foster Wheeler Receives Fort McClellan Cleanup Contract

Huntsville, Ala.—The cadence calls of training have disappeared from the fields and forests of Fort McClellan, Ala., the Army's former home of the Military Police and Chemical corps. The training mission is gone and the fort officially closed September 30, 1999 under the Base Closure and Realignment Act.

Much of its 23,157 acres sit idle and empty except for one legacy that remains of a long history of national defense, unexploded ordnance (UXO). UXO remains behind as a historical reminder and a future hindrance to any redevelopment.

Therefore, the cleanup of ordnance and explosives at Fort McClellan, Ala., is both a necessity and a priority for the U.S. Army Corps of Engineers and the civilian communities near the former Fort McClellan.

In significant progress toward the cleanup goal, the U.S. Army Engineering and Support Center, Huntsville, awarded the Foster Wheeler Environmental Corporation of Huntsville a \$50 million, five-year contract for ordnance and explosive cleanup at Fort McClellan.

Foster Wheeler will integrate, manage and execute aspects of ordnance and explosives risk reduction and cleanup. This may include systems

integration, data management using geographical information systems, historical data analysis, footprint reduction methodologies, field reconnaissance, engineering evaluations, geophysical mapping, anomaly discrimination, cost analysis, risk analysis, statistical sampling and analysis, and unexploded ordnance removal and disposal.

The company has already received the first task order award from this contract, which was for the preparation of an engineering evaluation and cost analysis for ordnance and explosive characterization of an area of Fort McClellan that includes several formerly used firing ranges.

The Army's objective is to conduct cost-effective risk reduction and cleanup using innovative technologies and techniques to improve quality and productivity. The Army believes it has found the "best possible contractor with the best possible technology," said Bob DiMichele, public affairs officer of the Corps of Engineers' Huntsville Center.

"Foster Wheeler was chosen because it provided some of the most accurate results ever exhibited in the munitions-clearing industry," added David Skridulis,

project manager for ordnance and explosive removal for the Huntsville Center.

"We are extremely pleased to be awarded this contract," said Sam Box, Foster Wheeler Environmental Corporation's chairman, president and CEO. "We competed in an actual field test against the best unexploded ordnance firms in the industry and came out on top. This project brings to bear our use of innovative technology and proprietary software, people, experience and our strong commitment to safety and service to our client."

In addition, the Huntsville Center has contracted Parson Engineering Science of Atlanta, Ga., to conduct the investigation for chemical warfare materiel on Fort McClellan. The investigation will look at 20 sites that official records and historical documents indicate have the potential for buried chemical warfare materiel.

Currently, there are no known sites of buried chemical warfare materiel on Fort McClellan. The investigation will look at sites where records indicate past practices included aspects of chemical warfare training. The planning for and conduct of the chemical warfare materiel investigation will take approximately one year to complete.



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Site Reveals Radioactive Cannonball

by Gregg Kocher, St. Louis District

Most people know what a nuclear weapon is, but how many have heard of a radioactive Civil War cannonball? The discovery of two Civil War-era projectiles at the St. Louis Downtown Site (SLDS) of the Formerly Utilized Sites Remedial Action Program (FUSRAP), prompted further investigation of the spoil excavated from a large pit.

The pit is located on property owned by the Mallinckrodt Chemical plant, which processed uranium for the Manhattan Project during World War II in the development of the atomic bomb. Historical research shows that prior to Mallinckrodt's occupation of the site, a stove manufacturer had a foundry and pig iron yard there. It is surmised that the two projectiles were scrap iron that was to be smelted.

Hank Counts of the the Corps' St. Louis District's Ordnance and Technical Services Branch (ED-P) of Engineering Division, drafted a work plan, which was eventually approved by both the Huntsville Engineering and Support Center and the Mallinckrodt corporation. Mike Dace, Chief of ED-P and Tom Freeman, Engineering Division Technical Coordinator, facilitated and harmonized the effort with leaders at Huntsville and Mallinckrodt.

On Saturday, September 11, Safety Specialists from ED-P, Hank Counts, Gregg Kocher and George Sloan, all former military bomb disposal technicians who also have extensive training in radiation safety, met with contractor safety representatives and equipment operators at the SLDS. Once the required briefings were given, entering the exclusion zone surrounding the pit necessitated donning protective clothing: Tyvek coveralls, two rubber booties over work boots, three pairs of gloves, as well as hard hat and safety glasses.

Using magnetometers that detect ferrous metal, Counts and Kocher searched the pile of dirt, then had rough terrain dump trucks affectionately called "T-Rex," haul it away. Sloan performed quality assurance at another location using a Mark 26 ordnance locator as a final check.

The highlight of the day came when a

lump of metal was detected in the gray clay that turned out to be a cannonball. The 4.5-inch sphere was cleaned, then



Counts and Kocher search for unexploded ordnance using magnetometers.



The 12-pounder cannonball and black powder.

checked for radioactivity by health physicists. The round had scaly rust, but was otherwise in good condition. Initially believed to be solid shot, the round was handed over to the St. Louis Police Department's Bomb and Arson Squad, who were standing by. They transported the cannonball in a bomb containment vessel and later returned with a surprise.

Wraps of detonating cord had removed the rust and exposed a fuse hole containing a time fuse that was described as being made of tarred cloth. A hollow cavity inside held black powder that was still capable of being ignited after 130+ years. The cannonball is believed to be a Confederate 12-pounder common shell.

The team continued to work until sunset, having searched over 250-cubic yards of material. At the conclusion of the work, the site had been stabilized in accordance with the work plan. The success of this mission was due to teamwork, partnering, and prior coordination at all levels.

Smaller footprints equal big steps

CEHNC, ORNL form partnership

**by Amy King,
Oak Ridge National
Laboratory**

What do a national research laboratory and Huntsville Center have in common? A partnership is being developed between Oak Ridge National Laboratory (ORNL) and Huntsville Center to share environmental technology information and methodologies to conduct ordnance detection and clean-up more efficiently. By sharing technologies, technical resources, and lessons learned, Huntsville Center and ORNL are improving the efficiency and effectiveness of UXO and other ordnance-related clean-up.

Remote Sensing

For several years, ORNL has been using remote sensing technologies to characterize and monitor hazardous waste sites on the 35,000-acre U. S. Department of Energy Oak Ridge Reservation (ORR). In early 1997, ORNL began applying the technologies and methodologies to the detection of unexploded ordnance (UXO) and ordnance burial sites. Then, in 1998, ORNL began assisting Huntsville Center with ordnance characterization activities by applying a modified version of the ORNL-developed Footprint Reduction Methodology to areas of concern at the Fort McClellan Army Installation in Anniston, Ala.

The Footprint Reduction

Methodology was developed by ORNL to identify those areas on the ORR that are free of contamination. The process uses historical information, remote sensing technologies, geographic information systems (GIS), field inspections, and global positioning systems (GPS) to identify and document areas of potential contamination on the ORR.

Once the Footprint Reduction Process is completed for each study area, the clean areas within the study area are submitted to regulatory agencies for approval and removal from the ORR National Priorities List (NPL) Site.

Methodology

Leveraging extensive experience and lessons learned on previous large-scale Footprint Reduction projects, ORNL and Huntsville Center have teamed to undertake a series of projects to reduce the clean-up footprint at Fort McClellan. ORNL began the process by developing a Fort McClellan-specific historical aerial photograph interpretation methodology. A site-specific land use/land cover classification system was developed for Fort McClellan and the surrounding area. ORNL then developed a process

(See Smaller footprints, page 5)



This 1954 aerial photograph of Fort McClellan depicts ranges east of Rock Hollow Road.

Smaller footprints

(Continued from page 4)

for the interpretation work itself.

Four Phases

The process was broken into four phases: preparation, interpretation, anomaly resolution, and documentation.

During the preparation phase, the photographs for each study area are selected for interpretation. The photographs are scanned at high resolution and converted to digital images. The digital images are then rectified to geographic coordinates. During the interpretation phase, the digital images are interpreted and land use/land cover types are digitized.

During the third phase, anomalies are identified, tracked, and resolved. Land areas within the images that do not follow natural land cover succession (i.e., over time grass becomes scrub/shrub vegetation which becomes a forested area) are identified as anomalies using ORNL-developed software.

Anomaly Causes

The anomalies are numbered and assessed to determine the cause of each anomaly. Anomalies caused by roads, buildings, and landscaping activities are considered human disturbance to land cover, but are not necessarily associated with ordnance or contamination activities. Anomalies caused by the undocumented clearing of vegetation, range/ammunition activities,

undocumented activities, and unidentifiable objects/structures are determined to be of concern and require follow-up field investigations by Huntsville Center.

Final Phase

During the final phase, ORNL culls information from the Fort McClellan Archives Search Report, historical Fort McClellan maps, and previous investigation reports to determine the nature of the anomalies of concern. The findings are documented in a final investigation report.

Historical aerial photographs can be a key indicator of previous land use/land cover practices over large geographic areas (see 1954 Fort McClellan photograph). Since photographs are historical records, they may be used in research and as legal documentation of activities that relate to prior uses of land.

Aerial Photographs

Historical aerial photographs are available for most of the Fort McClellan Army Installation from 1937 through 1994. So far the photographs have been used by Huntsville Center and ORNL to investigate and document prior activities in the East By-Pass Area, 19 chemical training areas, and 10 areas containing multiple ranges. "ORNL has saved us significant time and money in the Fort McClellan clean-up process by readily providing the technical expertise necessary to reduce the clean-up footprint," commented David

Skridulis, Huntsville Center Program Manager for the Fort McClellan Project.

This fall the Huntsville Center plans to initiate an investigation of portions of the Choccolocco Mountain Range.

Other Projects

The Huntsville Center and ORNL partnership is also using innovative technologies for UXO characterization activities at the Badlands Bombing Range in South Dakota. This project is assessing the UXO detection capabilities of an airborne magnetic sensor. The partnership submitted a proposal to the Environmental Security Technology Certification Program (ESTCP) to determine the effectiveness of identifying and mapping UXO and other ordnance items using several remote sensing technologies. The proposed project was accepted and the two-year project will begin next month.

Shared Resources

The Huntsville Center and ORNL partnership allows each organization to build research and project teams from a diverse pool of expert technical staff. By sharing resources, experienced team members are available for fast response to time-critical tasks and creative innovation of ideas is spurred by the interactions of personnel from Government organizations with vastly different national objectives.

Huntsville Center RCWM Team Completes Cleanup at England Air Force Base

by **Bob DiMichele**

The sign said, "Chemical Burial Area, Keep Out." For thirty years, it was a concise reminder of the potential hazard facing the environmental cleanup of England Air Force Base, near Alexandria, La.

Closed in 1992, the redevelopment of England Air Force Base faced a difficult environmental hurdle, the threat of chemical warfare materiel contamination.

A dirt berm had been built on the base as a backstop for a small arms range. The berm was 380 feet long, 65 feet wide at the base, and 8 feet high. In 1969, workers excavating fill from the abandoned firing range backstop were overcome by an unknown gas. The workers had uncovered glass vials from a chemical agent identification set. The sets were common items on military installations from 1928 to 1969 because service members used them as training devices to identify chemical warfare agents. Research by the Huntsville Center indicated the uncovered glass vials probably contained the chemical warfare agents phosgene, chloropicrin, dilute sulfur mustard, and dilute lewisite. They were probably buried in the mid-1940s.

Base closure meant it was now time to deal with the berm in a safe

and effective manner before releasing it outside the military. In fact, it was within a few hundred feet of an airplane taxiway for Alexandria's new airport. The Air Force Base Conversion Agency in Austin, Texas, called in the Huntsville Center because of its status as the U.S. Army Corps of Engineers' Ordnance and Explosives Center of Expertise and Design Center. It has some of the nation's leading experts in the recovery of chemical warfare materiel.

The Huntsville Center created a team of specialists that could address any chemical warfare hazard the site might pose. Parsons Engineering Science from Atlanta, Ga., was hired as the architect-engineering firm for the geophysical investigation that researched the characteristics of the site. Human Factors Applications, Inc., Waldorf, Md., served as the removal contractor.

The Army's Technical Escort Unit brought its unique chemical warfare materiel handling skills and the Edgewood Chemical and Biological Center provided its chemical analysis capabilities. Both organizations are headquartered at Edgewood Arsenal, Md.

The team began the excavation July 9. Ken Shott, a safety specialist from the Huntsville Center's Recovered Chemical Warfare Team, supervised site safety during the work.

He said the contractors first cleared the trees, shrubs, and weeds that had overgrown the berm. Then, they excavated the entire berm.

"They started with the face of the berm that served as the

impact area for the small arms' bullets," Shott said.

Lead contamination from the bullets was an additional concern because of the bullets, he stated. "But first, we tested the dirt for chemical warfare contamination so we wouldn't spread a hazard." Then, according to Shott, when the specialists from the Edgewood Chemical and Biological Center found it to be clean of chemical agent, samples of the dirt were then shipped off site to a commercial lab to test the dirt for lead contamination. Fortunately, the dirt did not contain that hazard.

Shott explained that the workers sifted more than 5,150 cubic yards of dirt as they reduced the entire berm to ground level. The team not only investigated the berm but also the five-acre site surrounding the berm. He said the team excavated more than 1,000 "hits," subsurface anomalies mapped during the geophysical investigation.

"But, there was a lot of junk," he emphasized. "The HFA workers found fence posts, vehicle parts, building hinges, wire and even found old radio tubes. Only the radio tubes appeared to have been buried purposely. The other scrap was found within inches of the surface."

The end result was that the site was found to be clean. That's right. There was no chemical warfare materiel anywhere.

The glass vials found back in 1969 were not really an indication of a chemical burial site, just a single, unfortunate incident.

The sign that stood guard for three decades is now gone. The concern that sign represented can disappear as well and the redevelopment of that part of England Air Force Base can continue.



Workers sift dirt from a small arms range berm while looking for buried chemical warfare materiel.

Tierrasanta Project Remains Protective of Public Five Years After Completion

by **Kim Gillespie, Huntsville Center**

The Corps of Engineers' first ordnance investigation and removal project in the Tierrasanta community and Murphy Canyon Naval Housing Area in San Diego, Calif., marked five years since its completion and underwent the first ordnance and explosives

Long Term Monitoring review this year. "The site remains protective of the public and we attribute the success of this initial project and our first Long Term Monitoring effort to the stakeholders of the community. The members of the community are highly proactive and initiated local action to maintain or increase protectiveness without Federal assistance," said Brad McCowan of the Corps' Huntsville Center, Ordnance and Explosives Design Center.

Long Term Monitoring is intended to evaluate whether ordnance clearance actions and/or other risk reduction methods used at a site remain effective and continue to protect the public. The Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) requires that Hazardous, Toxic, and Radioactive Waste (HTRW) sites undergo this evaluation within five years of the completion of the agreed upon removal action or as circumstances may warrant. The Corps has adopted this requirement for ordnance sites where indicated.

The Corps' Los Angeles District and Huntsville Center performed this initial Long Term Monitoring review for Tierrasanta. The process included working closely with state regulators, who helped plan this first-ever effort. A site investigation (performed by Corps' safety personnel), stakeholder interviews, public meetings and a survey of community members were all performed as part of the process. The draft Long Term Monitoring report was provided to state regulators for review and comments, and a 30-day public review and comment period was included in the process.

"Our initial efforts at Long Term Monitoring were a success because of the early coordination and collaboration among the Corps, stakeholders, local

authorities, state regulators and the Navy," said McCowan.

A presentation was made to the community association before any work began, and a survey was issued to the approximately 10,000 homes that comprise the community. Over 1,000 surveys were returned providing the Corps with feedback, concerns and recommendations regarding previous work and suggestions for future public outreach.

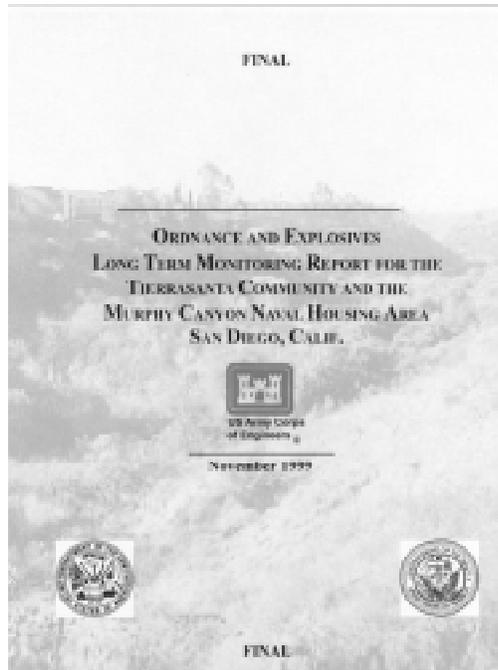
"Meaningful stakeholder participation is defined by this site. The local parties involved committed to supporting initiatives such as school programs warning about OE in the Canyons, proactive management of habitat and other resources, and proactive control of development or intrusive activity through building permits and other local initiatives," said McCowan.

The state regulator, the California Environmental Protection Agency, also pledged its support. "The state accepted responsibility for oversight of the continuing effort to protect the people of the Tierrasanta community," said McCowan.

The Corps of Engineers renewed its commitment to support all local initiatives that maintain protectiveness of the project. "We have developed plans for annual articles in the paper and ordnance education brochures for newcomers to the community," added McCowan.

The final version of the Long Term Monitoring Report for the Tierrasanta Community and Murphy Canyon Naval Housing Area has been placed in the local public repositories and can also be accessed through the internet after January 2000 at www.hnd.usace.army.mil/oew/index.htm.

"Returning to our first project site and being able to proclaim that our cleanup efforts remained protective of the public was a real milestone for us. But the real success story is the support and commitment the stakeholders provided to ensure our efforts are continued," said McCowan.



The final version of the Long Term Monitoring Report for the Tierrasanta Community and Murphy Canyon Naval Housing Area is now available.

Partnering Agreement Aims to Elevate Environmental Policy Needs

by **Kim Gillespie, Huntsville Center**

The U.S. Army Environmental Policy Institute (AEPI), and the U.S. Army Corps of Engineers (USACE), Office of the Deputy Commanding General for Military Pro-



grams, Environmental Division, formalized a partnering agreement pertaining to environmental issues in November. The agreement is designed to identify, analyze and elevate environmental policy issues to the Army leadership. “This agreement will strengthen USACE support to the Army by providing a mechanism that ensures the lessons learned at the point of execution are incorporated in environmental policies,” said Patricia Rivers, Chief

of the Environmental Division at Headquarters USACE.

The AEPI was formed in the early 1990’s to assist the Army Secretariat in developing strategies and policies to address environmental, safety and occupational health issues.

In executing its mission, the AEPI monitors state and federal environmental legislation, analyzes future environmental challenges, provides policy makers with environmental investment strategies, monitors emerging environmental technologies, and facilitates interaction with academia, industry and the Army users.

“This new relationship with the U.S. Army Corps of Engineers will help us ensure that evolving Army Environmental policy is valid with respect to practical realities and that execution can keep pace with change. The results should be policy and execution that are financially and technically supportive of mission accomplishment,” said Rebecca Rubin, Director of the Army Environmental Policy Institute.

As part of the agreement, the AEPI will participate with the Corps in program and project reviews. The purpose of such reviews will be to provide feedback to both the policy developers (Army leadership) and the program and project executors (the Corps). “Our first ‘project review’ with the AEPI was our first Long-Term Monitoring effort at the Tierrasanta community and Murphy Canyon Naval Housing Area in San Diego, Calif. (see page 6 story),” said Dr. John Potter, Chief of the OE Center of Expertise at the Corps’ Huntsville Center.

“They have followed our process, reviewed our documentation, performed interviews with the players involved, and provided feedback as we went along. They also will provide us a final report of ‘lessons learned’ from the policy standpoint. In turn, we are providing them with feedback from the standpoint of the project executor so they can elevate the issues requiring policy decisions from the Army leadership,” said Dr. Potter.

The relationship provides unique opportunities for both agencies. “The AEPI will be working directly with us on issues, which allows them to view firsthand how we actually implement policies, rather than reading a summary or receiving a condensed version of our project efforts. That’s really a first for us,” added Dr. Potter.

“The activities resulting from this agreement will facilitate communications between the field personnel and the environmental policy makers in the Army. The Corps’ Centers of Expertise are committed to their assigned roles in these endeavors,” said Dr. Marcia Davies, Director, Hazardous, Toxic, Radioactive Waste Center of Expertise at the Corps’ Omaha District.

The partnership also calls for both parties to review each other’s initiatives. “If we can share information and resolve policy needs in the early stages, it may well save us, and ultimately the Army, both time and money in the future,” emphasized Dr. Potter.