



New Innovative technologies designed for DCSR program...

ROBOTICALLY CONTROLLED HYDROCUTTER SYSTEM TO DEMIL HIGH EXPLOSIVE DU ROUNDS

Designed, fabricated, pilot tested, & implemented a first of its kind treatment technology to demil DU contaminated high explosive rounds. Utilizing a robotically controlled 10,000 PSI abrasive slurry jet within a blast chamber, this treatment effectively controlled radiological contamination and safely eliminated UXO hazards.

This method was developed as a response to the absence of nationwide facilities for treating mixed radiological, UXO & RCRA wastes, & lack of methods that eliminate explosive hazard without spreading radioactivity from detonation.



Hydro-Cut HE Rounds

A-CLASS: Aerial DU Detection

Developed, pilot tested, and fielded real-time, 3-D correlated airborne DU survey system to identify contamination in areas where conventional survey techniques are not safe or practical. The A-CLASS uses custom algorithms to process

millions of data points in near real-time, providing field personnel with the ability to focus the survey on affected areas and reach completion quicker.



Cabrera A-CLASS at Pohakuloa

- Saved \$1M over conventional ground survey costs and eliminated the potential for serious injury from munitions and terrain.
- Laser range finder coupled with GPS provides real time 3-dimensional guidance to helicopter pilot eliminating double pass and missed survey areas in featureless landscapes like lava flows at PTA and seas of vegetation at MMR.
- Lightweight waterproof platform attaches instruments to any helicopter; requires no FFA approval
- Custom software algorithms allow for near real-time survey results.

CABRERA has similar successes at other DoD DU/penetrator sites...

Aberdeen Proving Ground

- NRC unrestricted release of 10 buildings and three land areas

Twin Cities Army Ammunition Plant

- NRC unrestricted release a building

Nellis Air Force Base

- NV State unrestricted release of multiple vehicles

Grissom Air Reserve Base

- AF Safety Center/NRC unrestricted release of two land areas

Kirtland Air Force Base

- NM State unrestricted release

McClellan Air Force Base

- NRC unrestricted release of 12 buildings and 21 land areas

DCSR Program: A Team Approach

CABRERA personnel have not only supported the US Army DCSR program through projects in the field, but also by assisting in assembling historical information. We provided this valuable input to the USACE St. Louis District office, who was tapped with generating the Archive Search Reports. Such continuous, quality, team communication has enabled that Army and USACE to narrow the potential scope of the program to sites with actual potential for DCSR impact..

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CABRERA SERVICES

DAVY CROCKETT SPOTTER ROUNDS

CABRERA PROGRAM SUMMARY



DCSR PROGRAM

NOTABLE ACCOMPLISHMENTS

- Lake City AAP: 600 Bullet Catcher Unrestricted Release by NRC
- LCAAP: Building 3A , sumps and sewer lines Unrestricted Release by the NRC
- Achieved no further action at LCAAP range, avoiding potential impact to munitions production
- Developed A-CLASS DU Survey System for Inaccessible Areas
- Designed DCSR Hydro-Cutter for UXO DCSR
- Development of Uniform, Cost Saving Approach for DCSR Sites
- Continual Progress on DCSR Sites in Challenging Hawaii Environment
- Innovation results in total program savings well in excess of \$20M to date
- Efficient and Effective US Army & Cabrera Partnership

GSA Number: GS-10F-0360N

US Army & Cabrera Services: 10 Strong Years

Cabrera Services is uniquely honored to have been selected by the Army to support their Davy Crockett Spotter Round (DCSR) program. We are proud of this partnering relationship and the many successes we have achieved together over the past ten years. During that time, we have managed the removal of thousands of DCSRs from Army ranges, the removal of millions of pounds of Munitions Debris (MD) contaminated with DU, and the disposal of tens of thousands of tons of DU contaminated soil/debris.

We have collectively developed cutting edge technologies to address both detection and disposal of DCSRs at various locations. These technologies include Air-borne platforms for detection, custom algorithms and software for analyzing the data, and hydro-cutting tools for demilitarizing DCSR UXO rounds.

Our proactive teaming approach and out of the box thinking has resulted in substantial cost and time savings. Including, positive public perception for taking quick, effective steps to address legacy issues at DCSR sites. We at CABRERA look forward to continuing our partnering relationship with the Army in to address similar challenges worldwide. This handout summarizes our successes to date.



CABRERA SERVICES



Lake City Area 10 Rad/UXO Screening Plant

Lake City Army Ammunition Plant

Lake City AAP served as a DCSR production facility, test range, and demilitarization location.

600 YARD BULLET CATCHER

Over 40,000 rounds were fired into the 600 Yard Bullet Catcher as part of the demilitarization process. CABRERA performed excavation, demolition, and T&D resulting in **NRC unrestricted release**.

- Designed, operated, and permitted **system to separate UXO from soil** contaminated with DU and lead
- Conceptualized, designed, fabricated and operated **first-of its-kind hydro-cutter system** to render 759 DCSR and HE/HEI rounds inert for disposal
- Obtained **fast-track approval for RCRA treatment** of soil and UXO through negotiations with Missouri DNR, saving \$30K in possible penalties
- Operation of on-site laboratory provided near real-time feedback during remediation **reducing remediation volume** by over 20%
- **Negotiated alternate disposal facility** for 1,500 cubic yards of slightly contaminated soil saving \$600K in T&D costs

BUILDING 3A DU WING DEMO, SUMP AND SEWER LINE REMOVAL

The Building 3A DU Wing supported production of DCSRs. The Building 3A DU Wing and some of its industrial sumps and sewer lines became contaminated with DU.

CABRERA supported and finalized demolition, excavation, industrial line/sump excavation and removal, sewer line radiological assessment, and offsite T&D, **securing NRC unrestricted release**.

- **Justified no further action** for non-impacted process sewer lines Achieved using innovative survey methods (crawler with radiological instrumentation and differential GPS), saving \$100K in T&D costs

- **Negotiated alternate disposal facility** for 1,100 cu yards of slightly contaminated debris saving \$440K. Four large concrete sumps and over 300 LF of process piping/soil was removed

AREA 27 RISK ASSESSMENT

The firing range was used for testing of the DCSRs. CABRERA performed radiological /chemical characterization and developed a risk assessment model to quantify radiological and chemical risk, **justifying no further action**.

AREA 10 SAND PILES

The Area 10 Sand Piles were generated as bullet catchers were emptied during routine operations, including the 600 Yd Bullet Catcher used for DCSR demil. CABRERA performed investigation, remedial design, onsite metals treatment, and offsite T&D.

- Designed and operated system to **separate UXO and DU frags from soil**
- Designed and implemented **innovative survey technique** to demonstrate soil was free from radioactive materials
- Negotiated with NRC and State of Kansas to **dispose of 97% of soil as non-radioactive** daily cover at sanitary landfill (58,000 tons), saving \$9M in T&D
- **Negotiated alternate disposal facility** for 1,000 tons of slightly contaminated debris saving \$4M in T&D costs
- Achieved remedy in place and **met challenging FFA and NRC deadline**, avoiding potential license violation

AREA 31 REMEDIATION

DCSR DU bodies were unexpectedly discovered during remediation of a site landfill (Area 31). CABRERA was contracted to address State and NRC concerns.

- Designed and implemented rad survey resulting in **NRC unrestricted release**
- **Negotiated approval for non-rad disposal** of over 5,000 cu yards of soil/debris, saving \$2.5M in T&D



Fort Campbell Historic Photo

Schofield Barracks

The SB Impact Range is currently under going a multi-million dollar BAX Construction project. During the course of site preparation, DU from the DCSR was discovered on the range in 2006.

CHARACTERIZATION

- Surveyed 425 acres of an active impact area, collecting over 1100 samples
- Coordinated survey with SB Range Control to **minimize Army training delays**

RISK ASSESSMENT

- Performed Human Health Risk Assessment for SB BAX Construction Area **finding no appreciable risks exist at site**
- Document developed in coordination with DASA, USACHPPM, CDC, NRC, USAG-HI, IMCOM-Pacific

PUBLIC MEETING/PRESS SUPPORT

- Supported **multiple press conferences** to update the public on the status of projects
- Maintained strict document timelines to support the **public release of project documents (BHHRA)**

CONSTRUCTION SUPPORT

- **Responded quickly to changing USACE needs** for health physics support for the BAX Construction
- Cleared 150 acres of construction footprint of surface DU
- Maintained a **Radiological Controlled Zone** around the BAX Construction
- Established onsite laboratory to provide near real-time assessment of DU concentration in spoils, **accelerating schedule by months**

RANGE SUSTAINMENT

- Surveyed over **2 million pounds of Munitions Debris** to remove DU and Radium (Ra)
- Source term removal of over **200 ft³ of DU contaminated soils** from BAX

Makua Military Reservation/Pohakuloa Training Area

MMR and PTA represent **vital Army training areas in Hawaii** which are the subject of **intense public scrutiny** regarding the Army's management of the land. Both areas were suspected to have been DC training areas.

DCSR SCOPING SURVEYS

Challenging terrain dictated the use of **helicopters to perform visual reconnaissance** during the scoping surveys to locate DC pistons.

- Verified the presence of DU at PTA in **less than three days time** (55,000+ acres site, DCSR 20mm)



DCSR Recovered at PTA 2007

DCSR CHARACTERIZATION SURVEYS

- Used A-CLASS to survey over 1000 acres at PTA and over 200 acres at MMR
- **Saved over \$3M and six months of schedule**; ground surveys would have cost \$3M more than aerial surveys and would have taken 6+ months to conduct as opposed to the two months for aerial surveys
- Continued to establish **evidence of NO DCSR at Makua** and narrowed down the likely impacted areas at PTA from **2500+ acres to under 500 acres**

Fort Carson / Fort Hood

Both sites represent DC training areas which are undergoing significant construction in areas which may have been impacted by DC activities.

FORT CARSON SCOPING SURVEY

- **Responded to Army need in less than three days** to scope construction sites for potential DCSR impacts
- **Briefed deputy garrison commander** regarding DC history and methodology for conducting scoping
- Conducted reconnaissance in **construction area and Battle Force Training Area (50,000+ acres)**
- Briefed DASA/IE Mr. Davis regarding initial findings

FORT HOOD HUMAN HEALTH RISK ASSESSMENT

Firing range area impacted with DCSR was chosen as site to model a cost saving response to future DCSR sites.

- Developed **innovative methodology** with the Army for using analogous data from similar sites along with site specific information to develop risk assessment.
- Process will **save millions of dollars** in onsite survey costs and should be **applicable to most DCSR sites**.