

# U.S. ARMY CORPS OF ENGINEERS PERSPECTIVE: ADVANCED GEOPHYSICAL CLASSIFICATION (AGC)

Nick Stolte (presented by John Jackson)  
Environmental and Munitions Center of Expertise  
U.S. Army Engineering and Support Center, Huntsville  
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# TOPICS

- Why AGC?
- 24 April 2017 AGC guidance memo
- Policy Requirements
- Current AGC projects
- Contracting with USACE
- Example Project Cost Analysis
- USACE Military Munitions Geophysicist Group



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## WHY AGC?



- Defensible environmental data
- More robust MRS characterization
- Cost savings in the remedial action
- Bounding and understanding uncertainty



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# FUDS IMPLEMENTATION GUIDANCE FOR AGC

- Developed by the Military Munitions Design Centers and EM CX
- Standardizes use of AGC for RI and RA
- Requires Accreditation and USACE expertise
- Requires the FS to include at least one remedial alternative with AGC
- Provides standardized PWS language for AGC to ensure consistency



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DEPARTMENT OF THE ARMY  
U.S. ARMY CORPS OF ENGINEERS  
441 G STREET, NW  
WASHINGTON, DC 20314-1000

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MEMORANDUM FOR SEE DISTRIBUTION

SUBJECT: Advanced Geophysical Classification (AGC) Implementation at Formerly Used Defense Sites (FUDS) Military Munitions Response Program (MMRP) Projects

1. PURPOSE: This guidance memo and enclosures provide instructions on how to implement AGC technology in all phases of the munitions response process.

2. BACKGROUND: Munitions response activities involve detection and inspection of buried metallic objects (i.e., geophysical anomalies) that may be Munitions and Explosives of Concern (MEC). Traditional munitions response actions utilizing single loop sensors require a significant amount of digging to determine if they are MEC or other metallic debris. Often, less than 1% of the detected anomalies are actual MEC; thus, this method expends a huge amount of resources digging up items that turn out not to be hazardous. New geophysical sensors capable of detecting and classifying anomalies as MEC or other metallic debris are available for use in munitions response activities. This process, known as Advance Geophysical Classification (AGC), fits physics-based models to the observed sensor responses to determine physical characteristics such as geometry and wall thickness. The physical properties are compared to a library of known MEC items to classify them based on the closest match. The library forms the basis for determining if anomalies are potentially MEC or other metallic debris. Classification using advanced electromagnetic induction sensors has been shown to significantly reduce the cost of a munitions response.

On April 11, 2016, the Office of the Assistant Secretary of Defense, Energy, Installations, and Environment (ASDEI&E) issued a policy memorandum Subject: Department of Defense Advanced Geophysical Classification Accreditation Program (DAGCAP). ASD (EI&E) established the DAGCAP to accredit organizations that use AGC at Munition Response Sites (MRSs). The DAGCAP provides a unified program for organizations performing AGC to demonstrate competency and document conformance to minimum quality systems requirements based on the International Organization for Standardization and the International Electrotechnical Commission standards.

3. APPLICABILITY: This guidance is applicable to all USACE organizations engaged in FUDS MMRP projects.

4. REFERENCES:

(a) Office of the Assistant Secretary of Defense Memorandum, Subject: Department of Defense Geophysical Classification Accreditation Program, April, 11, 2016.



## AGC IS THE PREFERRED METHOD

- Prior to beginning a munitions response project, the MMDC evaluates the site and develops preliminary design.
- Cost to completes (CTCs) and Independent Government Estimates (IGEs) assume AGC when it can be implemented.
  - Hybrid model approach
- For most MRSs, use of AGC will provide the best value for the life of the project.



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# CONTRACTORS MUST BE ACCREDITED

## 9 Accredited Firms:

- *AcornSI and NAEVA Joint Venture, LLC (AN JV)*
- *Aptim Federal Services, LLC*
- *Arcadis U.S., Inc.*
- *Black Tusk Geophysics*
- *CH2M Hill, Inc.*
- *Parsons Corporation*
- *Tetra Tech EC, Inc.*
- *Weston Solutions, Inc.*
- *TPMC – White River, LLC*

The screenshot shows the DENIX (DoD Environment, Safety and Occupational Health Network and Information Exchange) website. The page is titled "Advanced Geophysical Classification Accreditation and Other Tools" and is part of the "Defense Environmental Restoration Program Military Munitions Response Program". The page content includes a navigation menu, a search bar, and a main text area. The main text area discusses the DoD Advanced Geophysical Classification Accreditation Program (DAGCAP) and provides information on how to become accredited, including a list of requirements and contact information for accreditation bodies.

**DENIX**  
DoD Environment, Safety and Occupational Health Network and Information Exchange

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**Defense Environmental Restoration Program**  
**Military Munitions Response Program**

**Advanced Geophysical Classification Accreditation and Other Tools**

**DoD Advanced Geophysical Classification**

DoD developed advanced geophysical classification to improve the efficiency of cleaning up munitions and to focus its resources on addressing the potential explosives safety risks at munitions response sites (MRSs). To ensure quality data, the Office of the Deputy Assistant Secretary of Defense for Environment, Safety and Occupational Health (ODASD/ESOH) created the DoD Advanced Geophysical Classification Accreditation Program (DAGCAP) to accredit organizations that use advanced geophysical classification at MRSs.

**DAGCAP**

On April 11, 2016, the Assistant Secretary of Defense (Energy, Installations, and Environment) established the DAGCAP, requiring the DoD Components to begin using DAGCAP accredited organizations for advanced geophysical classification work beginning in calendar year 2017.

Accreditation through the DAGCAP is achieved through a two-step process: 1) assessing the organization's quality system, and 2) successfully demonstrating capabilities performed at the Aberdeen Proving Ground DAGCAP test site.

The DAGCAP uses two third-party accreditation bodies to provide a unified program for organizations to demonstrate competency and document conformance to requirements.

The requirements are based on the international standard ISO/IEC 17025:2005, supplemented by the [DoD Quality System Requirements for Organizations Performing Advanced Geophysical Classification](#). This scope of accreditation is as follows: ISO 17025:2005, General Requirements for the Competence of Testing and Calibration laboratories, accreditation for Technology (Electro Magnetic Induction), Test (Subsurface Munitions), and Method (Advanced Geophysical Accreditation). The Environmental Data Quality Workgroup provides management and oversight of the DAGCAP.

DoD has selected and formally recognized two accreditation bodies to administer the DAGCAP:

American Association for Laboratory Accreditation (A2LA) <https://www.a2la.com>  
Laboratory Accreditation Bureau (LAB) <http://lab-a-b.com>

Organizations planning to use the advanced geophysical classification at DoD MRSs should begin the application process by directly contacting either accreditation body.

<http://www.denix.osd.mil/mmrp/advanced-geophysical-classification-accreditation-and-other-tools/>



## PWS SHALL INCLUDE STANDARDIZED TEXT

- AGC-specific text was developed by the USACE geophysicists at the MM DCs and EM CX.
- Separate templates for investigations and remedial/removal actions.
- Text is included in each RFP for a MR project.
- Training is provided for PDTs in the AGC business process, to include proposal evaluation. (FUDS 208)



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## PDT TO INCLUDE EXPERIENCED GEOPHYSICIST

- Each AGC project will include a geophysicist that is a SME in classification processes and procedures.
- Internal training plan is in place to grow AGC expertise.
- USACE geophysics group meets monthly to discuss issues and share ideas and lessons learned.



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## FS TO INCLUDE AGC-SPECIFIC ALTERNATIVE

- Remedial Action Objectives shall be clearly defined in the FS.
- Benefits of AGC in achieving the Remedial Action Objective are evaluated and compared to other MEC remedial alternatives.
- Accurate probability of detection rates must be stated and evaluated as part of the analysis.
- Acceptable end states are identified.
- If AGC is not considered effective, the reasons must be documented in the context of the detailed analysis of the alternative in the FS.



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## CURRENT FUDS AGC PROJECTS (24)

Project	Phase
Camp Breckinridge	RI
Camp Ellis	RA
Camp Sherman Artillery Range	RI
Fort Custer	RI
Lockbourne AFB	RI
Spring Valley	RA
Fort Jay	RI
FLBGR	RA
He'eia	Pilot Study
Ordnance Plan	RI
Waikaloa	RA
Pacific Jungle Combat Training Center	RI
Bostwick	RI
Camp Blanding	RA
Culebra	TCRA
Fort Pierce	RI/Treatability Study
Fort Pickens	Treatability Study
Fort Taylor	RI
Motlow Range	RA
Mt Owen	RI
Camp Beale	RI
Camp San Louis Obispo	FS
Camp Bowie	RI
Camp Fannin	RA



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## CONTRACTING WITH USACE

Majority of Contracts will be through one of 4 Military Munitions Design Centers:

- Huntsville, Baltimore, Omaha, Range Support Center

“Best Value” is the preferred evaluation criteria

- Low cost doesn't always win
- Clear preference for AGC
  - AGC can cost more in the RI but...
  - AGC can save millions in the RA



# EXAMPLE PROJECT: CAMP SAMPLE RANGE COMPLEX

- 2,000-acre MRS
- No mention of AGC<sup>4</sup> in the FS
- Alternative for Surface and Subsurface Clearance ultimately chosen, FS cost estimate ~ \$44,000,000
- RA scoped prior to AGC policy and did not specify AGC
- Government Estimate was ~ \$75,000,000
- Winning contractor included AGC in their proposal, which resulted in up to 45% cost savings



# MILITARY MUNITIONS GEOPHYSICISTS GROUP (M2G2)

## EM CX

- Andy Schwartz
- John Jackson
- Mike Madcharo
- Nick Stolte

## HNC

- Amy Walker
- Bob Selfridge
- Debra Edwards
- Erin Wallin
- Kelly Enriquez
- Richard Grabowski
- Richard Perry

## NAB

- David King
- Thomas Colozza
- Douglas Rissing

## SPK

- Cheryl Webster
- Kyle Lindsay
- Lew Hunter
- Teresa Rodgers

## SWF

- Eric Kirwan



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# Questions?



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