



EQT UXO PROGRAM

U.S. ARMY ENVIRONMENTAL QUALITY TECHNOLOGY (EQT) UNEXPLODED ORDNANCE (UXO) PROGRAM



Team evaluates a UXO technician at the Aberdeen Test Center to determine degree of operator influence.

For more information

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The U.S. Army is committed to being a leader in environmental stewardship. To succeed, the Army implements state of the art technological improvements that strengthen its ability to meet ambitious stewardship goals without compromising the primary mission of training. The environmental quality technology (EQT) program focuses research and development, test and evaluation, technology demonstrations, and technology transfer efforts that enhance the Army's ability to conserve natural resources, reduce operating costs, and field systems with minimal or no impact to the environment.

The U.S. Army Environmental Command (USAEC), the U.S. Army Corps of Engineers Huntsville Engineering and Support Center, the U.S. Army Engineer Research and Development Center (ERDC), and the U.S. Army Aberdeen Test Center (ATC) established an EQT UXO product delivery team (PDT). The multi-agency Army UXO PDT has partnered in the development of innovative UXO detection and discrimination technologies in support of active range sustainability and the cleanup of UXO on an estimated 1,700 Formerly Used Defense Sites (FUDS), 25 Base Realignment and Closure (BRAC) sites, and on many active installations covering millions of acres.

The goals of the EQT UXO program are to provide the munitions and explosives of concern (MEC) community with technologies that:

- Lower costs associated with UXO removal actions at munition response sites (MRS).
- Reduce the risk to humans (e.g., explosive ordnance disposal personnel).
- Provide rapid UXO detection/discrimination in support of active range sustainability

Failure to discriminate between UXO and non-hazardous materials such as range clutter results in a high percentage of false alarms. These false alarms significantly increase the time and cost required to successfully remediate a site. Accurately identifying UXO while rendering a site safe in a timely manner significantly reduces the risk to those involved with cleanup efforts.

The EQT UXO Program is divided into three general phases: 1) Research and Development; 2) Demonstration and Validation, and 3) Technology Transfer. Much of the research and development work transitions to demonstration and validation phase of the program.

The major research and development thrust areas for the EQT UXO program were:

- I. Site Characterization Issues and Approach Strategy;
- II. Modeling, Analyses, and Processing;
- III. Sensor Design and Enhancement; and
- IV. Hand Held UXO Detector Design.

The major demonstration and validation thrust areas for the EQT UXO program are:

- I. Standardized UXO Technology Demonstration Sites;
- II. UXO Technology Demonstrations;
- III. Hardware/Software Integration; and
- IV. Geophysical QA/QC.

Technology Transfer is provided via:

- I. Conference Presentations and Papers;
- II. Technical Reports and Journal Articles;
- III. Hardware and Software Workshops; and
- IV. USAEC and ERDC UXO websites.

The Standardized UXO Technology Demonstration Sites were established at Aberdeen Proving Ground (APG), Maryland, and Yuma Proving Ground (YPG), Arizona, by the Army EQT Program and the DoD Strategic Environmental Research and Development Program/ Environmental Security Technology Certification Program (SERDP/ESTCP) in order to provide consistent and scientifically defensible UXO technology demonstration sites. These two sites evaluate current technologies under field conditions typically found on munition response sites. In addition to the traditional land-based sites, APG also has shallow water and active response sites. The Active Response Site is a two acre area adjacent to the APG Standardized Site that contains materials of concern deposited from range activity. The Active Response Site validates the UXO detection and discrimination technology demonstrations. These sites enable both land and shallow water technologies to be fully and consistently evaluated for capabilities and limitations.

The Standardized Sites have proven to be very beneficial to the UXO community. For example, the APG blind grid was used to give researchers a better understanding of how individual operators of UXO detection/discrimination systems can influence data collection. The EQT UXO Program studied both novice and expert operators trained in identical manners and compared their ability to operate a system as instructed. The Standardized Sites have also been used to demonstrate and validate other EQT UXO technologies such as the innovative dual-mode systems. Vehicular-towed and hand-held dual-mode systems were developed by the ERDC and corporate partners Geo-Centers, Inc., AETC, Inc., and G-tek Ltd., and combine the benefits of both magnetometry and electromagnetic induction. Dual-mode systems were developed during 2003-2005 and did not exist prior to the Army EQT UXO Program.

The Army EQT UXO Program has also advanced geophysical data processing and analysis approaches that enhance the users ability to detect and discriminate buried UXO in a wide range of environmental and geophysical conditions. The rapid detection and discrimination of UXO from range clutter is expected to reduce the cost of UXO site remediation by approximately 75 percent versus conventional detect and excavate technologies.



Demonstrator displaying their shallow water detection system.



Demonstration of a detection system on the mogul challenge area at Yuma Proving Ground.

