

## **UTILIZATION OF AIRBORNE MAGNETOMETRY FOR THE DETECTION, CHARACTERIZATION AND IDENTIFICATION OF UXO AND HTRW PITS AND TRENCHES**

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### **ABSTRACT CATEGORY: DEMONSTRATION OF INNOVATIVE TECHNOLOGY**

To facilitate the detection and removal of buried munitions, the U.S. Army Engineering and Support Center, Huntsville has been applying innovative tools and techniques to do a better job and to be more cost effective. One of these tools is the use of an airborne magnetometer to identify potential UXO. The Center conducted a demonstration and evaluation of this technology at the Badland Bombing Range, Pine Ridge, SD. In 1999 we successfully deployed a commercial system with custom enhancements to demonstrate the proof-of-concept. In 2000 the team independently created a greatly improved prototype system that we tested and then incorporated into the Pine Ridge FUDS project. Unlike the typical environmental problem with the associated pits and trenches, the UXO objective is small and we desire to locate individual items. This necessitates flying close to the ground. This same technology can easily locate concentrations of ferrous items as associated with a disposal pit from above tree top level. This presentation will present an overview of the system, the areas surveyed and the initial results from field validation sampling. Performance will also be presented for large concentration of ferrous items at various stand off heights for HTRW applications.

For Phase I in 1999 a test grid was established and seeded with representative OE items (2.75", 100# and 250# practice bombs), stimulants and miscellaneous ferrous hardware. Items were included that were too small and too deep for the expected performance. This test grid was doubled in size in 2000 with the addition of 30 new seeded OE items to include 60mm, 81mm, 105mm, 155 mm and 100# and 500# practice bombs. This test site was mapped with the airborne magnetometer at various heights as well as with a prototype aerial EM system. In addition over 2200 acres of bombing targets and random transects was mapped by the aerial magnetometer for target location and site characterization. This was to support ESTCP testing as well as for direct application to the EE/CA work being performed for the FUDS program. The data was analyzed and targets selected for performance evaluation. The selected targets have been excavated for validation. Predicted performance for locating HTRW pits and trenches will be based upon these tests. This presentation will include the demonstrated performance from this validation as well as planned enhancements, future validation testing and predicted performance at tree top heights.

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