Terminology and Acronyms used in ITRC "Geophysical Classification for Munitions Response" Training

ITRC's Geophysical Classification for Munitions Response training and associated document (GCMR-2, 2015, http://www.itrcweb.org/GCMR-2/) explain the process of geophysical classification, describe its benefits and limitations, and discuss the information and data needed by regulators to monitor and evaluate the use of the technology. More information is available at www.itrcweb.org.

AB	**Accreditation Body:** Organization authorized by DOD to evaluate and certify a company to implement Geophysical Classification for Munitions Response.
Advanced Electromagnetic Induction Sensors	Munitions-classifying sensors that are designed with many transmit and receive coils rigidly assembled in a fixed-array configuration. The combination of multiple receive coils, large bandwidth electronics, and supporting sensor data results in the collection of significantly more data than can be collected with single-axis EM61 sensors.
Anomaly	Area of anomalous response from a geophysical sensor. Most often caused by a buried metal object but can also result from geologic interference.
ANSI/ASQ E4-2004	Quality Systems for Environmental Data and Technology Programs—Requirements with Guidance for Use
CA	corrective action
Classify	Determine whether an anomaly is a Target of Interest (TOI) or "non-TOI". This ability is the key capability provided by GCMR technology.
Clutter	Non-hazardous metal items or "fragments" of items, also often called "FRAG".
Cluster	A group of metal items with nearly identical polarizability signatures.
Cued Mode	Advanced sensor data collection scheme in which the user positions the sensor at discrete XY locations previously identified by other means (also referred to as static or stationary measurement).
CSM	**Conceptual Site Model:** Iterative representation of the site that summarizes and helps project planners visualize and understand available information. The CSM is the primary planning and decision making tool used to identify the key issues and the data necessary to transition a project from characterization through post-remedy.
DAGCAP	DOD Advanced Geophysical Classification Accreditation Program
DAQ	data acquisition
DD	Decision Document

DGM	**Digital Geophysical Mapping:** Data collection process that employs a metal detector system to digitally record sensor and position data for subsequent data analysis and presentation.
DMM	discarded military munition
DOD	United States Department of Defense
DQI	data quality indicator
DQO	**Data Quality Objective:** A qualitative and quantitative statement developed to clarify study objectives, define the type of data needed, and specify the tolerable levels of potential decision errors. A DQO is used as the basis for establishing the type, quality, and quantity of data needed to support decisions.
DUA	data usability assessment
ECOS	Environmental Council of the States
EDQW	DOD Environmental Data Quality Workgroup
EMI	**Electromagnetic Induction:** Geophysical technique in which an EMI sensor emits a primary electromagnetic field that induces secondary electromagnetic fields in metallic objects, which are subsequently measured by the EMI sensor.
EOD	explosive ordnance disposal
ERIS	Environmental Research Institute of the States
ESTCP	Environmental Security Technology Certification Program
EZ	exclusion zone
FUDS	formerly used defense sites
Geophysical Classification	The process of making principled decisions, using data collected by advanced geophysical sensors, to differentiate between buried items that are potentially hazardous and those that can be safely left in the ground during munitions response actions.
GCMR-QAPP	**Geophysical Classification for Munitions Response - Quality Assurance Project Plan:** A QAPP developed specifically to implement Geophysical Classification at a Munitions Response Site.
Geophysical System Verification	The quality control (QC) process used to verify that a geophysical sensor is operating properly, and to provide ongoing monitoring of the quality of the geophysical data collection and target selection process as it is performed in the production survey. The process includes daily measurements of an instrument verification strip and production area blind seeding.

GPS	global positioning system
IDQTF	Intergovernmental Data Quality Task Force
IMU	inertial measurement unit
ISO	**Industry Standard Object:** Commonly available pipe sections that have been characterized and can be used as munition surrogates in the geophysical system verification process.
ISS	informed source selection
ITRC	Interstate Technology and Regulatory Council
IVS	**Instrument Verification Strip:** One or more buried inert munitions or industry standard objects emplaced in a line. Data are collected over the IVS twice daily to verify that the geophysical sensor system can deliver the expected detection and classification performance.
Inversion	Fitting measured sensor data to an EMI response model (commonly the dipole model) to obtain the model parameters, including the object's location and depth, orientations of its principal axes, and its principal axis response functions.
Library Matching	Comparing the derived polarizabilities of each detected buried metal object with the polarizabilities of a collection of known munition items in a library. The objective is to classify the unknown objects based on the similarity of their polarizabilities to an entry in the library.
MEC	munitions and explosives of concern
MMRP	Military Munitions Response Program
MPC	measurement performance criteria
MPV	man-portable vector
MQO	measurement quality objective
MRS	munitions response site
Multiaxis Sensor	Advanced EMI Sensor with excitation and receive coils arranged to interrogate a buried object along multiple axes from one measurement location.
Advanced EMI Parameters	Parameters used to define the dipole that best fit the observed data. These parameters are used as estimates of extrinsic or intrinsic characteristics of a buried metal object. Extrinsic characteristics include position and orientation and intrinsic characteristics are the principal axis polarizabilities ('betas') related to the object size, shape, wall thickness, and material composition.
Polarizabilities	Three principal axis responses resulting from the inversion process, which relate directly to physical attributes of the object under investigation. The degree to which these polarizabilities match an item from a library of candidate responses

	forms the basis for classification decisions.
QA	quality assurance
QA Seeds	**Quality Assurance Validation Blind Seeding:** Seeds emplaced by the government (or its representative) and blind to the production team to provide confidence to the entire project team and stakeholders that the data collected in the project are usable for their intended purpose.
QC Seeds	**Quality Control Blind Seeding:** Inert munition or munitions surrogate buried on the site to serve as a process QC check. Surrogates are selected to correspond with munitions of interest on the site. QC blind seeds allow the production team to recognize that problems exist, and provides a means of identifying root causes so that corrective action can be undertaken while still in the field.
QAPP	Quality Assurance Project Plan
QASP	Quality Assurance Surveillance Plan
QC	quality control
Quality System	A structured and documented management system describing the policies, objectives, principles, organizational authority, responsibilities, accountability, and implementation plan of an organization to ensure quality in work processes, products (items), and services. The quality system provides the framework for planning, implementing, and assessing the work performed by an organization and for carrying out required quality assurance and QC activities.
RAO	**Remedial Action Objective:** Cleanup goals for a selected remedial action. Preliminary RAOs are often developed during the Preliminary Assessment/Site Investigation phase of a munitions response, and are refined into definitive RAOs during the course of the Remedial Investigation/Feasibility Study process. Final RAOs are documented in the Record of Decision or Decision Document. Remediation efforts are considered complete upon attainment of the RAOs.
RCA/CA	**Root Cause Analysis/Corrective Action:** The process of determining the cause of a failure, the implications of this cause on the remainder of the data set, and the corrective action(s) required to ensure the data will meet project objectives.
ROD	Record of Decision
RTK	real-time kinematic
SERDP	Strategic Environmental Research and Development Program
Single Axis EMI Sensor	"Traditional" EMI metal detector, uses a single transmit coil to induce currents in a buried metal object for measurement by a receive coil.
SOP	standard operating procedure

Dynamic Survey	A data collection method in which the user scans the ground with a sensor while in motion.
Target	A targeted location for future investigation (cued classification or intrusive) derived from: amplitude response detection (anomaly peak locations), advanced detection (source locations), geophysical classification (source locations), or analog assisted detect and dig.
TOI	**Target of Interest:** Items that must be correctly classified and excavated to accomplish site remediation goals. All munitions, QC and QA seeds, and other items designated by the site team, such as significant pieces of munitions, are targets of interest. Some site teams may even include selected fuzes and other components to the TOI list. Munitions do not have to contain high explosive filler to be classified as TOI; anything that must be excavated and examined to determine whether it is hazardous should be included in the definition of TOI.
Non-TOI	**Non-Target of Interest:** Items that do not need to be excavated.
UFP-QAPP	Uniform Federal Policy for Quality Assurance Project Plans
UFP-QS	Uniform Federal Policy for Implementing Environmental Quality Systems
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
UXO	unexploded ordnance
Validation	Procedures used to make sure items were correctly classified using GCMR technology and processes. Process validation tests the overall approach in the following four ways: (1) placing blind validation seeds (the locations of which are known only to the government); (2) comparing recovered items to the predictions contained on the dig list; (3) excavating an additional 200 objects (threshold verification digs) beyond last TOI to verify correct placement of the threshold; and (4) conducting validation digs of 200 randomly selected non-TOIs at the end of the project to provide added confidence that anomalies classified as non-TOIs are, in fact, non-TOIs.
Verification	Process of ensuring data are collected properly.