Stakeholders' Forum on the Use of Geophysical Classification for Munitions Response

by Lenny Siegel
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Munitions Response projects are typically conducted by private contractors on behalf of the Defense Department or other entities with oversight by state environmental regulatory agencies and/or the U.S. Environmental Protection Agency. However, the people who live in the communities where teams look for and destroy unexploded ordnance—in some cases directly on project sites—are the *ultimate customers* of munitions response. As the Defense Department leads the way toward the adoption of more efficient characterization technologies, such as Geophysical Classification, it is essential that those ultimate customers have an opportunity to review and offer feedback on the appropriate use of those technologies. For that reason, I helped the Defense Department's Environmental Security Technology Certification Program (ESTCP) convene the Stakeholders' Forum on the Use of Geophysical Classification for Munitions Response in Phoenix, Arizona, on November 27, 2012.

At the Forum, ten geographically representative stakeholders from some of the nation's best known former range sites met to learn about and discuss the use of this emerging technology. Participants were uniformly positive about the technology, but they raised important questions about the ways that the technology will be implemented.

Camp Butner (NC) Demonstration Site

Three participants were tribal officials. At least three others are active on Defense Department-sponsored Restoration Advisory Boards at range sites. A number of the sites, listed below, have been or will be ESTCP demonstation sites.

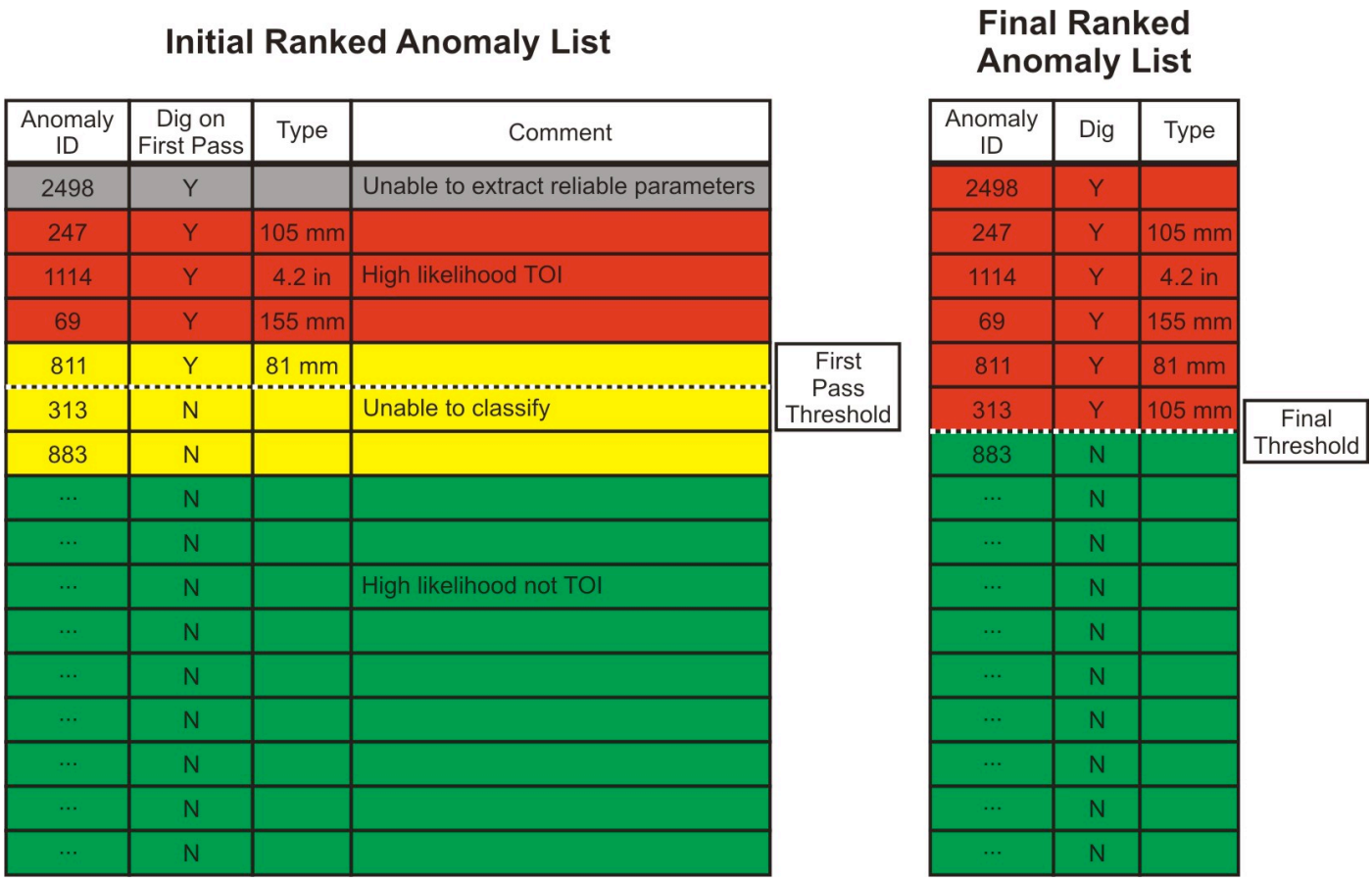
Ak-Chin Indian Community, Arizona
Massachusetts Military Reservation, Cape Cod, Massachusetts
Camp Butner, North Carolina
Fort Ord, California
Jefferson Proving Ground, Indiana
Laguna Pueblo, New Mexico
Lawrence Livermore National Labs, California
Lowry Range, Colorado
Tierrasanta, San Diego, California
Vieques, Puerto Rico

After introductions, the Forum began with a single PowerPoint presentation by Herb Nelson, Program Manager for Munitions Response at ESTCP. Prior to the meeting I had supplied all the attendees with fact sheets developed by both ESTCP and the Interstate Technology Regulatory Council (ITRC) Munitions Response work team. I facilitated the discussions, working from the appended discussion questions, also provided in advance.

Participants were familiar with the traditional approach to munitions surveys. Single-dimension electromagnetic devices, such as electromagnetic induction devices or magnetometers, are used to identify and map subsurface metal. The signals generated by those items are known as anomalies. Then, trained technicians carefully uncover each item, removing or destroying bombs, shells, and other items that may contain explosives, and collecting other metal items, such as horseshoes, barbed wire, and nails, as well as metal fragments ("frag") from explosives devices that detonated.

Nelson explained how geophysical classification begins with the same type of survey. Then teams return to each anomaly to conduct a "cued" investigation with instruments such as the MetalMapper and TEMTADS, which collect three-dimensional electromagnetic data. From that data, analysts create "dig lists." Electromagnetic anomalies that fit the profile of projectile-shaped ordnance are assigned for digging. Those that clearly are not munitions are indicated to be left underground. And those that analysts are unable to classify are assigned for excavation as well.

At the ESTCP Demonstration sites, inert munitions are placed underground ("seeded") to increase the number of geophysical anomalies, and after analysts create their dig lists all anomalies are excavated to check how accurate they are. At production sites, only those designated for excavation are dug.



At traditional munitions response sites, technicians must excavate large numbers of anomalies for each round of live explosive found. Nelson explained how at Camp Butner, North Carolina, only 146 pieces of live ordnance were found among more than a half million items excavated. At ESTCP Demonstration sites, only a fraction—from 10% to 25%—of the anomalies are dug, suggesting that classification can cut the total cost of a munitions response project by half or more. When classification is more widely used, there will be other advantages: There will be less environmental damage because fewer holes are dug. In populated areas, with technicians digging fewer suspected ordnance items, evacuation will be much less common.

Of course, these advantages will materialize only if *the ultimate customers* accept the practice of not digging every anomaly. Therefore, I asked the stakeholders: "Under what circumstances, if any, do you believe that your community or tribe (or a similar community) will accept decisions not to dig suspected munitions based on geophysical classification?"

No one had a problem with informed decisions not to excavate at anomalies—that is every piece of detected metal—as long as they could be assured that the classification of anomalies was conducted properly.

It was clear from the discussion that participants understood Nelson's explanation of geophysical classification and were able to view the concept through the lens of their site experiences. In fact some praised the style and content of his remarks.

Aware that ESTCP field demonstrations rely on the judgment of highly trained geophysicists, forum participants asked how they could be assured that the same level of expertise would be used at full-scale munitions response sites. They expressed concern that Army Corps or other contracting entity would award contracts to the lower bidders or businesses receiving preferential treatment, not the firms most qualified to distinguish live ordnance from scrap. They want these life-and-death decisions to be made by people they can trust.

The stakeholders made two suggestions: First, some suggested that there be some form of certification that the person conducting the analysis be qualified by training and experience to make dig/no-dig decisions, and that the basis of those decisions be transparent. Second, some of the stakeholders urged that there be independent verification of those decisions, perhaps by geophysicists working for regulatory agencies. That is, to the degree that forum participants represent people from their communities, they are perfectly comfortable, in theory, with the geophysical classification strategy—that is, leaving metal in the ground—if in practice decisions are made properly.

Furthermore, participants recognized that there is no guarantee that any munitions response strategy will find and remove all explosive hazards. As stakeholders from sites with ongoing programs, they already know that some items may be missed, even if the initial survey is conducted properly. They understood that it is unlikely that the three-dimensional instruments used to collect cued data will find additional items of live ordnance. They discussed the need for institutional controls and education as key elements of any risk management strategy, but they recognized that the need is there whether of not classification is used. Some attendees warned that while it is easy to impose land use controls, there often is no one there to monitor and enforce them.

Attendees said that geophysical classification is appropriate if it "fits the site." They are familiar with the CERCLA process, in which initial investigations develop conceptual site models, and from that remedial action objectives are set. Not only does the success of electromagnetic surveys depend on site conditions such as terrain, weather, and geology, but also the size and depth of the buried munitions. Several participants reminded us that land use often influences remedial objectives. For example, on some cattle ranges it may prove desirable to remove buried frag so it won't rise to the surface.

While participant agreed that reducing the number of digs is likely to be good for the environment and reduce the number of inconvenient evacuations, most of the participants volunteered that they supported classification as a way to reduce waste and save money. One stakeholder, however, warned that others in his community could care less about saving the federal government money.

While the obvious goal of munitions response is to prevent explosions and the resulting injuries and death, those present also pointed out that munitions clearance makes land available for transfer and reuse. Better, faster investigations mean that land may be made available for new uses in a more timely manner.

Stakeholders said that communications with the public, particularly those who are on the land, is essential. People who live, work, or recreate on former munitions sites should be fully aware of what has been left behind, so they know what to do when they encounter a potential munitions item. A couple of participants, who have been involved in school programs about ordnance risk, warned that those programs may disappear. The curriculum in Tierrasanta, where two boys were killed by unexploded ordnance in 1983, was dropped because "there wasn't enough time."

Overall, this group of stakeholders with extensive experience at munitions response sites was not just accepting, but excited about the new technology. Some said they wished it had been available years ago. One stated that it should be *required.* They recognized that geophysical classification was not universally applicable at all munitions response sites, but they believed that communities and tribes would welcome and even seek the new technology as long as they could be assured that it would be implemented properly.

Discussion Questions (provided in advance)

1. Under what circumstances, if any, do you believe that your community or tribe (or a similar community) will accept decisions not to dig suspected munitions based on geophysical classification?

2. Do you feel that the policy of digging where analysis indicates uncertainty is sufficiently protective?

3. Proponents of limiting excavation based upon classification make the following arguments. Do you agree or disagree? Limited excavation:

a. saves money and leads to response over wider areas.
b. protects habitat.
c. reduces the need for evacuation
d. reduces waste.

4. Do you think communities and tribes believe geophysical classification will put public safety at risk?

5. Do you believe conventional methods of munitions response are sufficiently protective?

6. What risk communication should be done in communities before a decision is made to implement munitions response based upon geophysical classification?

7. What other factors might influence a community or tribe's perspective on a proposal to use geophysical classification?