Site Characterization Using Visual Sample Plan

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Objective:
To engage the developers of the Visual Sample Plan (VSP) for UXO software with the project delivery teams of different FUDS projects so that stakeholders and regulators are informed and technical team members are trained to utilize VSP on actual projects. Project sites are identified to provide a range of site conditions over which VSP will be used. Additionally, the objective is to apply VSP to guide PDT decisions during the progression of RI projects, resulting in a better characterization and a more complete understanding of the results.

Problem being solved:
VSP is being used more frequently on MMRP projects; however, it is still largely misunderstood by contractors, regulators and USACE team members. There is a concern within the MMRP community that it may be misapplied or the results misrepresented due to this lack of understanding.

Technology Description:
VSP is a software tool developed by the Pacific Northwest National Lab (PNNL) that supports the development of a defensible sampling plan based on statistical sampling theory and the statistical analysis of sample results to support confident decision making. The objective is to ensure that the right type, quality, and quantity of data are gathered to support decisions. VSP allows real-time evaluation of the tradeoffs between increased confidence in decisions and costs or number of samples required. The UXO module of VSP addresses the following five elements of site characterization: 1) transect design to ensure that target areas of concern are identified with a prescribed confidence level, 2) flagging of potential target areas along the transects obtained at the site, 3) mapping of the estimated anomaly density at all locations across the site based on the transect data and the model of spatial variation derived from those data, 4) delineation of the target boundary from the anomaly density maps, and 5) assessing probability of target area traversal based on actual transect pattern. (http://vsp.pnl.gov)

Technical approach:
These projects will allow hands-on training of the technical PDT on real world projects, with input from the developers, to more fully transition the technology and provide a better understanding of the capabilities and limitations of VSP. The software developers will work with the PDT to utilize VSP to assist in data reduction and analysis, and determine the path forward. The team will use the software together to try to answer characterization questions, and to see how various inputs affect the outcome (i.e. what confidence levels have been achieved with the data collected so far? Are additional transects needed and where? Were target areas detected? What is the probability of target area traversal based on actual transect pattern? Etc.) The contractor may then collect supplemental data to support PDT decisions guided by VSP during the progression of the RI.

For some sites it is anticipated ROE's will not be obtained for large portions of the site, so the analysis of actual transect pattern will be especially valuable in determining whether overall characterization goals have been or can be met.

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Expected DoD Benefit:
There are three main benefits expected from this effort: (1) A more complete characterization and a better understanding of the results for sites where this technology is used, (2) All PDT members will be better informed and trained on the use of VSP and can apply that knowledge to future MMRP characterizations, and (3) The software developers will gain an increased understanding of the complexities and realities of actual project sites, and may apply that knowledge to future improvements to the software.

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