



Soil sorting technology saves taxpayer money

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The Formerly Utilized Sites Remedial Action Program executed by the St. Louis District has realized an 87 percent reduction in contaminated soil shipping and disposal, and associated costs at the Iowa Army Ammunition Plant over the past three years as a result of using a highly effective material sorting process.

The IAAAP is an active, government-owned, contractor-operated facility that occupies approximately 19,000 acres or approximately 30 square miles, in Des Moines County, Iowa. The facility is under the command of the U.S. Army Joint Munitions Command in Rock Island, Illinois.

Since 1941, the IAAAP has produced projectiles, mortar rounds, warheads, demolition charges and other munitions components as part of its load, assemble and pack operations. From 1947 to 1975, portions of the IAAAP facility were under the control of the Atomic Energy Commission for development of nuclear weapons and additional weapon-assembly operations on approximately 1,630 acres of the plant.

The FUSRAP is being used to 1) identify and remediate, or otherwise control, sites where residual radioactivity remains from AEC activities conducted in the past, and 2) to comply with the requirements under the Comprehensive Environmental Response, Compensation, and Liability Act.

The FUSRAP Operable Unit 8, completed in September 2011, outlines the remedial activities that will be undertaken at IAAAP to address contamination resulting from AEC activities. The OU8 ROD selected remedy includes excavation of depleted uranium-contaminated soil with physical treatment and off-site disposal, along with decontamination/replacement of structures.

The Remedial Design/Remedial Action Work Plan, completed in February 2013, outlines a comprehensive process that follows the governing CERCLA requirements for implementing the selected remedy in the OU8 ROD. A pilot study in 2013 determined whether the ScanSortSM system (a conveyor-assisted, automated soil surveying and sorting system) could effectively detect and isolate DU fragments from bulk soil while confidently satisfying the remediation goals.

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During the first shipping campaign at the Iowa Army Ammunition Plant, approximately 1,900 cubic yards of depleted uranium-contaminated soil were loaded onto railcars and shipped out of the installation.

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The pilot was a resounding success, and as of today, decontamination of structural surfaces and/or replacement of structural components, e.g., Building 1-11 floor grate and Building 1-63-6 air filters, have been completed, and excavation, processing/ sorting and disposal of reduced amounts of DU-contaminated soil continues.

The soil sorting method used at IAAAP is a conveyor-based system that accurately surveys, monitors and sorts material by segregating scanned material that is above remedial goals from material that is below RGs into two separate discharge stockpiles. Custom detectors, proprietary scanning spectroscopy software, a rapid reversing conveyor and customizable reporting software are unique to this technology. It provides all-weather scanning and sorting of wet or dry material, including soil, crushed stone and concrete, and slurry.

The following results have been

obtained to date at IAAAP: 26,218 cubic yards processed.

- *22,628 cubic yards below soil remedial goals and re-used or will be used as backfill*
- *3,505 cubic yards above soil RG*
- *Approximately 3,863 cubic yards have been shipped out to Utah for disposal/ storage, including an additional 6 inches in depth of scraped off soil under the stockpile area.*
- *87 percent recovery*

Benefits of this system include:

- *100 percent assay of material by lab-quality gamma spectroscopy*
- *Bulk sorting for disposal or re-use as clean backfill*
- *Faster processing*
- *Lower shipping and burial charges*
- *Reduced manpower requirements*

This 87 percent recovery is resulting in cost savings that more than offset the cost of the physical treatment. For example, one of the most costly elements of this remediation work is transportation and disposal. Approximately 26,218 cubic yards have been excavated and processed in the three previous construction field seasons. The current cost of T&D is \$229 per cubic yard or about \$6 million. Instead, because of the sorting and scanning process, approximately 3,863 cubic yards have been shipped as of October 2016 at a cost of \$885,000. That accounts for 85 percent cost savings on T&D only without the cost of hauling and backfilling clean soil needed to replace 26,218 cubic yards of material.

The technology being used is applicable specifically to DU contamination and comes highly recommended to other FUSRAP site managers as a proven technology that can save taxpayer money.