US Army Corps of Engineers®
Engineer Research and Development Center

Remediation of Metals on Active and Inactive Firing Ranges

Problem

The Department of Defense (DoD) operates more than 2800 small arms training ranges. No comprehensive heavy metals management tools exist for active small arms ranges. Current and proposed best management activities are cost-prohibitive, of unknown effectiveness, and are inconsistent with Army training needs. For ranges no longer in use, the current range soil cleanup approach is excavation, transportation, and disposal as hazardous waste. This is not a cost-effective remediation technology for range cleanup. The volume of soil impacted by heavy metal at small arms ranges represents more than $2.5 billion in cleanup costs for the Army.

Lead fragments following bullet impact

Description

ERDC has the Army Environmental Quality Technology (EQT) Program lead for the development of innovative technologies to reduce heavy metals migrating from small arms firing ranges (SAFR) and the cleanup of heavy metals in SAFR soil. Research conducted at ERDC extends from fundamental studies and phenomenological modeling to applied research, development, demonstration, and validation of engineered systems that ensure SAFR sustainability. For range soil cleanup, the research focuses on processes by which the heavy metal volumes requiring disposal can be reduced using particle size and density separation processes. After engineered systems for volume reduction are evaluated in laboratory and pilot-scale studies, these systems are demonstrated and validated in the field.

Expected Products

To manage heavy metals on active ranges, ERDC will develop cost-effective range management technologies that ensure compliance with federal and local environmental regulations concerning heavy metals associated with SAFR training activities. The research will provide techniques, procedures, engineering guidelines, and expert systems for operational environmental SAFR management. For cleanup of heavy metals during range soil remediation, ERDC will develop cost-effective range cleanup technologies that ensure compliance with federal and local environmental regulations concerning heavy metals associated with small arms range closure. The research will provide techniques, procedures, engineering guidelines, and expert systems for low-cost and environmentally effective SAFR cleanup.

Live-fire lysimeter

Potential Users

Primary users of these technologies are DoD installation and range managers. The technologies are dual use and are suitable for application to civilian small arms ranges.

Projected Benefits

Remediation research being conducted at ERDC will greatly reduce the cost of soil remediation at small arms training ranges by reducing the volume disposed of as hazardous waste. This research supports the DoD Range Sustainability Program.

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