New approaches needed for uncovering, identifying, and treating buried chemical warfare material

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The current approach for identifying and destroying buried chemical munitions and related chemical warfare materials uncovered during environmental remediation projects is neither reliable enough nor has the capability to efficiently tackle large-scale projects, says a new report from the National Research Council. An alternative or modified approach is needed to remediate the Redstone Arsenal and other such projects on active and former U.S. Department of Defense sites and ranges.

Additionally, the report recommends that the Office of the Secretary of Defense and the Army each select a single office to manage and fund recovered chemical warfare materiel (RCWM) remediation activities for DOD. Currently, authority and funding for RCWM activities depend on how and where the materiel is discovered, and could fall under multiple offices of either the secretary of defense or the Army Secretariat. The Army mission for RCWM remediation is turning into a much larger program that will rival those for conventional munition and hazardous substance cleanup, the report says, and is expected to cost billions of dollars over several years. A clear organizational structure and long-term funding are needed.

The secretary of the Army should also establish a new position at the level of the senior executive service (civilian) or a general officer (military) to lead the RCWM program. The secretary should delegate

full responsibility and accountability for RCWM program performance to this person, including for planning, budgeting, and execution and for day-to-day oversight, guidance, management, and direction of the program.

Following a 1985 directive from Congress, the Army has undertaken the monumental task of destroying the existing U.S. stockpile of chemical weapons. To date, 90 percent of the stockpile has been destroyed, and the remaining 10 percent is expected to be destroyed by 2022. However, during the early- to mid-20th century, chemical weapons and chemical warfare materiel were often disposed of by open pit burning and burial at approximately 250 sites in 40 states, the District of Columbia, and three territories. Remediation of this buried materiel, in addition to environmental cleanup of the burial sites, therefore poses significant challenges to the nation and DOD. The report examines important regulatory issues that ultimately affect the need, timing, and costs of remediating these sites. Federal and state environmental remediation policies address whether buried CWM must be excavated and destroyed or contained in place.

To destroy any intact chemical munitions uncovered during remediation efforts, teams will most likely use either the Army's Explosive Destruction System (EDS) or one of three commercially available technologies. The EDS is an effective and reliable technology, and the Army has an active research and development program under way to improve the throughput rate, or speed at which chemicals can be identified. The three commercially available destruction technologies have higher throughput rates, but reliability problems were encountered when one of these -- the Dynasafe Static Detonation Chamber -- was recently used to destroy a portion of stockpiled munitions in Anniston, Ala. The report recommends ways to alleviate these problems and suggests alternatives to the EDS and commercial systems. Also explored is the potential use of robotic systems to access and remove buried

CWM.

The lack of an accurate inventory of buried munitions and of a reliable cost estimate for the RCWM program makes it difficult to establish precise, long-term budget requirements and draw up a funding plan for an RCWM program going forward that has the level of certainty typically associated with DOD project implementation. The report recommends as a "matter of urgency" that the secretary of defense increase funding for the remediation of chemical warfare materiel to enable the Army to complete the inventories of known and suspected buried chemical munitions no later than 2013 and develop a quantitative basis for overall funding of the program, with updates as needed to facilitate accurate budget forecasts. Pending establishment of a final RCWM management structure, this task should be assigned to the director of the Army's Chemical Materials Agency as chair of the provisional RCWM integrating office.

Redstone Arsenal facility in Alabama -- the site with the largest quantity of buried CWM in the U.S., and which has groundwater contamination -- is presented as a case study to show how issues raised in the report can be practically applied.

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