



Highlights of [GAO-09-913](#), a report to the Subcommittee on Energy and Water Development, Committee on Appropriations, House of Representatives

Why GAO Did This Study

At its Hanford Site in Washington State, the Department of Energy (DOE) is responsible for one of the world's biggest cleanup projects: the treatment and disposal of about 56 million gallons of radioactive and hazardous waste, stored in 177 underground tanks. Two decades and several halted efforts later, none of this waste has yet been treated, cleanup costs have grown steadily, and prospective cleanup time frames have lengthened.

GAO was asked to assess (1) DOE's current tank waste cleanup strategy and key technical, legal, and other uncertainties; (2) the extent to which DOE has analyzed whether this strategy is commensurate with risks from the wastes; and (3) opportunities to reduce tank waste cleanup costs. GAO reviewed pertinent documents, visited the site, and interviewed officials and independent experts.

What GAO Recommends

GAO is recommending that, for Hanford, DOE (1) improve its life-cycle cost and schedule estimates, (2) adopt a risk assessment framework that considers available guidance, (3) consider seeking congressional clarification about reclassifying its high-level tank waste, and (4) work with regulators on tank closure options. DOE agreed with three of these; it disagreed with seeking further clarification about reclassifying high-level waste. GAO believes this recommendation remains valid, given the importance of waste reclassification to DOE's strategy.

View [GAO-09-913](#) or [key components](#). For more information, contact Gene Aloise at (202) 512-3841 or aloise@gao.gov.

NUCLEAR WASTE

Uncertainties and Questions about Costs and Risks Persist with DOE's Tank Waste Cleanup Strategy at Hanford

What GAO Found

DOE's tank waste cleanup strategy consists of five key phases—waste characterization, retrieval, pretreatment, treatment, and permanent disposal—but critical uncertainties call into question whether the strategy can succeed as planned. Technical uncertainties include whether DOE can retrieve waste from tanks at the rate needed to support continuous operation of the waste treatment complex now under construction and whether key treatment technologies will work. Legal uncertainties include whether DOE can treat and dispose of some tank waste as other than high-level (highly radioactive) waste and how much residual waste can be left in the tanks when they are eventually closed. Such uncertainties could lead to significant cost increases and further delays in completing Hanford's tank waste cleanup activities.

DOE has not systematically evaluated whether its tank waste cleanup strategy is commensurate with risks posed by the wastes. DOE lacks credible or complete estimates of how much the strategy will cost or how long it will take. The total project cost of constructing the waste treatment plant alone grew from \$4.3 billion in 2000 to \$12.3 billion in 2006. In addition, DOE did not include, or has been unable to quantify, a number of significant costs in its current estimate of the overall cost of its cleanup strategy. For example, DOE has not included some actual expenditures to date or storage costs for high-level waste canisters. Further, DOE's schedule targets have slipped, with end of treatment extending from 2028 to 2047, which increases overall operations costs. Overall the total estimated cost could significantly exceed DOE's current estimate of \$77 billion, with estimates ranging from about \$86 billion to over \$100 billion, depending upon the date cleanup is completed. DOE has also fallen short in terms of risk-informed decision making. While DOE has analyzed risks in environmental impact statements required for its tank waste treatment activities at Hanford, it has not followed a systematic risk assessment framework, like one outlined in a 1983 report, updated in 2008, by the National Academy of Sciences. As a result, DOE cannot be assured that its present strategy is proportional to the reduction in risk that cleanup is to achieve.

Some opportunities may still exist to reduce the costs of DOE's tank waste cleanup strategy, but the likelihood of success is unknown. For example, DOE is trying to increase the concentration of high-level waste in each disposal canister, thereby reducing the number of canisters and possibly shortening treatment time frames. DOE could also work with regulators to demonstrate, on a tank-farm basis, the feasibility of leaving varying amounts of residual waste in tanks at closing without threatening human or ecological health. In removing waste from tanks, DOE has found that the last portion can be disproportionately difficult and costly to remove. Specifically, the cost of removing the last 15 percent of waste can equal or exceed the cost of removing the first 85 percent.