



Highlights of [GAO-10-48](#), a report to congressional requesters

Why GAO Did This Study

High-level nuclear waste—one of the nation's most hazardous substances—is accumulating at 80 sites in 35 states. The United States has generated 70,000 metric tons of nuclear waste and is expected to generate 153,000 metric tons by 2055. The Nuclear Waste Policy Act of 1982, as amended, requires the Department of Energy (DOE) to dispose of the waste in a geologic repository at Yucca Mountain, about 100 miles northwest of Las Vegas, Nevada. However, the repository is more than a decade behind schedule, and the nuclear waste generally remains at the commercial nuclear reactor sites and DOE sites where it was generated.

This report examines the key attributes, challenges, and costs of the Yucca Mountain repository and the two principal alternatives to a repository that nuclear waste management experts identified: storing the nuclear waste at two centralized locations and continuing to store the waste on site where it was generated. GAO developed models of total cost ranges for each alternative using component cost estimates provided by the nuclear waste management experts. However, GAO did not compare these alternatives because of significant differences in their inherent characteristics that could not be quantified.

What GAO Recommends

GAO is making no recommendations in this report. In written comments, DOE and NRC generally agreed with the report.

View [GAO-10-48](#) or [key components](#). For more information, contact Mark Gaffigan at 202-512-3841 or gaffiganm@gao.gov.

NUCLEAR WASTE MANAGEMENT

Key Attributes, Challenges, and Costs of the Yucca Mountain Repository and Two Potential Alternatives

What GAO Found

The Yucca Mountain repository is designed to provide a permanent solution for managing nuclear waste, minimize the uncertainty of future waste safety, and enable DOE to begin fulfilling its legal obligation under the Nuclear Waste Policy Act to take custody of commercial waste, which began in 1998. However, project delays have led to utility lawsuits that DOE estimates are costing taxpayers about \$12.3 billion in damages through 2020 and could cost \$500 million per year after 2020, though the outcome of pending litigation may affect the government's total liability. Also, the administration has announced plans to terminate Yucca Mountain and seek alternatives. Even if DOE continues the program, it must obtain a Nuclear Regulatory Commission construction and operations license, a process likely to be delayed by budget shortfalls. GAO's analysis of DOE's cost projections found that a repository to dispose of 153,000 metric tons would cost from \$41 billion to \$67 billion (in 2009 present value) over a 143-year period until the repository is closed. Nuclear power rate payers would pay about 80 percent of these costs, and taxpayers would pay about 20 percent.

Centralized storage at two locations provides an alternative that could be implemented within 10 to 30 years, allowing more time to consider final disposal options, nuclear waste to be removed from decommissioned reactor sites, and the government to take custody of commercial nuclear waste, saving billions of dollars in liabilities. However, DOE's statutory authority to provide centralized storage is uncertain, and finding a state willing to host a facility could be extremely challenging. In addition, centralized storage does not provide for final waste disposal, so much of the waste would be transported twice to reach its final destination. Using cost data from experts, GAO estimated the 2009 present value cost of centralized storage of 153,000 metric tons at the end of 100 years to range from \$15 billion to \$29 billion but increasing to between \$23 billion and \$81 billion with final geologic disposal.

On-site storage would provide an alternative requiring little change from the status quo, but would face increasing challenges over time. It would also allow time for consideration of final disposal options. The additional time in on-site storage would make the waste safer to handle, reducing risks when waste is transported for final disposal. However, the government is unlikely to take custody of the waste, especially at operating nuclear reactor sites, which could result in significant financial liabilities that would increase over time. Not taking custody could also intensify public opposition to spent fuel storage site renewals and reactor license extensions, particularly with no plan in place for final waste disposition. In addition, extended on-site storage could introduce possible risks to the safety and security of the waste as the storage systems degrade and the waste decays, potentially requiring new maintenance and security measures. Using cost data from experts, GAO estimated the 2009 present value cost of on-site storage of 153,000 metric tons at the end of 100 years to range from \$13 billion to \$34 billion but increasing to between \$20 billion to \$97 billion with final geologic disposal.