

YUCCA MOUNTAIN

GAO looks at potential uses for abandoned repository

NOW THAT THE Department of Energy's high-level radioactive waste project at Yucca Mountain is dead, the site in Nevada is available for an alternative use. No one knows what to do with it, however, although many ideas have been proposed.

The Government Accountability Office's 57-page report, *Yucca Mountain: Information on Alternative Uses of the Site and Related Challenges*, which was prepared for Senate Majority Leader Harry Reid (D., Nev.), contains 16 experts' evaluations of stakeholder proposals for dealing with the Yucca Mountain site.

The report notes that Yucca Mountain has several geographical, structural, and geophysical characteristics that may be relevant in considering potential alternative uses. Geographically, the site spans a large land area in a remote part of Nevada and includes some of the lands of two adjacent highly secure national security sites—the U.S. Air Force's Nevada Test and Training Range and the DOE's Nevada National Security Site.

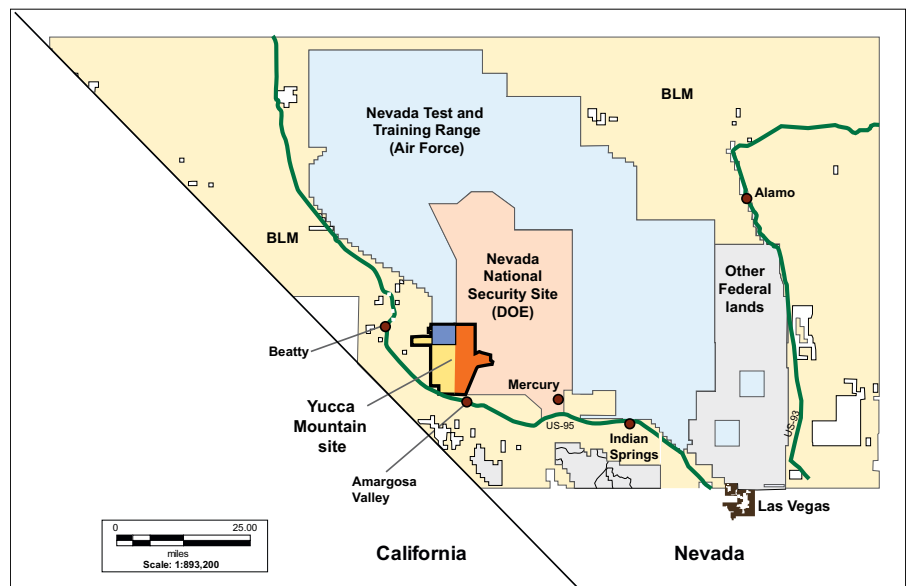
The site's lands have been historically under the control of three federal agencies: the DOE; the Department of Defense; and the Bureau of Land Management (BLM), under the Department of the Interior.

The report says that the site's most notable structural features are two large tunnels that the DOE bored into and underneath Yucca Mountain, one about 5 miles long and 25 feet in diameter, another 2 miles long that branches off of the main tunnel.

"Geophysically, the Yucca Mountain area is semiarid and has little surface water; is comprised of strong, very low-permeability volcanic rock; and is located in an area with low levels of seismic activity," the report says.

The stakeholders the GAO contacted—federal officials, state and local government officials, private companies, and others—proposed 30 alternative uses for the Yucca Mountain site. These proposed alternatives were then evaluated by experts. "There was

The Government Accountability Office has conducted a survey on possible uses for the Yucca Mountain site in Nevada.



Regional location of Yucca Mountain site (Source: GAO)

no broad consensus, however, regarding the benefits and challenges of these uses among the experts we consulted," the report notes.

According to the report, the proposed alternative uses span five broad categories: nuclear or radiological uses, such as locating a nuclear reprocessing complex at or near the site; defense or homeland security activities, such as testing systems to detect and identify radioactive materials; information technology uses, such as secure electronic data storage; energy development or storage, such as using the site for renewable energy development; and scientific research, such as geology or mining research.

While some experts identified benefits of the site for certain uses, they also noted that many of the proposed uses would involve significant challenges and high costs, the report says. For example, regarding nuclear or radiological uses, the experts eval-

uated 10 ideas, including the production of medical isotopes, reprocessing of spent nuclear fuel, temporary or interim nuclear or radioactive waste storage, and several uses related to nuclear power generation. While several experts contacted by the GAO identified interim storage as a good or great potential use of the site, one said that using the site for interim storage was a bad idea because it would be impractical to transport high-level nuclear waste more than once.

Similarly, two experts proposed producing medical isotopes on the site, but others disagreed on the benefits and challenges of this use. For example, one expert questioned the viability of the technologies that were proposed to produce the medical isotopes—the use of electron accelerators or neutron generators. Two additional alternative uses were proposed related to nuclear

research—a nuclear technologies research facility and a research reactor. These also received mixed responses from the experts who were consulted. Some experts noted that such research is already being conducted at other locations, such as the DOE's Idaho National Laboratory, and that another research location is not necessary. Further, some experts said that they did not believe that there would be an adequate workforce in Nevada to support such a facility. Several experts noted that Yucca Mountain's characteristics would not be critical to a number of the proposed uses that could be undertaken elsewhere.

The GAO also found that alternative uses of the Yucca Mountain site face a number of legal and administrative challenges. First, the report notes that the DOE's withdrawal of its application to build a repository at Yucca Mountain is subject to continuing legal proceedings, and the resolution of these proceedings could preclude or significantly delay alternative uses of the site.

Second, potential litigation regarding mining claims may affect alternative uses of the site. Following the 2010 expiration of a land withdrawal order, 35 mining claims were recorded and processed by the BLM. "Although BLM declared these claims void in August 2011, their legitimacy could be litigated, which could delay or pose challenges to alternative uses of the site," the report says.

Third, because control of the site is divided among three different federal agencies, potential alternative uses may face challenges related to the management of the site's lands.

Fourth, potential alternative uses of the site may be limited by national security activities that currently take place on adjacent lands.

Fifth, as with any activity, proposed uses of the site will require that the user comply



The Yucca Mountain north portal tunnel entrance (Photo: GAO)

with applicable federal and state regulations.

One thing is for sure: The future of Yucca Mountain is uncertain. Since 1983, the DOE has spent billions of dollars to evaluate the site for potential use as a nuclear waste repository. In February 2010, President Obama proposed eliminating funding for the project, and in March 2010, the DOE filed a motion to withdraw its license application. Subsequently, the DOE's budget was zeroed out for Yucca Mountain funding.

The Interior Department generally agreed with the GAO's findings. The DOE, the U.S. Air Force, and the Nuclear Regulatory Commission neither agreed nor disagreed with the findings.

The experts consulted for the report were Thomas Cochran, senior scientist, nuclear program, Natural Resources Defense Council; John Crockett, director, research project

development, San Diego State University Research Foundation; Pamela Drew, senior vice president, TASC; Donald Gibson, vice president, TASC; Herb Hayden, chief technical officer, Southwest Solar Technologies Inc.; Andrew Kadak, director, nuclear services, Exponent Inc.; Joel Kurtzman, executive director, Center for a Sustainable Energy Future, Milken Institute; Tom LaTourrette, senior physical scientist, Rand Corporation; Herb Lin, chief scientist, Computer Science and Telecommunications Board, National Research Council of the National Academies; Jane Long, associate director at large, Lawrence Livermore National Laboratory; Brian Looney, senior advisory engineer, Savannah River National Laboratory; S. Andrew Orrell, director, nuclear energy and fuel cycle programs, Sandia National Laboratories; Don Steeples, McGee Distinguished Professor of Geophysics, University of Kansas; Ben K. Sternberg, professor, Geological and Geophysical Engineering and Electrical and Computer Engineering, and director, Laboratory for Advanced Subsurface Imaging, University of Arizona; Darrell M. West, vice president and director of governance studies and director of the Center for Technology Innovation, Brookings Institution; and Chris G. Whipple, principal, Environ.

The report is available online at <http://www.gao.gov/new.items/d11847.pdf>.



The interior of Yucca Mountain's main tunnel (Photo: DOE)