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## ENERGY

# Berkeley-based startup partners with Bechtel for nuclear waste disposal contracts 🔑



Elizabeth Muller and her father Richard Muller perform a recovered canister test for their nuclear waste startup Deep Isolation.

COURTESY OF DEEP ISOLATION



By Ted Andersen  
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The United States has a problem with its nuclear waste: it keeps building up and the government doesn't know where to put it longterm.

The U.S. once touted a permanent plan to dispose of the highly volatile waste deep in the ground at Yucca Mountain in Nevada — about 85 miles northwest of Las Vegas — but funding for that was cut off after 2011.

This leaves the government, which currently disposes of its waste more than 2,000 feet below the surface at the Waste Isolation Pilot Plant in New Mexico, without any final storage

for the high-level radioactive waste — both from private utilities and also from the Department of Defense. It's temporary solution includes allowing the private sector build large concrete casks to house the waste at facilities throughout the country.

Enter a Berkeley-based daughter-father duo who have teamed up to start a company with an ambitious plan to tackle this disposal issue. In 2016, [Elizabeth Muller](#) started Deep Isolation with her father Richard, now a professor emeritus of physics at UC Berkeley, in order to disrupt an industry she sees ripe for opportunity — both environmentally and financially.

She said the two had together been running an environmental nonprofit, Berkeley Earth, for 10 years before deciding to take their nuclear waste solutions to the next level with her as the CEO and her father as the chief technology officer.

Muller said the company follows the international consensus that radioactive waste needs to be put in deep geologic isolation and taken out of the biosphere. The company drills boreholes into the earth and stores the long, cylindrical canisters there. She said the depth depends on the specific geology at the site, but a typical range could be 0.5 to 2 miles deep.

Deep Isolation aims to do on-site deep storage of nuclear waste at facilities across the country in order to eliminate the transportation of the material and also to remove it from temporary surface containers.

She said her 22-person, Berkeley-based company is now aiming at contracts to dispose of waste for both private utilities that run nuclear plants — such as Southern Nuclear, Xcel, PG&E and Edison — as well as the U.S. government. Private utilities put the spent fuel rods in pools to cool from which point the government is supposed to pick them up and dispose of them, according to the 1987 law that established the Yucca Mountain disposal site, but that hasn't been happening, she said.

"Nobody ever came to take the waste from the reactors and it started building up in the pools," Muller said. "(Utilities) had to figure out a temporary solution until the Department of Energy could take it, so they put it in giant concrete casts on the ground."

She said three companies — Holtec, NAC International and Orano — currently make these above-ground casks, which are about 6 to 7 feet in diameter and about 10 to 15 feet tall, and sell them to utilities to house their spent fuel rods.

"It's actually quite a big business," Muller said.

She said nuclear defense waste is currently housed at three main sites — Hanford Site in Washington, Savannah River Site in Georgia and Idaho National Laboratory — but that these sites are also facing longterm disposal issues. She also saw this as an opportunity.

But a big problem her company faced early on was getting getting a seat at the table with potential customers, given that these issues were usually handled by large companies or the government. But following a public demonstration of its technology in early 2019, Deep Isolation gained more traction through its partnership with Bechtel National Inc., formerly headquartered in San Francisco.

“We are a global company with decades of service to the nuclear industry, from research and development to decommissioning and cleanup,” James Taylor, general manager of Bechtel’s Environmental business line, said in a statement. “We believe the Deep Isolation solution holds great promise as a safe and cost-effective alternative for any nation committed to responsible storage or disposal of used nuclear fuel.”

Now that Bechtel has helped Deep Isolation gain a platform to negotiate with potential customers, it is working out details in getting licensed by the government to dispose of the waste as well as getting a dry cask license, which Muller hopes would allow the company to still deploy their technology underground.

In addition, she said in government's spending budget for 2020, there was some language that directed the Department of Energy to look at more innovative options for disposal, which she believes could help open the door for contracts for the company.

"We have a three of contracts that are in procurement," she said. "Our goals are to confirm our first customers. Do feasibility studies and make sure the community is on board."

Muller said she is also eyeing the needs of countries such as Japan, the U.K., Taiwan, Germany and South Korea.

“This is a \$500 billion global opportunity that is ripe for disruption,” current investor David Marquardt said in a statement. “No country anywhere in the world has successfully disposed of high-level nuclear waste. Deep Isolation has both the technology and the stakeholder engagement expertise that is critical for success.”

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