

The Yucca Mountain Nuclear Waste Burial Proposal

Scientifically disqualified

A NUKEWATCH FACT SHEET

The Nuclear Waste Policy Act sets strict standards that must be met before a high-level nuclear waste dumpsite can be licensed to receive the ferociously hot waste (thermally and radioactively) from nuclear power reactors. The Yucca Mountain site in Nevada, 90 miles northwest of Las Vegas — the only place currently being considered for burial of the private utility industry’s waste reactor fuel — occupies land reserved in treaty law by the Western Shoshone Nation which is opposed to the dump.

Yucca Mt. cannot prevent the waste’s radiation from leaking, and the water table under the mountain is only 700 feet below the proposed repository. The mountain’s geology does not meet the original statutory requirements established for deep underground disposal of high-level waste, so, instead of being cancelled, legally binding specifications have repeatedly been weakened.

Federal Environmental Protection Agency standards now in place hope to limit the site’s release of radiation to levels that will cause no more than 1,000 cancer *deaths* over 10,000 years. Increased cancer *incidence* has not been estimated. Whether or not the EPA’s technically callous requirements can be met is a matter of heated scientific debate and ongoing litigation.

According to authoritative studies, the Yucca Mt. plan is ill-conceived, ill-managed and can no longer be defended on scientific grounds.¹

In a 1998 study, the Department of Energy (DOE) itself acknowledged that the site is fractured and leaky, plagued by earthquakes and that its untested waste containers have limited viability. As Mary Olson of Nuclear Information and Resource Service Southeast says, “Yucca Mountain is a sieve.”²

The DOE’s proposed waste transport routes — from 72 U.S. nuclear reactor sites — would take the deadly fuel through at least 40 states, 40 Indian reservations, 600 counties and 100 major cities. About 138 million Americans would be exposed

to the risk of dangerous levels of radiation and to the truck and train crashes that are statistically inevitable. Dept. of Transportation and Nuclear Regulatory Commission (NRC) regulations allow these containers at their surface to emit 100 millirems per hour — equal to the allowable public dose for an entire year. Tied-up in traffic three feet away, people in vehicles would get the equivalent of one chest X-ray/hour.³

In January 2008, Clark County, Nevada planner and former state transportation analyst Fred Dilger caused a state-wide uproar when he said that if the waste trains go through Las Vegas, “All of the casinos on the west side of Las Vegas Boulevard would be bathed in gamma radiation.”⁴

The Yucca Mt. plan does not begin to address the vast nuclear waste problem, but merely transfers the risk of radiation accidents and leaks to Nevada residents and to millions of people along proposed waste transport routes.

An August 1999 DOE report declared that leaving the waste in storage at reactor sites is just as safe as moving it to Yucca Mt., as long as the waste is repackaged every 100 years.⁵

Given the uncertainties about Yucca Mt. and the enormous risk of moving waste fuel, it makes much more sense to leave it at the power reactors while developing better alternatives. Independent scientists suggest on-site, above-ground, monitored storage, along with additional counter-measures for safety and security.

Yucca Mt. should be disqualified: A long list of scientific reasons to disqualify the site follows. Any one of these major problems should have already disqualified the site.

In 2007, the Bow Ridge earthquake fault was discovered by the DOE to be hundreds of feet east of where scientists had estimated. It passes directly under a planned pad where waste canisters would cool down before they are entombed in tunnels inside the mountain. A May 21, 2007 letter from the chief of the U.S. Geological Survey’s Yucca Mt. Project Branch to the DOE’s lead laboratory, announced this “show stopper.” The error means designers must revamp or scrap their plans. Yucca project officials say they are still developing repository design, construction and operating ideas for the dump. The DOE has never produced blueprints that state officials can review for comments, and “Everything is conception designs and cartoons,” said Bob Loux, director of the Nevada Agency for Nuclear Projects.⁶

In 2002, a mild earthquake on June 14, about 12 miles southeast of Yucca Mt. fueled opposition to plans for the dump. The magnitude 4.4 quake was called a “wake-up call” by critics of the project. They pointed to the potential for damage to above-ground storage facilities, where tens of thousands of tons of the waste brought to the site would be kept for decades while it cools. “If anyone ever wondered about the wisdom of locating an underground radioactive

¹ Aujun Makhijani, “The Needless Yucca Mt. Rush of 1998,” *Science for Democratic Action*, Institute for Energy & Environmental Research, May 1997, p.1

² Nuclear Information and Resource Service SE Report, Dec. 18, 1998, on DOE “Viability Assessment” for Yucca Mt. repository

³ *Ibid*

⁴ *Las Vegas Review-Journal*, Jan. 17, 2008

⁵ Matthew Wald, “Study Advances Plan for Nuclear Storage Site, but Questions Remain,” *New York Times*, Aug. 7, 1999

⁶ *Las Vegas Review-Journal* and *Las Vegas Sun*, Sept. 24, 2007

dump site on an active fault line, this shows why,” Rep. Shelley Berkley, D-Nev., said after the quake.⁷

In December 2001, the General Accounting Office report reported that the Yucca project managing contractor, Bechtel SAIC, said there were still 293 unresolved technical “agreements” to further analyze the mountain’s geology and the makeup of the metal casks that would hold the waste, studies that would take many years.⁸

In August 1999, evidence that the inside of the mountain is periodically flooded with water came in the form of Zircon crystals found deep inside. “Crystals do not form without complete immersion in water,” said Jerry Szymanski, formerly the DOE’s top geologist at Yucca. Szymanski’s finding that deep water rises and falls inside Yucca Mt. was disregarded by the DOE.⁹ “That would mean hot under-ground water has invaded the mountain and might again in the time when radioactive waste would still be extremely dangerous. The results would be catastrophic.”¹⁰

In March 1998, the Yucca Mt. site was found to be subject to earthquakes or lava flows every 1,000 years — 10 times more frequently than earlier estimated — according to a Calif. Institute of Technology study. The finding means that radiation dispersal from the Yucca Mt. site is much more likely during the dump’s 250,000-year radioactive hazard period.¹¹

In June 1997, DOE researchers announced that rain water had seeped from the top of Yucca Mt. 800 feet into the repository in a mere 40 years (as dated by chlorine-36). Government scientists had earlier claimed that rainwater would take hundreds or thousands of years to reach the waste caverns. Federal guidelines have long required that the existence of fast-flowing water would disqualify the site.¹²

In March 1995, government physicists at Los Alamos National Laboratory dropped a bomb on the Yucca plan, charging that the wastes might erupt in a nuclear explosion and scatter radioactivity to the winds or into groundwater or both.¹³ Charles Bowman and Francesco Venneri found that staggering dangers will arise thousands of years from now — after steel waste containers dissolve and plutonium begins to disperse into surrounding rock. Former DOE geologist Jerry Szymanski said, “You’re talking about an unimaginable catastrophe. Chernobyl would be small potatoes.”¹⁴ So serious a dispute, coming so late in the planning process, might cripple the plan or even kill it, the *New York Times* reported.

In July 1990, the National Research Council said the DOE’s Yucca Mt. plan is “bound to fail” because it demands a level of safety that science cannot guarantee.¹⁵

In 1989, 16 geologists from the U.S. Geologic Survey bluntly charged that the DOE was using stop-work orders to prevent the discovery of problems that would doom the repository.¹⁶ The government geologists reported that “There is no facility for trial and error, for genuine research, for innovation, or for creativity.”¹⁷ Even the NRC complained that work at Yucca Mt. seemed designed mostly to get the repository built rather than to determine if the site is suitable.¹⁸

In 1983, the National Academy of Sciences noted that the chemical characteristics of the water at Yucca Mt. are such that the wastes would dissolve more easily than at most other places.¹⁹

While plutonium-239 in the reactor waste is radioactive and deadly for essentially the rest of time, some reporters have lately been understating the duration of its toxicity. *New York Times* science writer Matthew Wald has noted in 1989 that some of the waste “remains radioactive for millions of years.”²⁰ A month later Wald wrote again, “Though the wastes that would go into the site would be hazardous for millions of years, predictions are limited to 10,000 years.”²¹ In 1997, Mr. Wald minimized the danger by an order of magnitude, writing, “The wastes would be dangerously radioactive for hundreds of thousands of years and would most likely reach humans through water flowing underground through the wastes and eventually reaching the surface through springs or wells,”²² and in 2001 he called the timespan only “millenniums.”²³

DOE scientists know that the steel canisters will dissolve long before the waste’s radiation hazards are gone. Current canister designs envision a mere 10,000-year life span for the dump. Because of the million-year cancer dangers of the waste, “testing of the whole project is impossible,” according to Dr. R. Darryl Banks, biophysicist at World Resources Institute in Washington, as it “would require a time machine.”²⁴

There are good alternatives to a Yucca Mt. dump. Storing radioactive wastes at reactor sites that generate it will allow time to give other proposals the consideration they deserve²⁵ and allow the most dangerous fission products to become less hazardous.

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⁷ *Washington Post*, & *New York Times*, June 15, 2002

⁸ Steve Tetreault, “GAO’s final report: Opting to proceed with Yucca Mt. might be premature,” *Las Vegas Review Journal*, Dec. 22, 2001; Eric Pianin, “GAO Challenges Plans for Storage of Nuclear Waste,” *Washington Post*, November 30, 2001

⁹ *New York Times*, August 7, 1999

¹⁰ Matthew Wald, “Radioactive Waste Site: A Shift In Strategy,” *New York Times*, July 31 2001, & August 10, 1999

¹¹ Peter Spotts, “New Quake Concerns at Nuclear Dump Site,” *Christian Science Monitor*, March 27, 1998

¹² *New York Times*, June 20, 1997

¹³ *Washington Post*, Dec. 15, 1998 & *New York Times*, Mar. 5, 1995

¹⁴ Joby Warrick, “At Nevada Nuclear Waste Site, the Issue is One of Liquidity,” *Washington Post*, December 15, 1998

¹⁵ Associated Press, “Nuclear waste dump plan is doomed, report concludes,” *Milwaukee Journal*, July 19, 1990

¹⁶ *New York Times*, January 17, 1989

¹⁷ *New York Times*, February 12, 1989

¹⁸ *New York Times*, January 17, 1989

¹⁹ *Ibid*

²⁰ *Ibid*

²¹ *New York Times*, February 12, 1989

²² *New York Times*, June 20, 1997

²³ Matthew Wald, “Radioactive Waste Site: A Shift In Strategy,” *New York Times*, July 31, 2001

²⁴ *New York Times*, August 2, 1995

²⁵ Arjun Makhijani, “Independent Institute Recommends Alternative Nuclear Waste Plan,” Institute for Energy & Environmental Research press release, ieer.org, June 4, 2002