

Fallout Over Nevada's Nuclear Destiny

Plans to bury highly radioactive wastes reignite the Silver State

By JANET RALOFF

“We've solved the nuclear waste problem,” declared Sen. J. Bennett Johnston (D-La.) two years ago when Congress instructed the Department of Energy to consider permanently interring the nation's high-level nuclear wastes within Nevada's Yucca Mountain.

Now, Johnston isn't so sure about that, and many others echo his uncertainty.

In late November, the Department of Energy (DOE) announced dramatic revisions in its plans for site analysis and preconstruction testing at Yucca Mountain and in its long-term schedule for interring wastes. Though Congress had ordered the federal government to begin accepting high-level radioactive wastes by 1998 for disposal at a yet-undetermined site, DOE now says it cannot offer a permanent storage vault until 2010 at the earliest. And even that prospect rests on the suitability of the Nevada site, where wastes would lie buried 1,200 feet below the surface. If the site proves unacceptable or unavailable, forcing DOE to look elsewhere, department officials say the earliest date for beginning permanent burial will slip well beyond 2010.

Indeed, if Nevada has its way, the department will have to scout out a new gravesite soon. DOE applied two years ago for state permits to begin preliminary testing at Yucca Mountain, and though such permits normally take 75 days to obtain, Nevada officials have yet to process even one. In November, DOE asked the Justice Department to bring suit against the state over the holdup, perhaps as early as this week. But Nevada Governor Bob Miller says he has no intention of issuing those permits — ever.

Hanging in the balance is the fate of the nation's most dangerous garbage: some 95 million gallons of highly radioactive wastes generated at the nation's defense facilities and used fuel from defense and commercial nuclear reactors. Electric utilities running the nation's 110 nuclear power plants are likely to feel the pinch first and worst. Some could even face plant closings as a result.

With no licensed facility available to

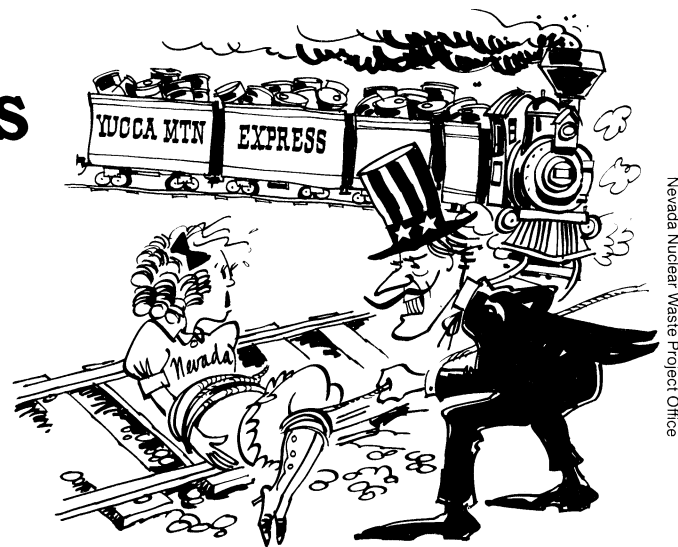
accept their wastes, utilities have been storing their spent fuel on-site, mostly in huge, heat-dissipating structures nicknamed “swimming pools.” But their current stockpiles of radioactive rods — totaling some 15,000 to 20,000 metric tons — are expected to double within the next decade, notes Steven P. Kraft, director of nuclear waste and transportation for the Edison Electric Institute in Washington, D.C. And with the storage pools already nearing capacity at several utilities, many commercial power generators are exploring other options, such as dry storage. Though less expensive than pool storage, dry storage could cost tens of millions of dollars per utility, Kraft says.

The nuclear power industry's most serious worry is that the lack of visible progress in fuel disposal will jeopardize its very existence. A federal regulation known as the waste-confidence rule specifies that the Nuclear Regulatory Commission can actually shut down plants if it cannot ascertain that the government has an ongoing waste-disposal program, Kraft explains.

“If there was a belief that the DOE program for examining Yucca Mountain was not moving forward, you would probably start seeing action within a year or so by individuals trying to get their local [nuclear power] plant shut down,” says Kraft. And at least one state, California, has a statute prohibiting the licensing of any new nuclear plant until the nation's waste-disposal problem is solved.

In a Nov. 14 letter to Energy Secretary James D. Watkins, Miller asserts that scientific analyses by his state indicate Yucca Mountain fails to meet several key qualifying criteria for entombing radioactive waste. Moreover, the governor argues, because Nevada's legislature has “lawfully vetoed” the proposed facility, DOE's authority “to pursue the Yucca Mountain site as a nuclear waste repository has terminated.”

Under the federal Nuclear Waste Policy Act, states have the right to veto a federal facility within their territory, says Robert



This cartoon, which appeared in the DOE-funded NEVADA NUCLEAR WASTE NEWSLETTER, reflects the state's fear that it will be railroaded into serving as the nation's first high-level nuclear dump.

R. Loux, executive director of Nevada's Nuclear Waste Project Office in Carson City. Last April, Nevada lawmakers passed a joint resolution declaring their state unwilling to accept a nuclear repository. While federal lawmakers can override such a veto, “Congress did not act within the required 90 days,” Loux says. And in July, a state law instituted a statutory prohibition against storing radioactive wastes anywhere within Nevada's borders.

As Nevada officials view it, Loux says, Yucca Mountain's selection as the only candidate for the nation's first licensed high-level nuclear waste dump “was based wholly and solely on political considerations.” Moreover, he contends, “all pretense that science would ever factor into a decision of where to place these wastes went out the door” when Congress decided two years ago to narrow DOE's geologic-suitability analyses from three sites to just Yucca Mountain (SN: 2/27/88, p.139). As a result, DOE's incentive to find this site acceptable is now so great that it hinders objective evaluation of potentially disqualifying factors, Loux says.

In his letter, Miller lays out three such factors: active tectonics, the potential for movement of contaminated groundwater from the site, and mineralization.

Under federal law, any site with a history of active geologic processes that might lead to future releases of radioactive waste must be disqualified, Loux notes, “and we think these conditions exist at Yucca Mountain. There is a young, active volcano within 7 miles of the site. And according to DOE's own data, there are 32 active faults on the site itself.”

Yucca Mountain's many geologic faults and its large amount of fractured rock also suggest contaminated water could escape through a network of cracks,

carrying leached wastes 5 kilometers or more from the site in as little as 400 or 500 years, according to state analyses. Federal requirements prohibit building a nuclear waste repository where water can travel 5 km from the burial site in less than 1,000 years. "DOE concedes that if the state's view is right, then the site's no good," Loux says. "But they've refused to do any real work to find that out."

Finally, to keep prospectors from digging into interred wastes at some distant time, federal law calls for a site devoid of precious natural resources. Yet Yucca Mountain "is probably among the most highly mineralized areas on this continent," Loux says. "In fact, two of North America's biggest gold mines are within a stone's throw — 15 to 20 miles away." He adds that the U.S. Geological Survey "has already found gold and silver in several bore holes at Yucca Mountain."

Ultimately, such issues may indeed disqualify the site, says DOE's Philip A. Garon. However, he adds, DOE cannot make that assessment until it can begin site characterization studies. And to conduct useful investigations, "we need those environmental permits [from the state]," he told SCIENCE NEWS.

As for Nevada's claim to have lawfully vetoed the site, Garon says DOE interprets the Nuclear Waste Policy Act as saying that the only veto that counts

comes after the President recommends a site for permanent waste storage. Even if Yucca Mountain's geology proves acceptable, Garon says, such a recommendation is at best many years off.

On Nov. 28, DOE announced it would immediately seek authorization to begin constructing an interim storage facility for high-level wastes, though it did not specify a site. The plan involves building a simple, above-ground structure called a monitored retrievable storage (MRS) facility — a sort of halfway house for wastes awaiting permanent disposal. Two years ago, Congress debated whether to authorize the construction of such a facility. In the end, it decided to allow DOE to build an interim facility — but only if the department first found a suitable permanent repository site and received construction authorization for that site from the Nuclear Regulatory Commission.

As things now stand, the earliest the Energy Department could meet these criteria and begin accepting wastes at an MRS would be 2007, says Jane A. Axelrad, executive director of the MRS Review Commission, a presidentially appointed panel that expired Dec. 31. However, if Congress agrees to let DOE begin constructing an interim facility before fulfilling the specified criteria — as the review commission recommended in its Nov. 1 report to Congress — "we believe it could begin receiving waste maybe as early as 1998," says DOE's Ginger P. King.

Dan W. Reicher, an attorney with the Natural Resources Defense Council in Washington, D.C., doesn't like that idea. Allowing DOE to develop an MRS before it obtains a construction license for a permanent waste repository "would significantly undercut efforts to find a permanent resting place for high-level wastes," he told SCIENCE NEWS. In fact, Reicher says he worries that "the [MRS] itself could end up as a *de facto* repository." Congress sought to prevent just that when it tied MRS construction to the acquisition of a construction license for the permanent repository, he notes.

Just last week, Nevada filed a suit against DOE's Watkins with the 9th Circuit Court of Appeals in San Francisco. The suit asks the court to validate Nevada's legislative actions vetoing the nuclear repository, and to consider whether Watkins could legally ignore the potentially disqualifying factors raised by Miller in his Nov. 14 letter. It also seeks an injunction to stop further federal work on the Yucca Mountain project.

Thus the seeds have been sown for intense negotiations between DOE and Congress over early authorization for an MRS, and between DOE and Nevada over whether and how to establish Yucca Mountain's suitability as a permanent nuclear dump. What all this suggests, Reicher says, is that the high-level nuclear waste problem "appears anything but solved." □

There is No Zoo in Zoology . . . and other beastly mispronunciations

By Charles Harrington Elster

Do you pronounce the arctic "AHRK-tik" or "AHR-tik"? Is it "ca-PRISH-us" or "ca-PREE-shus"? "Cari-BEE-an" or "Ca-RIB-ee-an"? According to Charles Harrington Elster's "Opinionated Guide for the Well-Spoken," these are just a few of the many common words "that are frequently and flagrantly mispronounced—not only by John Doe but by a great number of well-educated, well-read, professional and prominent people as well." THERE IS NO ZOO IN ZOOLOGY is an informative pronunciation guide to over 400 of those words. Arranged alphabetically, each entry offers an enlightening discourse on how the word has been spoken since its appearance in the English language. Drawing upon dozens of sources, both historic and current, Elster offers an informed consensus of how a word should be pronounced and why it should be pronounced in that manner.

The book includes a "literal" pronunciation key, without confusing diacritical marks. Here are a few examples:

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- **Finis:** FIN-is. Occasionally, FY-nis. Fee-NEE is wrong.

Finis means the end. It comes through Middle English from the Latin *finis* (Latin pronunciation FEE-nis or FY-nis). Finis is often mistakenly thought to be French, which is why so many mispronounce it fee-NEE.

- **Victuals:** VIT-ulz.

You can take your cue on this word from Jed Clampitt and the other Beverly Hillbillies: VIT-ulz is the only standard pronunciation. Victuals dates back to 1300. The C is left over from the Latin root, *victualis*, pertaining to food; it was dropped in the Middle English *vitaile*, provisions, and reinstated in the sixteenth and seventeenth centuries. The spelling pronunciation VIK-choo-ulz, which is sometime heard in educated speech, is nonstandard and not countenanced by dictionaries. Pronounce victuals to rhyme with whittles.

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