

# Nuclear Waste Update

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## DOE Submits License Application for Yucca Mountain Repository

Moving one step closer to the construction of a nuclear waste repository at Yucca Mountain, the Department of Energy (DOE) has filed its application for a license to construct the facility. The June submission of the application to the Nuclear Regulatory Commission (NRC) comes after various delays, and marks an important milestone in the repository project. DOE must be granted a license to construct and operate the facility by the NRC before it can begin receiving and storing waste at the proposed repository.



The NRC's primary task in reviewing DOE's license application will be to determine whether the proposed repository's design will protect public health and safety and the environment for up to a million years. About \$6 billion has been spent in research and engineering at the Yucca Mountain site, including construction of a tunnel deep into the volcanic rock where the canisters of used reactor fuel would be placed. The facility, if licensed, will be constructed to hold 77,000 tons of nuclear waste, mostly in the form of used reactor fuel from nuclear power plants. Currently, most of the waste is stored onsite at 104 nuclear power plants across the country. A smaller fraction of the waste resides at federal nuclear weapons plants.

NRC Chairman Dale Klein promised a review based "entirely on technical merits." According to Klein, the commission "will perform an independent, rigorous and thorough examination to determine whether the repository can safely house the nation's high level waste."

On June 3rd, DOE delivered the license application to NRC's office in Rockville, Maryland. Fifteen sets of the application documents were delivered by truck. Each set consisted of 17 binders with a total of 8,647 pages. According

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## DOE Selects Contractors to Build Nuclear Waste Canisters

The Department of Energy (DOE) has picked two contractors to design and build nuclear waste transportation and storage canisters as part of the Yucca Mountain Project. The selected contractors are NAC International of Norcross, Georgia and Areva Federal Services LLC of Bethesda, Maryland. The two contracts are for five years and have a value of up to \$7.3 million each.

According to Yucca Mountain project chief Edward F. "Ward" Sproat, the selection of these two contractors is a "significant step forward in the Department's efforts to license and construct the repository at Yucca Mountain."

The companies will be designing canisters for the Transportation, Aging, and Disposal (TAD) canister system. First announced in October 2005, the canister approach is aimed at minimizing the handling of spent nuclear fuel at the repository by using the same canister from the time it leaves a nuclear power plant to the time it is placed in a waste-disposal package at Yucca Mountain. The TAD-based approach eliminates the need for the construction of several multi-billion dollar facilities for handling spent fuel at the proposed repository.

"We believe that these advanced canisters will provide for the safe, long-term storage of our nation's spent nuclear fuel," said Sproat in a DOE press release.

According to DOE, the TAD canister will be the primary means for packaging nuclear

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to Energy Secretary Samuel Bodman, "Today's application begins a new phase for the Yucca Mountain Project. This is a filing that will put this project in a new frame of mind moving forward."

The licensing paperwork was drawn from decades of study into the geology of Yucca Mountain and a number of engineering add-ons. The project envisions storing radioactive waste in as many as 11,000 containers in a 41-mile system of tunnels 1,000 feet below the surface. According to Ward Sproat, Yucca Mountain project chief, the earliest a repository could start accepting nuclear waste, assuming the licensing process goes smoothly and funding remains stable, is 2020. Other experts think that a better estimate is the middle of that decade, or even later. The lifetime cost of the facility is estimated to be as high as \$96 billion.

DOE's previous target date for opening the repository was 2017. That date officially fell by the wayside in late 2007 after Congress cut the program's 2008 budget by 21 percent.

### The Licensing Process

NRC is a federal agency that regulates all of the nation's nuclear facilities with the exception of the nuclear weapons complex. All commercial, industrial, and academic entities must apply for a license from the NRC before building any facility containing or involving the use of nuclear materials. This includes nuclear power plants, research reactors, scientific labs and other facilities that produce or store radioactive materials. The NRC also licenses transportation casks used for storing and moving nuclear waste.



Department of Energy's License Application and supporting documents  
(Source: DOE)

The NRC will undertake an initial review of DOE's application in order to determine if it is complete enough for a full technical review. If the paperwork is in order, the commission will formally docket the application and start in-depth safety reviews and license hearings that could take years. NRC staff is expected to take 90 days to determine whether the commission will docket the case for review and could announce the decision in September of 2008.

Once docketed, the NRC will give prospective hearing participants 30 days to file challenges, or "contentions" to elements of the license application. In early 2009, the commission will decide who will participate in hearings before three-member panels of Atomic Safety and Licensing Board administrative law judges at sessions in Las Vegas and Washington, D.C.

When the hearing boards convene, it is expected that participants will include the states of Nevada and California, counties surrounding the proposed repository, and the pro-Yucca Nuclear Energy Institute.

According to federal legislation, the NRC must complete the review of the Yucca Mountain license application within four years. However, there is no penalty if the NRC fails to finish the review in four years and some experts believe it will take the commission years longer to complete the complex Yucca Mountain license case.

### Opposition to the Application

Nevada officials have voiced their opposition to DOE's license application. On June 4th Nevada Attorney General Catherine Cortez Masto filed a petition with the NRC calling on the commission to reject the license application. Attorneys for the state say they are planning to prepare a number of challenges to be aired during the license hearings.

Deputy attorney general Marta Adams said that Nevada officials are reviewing the application to determine whether any key elements are missing. According to Adams, the state "anticipate[s] challenging the completeness of the license application."

The petition filed by the state argues the license application does not contain the final design of the repository and that there is no design covering transportation, aging, and disposal canisters. The state also objects to



DOE’s plan to store spent reactor fuel above ground on “aging pads” at the repository site. The petition stated that the Nuclear Waste Policy Act “expressly forbids” that type of storage.

The state’s petition was supported by a letter from the five-member Nevada congressional delegation in Washington, D.C.

**The Role of EPA’s Radiation Standard**

Another stumbling block in the license approval process may be the lack of a final radiation standard for the repository. The Environmental Protection Agency’s (EPA) initial standard was overturned in a 2004 court ruling and the agency has yet to finalize a revised rule. NRC must adopt this standard, which will set public health limits on radioactive materials, and then determine whether the license application conforms to it.

When asked to explain the delay in the issuance of the final rule, EPA administrator Stephen Johnson said that the process is “very complex.” According to Johnson, “As [is the case with] any major regulation, it is important for us to reflect on it and go through an inter-agency process.”

Johnson could not say when the standard would be made final. Currently, the standard is undergoing review by the White House’s Office of Management and Budget. “My expectation is to have a decision certainly by the time I leave office,” said Johnson, who is expected to step aside by the time a new president is inaugurated next January.

While a license cannot be granted in the absence of a finalized EPA standard, NRC and DOE officials contend that a license review can be started prior to the adoption of the standard. According to Energy Secretary Bodman, having an EPA standard in hand is not a require-

**The Licensing Support Network**

The Licensing Support Network (LSN) is an internet database in which all background documents supporting research on the Yucca Mountain Project are made publicly available. It includes DOE-authored documents as well as materials uploaded by different stakeholders in the repository process. All parties and potential parties who will be involved in the licensing hearings were required to post any documents that may serve as evidence in the proceedings before DOE submitted the license application.

The LSN site may be accessed by members of the public via the following link:

<http://www.lsnnet.gov>

Eureka County’s LSN document collection may be accessed via the following link:

<http://lsndocuments.org>

ment. “It is certainly possible and appropriate for us to file an application prior to EPA determining the standard. Let’s get the review started,” Bodman said. ☒

DOE’s license application, as well as information on upcoming hearings can be accessed online via NRC’s website:

<http://www.nrc.gov/waste/hlw-disposal/yucca-lic-app.html>

Sources:

*Las Vegas Review-Journal*: 5/20/08, 6/4/08, 6/5/08, 6/7/08

*Las Vegas Sun*: 6/3/08

“Contractors” continued from page 1

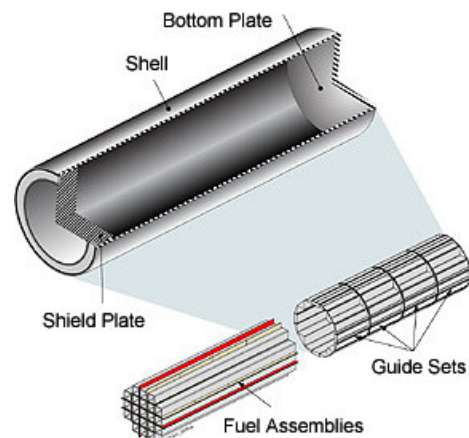
waste for transportation and disposal at the proposed repository. DOE estimates that up to 90 percent of the spent nuclear fuel to be stored at Yucca Mountain will be transported in TAD canisters.

DOE anticipates that the TAD canisters could be available as early as 2013. However, the earliest the proposed repository, if licensed, would be able to accept nuclear waste is currently estimated to be 2020. ☒

Sources:

*Las Vegas Sun*: 5/21/08

Department of Energy Press Release: 5/22/08



**Diagram of a TAD canister** (Source: DOE)

## Timeline: U.S. Nuclear Waste Policy

**1954** The Atomic Energy Act is passed by Congress directing the federal government to promote the peaceful use of atomic energy, with the understanding that disposal of the highly radioactive waste produced would be the responsibility of the federal government.

**1956** The National Academy of Sciences recommends deep geologic disposal of the long-lived, highly radioactive wastes from nuclear reactors, suggesting that buried salt deposits and other rock types be investigated for permanent repositories.

**1975** The Energy Research and Development Administration (ERDA) begins to search for a possible permanent repository for the nation's nuclear waste. A multiple site survey emphasizing buried salt deposits and federal nuclear facility sites is conducted in 36 states, including Nevada, but is reduced in scope due to decreased funding and political opposition from states.

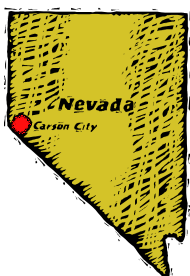


**1980** Deep geologic disposal is selected by the Department of Energy (formerly ERDA) in an Environmental Impact Statement as the preferred alternative for permanent disposal of commercial high-level nuclear waste.

**1982** Congress passes Nuclear Waste Policy Act of 1982 which establishes a repository site screening process, requires two repositories to assure regional equity, sets a schedule leading to federal waste acceptance for disposal beginning in 1998, starts the Nuclear Waste Fund to pay for the waste program with fees collected on the generation of electricity from nuclear power plants, and requires that the repositories be licensed by the Nuclear Regulatory Commission (NRC).

**1983** The Department of Energy (DOE) names nine previously screened potential repository sites in six states: seven in salt deposits and two on western federal nuclear facility sites (including the Nevada Test Site) in volcanic rock deposits.

**1986** DOE issues final Environmental Assessments and nominates five candidate repository sites from the original nine. The department selects three western sites -- in Nevada, Texas, and Washington -- for detailed investigation, one of which is to be selected for repository licensing.



**1987** Congress amends the Nuclear Waste Policy Act, designating Yucca Mountain, Nevada as the sole repository site to be studied for the permanent burial of 77,000 tons of high-level nuclear waste. Two other sites are removed from consideration, the screening process for a second repository site is ended, and studies of repository sites in granite are prohibited.

**1988** DOE holds public hearings on its site characterization plan for Yucca Mountain.

**1991** Surface studies begin at the Yucca Mountain site.

**1992** Congress passes the Energy Policy Act, directing the Environmental Protection Agency (EPA) to develop site-specific radiation standards for Yucca Mountain.

**1993** DOE begins grading work on first phase of the Exploratory Studies Facility at the proposed repository site. DOE formulates a new Program Approach that sets waste acceptance to begin in 2010 and relies on the development and distribution of Multi-Purpose Canisters to begin interim waste storage in 1998.

**1994** Portal entrance to the Exploratory Studies Facility is constructed and tunneling into Yucca Mountain begins.

**1995** The tunnel boring machine makes progress into Yucca Mountain but encounters loose ground at various points. Bills are pending in Congress that re-prioritize the waste program to emphasize interim waste storage and transportation, with site characterization as a lower priority.

*See "Timeline" continued on page 5*

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**1997** Workers complete a five-mile U-shaped exploratory tunnel at Yucca Mountain. Thermal testing, scheduled to take eight years, begins at Yucca Mountain.

**1998** DOE fails to meet its January deadline for waste acceptance. Lawsuits are filed by states and the nuclear industry. Legislation that would put an interim storage facility on the Nevada Test Site dies in Congress. The Yucca Mountain Viability Assessment is released in December with DOE declaring the site "viable," but admitting that much work still needs to be done before the site can be officially recommended to the President for approval.

**1999** The Draft Environmental Impact Statement for Yucca Mountain is released for public comment.

**2000** DOE revises the guidelines under which the Yucca Mountain site would be considered suitable for a repository. The revised guidelines shift the reliance for waste containment from the geologic features of the mountain to man-made barriers such as waste canisters and drip shields.

**2001** The EPA announces proposed radiation standards for Yucca Mountain. The state of Nevada files suit against the EPA, arguing the standards are inadequate.

**2002** The Final Environment Impact Statement for the proposed repository is released. Energy Secretary Spencer Abraham recommends Yucca Mountain as a suitable site to President George W. Bush, who approves the recommendation. Nevada Governor Kenny Guinn exercises the state's right to veto the Yucca Mountain project. The project moves to Congress, where Guinn's veto is overturned in both houses. President Bush signs the joint resolution into law, officially designating Yucca Mountain as the nation's nuclear waste repository site. The State of Nevada files lawsuits against DOE, the NRC, and the Bush administration.

**2003** DOE continues work on its license application to the Nuclear Regulatory Commission. Nevada's lawsuits against the Yucca Mountain repository are set for oral arguments in front of the D.C. Court of Appeals in January 2004.

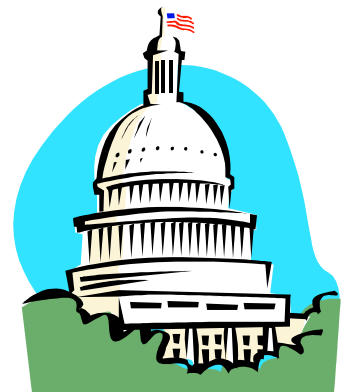
**2004** The U.S. Court of Appeals in Washington, D.C. throws out the EPA's 10,000 year radiation standard for Yucca Mountain; however, the court dismisses Nevada's other lawsuits. The Department of Energy selects the southern Nevada Caliente corridor to build a rail line for shipping waste to Yucca Mountain, designating the Carlin route as the alternative. An NRC Board rules that the Licensing Support Network, DOE's Yucca Mountain public internet database, is incomplete.

**2005** DOE announces plans to ship nuclear waste to Yucca Mountain in "dedicated trains," meaning that railroad cars carrying nuclear waste will not share trains with any other cargo. DOE releases emails indicating that documentation of quality assurance data may have been falsified by U.S. Geological Survey staff. The EPA releases a revised two-part draft radiation standard for public comment. DOE shifts the design of the proposed repository to a "clean" facility, unveiling the Transportation, Aging, and Disposal (TAD) canister system.

**2006** DOE sets a new target date of 2017 for the opening a the Yucca Mountain repository. In a waste management policy shift, the Bush administration launches the Global Nuclear Energy Partnership, or GNEP, an initiative to research nuclear waste reprocessing. DOE reopens its study of the so-called Mina rail route to Yucca Mountain.

**2007** The Walker River Paiute Tribe withdraws its permission to ship nuclear waste through its reservation, forcing DOE to drop plans for further study of the Mina rail route. DOE releases the design requirements for its TAD canisters as well as two draft EIS documents relating to the project. DOE abandons 2017 opening date for Yucca Mountain, estimating that the facility will not be operational until 2020 at the earliest. The Licensing Support Network, DOE's Yucca Mountain public internet database, is ruled complete.

**2008** DOE submits its license application to the NRC for review. Nevada officials file a petition urging the NRC to reject the application based on the lack of critical information. ❏



## Nuclear Industry Broadens Waste Management Policy

With delays mounting in the development of a proposed Yucca Mountain nuclear waste repository, the nuclear industry has broadened its policy on spent nuclear fuel management. No longer relying solely on Yucca Mountain as a solution, industry officials have begun exploring other waste management strategies, including the establishment of long-term interim storage sites.

According to Nuclear Energy Institute (NEI) executive Marshall Cohen, industry officials are meeting with governors and elected officials in order to locate a community interested in hosting an interim storage facility. Cohen said that talks are moving forward with two or three communities.

“What we are willing to do is put an entire industry behind the effort,” Cohen said of locating volunteers to hold on to nuclear waste until it can be moved to Yucca Mountain or to a reprocessing plant. If NEI can recruit one or more volunteer sites, “it can be very, very helpful in the long run for the utilities to be able to answer the inevitable question, ‘What about the waste?’” Cohen said.

NEI’s interim storage campaign reflects a general shift in the way the industry views the much-delayed Yucca Mountain project. Burial in the proposed Nevada repository was once seen as the only solution for thousands of tons of spent fuel piling up onsite at nuclear power plants. Now, NEI is advocating a broader policy that includes advancing nuclear fuel processing and exploring options for interim storage.

NEI is an industry organization charged with establishing unified policy on matters affecting the nuclear energy industry. Its members include all utilities licensed to operate nuclear power plants, nuclear plant designers, fuel fabrication facilities, and other stakeholders in the nuclear energy industry.

Referring to its current nuclear waste policy as “Integrated Used Fuel Management,” NEI now envisions a three-pronged approach to waste management:

- ◆ Interim storage of used fuel until recycling and/or permanent disposal are available
- ◆ Research and development into recycling technologies to close the nuclear fuel cycle
- ◆ Permanent disposal

While an operational Yucca Mountain repository remains a long-term goal, the industry is moving forward on the shorter-term goals of identifying voluntary sites for interim storage and investing in technology for

waste recycling.

Currently, commercial nuclear waste is being stored temporarily at 121 sites in 39 states. A typical nuclear reactor creates about 20 tons of spent fuel a year.



In the early 1980s, all reactor owners were required to sign contracts in which the federal government agreed to dispose of their nuclear waste starting in the year 1998. Utilities have since filed 60 lawsuits with the federal government, which has failed to begin collecting the waste due to delays in the proposed Yucca Mountain repository project.

As a result of various court orders and settlements, the federal government has already paid nuclear utilities a total of \$342 million. Total payments to the industry for breach of contract could come to \$11 billion, according to Yucca Mountain project chief Edward F. “Ward” Sproat, if the repository is operational by the target year of 2020. For every year beyond that, damages will come to about \$500 million more. ☒

Sources:

*Las Vegas Review Journal*: 2/23/08; *New York Times*: 2/17/08; NEI presentation to the Nevada Legislature Committee on High-Level Radioactive Waste: 5/14/08

### ***Nuclear Waste Update*** **Eureka County Yucca Mountain** **Information Office**

The Eureka County Nuclear Waste Update is published by the Eureka County Yucca Mountain Information Office, P.O. Box 990, Eureka, NV 89316, (775) 237-5707. The purpose of the *Update* is to provide information to the public about issues related to the proposed nuclear waste repository at Yucca Mountain.

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Articles in this newsletter may not necessarily reflect the positions or opinions of the Eureka County Board of Commissioners.

For more information on the Yucca Mountain project, contact the county’s Yucca Mountain Information Office: (775) 237-5707 or email [ecyucca@eurekanv.org](mailto:ecyucca@eurekanv.org).

Newsletter Staff:

**Abby Johnson, Editor**

**Sarah Walker, Technical Writing and Layout**

## Federal Railroad Board to Consider DOE's Application

The Surface Transportation Board (STB) has ruled that it will consider the Department of Energy's (DOE) bid to build a rail line to transport nuclear waste through Nevada to the proposed Yucca Mountain repository. Questioning the completeness of DOE's application, Nevada officials had requested that the rail board reject DOE's application.

On March 17, DOE filed an application seeking authorization from the board to construct and operate the 300-mile Caliente rail line to Yucca Mountain. The proposed rail line would connect the existing Union Pacific rail line near Caliente to the nuclear waste repository. If constructed, the rail line would run through or near the Nevada towns of Tonopah, Goldfield, Beatty, and Amargosa Valley. The STB officially adopted a schedule for consideration of DOE's application in April of 2008.

Attorneys for the state of Nevada had filed a motion asking the STB to reject the application as incomplete. The state argued that DOE's application lacked key information, including an operating plan and a meaningful analysis of environmental impacts and terrorism risks. The STB, however, denied Nevada's request to reject the application. According to the three-member rail board, DOE has submitted sufficient information to move forward with the review.

The STB regulates freight railroads under the Interstate Commerce Act. The board, whose three members are appointed by the President and serve five-year terms, is charged with reviewing proposals to construct and operate new rail lines.

In a seven-page ruling issued on the matter, the board stated "we find that DOE's application is sufficiently complete, and that we do not need additional information from the applicant at this time." Nevada officials have said they are considering options for a possible appeal. ☒

Sources: *Las Vegas Review-Journal*: 7/02/08; STB Press Release: 6/27/08



Source: *Las Vegas Review-Journal*

## Nuclear News . . . In Brief

**Yucca Mountain Cost Estimate Tops \$96 Billion...** A recent Department of Energy (DOE) report estimates that costs for building a nuclear waste repository and operating it for 100 years could exceed \$96 billion. This is a revision of the previous "total system life cycle" cost estimate of \$57.5 billion, set in 2001. The increased costs are due not only to project delays, but also to inflation and DOE assumptions that the Yucca Mountain site will be expanded to hold more waste. Currently, the capacity of the repository is capped at 77,000 metric tons. DOE is reportedly planning to recommend that Congress lift the cap. (*Las Vegas Review-Journal*, 7/16/08; Department of Energy Press Release, 8/5/08)

**Senator Proposes Interim Storage Sites as an Alternative to Yucca Mountain...** New Mexico Senator Pete Domenici has unveiled a bill that proposes an alternative to the proposed Nevada repository. This new strategy would partner the government with the nuclear industry to develop privately owned storage sites and recycling factories. In this plan, Yucca Mountain would be used only to house radioactive products that cannot be recycled. The bill, which was introduced in the Senate in June, would authorize DOE to enter into contracts with private companies to store waste at two interim sites—one in the West and one in the East—while reprocessing sites are built nearby. (*Las Vegas Review-Journal*, 6/28/08)

Continued on back page

## Nuclear News . . . In Brief

**Senate Panel Cuts Yucca Budget by More Than 20 Percent...**The Senate's subcommittee on energy and water has approved a \$386.4 million budget for the Department of Energy's Yucca Mountain Project for fiscal year 2009. The amount is over \$100 million, or 22 percent, less than DOE had requested. DOE representative Allen Benson said the department would not comment until Congress approves a final version of the budget. Last month, a corresponding bill passed in the House fully funded DOE's request at \$494.7 million. The House and Senate will need to settle on a final amount, but Congressional leaders have not said when the bill will be finished. Congress last year forced cuts of over \$100 million in the project, prompting several hundred layoffs and a DOE reorganization. (*Las Vegas Review-Journal*, 7/9/08)

**Early Yucca Supporter Changes Tune...**Former Senator J. Bennett Johnston, one of the lawmakers responsible for turning Yucca Mountain into the nation's only option for a nuclear waste repository, now says that the project should never have been billed as a place to hold waste indefinitely. Johnston says the repository might have won more public support in Nevada had it been designed instead as a temporary facility. "I think it

should have been designed differently," Johnston said. "I knew we'd run into the kinds of problems that we have—where you can't absolutely prove with certainty what's going to happen in 10,000 to 100,000 years." Johnston, now a consultant in Washington, D.C., led the drive in Congress for a permanent waste repository 20 years ago. The former Senator's renewed interest in temporary storage mirrors a similar shift within the nuclear industry, which is now exploring alternatives to Yucca Mountain. (*Las Vegas Sun*, 5/21/08)



Source: *Las Vegas Sun*

**Law Firm to Stay on Yucca Mountain Case...**Morgan Lewis & Bockius, the law firm hired by DOE to handle the Yucca Mountain licensing process, will remain on the job. Attorneys for the state of Nevada had argued that the firm had irreparable conflicts of interest. The firm also represents more than a dozen nuclear utility companies that have sued DOE for failure to bring the repository into operation on time. However, the Nuclear Regulatory Commission dismissed the complaint, citing lack of evidence that the Yucca Mountain hearings would be compromised. (*Las Vegas Review-Journal*, 6/7/08)



### Eureka County on the Web! New Updates on the Yucca Mountain Project!

Check out the county's website at [www.co.eureka.nv.us](http://www.co.eureka.nv.us). Log on to our nuclear waste website at [www.yuccamountain.org](http://www.yuccamountain.org) to get information on Yucca Mountain and its effects on the residents of Eureka County. Info includes news, maps, links, photos, and transportation updates.



*Eureka County*  
*Yucca Mountain Information Office*  
*P.O. Box 990*  
*Eureka, Nevada 89316*

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