

The Challenge of Nuclear Waste Governance in the United States

Richard Forrest
Otto-Suhr Institute &
Environmental Policy Research Center (FFU)
Freie Universität Berlin

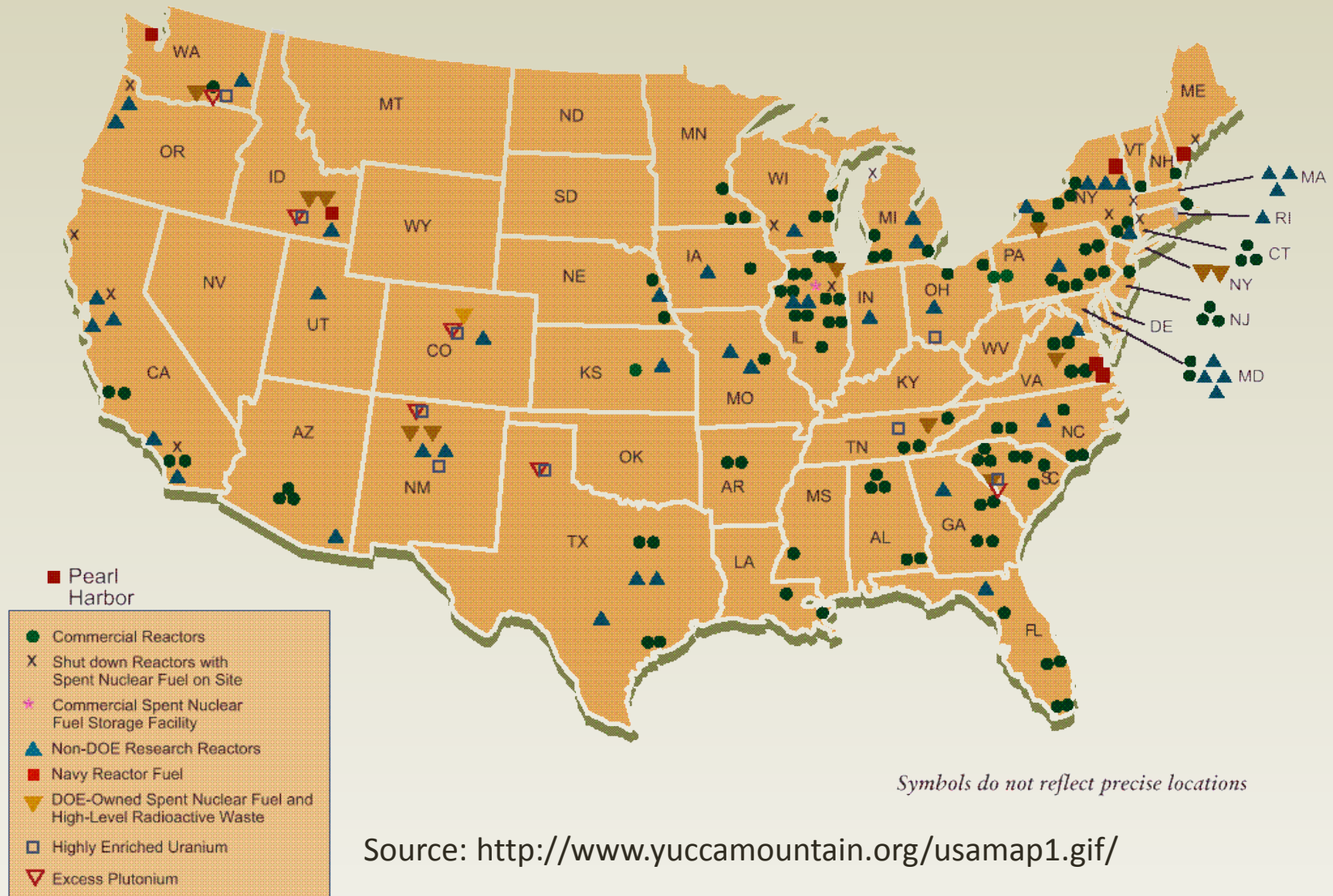
*Prepared for Presentation at
The 18th REFORM Group Meeting, Salzburg, Austria
August 26-30, 2013*

*Session:
Climate Policy Strategies and Energy Transition –
Nuclear Waste Governance in Comparison*

High-level radioactive waste (HLW) situation in the United States:

- Complex
 - long history
 - large-scale
 - both civilian and military activities
 - terrorism concerns
- Governance in the US in general
 - multi-level
 - strong state's rights
 - variety of access and leverage points

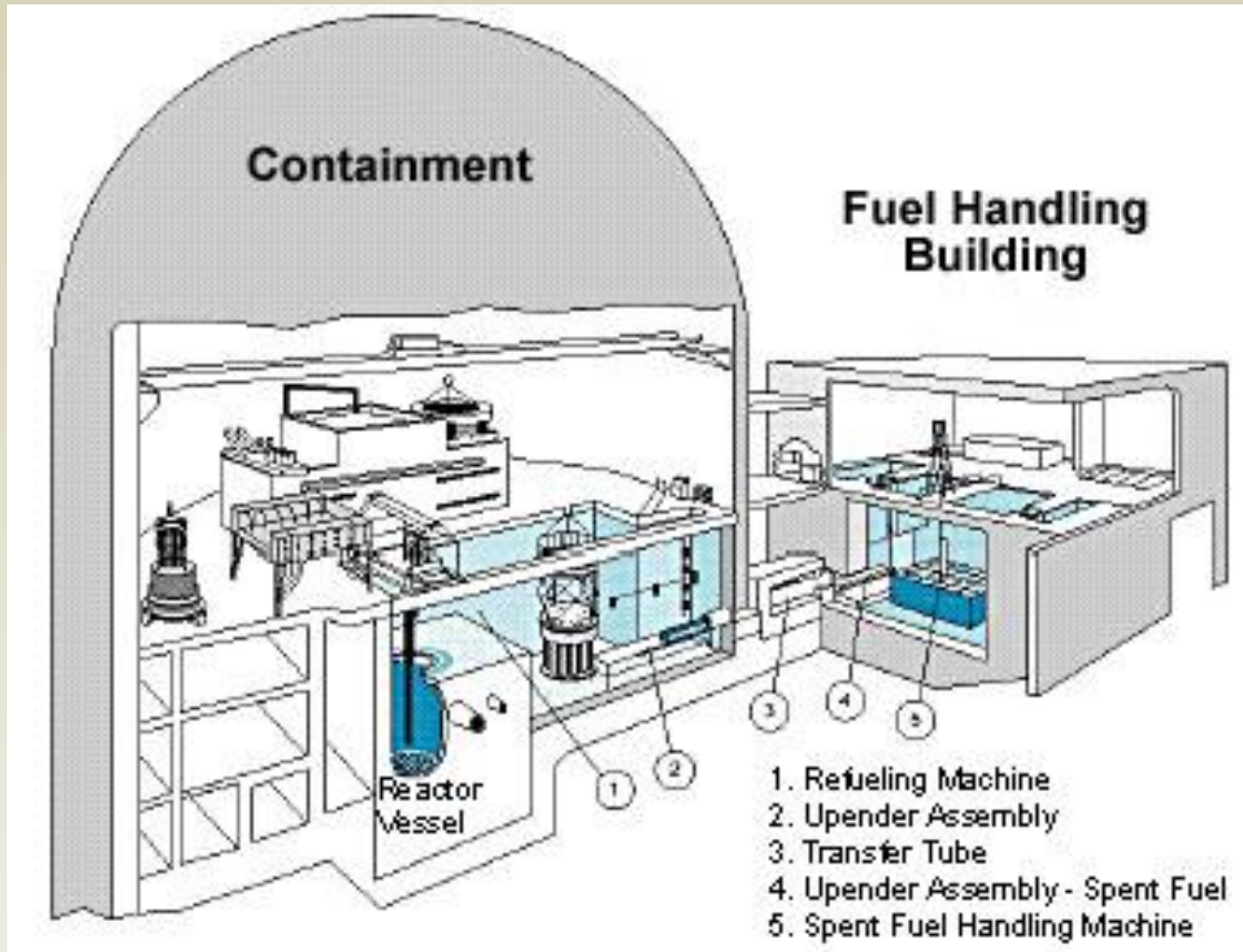
Locations of Spent Nuclear Fuel and High-Level Radioactive Waste Destined for Geologic Disposal



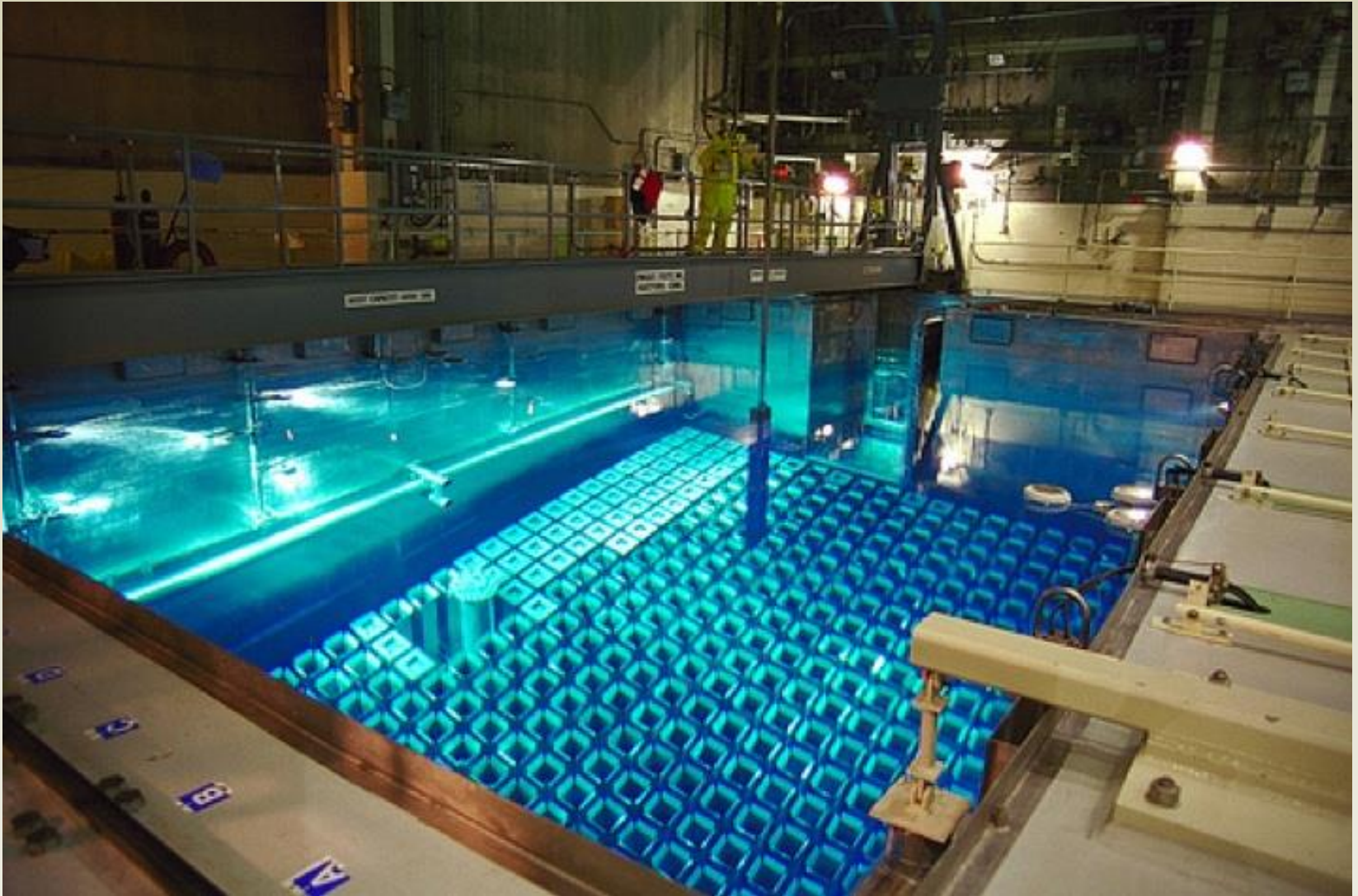
Present Policy for Storage of HLW

- >70,000 metric tons 3,000 tons added annually
- Military
 - Hanford Reservation (Washington)
 - 177 storage tanks -- multiple leaks 2013
 - Savannah River Plant (South Carolina)
- Civilian
 - 60,000 metric tons
 - 104 civilian nuclear reactors clustered at 65 facilities
 - 2 being decommissioned
 - 10 reactors at 9 locations already decommissioned
 - 63 “independent spent fuel storage installations” (ISFSIs) in 33 states
- Total 126 locations
 - Spent fuel pools ("wet pools") - 78% of total
 - Dry Cask Storage – 22% of total

Spent Fuel



Spent Fuel Pool



Source: <http://noyonews.net/?p=7878>

Dry Casks



Source: <http://www.scientificamerican.com/blog/post.cfm?id=whatever-happened-to-plans-to-bury-2009-03-09>

Waste Storage Concept

- Dry cask and wet pool storage
 - considered safe only for perhaps 100 years
- Geologic storage
 - need for tens of thousands to 1 million years
 - suitable sites
 - arid climate and low annual rainfall
 - remoteness from population centers
 - overall geological stability
 - "host rock" –a low permeability or water intrusion potential

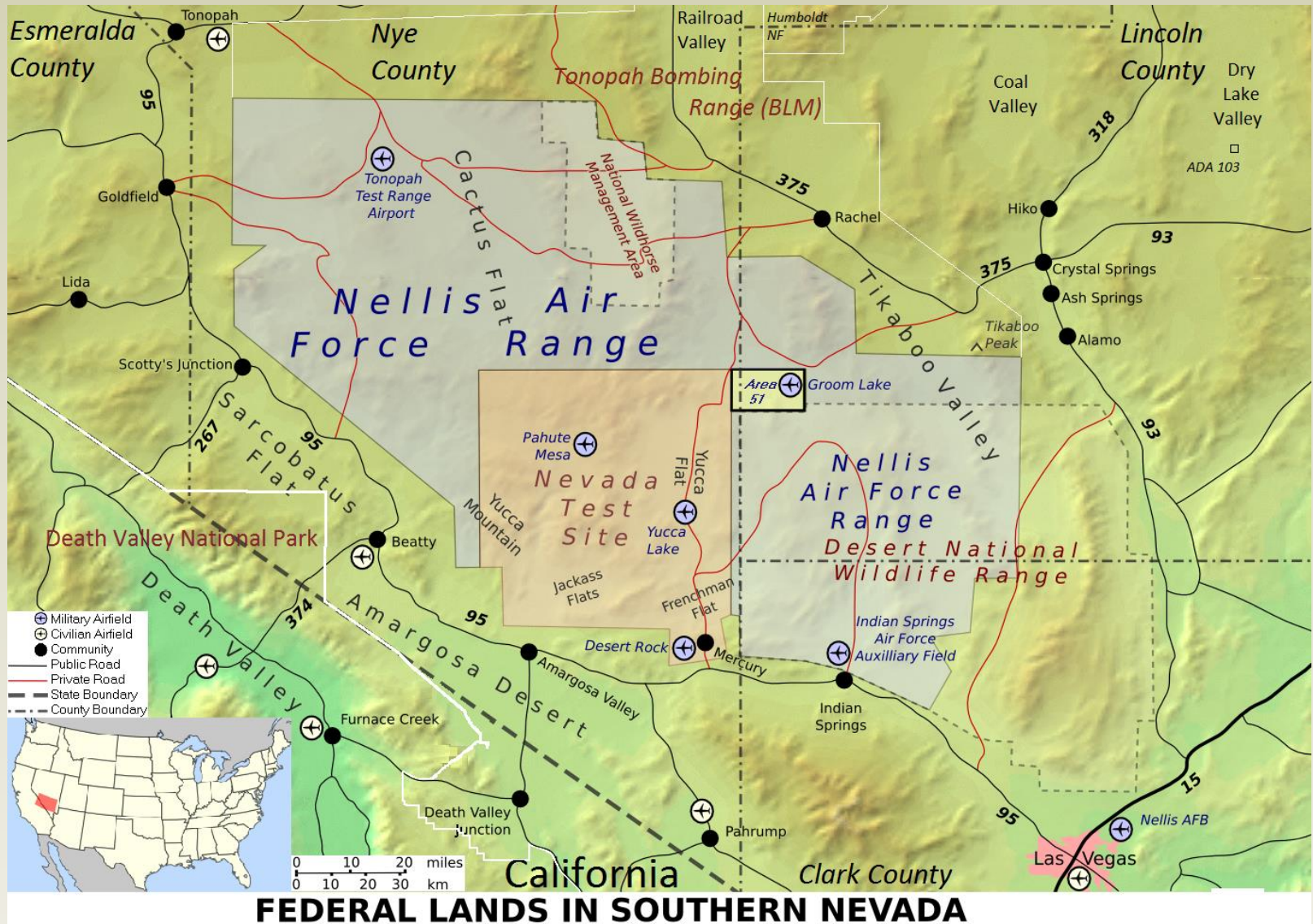
Nuclear Waste Policy Act (NWPA) (1982)

- Department of Energy (DOE) to assess candidate sites
 - scoping ~120 sites
 - assessed in detail: 5 sites
 - 3 sites to be formally recommended by 1985.
 - second repository also to be designated
- 1987--NWPA amended:
 - open by 1998
 - restrict research to Yucca Mountain
 - (cost considerations)

Yucca Mountain

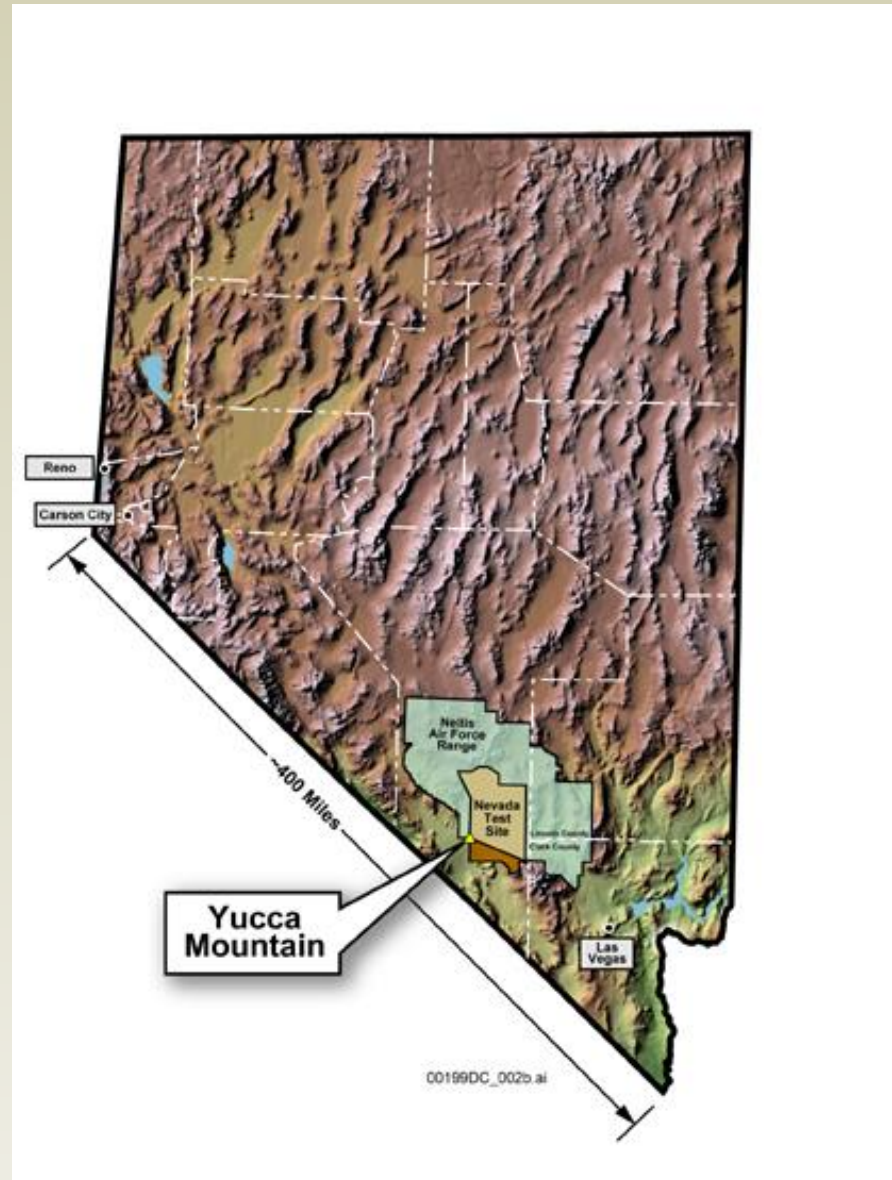
- 2002 DOE formally recommended opening Yucca Mountain Nuclear Waste Repository
 - Construction work—open 2017?
 - 2008 GW Bush Administration formal application to Nuclear Regulatory Commission for approval

Yucca Mountain – Location



Source: http://en.wikipedia.org/wiki/File:Wfm_area51_map_en.png

Yucca Mountain – Location



Source: http://www.nei.org/corporatesite/media/filefolder/yucca_nevada_map.jpg

Yucca Mountain



Source: <http://www.americainfra.com/article/yucca-mountain/>

Nevada Test Site

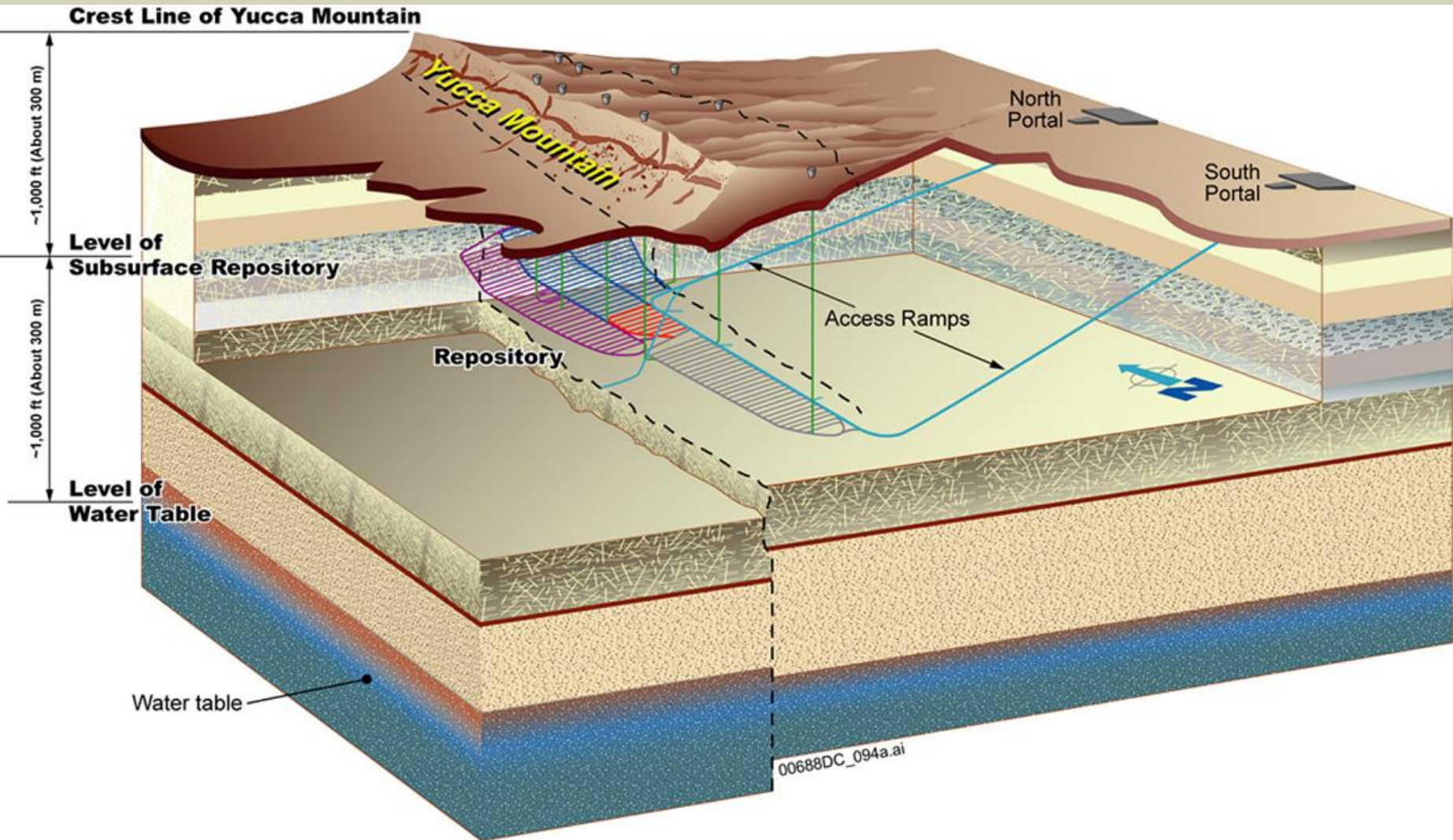


Source: <http://ndep.nv.gov/boff/atomic.jpg> (left) and <http://upload.wikimedia.org/wikipedia/commons/e/eb/NNSA-NSO-787.jpg> (right)

Yucca Mountain

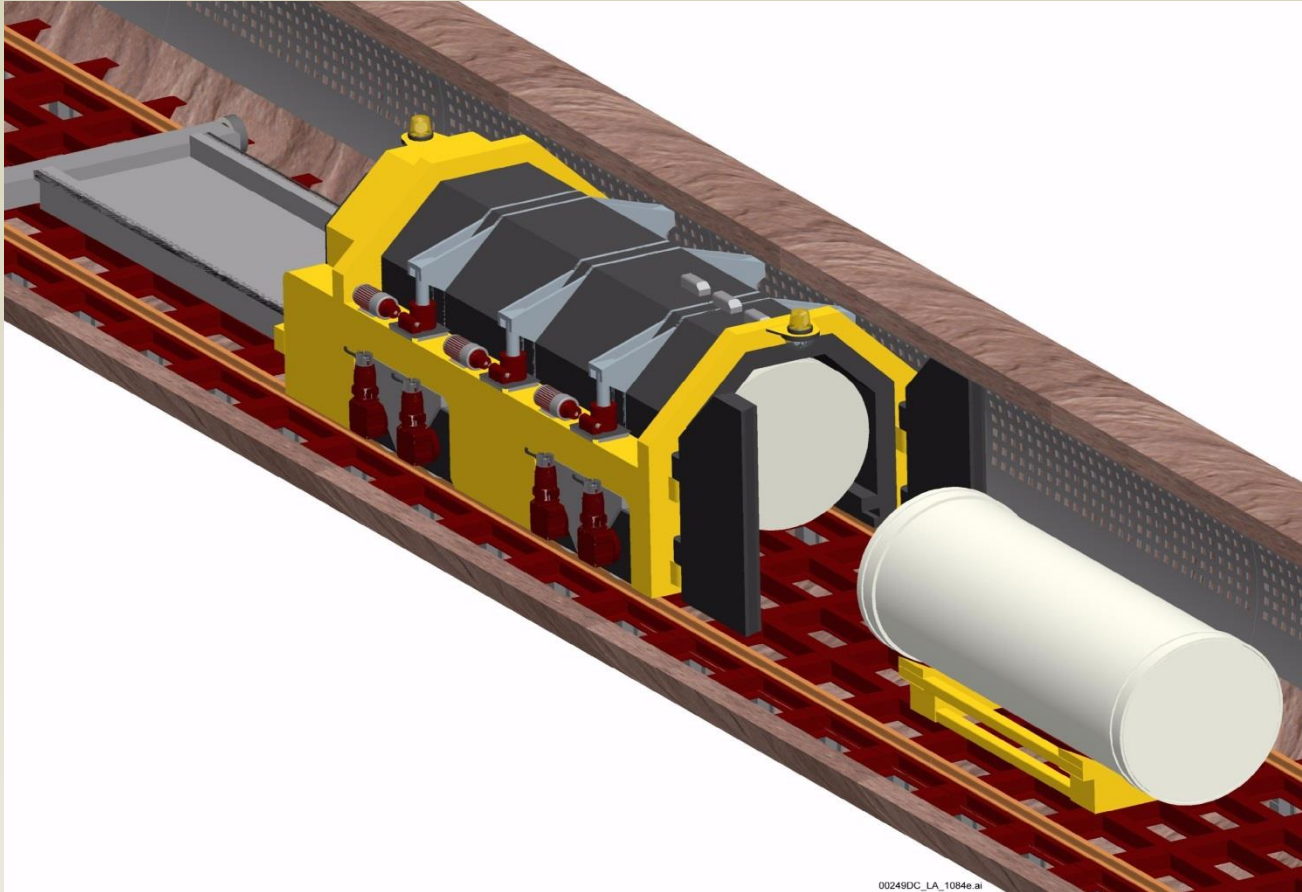
- Nye County, Nevada.
 - 150 km NW of Las Vegas
- "The most studied piece of real estate on the planet."
- igneous rock -- welded tuff
- Adjacent to former Nevada Test Site
- Issues:
 - earthquakes
 - volcanism
 - water intrusion
 - management issues (data falsification?)
- capacity 70,000 tons – to increase to 125,000 tons?

Yucca Mountain – Schematic



Source: <http://www.tunneltalk.com/images/Yucca-Mountain/2-YuccaMountain-Fig1.jpg>

Yucca Mountain – Schematic

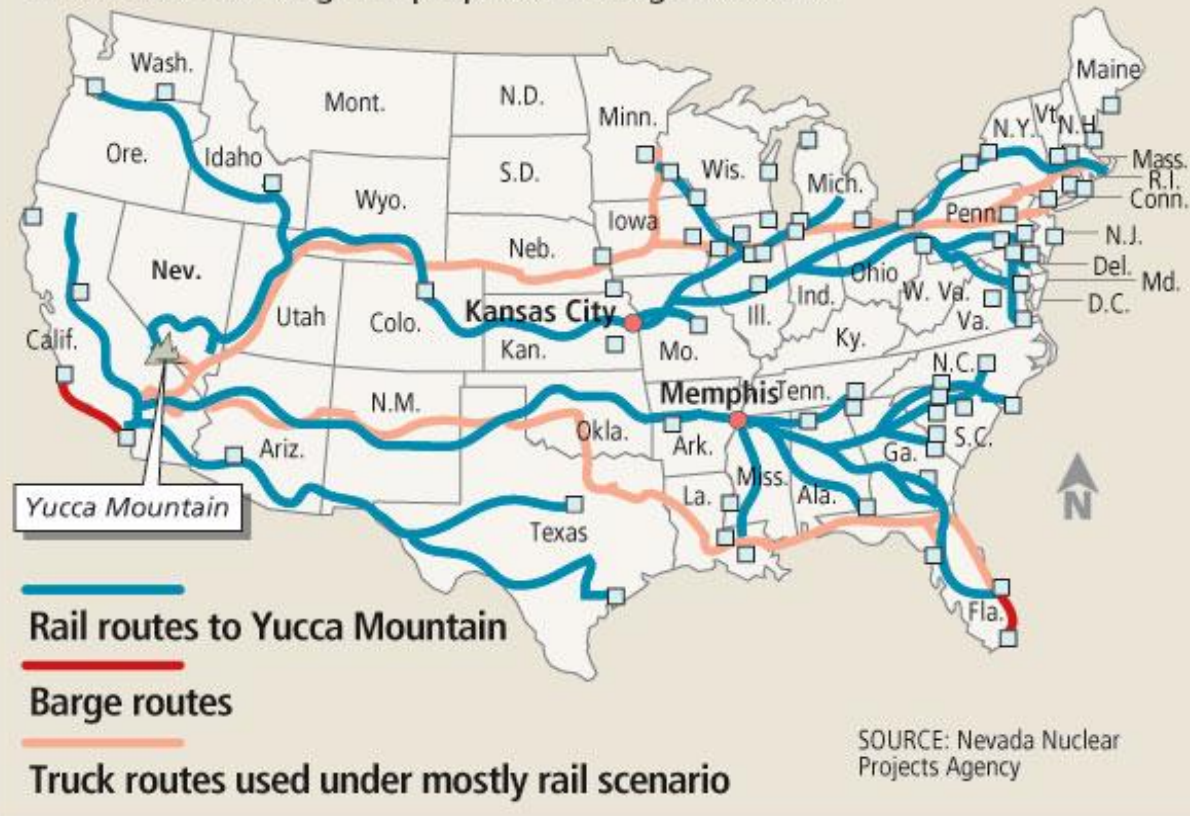


Source: <http://pbadupws.nrc.gov/docs/ML0815/ML081560427.pdf>, p. 103

Yucca Mountain – Waste Transportation Routes

Yucca Mountain routes

Potential nuclear waste transportation routes would shuttle spent fuel through Kansas City and Memphis to reach Yucca Mountain under a mostly rail scenario. Public hearings will be held in the fall to select a rail corridor in Nevada including one proposed through Caliente.



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\$15 billion already spent on research, construction & preparation

- However, Candidate Obama and Harry Reid opposed
 - 2009 Obama budget:
 - *"The Yucca Mountain program will be scaled back to those costs necessary to answer inquiries from the Nuclear Regulatory Commission, while the Administration devises a new strategy toward nuclear waste disposal."* (OMB 2009, p. 65)
 - No clear explanation or rationale given
- March 2010 DOE "Motion to Withdraw"
 - advancements in science
 - lack of "broad public support"
- New funding cut off

President Obama and Senate Majority Leader Reid (D - NV)



Source: <http://www.politico.com/news/stories/1010/44055.html>

Status

- Lawsuit brought by Washington and South Carolina
 - U.S. Federal Court of Appeals ruling August 13, 2013
 - in favor of the plaintiffs
 - NRC was “simply flouting the law”
 - must proceed with the processing of the DOE application for use of the YMNWR
 - only \$11 million

Legal framework

- Federal:
 - Nuclear Waste Policy Act (NWPA)
 - Nuclear Waste Fund (NWF)
 - To fund eventual geologic storage
 - \$9 billion used ; \$29 billion in fund; \$750 million added annually
 - Other
 - *Energy policy, etc.*
 - Atomic Energy Act of 1954
 - Energy Policy Act of 2005;
 - *Environmental laws*
 - National Environmental Policy Act (1970; EIS)
 - Clean Water Act (1972);
 - Safe Drinking Water Act (1974);
 - Resource Conservation and Recovery Act (1976);
 - Toxic Substances Control Act (1976); and
 - CERCLA (1980 "Superfund")

Regulations Regarding Radioactive Wastes

- "Licensing requirements for Land Disposal of Radioactive Waste" (1960);
- "Disposal of High-Level Radioactive Wastes in Geologic Repositories" (1990);
- "Disposal Standards for Long-Lived Waste" (1992);
- "Radiation Protection of the Public and the Environment" (1993);
- "Public Health and Environmental Radiation Protection Standards for Yucca Mountain, Nevada" (1998);
- "General Guidelines for the Recommendation of Sites for Nuclear Waste Repositories" (1999);
- "Disposal of High-Level Radioactive Waste in a Geologic Repository at Yucca Mountain, Nevada" (2000);
- "Nuclear Safety Management" (2001);
- "Conduct of Operations Requirements for Nuclear Facilities" (2001), among others

Information policy and participation

- Freedom of Information Act (FOIA)
- Administrative Procedures Act (APA)
- National Environmental Policy Act (NEPA)
- etc.

Yucca Mountain – Public Comments

TRIBAL INTERACTIONS MEETING 6/2/2004

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YUCCA MOUNTAIN
TRIBAL INTERACTIONS MEETING

REPORTER'S TRANSCRIPT OF COMMENTS

Taken at the Desert Research Institute
755 E. Flamingo Road
Las Vegas, Nevada

On Wednesday, June 2, 2004
At 2:27 p.m.

Reported by: Deborah Ann Hines, CCR #473, RPR

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1 opportunity to participate in this dialog, we want to
2 also allow DOE to recognize that it's been nearly
3 going on four years perhaps that we haven't met, so
4 it makes it very difficult for us to provide
5 information on a rail transportation system that's
6 being evaluated or going to be developed through the
7 EIS.

8 We believe that the comment period should be
9 extended for the tribal governments to provide
10 additional comments to the process and request that
11 that be extended by 90 days.

12 Secondly, we are a bit concerned that no
13 contractors have been identified to provide the EIS,
14 as is typically customary.

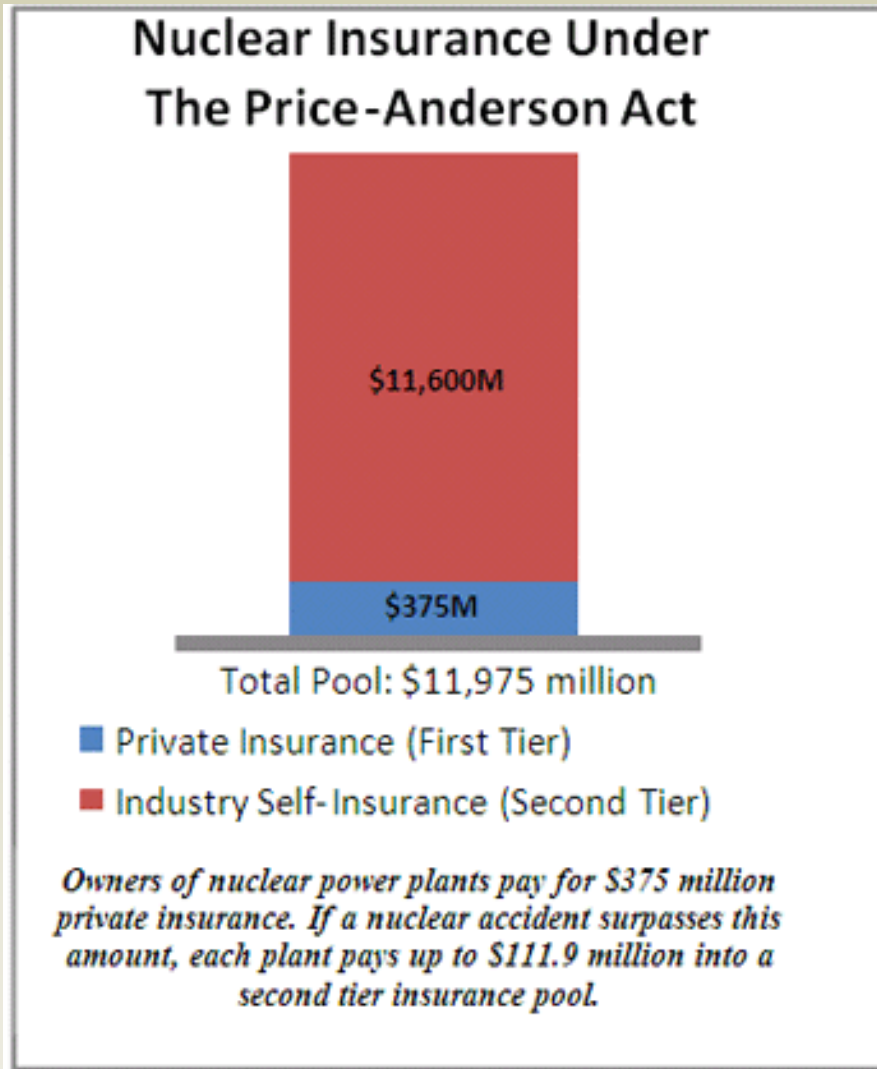
15 Thirdly, we believe that the American Indian
16 Rider Subgroup should be permitted to develop a
17 resource document for reference to and inclusion as
18 appropriate in the final EIS, the draft EIS. We
19 would hope and suggest that as recommended previously
20 in the resource document to the EIS dated February
21 1998 that systematic ethnographic studies that deal
22 with the misperception analysis of the proposed
23 transportation corridor be implemented and properly
24 evaluated.

25 The rail shipments that would be coming

Compensation

- Price-Anderson Nuclear Industries Indemnities Act (1957)
 - extended to 2025
- regulates liability for civilian nuclear facilities
 - created a "no-fault" insurance fund (\$12.6 billion in 2011) to supplement mandated industry-purchased private insurance coverage of \$375 million per facility
 - "American Nuclear Insurers (ANI)" insurance pool
 - 60 U.S. private insurance companies.
- would also cover transportation incidents

Insurance – Price-Anderson Act



Source: <http://www.nrc.gov/reading-rm/doc-collections/fact-sheets/funds-fs.html>

Price-Anderson Act (continued)

- "Claims can include any incident (including those that come about because of theft or sabotage) in the course of transporting nuclear fuel to a reactor site; in the storage of nuclear fuel or waste at a site; in the operation of a reactor, including the discharge of radioactive effluent; and in the transportation of irradiated nuclear fuel and nuclear waste from the reactor." (NRC 2011)

Institutional Framework

- Regulatory functions
 - Nuclear Regulatory Commission – develops regulations
 - Environmental Protection Agency – establishes environmental standards
 - Department of Energy
 - Office of Civilian Radioactive Waste Management (OCRWM) – closed
 - Nuclear Waste Technical Review Board (NWTRB) -- provides technical assistance to DOE
 - Department of Transportation
- State-level agencies
- Nuclear power industry
 - Nuclear Energy Institute (NEI)
- Courts

Regulation



State and local level

- Nevada:
 - 1987-8: Bullfrog County
 - State veto exercised -- overridden by Congress
 - Nye County
 - Nuclear Waste Repository Project Office (NWRPO)

Blue Ribbon Commission on America's Nuclear Future (BRC) – 2010-2012



BLUE RIBBON COMMISSION
ON AMERICA'S NUCLEAR FUTURE

- Recommendations included:
 - permanent deep geological facilities should be developed
 - a new organization should be established to provide oversight
 - "consent-based approach"
 - "all affected levels of government (local, state, tribal, etc.) must have, at a minimum, a meaningful consultative role"
 - decisions should be "science-based"

Public Opposition

AUGUST 23, 2013

Currently: 80° — Complete forecast | Log in

LAS VEGAS SUN

N E W S P I N S P O R T S L I T E I N C T S E R T A I U N . M S E N & T W O R L D I A S I N C H O U S A U T

Weekend Best Bets | Cartoon Contest | High School Football | Health Care Quarterly | Joe Downtown | UFC | Rebels

SEARCH

56 COMMENTS



LETTER TO THE EDITOR:

Yucca Mountain? Not at any price

Mamie Glorioso, Las Vegas

Thursday, Aug. 22, 2013 | 2:03 a.m.

Wake up, Nevada. First our country used you as a nuclear testing ground, causing a lot of people to get cancer, and now the government wants to store hazardous waste.

It's about time our state and our governor tell the United States government where to go. Not this time. We've already paid our dues. Go find another place to destroy.

Our governor should tell them that those waste trucks will never cross our borders. Our lives and the lives of our children are worth fighting for.

And for those who feel we should do it for the right price, let me ask you: What price is enough for your life and the lives of your loved ones?

View more of the Sun's opinion section

- Editorials - the Sun's viewpoint
- Columnists - local and syndicated writers
- Letters to the editor - readers' views
- Write a letter to the editor

Viewed Discussed Trending

1. 9,000-home development planned for northwest valley
2. Metro Police infiltrates Sovereign Citizens, uncovers plots to 'snatch,' execute officers
3. 'Pawn Stars' shop temporarily closing for renovations
4. Tax evasion sends Las Vegas attorney to

Another Potential Site? DOE Waste Isolation Pilot Plant (WIPP)



Source: <http://www.americainfra.com/article/yucca-mountain/>

WIPP Supporters – Carlsbad, New Mexico



Source: <http://www.forbes.com/sites/christopherhelman/2012/01/25/nuke-us-meet-the-town-that-wants-americas-worst-nuclear-waste/>

The Last Word?

- Asked what he thought about the August 2013 U.S. Court of Appeals ruling, Harry Reid said:
 - “....some really bad judges...produced a 2-1 decision requiring the Nuclear Regulatory Commission to license Yucca Mountain. Their opinion means nothing. Yucca Mountain is dead. It’s padlocked. There’s nothing going on there.”
(Velotta 2013)

Lessons Learned

- Potential for intervention and veto opportunities by political actors
 - Allows rejection of "scientific consensus"
- No clear guidelines or criteria for making next decisions
- Prevailing tacit political consensus:
 - neither expand nor reduce nuclear power generation
 - not actively address and solve the long-term waste disposal issue
 - ...likely continued state of limbo
- Is this Success or Failure of Governance?
 - Is it a "lack" of governance?

Thank you for your attention.

Contact Information:

Richard Forrest

Free University of Berlin

raforrest@gmail.com