

The U.S. Environmental Protection Agency's

40 CFR Part 197

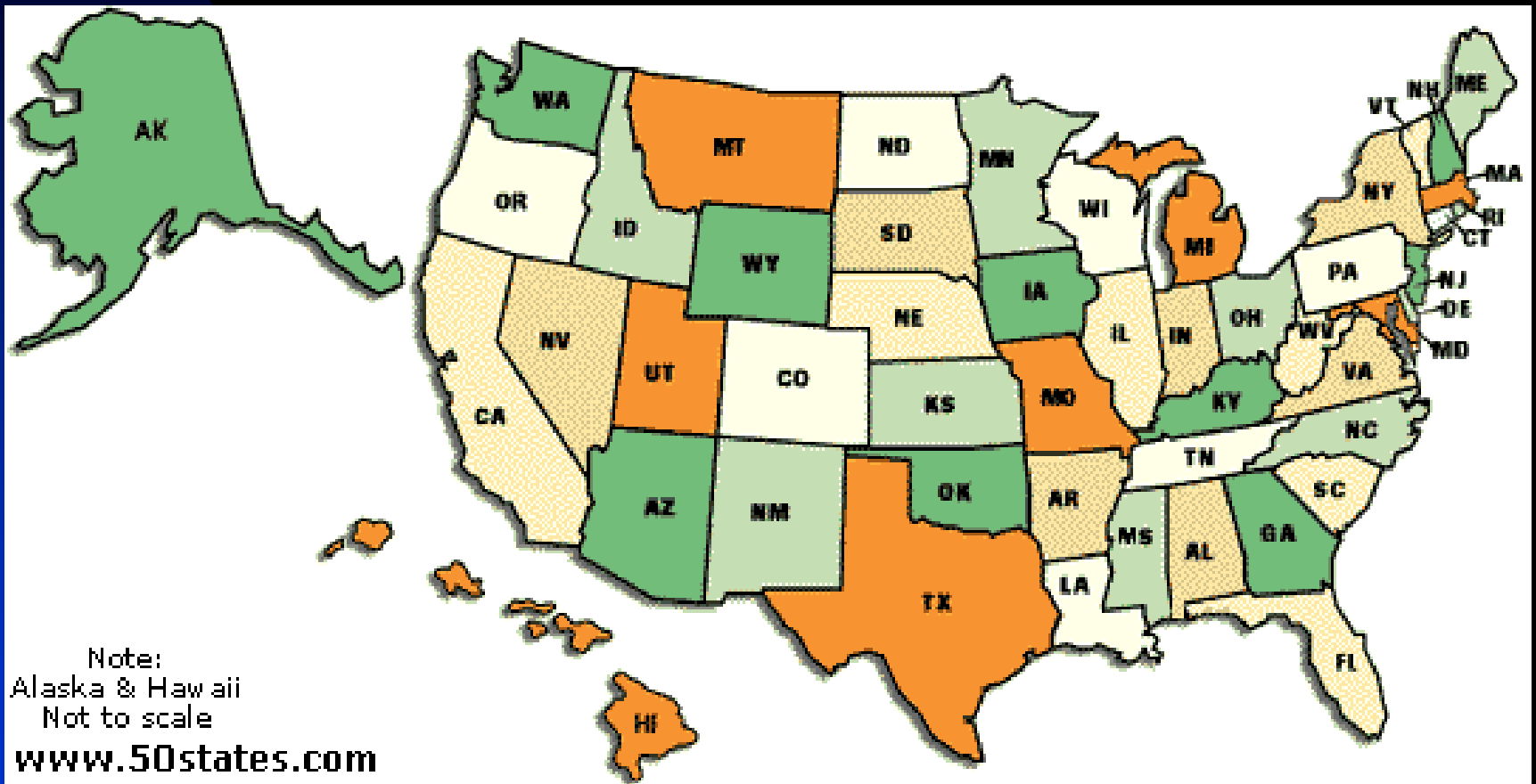
**Public Health and Environmental
Radiation Protection Standards for
Yucca Mountain**



Introduction

- On 5 June 2001, the Administrator approved the final public health and environmental radiation protection standards for Yucca Mountain – 40 CFR Part 197
- The Nuclear Regulatory Commission (NRC) will implement the standards by incorporating them into its licensing regulations

Map of the United States



Nevada Map

STOREY
CARSON CITY
DOUGLAS



Yucca Mountain is on the Nevada Test Site, which is in Nye County. (click on Nye County to see more)

CLARK
Las Vegas

Nye County

Yucca Mountain is about 100 miles northwest of Las Vegas, Nevada.



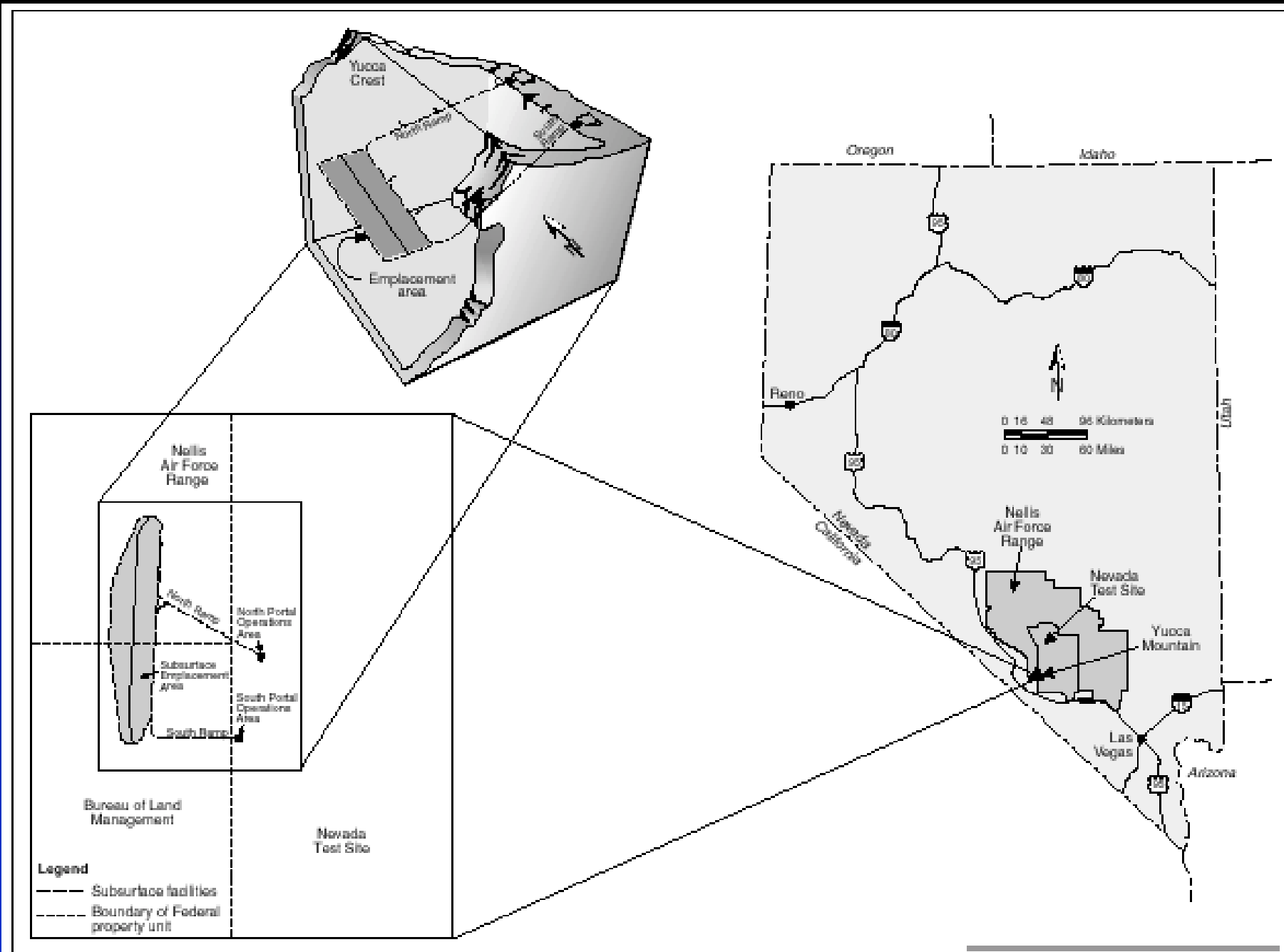
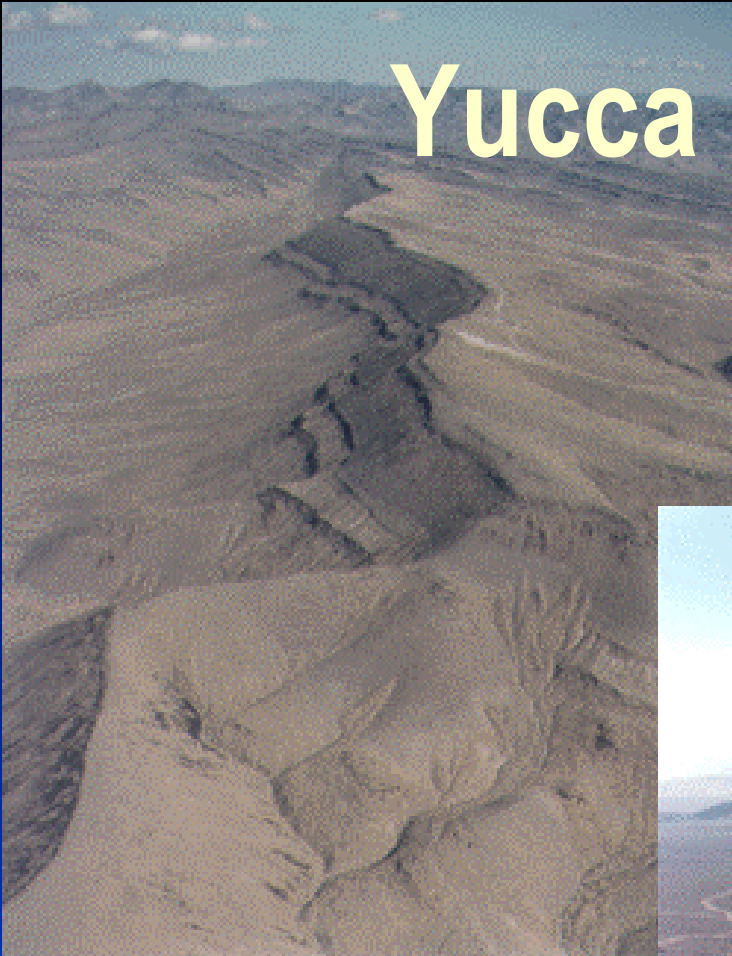
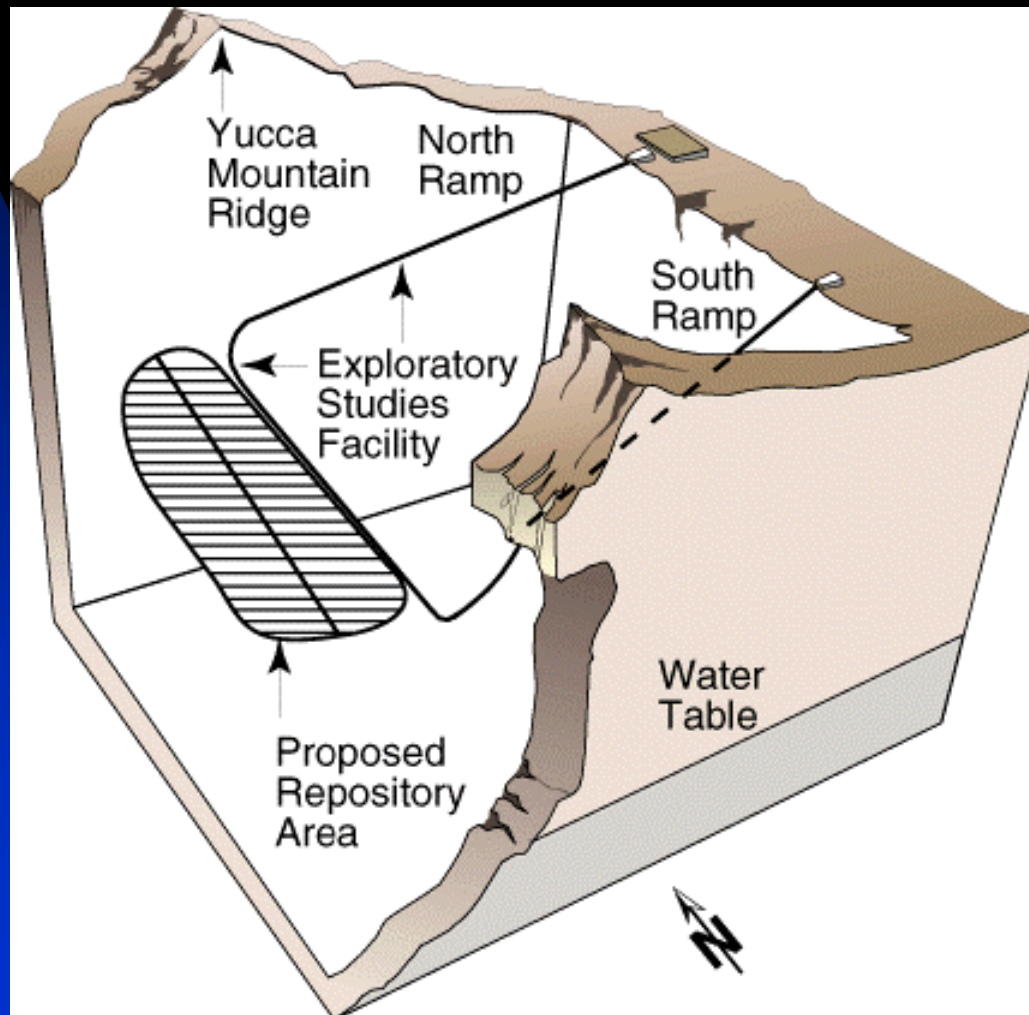


Figure 2-1. Diagram and location of the proposed repository at Yucca Mountain.

Yucca Mountain Environs



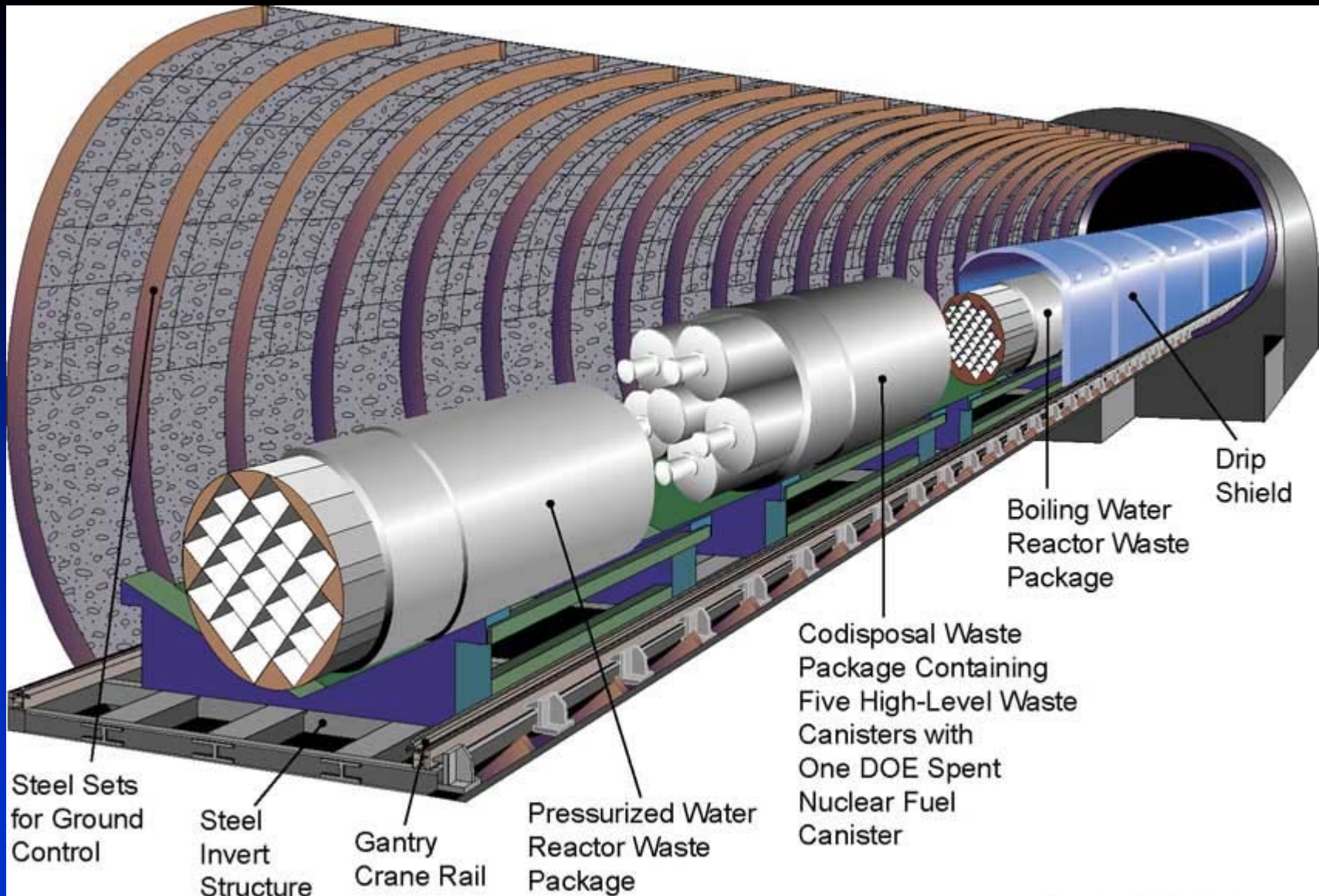
Facility Layout



Types of Waste

- 70,000 metric tons of heavy metal limit
- About 90% commercial spent nuclear fuel
- About 10% defense high-level waste
- Other wastes, e.g., excess plutonium

Emplacement Drift



Drawing Not to Scale
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History of Part 197

- WIPP Land Withdrawal Act of 1992
 - ◆ Exempted Yucca Mountain from 40 CFR 191
- Energy Policy Act of 1992
 - ◆ Set site-specific standards for Yucca Mountain
 - ◆ Establish limit on individual dose
 - ◆ Contract with National Academy of Sciences
 - ◆ Standards to be based upon, and consistent with, the NAS findings and recommendations
- Received the NAS Report in August 1995

Public Input

- Public comment period 27/8 – 26/11/99
- Hearings
 - ◆ Washington, DC
 - ◆ Amargosa Valley, Nevada
 - ◆ Las Vegas, Nevada
 - ◆ Kansas City, Missouri
- Received about 800 comments

Outline of the Standards

- Subpart A – Storage
- Subpart B – Disposal
 - ◆ Individual-protection standard
 - ◆ Human-intrusion standard
 - ◆ Ground Water Protection standards
 - ◆ Other provisions

Storage Standards

- 150 μSv (15 mrem)/year committed effective dose equivalent (CEDE) for any member of the public
- Anywhere outside of the Yucca Mountain Site, the Nevada Test Site, and the Nellis Air Force Range

Disposal Standards

Individual Protection

- 150 μSv (15 mrem) CEDE/year
- Reasonably maximally exposed individual living in the accessible environment above the highest level of concentration in the plume of contamination
- 10,000 years
- All pathways

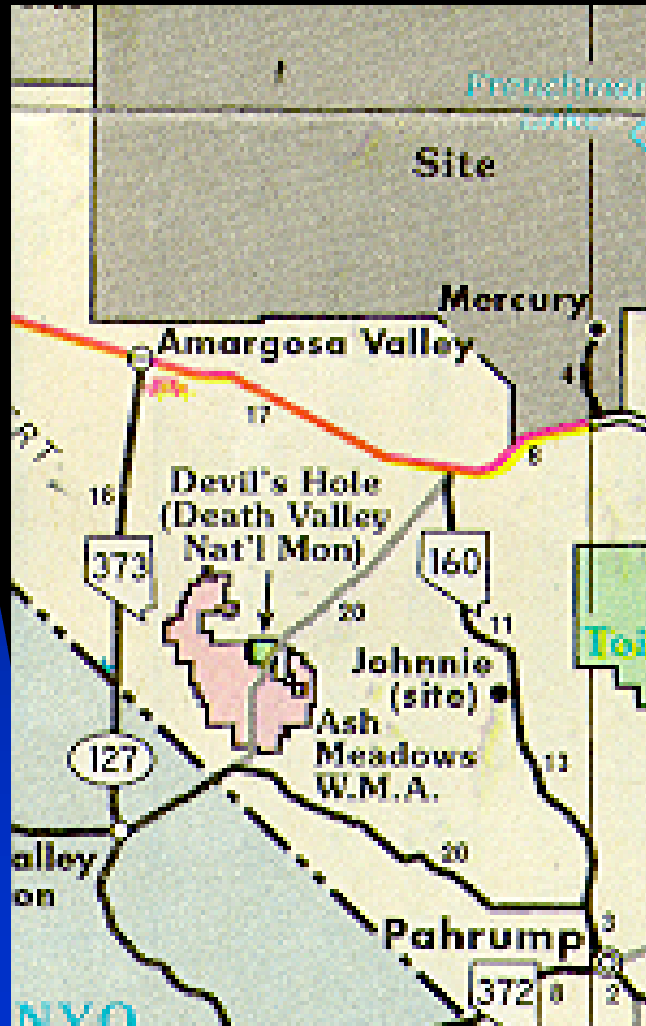
Reasonably Maximally Exposed Individual (RMEI)

- Hypothetical person
- Rural-residential living style (works elsewhere, but eats some locally grown food)
- Has characteristics of people currently living in the Town of Amargosa Valley, Nevada
- Drinks 2 liters/day of ground water from a well tapping the highest level of contamination in the accessible environment

Accessible Environment

- Anywhere outside of the controlled area
- Controlled area
 - ◆ No larger than 300 km²
 - ◆ No farther south than the southern edge of NTS (i.e., north latitude 36° 40' 13.6661")
 - ◆ No farther than 5 km in any other direction

Amargosa Valley relative to Yucca Mountain



Disposal Standards

Human Intrusion

- Purpose is to test “resilience” of disposal system
- 150 μSv (15 mrem) CEDE/yr from an intrusion within 10,000 yr, with analysis and results after 10,000 yr put into Yucca Mountain environmental impact statement (EIS)
- Occurs when package penetration not noticed by drillers (after package is well deteriorated)
- If intrusion cannot occur before 10,000 yr, post-10,000-yr analysis and results to be put into Yucca Mountain EIS (no quantitative limit)

Circumstances of the Intrusion

- Single intrusion resulting from water exploration
- Borehole through waste package and into the aquifer
- Borehole is not carefully sealed
- Only releases through the borehole are analyzed
- No releases caused by unlikely natural features, events, or processes are to be considered (level of “unlikely” probability to be set by NRC)

Disposal Standards

Ground Water Protection

- Applies existing MCLs in the representative volume
- Representative volume
 - ◆ Annual withdrawal volume representing the current or planned uses in the Town of Amargosa Valley
 - ◆ 3,000 acre-feet (almost 1 billion gallons)
 - ◆ Is positioned in the accessible environment and contains the highest concentration in the plume of contamination

Other provisions

- Post-10,000 yr analysis results, to the time of peak individual dose, in Yucca Mountain EIS
- Do not analyze events that have a probability of < 1 in 10,000 of occurring within 10,000 yr
- Assume that society, the biosphere (except climate), human biology, and human knowledge are the same in the future as today
- Must vary climatic, geologic, and hydrologic values

Future Activities

- Present the standards to, and meet with, interested groups
- Help the Department of Justice defend the lawsuits
- Maintain cognizance of Yucca Mountain-related activities and committees
- Review the DOE site recommendation and related documents
- Comment as appropriate, particularly related to Part 197