

YUCCA
MOUNTAIN
PROJECT

Studies

DOE Interim Postclosure Performance Measure

Presented to:
Nuclear Waste Technical Review Board
Panel on the Environment, Regulations, and QA

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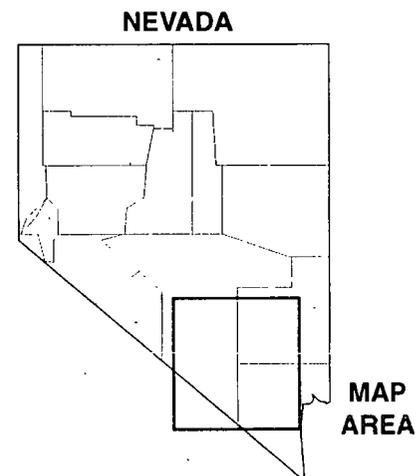
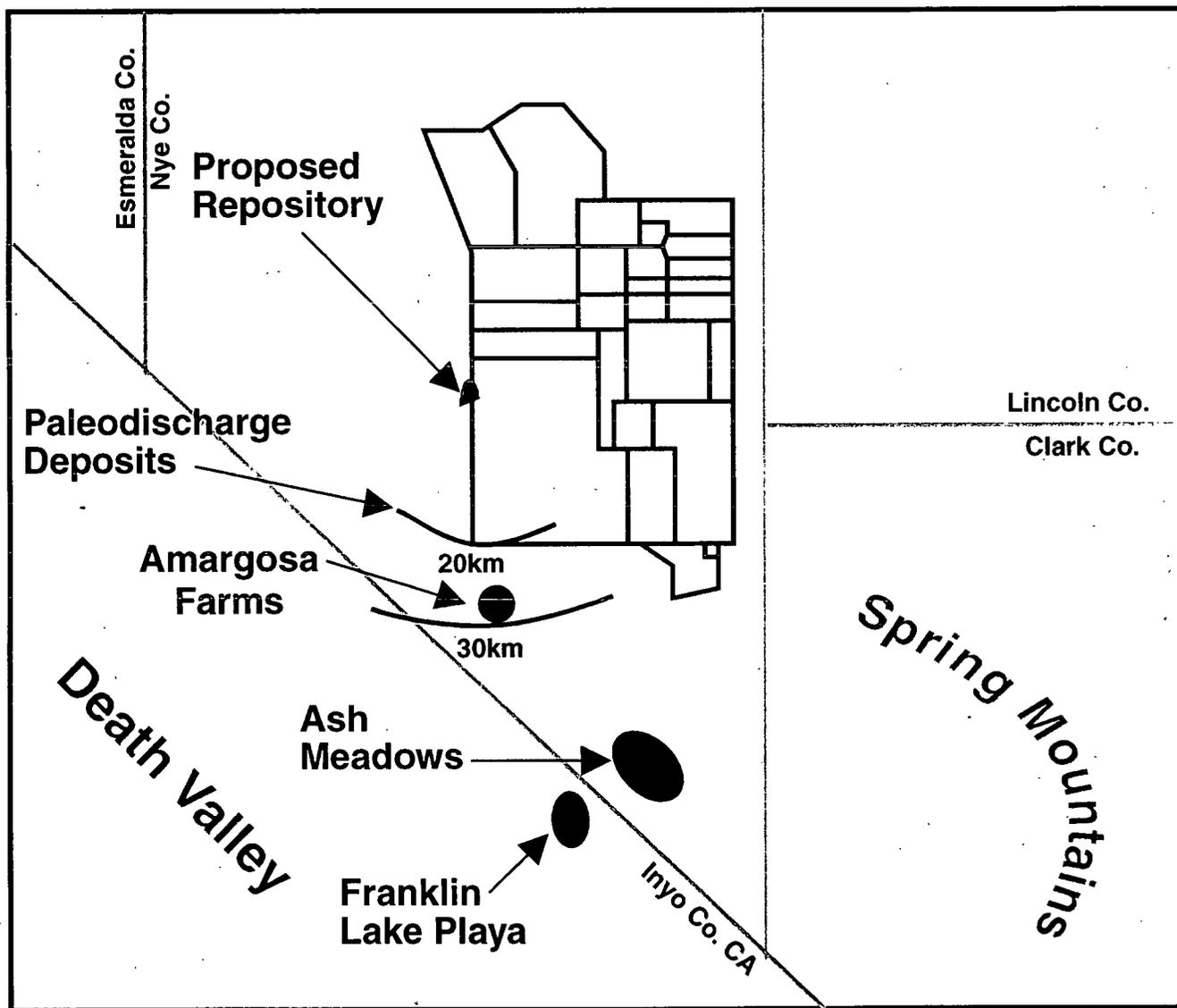


U.S. Department of Energy
Office of Civilian Radioactive
Waste Management

Outline

- **Background**
- **Interim Postclosure Performance Measure**
 - Performance measure
 - Goal
- **Rationale for Interim Performance Measure**
 - Time frame
 - Dose limit
 - Compliance location

General Map of Yucca Mountain Vicinity



20 km - Approximates Nevada Test Site Boundary

30 km - Approximates distance to Amargosa Farms area

Background

- **In 1987, the U.S. District Court remanded EPA's 40 CFR 191**
- **Since that time, the Yucca Mountain Project has been without an applicable postclosure standard**
- **In 1992, Congress directed EPA to promulgate a site-specific standard for Yucca Mountain**
- **EPA has not promulgated such a standard**
- **Until an EPA standard is promulgated, DOE is using an internal interim performance measure developed to guide the technical program**

Interim Postclosure Performance Measure

Performance Measure

The expected annual dose to an average individual in a critical group living 20 km from the repository shall not exceed 25 mrem from all pathways and all radionuclides during the first 10,000 years after closure

Interim Postclosure Performance Measure

(continued)

Goal

Conduct analyses beyond 10,000 years to gain insight into longer-term system performance. For this period, the expected annual dose to an average individual in a critical group living 20 km from the repository should be below the 10,000 year performance measure.

Rationale

Time Frame

- **10,000 years is a sufficiently long time period for public protection**
 - **Regulatory precedence (nationally and internationally) exists for a 10,000-year compliance time frame**
 - **A regulatory compliance time frame greater than 10,000 years adds to the regulatory complexity without providing added public safety protection**

Rationale

(Continued)

Time Frame (continued)

- **Post 10,000-year calculations can provide insight regarding longer-term system behavior**
 - Results can be used to evaluate potential engineered barrier enhancements
- **The post 10,000-year “Goal” was established to complement the 10,000-year performance measure**
 - Based on recent information regarding time of peak dose
 - Peak dose now in the tens of thousands of years vs. hundreds of thousands of years

Rationale

(Continued)

Dose Limit

- **A dose limit on the order of 100 mrem/year is protective of the public**
- **This is consistent with:**
 - **10 CFR 20, Standards for Protection Against Radiation**
 - **NRC Chairman Jackson's testimony to the House Subcommittee on Energy and Power (April 29, 1997)**
 - **Recommendations of the National Council on Radiation Protection and Measurements (NCRP-91)**
 - **Recommendations of the International Commission on Radiological Protection (ICRP-60)**
 - **EPA generic Radiation Protection Guidance**

Rationale

(Continued)

Dose Limit (continued)

- **A dose limit of 25 mrem/year was selected as the interim performance measure**
 - Represents a fraction of the 100 mrem/year primary limit
 - Provides for reasonable assurance
 - Is consistent with NRC Chairman Jackson's testimony to the House Subcommittee on Energy and Power (April 29, 1997)
 - Is consistent with the recent NRC rule on license termination (10 CFR 20)
- **Since the 25 mrem/year limit is an all-pathway limit, a separate groundwater protection limit is not needed**

Rationale

(Continued)

Compliance Location

- **The critical group should be located down gradient from Yucca Mountain**
 - Down gradient population is the group most at risk
- **The characteristics of this critical group should be established based on present-day knowledge, using cautious but reasonable assumptions**
 - To predict future population characteristics would be speculative and insupportable
 - This is consistent with NAS recommendations to EPA

Rationale

(Continued)

Compliance Location (continued)

- **Based on present-day characteristics, the critical group would be located in the farming community of Amargosa Farms (30 km from repository)**
 - This is where people are living today
 - This is where the majority of wells are located
 - Groundwater is readily accessible
 - The water is used for both farming and personal use
 - Soil conditions are conducive to farming

Rationale

(Continued)

Compliance Location (continued)

- **However, 20 km was chosen as the compliance location**
 - This is considered to be conservative
 - While there are several wells located at Lathrop Wells Junction, these wells are not representative of current day characteristics for the critical group

Summary

- **The DOE interim postclosure performance measure provides a reasonable target to guide our technical program**
- **The interim performance measure is protective of the public health and safety**