
Presentation to the
Nuclear Waste Technical
Review Board

January 20, 1998

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Briefing Overview

- Background on NEPA and NWPA
- Description of the Repository EIS
 - Proposed Action and General Approach to Development of the EIS
 - Transportation Analysis
 - The No-Action Alternative
 - Technical Information to Support the EIS
 - Disciplines to be Evaluated
- History of EIS Development
- EIS Schedule

EIS Regulatory Drivers

- Nuclear Waste Policy Act, as amended (NWPA)
- National Environmental Policy Act (NEPA)
- Council on Environmental Quality (CEQ) regulations (40 CFR Part 1500-1508)
- DOE NEPA Implementing Procedures (10 CFR Part 1021)

Repository EIS Objectives

- Prepare an EIS to accompany a site recommendation and, if appropriate, a license application, as required by NWPA.
- Prepare an EIS that will comply with NWPA, CEQ, and DOE requirements.
- Prepare an EIS that the NRC can adopt, to the extent practicable.

Nuclear Waste Policy Act: NEPA “Roadmap”

The Yucca Mountain Repository EIS need not consider:

- the need for a repository
- alternatives to geologic disposal
- alternative sites to Yucca Mountain

Proposed Action for Repository EIS to Support Major Decision

Construct, operate, and close a geological repository for permanent disposal of spent nuclear fuel (SNF) and high-level radioactive waste (HLW) at Yucca Mountain.

General Approach to Repository EIS

- To assist with meaningful comparison of potential impacts, three scenarios based on thermal load objectives will be evaluated:
 - high thermal load (>80 MTU/acre)
 - intermediate thermal load (40 - 80 MTU/acre)
 - low thermal load (<40 MTU/acre)

Implementing Alternatives

- EIS will provide a bounding analysis to preserve future program flexibility and design evolution
- Performance relies on the interrelationship between the engineered and natural systems, primarily because SNF and HLW produce heat (i.e., thermal load) that could affect, for example:
 - Performance considerations
 - » Longevity of waste packages
 - » Stability of tunnels
 - » Geochemistry and hydrology of rock
 - Other considerations
 - » Industrial safety
 - » Surface ecosystem
 - » Surface disturbance from muck rock storage

Implementing Alternatives (Cont.)

- Reference design will be used for high thermal load
- The EIS will evaluate the intermediate and low thermal load designs:
 - Using elements common among all three designs
 - Focusing on differences from the reference design that are important to a meaningful assessment of impacts
- Additional design enhancements considered as possible mitigation measures
 - Enhancements will vary according to thermal load alternative
 - Examples include: ventilated repository, drip shields, backfill

Expanded Inventory

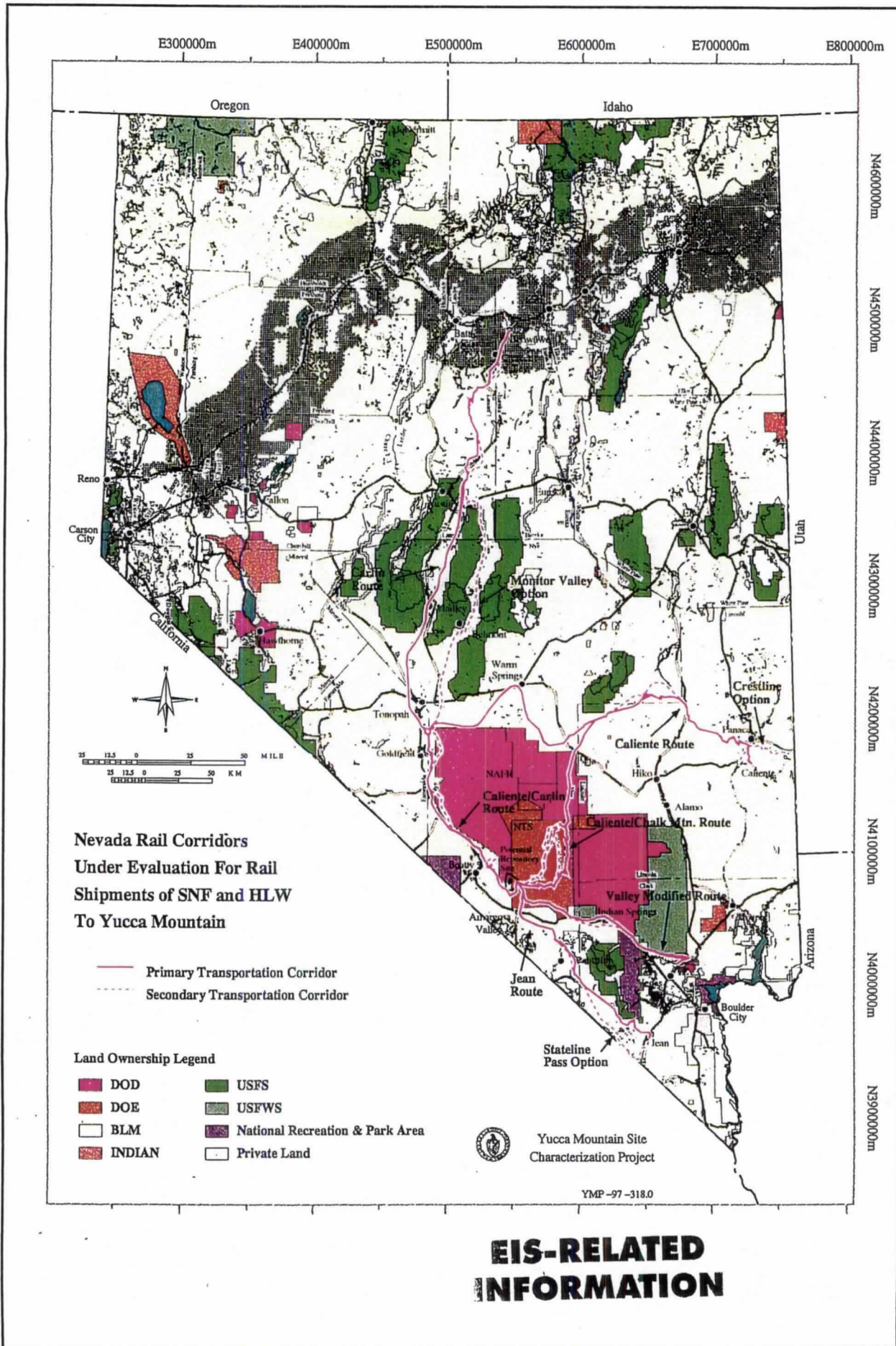
- Based on comments from scoping, the EIS will also evaluate potential expanded inventories of wastes.
- Inventory evaluated for Proposed Action:
 - Base Case: 70,000 MTHM of SNF and HLW
 - » 10% allocation to DOE-owned SNF and HLW
- Inventory evaluated for cumulative impacts
 - Module 1: Base Case, plus all other remaining SNF and HLW from commercial or DOE sources
 - Module 2: Module 1, plus commercial “greater-than-Class-C” radioactive waste and DOE “special-performance-assessment-required” waste

General Approach to Transportation Analysis

- The EIS will evaluate several different transportation options.
- Produce broadest range of potential operating conditions relevant to potential impacts (bounding analysis)
 - Two national transportation options
 - » Mostly truck to repository, except for Naval fuel that will come to Nevada by rail
 - » Mostly rail to repository, except for reactors without railhead or associated rail handling capability (ship by other means to nearest railhead)

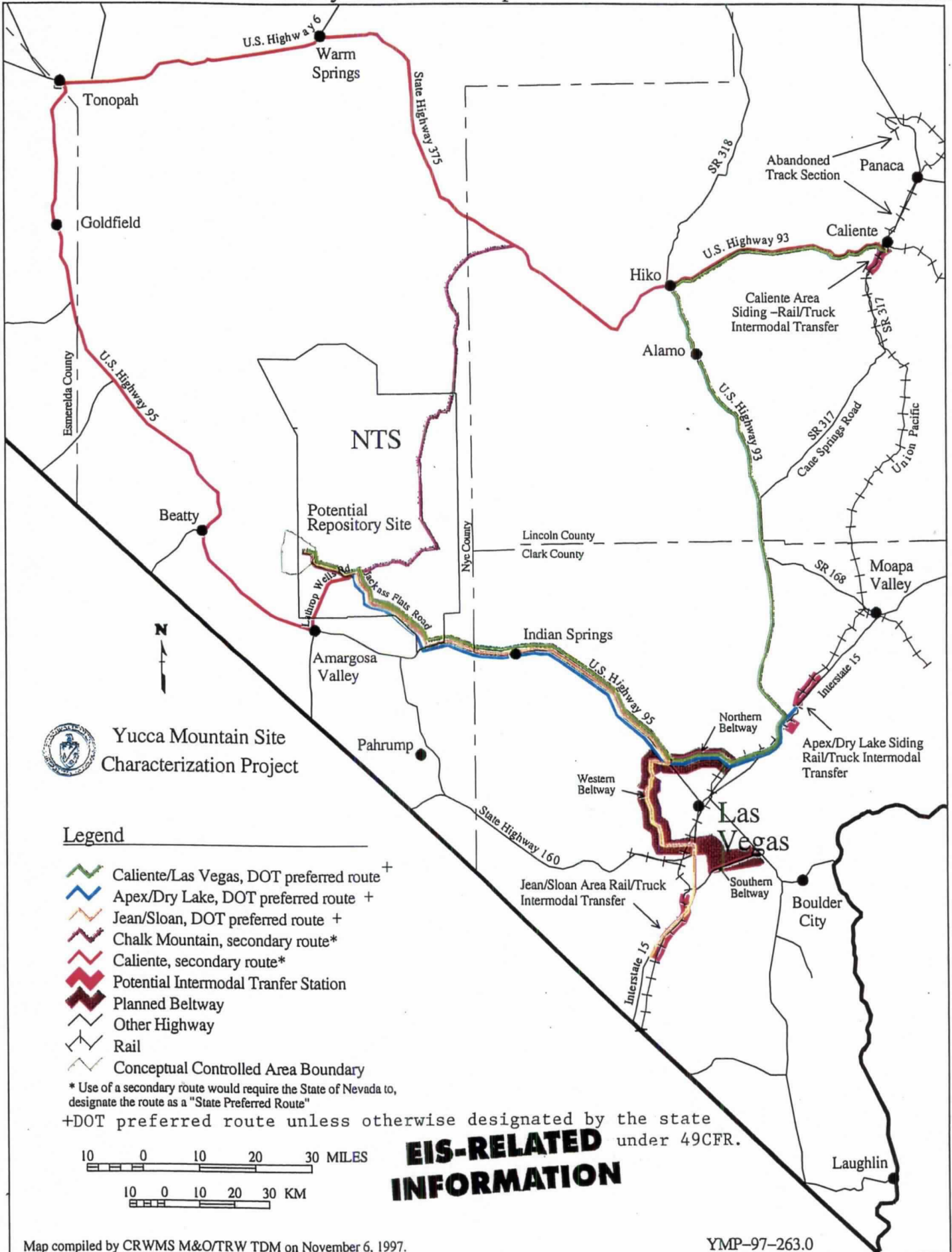
General Approach to Transportation Analysis (Cont.)

- Several Nevada transportation options analyze (see maps that follow):
 - Potential rail corridors to the repository
 - Rail transport to an intermodal transfer station, then heavy-haul truck to the repository
 - Legal-weight truck shipments directly to the repository
- Impacts are incident-free or due to accidents
- Impacts are radiological or nonradiological
 - Radiological impacts are cargo-related
 - Nonradiological impacts are vehicle-related

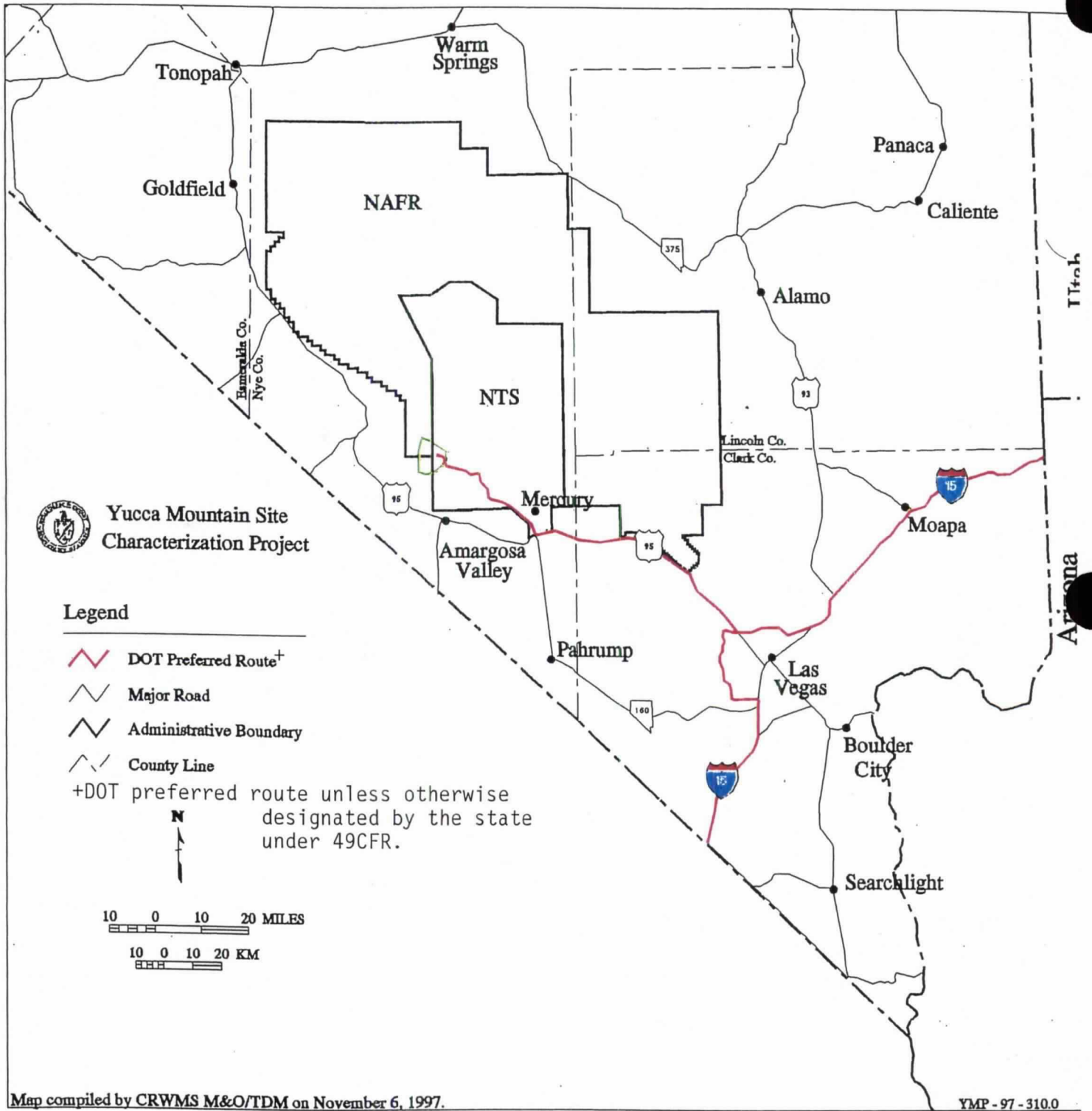


EIS-RELATED INFORMATION

DOT Preferred Routes for Heavy-Haul Truck Shipments of SNF and HLW to Yucca Mountain



DOT Preferred Routes for Legal-Weight Truck Shipments of SNF and HLW to Yucca Mountain



**EIS-RELATED
INFORMATION**

General Approach for Evaluating Packaging Options

- EIS will evaluate two packaging options:
 - Mostly uncanistered material
 - Mostly canistered material

- Impacts that differ from handling of canistered versus uncanistered packages will include:
 - Differences in extent of handling operations required for uncanistered material
 - Differences between dry and wet handling

General Approach to No-Action Analysis

- Provide an environmental baseline against which EIS can compare impacts of the Proposed Action
- Leave SNF and HLW at generator sites and analyze two scenarios to bound impacts
 - Maintain institutional control (10,000 years)
 - Lose institutional control after 100 years; evaluate impacts out to 10,000 years
- Terminate Yucca Mountain activities and analyze impacts of reclamation of Yucca Mountain site

General Approach to No-Action Analysis (Cont.)

- Long-Term Institutional Control
 - Evaluate radiological impacts from inspection, handling, and repackaging.
 - Evaluate costs from facility operations, storage package upgrades, and facility upgrades and replacements.
- Loss of Institutional Control after 100 years
 - Evaluate impacts of radionuclide release to environment for transport via liquid pathways and air resuspension pathway following storage facility and storage package failure.

Technical Information Available to Support the EIS

- Yucca Mountain site data has been gathered over the last 15 years. Examples include:
 - Site characterization data has been generated to support a site recommendation and a license application.
 - Environmental data are being gathered as necessary to support other regulatory requirements (e.g., air quality, water resources, Endangered Species Act, National Historic Preservation Act).

Technical Information Available (Cont.)

- Additional data are being gathered to support Nevada transportation options, the No-Action Alternative, and expanded waste inventories. Examples include:
 - Data from existing or in-process EISs (FRR, Idaho SNF, WIPP, NTS Sitewide)
 - Data from DOE sites and publicly available utility safety and environmental reports
- A key challenge: ferret out the appropriate data set from the voluminous record that has been developed to date.

Technical Analysis Areas & Measures (the “-ologies”)

Environmental Resource Area

Accidents

Examples of Impact Measures

- Latent cancer fatalities (Rad)
- Increased lifetime cancer risk (Non-rad)

Transportation

- Latent cancer fatalities
- Traffic-related fatalities

Air Quality

- Hazard index
- Increased lifetime cancer risk

Human Health & Safety

- Latent cancer fatalities
- Hazard index
- Industrial injury and fatalities
- Increased lifetime cancer risk

Performance Assessment

- Latent cancer fatalities
- Increased lifetime cancer risk

Technical Analysis Areas & Measures (the “-ologies”) (Cont.)

Environmental Resource Area

Biological Resources

Subsurface Water

Surface Water & Soils

Noise

Cultural Resources

Examples of Impact Measures

- Habitat lost
- Take of threatened and endangered species
- Groundwater withdrawal
- Surface water contamination
- Soil disturbance and contamination
- Level, frequency, and time of day
- Disruption of cultural sites

Technical Analysis Areas & Measures (the “-ologies”) (Cont.)

Environmental Resource Area

Aesthetic & Scenic Resources

Land Use

Waste and Materials

Utilities & Energy

Socioeconomics

Environmental Justice

Examples of Impact Measures

- Profile and visibility beyond site boundary
- Proximity to recreational areas

- Impacts on other uses

- Waste types and quantities for on- and off-site management

- Impacts on availability

- Effect on services and local economy

- Disproportionate and adverse impacts on minorities and low income population

EIS Development Efforts

- Before 10/1/96
 - Notice of Intent (NOI) published in FR on 8/7/95, initiating public scoping period
 - 15 nationwide scoping meetings held; approximately 800 people attended and 1,000 comment documents received
 - Transcripts prepared and placed in reading rooms across the country
 - Scoping closed on 12/5/95
 - FY 1996 planned EIS activities deferred due to budgetary constraints
 - EIS Contractor (Jason Technologies Corp.) selected in 9/96
 - EIS activities resumed 10/1/96 (FY 1997)

EIS Development Efforts (Cont.)

- Since 10/1/96:
 - Review of existing Project data to determine data needs
 - Independent assessment of data gaps that need to be filled
 - Communication of data needs to YMP organization
 - Review of additional data collected to meet EIS needs
 - Support to DOE in consultations with external agencies to assess whether additional information sources are available

EIS Schedule

- July 1999 - Issue Draft EIS and begin Public Comment Period
- August 2000 - Issue Final EIS
- September 2000 - Issue Record of Decision