

Environmental, historic preservation, public use, or trail use/rail banking conditions will be imposed, where appropriate, in a subsequent decision.

Pursuant to the provisions of 49 CFR 1152.29(e)(2), IC shall file a notice of consummation with the Board to signify that it has exercised the authority granted and fully abandoned the line. If consummation has not been effected by IC's filing of a notice of consummation by April 16, 2009, and there are no legal or regulatory barriers to consummation, the authority to abandon will automatically expire.

Board decisions and notices are available on our Web site at <http://www.stb.dot.gov>.

Decided: April 9, 2008.

By the Board, David M. Konschnik,  
Director, Office of Proceedings.

Anne K. Quinlan,

Acting Secretary.

[FR Doc. E8-7965 Filed 4-15-08; 8:45 am]

BILLING CODE 4915-01-P

## DEPARTMENT OF TRANSPORTATION

### Surface Transportation Board

[STB Finance Docket No. 35106]

#### United States Department of Energy— Rail Construction and Operation— Caliente Rail Line in Lincoln, Nye, and Esmeralda Counties, NV

AGENCY: Surface Transportation Board,  
DOT.

ACTION: Notice of Construction and  
Operation Application and Adoption of  
Procedural Schedule.

**SUMMARY:** The Board is publishing notice of an application filed by the United States Department of Energy (DOE) seeking authority to construct and operate an approximately 300-mile rail line, to be known as the Caliente Line, connecting an existing Union Pacific Railroad Company line near Caliente, NV, to a proposed geologic repository at Yucca Mountain, Nye County, NV. The purpose of this proposed rail line is to allow DOE to transport spent nuclear fuel and high-level radioactive waste for disposal at the proposed geologic repository, as well as to provide common carrier rail service to communities situated along the proposed line.

The Board, on its own motion, is adopting a procedural schedule that calls for notices of intent to participate and establishes filing dates for submissions on whether this application meets the criteria of 49 U.S.C. 10901.

**DATES:** This notice is effective on April 16, 2008. Pleadings must be filed in

accordance with the schedule set forth in the Appendix to this notice. All filings, except notices of intent to participate, must be concurrently served on all parties of record and must be accompanied by a certificate of service.

**ADDRESSES:** Any filing submitted in this proceeding must be submitted either via the Board's e-filing format or in the traditional paper format. Any person using e-filing should attach a document and otherwise comply with the instructions found on the Board's Web site at [www.stb.dot.gov](http://www.stb.dot.gov) at the "E-FILING" link. Any person submitting a filing in the traditional paper format should send an original and 10 paper copies of the filing (and also an electronic version) to: Surface Transportation Board, 395 E Street, SW., Washington, DC 20423-0001. In addition, one copy of each filing in this proceeding must be sent (and may be sent by e-mail only if service by e-mail is acceptable to the recipient) to each of the following: (1) Director, Office of Civilian Radioactive Waste Management, United States Department of Energy, 1000 Independence Ave., SW., Washington, DC 20585; (2) Director, Office of Logistics Management, United States Department of Energy, 1000 Independence Ave., SW., Washington, DC 20585; (3) Assistant General Counsel for Civilian Nuclear Programs, ATTN: Bradley L. Levine, GC-52, United States Department of Energy, 1000 Independence Ave., SW., Washington, DC 20585; and (4) any other person designated as a party of record on the service list notice described below.

**FOR FURTHER INFORMATION CONTACT:** Joseph H. Dettmar, (202) 245-0395. [Assistance for the hearing impaired is available through the Federal Information Relay Service (FIRS) at: 1-800-877-8339].

**SUPPLEMENTARY INFORMATION:** The Board's review of construction applications is governed by 49 U.S.C. 10901 and by the requirements of the National Environmental Policy Act of 1969, 42 U.S.C. 4321-4370d (NEPA), and related environmental laws. Section 10901 requires the Board to grant a construction application unless the Board finds that the proposal is inconsistent with the public convenience and necessity. Under our regulations, comments on DOE's application are due 35 days after its March 17, 2008 filing date, and DOE's reply is due 5 days after the comments are due. See 49 CFR 1150.10(g) and (h). However, because the application is extensive, replies might be lengthy, and the proceeding might be controversial,

we find that the standard timetable is not appropriate in this proceeding. Accordingly, to guide the submission of filings on the merits of the application, we will adopt a procedural schedule similar to the one used in a recent proceeding involving a voluminous and controversial construction application, *Tongue River Railroad Company, Inc.—Construction and Operation—Western Alignment*, STB Finance Docket No. 30186 (Sub-No. 3). The schedule for the DOE proceeding, which is set forth in the Appendix, will accord all parties due process because it provides ample time and opportunity for the submission of comments and replies. The schedule will also better enable the Board to determine whether the proposed construction meets the criteria of section 10901.

DOE has caused notices to be published stating that comments on the application are due on or before April 21, 2008, as ordinarily required by our rules. While interested parties may continue to file comments by April 21, 2008, the parties may also file comments pursuant to the longer time frames in the procedural schedule we establish here. To alert the parties of the new schedule, we will require DOE to cause this notice to be published in the same places as the prior notices and to certify to the Board that it has done so.

Any person who wishes to participate as a party of record in this proceeding by filing comments and by receiving other parties' pleadings must file with the Acting Secretary of the Board an original and 10 copies of a notice of intent to participate in accordance with the attached procedural schedule. In order to facilitate service of pleadings on parties of record, the Board will issue a list of those persons who have given notice of their intent to participate. However, an interested person does not need to be on the service list to obtain a copy of the primary application or any other filing made in this proceeding. The primary application and other filings in this proceeding will also be available on the Board's Web site at <http://www.stb.dot.gov> under "E-LIBRARY/Filings." Additionally, electronic copies of the application are available from DOE online at <http://www.ocrwm.doe.gov>.

On April 2, 2008, the State of Nevada filed a motion asking the Board to reject the application, or in the alternative, to make replies to the application due after the applicant has supplemented the record. DOE's reply to this motion is due by April 22, 2008. We will address the State's motion and any reply in a

later decision.<sup>1</sup> Our issuing this notice now does not constitute a determination as to whether DOE's application is complete or otherwise prejudice the State's motion. We will modify the schedule, if necessary, as a result of our subsequent ruling on the State's motion.

The environmental review related to the proposed construction and operation of a rail line to Yucca Mountain began in 2004 and is well underway. In 2004, the Board accepted DOE's invitation to participate as a "cooperating agency" under the President's Council on Environmental Quality regulations at 40 CFR 1501.6 to give DOE the benefit of the Board's expertise in freight rail transportation in the preparation of Environmental Impact Statements (EISs) addressing a potential Nevada rail transportation corridor and alternative rail alignments. DOE was also aware when it asked the Board to become a cooperating agency that the Board would have jurisdiction over the proposed new rail line in the event DOE were to decide to have the proposed line operated as a common carrier rail line. (The cooperating agency process is intended to make environmental review under NEPA more efficient by giving all agencies with licensing authority over a project the environmental information they need to comply with NEPA and related environmental laws in undertaking their decisionmaking.)

The Board's Section of Environmental Analysis (SEA) and the other cooperating agencies on the Nevada rail corridor and rail alignment EISs (the Bureau of Land Management and United States Air Force) have participated in every step of the EIS process. The Draft EISs were issued for public review and comment in October 2007 in *Draft Environmental Impact Statement for a Rail Alignment for the Construction and Operation of a Railroad in Nevada to a Geologic Repository at Yucca Mountain, Nye County, Nevada* (DOE/EIS-03691) and in *Draft Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada—Nevada Rail Transportation Corridor* (DOE/EIS-0250F-S2D). DOE has made electronic copies of the Draft EISs addressing the Nevada rail corridor and alternative rail alignments available at <http://www.ocrwm.doe.gov>.

SEA participated in the public hearings that were held on the Draft

EISs in November and December 2007. Following the close of the comment period in January 2008, preparation of Final EISs addressing the Nevada rail corridor and alternative rail alignments began. DOE estimates that it will issue the Final EISs in June 2008. The EISs (including the public comments) will serve as the basis for SEA's recommendations to the Board regarding whether, from an environmental perspective, DOE's construction and operation application should be granted, denied, or granted with environmental conditions.

The Board has not participated in the ongoing EIS process for the proposed geologic repository that the proposed new line would serve.

The Board will take into consideration both the transportation merits and the environmental impacts of constructing and operating the proposed line when ruling on DOE's application.

This decision will not significantly affect either the quality of the human environment or the conservation of energy resources.

Board decisions and notices are available on our Web site at <http://www.stb.dot.gov>.

Decided: April 10, 2008.

By the Board, Chairman Nottingham, Vice Chairman Mulvey, and Commissioner Buttery.

Anne K. Quinlan,  
Acting Secretary.

#### Appendix

##### *Procedural Schedule on the Merits*

April 16, 2008—Publication of notice adopting procedural schedule.

April 28, 2008—Due date for certification by DOE that it has published newspaper notices announcing this procedural schedule.

May 7, 2008—Due date for notices of intent to participate as a party of record.

July 15, 2008—Due date for comments in support of or opposition to the application.

August 29, 2008—Due date for DOE's reply.

[FR Doc. E8-8161 Filed 4-15-08; 8:45 am]

BILLING CODE 4915-01-P

## DEPARTMENT OF THE TREASURY

### Office of the Secretary

#### Notice of Call for Redemption of 12 Percent Treasury Bonds of 2008-13

AGENCY: Department of the Treasury.

ACTION: Notice.

SUMMARY: As of April 15, 2008, the Secretary of the Treasury gives public

notice that all outstanding 12 percent Treasury Bonds of 2008-13 (CUSIP No. 912810 DF 2) dated August 15, 1983, due August 15, 2013, are called for redemption at par on August 15, 2008, on which date interest on such bonds will cease.

DATES: Treasury calls such bonds for redemption on August 15, 2008.

FOR FURTHER INFORMATION CONTACT: Definitives Section, Customer Service Branch 3, Office of Retail Securities, Bureau of the Public Debt, (304) 480-7711.

#### SUPPLEMENTARY INFORMATION:

##### 1. Bonds Held in Registered Form.

Owners of such bonds held in registered form should mail bonds for redemption directly to: Bureau of the Public Debt, Definitives Section, Customer Service Branch 3, P.O. Box 426, Parkersburg, WV 26106-0426. Owners of such bonds will find further information regarding how owners must present and surrender such bonds for redemption under this call, in Department of the Treasury Circular No. 300 dated March 4, 1973, as amended (31 CFR Part 306); by contacting the Definitives Section, Customer Service Branch 3, Office of Retail Securities, Bureau of the Public Debt, telephone number (304) 480-7711; and by going to the Bureau of the Public Debt's Web site, <http://www.treasurydirect.gov>.

##### 2. Bonds Held in Book-Entry Form.

Treasury automatically will make redemption payments for such bonds held in book-entry form, whether on the books of the Federal Reserve Banks or in Treasury Direct accounts, on August 15, 2008.

Gary Grippo,

Acting Fiscal Assistant Secretary.

[FR Doc. E8-7945 Filed 4-15-08; 8:45 am]

BILLING CODE 4810-40-P

## DEPARTMENT OF THE TREASURY

### Internal Revenue Service

#### IRS/VA FFRDC Co-Sponsorship

AGENCY: Internal Revenue Service (IRS), Treasury. National Office Procurement.

ACTION: Notice.

SUMMARY: The Internal Revenue Service (IRS) and The Department of Veterans Affairs (VA) executed a Memorandum of Understanding (MOU) on February 7, 2008 to designate VA as a Co-Sponsor of the Federally Funded Research and Development Center (FFRDC), titled The Center for Enterprise Modernization (CEM). CEM is operated by The MITRE Corporation (MITRE). IRS remains the

<sup>1</sup> On April 8, 2008, Nevada Central Railroad filed a notice stating that it intends to participate in this proceeding and that it also plans to file a motion to reject the application.

B. Miller  
1



Betty L  
Miller/HQ/Caltrans/CAGov  
11/16/2007 08:01 AM

To Gayle Rosander/D09/Caltrans/CAGov@DOT  
cc "Barbara Byron" <Bbyron@energy.state.ca.us>, Brad  
Mettam/D09/Caltrans/CAGov@DOT, Charleen  
Fain-Keslar/HQ/Caltrans/CAGov@DOT  
bcc  
Subject Re: Yucca Mountain - CA/Caltrans comments?

I'll put the docs in the interoffice mail. Will also send a copy of the materials that Barbara distributed last Friday at our meeting.  
Later, gatorette.  
Gayle Rosander/D09/Caltrans/CAGov



Gayle  
Rosander/D09/Caltrans/CAGov  
11/16/2007 07:57 AM

To Betty L Miller/HQ/Caltrans/CAGov@DOT  
cc "Barbara Byron" <Bbyron@energy.state.ca.us>, Brad  
Mettam/D09/Caltrans/CAGov@DOT, Charleen  
Fain-Keslar/HQ/Caltrans/CAGov@DOT  
Subject Re: Yucca Mountain - CA/Caltrans comments?

Hi,  
I am most interested in what will be said now. But, so I do not have to dig in our many boxes of things, please send the 2005 letter.  
Have a fine weekend.  
Thanks,  
GJR

Betty L Miller/HQ/Caltrans/CAGov



Betty L  
Miller/HQ/Caltrans/CAGov  
11/16/2007 07:48 AM

To Gayle Rosander/D09/Caltrans/CAGov@DOT  
cc "Barbara Byron" <Bbyron@energy.state.ca.us>, Brad  
Mettam/D09/Caltrans/CAGov@DOT, Charleen  
Fain-Keslar/HQ/Caltrans/CAGov@DOT  
Subject Re: Yucca Mountain - CA/Caltrans comments?

Good morning, Gayle:

I can forward a copy of the November 21, 2005 comments that were consolidated by Barbara and submitted to the U.S. EPA. Will that help?  
Betty

Gayle Rosander/D09/Caltrans/CAGov



Gayle  
Rosander/D09/Caltrans/CAGov  
11/15/2007 04:58 PM

To "Barbara Byron" <Bbyron@energy.state.ca.us>, Charleen  
Fain-Keslar/HQ/Caltrans/CAGov@DOT  
cc "Betty L Miller" <betty\_l\_miller@dot.ca.gov>, Brad  
Mettam/D09/Caltrans/CAGov@DOT

B. Miller  
2



Subject Yucca Mountain - CA/Caltrans comments? 

Hello,

Since District staff will be attending the Nov. 29 Lone Pine meeting on the subject (which is getting much media attention in the Inyo Register and on local radio), please provide me a copy of our California response (or draft response).

In Inyo County, Caltrans people cannot show up at public meetings incognito, so we need to prepare ourselves the best we can.

Thank you,  
Gayle Rosander  
IGR/CEQA Coordinator  
Caltrans D-9  
760-872-0785

**California Nuclear Waste Transport Working Group Meeting**

**Friday, November 9, 2007**

**10 a.m. to Noon**

**Third Floor Conference Room  
California Energy Commission  
1516 Ninth Street**

**(Corner of 9<sup>th</sup> and P Streets Downtown Sacramento)**

- 10:00 to 10:10 a.m. Welcome and Introductions
- 10:10 to 11:15 a.m. Purpose of Meeting: Discuss Plans for Proposed CA Comments on the Draft U.S. Dept. of Energy SEIS for the Yucca Mt. Repository
- Major Milestones:
    1. DOE filed License Support Network
    2. DOE plans to submit license application 6/30/08
    3. No final U.S. EPA Radiation Protection Standard yet
    4. U.S. Senate Committee hearing held on Yucca Mt. 10/31/07
  - Opportunity for public NEPA comments may close in Jan. 2008
  - California's Previous Comments on Potential Transportation Impacts in California:
  - Western Governors' and WIEB High-Level Waste Committee's Issues
  - Inyo County's Issues
  - Nevada's Issues
- 11:15 to 11:45 a.m. Proposed Schedule
- CEC prepares draft comments for review by 11/16
  - Agencies review draft by 11/20
  - CEC provides oral comments at public hearing 11/29 in Lone Pine (tentative)
  - CEC submits written comments to DOE by deadline 1/4/08
  - Public comments on DOE's Proposed 180(c) Policy (Funding and Technical Assistance for Emergency Response) deadline is 1/22/08
- 11:45 to Noon Meeting Wrap-up

*1025 -  
Brad Mettem -*

**Suggested Schedule for California Agencies'  
Review and Comment on Potential Transportation Impacts from the  
Proposed Yucca Mt. High-Level Waste Repository Project  
(Draft SEIS for a Geologic Repository/DOE/EIS-0450F-S1D)**

1. Review Transportation Impacts in the SEIS (Vol. I , p. 2-42 through 2-45; and Vol. II Appendix G)
2. Review Inyo Co. and Nevada Comments and materials from 7/9/07 meeting
3. Review Draft Major Points (handed out at 7/9/07 meeting)

Short oral presentation on potential CA impacts:

1. Deadline: November 19 Hearing in Reno; fall-back is Nov. 29 hearing in Lone Pine
2. E-mail to Barbara by Nov. 15 any comments on potential transportation impacts or issues (major points)

Written Comments on potential CA impacts:

1. Deadline: January 10, 2008
2. Agencies e-mail comments to Barbara Byron or status of their review by December 1, 2007
  - a. Barbara compiles draft written comments; sends out to agencies for review by December 10
  - b. Agencies review and provide comments on final draft by December 16
  - c. CEC prepares final comments and submits before January 10, 2008

Department of Toxic Substances Control  
California Environmental Protection Agency  
8810 Cal Center Drive  
Sacramento, CA 95826  
Phone: 916- 255-6572  
Fax 916- 255-6621  
E-mail: [Apalmer@dtsc.ca.gov](mailto:Apalmer@dtsc.ca.gov)

**California Fish and Game**

*Larry Kirsch*  
Department of Fish and Game  
Office of Spill and Prevention Response  
P.O. Box 944209  
Sacramento, CA 94244  
Phone: 925-945-6732  
Fax: 916-324-8829  
E-mail: [Lkirsch@ospr.dfg.ca.gov](mailto:Lkirsch@ospr.dfg.ca.gov)

**California Highway Patrol**

*Jim Epperson*  
California Highway Patrol  
Enforcement Services Division  
444 N. Third Street, Suite 310  
Sacramento, CA 95814-0228  
(916) 445-1865 Fax (916) 446-4579  
E-mail: [JEpperson@chp.ca.gov](mailto:JEpperson@chp.ca.gov)

*Bill Wedderburn, Jim McNeill*  
Phone: 916-445-1865  
Fax: 916-446-4579  
E-mail: [BWedderburn@chp.ca.gov](mailto:BWedderburn@chp.ca.gov)  
[Jmcneill@chp.ca.gov](mailto:Jmcneill@chp.ca.gov)

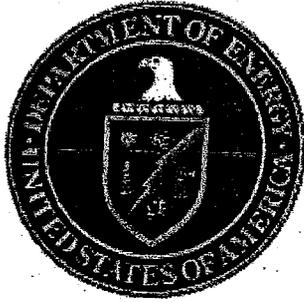
**Governor's Office of Emergency Services**

*Ben Tong*  
Radiological Preparedness Unit  
P.O. Box 419047, Rancho Cordova, CA 95741-9047  
Phone: 916-845-8797  
Fax: 916-845-8735  
E-mail: [Ben\\_Tong@oes.ca.gov](mailto:Ben_Tong@oes.ca.gov)

*Bill Potter, Ken Peel*  
Phone: 916-845-8755 (Bill), 845-8757 (Ken)  
Fax: 916-845-8735  
E-mail: [Bill\\_Potter@oes.ca.gov](mailto:Bill_Potter@oes.ca.gov)

**Public Utilities Commission-Railroad Safety Branch**

*Joe Farley and John Healy*  
California Public Utilities Commission  
Railroad Safety Branch  
Railroad Operations and Safety Section  
Phone: 916-327-3239 (Farley) 916-718-1616 (Healy)  
E-mail: [Jyh@cpuc.ca.gov](mailto:Jyh@cpuc.ca.gov) (Joe) and [Jpf@cpuc.ca.gov](mailto:Jpf@cpuc.ca.gov) (John)



United States Department of Energy  
**Office of Public Affairs**

Washington, D.C. 20585

**News Media Contact:**  
Allen Benson, (702) 794-1322

**FOR IMMEDIATE RELEASE**  
Thursday, October 4, 2007

**U. S. Department of Energy Issues National Environmental Policy Act  
Documents for Public Comment**

Las Vegas, NV – The U. S. Department of Energy (DOE) this week is issuing for public comment two Draft National Environmental Policy Act documents related to the Yucca Mountain Project. The 90-day comment period begins October 12, 2007 and ends January 10, 2008.

- *Draft Supplemental Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada* (Draft Repository SEIS)
- *Draft Supplemental Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada – Nevada Rail Transportation Corridor* (Draft Nevada Rail Corridor SEIS) and *Draft Environmental Impact Statement for a Rail Alignment for the Construction and Operation of a Railroad in Nevada to a Geologic Repository at Yucca Mountain, Nye County, Nevada* (Draft Rail Alignment EIS)

The first document, the Draft Repository SEIS, is a supplement to the Yucca Mountain Final EIS that DOE issued in 2002. The Draft Repository SEIS evaluates the potential environmental impacts of constructing and operating the Yucca Mountain repository under the repository design and operational plans that have been developed since the Yucca Mountain Final EIS was issued.

The second document relates to the transportation of spent nuclear fuel and high-level radioactive waste in Nevada and contains two parts. The first part, the Draft Nevada Rail Corridor SEIS, considers the potential environmental impacts of transport along the Mina corridor, which was analyzed in response to public comments. It also updates the information and analysis for other Nevada rail corridors evaluated in the Yucca Mountain Final EIS. The second part, the Draft Rail Alignment EIS, evaluates the potential environmental impacts of constructing and operating a railroad along specific alignments for both the Mina and Caliente corridors, although Caliente is the Department's preferred corridor.

**DOE Draft Supplemental EIS  
for Yucca Mountain:  
Preliminary Comments on  
Transportation Implications  
for California**

Bob Halstead

Nevada Agency for Nuclear Projects

Fred Dilger, PhD

Black Mountain Research

November 8, 2007

# DSEIS Evaluates Impacts of Repository Use of TAD Canisters

- Under DOE Proposed Action, up to 90% of spent fuel would be loaded into Transport, Aging and Disposal (TAD) canisters at reactors and welded shut
- TAD canisters would be inserted into large transportation casks and shipped by rail to Yucca Mountain
- TADs are large (hold up to 10 MTU) and heavy (weigh up to 180 tons with impact limiters & skids)
- At about 25 reactor sites which lack rail access, TADs would be moved by barge or heavy haul truck to rail (Diablo Canyon)
- 10% of spent fuel would shipped directly to repository by truck (DOE says it would use over-weight trucks)

# Uncertainties About Proposed TAD Canister System

- No final designs (“Proof of concept” only)
- NRC must approve TAD transport and storage components separately (10CFR Part 71 & 72)
- Costs and financial arrangements are unknown
- Proposed TAD system incompatible with dry storage systems currently in use at civilian nuclear power plants
- Utilities may decide not to use DOE TAD canister system
- All four California reactor sites may have specific problems with the proposed TAD system
- DSEIS offers no meaningful alternative to the proposed TAD canister system (Under the DSEIS No Action Alternative, “DOE would not construct a repository at Yucca Mountain.”)

# Use of TAD Canister Systems Creates Risks at Reactor Sites

- Risks associated with handling bare spent fuel assemblies, and loading and welding canisters (routine exposures, accidents)
- NRC has no clear role in regulating & inspecting TAD operations at reactors
- Uncertainties about waste acceptance at the repository and potential return of rejected TADs to originating sites

# Uncertainties About Rail Transportation to Yucca Mtn

- TAD Canister system requires rail transportation
  - Yucca Mountain lacks rail access
  - DOE selected Caliente as preferred rail access option
  - Estimated cost of Caliente railroad has escalated from \$800 million in 2002 to \$2.5-3.0 billion in 2007
  - Strong opposition in Nevada likely to delay rail access
  - One-third of shipping sites lack rail access
  - Post 9/11 security concerns about cross-country rail shipments through major cities
  - RA DEIS No Action Alternative: If DOE does not select Caliente or Mina rail alignment, future course “is uncertain”
-

# DSEIS on Transportation Safety and Security Impacts

- Does not consider worst case accidents because DOE believes such combinations of factors “are not reasonably foreseeable”
- Underestimates consequences of severe accidents involving long duration fires
- Underestimates consequences of successful terrorist attack
- Dismisses potential for human error to exacerbate consequences of accidents or terrorist attacks
- Dismisses potential for unique local conditions to exacerbate consequences of accidents or terrorist attacks
- Acknowledges that clean-up costs after very severe incident resulting in release of radioactive material could range from \$300,000 to \$10 billion

# DSEIS Total Shipment Numbers

- Proposed Action (70,000 MTU, 50 years)
  - Rail Casks: 9,495
  - Truck Casks: 2,650
- Expanded Repository (133,000 MTU,)
  - Rail Casks: 24,112
  - Truck Casks: 5,025

Source: DSEIS, p. 8-32

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# DSEIS Shipments through California

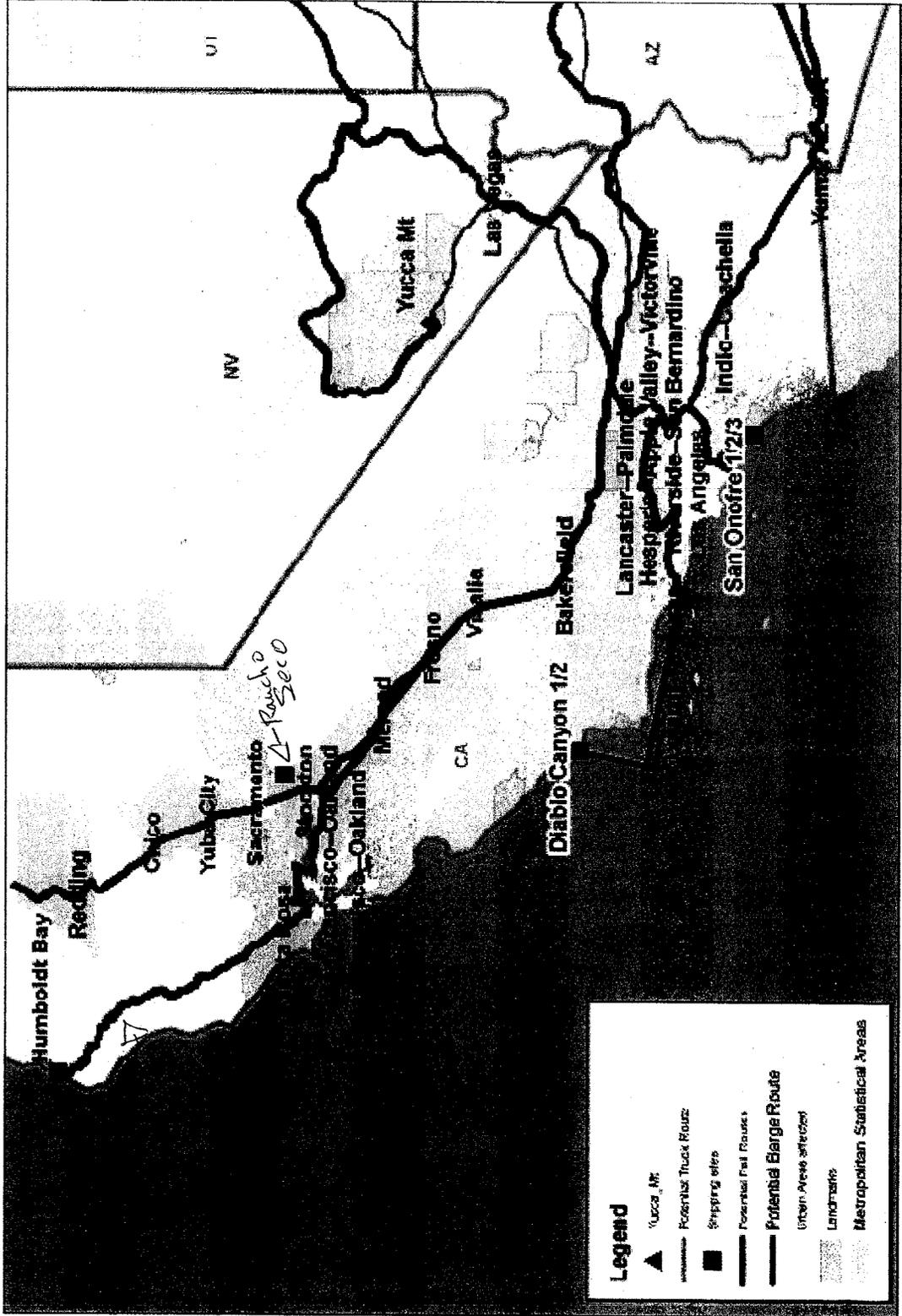
- Proposed Action (Caliente Option)
  - Rail Casks: 755 (8 % of total)
  - Truck Casks: 857 (32% of total)
- Proposed Action (Mina Option)
  - Rail Casks: 1,963 (21% of total)
  - Truck Casks: 857 (32% of total)

Source: DSEIS, p. G-64

# DSEIS on California Shipments

- DSEIS ignores potential for larger number of rail cask shipments through CA for Caliente or Mina options (>4,400, or >45% of total)
- DSEIS ignores potential for rail shipments on BNSF Railroad to San Bernardino
- DSEIS conceals potential for large number of barge shipments from Diablo Canyon to Port Hueneme (>300 rail casks on >300 barges)
- DSEIS ignores potential for large number of LWT shipments through CA if no rail access (>24,000, >45% of total)

# California Cities along Probable Routes to Yucca Mountain



# Potential Barge Shipment Route from Diablo Canyon to Port Hueneme



California

Diablo Canyon

Oxnard, Port of Hueneme

Pacific Ocean

Rail access

Vehicle Code  
Section  
1150 Title 13  
HRCQ >

Potential for 121-312  
barge shipments,  
according to FEIS  
(2002)



(397) - Transport requirements. One railcar wt: 186,000 lbs. Question: Can rails carry weight.

# California Implications

- Emergency Response funding for Nuclear Waste Shipments(180c)
  - Training and Equipment
  - Probably less than DOT HMEP grant
- Significant train transportation through urban areas and major rail hubs-Barstow

# Institutional Issues

- Inspections, staffing, liability, mutual aid
- Significant Coordination required. Within 10 miles of rail routes there are:\*
  - 33 Emergency care facilities
  - 19 Emergency centers
  - 282 Fire stations
  - 424 Police Stations
  - 5740 Schools

\*Source: FEMA MH-HAZUS Database

UCD } only 2 facilities  
UCLA } in state that can  
          } treat for radiation.

# More California Implications

- Impacts on Tribal lands (eight CA tribes impacted by rail shipments)
- Routine radiation
  - Exposed pop within 1600 meters of a rail route: approx 3.4 million people\*
- Accidental release in an urban area: up to \$10 billion to clean up (SDEIS, Pp.G-52-54)

*basis for exposure numbers?*

\*Source: Census 2005 Block group update

# More California Implications

- Security
  - Civil unrest
  - Terrorism
- Economic
  - Death Valley National Park has not yet recovered from 9/11 Important economically-important in region
  - Vulnerability of major transportation system hubs to long-term disruption

**Barbara Byron - NEPA**

---

**From:** "Matt Gaffney" <mgaffney@inyoyucca.org>  
**To:** "Barbara Byron" <Bbyron@energy.state.ca.us>  
**Date:** 11/7/2007 9:40 AM  
**Subject:** NEPA

---

I will comment on the following:

1. Inadequate analysis relating to groundwater impacts to the Lower Carbonate Aquifer in Inyo County.
2. Inadequate analysis relating to groundwater pumping in the region, its effects on repository compliance and groundwater migration from the repository.
3. Inadequate analysis relating to socio-economic impacts to Inyo County. DOE considers Inyo outside the "region of influence" for socio-economic impacts analysis.
4. Inadequate analysis relating to reasonable alternatives to the Caliente Rail Corridor.
5. Inadequate analysis of impacts relating to the movement of construction equipment and personnel on Highway 127 for the Caliente Rail Corridor.

Matt Gaffney, Project Coordinator  
Yucca Mountain Repository Assessment Office

Inyo County Water Department  
163 May Street  
Bishop, CA 93514  
Phone: 760-873-7423  
Fax: 760-873-7437  
[mgaffney@inyoyucca.org](mailto:mgaffney@inyoyucca.org)

Proposed Action and No-Action Alternative

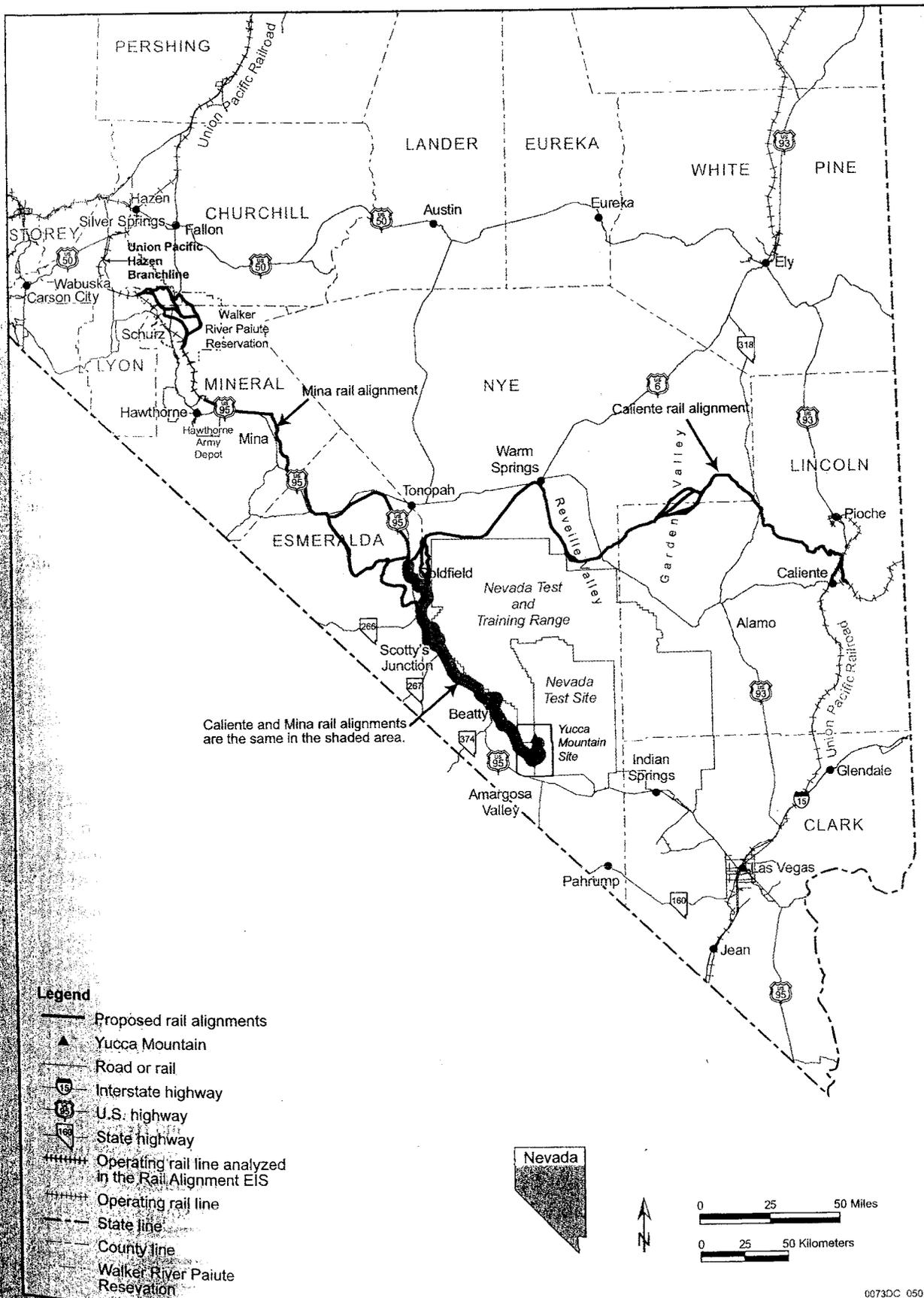


Figure 2-13. Caliente and Mina rail alignments



## **INYO COUNTY YUCCA MOUNTAIN NUCLEAR WASTE REPOSITORY PROGRAM STATEMENT OF PROBLEM**

The U.S. Department of Energy (DOE) is preparing a license application for a high-level nuclear repository for construction at Yucca Mountain, Nevada—just to the west of the Nevada Test Site and forty miles northeast of Death Valley, California. The repository is to be a mine in unsaturated volcanic tuffs beneath the mountain.

Underlying the Tertiary tuffs that make up the upper parts of the mountain at the site is a sequence of much older Paleozoic carbonate rock that is a good aquifer. Winograd and Thordarson (1975) working at the Nevada Test Site in the 1950s indicated that this large Paleozoic Carbonate Aquifer underlies a large area of southern and eastern Nevada and integrates the groundwater hydrology of a number of valleys in the region. Groundwater that flows beneath Yucca Mountain and the Nevada Test Site and discharges in large spring complexes to the south—Ash Meadows in Nevada, and the Furnace Creek springs in Death Valley, California. Flowing groundwater in the Paleozoic Carbonate Aquifer is one potential pathway by which contaminants from the proposed repository could reach the biosphere.

Working on behalf of Inyo County, California, the Hydrodynamics Group is concerned with the potential for contaminants from the Yucca Mountain Repository to reach the Paleozoic Carbonate Aquifer. A number of groundwater models of the hydrology of the area were created. Key models include Yucca Mountain Repository site model by DOE, several regional models by the USGS, and several models by our Group. The models show that should contaminants reach the Carbonate Aquifer they will almost certainly be quickly transported to the springs in Death Valley.

### **What Protects the Carbonate Aquifer at Yucca Mountain**

Only one borehole, UE 25p1, reached the Paleozoic Carbonate Aquifer in the vicinity of Yucca Mountain; it penetrated the aquifer at a depth of approximately 1200 m (3900 ft). The aquifer was quite permeable with a low porosity—less than 1% porosity. It also had a hydraulic head in the Paleozoic Carbonate Aquifer that was 15 m higher than the hydraulic head in the overlying Tertiary volcanic rocks. This higher head has the potential to move groundwater upward from the carbonate into the overlying volcanic sequence of rocks. As long as the head relationship remains as presently observed, the carbonate is protected from contamination moving downward from the repository to the Carbonate Aquifer. Our group drilled a second deep Paleozoic Carbonate Aquifer observation well just to the northeast of the Funeral Mountains in California, adjacent to Death Valley National Park.

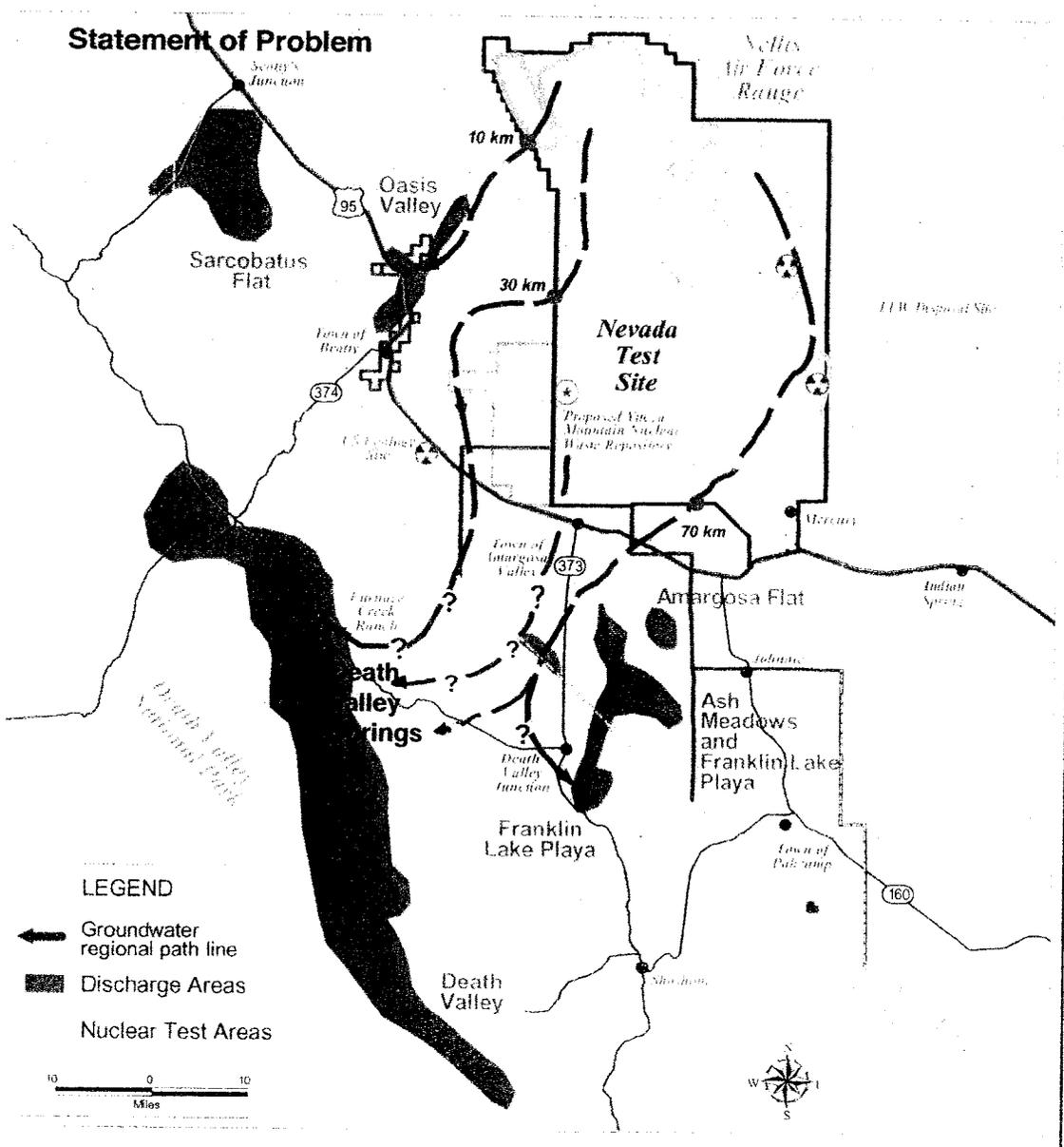
### **A Potential Problem**

Hydraulic head is one of the more ephemeral of hydrologic conditions. Head is subject to change by development of groundwater for water supply in the Amargosa Valley south of the Repository site. The population of southern Nevada is growing rapidly. Local groundwater is looked to for a large portion of the water supply. Both the valley fill deposits and the Paleozoic Carbonate Aquifer are targets for development. Groundwater pumping, lowering the hydraulic head, could eliminate the upward hydraulic head gradient that serves as the barrier to contaminate movement into the Carbonate Aquifer at Yucca Mountain.

For example, recently the Southern Nevada Water Authority (SNWA) proposed to pump groundwater from the Paleozoic Carbonate Aquifer in the vicinity of Ely, Nevada and pipe it to Las Vegas. In a recent request they received approval to pump from the Nevada State Engineer pump 74 million cubic meters (60,000 acre-feet) annually from Spring Valley. Nye County has recently made a request to pump 87,680 acre-feet per year, from the Carbonate Aquifer in the vicinity of the southern boundary of the Nevada Test Site.

**The Bottom Line**

Ground water development could destroy the upward head gradient in the Paleozoic Carbonate Aquifer that currently serves as a barrier to downward contaminant movement at Yucca Mountain. Should contaminants reach the Paleozoic Carbonate Aquifer, they will be transported quickly to the springs in Death Valley.



**Regional Groundwater Flow Path Line from Yucca Mt. And Nevada Test Site.**



## Western Governors' Association

### Policy Resolution 05-15

June 14, 2005

Breckenridge, Colorado

### *Transportation of Spent Nuclear Fuel and High-Level Radioactive Waste*

#### A. BACKGROUND

1. This nation must dispose of significant amounts of spent nuclear fuel and high-level radioactive waste (HLW).
2. The federal government is responsible for the disposal of these wastes under the Nuclear Waste Policy Act (NWPA).
3. Plans of the federal government place a disproportionate share of the national burden of nuclear waste transportation on Western states, since all of the planned spent nuclear fuel and HLW storage and disposal sites are located in the West. *← (some) land here*
4. The Governors recognize that a transportation program developed and implemented cooperatively with Western states, such as that used for cesium shipments and shipments to the Waste Isolation Pilot Plant (WIPP), can be developed with proper planning and commitment by the federal government.
5. Litigation and proposed federal legislation have increased pressure on the federal government to accept private reactor spent nuclear fuel under the NWPA, before the Department of Energy's (DOE) plans to accept waste in 2012.
6. The analysis by and experience of Western states show that adequate preparations to accommodate large scale shipments require at least three years following the designation of routes and shipping modes.
7. For many years, the Western Governors have consistently urged the federal government to develop a comprehensive transportation plan, including the preparation of contingency plans for events such as the early shipment of waste.
8. DOE has not prepared a comprehensive transportation plan and has no effective contingency plans to accommodate shipments.
9. The Secretary of Energy has entered into an agreement with at least one utility company whereby DOE would provide for temporary storage of spent fuel at commercial nuclear power plant sites until such a time as a permanent repository is available for disposal of the spent fuel. This plan, if applied to other utility companies, would compensate them for the cost of storing the waste on-site, address DOE's failure to meet its deadlines under the Nuclear Waste Policy Act of 1982, as amended, and provide much needed flexibility

within the federal high-level waste program for carrying out scientific activities and conducting required transportation planning.

**B. GOVERNORS' POLICY STATEMENT**

*Storage and Disposal*

1. The Western Governors' Association supports permanent, safe geologic disposal as the long-term national policy for managing and finally disposing of spent nuclear fuel and HLW.
2. The Governors strongly encourage the U.S. Department of Energy to work cooperatively with the states in implementing this policy to ensure the safe storage, transportation and disposal of spent nuclear fuel and HLW and to comply with agreements which have been negotiated and entered into by a state's Governor regarding the management, transportation and storage of spent nuclear fuel and high-level radioactive waste. Moreover, the federal government should not site such waste in a state for interim storage without written agreement from the affected states' Governors.
3. The Governors support efforts by the federal government to examine alternative waste acceptance options, including but not limited to, providing funds to utilities for expanded on-site storage and taking title to spent nuclear fuel at individual reactor sites. The search for alternatives must not be construed as lessening the need to develop a permanent solution to the management of spent nuclear fuel.

*Transportation*

4. The Governors' objective is the safe and uneventful transport of nuclear waste which must be paramount in all federal policies regarding nuclear waste transportation.
5. The Governors find that as a result of federal government inaction and delays, and inadequate strategic planning involving stakeholders, a national transportation system for commercial spent nuclear fuel is not presently available and would, at the earliest, be available no sooner than three years after routes have been identified and technical assistance and funds have been provided to states.
6. Early coordination and effective communications with state, tribal, and local governments is essential to the ultimate success of any nuclear waste transportation safety program.
7. In order to develop a safe and effective system for accepting commercial spent nuclear fuel and HLW at a repository or any other central storage facility, the federal government must expand its focus beyond siting, and develop, in coordination with the states and tribes, a logical and timely transportation program. This requires policy commitments from DOE and other federal agencies to:

*Develop a transportation program*

- a. Fix the shipping origins and destination points as early as possible;
- b. Ensure the availability of rail and truck shipping casks;
- c. Conduct full-scale testing of casks to be used to transport spent nuclear fuel and HLW;
- d. Prepare a comprehensive transportation plan that includes the analysis of all needed transport-safety activities in a single document;
- e. Develop responsible criteria for selecting shipping routes;
- f. Develop a sound methodology for evaluating optional mixes of routes and transportation modes; and
- g. In light of the events of September 11<sup>th</sup>, conduct a thorough review of the risks of terrorism and sabotage against spent fuel and HLW shipments and work with state governments to assure that adequate safeguards are in place prior to shipments occurring.

*Evaluate  
transportation  
risks*

8. The Governors believe that DOE or any other operator of a central interim storage facility must look to the WIPP transportation and cesium capsule return programs for guidance in conducting any SNF and HLW shipping campaign to a repository or any central storage facility:

- a. A safety and public information program similar to that developed with Western states for shipments of transuranic waste to WIPP and cesium capsules to Hanford should be utilized for all highway route-controlled quantity (HRCQ) DOE shipping campaigns. Safety programs should be evaluated and improved as needed.
- b. The WIPP Transportation Safety Program Implementation Guide is an excellent framework for transportation planning, and a similar document should be used as a base document for DOE's or any other central interim storage facility operator's various transportation programs.
- c. DOE or any other central interim storage facility operator should follow the WIPP example of working through its regional cooperative-agreement groups to propose a set of shipping routes to affected states and tribes for their review and comment. This process should result in the identification of a set of primary and secondary routes from each site of origin to each destination. DOE should require the use of these routes through mandatory contract provisions with any private contractors.
- d. DOE should work to identify flexible funding resources and cooperative agreements between their civilian, power and defense agencies as a means for supporting WGA and DOE application of lessons learned through the WIPP safety program to other DOE shipping campaigns.

*Identify routes & require their use*

9. DOE or any other central interim storage facility operator should operate a tracking system capable of monitoring the location and status of the vehicle and cask and provide access to this system to the states. The system should have a communications capability for notifying the vehicle operator, DOE, and states and tribes of the location, potential bad weather and road conditions, and occurrence of incidents.

### *Financial and Technical Assistance Responsibilities*

10. The Governors believe it is the responsibility of the generators of spent nuclear fuel and HLW and the federal government, not the states and tribes, to pay for all costs associated with assuring safe transportation, responding effectively to accidents and emergencies that will inevitably occur, and otherwise assuring public health and safety. This includes costs associated with route evaluations and inspecting and escorting shipments.
11. The Governors insist that no shipments of spent nuclear fuel and HLW be made to storage facilities or a repository, until shipping routes have been cooperatively identified and funds and assistance have been made available to states at least three years prior to the start of shipments, notwithstanding whether such facilities are publicly or privately owned or whether there are any sudden changes in DOE's shipping schedule.
12. Critical steps need to be taken to prepare states and tribes for shipments, including but not limited to:
  - a. Appropriate funds for technical assistance and training programs for states and tribes through whose jurisdictions spent nuclear fuel and HLW are to be transported;
  - b. Implement policies and procedures to assure that states are fully compensated for all training, preparedness, and response costs associated with spent nuclear fuel and HLW shipments. Assistance to states must not be based on arbitrarily established criteria, but closely linked to state-specific assessments of need;
  - c. Adopt regulations to implement a mutually acceptable program of technical assistance and training funds. Such regulations should:
    - i. Provide for the development and funding of state and tribal plans that identify the minimum elements necessary to ensure safe routine transportation and procedures for dealing with emergency response situations, the current capabilities along each corridor, the activities needed to achieve minimum elements, and performance measures to evaluate programs implemented under the plan.
    - ii. Provide annual implementation grants to states and tribes. to ensure adequate funding levels and program capabilities among impacted states and tribes.
    - iii. Provide flexibility in the expenditure of funds by states and tribes pursuant to the provisions of the state or tribal plan.
    - iv. Prior versions of this resolution included a formula for the annual implementation grants, with 75 percent of grant funds allocated according to the number of projected shipment miles in the jurisdiction and 25 percent allocated to ensure minimum funding levels and program capabilities among impacted states and tribes. Because of the current uncertainties in the transportation system (e.g., routing, mode, intermodal transfers, schedules, security measures), it is premature for DOE to finalize 180(c) and other funding allocations for annual implementation grants. Once states and tribes have assessed their needs through planning

grants provided by DOE, DOE should then consult with states and tribes to determine how to best allocate funds to states and tribes effectively, efficiently and equitably.

*Privatization*

13. In any Nuclear Waste Policy Act shipping campaign, the Department of Energy cannot privatize or delegate to a contractor key transportation responsibilities, including but not limited to:
  - a. Interaction with states and tribes;
  - b. Selection of transportation modes and routes;
  - c. Preparation of environmental impact statements addressing transportation concerns;
  - d. Selection of transportation casks;
  - e. Working with states and tribes to develop acceptable transportation communication, training and security plans; and
  - f. Decisions regarding the provision of adequate technical assistance and funding to states and tribes to prepare for shipments.

**C. GOVERNORS' MANAGEMENT DIRECTIVE**

1. The Western Governors' Association (WGA) shall post this resolution to its Web site to be referred to and transmitted as necessary.
2. This policy resolution shall be specifically conveyed to the President of the United States, the Secretaries of Energy and Transportation, the chairman of the Nuclear Regulatory Commission, the Chairman of the Board and the Chief Executive Officer of Private Fuels Storage, LLC, and the appropriate members and committees of Congress.
3. The WGA staff, in cooperation with the Western Interstate Energy Board, shall monitor implementation of this resolution and inform the Governors of progress towards meeting the Governors' objectives. WIEB is directed to evaluate and report on actions necessary for the safe and uneventful transportation of spent fuel to any proposed interim storage site. WGA and WIEB are to provide the federal government and nuclear utility industry with assistance in the development and implementation of transportation, communications and security plans for spent nuclear fuel and high-level radioactive waste.

*This resolution was originally adopted in 1999 as WGA Policy Resolution 99-014 and readopted in 2002 as WGA Policy Resolution 02-05.*

Draft

# Supplemental Environmental Impact Statement

for a

Geologic Repository for the Disposal of  
Spent Nuclear Fuel and High-Level  
Radioactive Waste at Yucca Mountain,  
Nye County, Nevada

Volume I Impact Analyses  
Chapters 1 through 13



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

DOE/EIS-0250F-S1D

October 2007

*radionuclide* migration over extended periods, so these openings could not become pathways that could compromise the repository's postclosure performance.

Surface facilities would be decontaminated, if required, and dismantled. Equipment and materials would be salvaged, recycled, or reused, if possible. Reclamation would include restoration of the site to as near its preconstruction condition as practicable, which would include the recontouring of disturbed surface areas, surface backfill, soil buildup and reconditioning, site revegetation, site water course configuration, and erosion control, as appropriate.

In compliance with 10 CFR Part 63, DOE would erect a network of permanent monuments and markers around the site to warn future generations of the presence and nature of the buried waste, and detailed public records would identify the location and layout of the repository and the nature and hazard of the waste it contains. The Federal Government would maintain *institutional control* of the site. Active and passive security systems and monitoring would prevent deliberate or inadvertent human intrusion and any other human activity that could adversely affect the repository.

### **2.1.7 TRANSPORTATION ACTIVITIES**

Under the Proposed Action, DOE would transport spent nuclear fuel and high-level radioactive waste from commercial and DOE sites to the repository. The Naval Nuclear Propulsion Program would transport *naval spent nuclear fuel* from the Idaho National Laboratory to the repository. Section 2.1.7.1 discusses loading activities of these materials at generator sites. Sections 2.1.7.2 and 2.1.7.3 discuss transportation of the materials to the Yucca Mountain site, across the nation and in Nevada, respectively. Chapter 6 and Appendix G of this Repository SEIS provide further discussion of transportation activities and resultant environmental impacts.

#### **2.1.7.1 Loading Activities at Commercial and DOE Sites**

The Proposed Action in this Repository SEIS includes the shipping of empty casks and TAD canisters to commercial and DOE sites, as well as loading of spent nuclear fuel and high-level radioactive waste at commercial and DOE sites for transportation to Yucca Mountain. Loading activities would include preparing the spent nuclear fuel or high-level radioactive waste for shipment, loading it into a transportation cask, and placing the transportation cask on a vehicle. Other activities would include the loading of commercial spent nuclear fuel into TAD canisters and the subsequent loading of TAD canisters into transportation casks. This Repository SEIS assumes that at the time of shipment, the spent nuclear fuel and high-level radioactive waste would be in a form that met approved acceptance and disposal criteria for the repository.

#### **2.1.7.2 National Transportation**

Under the Proposed Action evaluated in this Repository SEIS, DOE would transport spent nuclear fuel and high-level radioactive waste from 76 sites across the country to the repository by mostly rail. Some spent nuclear fuel and high-level radioactive waste would be transported by truck. Figures 2-11 and 2-12 show the representative national rail and truck routes, respectively, evaluated in this Repository SEIS.

For this Repository SEIS, DOE has updated the routes to reflect the current highway and rail routes in the United States and to add routes that support the Mina Corridor that DOE considers in the Rail Alignment EIS. Representative routes are routes that were analyzed but might not be the routes actually used for

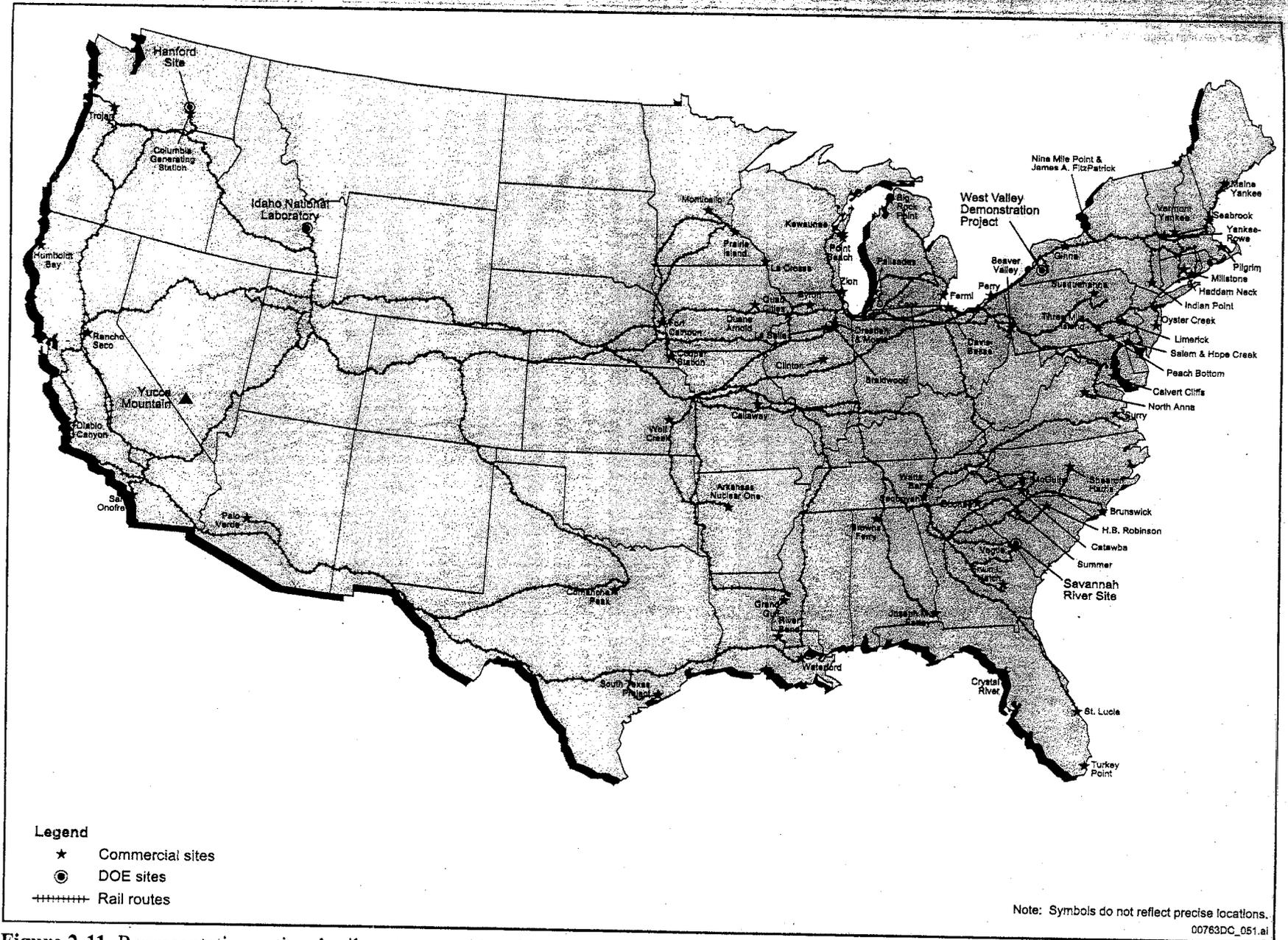


Figure 2-11. Representative national rail routes considered in the analysis for this Repository SEIS.

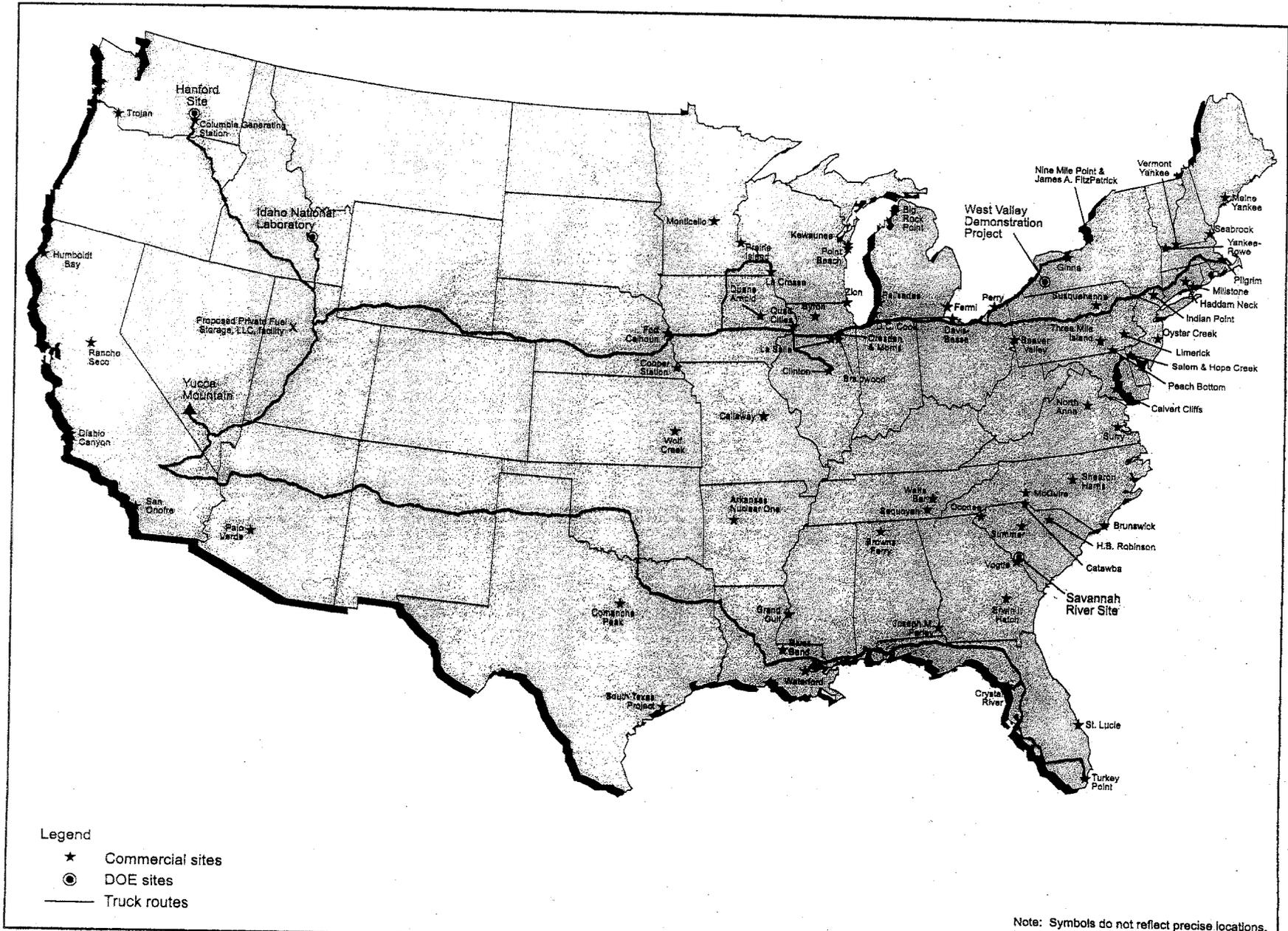


Figure 2-12. Representative national truck routes evaluated in this Repository SEIS .

shipment to the repository. Rail routes are based on maximizing the use of mainline track and minimizing the overall distance and number of interchanges between railroads.

Important elements of DOE's national transportation plan that have evolved since publication of the Yucca Mountain FEIS include the following:

- DOE has established the policy to use dedicated trains for shipments of commercial and DOE spent nuclear fuel and high-level radioactive waste. This policy would not apply to shipments of naval spent nuclear fuel. For shipments of commercial and DOE spent nuclear fuel and high-level radioactive waste, there would be from one to five casks that contained spent nuclear fuel or high-level radioactive waste per train. For shipments of naval spent nuclear fuel, this analysis assumed regular freight service and from 1 to 12 casks that contained spent nuclear fuel per train. In both cases, two buffer cars, two to three locomotives, and one to two escort cars would be present. A buffer car is a flatbed railcar that would be at the front of a cask train between the locomotive and the first cask car and at the back of the train between the last cask car and the escort car. An escort car is a railcar in which escort personnel would travel on trains that carried spent nuclear fuel or high-level radioactive waste.
- Trucks that carried transportation casks could be overweight rather than legal weight. These *overweight trucks* would be subject to the additional permitting requirements in each state through which they traveled.
- This Repository SEIS evaluates transportation of spent nuclear fuel and high-level radioactive waste from 72 commercial sites and 4 DOE sites, for a total of 76 locations (one less than in the Yucca Mountain FEIS because DOE will ship spent nuclear fuel currently stored at Fort St. Vrain, Colorado, to the Idaho National Laboratory for packaging and then to the repository). This Repository SEIS analyzes the shipment of approximately 9,500 rail casks and 2,700 truck casks of spent nuclear fuel and high-level radioactive waste. The Yucca Mountain FEIS analyzed approximately 9,600 rail casks and 1,100 truck casks under the mostly rail shipping scenario. The estimated number of truck and rail casks changed primarily due to the use of TAD canisters and revised information on interface capabilities and cask handling capabilities at U.S. nuclear facilities.
- Based on interim compensatory measures now required by the NRC that DOE would follow, at least two security escorts would be present in all areas (urban, suburban, and rural) during the shipment of spent nuclear fuel and high-level radioactive waste.

### **2.1.7.3 Nevada Transportation**

Concurrent with this Repository SEIS, DOE has prepared the Nevada Rail Corridor SEIS and the Rail Alignment EIS to make further transportation decisions in the State of Nevada. In the Nevada Rail Corridor SEIS, DOE considered the feasibility and environmental impact of using the Mina rail corridor, which it had excluded from consideration in the Yucca Mountain FEIS, as explained in the Foreword of this Repository SEIS. In addition, DOE updated environmental information for three other rail corridors considered in the Yucca Mountain FEIS, specifically the Carlin, Jean, and Valley Modified Corridors. DOE examined both the Mina and Caliente rail corridors at the alignment level in the Rail Alignment EIS. DOE had selected the Caliente rail corridor in its April 8, 2004, Record of Decision (69 FR 18557).

radioactive commercial waste disposal facility in a letter to American Ecology dated December 30, 1997 (DIRS 148088-AEC 1999, all). The U.S. Ecology Hazardous Waste Treatment, Storage and Disposal Facility is a *Resource Conservation and Recovery Act*-permitted facility, with engineered barriers and systems and administrative controls that minimize the potential for offsite migration of hazardous constituents. DOE has determined that cumulative postclosure impacts from the Beatty low-level radioactive waste disposal facility with the repository would be very small.

## 8.4 Cumulative Transportation Impacts

This section discusses the results of the cumulative impact analysis of transportation. The information in Section 8.4.1 covers cumulative impacts of the transportation of spent nuclear fuel and high-level radioactive waste from 72 commercial and 4 DOE sites to the proposed repository. Chapter 6 discusses environmental impacts of national transportation. Section 8.4.2 presents the cumulative impacts from the Rail Alignment EIS.

### 8.4.1 NATIONAL TRANSPORTATION

This section describes cumulative impacts from national transportation. Section 8.4.1.1 presents potential cumulative impacts from the storage and loading of spent nuclear fuel and high-level radioactive waste at commercial generator sites and DOE facilities to the proposed repository. Section 8.4.1.2 presents the potential cumulative impacts from shipment of Inventory Module 1 or 2 from commercial generator sites and DOE facilities. Section 8.4.1.3 presents potential cumulative national transportation impacts for the Proposed Action and Module 1 or 2 when combined with past, present, and reasonably foreseeable future shipments of radioactive material.

#### 8.4.1.1 Cumulative Impacts of Storage and Loading at Generator Sites

The activities associated with the Proposed Action would include the loading of commercial spent nuclear fuel into transportation, aging, and disposal (TAD) canisters at the commercial generator sites, loading of the TAD and other canisters into rail casks, and loading of the rail casks onto rail cars. Additional related activities that could result in impacts at the generator sites include the loading of commercial spent nuclear fuel into other canisters, such as dual-purpose canisters and the storage of commercial or DOE spent nuclear fuel or high-level radioactive waste. This section describes the cumulative impacts of these related actions.

The primary cumulative impacts from these actions would be from radiation exposures of workers, fatalities from industrial accidents, and from radiation exposures of members of the public.

Table 8-9 lists the cumulative radiological impacts to workers of storage and loading at the generator sites. DOE based the estimation of impacts of loading of canisters on the same methods and data as those for loading of TAD canisters (see Appendix G). The Department based the estimates of the impacts of canister storage at the commercial generator sites on data for surveillance and maintenance of dry storage casks (DIRS 175019-Holtec 2002, all). DOE used a 20-year storage period to estimate impacts for canister storage under the assumptions that the average spent nuclear fuel age would be 25 years and that the spent nuclear fuel would be in a spent nuclear fuel storage pool for 5 years before being moved to dry storage. DOE based the impacts of the storage of high-level radioactive waste were the impacts in *Final Waste Management Programmatic Environmental Impact Statement for Managing Treatment, Storage*

**Table 8-9.** Cumulative radiological impacts of storage and loading at the generator sites for workers.

Action	Radiation dose (person-rem)	Latent cancer fatalities
Loading of canisters	120	0.074
Storage of canisters <sup>a</sup>	2,400	1.5
Storage of high-level radioactive waste <sup>b</sup>	14,000	8.5
Storage of DOE spent nuclear fuel <sup>c</sup>	3,600	2.2
Proposed Action	10,000	6.0
Total	30,000	18

a. DIRS 175019-Holtec 2002, all.

b. DIRS 101816-DOE 1997, all.

c. DIRS 101802-DOE 1995, all.

and Disposal of Radioactive and Hazardous Waste (DIRS 101816-DOE 1997, all). The Department based impacts of the storage of DOE spent nuclear fuel on the impacts in *Department of Energy Programmatic Spent Nuclear Fuel Management and Idaho National Engineering Laboratory Environmental Restoration and Waste Management Programs Final Environmental Impact Statement* (DIRS 101802-DOE 1995, all). There would be an estimated 18 latent cancer fatalities in the exposed population of workers for loading and storage at the generator sites. These activities would take place at 76 facilities across the United States over 50 years, so the probability of a latent cancer fatality for an individual worker at an individual facility would be small.

Table 8-10 lists the cumulative industrial safety impacts of the loading and storage of spent nuclear fuel and high-level radioactive waste at the generator sites. DOE based the estimation of industrial safety impacts on the same methods and data as those for the loading of TAD canisters (Appendix G). DOE based the impacts of canister storage at the commercial generator sites on data from Holtec (DIRS 175019-Holtec 2002, all) for surveillance and maintenance of dry storage casks.

**Table 8-10.** Cumulative industrial safety impacts of storage and loading at the generator sites for workers.

Action	Industrial safety fatalities
Loading and storage of canisters <sup>a</sup>	0.0079
Storage of high-level radioactive waste <sup>b</sup>	2.5
Storage of DOE spent nuclear fuel <sup>c</sup>	<1
Proposed Action	0.25
Total	<3.8

a. DIRS 175019-Holtec 2002, all.

b. DIRS 101816-DOE 1997, all.

c. DIRS 101802-DOE 1995, all.

DOE based the estimates of impacts of canister storage on a 20-year storage time. It based the impacts of storage of high-level radioactive waste on the impacts in *Final Waste Management Programmatic Environmental Impact Statement for Managing Treatment, Storage, and Disposal of Radioactive and Hazardous Waste* (DIRS 101816-DOE 1997, all). The Department based the impacts of DOE spent nuclear fuel storage on the impacts in *Department of Energy Programmatic Spent Nuclear Fuel Management and Idaho National Engineering Laboratory Environmental Restoration and Waste Management Programs Final Environmental Impact Statement* (DIRS 101802-DOE 1995, all). There would be an estimated 4 fatalities from industrial accidents in the population of workers for loading and storage at the generator sites. These activities would take place at 76 facilities across the United States over 50 years, so the probability of a fatality for an individual worker at an individual facility would be small.

### 8.4.1.2 Inventory Module 1 or 2 Impacts at Generator Sites

This section describes the potential cumulative impacts of loading operations at the generator sites for Inventory Module 1 and 2. Chapter 6 presents the cumulative impact results of transportation for the Proposed Action inventory. Appendix G contains detailed analysis results.

For the Proposed Action, DOE would ship 70,000 MTHM of spent nuclear fuel and high-level radioactive waste from the generator sites to the repository. For Module 1, the inventory would be about 143,300 MTHM. Module 2 includes the Module 1 inventory and 2,203 canisters of Greater-Than-Class C radioactive waste. Table 8-11 lists the numbers of rail and truck casks for the Proposed Action and each of the Modules.

**Table 8-11.** Numbers of rail and truck casks for the Proposed Action, Module 1, and Module 2.

Mode	Proposed Action	Module 1	Module 2
Rail	9,495	21,909	24,112
Truck	2,650	5,025	5,025
Total	12,145	26,934	29,137

In Section 6.2.1, DOE estimated 1.4 fatalities from exposure to vehicle emissions and from traffic fatalities for shipment of empty TAD canisters and campaign kits to generator sites. Based on the increase in the number of casks for Module 1—about 120 percent—DOE estimated there could be about 3 fatalities from shipment of TAD canisters and campaign kits to generator sites for Module 1. For Module 2, the increase in the number of casks would be about 140 percent, and DOE estimated there could also be about 3 fatalities from shipment of TAD canisters and campaign kits to generator sites. Table 8-12 summarizes these impacts.

**Table 8-12.** Summary of cumulative fatality impacts at generator sites.

Activity	Proposed Action	Module 1	Module 2
Transportation of canisters to generator sites	1.4 <sup>a</sup>	3.1 <sup>a</sup>	3.4 <sup>a</sup>
Radiation exposure of public around generator sites	0.0017	0.0038	0.0041
Radiation exposure of workers at generator sites	6	13	14
Industrial accidents at generator sites	0.41 <sup>b</sup>	0.91 <sup>b</sup>	0.98 <sup>b</sup>

a. From exposure to vehicle emissions and from traffic fatalities.

b. From industrial accidents, exposure to vehicle emissions, and traffic fatalities for involved and noninvolved workers.

In Section 6.2.2, DOE estimated the probability of a latent cancer fatality for members of the public who would be exposed to radioactive releases from the generator sites would be 0.0017. Based on the increase in the number of casks for Modules 1 and 2, DOE estimated the probability of a latent cancer fatality for the exposed members of the public would be 0.0038 for Module 1 and 0.0041 for Module 2 (Table 8-12).

In Section 6.2.3, DOE estimated there would be 6 latent cancer fatalities in the population of workers who were exposed to radiation from loading activities at the generator sites. Based on the increase in the number of casks shipped for Modules 1 and 2, DOE estimated there could be 13 latent cancer fatalities among workers for Module 1 and 14 latent cancer fatalities for Module 2 (Table 8-12).

In Section 6.2.4, DOE estimated 0.41 fatality from industrial accidents, exposure to vehicle emissions, and traffic fatalities for involved and noninvolved workers at the generator sites. Based on the increase in

the number of casks shipped for Modules 1 and 2, DOE estimated 0.91 fatality for Module 1 and 0.98 fatality for Module 2 (Table 8-12).

In Section 6.2.5, DOE estimated the probability of a latent cancer fatality for the population within 16 kilometers (10 miles) of a generator site would range from  $1.5 \times 10^{-12}$  (1 chance in 700 billion) for an accident that involved the drop of a spent nuclear fuel assembly to  $3.6 \times 10^{-4}$  (1 chance in 3,000) for an accident that involved the drop of a transfer cask. Although the probability of these accidents could increase with the handling of more spent nuclear fuel, the consequences of the accidents would not increase and the impacts of loading accidents under Module 1 or 2 would be the same as those for the Proposed Action.

#### **8.4.1.3 Inventory Module 1 and 2 Impacts for National Transportation**

Table 8-13 lists the impacts for national transportation of spent nuclear fuel and high-level radioactive waste by rail and some truck shipments for the Proposed Action, Module 1, and Module 2. As with the cumulative impacts of loading and storage at the generator sites, DOE based the impacts of Module 1 and Module 2 on the impacts of the Proposed Action and on the increases in the number of rail and truck casks for Modules 1 and 2. For the Proposed Action, DOE estimated there could be a total of about 8 fatalities. The majority of these fatalities (about 80 percent) would be from worker radiation exposures and traffic accidents. The Department estimated there could be about 18 total fatalities for Module 1 and about 19 total fatalities for Module 2. As with the Proposed Action, the majority of these fatalities would be from worker radiation exposures and traffic fatalities.

DOE does not expect radiological impacts for maximally exposed workers and members of the public to change from the Proposed Action due to the conservative assumptions for the analysis of the Proposed Action (Chapter 6, Section 6.3). Maximally exposed workers would include a crew member, an inspector, and a rail yard crew member; maximally exposed members of the public would be a resident along a route, a person in a traffic jam, a person at a service station, and a resident near a rail stop). The assumptions for estimation of radiological doses include the use of the maximum allowed dose rate and conservative estimates of exposure distance and time. For example, DOE used the U.S. Department of Transportation maximum allowable dose rate of 10 millirem per hour at a distance of 2 meters (6.6 feet) [40 CFR 173.44(b)] to estimate exposures to individuals. In addition, it would be unlikely that the actual exposure distance and time for workers and the public would be higher than DOE's conservative assumptions for the Proposed Action are unlikely to be exceeded for Inventory Module 1 or 2.

#### **8.4.1.4 Inventory Module 1 and 2 Impacts for Transportation Impacts Associated with the Repository**

Chapter 6, Section 6.4.2 describes the impacts of the transportation of construction materials, repository components, and consumables to the repository; the impacts from workers who would commute to the repository; and the impacts of offsite shipment of nonhazardous solid waste and hazardous, mixed, and low-level radioactive waste. DOE estimated about 13 fatalities from exposure to vehicle emissions and 44 to 46 traffic fatalities due to these transportation activities.

The implementation of Inventory Module 1 or 2 would increase this transportation as a result of additional subsurface development and the longer time necessary for repository development, emplacement, and closure. For example, for Module 1 and Module 2, DOE would need additional

**Table 8-13.** National transportation impacts for the Proposed Action, Module 1, and Module 2.

Rail alignment	No. of casks	Members of the public radiation dose (person-rem)	Involved workers radiation dose (person-rem)	Members of the public (latent cancer fatalities)	Workers (latent cancer fatalities)	Vehicle emission fatalities	Radiological accident dose risk (person-rem)	Radiological accident risk (latent cancer fatalities)	Traffic fatalities	Total fatalities
<b>Proposed Action</b>										
<b>Caliente</b>										
Rail	9,495	800	4,700	0.48	2.8	0.99	4.1	0.0025	2.1	6.4
Truck	2,650	350	880	0.21	0.53	0.13	0.068	0.00041	0.57	1.4
<b>Total</b>	<b>12,145</b>	<b>1,200</b>	<b>5,600</b>	<b>0.69</b>	<b>3.4</b>	<b>1.1</b>	<b>4.2</b>	<b>0.0025</b>	<b>2.7</b>	<b>7.8</b>
<b>Mina</b>										
Rail	9,495	700	5,100	0.42	3	0.88	3.7	0.0022	2.2	6.5
Truck	2,650	350	880	0.21	0.53	0.13	0.068	0.00041	0.57	1.4
<b>Total</b>	<b>12,145</b>	<b>1,100</b>	<b>5,900</b>	<b>0.63</b>	<b>3.6</b>	<b>1</b>	<b>3.7</b>	<b>0.0022</b>	<b>2.8</b>	<b>8</b>
<b>Module 1</b>										
<b>Caliente</b>										
Rail	21,909	1,900	11,000	1.1	6.6	2.3	9.5	0.0057	4.8	15
Truck	5,025	660	1,700	0.4	1	0.25	0.13	0.00077	1.1	2.7
<b>Total</b>	<b>26,934</b>	<b>2,500</b>	<b>13,000</b>	<b>1.5</b>	<b>7.6</b>	<b>2.5</b>	<b>9.6</b>	<b>0.0058</b>	<b>5.9</b>	<b>18</b>
<b>Mina</b>										
Rail	21,909	1,600	12,000	0.98	7	2	8.5	0.0051	5	15
Truck	5,025	660	1,700	0.4	1	0.25	0.13	0.00077	1.1	2.7
<b>Total</b>	<b>26,934</b>	<b>2,300</b>	<b>13,000</b>	<b>1.4</b>	<b>8</b>	<b>2.3</b>	<b>8.6</b>	<b>0.0052</b>	<b>6.1</b>	<b>18</b>
<b>Module 2</b>										
<b>Caliente</b>										
Rail	24,112	2,000	12,000	1.2	7.2	2.5	10	0.0062	5.3	16
Truck	5,025	660	1,700	0.4	1	0.25	0.13	0.00077	1.1	2.7
<b>Total</b>	<b>29,137</b>	<b>2,700</b>	<b>14,000</b>	<b>1.6</b>	<b>8.2</b>	<b>2.8</b>	<b>11</b>	<b>0.0063</b>	<b>6.4</b>	<b>19</b>
<b>Mina</b>										
Rail	24,112	1,800	13,000	1.1	7.7	2.2	9.3	0.0056	5.5	17
Truck	5,025	660	1,700	0.4	1	0.25	0.13	0.00077	1.1	2.7
<b>Total</b>	<b>29,137</b>	<b>2,400</b>	<b>15,000</b>	<b>1.5</b>	<b>8.7</b>	<b>2.5</b>	<b>9.5</b>	<b>0.0057</b>	<b>6.6</b>	<b>19</b>

Note: Totals might differ from sums due to rounding.

repository components such as waste packages and drip shields. With the increased transportation of other material, personnel, and repository-generated wastes for Module 1 or 2, these transportation impacts could increase to about 14 fatalities from exposure to vehicle emissions and 47 to 50 traffic fatalities.

#### **8.4.1.5 Cumulative Impacts from the Proposed Action, Inventory Module 1 or 2, and Other Federal, Non-Federal, and Private Actions**

The overall assessment of the cumulative national transportation impacts for past, present, and reasonably foreseeable future actions concentrated on the cumulative impacts of offsite transportation, which would yield potential radiation doses to a greater portion of the general population than onsite transportation and could result in fatalities from traffic accidents. DOE used the collective dose to workers and to the general population to quantify overall cumulative radiological transportation impacts. The Department chose this measure because it relates directly to latent cancer fatalities with the use of a cancer risk coefficient and because of the difficulty in identification of a maximally exposed individual for shipments throughout the United States from 1943 through 2073. Operations at the Hanford Site and the Oak Ridge Reservation began in 1943, and 2073 is when the Repository SEIS analysis assumed that radioactive material shipments to the repository for Inventory Module 1 or 2 would end.

The cumulative impacts of the transportation of radioactive material would consist of impacts from:

- Historic DOE shipments of radioactive material to and from the Nevada Test Site, the Idaho National Engineering and Environmental Laboratory, the Savannah River Site, the Hanford Site, the Oak Ridge Reservation, and naval spent nuclear fuel and test specimens.
- Reasonably foreseeable actions that include the transportation of radioactive material in various DOE NEPA analyses; for example, the Nevada Test Site EIS (DIRS 101811-DOE 1996, all), the DOE spent nuclear fuel management EIS (DIRS 101802-DOE 1995, all; DIRS 101812-DOE 1996, all), and the DOE waste management EIS (DIRS 101816-DOE 1997, all) (see Table 8-14). In some cases, transportation impacts included impacts that might have been counted twice. For example, Table 8-14 includes the impacts from shipment of 40,000 MTHM of spent nuclear fuel to a potential Private Fuel Storage Facility in Tooele County, Utah (DIRS 157761-NRC 2001, all), but the impacts from the Proposed Action do not account for this 40,000 MTHM. Table 8-14 includes reasonably foreseeable projects that include limited transportation of radioactive material (for example, shipment of submarine reactor compartments from the Puget Sound Naval Shipyard to the Hanford Site for burial and shipments of uranium billets and low specific activity nitric acid from the Hanford Site to the United Kingdom). In addition, for reasonably foreseeable future actions for which there was no identified preferred alternative or Record of Decision, the analysis used the alternative that would result in the largest impacts. While this is not an exhaustive list of the projects that could include limited transportation of radioactive material, it indicates that the impacts of such projects would be low in comparison to major projects or general transportation.
- General radioactive materials transportation that would not relate to a particular action; for example, shipments of radiopharmaceuticals to nuclear medicine laboratories and shipments of commercial low-level radioactive waste to commercial disposal facilities.

Cumulative Impacts

Table 8-14. Cumulative transportation-related health effects.

Category	Worker dose (person-rem)	General population dose (person-rem)	Traffic fatalities
Historical DOE shipments (DIRS 101811-DOE 1996, all)	330	230	NL
Reasonably foreseeable actions			
Private Fuel Storage Facility (DIRS 157761-NRC 2001, all)	24	184	0.78
Sodium-Bonded Spent Nuclear Fuel (DIRS 157167-DOE 2000, all)	0.0044	0.032	0.0001
Idaho High-Level Waste and Facilities (DIRS 179508-DOE 2002, all)	520	2,900	0.98
Surplus Plutonium Disposition (DIRS 118979-DOE 1999, all)	60	67	0.053
Sandia National Laboratories Site-Wide EIS (DIRS 157155-DOE 1999, all)	94	590	1.3
Depleted Uranium Hexafluoride (DIRS 152493-DOE 1999, all)	—	750	4
Tritium Production in a Commercial Light Water Reactor (DIRS 157166-DOE 1999, all)	16	80	0.06
Parallex Project (DIRS 157153-DOE 1999, all)	0.00001	0.00007	0.00005
Los Alamos National Laboratory Site-Wide EIS (DIRS 157154-DOE 1999, all)	580	310	8
Plutonium Residues at Rocky Flats (DIRS 155932-DOE 1998, all)	2.1	1.3	0.0078
Import of Russian Plutonium-238 (DIRS 157156-DOE 1993, all)	1.8	4.4	0.0036
Nevada Test Site Expanded Use (DIRS 101811-DOE 1996, all)	—	150	8
Spent nuclear fuel management (DIRS 101802-DOE 1995, all; DIRS 101812-DOE 1996, all)	360	810	0.77
Waste Management FEIS (DIRS 101816-DOE 1997, all)	16,000	20,000	36
Waste Isolation Pilot Plant (DIRS 148724-DOE 1997, Appendix E)	790	5,900	5
Molybdenum-99 production (DIRS 101813-DOE 1996, all)	240	520	0.1
Tritium supply and recycling (DIRS 103208-DOE 1995, all)	—	—	0.029
Surplus HEU disposition (DIRS 103216-DOE 1996, all)	400	520	1.1
Storage and Disposition of Fissile Materials (DIRS 103215-DOE 1996, all)	—	2,400	5.5
Stockpile Stewardship (DIRS 103217-DOE 1996, all)	—	38	0.064
Pantex (DIRS 103218-DOE 1996, all)	250	490	0.006
West Valley (DIRS 179454-DOE 2003, all)	520	410	0.15
S3G and D1G prototype reactor plant disposal (DIRS 103221-DOE 1997, all)	2.9	2.2	0.010
S1C prototype reactor plant disposal (DIRS 103219-DOE 1996, all)	6.7	1.9	0.0037
Container system for Naval spent nuclear fuel (DIRS 101941-USN 1996, all)	11	15	0.045
Cruiser and submarine reactor plant disposal (DIRS 103479-USN 1996, all)	5.8	5.8	0.00095
Submarine reactor compartment disposal (DIRS 103477-USN 1984, all)	—	0.053	NL
Uranium billets (DIRS 103189-DOE 1992, all)	0.5	0.014	0.00056
Nitric acid (DIRS 103212-DOE 1995, all)	0.43	3.1	NL
Los Alamos Relocation of Area 18 FEIS (DIRS 162639-DOE 2002, all)	< 1	< 1	0.00020
Construction, Operation of Depleted DUF6 Conversion Facility, Portsmouth, Ohio FEIS (DIRS 182373-DOE 2004, all)	520	29	0.45
Enrichment Facility in Lea County, New Mexico (DIRS 182375-NRC 2005, all)	10	170	0.6
Decontamination, Demolition, and Removal of Facilities at West Valley (DIRS 182374-DOE 2006, all)	14	11	0.013
Hanford Site Solid Waste Program FEIS (DIRS 182376-DOE 2004, all)	1,200	11,000	2.4
Moab Uranium Mill Tailings FEIS (DIRS 182377-DOE 2005, all)	0.09	3.4	0.33
MOX Fuel Fabrication at Savannah River Site (DIRS 178816-NRC 2005, all)	530	560	0.056
GNEP	In preparation	In preparation	In preparation
Complex Transformation PEIS	In preparation	In preparation	In preparation
General radioactive material transportation			
1943 to 2073	350,000	300,000	28
Subtotal of non-repository-related transportation impacts 1943 to 2073	370,000	350,000	100
Proposed Action	5,600–5,900	1,100–1,200	2.7–2.8
Module 1	13,000	2,300–2,500	5.9–6.1
Module 2	14,000–15,000	2,400–2,700	6.4–6.6
Total collective dose (total latent cancer fatalities) and total traffic fatalities			
Proposed Action	380,000 (230)	350,000 (210)	100
Module 1	380,000 (230)	350,000 (210)	110
Module 2	390,000 (230)	350,000 (210)	110

NL = Not listed; information was not listed in the reference.

- Shipments of spent nuclear fuel, high-level radioactive waste, Greater-Than-Class-C waste, and Special-Performance-Assessment-Required waste under the Proposed Action or Inventory Module 1 or 2.

NRC evaluated these types of shipments based on a survey of radioactive materials transportation published in 1975 (DIRS 101892-NRC 1977, all). Categories of radioactive material evaluated in this NRC document included: (1) limited quantity shipments, (2) medical, (3) industrial, (4) fuel cycle, and (5) waste. NRC estimated that the annual collective worker dose for these shipments was 5,600 person-rem (DIRS 101892-NRC 1977, p. 4-15). The annual collective general population dose for these shipments was estimated to be 4,200 person-rem (DIRS 101892-NRC 1977, p. 5-52). These collective dose estimates were used to estimate transportation collective doses for 1943 through 1982 (40 years). Based on the NRC transportation dose assessments, the cumulative transportation collective doses for 1943 through 1982 were 220,000 person-rem for workers and 170,000 person-rem for the general population.

In 1983, another survey of radioactive materials transportation in the United States was conducted. This survey included NRC, Agreement State licensees, and DOE. Both spent nuclear fuel and radioactive waste shipments were included in the survey. Weiner et al. (DIRS 146270-1991, all) used the survey to estimate collective doses from general transportation. These transportation dose assessments were used to estimate transportation doses for 1983 through 2073 (91 years). Weiner et al. evaluated eight categories of radioactive material shipments: (1) industrial, (2) radiography, (3) medical, (4) fuel cycle, (5) research and development, (6) unknown, (7) waste, and (8) other. Based on a median external exposure rate, an annual collective worker dose of 1,400 person-rem and an annual collective general population dose of 1,400 person-rem were estimated (DIRS 146270-Weiner et al. 1991, Table VI). Over the 91-year period from 1983 through 2073, the collective worker and general population doses would be 130,000 person-rem.

For the period 1943 through 2073, the collective worker dose would be 350,000 person-rem and the collective population dose would be 300,000 person-rem.

NRC evaluated traffic fatalities and estimated that there could be 0.213 traffic fatality per year from radioactive material shipments (DIRS 101892-NRC 1977, p. 5-52). Using this estimate, for the 131-year period between 1943 through 2073, there could be 28 traffic fatalities:

Table 8-14 lists the cumulative doses to workers and the general population from the transportation of radioactive material, and it lists the numbers of traffic fatalities. The estimated cumulative transportation-related collective worker doses would range from 380,000 to 390,000 person-rem (230 latent cancer fatalities) for the Proposed Action, Module 1, and Module 2. The estimated general population doses would be about 350,000 person-rem (210 latent cancer fatalities) for the Proposed Action, Module 1, and Module 2. Most of the doses to workers and the general population would result from general transportation of radioactive material. For perspective, about 600,000 people die from cancer in the United States every year.

For transportation accidents that involved radioactive material, the dominant risk would be from accidents that do not relate to the cargo (traffic or vehicular accidents). The radiological accident risk (latent cancer fatalities) from transportation accidents is typically less than 1 percent of the vehicular accident risk. In addition, no acute radiological fatalities from transportation accidents have ever occurred in the United

States. Therefore, the number of vehicular accident fatalities was used to quantify the cumulative impacts of transportation accidents.

From 1943 through 2073, DOE estimated 5 million motor vehicle fatalities and about 130,000 transportation accident fatalities. Based on the estimated number of traffic fatalities for the reasonably foreseeable future actions and for the Proposed Action and Inventory Module 1 or 2 in Table 8-14, the transportation accidents involving radioactive material could contribute a total of about 100 to 110 fatalities.

## **8.4.2 NEVADA RAIL ALIGNMENT TRANSPORTATION**

This section summarizes cumulative impacts for Nevada rail transportation from Chapter 5 of the Nevada Rail Alignment EIS. DOE evaluated two rail alignments—Caliente and Mina. The area for each rail alignment would be from the node of the alignment to the proposed repository. The following sections discuss the impacts to each rail alignment by resource area.

### **8.4.2.1 Physical Setting**

The Rail Alignment EIS cumulative impact section evaluates two areas of physical setting impacts: disturbance of physical resources and known or potentially contaminated soils. Activities that would change the physical setting include cuts and fills and new structures such as buildings and bridges. Due to the large amount of land potentially available for development of existing and reasonably foreseeable projects, and the small percentage of potentially available land required for the proposed railroad, cumulative impacts to physical setting in the Caliente or Mina rail alignment region of influence would be small.

The major sources of existing soil contamination in the Caliente rail alignment region of influence are mining and the Nevada Test Site. These two sources, along with the Hawthorne Army Depot, are the major sources of existing soil contamination in the Mina rail alignment region of influence. Mining wastes still remain from older operations before the regulatory framework required waste management and cleanup. Historical contamination of soil resources at the Nevada Test Site resulted primarily from radioactive-waste management sites and nuclear testing activities. Explosives and heavy metals are the primary soil contamination concerns at the Hawthorne Army Depot. The proposed railroad could result in very localized contamination of soils through occasional spills (such as fuel, oil, and solvents). However, such incidents would be minor in scope and quickly mitigated in accordance with plans and regulations. All existing and foreseeable projects would be subject to the same regulations. Cumulative impacts related to contamination of soils in Caliente or Mina rail alignment would be small.

### **8.4.2.2 Land Use and Ownership**

The Rail Alignment EIS cumulative impact section evaluates several areas of land use and ownership impacts: land use changes, existing or potential land use conflicts, energy and mineral development, Bureau of Land Management land sales and other disposals, recreational land use, Bureau of Land Management rights of way, other Bureau land management actions, and urbanization and economic development initiatives for the Caliente and Mina rail alignments.

Land use changes. Many of the past, present, and reasonably foreseeable future actions in the Caliente and Mina rail alignment regions of influence result in land use changes. The Caliente rail alignment

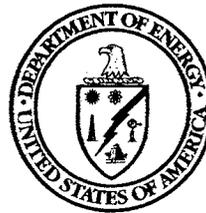
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# Supplemental Environmental Impact Statement

for a

Geologic Repository for the Disposal of  
Spent Nuclear Fuel and High-Level  
Radioactive Waste at Yucca Mountain,  
Nye County, Nevada

Volume II  
Appendixes A through J



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

DOE/EIS-0250F-S1D

October 2007

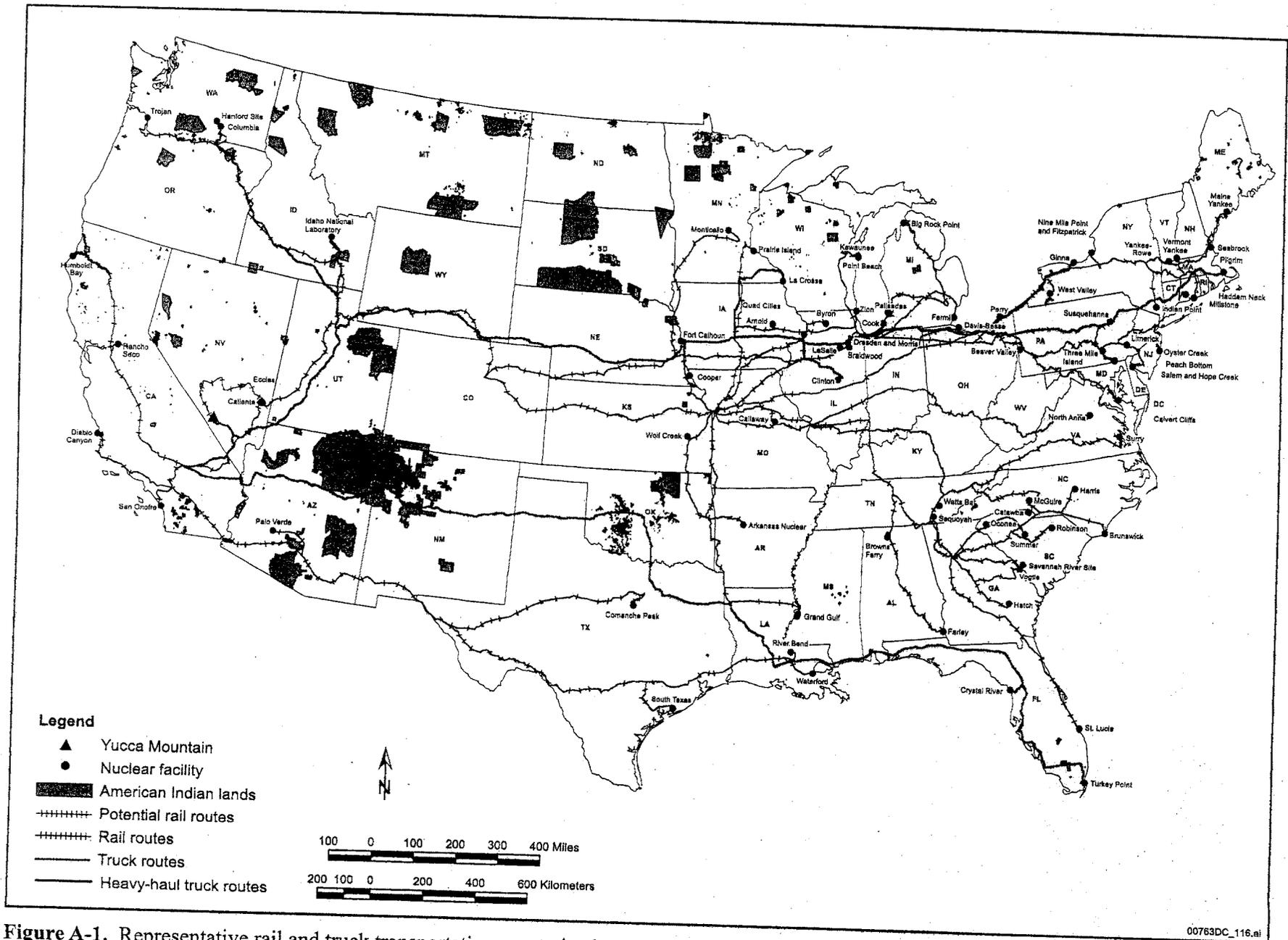
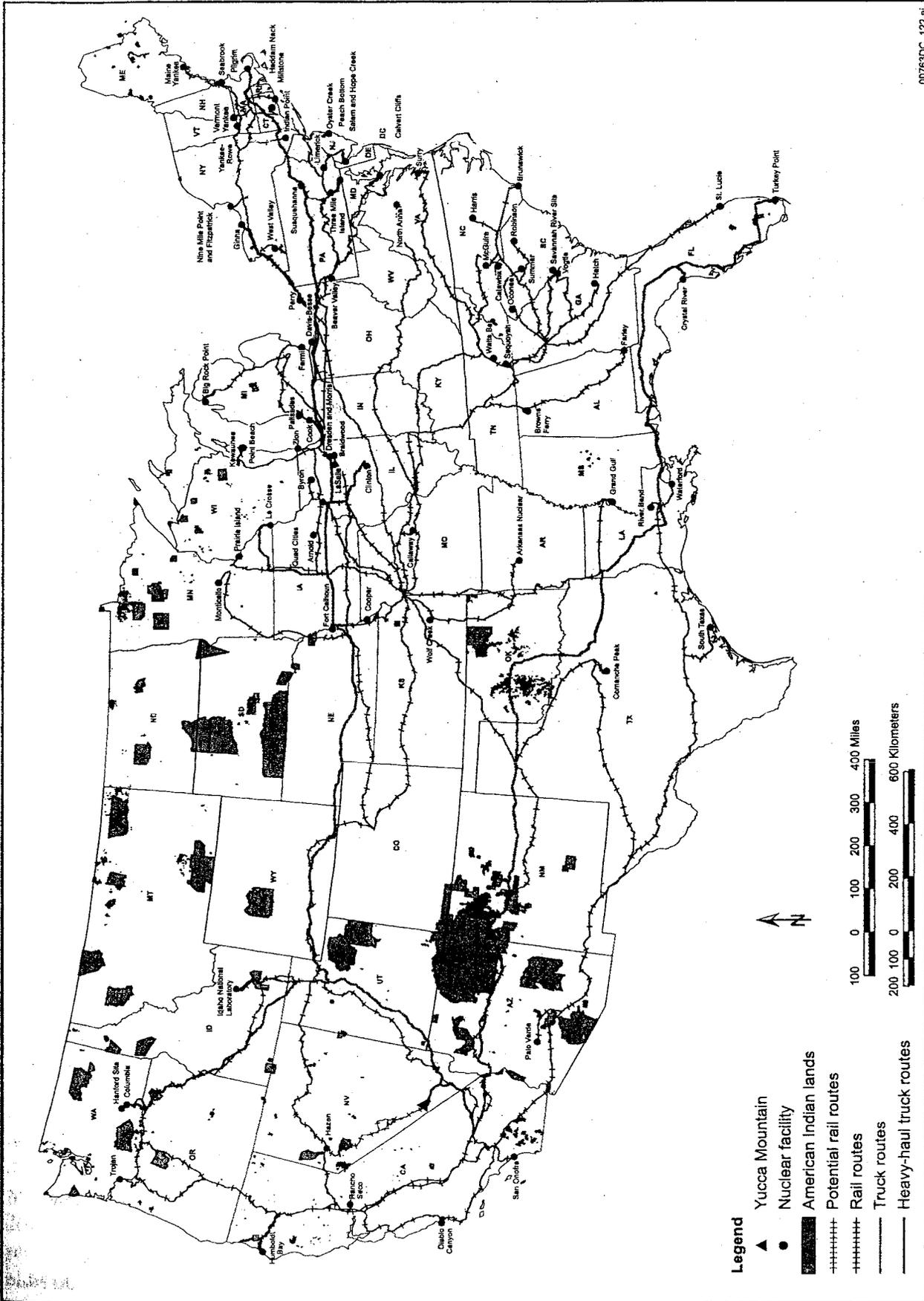


Figure A-1. Representative rail and truck transportation constrained routes if DOE selected the Caliente rail corridor in Nevada.

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Figure A-2. Representative rail and truck transportation constrained routes if DOE selected the Mina rail corridor in Nevada.

**Table G-25.** Estimated transportation impacts for the State of California.

Rail alignment	No. of Casks	Members of the public radiation dose (person-rem)	Involved workers radiation dose (person-rem)	Members of the public (latent cancer fatalities)	Involved workers (latent cancer fatalities)	Vehicle emission fatalities	Radiological accident dose risk (person-rem)	Radiological accident risk (latent cancer fatalities)	Traffic fatalities	Total fatalities
<b>Caliente</b>										
Rail	755	35	82	0.021	0.049	0.042	0.16	$9.9 \times 10^{-5}$	0.032	0.14
Truck	857	7.6	24	0.0045	0.015	0.0010	$3.1 \times 10^{-4}$	$1.9 \times 10^{-7}$	0.015	0.036
Total	1,612	43	110	0.026	0.064	0.043	0.16	$9.9 \times 10^{-5}$	0.047	0.18
<b>Mina</b>										
Rail	1,963	99	160	0.059	0.098	0.12	0.35	$2.1 \times 10^{-4}$	0.087	0.36
Truck	857	7.6	24	0.0045	0.015	0.0010	$3.1 \times 10^{-4}$	$1.9 \times 10^{-7}$	0.015	0.036
Total	2,820	110	190	0.064	0.11	0.12	0.35	$2.1 \times 10^{-4}$	0.10	0.40

a. Totals might differ from sums of values due to rounding.

# Transportation

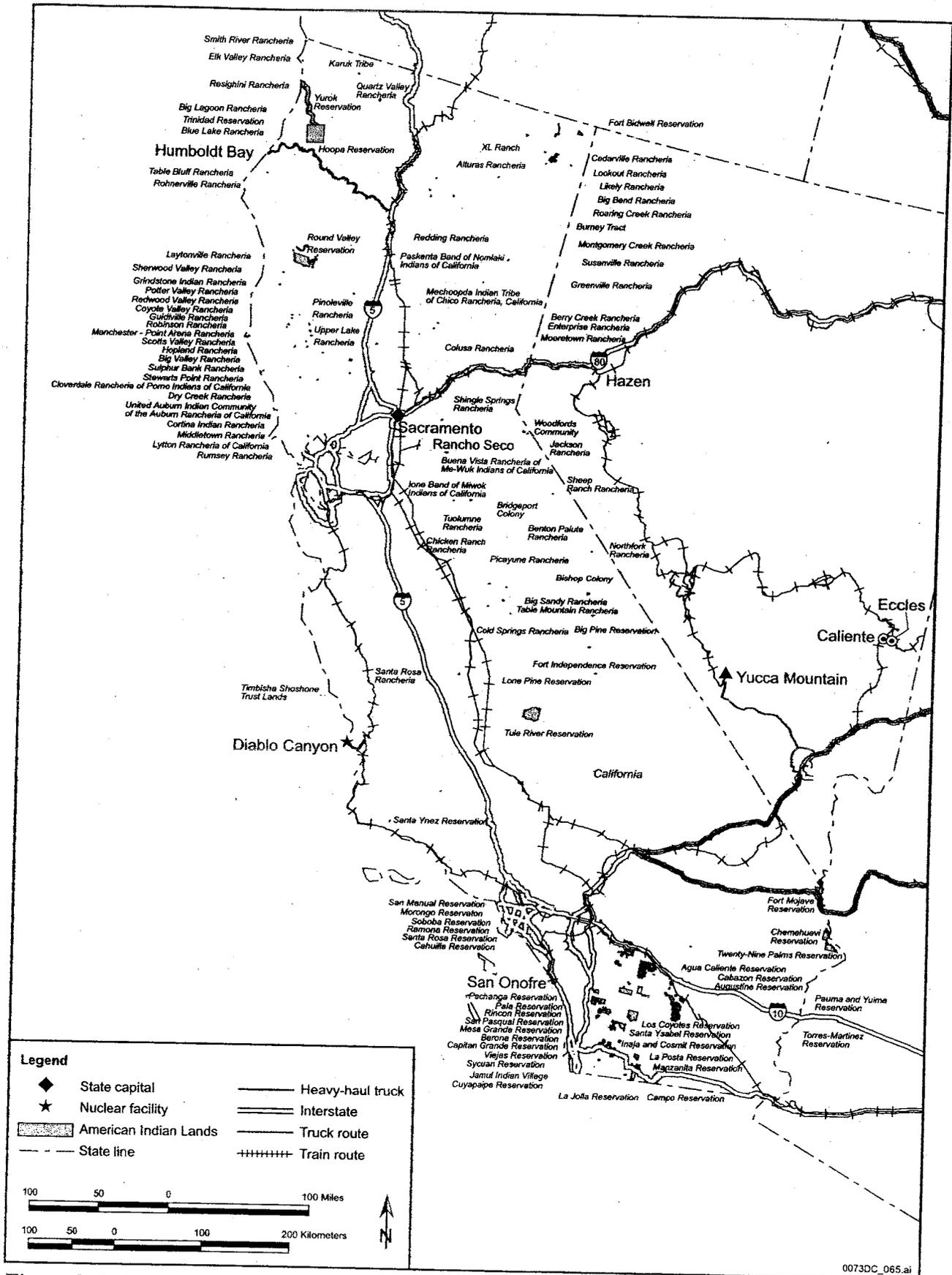


Figure G-6. Representative transportation routes for the State of California.

# **An Overview of the U.S. Department of Energy's Yucca Mt. High-Level Nuclear Waste Repository**

**Barbara Byron  
California Energy Commission  
November 9, 2007**

- 1. The U.S. Department of Energy is proposing to construct, operate, and monitor and eventually close a geologic repository at Yucca Mountain in southern Nevada for the permanent disposal of "spent" or "used" nuclear fuel and high-level radioactive waste (waste from reprocessing).**
- 2. The waste is currently being stored in <sup>31</sup> states across the U.S. Most of the commercial reactors are located in eastern states. Some of these commercial reactor sites are exceeding their capacity for storage and have constructed Independent Spent Fuel Storage Installations (ISFSI) or dry cask storage facilities. All of the commercial reactors in California (Diablo Canyon, San Onofre, Humboldt Bay, Rancho Seco) have built or are building dry cask storage facilities to store waste onsite.**
- 3. Potential impacts in California from the proposed Yucca Mt. project include transportation impacts and potential groundwater contamination in the Death Valley region.**
- 4. The national policy for the disposal of spent nuclear fuel from nuclear reactors was set by Congress in the Nuclear Waste Policy Act (NWPA) of 1982, as amended in 1987.**
  - The NWPA calls for spent nuclear fuel and high-level waste ~~to be disposed of permanently in a geologic repository~~ beginning in 1998; DOE was not able to meet this deadline and the nuclear utilities have filed lawsuits against DOE to recover the costs of extended storage of spent fuel at the reactor sites.**
  - The NEPA amendment passed in 1987 established Yucca Mt. Nevada as the sole site for scientific evaluation. Previously there had been nine other sites in the U.S. under consideration including possible sites in Texas, Washington, Louisiana, Mississippi, and Utah. This list was later narrowed to three sites: Deaf Smith Co., Texas; Hanford, Washing, and Yucca Mt., Nevada.**
  - In 1998, DOE completed a viability assessment of Yucca Mt., as required by Congress, to provide Congress, the President and the public a progress report on the Yucca Mt.**

**Site Characterization project. Based on this viability assessment, DOE believes that the Yucca Mt. site is a promising site for a geologic repository. However, others consider the site is flawed because of its seismic activity, volcano risks, and porous rock formations. The site only meets two of the four criteria established by the International Atomic Energy Agency for permanent high-level waste repositories.**

- **Federal agencies responsible for developing and licensing the proposed high-level nuclear waste repository include: The U.S. department of Energy (overall project design, project development and license application), the U.S. Environmental Protection Agency (sets the radiation protection standard for the repository), and the U.S. Nuclear Regulatory Commission (reviews the license application for the facility and implements the EPA radiation standard)**

**5. The current schedule for the proposed repository is:**

- **DOE submits license application to the U.S. Nuclear Regulatory Commission in June 2008**
- **DOE opens the repository in 2017 (at the earliest)**

**6. California's review of the Yucca Mt. Project and potential impacts in California has been a cooperative, interagency effort.**

- **In 1988, we formed an Interagency High-Level Waste Task Force to evaluate DOE's Site characterization Plan for Yucca Mt., to address concerns regarding potential impacts in California from the proposed repository.**
- **In 1989 this interagency group, coordinated by the Energy Commission, prepared comments on the DOE's Site Characterization Plan.**
- **Under the direction of the Secretary for Resources Mary Nichols, the Energy Commission in 2000 reactivated this working group as well as a separate transportation working group to review and comment on the Draft Environmental Impact Statement for the Yucca Mountain Project.**
- **The California agencies participating in these reviews include experts in groundwater hydrology, the National Environmental Policy Act requirements, transportation, emergency response, geochemistry, geology, and radionuclide chemistry.**
- **Agencies participating include the Department of Conservation Geologic Survey (formerly Mines and**

**Geology), Energy Commission, Lahontan Regional Water Quality Control Board, Department of Water Resources, State Water Quality Control Board, Fish and Game, Parks and Recreation, Public Utilities Commission Railroad Safety Branch, Health Services, Office of Emergency Services, California Highway Patrol, Department of Toxic Substances Control, and the Department of Transportation.**

- 7. The U.S. selected a deep geologic repository to dispose of its spent fuel and high-level waste. Currently no repository for disposing of high-level waste exists anywhere in the world.**
  - The concept of geologic disposal is to place packaged waste in excavated tunnels in geologic rock formations. A series of barriers, natural and man-made, are designed to isolate the waste for tens of thousands of years to minimize the amount of radioactive materials that can reach the environment.**
  - Water is the primary means for radionuclides from a repository reaching the environment and causing human health effects. The major function of natural and engineered barriers is to keep water away from the waste to limit corrosion of the waste containers and possible release of radionuclides into the groundwater.**
  - The design of the repository has been evolving: DOE is now relying upon man-made barriers – titanium drip shields – to prevent water from reaching the buried waste containers and corroding them; originally the plan was to rely more upon geologic barriers.**
  - The repository would be constructed about 1,000 feet below the surface and about 1,000 feet above the water table (unsaturated zone).**
  
- 8. The Supplemental Environmental Impact Statement (SEIS) is an assessment of the environmental impacts of developing and operating the repository, transporting nuclear waste to the site, using the new Transportation, Aging and Disposal (TAD) containers, and eventually closing the repository.**
  - The SEIS did not identify any potential environmental impacts that would be a basis for not proceeding with the licensing, construction and operation of the repository.**
  - The SEIS has been heavily criticized for failing to identify and analyze the routes to the repository and not evaluating the impacts on states along transportation corridors.**

- California has criticized DOE that, whereas California has two operating commercial nuclear reactors, two shut-down commercial plants and several research reactors storing spent fuel, and will be heavily impacted by shipments to the repository as well as having potential groundwater impacts, only one hearing was held in California in Lone Pine.

**9. Potential impacts in California from the proposed repository include transportation and groundwater impacts.**

- Inyo County, California, which is adjacent to the Yucca Mt. site, has received federal funding to conduct an independent evaluation of impacts from the proposed project.
- The Timbisha Shoshone tribe in California has also just received status as an affected tribe and will receive funding from DOE to participate in DOE's Yucca Mt. proceedings.
- Inyo County identified the following deficiencies with the Yucca Mt. environmental impact statements: (1) inadequate evaluation of transportation impacts associated with transporting 77,000 tons of radioactive waste to the repository, (2) lack of thorough consideration of risks to regional groundwater, and (3) uncertainties regarding the long-term performance of the repository due to recent changes in the repository design.
- Critics of the repository note the potential dangers of a release of radioactive material following a train or truck accident or terrorist incident involving these shipments.
- The most probable rail routes identified by Nevada for waste shipments would impact Sacramento, the Los Angeles area, San Luis Obispo, Santa Barbara, San Bernardino, Fresno, Bakersfield, Barstow and other smaller cities and communities.
- DOE has selected rail as the preferred shipment mode for these shipments and plans to use dedicated trains. The West's major urban centers grew around rail centers; thousands of spent fuel shipments would pass through these areas' most heavily populated areas.
- Maps developed by Nevada showing likely routes to the repository are available at <http://www.state.nv.us/nucwaste/trans/images/18p1b.gif>

**10. The State of Nevada opposes the Yucca Mt. repository, although Nye County (site of the repository) supports it.**

- Nevada said the Draft EIS fails to identify spent fuel and high-level waste shipping modes and routes in a way that permits people in affected communities to participate in the review and public comment process.
- Nevada is concerned about the potential economic impacts the Yucca Mt. project would have on the State of Nevada, particularly Las Vegas and its tourist economy.
- Nevada also noted that the EIS ignores locally generated data on population demographics, highway accident rates, road conditions, emergency preparedness conditions and socioeconomic conditions.
- Nevada has stated that it has been proven that surface water has penetrated the repository depths at the site in less than 40 years at Yucca Mt. and that this violates the earlier criterion for the site that such water migration must take more than 1,000 years.
- In 1996, Nevada found evidence in Yucca Mt. rocks of chemical remnants from atmospheric nuclear testing, which they consider to be an indication that water had seeped to the level of the proposed repository within 40-50 years.
- Nevada officials have said that their research shows that even with man-made barriers, the Yucca Mt. will not isolate the waste for 10,000 years.
- The U.S. Environmental Protection Agency has not yet issued the final radiation protection standard for the repository. Nevada has charged that it is premature for DOE to apply for a license for the repository before EPA has finalized the standard.
- The State of Nevada has filed multiple lawsuits and will continue file them making it unlikely that, even if DOE receives a license from the Nuclear Regulatory Commission to begin construction, the repository likely cannot be built before the early 2020s at the earliest. The NRC will likely take four years to review the license application.

**DRAFT**

**PROPOSED MAJOR POINTS  
ON THE DRAFT YUCCA MT. SEIS  
November 9, 2007**

1. Inadequate Disclosure of Potential Impacts in CA: The potential impacts in California from the proposed repository include transportation impacts, potential groundwater impacts in the Death Valley region, as well as impacts on parks, habitats, and wildlife in California. DOE is required under the National Environmental Policy Act to provide a complete evaluation and disclosure of these impacts and provide adequate notice to the communities potentially affected by the proposed project.
2. SEIS Failed to Address Major Inadequacies Identified in Comments on the DEIS by California, Local Governments, and Others. These deficiencies include, among other things, an inadequate assessment of the impacts in California associated with the transportation of spent fuel and high-level waste and potential groundwater impacts.
3. Inadequate Notification of Local CA Communities: DOE failed to notify affected communities along the shipment corridors in California regarding their plans for SNF shipments to the repository. Without this information, these communities have had no way of knowing that they will be impacted by decisions being made regarding the Yucca Mountain project concerning the transport, storage and disposal of spent fuel and high-level waste. DOE should base their nuclear waste transport and disposal policy decisions on sound technical information that includes adequate input from the affected states, tribes, and local jurisdictions. Failure to do so would result in a fatally flawed process and serious questions regarding the potential public health and safety impacts from the proposed Yucca Mountain repository project.
4. Inadequate Public Disclosure: DOE held only two public hearings in California on the EIS for Yucca Mountain: one on November 4, 1999, in Lone Pine in response to a request by Inyo County, and a second hearing held February 22, 2000, in San Bernardino in response to a request by Senator Boxer. Only one public hearing is being held in California on this SEIS: Lone Pine, although the State of California requested hearings in Sacramento, Lone Pine, Bishop, and Barstow. No additional public hearings have been held in California, although they have been requested.

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5. DOE Has Failed to Conduct Route-Specific Analyses and Describe Mitigation for Potential Transportation Impacts in California: (Caltrans)  
No mitigation is being offered for national transportation impacts outside of Nevada. "Shipments of spent nuclear fuel and high-level radioactive waste would represent a very small fraction of total national highway and railroad annual traffic (less than 0.1 percent." Summary S.3.3.2 page S-42 (and other places). Certainly in the perspective of all highways in all states, the impact is minimal. However, to adequately determine impacts to a facility or particular city or county, individual route-specific analyses must be provided.
  6. DOE Has Failed to Identify Routes and Shipment Modes for Repository Shipments and potentially hazardous locations or conditions along these routes: Segments of the routes, e.g., tunnels, bridges, adjacent refineries could provide conditions in which an accident or terrorist attack could result in a long duration, fully engulfing fire that could exceed the spent fuel packaging test requirements. For example, two major highway accidents in California this year (e.g., the Bay Area freeway fire, which melted part of the roadway and the Santa Clarita tunnel fire) may have resulted in fire temperatures and durations that exceeded the fire testing requirements for the spent fuel packaging.

The National Academies' 2006 study of spent fuel and high-level waste transportation recommended that detailed surveys of transportation routes be done to identify potential hazards that could lead to or exacerbate extreme accidents involving very long duration, fully engulfing fires, and should take steps to avoid or mitigate such hazards. The National Academies' study concluded that the radiological risks associated with the shipment of spent fuel and high-level waste are well understood and are generally low, with the possible exception of the risks from releases in extreme accidents involving very long duration, fully engulfing fires. They further concluded that, "While the likelihood of such extreme accidents appears to be very small, their occurrence cannot be ruled out based on historical accident data for other types of hazardous materials shipments." They further concluded that recently published work suggests that extreme accident scenarios involving very long duration, fully engulfing fires might produce thermal loading conditions sufficient to compromise package containment effectiveness. The SEIS should evaluate the potential consequences of an accident involving extreme fire conditions exceeding packaging requirements and the SEIS should describe the bounding-level of package performance in response to such very long duration, fully engulfing fires.

7. Concerns About Possible Use of SR-127: Concern about Yucca Mountain shipments in California increased with DOE's decision to reroute a major portion of their low-level radioactive waste shipments from eastern states

to the Nevada Test Site in Nevada. Beginning in January 2000, DOE began using a southern route through California (State Route 127) for a major portion of thousands of low-level waste shipments annually from DOE facilities in eastern states to the Nevada Test Site. In 2004, shipments from the Nevada Test Site (NTS) to the Waste Isolation Pilot Plant also began using predominantly California routes (SR 127) to avoid shipments through Las Vegas even though this extended the shipment routes. DOE had rerouted these shipments through California in response to requests by the Governors of Nevada and Arizona that DOE avoid nuclear waste shipments through Las Vegas and over Hoover Dam.

Senators Dianne Feinstein and Barbara Boxer, the California Congressional Chairs Sam Farr and Jerry Lewis, Inyo and San Bernardino Counties, and the Cities of Needles and Barstow strongly objected to rerouting these shipments from eastern states through California over greater distances. Letters from the California Highway Patrol and the Energy Commission expressed strong concern to DOE over DOE's increased use of SR 127 in Inyo and San Bernardino Counties for these truck shipments. Concerns include SR-127 road conditions, periodic flash flooding, seasonally peaks in tourism (SR-127 is the main access route to the Death Valley National Park, which has 1.25 million visitors each year), scarcity of and long response time for emergency response to a shipment accident, and impacts on the road infrastructure from increased heavy truck traffic.

8. Inadequate Evaluation of Potential Groundwater Impacts in CA:
9. Inadequate Evaluation of Potential Impacts from a Terrorist Attack on Spent Fuel Shipments: The National Academies' 2006 spent fuel transport study noted that malevolent acts against spent fuel and high-level waste shipments are a major concern, especially following 9/11 terrorist attacks. NAS recommended an independent examination of the security of spent fuel and high-level waste transportation including the threat environment, the response of spent fuel packages to credible malevolent acts, and operational security requirements for protecting spent fuel and high-level waste while in transport. The SEIS should examine, to the extent possible without exposing classified information, the bounding consequences of a terrorist attack against these shipments. The SEIS should explain how the consequences of a severe accident or terrorist attack can be mitigated through, for example, emergency responder preparedness (how emergency responder professionals responding to the event or escorting the shipments can respond effectively and in a timely manner to a major event involving spent fuel and high-level waste shipments).