



# Yucca Mountain Licensing Update

Western Interstate Energy Board

High-Level Radioactive Waste Committee Meeting  
October 24, 2017

Robert J. Halstead

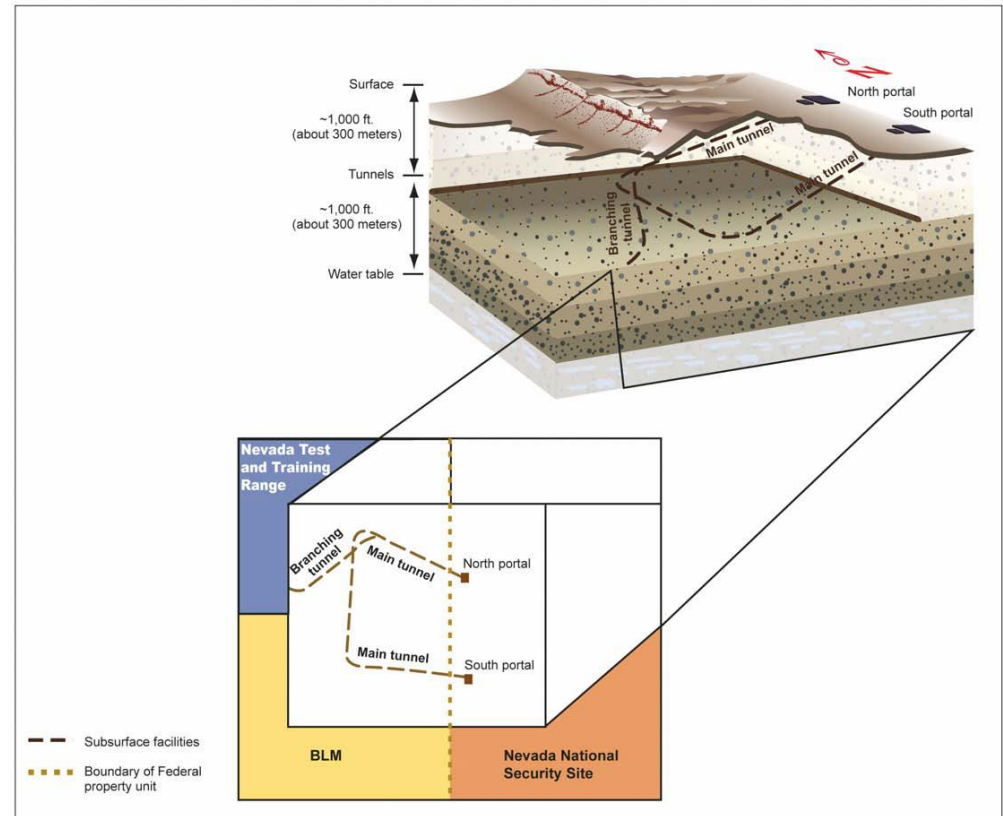
Office of the Governor

Nevada Agency for Nuclear Projects

# What Exists Today at Yucca Mountain

Only 5-Mile Exploratory Tunnel that cannot be used for storage or disposal

- No waste disposal tunnels (Over 40 miles needed)
- No waste handling facilities
- No state water permit
- No construction authorization
- No railroad
- Expired BLM land withdrawal



# Nevada Opposition to Yucca Mountain

- Governor Brian Sandoval
- Commission on Nuclear Projects
- Attorney General Adam Paul Laxalt
- Secretary of State Barbara Cegavske
- Congressional Delegation
- Mayor of Las Vegas, Las Vegas City Council, Clark County Commission
- Majority and Minority Leaders of the Legislature
- AJR 10 Resolution of Opposition: Assembly 32-6-4; Senate 19-2
- Nevada Opinion Polls (2010, 2017): Oppose – 58%; Favor – 33%

# NRC Licensing Proceeding 2008 - 2017

- DOE application submitted 2008
- NRC proceeding suspended 2011
- No new funds FY 2012 - 2016
- Court-ordered restart 2013
- NRC ordered partial restart 2013
- NRC staff Safety Evaluation Report 2015
- NRC staff EIS Supplement Groundwater Impacts 2016
- NRC staff LSN documents to ADAMS 2017
- NRC directs staff to reactivate LSN Advisory Review Panel and evaluate potential facilities for hearings 2017

# Recent Developments

- President's FY 2018 Budget Blueprint: Requested \$120 million for DOE and \$30 million for NRC to restart Yucca Mountain licensing activities and initiate a "robust" interim storage program. (March 2017)
- Energy Secretary Rick Perry Visit to Yucca Mountain (March 2017)
- Energy Secretary Rick Perry Meeting with Gov. Sandoval (March 2017)
- Lawsuit filed by State of Texas seeking expedited NRC licensing and other measures (State of Nevada Petition to Intervene April 2017)
- DOE and NRC Budget Request Details Released (May 2017)
- U.S. House of Representatives, Committee on Energy and Commerce, Reported H.R. 3053 Nuclear Waste Policy Amendments Act of 2017 (June 2017); Floor vote expected in October or November 2017
- Continuing Resolution for FY 2018 through December 8, 2017 provided no new funding for Yucca Mountain Licensing

# NRC Licensing Proceeding Could Resume 2018

- Discovery and trial-like hearings (5 years)
- 299 contentions currently pending
- Nevada would adjudicate 218 contentions
- Nevada would submit 30-50 new contentions
- DOE estimated cost \$1.66 billion
- NRC estimated cost \$330 million
- Nevada estimated cost \$40-50 million

# Overview: NRC Licensing Process

- DOE – submit application for construction authorization
- NRC staff – support accepted application
- Intervenors – oppose or support application
- Licensing Board(s) – grant or deny authorization
- The 5-Member Commission – sustain or overturn licensing board decision (final agency action)
- U.S. Court of Appeals for the District of Columbia Circuit - judicial review

# Nevada's Case Against DOE

- Post-closure Safety (One million years): Site is unsuitable and repository design fails to correct deficiencies
- Pre-closure Safety (300 years): Surface facilities are vulnerable to human events and natural disasters
- Transportation impacts (50-100 years) in Las Vegas and rural Nevada are unacceptable
- DOE Final Supplemental EIS fails to comply with the National Environmental Policy Act (NEPA)



# NRC ASLB Admitted 46 Transportation NEPA Contentions (May 11, 2009 Order)

As California persuasively argues, “[w]ithout transportation of the waste to it, Yucca Mountain would be just a very large, fancy, and expensive hole in a mountain.” ...there can be no serious dispute that the NRC’s NEPA responsibilities do not end at the boundaries of the proposed repository, but rather extend to the transportation of nuclear waste to the repository. The two are closely interdependent. Without the repository, waste would not be transported to Yucca Mountain. Without transportation of waste to it, construction of the repository would be irrational. Under NEPA, both must be considered.

# DOE 2008 FSEIS Transportation Radiological Impacts Adopted by NRC Staff

- **incident-free exposures to members of the public residing near or traveling on transportation routes** (up to 0.016 rem to a person in a gridlock traffic jam); [Pp.6-20, 6-21, 8-41]
- **incident-free exposures to transportation workers** such as escorts, truck drivers, & inspectors (by administrative controls, DOE would limit individual doses to 0.5 rem per year; the allowable occupational dose is 5 rem per year); [Pp.6-21, 8-41]
- **release of radioactive material as a result of the maximum reasonably foreseeable transportation accident** (probability about 5 in one million per year), involving a fully engulfing fire, 34 rem dose to the maximally exposed individual, 16,000 person-rem population dose and 9.4 latent cancer fatalities in an urban area, and cleanup-costs of \$300,000 to \$10 billion; [Pp.6-15, 6-24, G-56]
- **release of radioactive material following a successful act of sabotage or terrorism**, using a high-energy density device, resulting in 27-43 rem dose to the maximally exposed individual, 32,000-47,000 person-rem population dose and 19-28 latent cancer fatalities in an urban area, and cleanup costs similar to a severe transportation accident. [Pp.6-27, CR-467]

Source: Halstead and Dilger, ANS IHLRWMC 2011, Albuquerque, NM, April 10-14, 2011, Pp. 410-411.

# Nevada Admitted Contentions

## Transportation Incidents and Accidents

- NEV-NEPA-001 Transportation Sabotage Scenarios
- NEV-NEPA-002 Transportation Sabotage Cleanup Costs
- NEV-NEPA-003 Transportation Accident Cleanup Costs

# Different Casks & Shipment Characteristics Create Different Risks

- 43 Times More SNF Shipped Per Year
- 8 - 38 Times More Casks Per Year
- 5 - 40 Times More Shipments Per Year
- 443% Increase In Average Rail Miles
- 280% Increase In Average Truck Miles
- Western Route Conditions
- Potential Heavy Haul Trucks and Barges

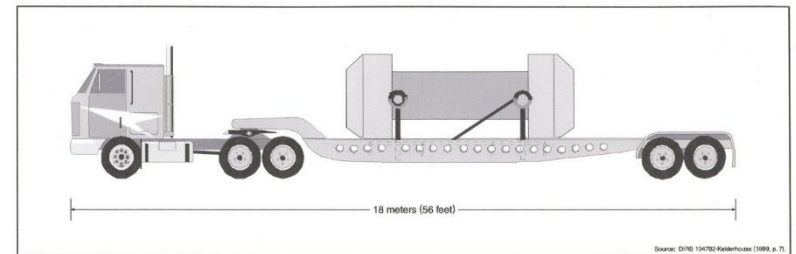


Figure J-3. Artist's conception of a truck cask on a legal-weight tractor-trailer truck.

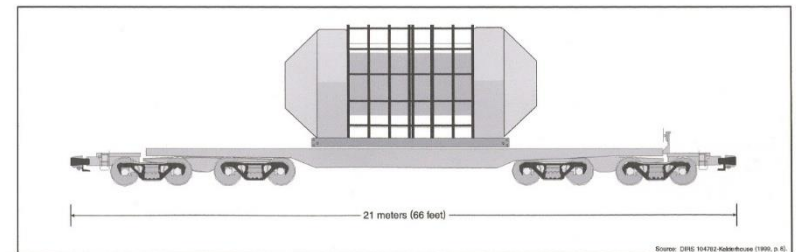


Figure J-4. Artist's conception of a large rail cask on a railcar.

Source: Halstead & Dilger, "How Many Did You Say? Historical and Projected Spent Nuclear Fuel Shipments in the United States, 1964-2048," Waste Management'03 Conference, February 25, 2003, Tucson, AZ

# Contentions Challenge Impacts of Transportation Radiological Sabotage

**Truck Cask Test, 1982**



**Rail Cask Test, 1998**



# Contentions Challenge Impacts of Transportation Accidents (Fires)

**MacArthur Maze - 2007**



**Baltimore Rail Tunnel - 2001**



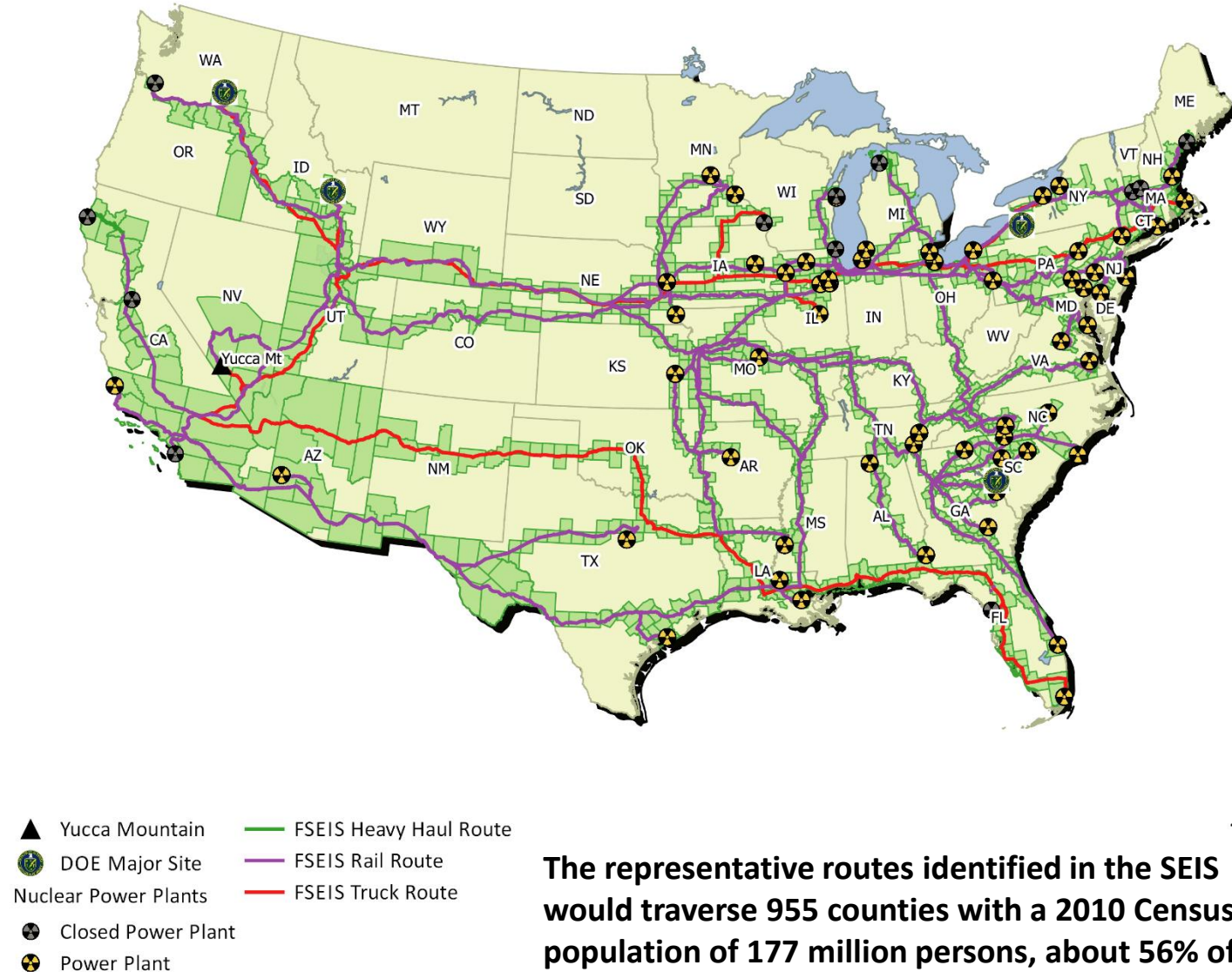
# Nevada Admitted Contentions

## Modes, Routes, Regions of Influence

- NEV-NEPA-004 Shared Use Option
- NEV-NEPA-005 Radiological Regions of Influence for Transportation
- NEV-NEPA-007 Overweight Trucks
- NEV-NEPA-015 TAD Shipment Estimates
- NEV-NEPA-016 Representative Routes

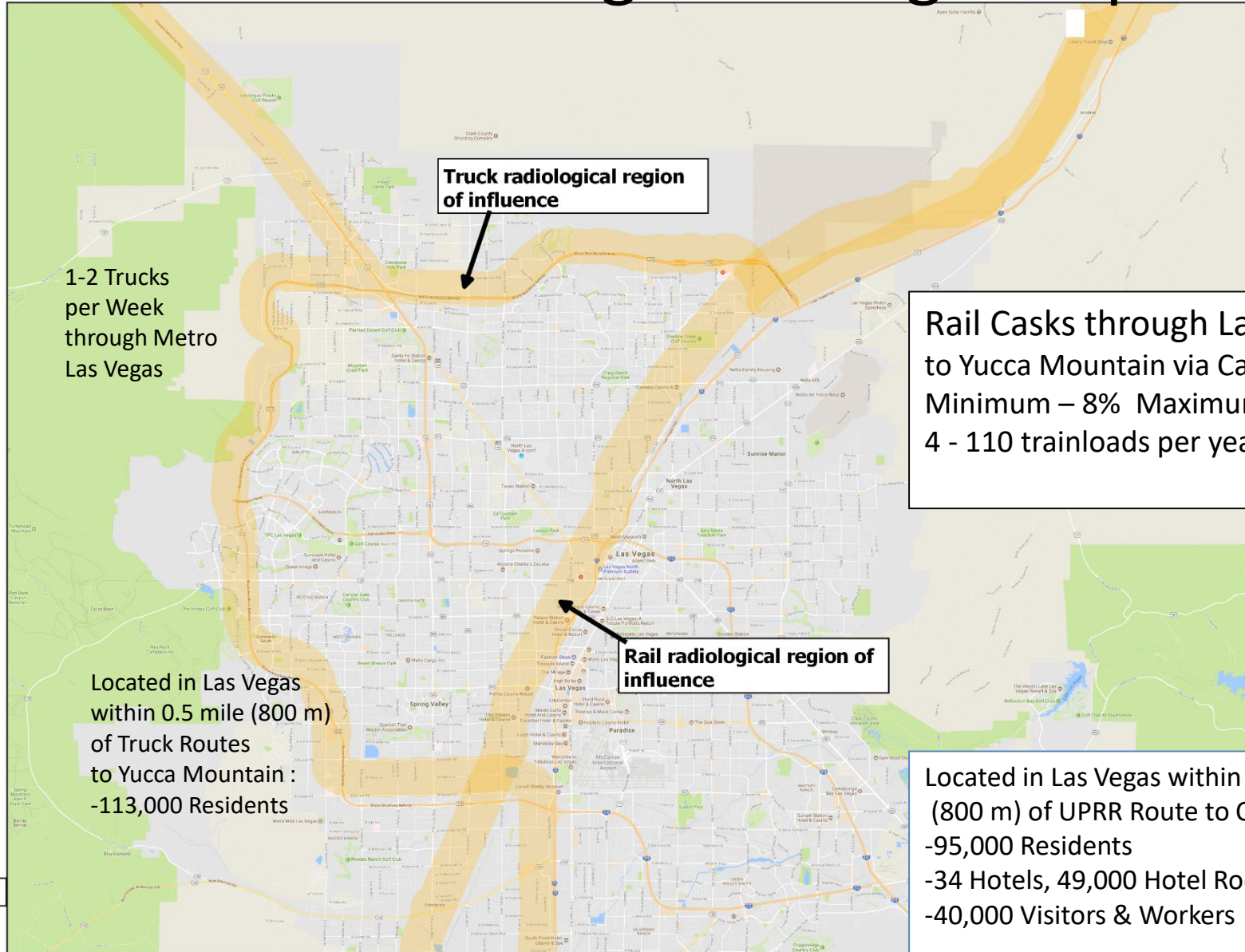
# Contentions Challenge National Impacts

## Rail/Truck Modal Mix, Use of Overweight Trucks, & Rail Routing





# Contentions Challenge: Las Vegas Impacts



1-2 Trucks  
per Week  
through Metro  
Las Vegas

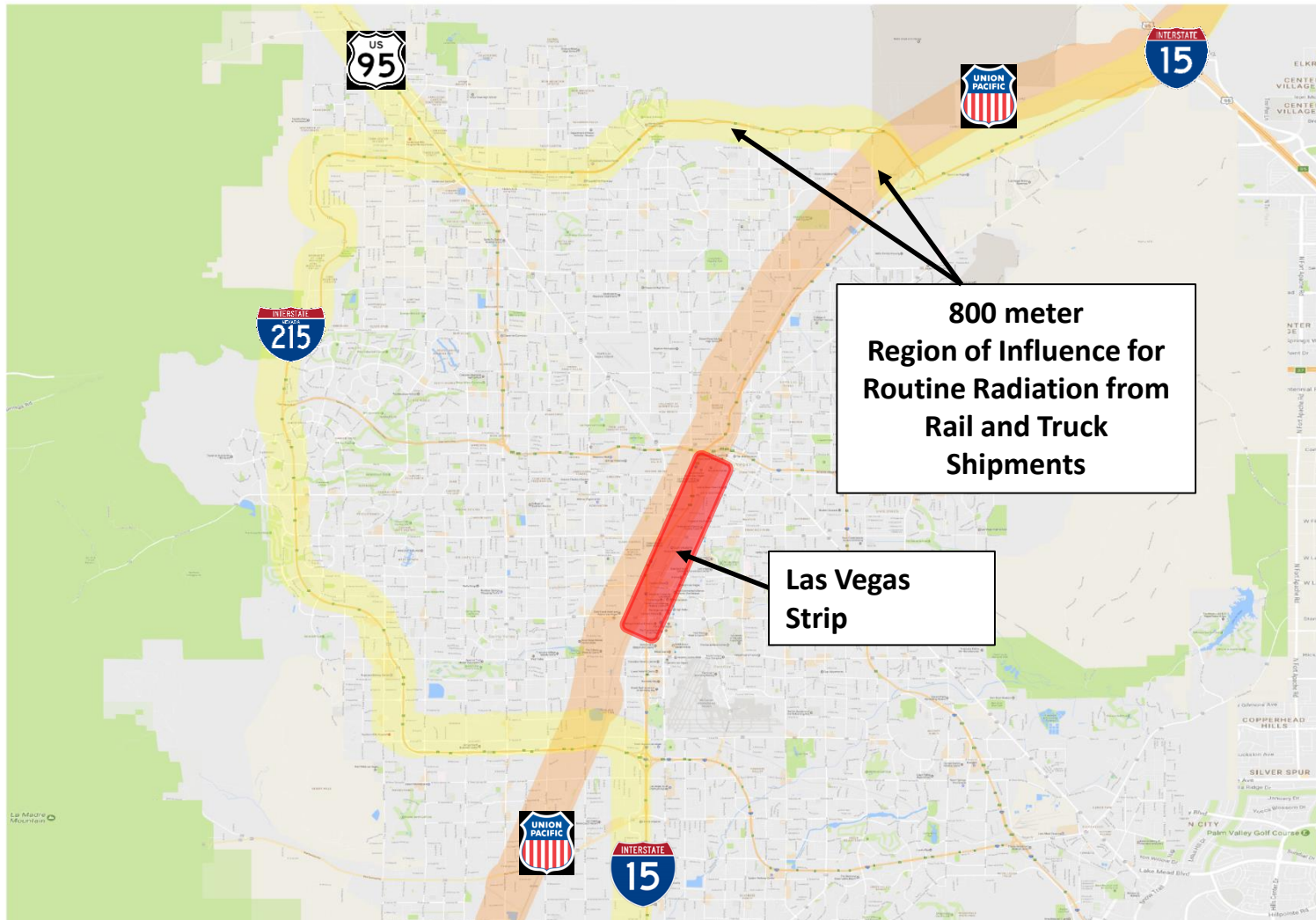
Located in Las Vegas  
within 0.5 mile (800 m)  
of Truck Routes  
to Yucca Mountain :  
-113,000 Residents

**Truck radiological region  
of influence**

**Rail radiological region  
of influence**

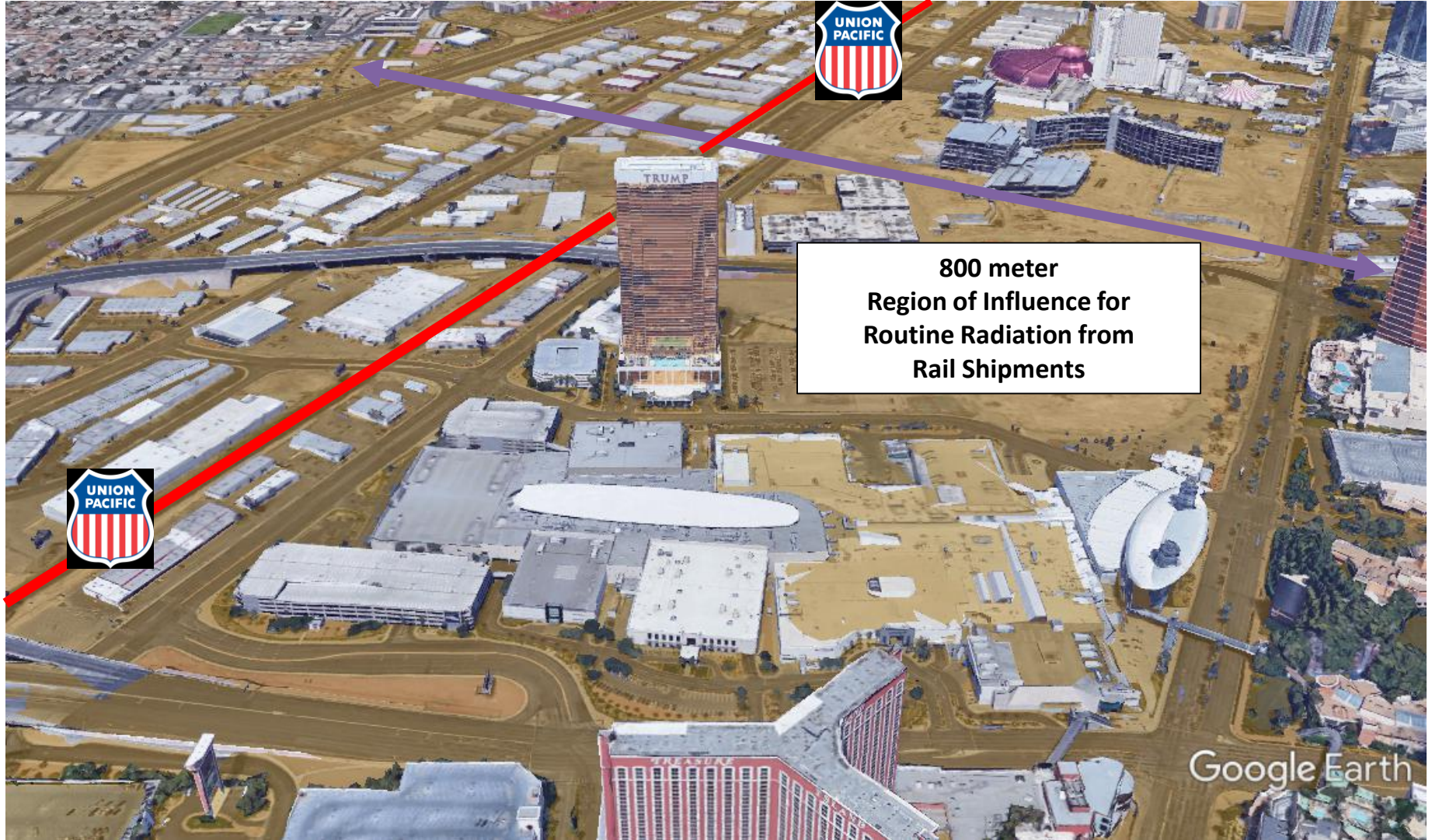
Rail Casks through Las Vegas  
to Yucca Mountain via Caliente  
Minimum – 8% Maximum – 79%  
4 - 110 trainloads per year

Located in Las Vegas within 0.5 mile  
(800 m) of UPRR Route to Caliente :  
-95,000 Residents  
-34 Hotels, 49,000 Hotel Rooms  
-40,000 Visitors & Workers



**800 meter  
Region of Influence for  
Routine Radiation from  
Rail and Truck  
Shipments**

**Las Vegas  
Strip**



**800 meter  
Region of Influence for  
Routine Radiation from  
Rail Shipments**



Google Earth

# Nevada Admitted Contentions Proposed Caliente Rail Alignment

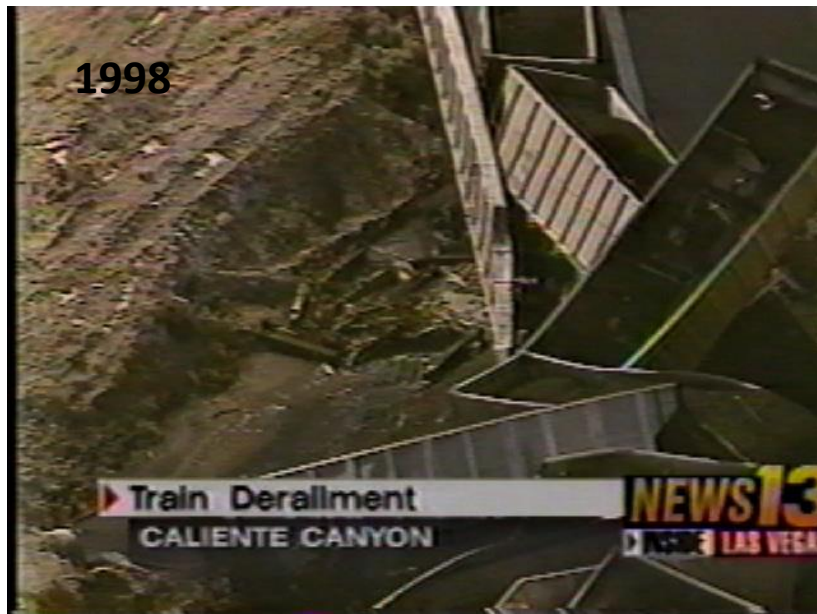
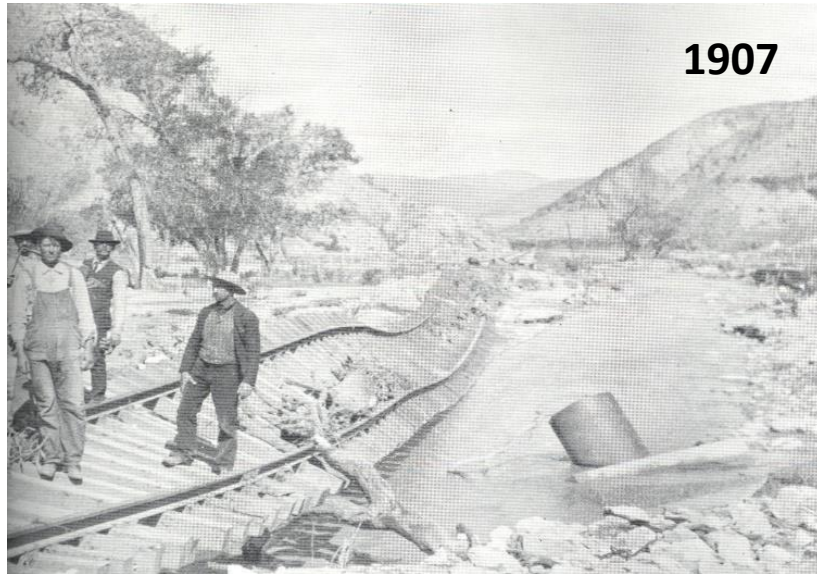
- NEV-NEPA-006 Caliente Rail Alignment Plan and Profile Information
- NEV-NEPA-008 Impacts on Aesthetic Resources
- NEV-NEPA-013 Grazing Impacts
- NEV-NEPA-014 Deferred Assessment of Railroad Construction Impacts on Grazing

# Union Pacific Route to Caliente Characteristics

(Uvada, MP 501.1; Caliente, MP 459.8; Moapa, MP 383.5)

- Salt Lake City - Los Angeles Constructed 1880-1905
- “The 118-mile study corridor traverses very rugged terrain. The route is confined within the canyon walls of Clover Creek and Meadow Valley Wash. The route exhibits a high degree of curvature as it descends 4,300 ft. from the high plateau at the Utah border to the desert floor beyond the southern end of the study area [Moapa].” (UNR, 1991, p. 25)
- Track equipped with high quality materials and maintained in good to excellent condition
- Steep grades and tight curves require speed restrictions, especially for westbound trains on the downgrade
- 15 tunnels, 107 bridges, 66 culverts
- Numerous rockfall areas and flood areas
- Updated accident study needed

# UP Mainline to Caliente Safety Issues



# UNR 1991 Rail Study Flood Warning

- “At MP 431.82 ...The bridge appears to have been designed to allow passage of the 25-year storm. However there is a 30% chance that a 100-year storm (probability of 0.01) will occur in any 35 years, and a 51% chance that a 50-year storm will occur during the same period.” (p.29)
- “From the analysis of the 100-year flow through the wash between the bridge at MP 431.82 versus the capacity of the channel provided, it was found that there is a significant danger of track becoming flooded or possibly the bridge washing out.” (p.52)

Norris, Gary, Survey and Evaluation of Nevada's Transportation Infrastructure:  
Task 3 – Railroads, University of Nevada, Reno, Prepared for State of  
Nevada Nuclear Waste Project Office, January, 1991

# Bridge Washout at MP 431.81 (January 2005)

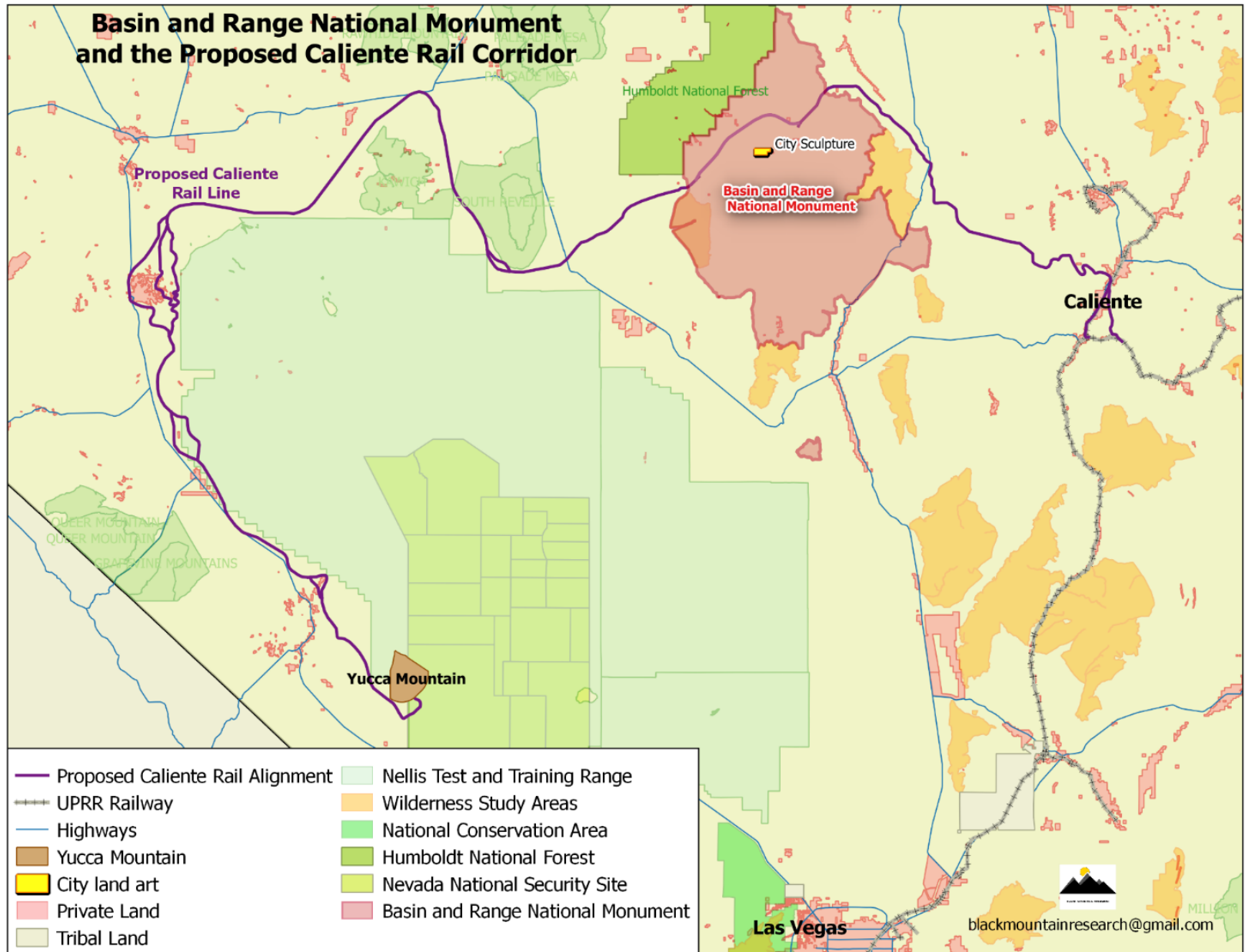


Cottonwood Wash  
MP 431.81

JAN 30 2005

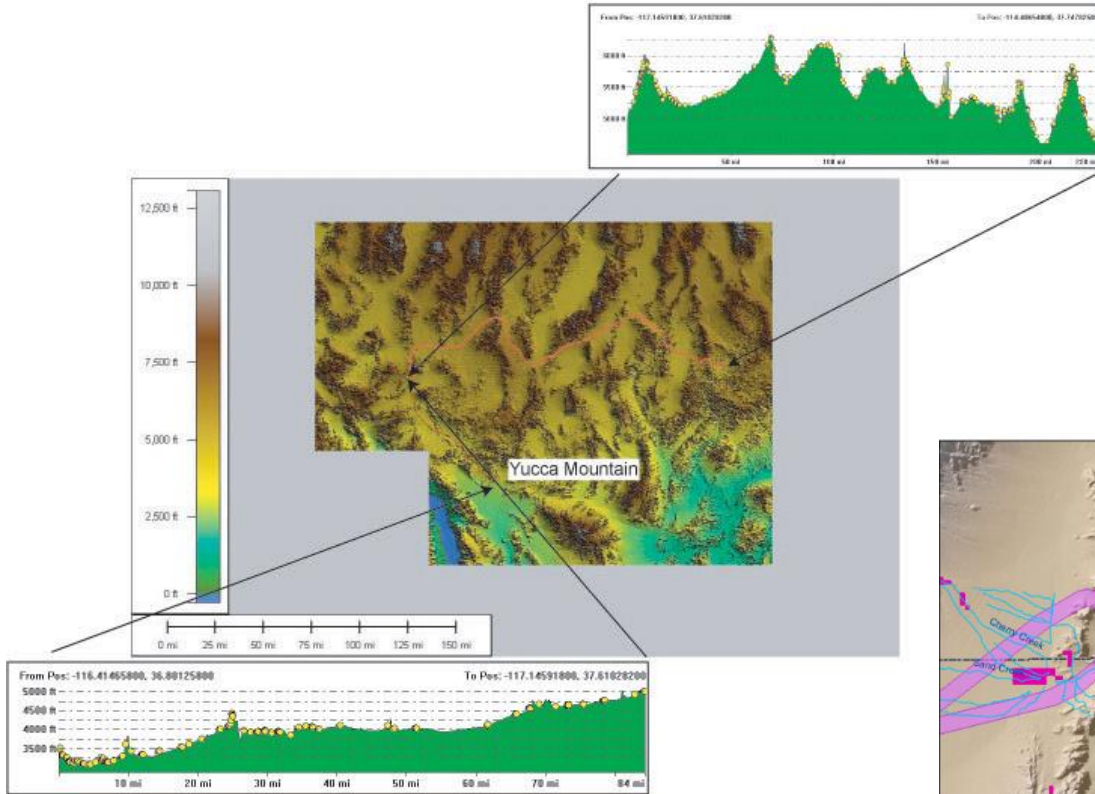


# Contentions Challenge Caliente Rail Impacts

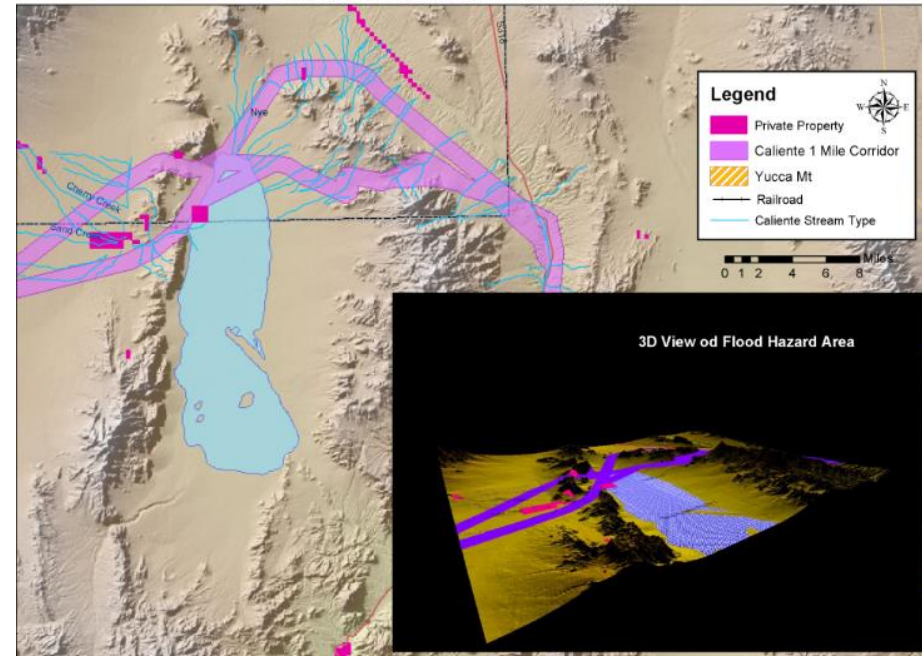


# Caliente Corridor Terrain Challenges

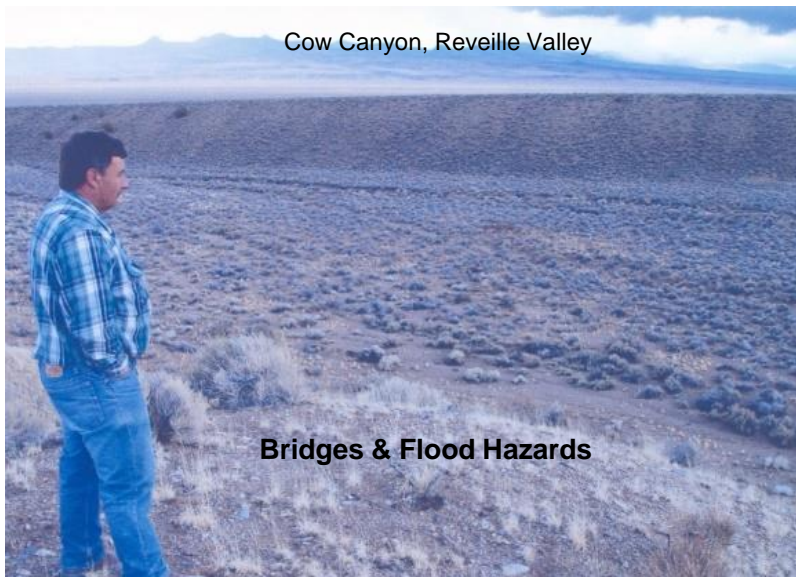
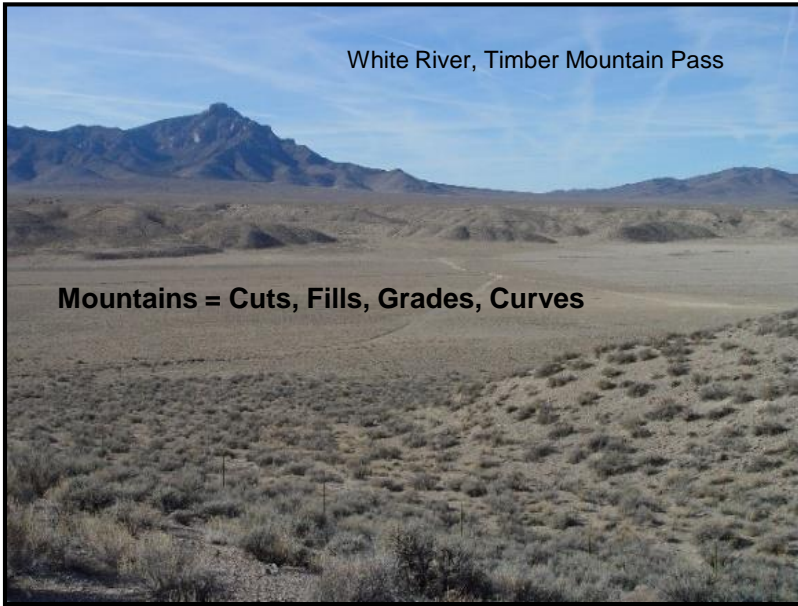
## Caliente Rail Profile



## Caliente Corridor Water Features



# Caliente Corridor NEPA Issues



# Michael Heizer & “City” -Garden Valley

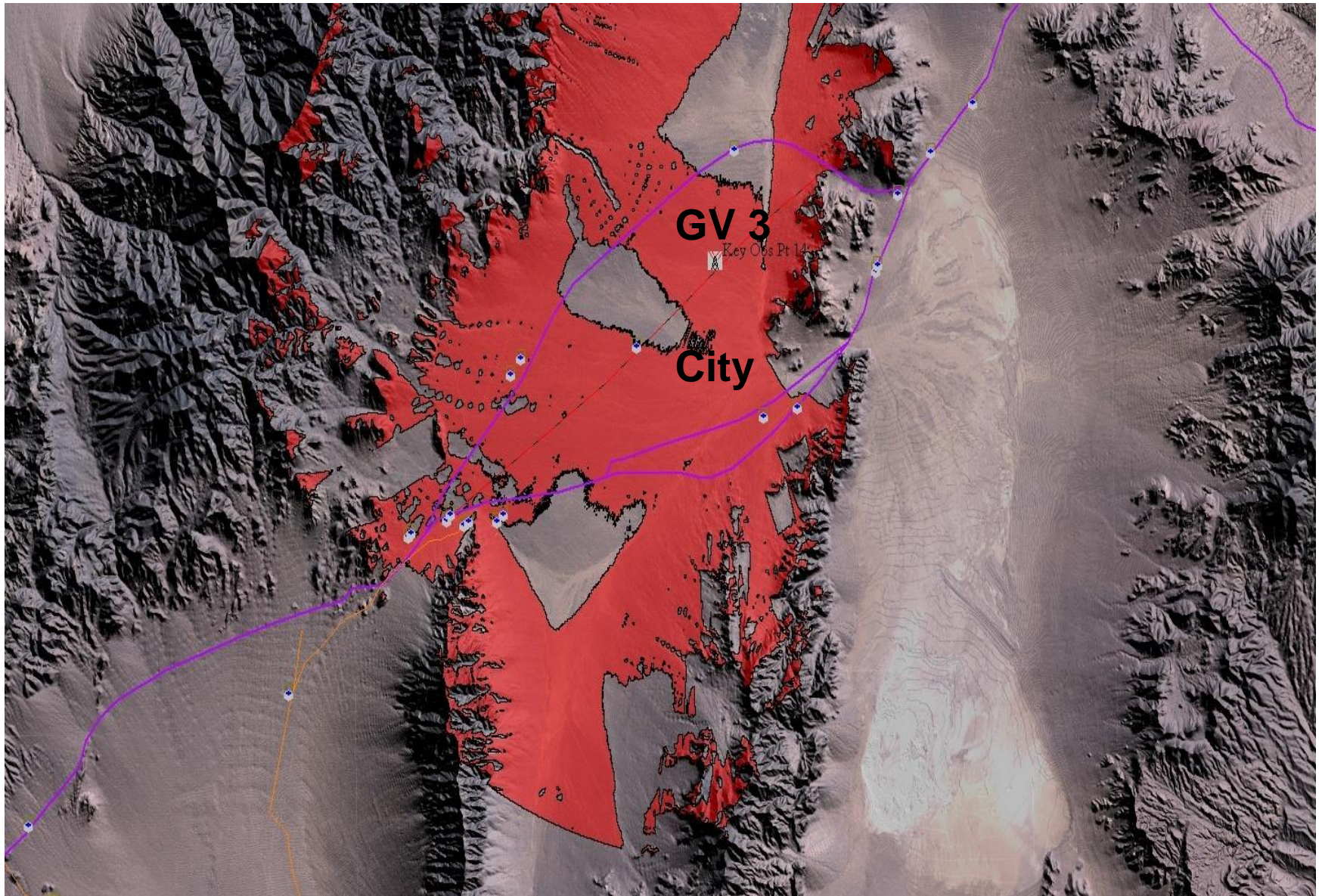
## An Artist at the End of the World

ment to finish what may be the biggest sculpture on earth.

**By Michael Kimmelman**



# Caliente Rail Alignment Impacts on Viewshed Around Michael Heizer's "City" Installation



# Nevada Admitted Contentions Comparative Impacts & Related Issues

- NEV-NEPA-009 Transportation Sabotage Risk vs. At-Reactor Storage
- NEV-NEPA-010 Long-Term Radiation Exposure Following Sabotage
- NEV-NEPA-011 Sabotage Risk, Pressurized Cask
- NEV-NEPA-012 Transportation Risk Assumptions

# Nuclear Waste Informed Consent Act

- S. 95 (Heller & Cortez Masto), The Nuclear Waste Informed Consent Act: Extend consent to Nevada by restricting NRC Nuclear Waste Fund expenditures for a repository (January 11, 2017)\*
- H.R. 456 (Titus, Kihuen, & Rosen), The Nuclear Waste Informed Consent Act: Extend consent to Nevada by restricting Nuclear Waste Fund expenditures for a repository (January 11, 2017)\*\*
- Parties to written consent agreement with Secretary of Energy: (1) Governor of the host State; (2) each affected unit of local government; (3) any unit of general local government contiguous to the affected unit of local government if spent nuclear fuel or high-level radioactive waste will be transported through that unit of general local government for disposal at the repository; and (4) each affected Indian tribe

\*Available on-line at: <https://www.congress.gov/bill/115th-congress/senate-bill/95>

\*\*Available on-line: <https://www.congress.gov/bill/115th-congress/house-bill/456>