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Process By Which the U.S. Nuclear Regulatory Commission is Reviewing the License Application for a Repository at Yucca Mountain, Nevada and an Update on Waste Disposal Legislation

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The NRC staff views expressed herein are preliminary and do not constitute a final judgment or determination of the matters addressed or of the acceptability of a license application for a geologic repository at Yucca Mountain.

Department of Earth and Environment
Nuclear Weapons, Power and Waste Disposal (STS 313)
Franklin & Marshall College
November 19, 2009

Skills for Applying Science in a Regulatory Framework

"The vision is that you have got to be nimble, you have got to be flexible, you have got to bring the crosscutting mix of scientific talents to bear on projects as they are needed in real time, not in geologic time." Chip Groat, former Director, United States Geologic Survey

"Policy-making is about rapid, timely decisions made in the face of constantly inadequate information. Science is about tentative conclusions made only after thorough examination of well-researched data."

Melody Brown Burskins, former Congressional Science Fellow

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Outline

- Nuclear waste primer
- Yucca Mountain site
- High-level waste – who is who and what are their responsibilities?
- Pending legislation and rulemaking
- U.S. Nuclear Regulatory Commission (NRC) license review process
- Summary

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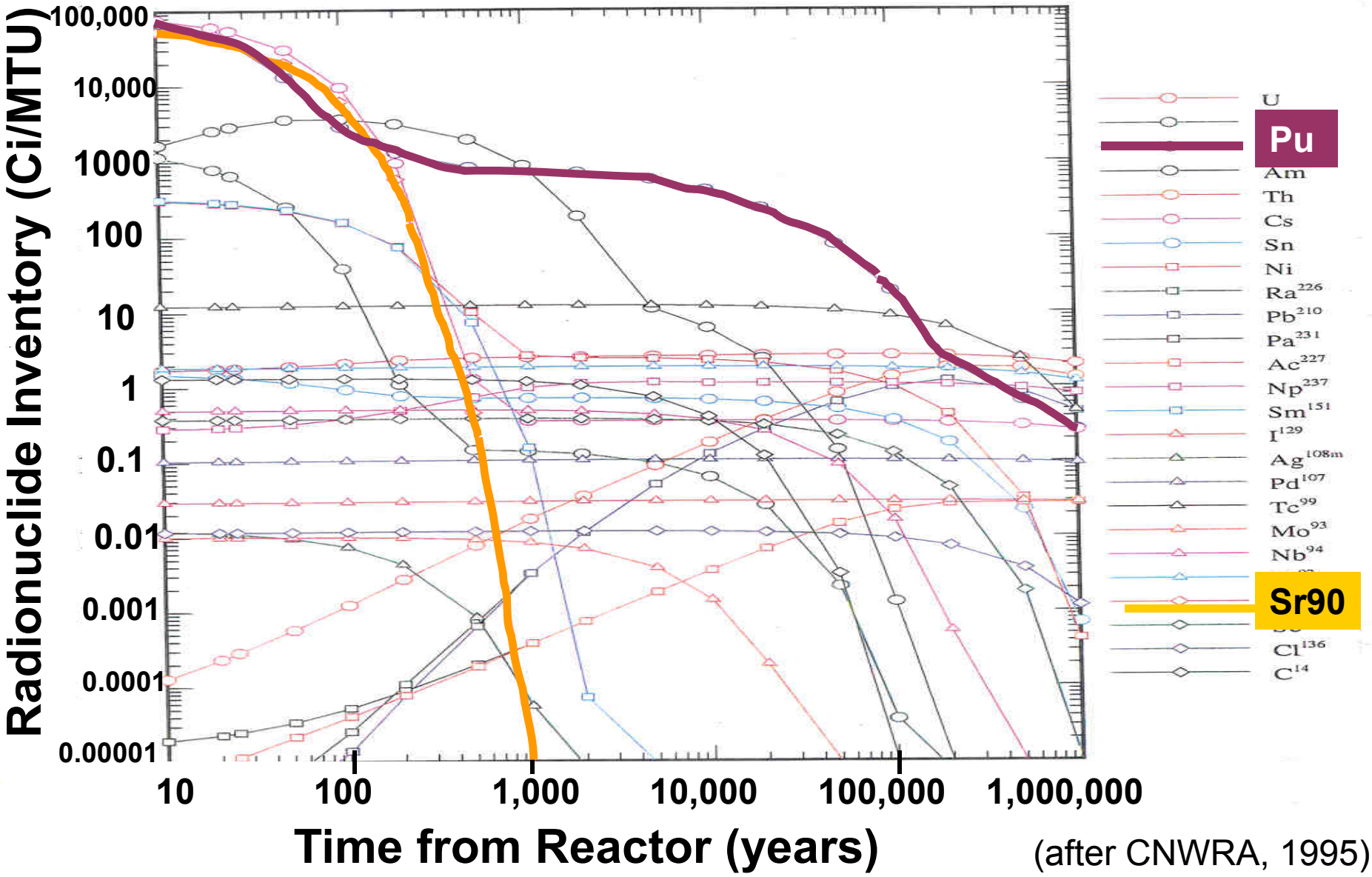
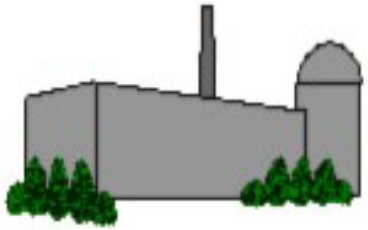
Nuclear Waste Primer: Radionuclide Inventory of Spent Nuclear Fuel

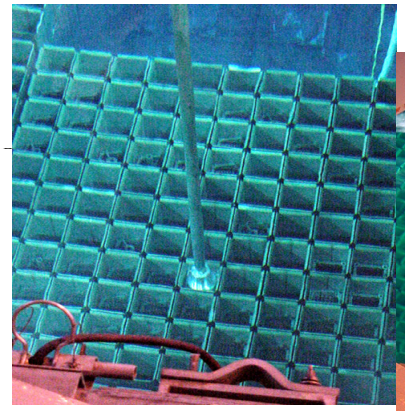


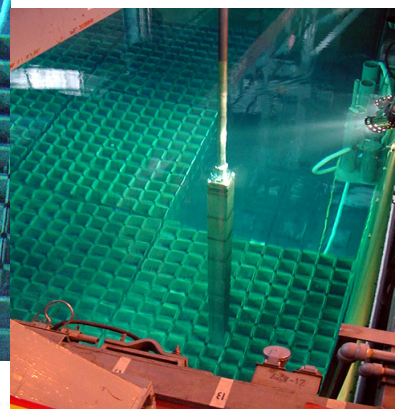
(after CNWRA, 1995)

Nuclear Waste Primer: Spent Nuclear Fuel



Light Water Power Reactors





Federal Waste Repository

Interim Storage

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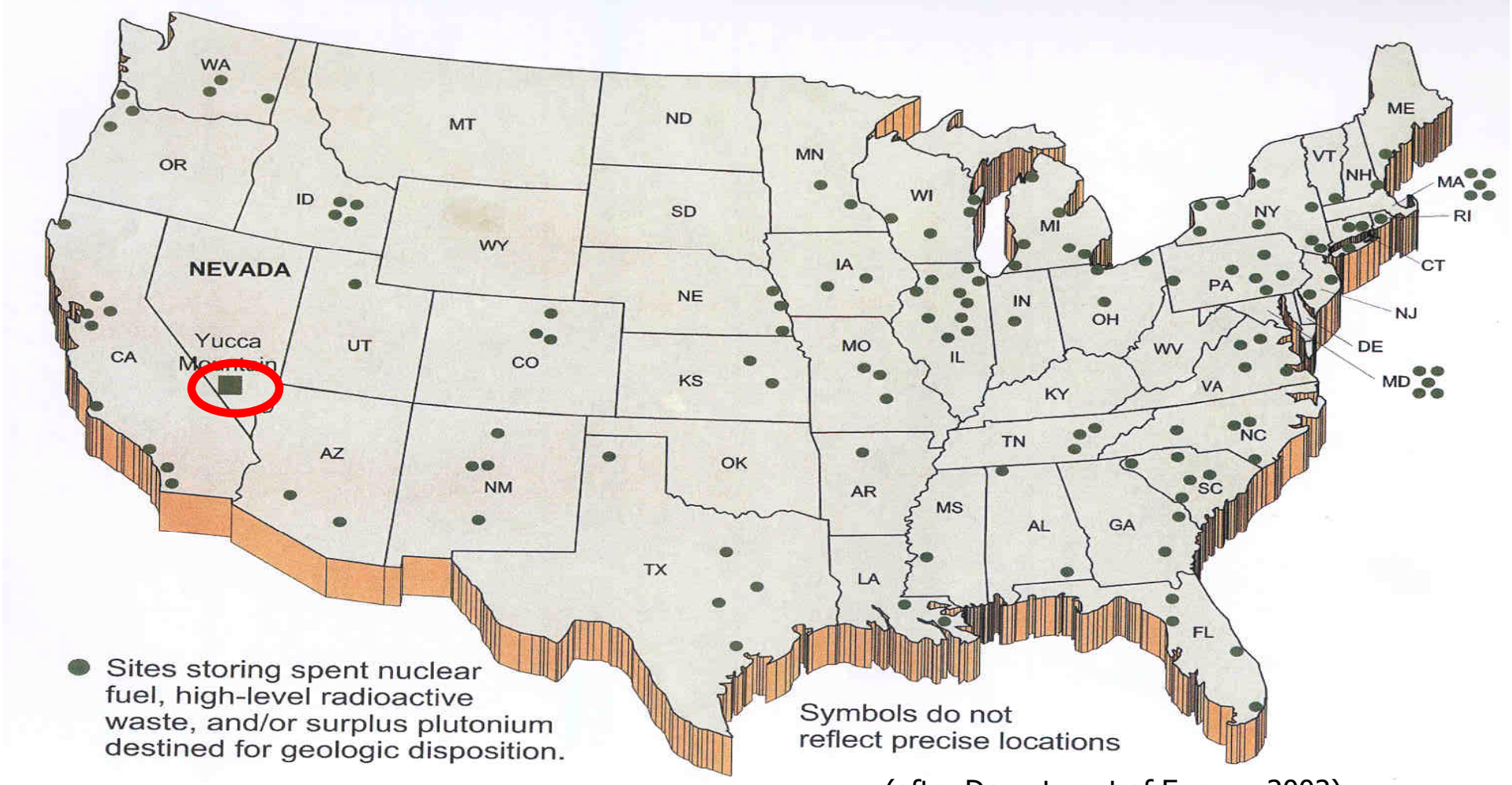
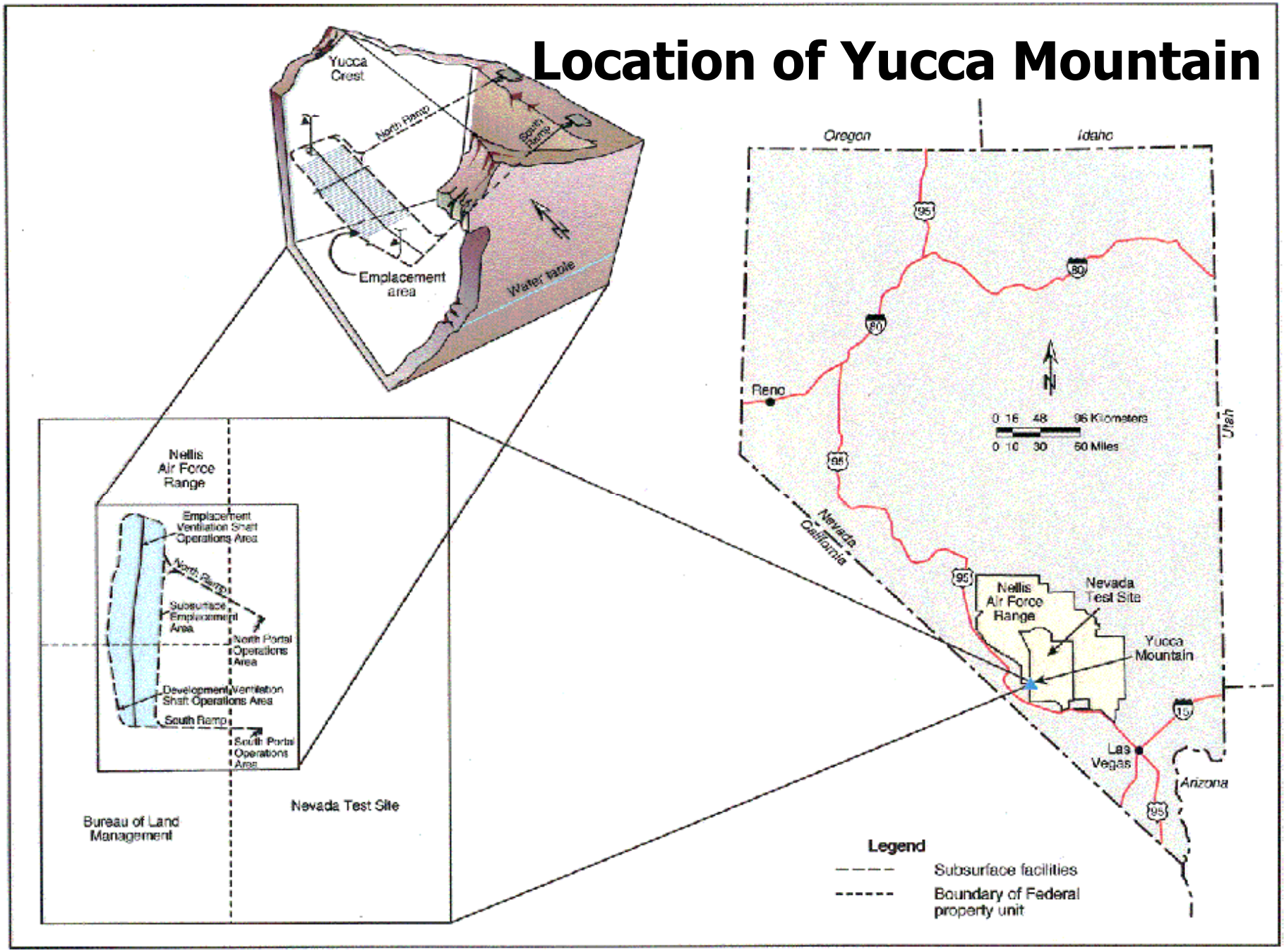
Where is the Spent Nuclear Fuel and High-Level Waste (HLW)?



(after Department of Energy, 2002)

Location of Yucca Mountain



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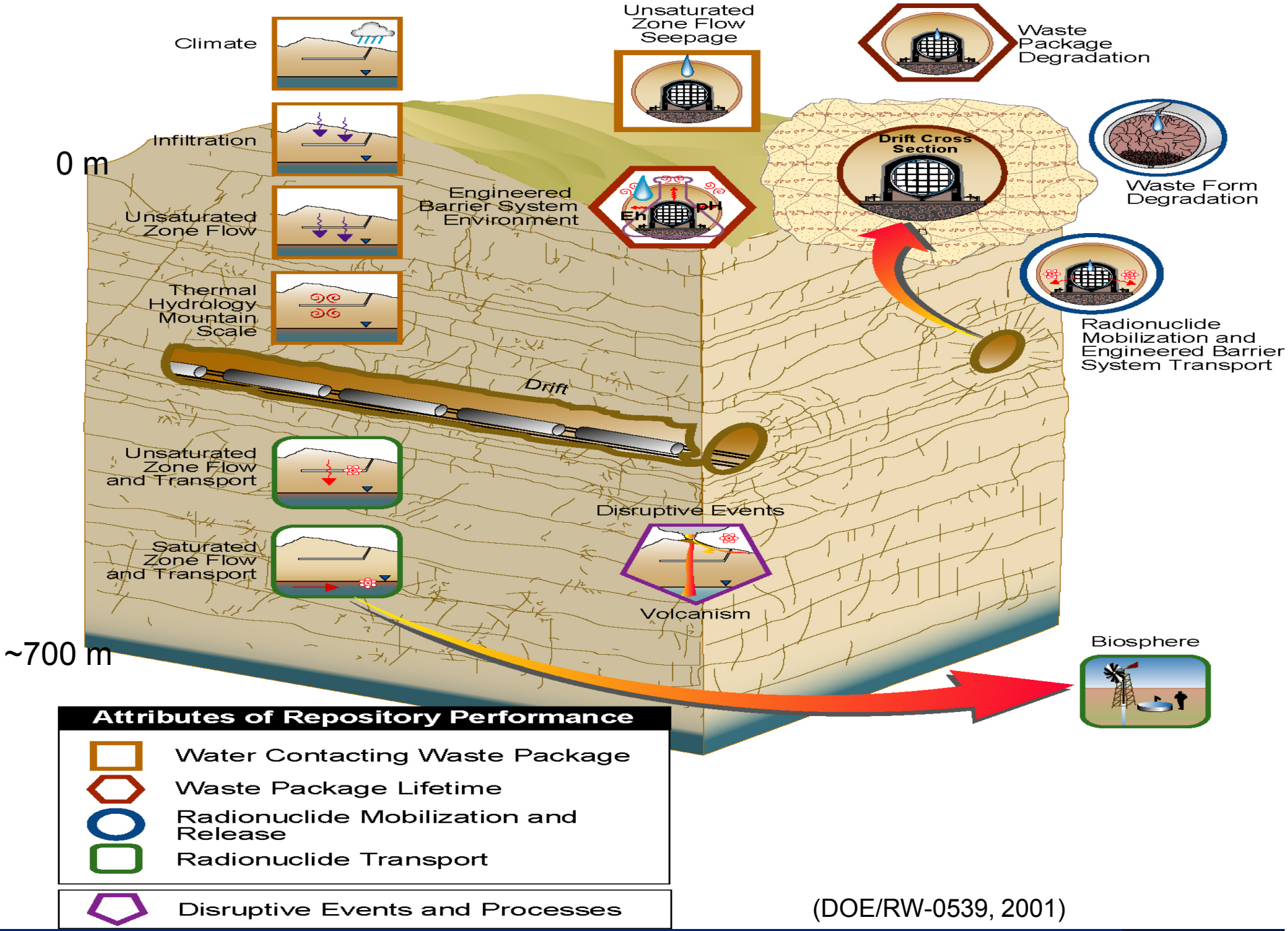
Yucca Mountain Viewed from the Southwest



(DOE/RW-0539, 2001)

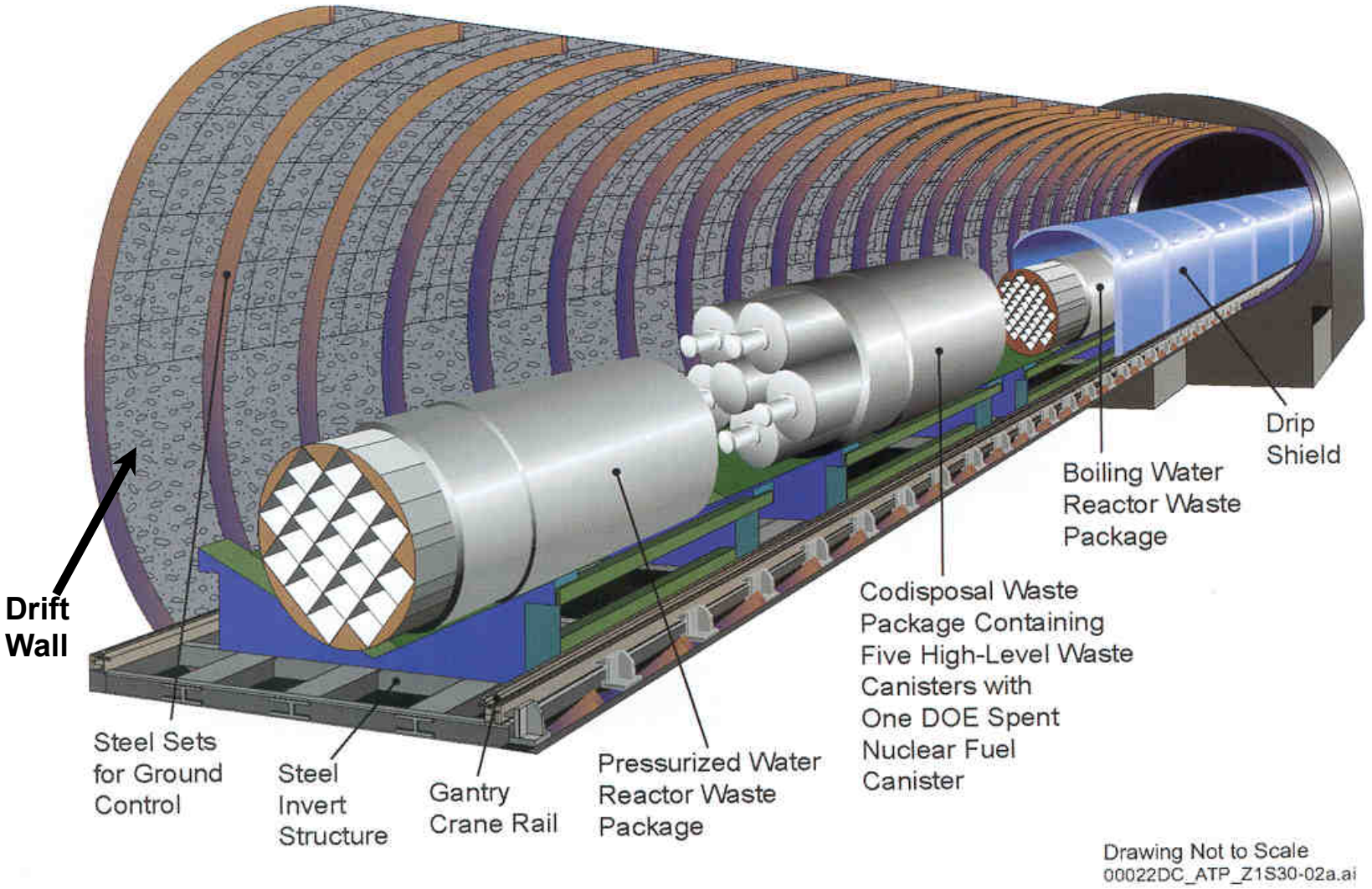


Figure 3-3. Schematic Illustration of the Emplacement Drift with Cutaway Views of Different Waste Packages

Ground support for emplacement drift walls is illustrated in the figure, which also shows three designs for dual-metal waste packages (representing various waste forms), a protective drip shield, and emplacement pallets supporting the waste package above the drift floor.

(DOE/RW-0539, 2001)

High-Level Waste Legal Framework

- Nuclear Waste Policy Act of 1982
  - Defined high-level radioactive waste
  - Established permanent disposal as national policy
- Nuclear Waste Policy Amendments Act of 1987 - Yucca Mountain, Nevada
- Energy Policy Act of 1992 – National Academy of Sciences provides technical bases for safety standard

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Who is Who?

- U.S. Department of Energy (DOE) – characterizes site, is license applicant, and potentially constructs and operates repository
- U.S. Environmental Protection Agency (EPA) – establishes safety standards for potential repository
- NRC – issues technical criteria and requirements for implementing EPA standards, and grants or denies construction authorization and license for repository

Where are we?

- 2002
  - DOE submitted Site Recommendation
  - President recommended site to Congress
  - State of Nevada disapproved
  - Joint Congressional resolution endorsed site recommendation
- July 2004
  - U.S. Court of Appeals for the District of Columbia Circuit vacated EPA 10,000 year compliance period

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Where are we? (continued)

- Fall 2005 – proposed rules addressing longer compliance period
  - EPA – August 2005
  - NRC – September 2005
- June 3, 2008 – DOE submits license application to NRC
- October 15, 2008 – EPA's final "Public Health and Environmental Radiation Protection Standards for Yucca Mountain, Nevada"
- March 13, 2009 – NRC's Final Rule "Implementation of a Dose Standard After 10,000 Years"

Pending* Legislation and Rulemaking

- Legislation to define authority
  - Yucca Mountain (H.R. 2372 and S. 861)
    - "require the President to certify that the Yucca Mountain site remains the designated site for the development of a repository for the disposal of high-level radioactive waste"
  - Blue Ribbon Commission (S. 591)
    - "establish a National Commission on High-Level Radioactive Waste and Spent Nuclear Fuel"

* As of October 4, 2009

Pending* Legislation and Rulemaking (continued)

- Appropriations for FY2010 (Energy and Water Development and Related Agencies Appropriations Act, 2010; H. Rept. 111-278)
  - *"Provided further, That of the funds made available in this Act for Nuclear Waste Disposal, $5,000,000 shall be provided to create a Blue Ribbon Commission to consider all alternatives for nuclear waste disposal."*
  - "*For necessary expenses of the Commission … $29,000,000 shall be derived from the Nuclear Waste Fund … .*"

* As of October 4, 2009; the Conference Report is H. Rept. 111-278

Pending Legislation and Rulemaking* (continued)

- NRC Waste Confidence Rulemaking
  - Waste Confidence Decision is tied to nuclear reactor licensing
    - Commission stated that, as a matter of policy, it "would not continue to license reactors if it did not have reasonable confidence that the wastes can and will in due course be disposed of safely." (July 5,1977; 42 FR 34393)
    - 10 CFR 51—Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions
      - §51.23 Temporary storage of spent fuel after cessation of reactor operation—generic determination of no significant environmental impact

* Status as of October 4, 2009

Waste Confidence Rulemaking (continued)

- Waste Confidence Findings
  - #1 – "The Commission Finds Reasonable Assurance That Safe Disposal of High-Level Radioactive Waste and Spent Fuel in a Mined Geologic Repository is Technically Feasible" (55 FR 38472-38514)
  - #2 – "The Commission Finds Reasonable Assurance that at Least One Mined Geologic Repository Will be Available Within the First Quarter of the Twenty-First Century, …" (55 FR 38472-38514)

Waste Confidence Rulemaking (continued)

- Waste Confidence Findings (continued)
  - #3 – "The Commission Finds Reasonable Assurance That HLW and Spent Fuel Will Be Managed in a Safe Manner Until Sufficient Repository Capacity is Available To Assure Safe Disposal of All HLW and Spent Fuel" (55 FR 38472-38514)
  - #4 – "The Commission Finds Reasonable Assurance That, if Necessary, Spent Fuel Generated in any Reactor Can Be Stored Safely and Without Significant Environmental Impacts for at Least 30 years beyond the Licensed Life for Operation …" (55 FR 38472-38514)

Waste Confidence Rulemaking (continued)

- Waste Confidence Findings (continued)
  - #5 – "The Commission Finds Reasonable Assurance That Safe Independent Onsite Spent Fuel Storage or Offsite Spent Fuel Storage Will Be Made Available if Such Storage Capacity Is Needed" (55 FR 38472-38514)

Waste Confidence Rulemaking (continued)

- Update and proposed revision of Waste Confidence Decision published (October 9, 2008; 73 FR 59551)

- [Draft] Final Update of the Commission's Waste Confidence Decision (SECY-09-0090; June 15, 2009)

[http://www.nrc.gov/reading-rm/doc-collections/commission/secys/2009]

- Commission Voting Records on SECY-09-0090: Commissioner Klein (9/16/09); Chairman Jaczko (9/17/09); Commissioner Svinicki (9/24/09)

[http://www.nrc.gov/reading-rm/doc-collections/commission/cvr/2009]

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Process By Which the U.S. Nuclear Regulatory Commission is Reviewing the License Application

- Disposal of high-level nuclear waste requires an NRC license
- NRC license review process includes
  - License application review
  - Adjudicatory hearings
- NRC developed regulations and procedures to conduct the review in a technically defensible, legally sound, and transparent manner

Regulatory Framework

- Safety
  - Regulation: Disposal of High-Level Radioactive Wastes in a Geologic Repository at Yucca Mountain, Nevada
  - Guidance: Yucca Mountain Review Plan
- Environmental – Regulation and guidance
- Rules of Practice for Domestic Licensing Proceedings – Regulation
  - Procedures and schedule
  - Electronic docket and discovery

License Application Review

- License application consists of
  - General Information and Safety Analysis Report
  - Accompanied by Environmental Impact Statement
- License application submitted by U.S. Department of Energy (DOE) on June 3, 2008
- NRC docketed application on September 8, 2008 and provided NRC Staff's Adoption Determination Report for the DOE's environmental impact statements

License Application Review

- NRC requests additional information (RAI)
  - As of September 8, 2009 over 550 RAIs
  - Non-classified RAIs are publicly available and each non-classified RAI is discussed with DOE in a conference call open to the public
- Meetings open to public
  - Bi-weekly status call
  - Management meetings
- NRC's Safety Evaluation Report will document the findings from the review

Adjudicatory Hearing Process

- Licensing Board
  - Administrative judges independent from NRC staff
  - Reach objective decisions based on the record
- Contested hearing
- Open and transparent
  - Documents publicly available
  - Some pre-hearing conferences have been webcasted
- Applicant defends its license application
- NRC staff defends its licensing decision

Adjudicatory Hearings

- Notice of hearing October 22, 2008
- 319 contentions filed by 12 groups of petitioners
- To determine admissible contentions
  - Board considered > 12, 000 pages of written material including petitions, answers to petitions, replies to answers, and oral arguments from prehearing conference
  - Board reviewed in accordance with Commission's regulations and applicable law
- Board admitted 8 petitioners and 299 contentions on May 11, 2009

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Summary

- Regulatory framework ensures scientific perspective is included in NRC's licensing decision
- Contested litigation issues are decided on the basis of findings of facts and conclusions of law

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Summary (continued)

- The license application review and adjudicatory process is conducted in a transparent manner

- Based on the results of the licensing review and the hearings, the Commission will determine whether to authorize construction of the Yucca Mountain repository

Additional information is available at http://www.nrc.gov/waste/hlw-disposal/yucca-lic-app.html

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Summary (continued)

- Disposal at Yucca Mountain is influenced by science, courts, and politics
- Regulators should be nimble, flexible, and able to make decisions in the face of uncertainty

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END