Briefing on the Draft Area Recommendation Report

January–February, 1986
Summary

• Need for geologic disposal of nuclear waste
• Nuclear Waste Policy Act of 1982 establishes process and schedule
• Crystalline Repository Project site selection process
• Draft Area Recommendation Report (Draft ARR) now available for State, Indian Tribe, and public review and comment
Need for Geologic Disposal of Nuclear Waste

• Nuclear power plants supply 13% of nation’s electricity
  — Generate spent nuclear fuel
  — Safe disposal required to protect man and environment
  — Over 10,000 metric tons of spent fuel now in temporary storage
    (40,000 metric tons by year 2000)

• Defense waste currently in existence; when solidified would be over
  10,000 metric tons

• Safe permanent disposal of waste technically and economically feasible
  — Shown in 30 years of studies

• Knowing this, Congress passed Nuclear Waste Policy Act of 1982
  — Act directs DOE to select, license, construct, operate one geologic
    repository and to site a second; but not to construct without
    Congressional authorization
Nuclear Waste Policy Act of 1982

• Approved by Congress 12/21/82
• Signed by President 1/7/83

**purposes**

• Establish schedule for siting, construction, operation of repositories
• Establish federal responsibility and policy for nuclear waste management
• Define relationships between federal government, state governments, and Indian Tribes
• Establish fund to cover disposal costs
Crystalline Site Selection Process

- National Academy of Sciences and the Inter-Agency Review Group recommended crystalline rock as having potential for repository siting

- Site Screening
  - National Survey—In 1983, DOE issued a national survey report on crystalline rocks which identified three regions for further study for possible repository sites.
  - Regional Survey—Compiled regional geologic and environmental characterization reports (data base) for regions identified in the national survey. Developed methodology for screening from regions to specific areas for further study.
  - Area Survey (field work)—Field investigations to determine if there are sites suitable for nomination/recommendation and site characterization.
Crystalline Site Selection Process (Continued)

- Nomination and recommendation
- Site characterization
- Request Congressional authority to construct
- Site recommendation and selection
- Licensing
- With Congressional authorization, construction
Northeastern Region

North Central Region

Southeastern Region

Crystalline Rock Regions Being Considered for Second Repository
Preliminary Recommendations

- Based on application of a Region-to-Area Screening Process to the data contained within the Regional Geologic and Environmental Characterization Reports and other publicly-available data
  - 20 candidate areas of which 12 are proposed Potentially Acceptable Sites (PAS)

- Results are preliminary
  - Subject to State, Indian Tribal, and public comments
## Proposed Potentially Acceptable Sites

<table>
<thead>
<tr>
<th>Region</th>
<th>State</th>
<th>Area Designation</th>
<th>Rock Body</th>
<th>Counties</th>
</tr>
</thead>
<tbody>
<tr>
<td>North Central</td>
<td>Wisconsin</td>
<td>NC-3</td>
<td>Wolf River Batholith</td>
<td>Langlade, Marathon, Menominee, Oconto, Portage, Shawano, and Waupaca</td>
</tr>
<tr>
<td>Minnesota</td>
<td>NC-6</td>
<td>Undifferentiated granites</td>
<td></td>
<td>Marshall, Pennington Polk, and Red Lake</td>
</tr>
<tr>
<td>Minnesota</td>
<td>NC-7</td>
<td>Undifferentiated granites</td>
<td></td>
<td>Norman and Polk</td>
</tr>
<tr>
<td>Minnesota</td>
<td>NC-10</td>
<td>Archean gneisses/ Central Minnesota granites</td>
<td></td>
<td>Benton, Mille Lacs, Morrison, andSherburne</td>
</tr>
<tr>
<td>Region</td>
<td>State</td>
<td>Area Designation</td>
<td>Rock Body</td>
<td>Counties</td>
</tr>
<tr>
<td>--------------</td>
<td>-------------</td>
<td>------------------</td>
<td>--------------------------</td>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td>Northeastern</td>
<td>Maine</td>
<td>NE-2</td>
<td>Bottle Lake Complex</td>
<td>Hancock, Penobscot, and Washington</td>
</tr>
<tr>
<td>Maine</td>
<td>NE-4</td>
<td>Sebago Lake Batholith</td>
<td>Androscroggin, Cumberland, and Oxford</td>
<td></td>
</tr>
<tr>
<td>New Hampshire</td>
<td>NE-5</td>
<td>Cardigan Pluton</td>
<td></td>
<td>Cheshire, Hillsborough, Merrimack, and Sullivan</td>
</tr>
</tbody>
</table>
### Proposed Potentially Acceptable Sites (Continued)

<table>
<thead>
<tr>
<th>Region</th>
<th>State</th>
<th>Area Designation</th>
<th>Rock Body</th>
<th>Counties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Southeastern</td>
<td>Virginia</td>
<td>SE-2</td>
<td>Lovingston Massif</td>
<td>Bedford</td>
</tr>
<tr>
<td></td>
<td>Virginia</td>
<td>SE-3</td>
<td>Virgilina Gneiss</td>
<td>Halifax and Pittsylvania</td>
</tr>
<tr>
<td></td>
<td>N. Carolina</td>
<td>SE-4</td>
<td>Rolesville Pluton</td>
<td>Franklin, Johnson, and Wake</td>
</tr>
<tr>
<td></td>
<td>N. Carolina</td>
<td>SE-5</td>
<td>Elk River Complex</td>
<td>Buncombe, Haywood, and Madison</td>
</tr>
<tr>
<td></td>
<td>Georgia</td>
<td>SE-7</td>
<td>Woodland Gneiss Complex</td>
<td>Lamar, Monroe, and Upson</td>
</tr>
</tbody>
</table>
### Other Candidate Areas

<table>
<thead>
<tr>
<th>Region</th>
<th>State</th>
<th>Area Designation</th>
<th>Rock Body</th>
<th>Counties</th>
</tr>
</thead>
<tbody>
<tr>
<td>North Central</td>
<td>Wisconsin</td>
<td>NC-2</td>
<td>Puritan Batholith</td>
<td>Ashland, Bayfield, and Sawyer</td>
</tr>
<tr>
<td></td>
<td>Minnesota</td>
<td>NC-9</td>
<td>Undifferentiated granites</td>
<td>Clearwater, Becker, and Mahnomen</td>
</tr>
<tr>
<td>Minnesota</td>
<td>NC-12</td>
<td>Archean gneisses</td>
<td></td>
<td>Pope, Stearns, and Todd</td>
</tr>
<tr>
<td>Minnesota</td>
<td>NC-13</td>
<td>Archean gneisses</td>
<td></td>
<td>Big Stone, Stevens, and Swift</td>
</tr>
<tr>
<td>Minnesota</td>
<td>NC-14</td>
<td>Archean gneisses</td>
<td></td>
<td>McLeod, Nicollet, Renville, and Sibley</td>
</tr>
<tr>
<td>Minnesota</td>
<td>NC-A5</td>
<td>Undifferentiated granites</td>
<td></td>
<td>Marshall</td>
</tr>
</tbody>
</table>
Other Candidate Areas (Continued)

<table>
<thead>
<tr>
<th>Region</th>
<th>State</th>
<th>Area Designation</th>
<th>Rock Body</th>
<th>Counties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Southeastern</td>
<td>Virginia</td>
<td>SE-1</td>
<td>Fredericksburg Complex/State Farm Gneiss</td>
<td>Goochland, Hanover, and Louisa</td>
</tr>
<tr>
<td></td>
<td>Georgia</td>
<td>SE-6</td>
<td>Lithonia Gneiss</td>
<td>Gwinnett and Walton</td>
</tr>
<tr>
<td>Northeastern</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>
Proposed Potentially Acceptable Sites and Candidate Areas for the Second Repository
Key Points to Region-to-Area Screening

• Step 1 — Applies disqualifying conditions as specified in the DOE Siting Guidelines

• Step 2 — Applies regional geologic and environmental screening variables

• Step 3 — Sensitivity analysis conducted to consider additional geologic variables. Modification of Step 3 variables, various weight sets, and another method to determine favorability

• Validation of results
Region-to-Area Screening Process

235 Crystalline Rock Bodies

20 Preliminary Candidate Areas

12 Proposed Potentially Acceptable Sites
Schedule for Final Decisions

- Public comment period closes—4/16/86
- Consult with States/Indian Tribes—Spring
- Issue Final Area Recommendation Report and response to comments—July 1986
- Formal notification of Potentially Acceptable Sites—July 1986
Public Briefings and Hearings on Draft Area Recommendation Report

• 90-day comment period beginning 1/16/86

• January–February briefing for States, Indian Tribes, and public—question and answer sessions

• Late February–March public hearings for comments—formal sessions for comment record
Area Phase Activities

- Detailed geologic, environmental, and socioeconomic data are gathered to determine the suitability of an area for further study.

- Area phase geologic work would involve the following types of activities:
  - exploratory drilling
  - sampling
  - geophysical surveys
  - hydrologic testing
  - seismic monitoring
  - geologic mapping

- Area phase environmental/socioeconomic work would involve analyses of the following:
  - meteorology/air quality analysis
  - aquatic and terrestrial ecology
  - in and off-site hazards
  - archaeology and historical features
  - projected populations
  - seasonal population fluctuation
  - labor availability
  - regional economics
  - land use compatibility
Background
Nuclear Waste Fund

• The nuclear Waste Policy Act of 1982 establishes a fund to be used for waste disposal expenditures.

• Commercial nuclear power utilities shall pay a fee equal to 1 mil per kilowatt-hour of electricity generated by each nuclear power reactor after April 6, 1983.

• A one-time fee is imposed on spent fuel or waste derived from spent fuel used to generate electricity prior to April 7, 1983.

• The Secretary of Energy had to establish procedures for collection and payment of fees by July 6, 1983.

• Adequacy of the fees shall be reviewed annually to insure full cost recovery.
Schedule for Second Repository Siting, Construction, and Authorization

- Issue Final Area Recommendation Report and identify Potentially Acceptable Sites July 1986
- Issue Final Area Characterization Plan December 1986
- Begin area field investigations December 1986
- Complete area field investigations 1990
- Issue Final Environmental Assessments 1991
- Nominate and recommend sites for characterization 1991
- President approves recommended sites 1991
- Issue initial site characterization plan 1993
- Request Congressional approval for construction 1993
Schedule for Second Repository Siting, Construction, and Authorization (Continued)

- President recommends site for repository to Congress 1998
- Submit license application to the Nuclear Regulatory Commission 1998
- Receive construction authorization from the Nuclear Regulatory Commission and begin construction 2000
- Begin waste emplacement 2006
What Sites are Eligible for Second Repository?

- Sites characterized but not selected for first repository
- Sites not nominated for first repository
- Crystalline rock sites
## Crystalline Rock Regions

<table>
<thead>
<tr>
<th>Region</th>
<th>States</th>
</tr>
</thead>
<tbody>
<tr>
<td>North Central</td>
<td>Michigan, Minnesota, Wisconsin</td>
</tr>
<tr>
<td>Southeastern</td>
<td>Georgia, Maryland, North Carolina, South Carolina, Virginia</td>
</tr>
</tbody>
</table>
The Nuclear Waste Policy Act of 1982 charges the U.S. Department of Energy with developing technology and facilities for the management of high-level nuclear waste. Studies are under way in four types of geologic formations—basalt, crystalline rock, salt, and tuff.

The Crystalline Repository Project is carried out through DOE’s Crystalline Repository Project Office. Additional information may be obtained by contacting:

U.S. Department of Energy
Office of Civilian Radioactive Waste Management
Crystalline Repository Project Office
9800 South Cass Avenue
Argonne, Illinois 60439

Dr. Sally A. Mann, Manager of CPO (312) 972-2257
Dr. Paul K. Kearns, Chief, Site Evaluation Branch (312) 972-2253
Mr. Richard J. Schassburger, North Central Regional Manager (312) 972-2570
Mr. F. Hunter Weiler, Northeastern Regional Manager (312) 972-2957
Dr. Maurice F. Bender, Southeastern Regional Manager (312) 972-3115