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Presentation as part of the

Panel on Regulation

Disposal Subcommittee

**Blue Ribbon Commission on
America's Nuclear Future**

Wednesday, September 1, 2010

Marriott Hotel, 1221 22nd Street NW,

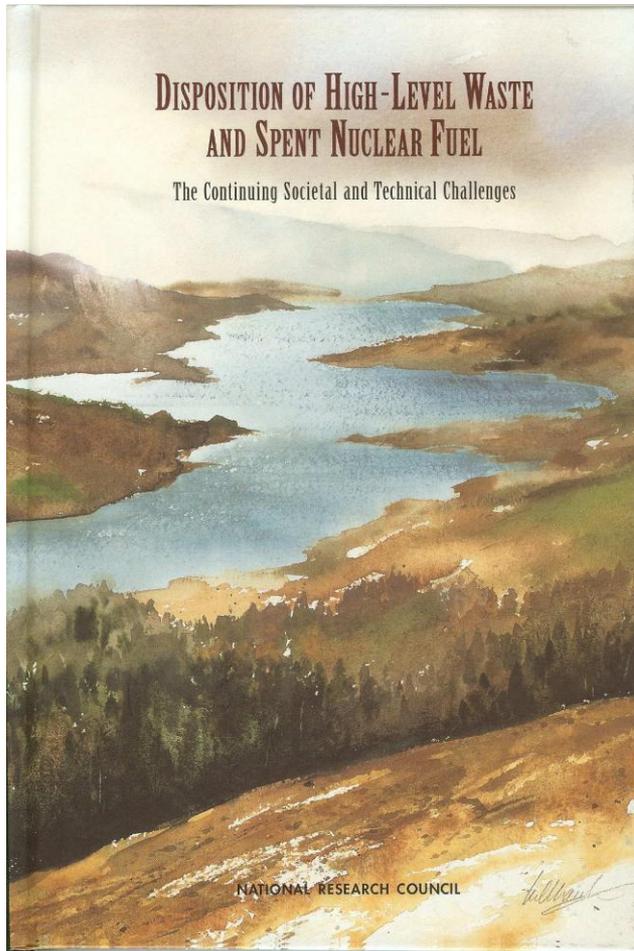
Washington, D.C.



Six Questions Posed

1. What should be the time frame for protection of public health and safety in disposal regulations?
2. How should compliance be demonstrated (including the role of performance assessment)?
3. Should there be requirements concerning retrievability?
4. Are regulatory changes needed to accommodate staged repository development concepts?
5. Would different regulations be required for disposal systems other than geologic repositories (e.g. deep boreholes)?
6. Are there other regulatory issues (e.g. waste classification, dual regulation with RCRA) that should be reconsidered?

National Academies Report: 2001

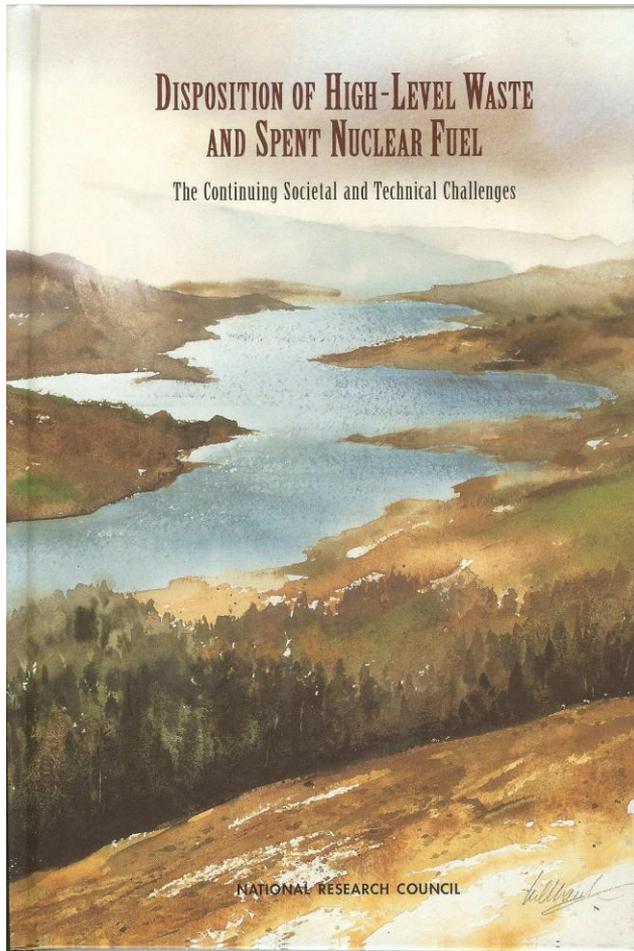


Disposition of High-Level Waste and Spent Nuclear Fuel: The Continuing Societal and Technical Challenge

1999 International Workshop (>200 people from 17 countries for exchange of views)

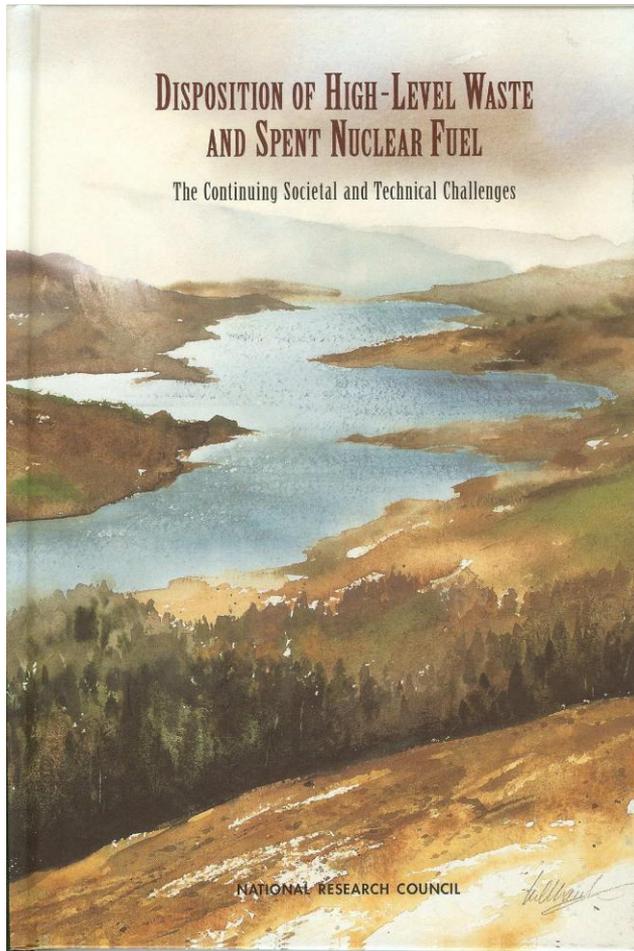
Then, two years work by international committee (7 countries) to write this report.

National Academies Report: 2001



**What does
the cover
picture
represent?**

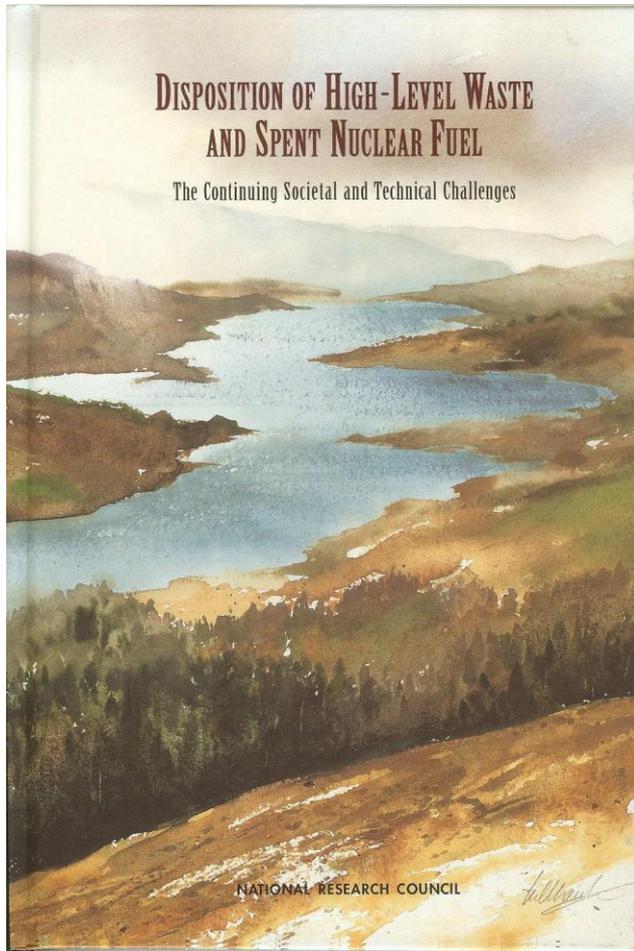
National Academies Report: 2001



“Time is a sort of river of passing events, and strong is its current; no sooner is a thing brought to sight than it is swept away and another takes its place, and this too will be swept away.”

- Marcus Aurelius,
Roman Emperor, nearly
2000 years ago

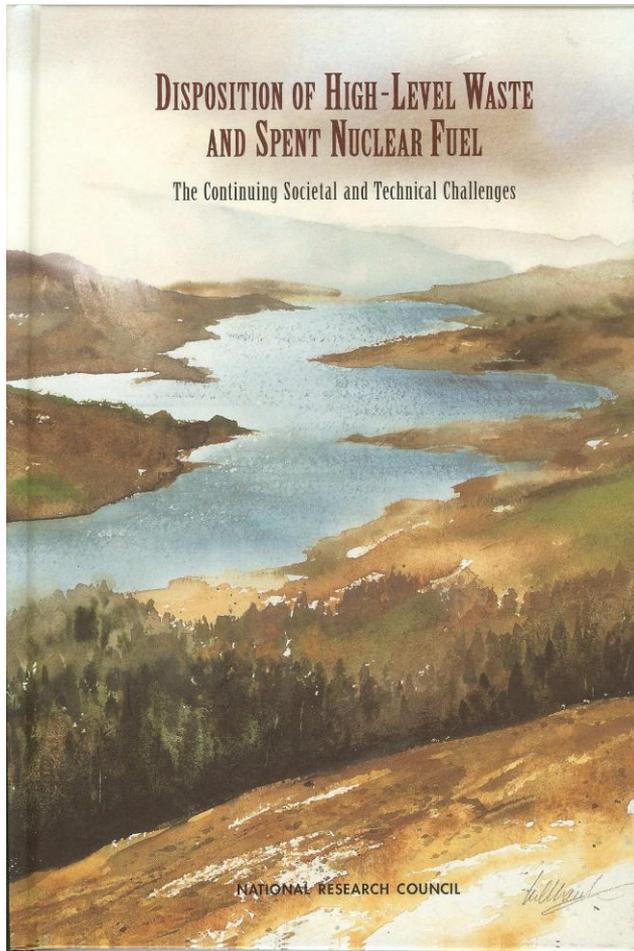
National Academies Report: 2001



This landscape is a loch in Scotland, created by glaciers during ice ages ending about 11,000 years ago.

Compliance time in current EPA regulation: **10,000 years, plus peak exposure up to 1 million years from now**

Performance Assessment



Methodology: page 97

Discussion: Uncertainty and
Confidence Building:
page 100

The Regulators' Dilemma:
page 104

Committee Views on
Regulatory Issues: page 106

Conclusions: page 111

Modeling: pages 87-96

Performance Assessment

FIRST REPORT TO

THE U.S. CONGRESS

AND

THE U.S. SECRETARY OF
ENERGY

FROM THE

NUCLEAR WASTE TECHNICAL
REVIEW BOARD

MARCH 1990

<http://www.nwtrb.gov/reports/1report.pdf>

It is evident that many **crucial issues in performance assessment cannot be addressed through data collection.**

Therefore, the DOE may need to use modeling techniques and the collective judgment of technical experts to assess performance for some issues. Examples of issues that may need such treatment include potential climate alteration, human intrusion, and projections of future volcanism and fault displacement. **The validity of models and credibility of expert judgment are likely to become important and potentially controversial issues in licensing of and in public acceptance of the repository should it be licensed.** While the **Board** endorses involving technical experts in addition to the DOE and its contractors, it **is concerned about** the DOE's **peer review process**, since detailed plans for the process, as well as for model validation and elicitation of expert judgment, have not yet been presented.

(page 21, emphasis added).

Social Trust and Credibility

Rosa, et. al, "Nuclear Waste: Knowledge Waste?" *Science*, 329:762-3 (issue of August 13, 2010)

National Research Council, *Disposition of High-Level Waste and Spent Nuclear Fuel: The Continuing Societal and Technical Challenges*, 2001, Chapter 5, "Societal Issues"

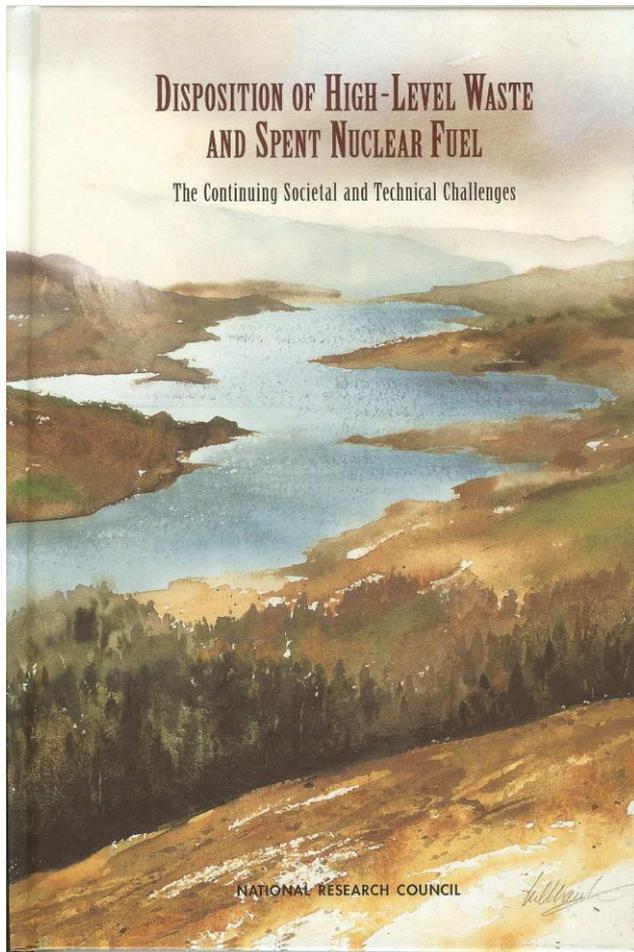
National Research Council, *Rethinking High-Level Radioactive Waste Disposal*, National Academy Press, 1990.

Office of Technology Assessment, *Managing Commercial High-Level Radioactive Waste*, 1982 (especially pp. 60-61.)

My Response to the Six Questions

- Present regulations are **adequate** as the decision criterion for a technically sophisticated federal agency such as the Nuclear Regulatory Commission (NRC) to evaluate the application for a construction license.
- Compliance with regulations for NRC license approval is **not adequate to assure enduring public and political support** for a facility to store dangerous materials in someone's "back yard" – with a decision process that could take more than a century from initial site evaluation to site closure, and for waste that remains dangerous for millennia.
- I favor retrievability, and I strongly favor a phased (or staged) and flexible decision process. I view placement of waste in deep boreholes as a geological repository. I do not at this time advocate altered regulatory requirements.

My Conclusion – Quote from the 2001 Report



“Measured against the frequency of changes in government leadership in democratic societies, the time necessary for implementing HLW policy is extremely long. **For a policy to remain in place over this period it must have broad and enduring public support.**”

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