# U.S. Nuclear Waste Technical Review Board

Presented to:

**Spring 2024 Board Meeting**

Presented By:

**Dr. Nathan Siu, Chair**

**May 21, 2024**

# Board Members

- **Nathan Siu, Ph.D., Chair** – U.S. Nuclear Regulatory Commission (retired)
- **Ronald Ballinger, Sc.D.** – Massachusetts Institute of Technology
- **Steven M. Becker, Ph.D.** – Old Dominion University
- **Allen G. Croff, Graduate Nuc. Engr. Degree, MBA** – Vanderbilt University
- **Tissa H. Illangasekare, Ph.D., P.E.** – Colorado School of Mines
- **Kenneth Lee Peddicord, Ph.D. , P.E.** – Texas A&M University
- **Scott Tyler, Ph.D., Deputy Chair** – University of Nevada, Reno
- **Brian Woods, Ph.D.** – Oregon State University
- (Position vacant)
- (Position vacant)
- (Position vacant)

# About the Board

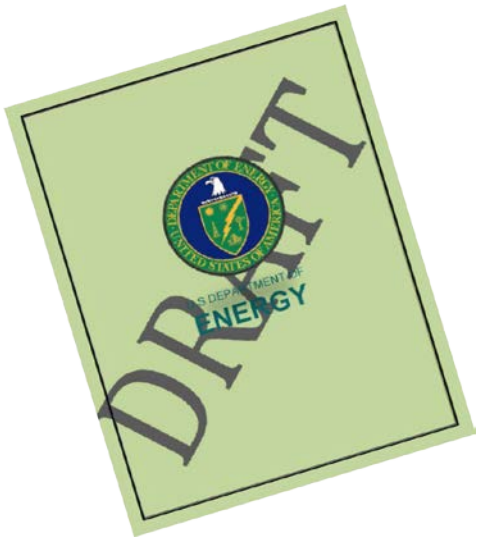
The U.S. Nuclear Waste Technical Review Board (Board) was established by Congress as an independent federal agency in the 1987 amendments to the Nuclear Waste Policy Act (NWPAA).

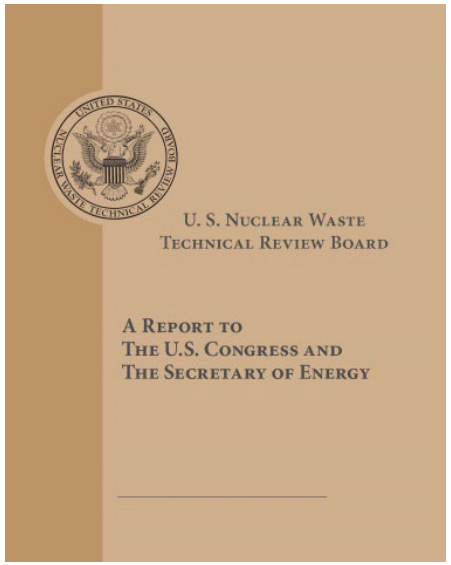

# Board Member Appointment

NATIONAL ACADEMY OF SCIENCES

- At full strength, the Board is composed of eleven members
- Board members are nominated by the National Academy of Sciences and appointed by the President to four-year terms
- Terms are staggered, and Board members may continue to serve until they are reappointed or replaced

# About the Board




The Board:

- Conducts independent and objective peer review of U.S. Department of Energy (DOE) activities
- Reports its findings, conclusions, and recommendations to the U.S. Congress and the Secretary of Energy
- By law, has access to draft DOE documents — according to the Legislative History of the NWPAA, so that Board recommendations can be made during decision-making, not after the fact
- Provides congressional testimony at the invitation of Congress

# About the Board (cont.)

UNITED STATES
NUCLEAR WASTE TECHNICAL REVIEW BOARD

- Holds public meetings each year, normally in different locations in the United States—meetings are webcast
- Provides technical and scientific comments in letters or reports to DOE following public meetings
- Makes all official documents and information (meeting transcripts, archived webcasts, and presentations; reports, correspondence, and congressional testimony) available on its website: *www.nwtrb.gov*

# Meeting Information

- Meeting agenda and presentations are available at www.nwtrb.gov
- Public comment periods (at the end of each day)
  - Oral commenters encouraged to sign the public comment register
    - Depending on the number of speakers, a time limit on individual remarks may be set
  - Virtual comments
    - Use “Comment for the Record”
    - Comments submitted online during the meeting will be posted to the Board’s website shortly after meeting adjournment
- The meeting is being webcast live (the transcript and archived recording of the meeting will be available at www.nwtrb.gov)

# Meeting Objectives

- Review the technical and scientific validity of DOE Research and Development (R&D) activities related to
  - evaluating potential disposal in crystalline host rocks
  - corrosion of commercial spent nuclear fuel

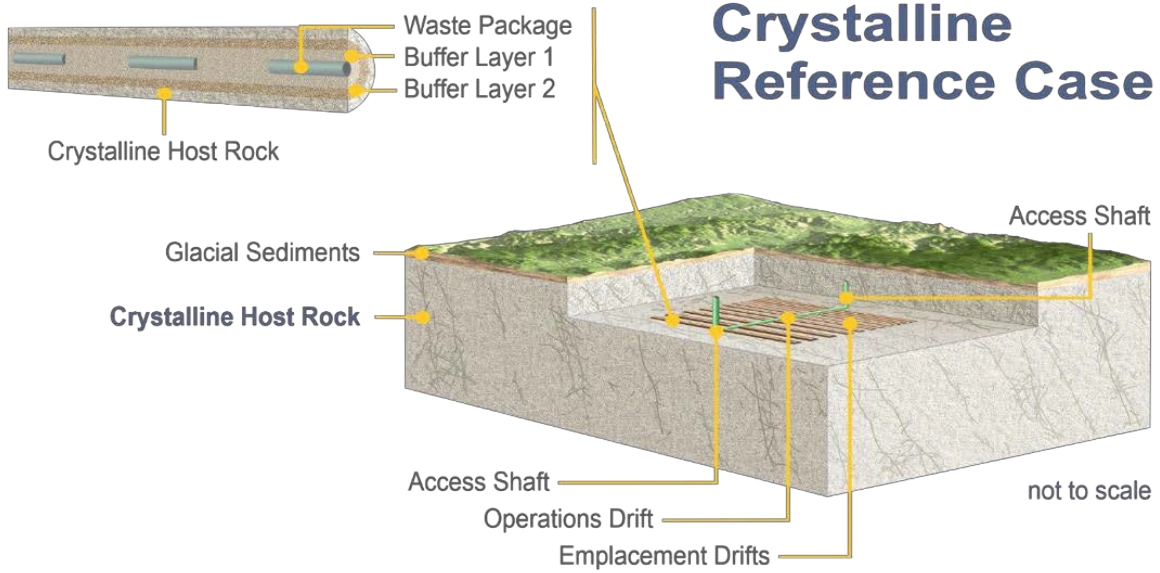



Figure 1. Schematic illustration of the crystalline reference case (Mariner et al. 2019)

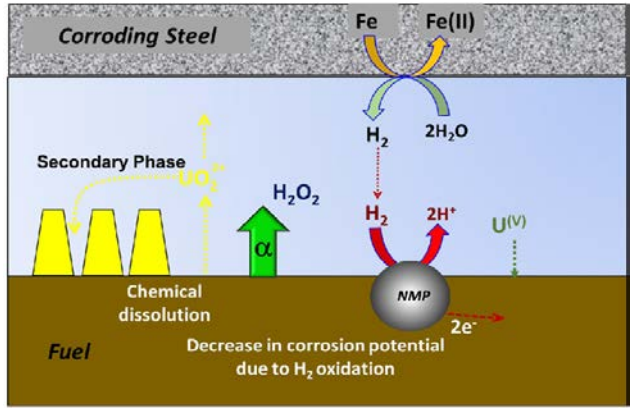



Figure 2. Schematic of processes in the corrosion model (Yao et al. 2023)

Yao et al. *Report on SNF Corrosion and Modeling Work*. M3SF-23PN010309054 PNNL-34735. Pacific Northwest National Laboratory. 2023.

# Meeting Agenda (May 21)

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|---|---|
| **8:15 a.m. EDT** | **Opening Remarks**<br>*Tim Gunther*, DOE, Office of Nuclear Energy |
| **8:30 a.m. EDT** | **Overview of Disposal Research and Development (R&D) Activities**<br>*Dave Sassani*, Sandia National Laboratories |
| **9:30 a.m. EDT** | **Overview of Activities Related to Disposal in Crystalline Host Rock**<br>*Emily Stein and Yifeng Wang*, Sandia National Laboratories |
| **10:30 a.m. EDT** | **Break** |
| **10:40 a.m. EDT** | **Geophysical Techniques for Site and Excavated Disturbed Zone Characterization**<br>*Patrick Dobson,* Lawrence Berkeley National Laboratory |
| **11:35 a.m. EDT** | **Physical and Geochemical Processes that Impact Flow and Transport Processes in Crystalline Host Rock**<br>*Matthew Sweeney,* Los Alamos National Laboratory |
| **12:15 p.m. EDT** | **Lunch** |

# Meeting Agenda (May 21) (continued)

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| **1:15 p.m. EDT** | **Buffer Extrusion, Erosion, and Clogging**<br>*Yifeng Wang,* Sandia National Laboratories |
| **1:55 p.m. EDT** | **R&D Activities to Address High Temperature and High pH Conditions in the Engineered Barrier System**<br>*Yifeng Wang,* Sandia National Laboratories |
| **2:35 p.m. EDT** | **Break** |
| **2:45 p.m. EDT** | **Geologic Disposal Safety Assessment R&D Activities Related to Crystalline Host Rock**<br>*Paul Mariner & Rosie Leone,* Sandia National Laboratories |
| **4:00 p.m. EDT** | **The Central Role of Geometry in Fracture Behavior**<br>*Laura Pyrak-Nolte,* Purdue University |
| **5:00 p.m. EDT** | **Public Comments** |
| **5:15 p.m. EDT** | **Adjourn Day 1** |

# Meeting Agenda (May 22)

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| **8:05 a.m. EDT** | **Spent Nuclear Fuel Disposal in Crystalline Rock – Current Status and Lessons Learned From Finland**<br>*Erika Holt*, Finnish Technical Research Centre, Finland |
| **9:05 a.m. EDT** | **Crystalline Rock Site Characterization by Canada's Nuclear Waste Management Organization**<br>*Andrew Parmenter,* Nuclear Waste Management Organization, Canada |
| **10:00 a.m. EDT** | **Break** |
| **10:10 a.m. EDT** | **Overview of Commercial Spent Nuclear Fuel Degradation Rate Models**<br>*Dave Sassani,* Sandia National Laboratories; *Brady Hanson,* Pacific Northwest National Laboratory |
| **11:10 a.m. EDT** | **Fuel Matrix Degradation Modeling and Electrochemical Testing**<br>*Paul Mariner, Sandia National Laboratories; Sara Thomas, Argonne National Laboratory* |
| **12:10 p.m. EDT** | **Public Comments** |
| **12:15 p.m. EDT** | **Adjourn Public Meeting** |