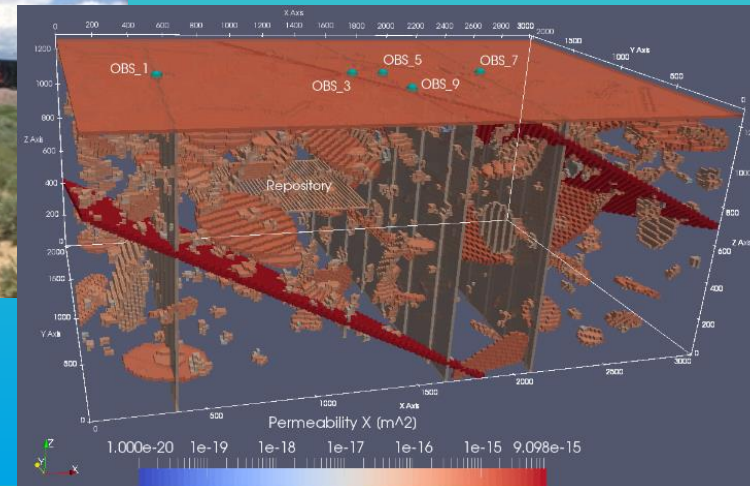


## Spent Fuel and Waste Science and Technology (SFWST)



## Disposal Research Program Overview

U.S. Nuclear Waste Technical Review Board  
Fall 2020 Fact-Finding Meeting  
November 4-5, 2020  
Virtual Meeting

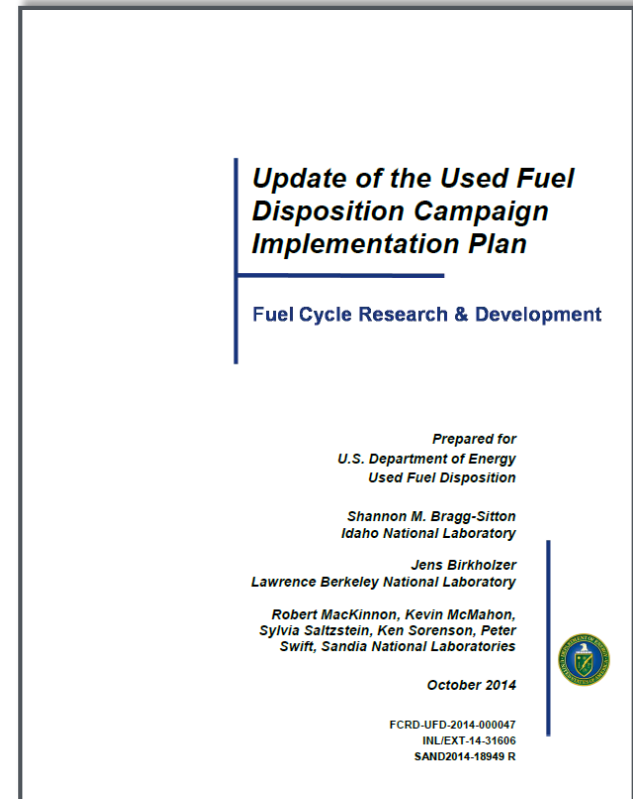
Timothy C. Gunter  
Program Manager  
Disposal Research & Development  
Office of SFWST

- Introduction/Overview
  - Program Mission and Disposal R&D Focus
  - Disposal R&D Timeline and Structure
  - Campaign Planning/Prioritization

# Disposal Research: Program Overview

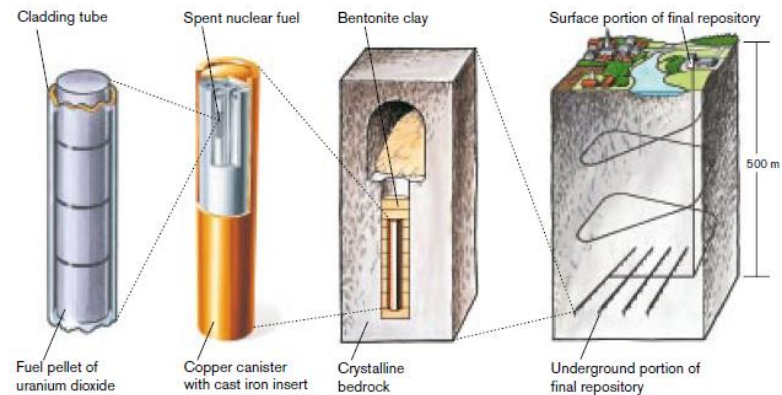
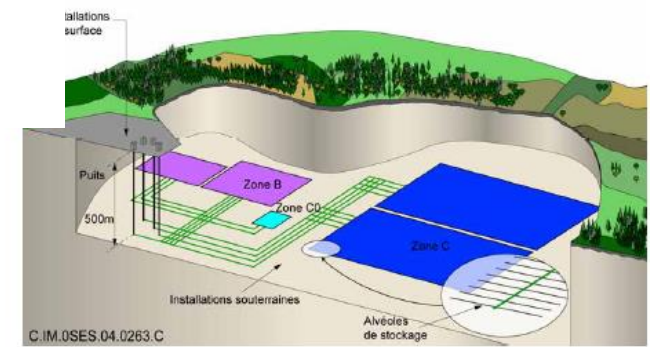
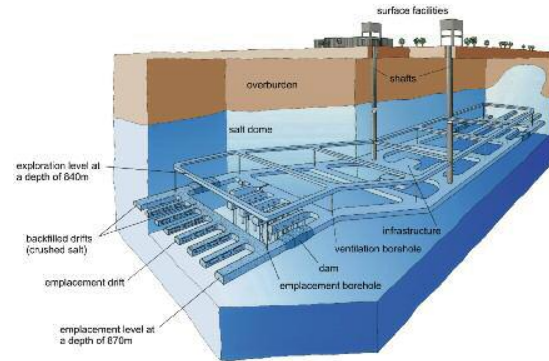
The mission of the Spent Fuel and Waste Science and Technology Disposition Campaign is to identify alternatives and conduct scientific research and technology development to enable storage, transportation and disposal of used nuclear fuel and wastes generated by existing and future nuclear fuel cycles.

Update of the Used Fuel Disposition Campaign Implementation Plan. FCRD-UFD-2014-000047, October 2014



# Campaign Strategic Focus: Disposal R&D

- Provide a sound technical basis for multiple viable disposal options in the US
- Increase confidence in the robustness of generic disposal concepts
- Develop the science and engineering tools needed to support disposal concept implementation



# Disposal Research Program Conceptual Timeline

## Concept Evaluation

Evaluate Disposal Concepts; FEPs;  
Develop and Demonstrate  
Technologies; Generic RD&D

We are HERE...

## Site Selection/Characterization

Development  
of Siting  
Guidelines/  
Criteria

Identification of  
Potential Sites

Progressive  
Site Down-  
Selection

Site  
Characterization

★ *LA for construction  
reviewed and granted*

## Repository Development

Repository  
Design

★  
Construction  
&  
Monitoring

Operations  
&  
Monitoring

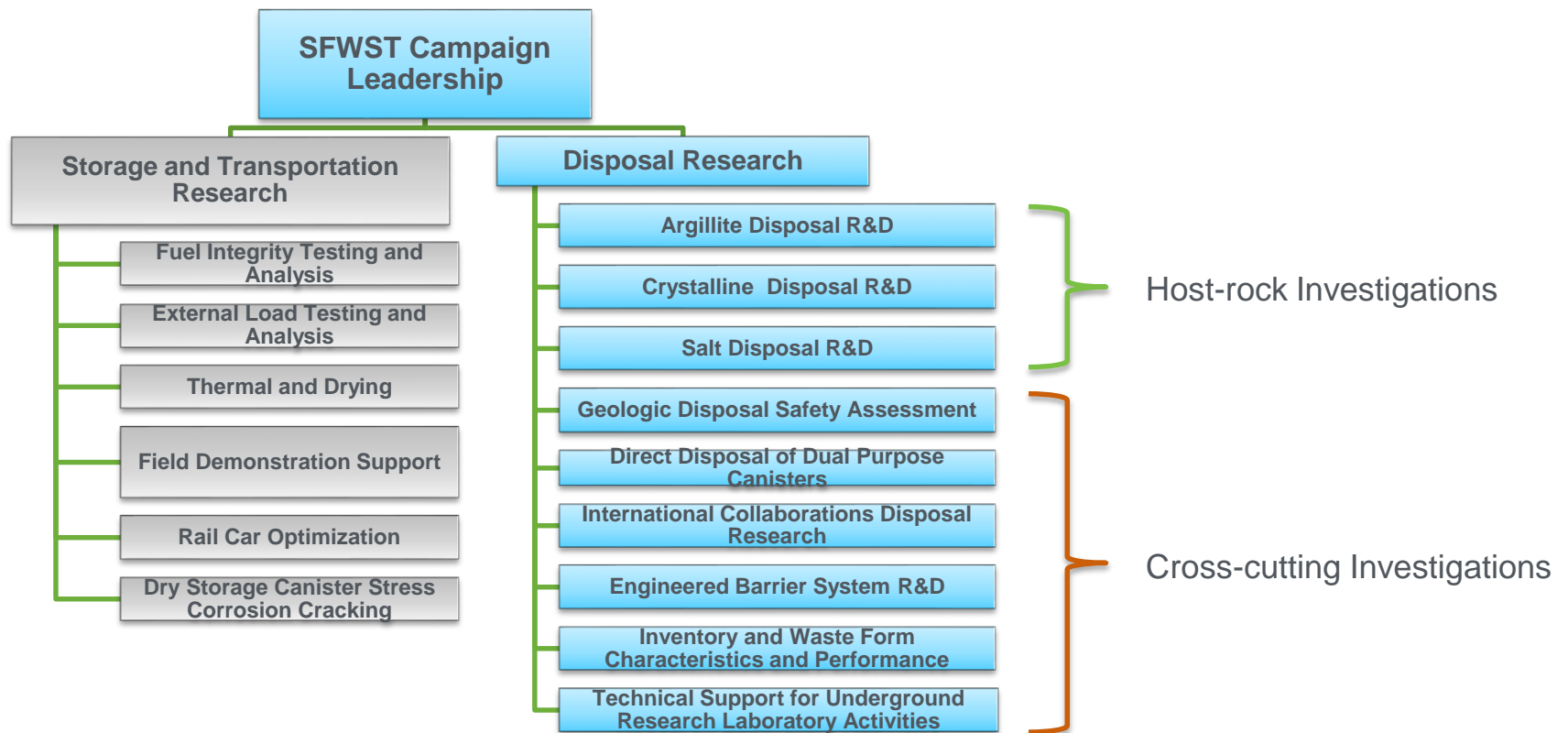
Closure

Generic

Assessment Bases

Final

# SFWST R&D Campaign Structure



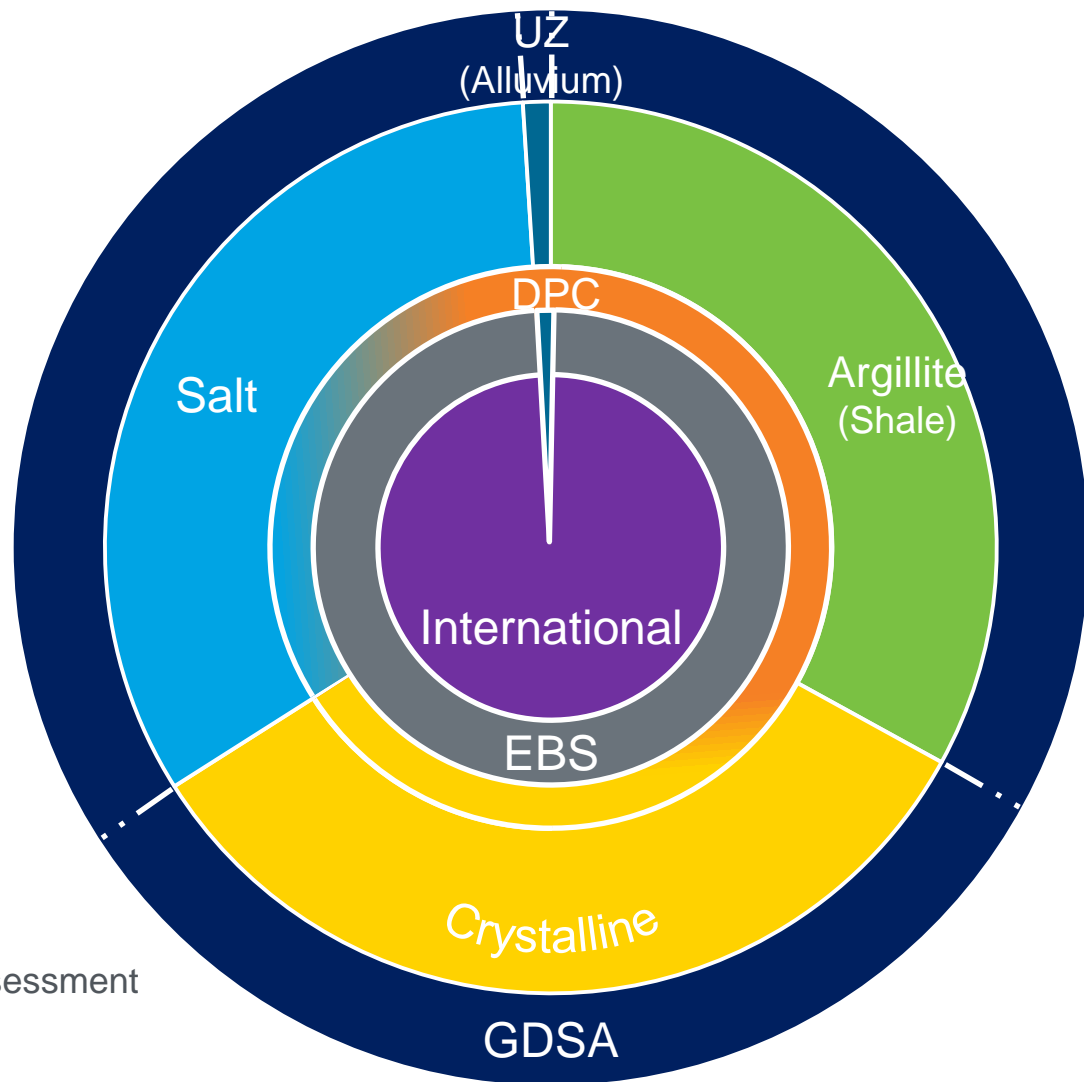
# SFWST R&D Prioritization

- R&D Campaign Prioritization documents
  - R&D Roadmap (2012)
  - SFWST Campaign R&D Roadmap Update (2019)
  - 5-yr Plan (2020)
- Congressional Appropriations
  - Funding levels
  - Appropriations Language
- DOE Management and Administration priorities
- Annual Baseline Planning

# SFWST R&D Priorities

- Host rocks are wedges of the pie.
- Partial circles are cross-cuts.
- Extent of circle indicates interfaces between host rocks and cross-cuts.

UZ = Unsaturated Zone  
DPC = Dual Purpose Canisters  
EBS = Engineered Barrier System  
SNF = Spent Nuclear Fuel  
GDSA = Geologic Disposal Safety Assessment





# References

- McMahon, Kevin A., Bragg-Sitton, Shannon, Mackinnon, Robert James, Saltzstein, Sylvia J., Sorenson, Ken B., Swift, Peter N., and Birkholzer, Jens T. *Update of the Used Fuel Disposition Campaign Implementation Plan*. United States: N. p., 2014. Web. doi:10.2172/1172802.
- Sassani, D., Birkholzer, J., Camphouse, R., Freeze, G., Stein, E., *SWFST Disposal Research R&D 5-Year Plan*, SAND2020-9053 R, July 31, 2020. Sandia National Laboratories, Albuquerque, New Mexico.
- Sevougian, S. D., P. E. Mariner, L. A. Connolly, R. J. MacKinnon, R. D. Rogers, D. C. Dobson and J. L. Prouty (2019b). *DOE SFWST Campaign R&D Roadmap Update, Rev. 1*. SAND2019-9033 R, July 22, 2019. Sandia National Laboratories, Albuquerque, New Mexico.
- Used Fuel Disposition Campaign, DOE-NE (UFDC), 2012, *Used Fuel Disposition Campaign Disposal Research and Development Roadmap*, U. S. Department of Energy Used Fuel Disposition Campaign, FCR&D-USED-2011-000065 REV 1.

Questions?