

# ARGILLITE R&D PRIORITIES DISCUSSION

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## SFWD

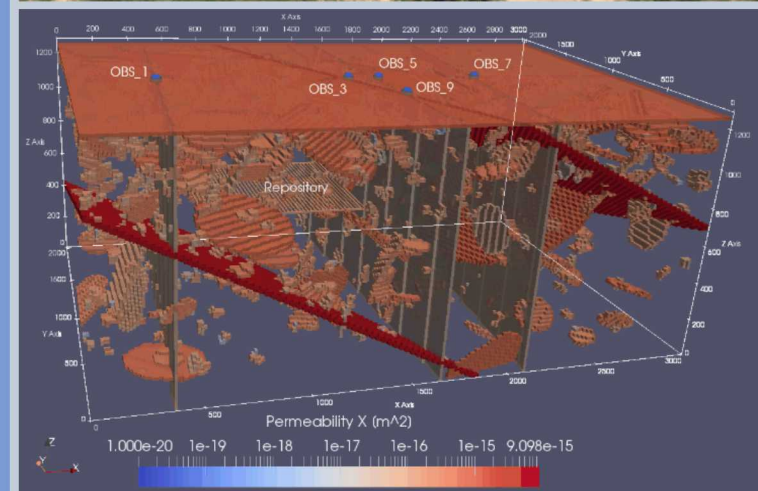
## SPENT FUEL & WASTE DISPOSITION

*Annual Working Group Meeting*

*UNLV-SEB – Las Vegas, Nevada*

*May 21-23, 2019*

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# ARGILLITE R&D PRIORITIES

- Priority Score Matrix in 2019 Roadmap Update
  - State-of-Art Level (SAL)
  - Importance to Safety Case (ISC)

<div> <div>SAL:</div> <div>ISC:</div> </div>	1	2	3	4	5
High (5)	L	M	M	M-H	H
Medium (3)	L	M	M	M	M
Low (1)	L	L	L	L	L

H = High; M-H = Medium-High; M = Medium; L = Low

# ARGILLITE R&D PRIORITIES IN 2019 DISPOSAL R&D ROADMAP UPDATE

## High Priority

<b>A-08</b>	Evaluation of ordinary Portland cement (OPC)
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## Medium-High Priority

<b>A-04</b>	Argillite Coupled THM processes modeling including host rock, EBS, and EDZ (TOUGH-FLAC)
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# HIGH IMPACT PRIORITIES IN 2019 DISPOSAL R&D ROADMAP UPDATE

- High Impact R&D Topics

High Impact R&D Topics	High-Priority R&D Activities	Medium-High-Priority R&D Activities
High temperature impacts	D-1, D-4, I-4, I-6, I-16, E-11, S-5	I-2, I-3, I-7, E-10
Buffer and seal studies	I-4, E-9, E-17, A-8, C-15	I-2, I-3, I-7, A-4, C-6, C-8, C-11
Generic PA Models	P-1, P-2, P-3, P-4	P-11, P-13, P-14
Coupled processes (Salt)	S-1, S-3, S-4, I-12, I-13	I-14, S-2, S-7, S-8, S-11
Gas flow in the EBS	I-6, I-8, I-18	I-9, P-17
Criticality	D-1, D-4, D-5	
Waste Package degradation	C-16, P-12	E-4, E-6
Radionuclide Transport	P-6	C-11, C-13, C-14, P-15, P-16
In-Package Chemistry	E-14	E-2, E-20, P-15, P-16
DFN issues		I-21, C-1, C-17
GDSA Geologic Modeling		O-2, O-3
THC Processes in EBS		E-3

Maroon color denotes argillite-related activities.



# DISCUSSION RE: R&D PRIORITIES

## ■ Discussion (20 minutes):

### For each High or Medium-High R&D Activity:

- Do we agree with the “R&D Needed” text in our database? If not, how should we change it?
- How can we translate the Activity into an input to GDSA? If we cannot, then which component of the safety case does the activity support?
- Are the Activity and the GDSA reference case consistent with each other? If not, how can we make them consistent?
- Tentatively schedule sit-down meeting among the project staff who need to integrate on a particular Activity and identify the primary topics for discussion

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considerations  
f. Integration with storage facilities

facility  
e. Waste acceptance criteria  
f. Impact of pre-closure activities on post-closure

basis  
d. Shafts/seals technical basis  
e. UQ (aleatory, epistemic)

basis  
c. Aquifer/other geologic units technical basis  
d. UQ (aleatory, epistemic)

– Surface environment  
– Flora & fauna  
– Human behavior

## 4. Disposal System Safety Evaluation

### 4.1 Pre-closure Safety Analysis

- a. Surface facilities and packaging
- b. Mining and drilling
- c. Underground transfer and handling
- d. Emplacement operations
- e. Design basis events & probabilities
- f. Pre-closure model/software validation
- g. Criticality analyses
- h. Dose/consequence analyses

### 4.2 Post-closure Safety Assessment

- a. FEPs analysis/screening
- b. Scenario construction/screening
- c. PA model/software validation
- d. Barrier/safety function analyses and subsystem analyses
- e. PA and Process Model Analyses/Results
- f. Uncertainty characterization and analysis
- g. Sensitivity analyses

### 4.3 Confidence Enhancement

- a. R&D prioritization
- b. Natural/anthropogenic analogues
- c. URL & large-scale demonstrations
- d. Monitoring and performance confirmation
- e. International consensus & peer review
- f. Verification, validation, transparency
- g. Qualitative and robustness arguments

## 5. Synthesis & Conclusions

- a. Key findings and statement(s) of confidence
- b. Discussion/disposition of remaining uncertainties
- c. Path forward

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