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Accelerated Basin De-inventory Project at the Savannah River Site

James E. Therrell

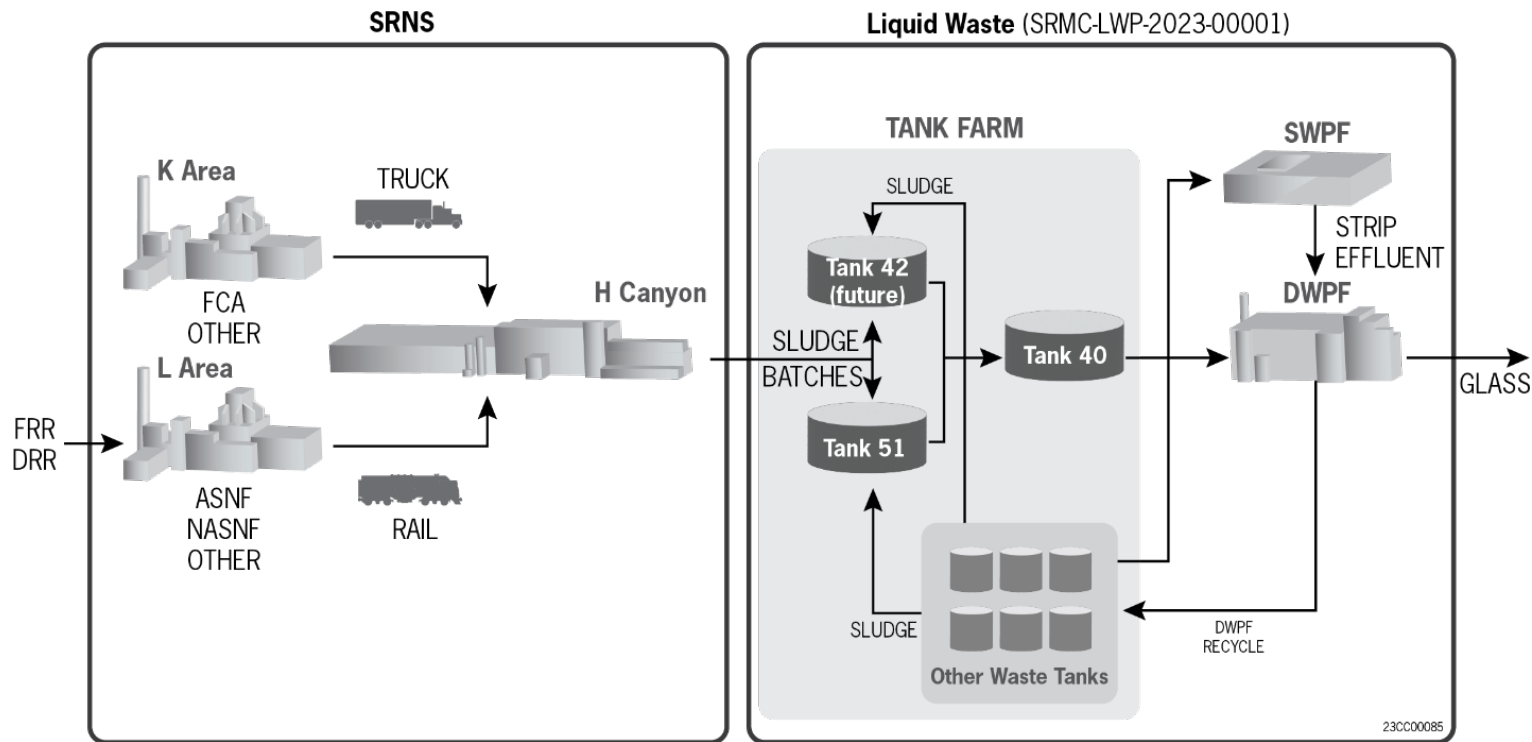
Mission Planning Manager

Environmental Management Operations

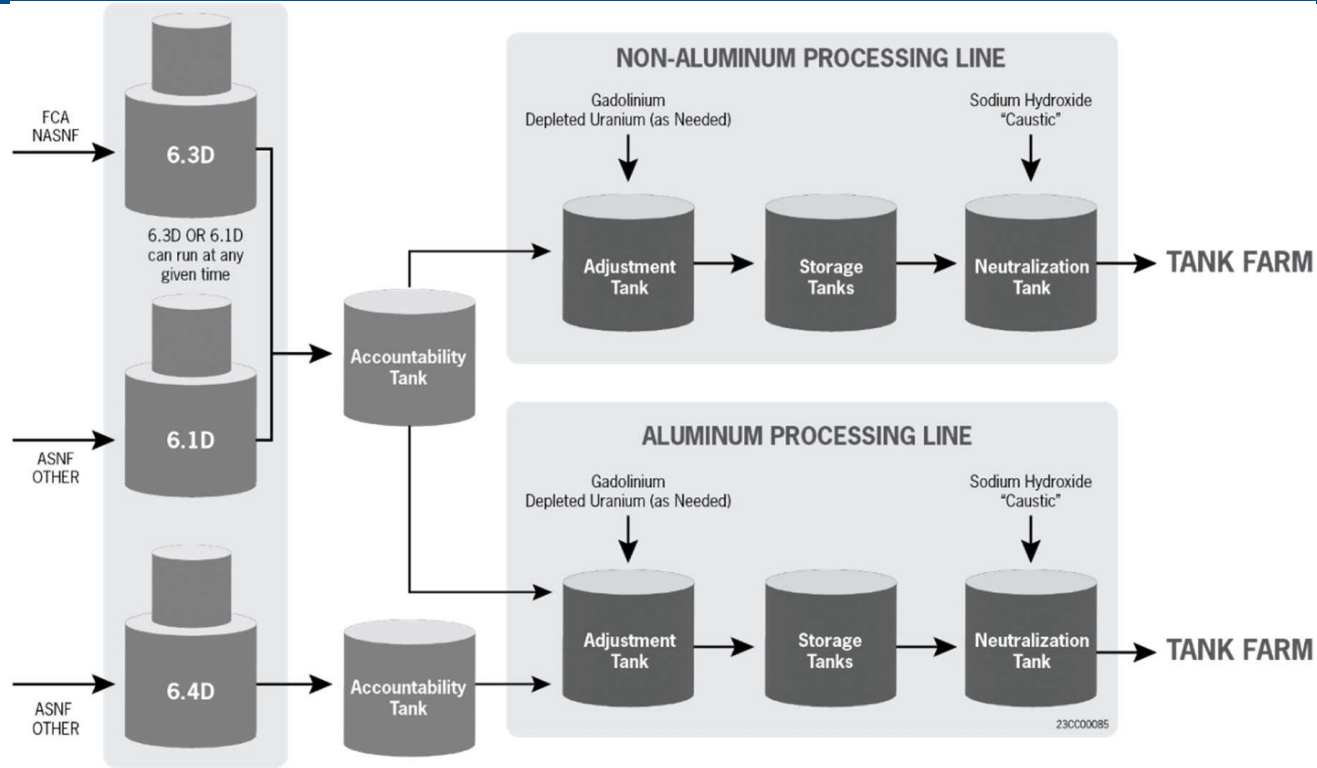
NWTRB Summer 2024 Board Meeting, August 29, 2024

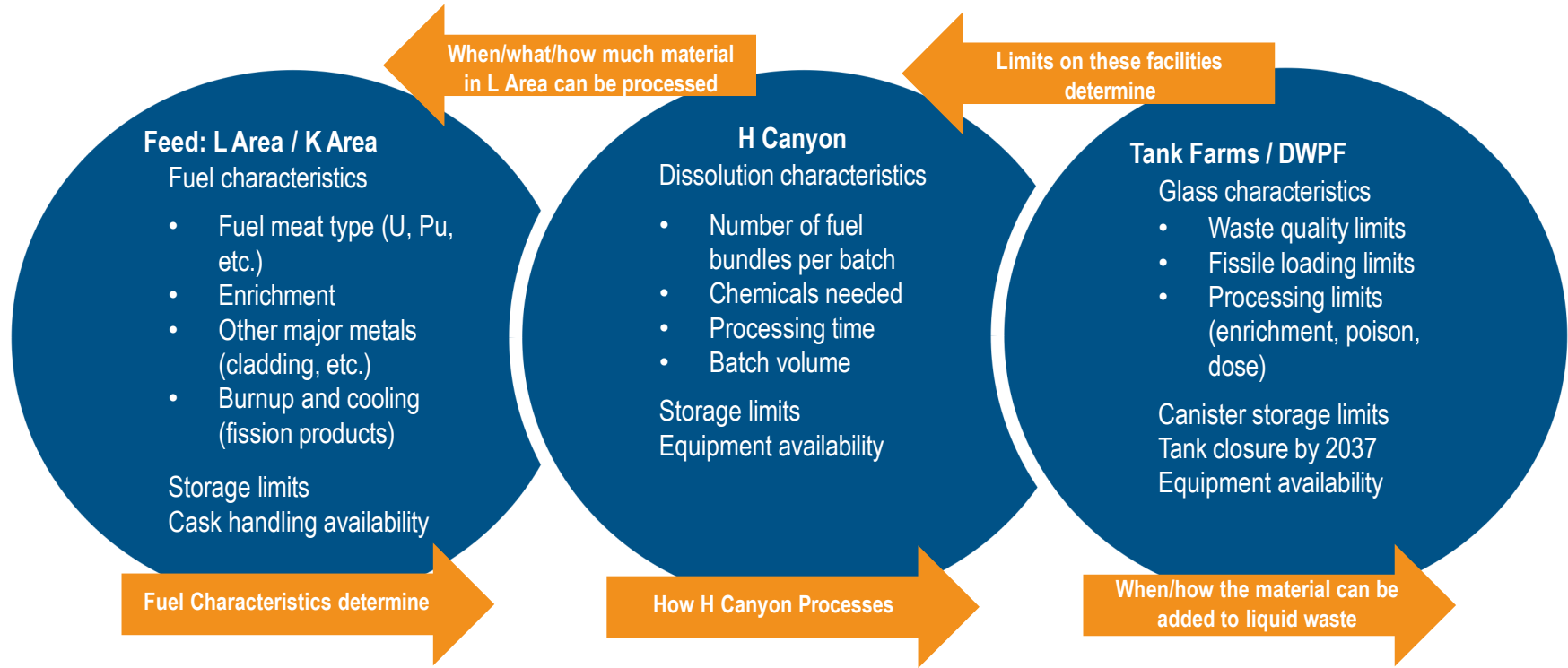
- **Synopsis of the Accelerated Basin De-inventory**
- **Major constraints on processing L-Basin SNF through H-Canyon**
- **Groups of SNF identified for processing through the project and challenges for processing each group through H-Canyon**
- **Overview of how H-Canyon integrates with Liquid Waste and meets WAC**
- **How will the addition of SNF processed through the project affect the expected number of HLW glass canisters**
- **What are the groups of SNF that are not expected to be processed during the project that will require continued storage (i.e., beyond 2034) in L-Basin**

Overview of the Accelerated Basin De-Inventory Flowsheet



H Canyon Flowsheet



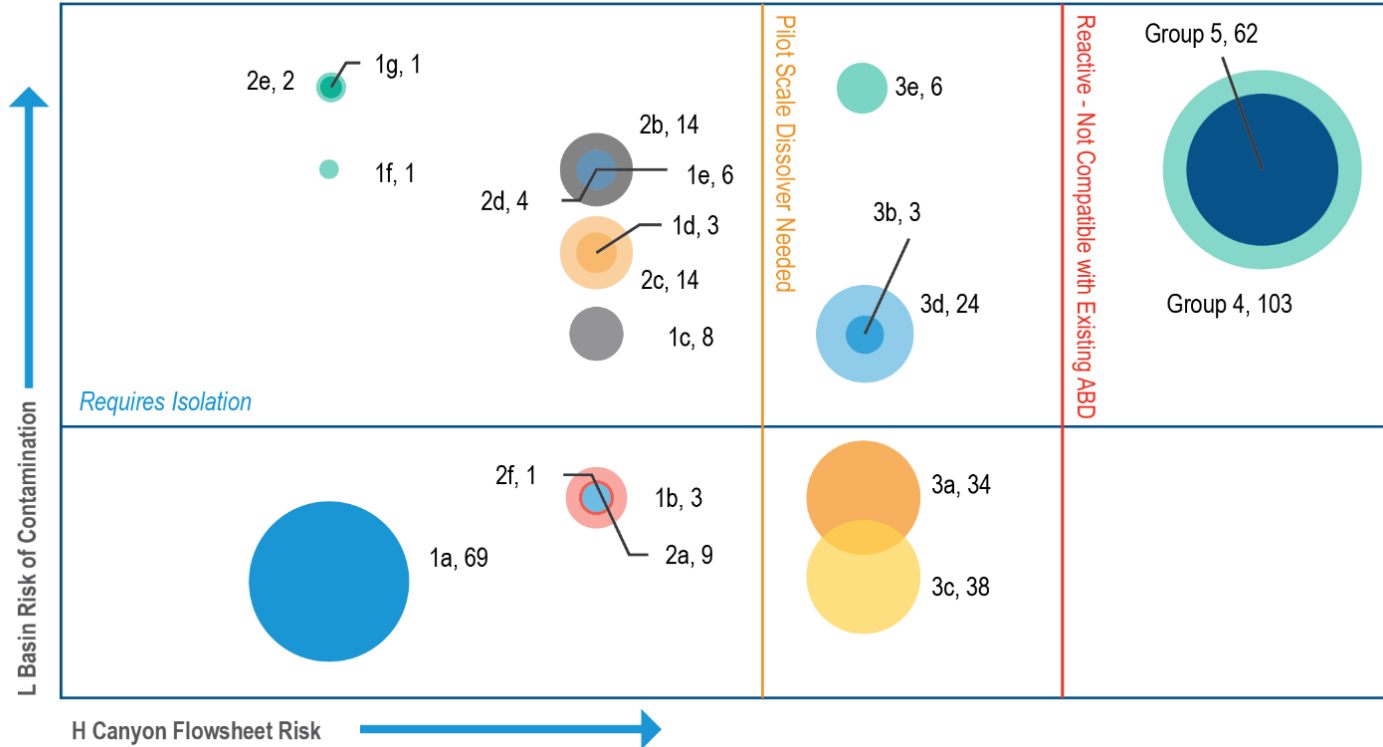


Nuclear Material Inventory

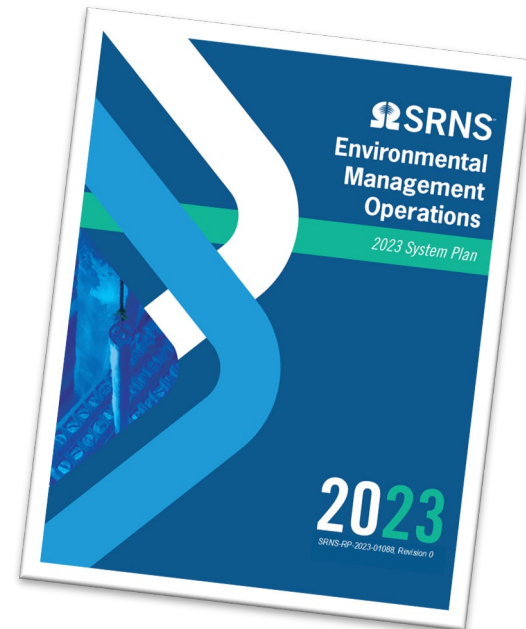


| Nuclear Material Category | | # of Items | Disposition Path | Nuclear Material Category | | # of Items | Disposition Path | Nuclear Material Category | | # of Items | Disposition Path |
|---------------------------|-------------------------|------------|------------------|---------------------------|--|------------|------------------|---------------------------|---------------------------------|------------|------------------|
| ASNf | HFIR | 60 | HCA | ASNf-NA | ASNf-NA | 381 | HCA | Other | Skull oxide | 5 | HCA |
| | MTR | 2,336 | HCA | | Future Receipts of ASNf-NA | 159 | HCA | | Kyoto | 1 | HCA |
| | Future Receipts of HFIR | 68 | HCA | Targets | Non-Mark 18A Targets | 7 | HCA | | Slowpoke | 5 | HCA |
| | Future Receipts of MTR | 161 | HCA | | Mark-18A Targets | 65 | SRNL | | TSR | 22 | HCA |
| NASNF | Groups 1 – 3 | 229 | HCA | Dry fuel | "Unirradiated" Fuel in 6M/2Rs or 9975s | 30 | HCA/SRNL | | RHF | 4 | HCA |
| | Groups 4 – 5 | 166 | TBD | | Irradiated Fuel in 6M/2Rs or 6L/2Rs | 37 | HCA | | HFBR | 1 | HCA |
| FCA | Plates and Rods | 118 | HCA | | INL Debris | 2 | SRNL/TBD | | Sources, Standards, and Samples | Various | HCA/TBD |

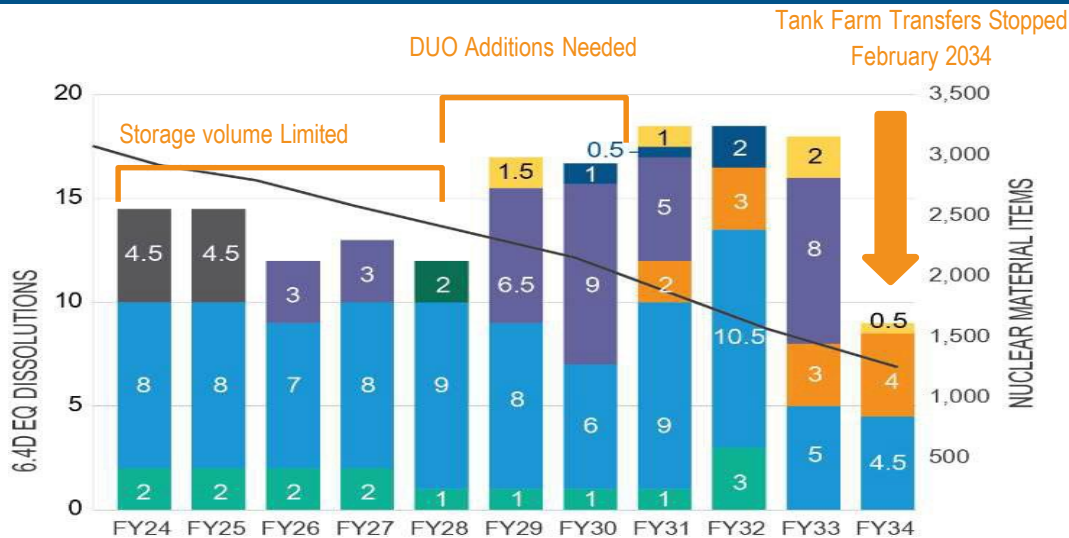
NASNF Campaigns Defined - Continued



- **To create a ten-year, executable processing plan that is integrated with the Liquid Waste system plan:**
 - Established processing priorities
 - Determined hard and soft limits
 - Grouped inventory by dissolution characteristics
 - Categorized inventory groups by readiness to process
 - Developed mathematical model to perform mass balances in L Area, H Canyon, and Liquid Waste
 - *Set input to annual, group specific, dissolver batches*
 - *Output needed H Canyon availability, key processing metrics, and projections against limits*
 - Generated scenarios by varying rankings of groups as a result of changing the weight assigned to each priority
 - Analyzed results and with concurrence from key stakeholders established a 'baseline' scenario



H Canyon Dissolution Targets

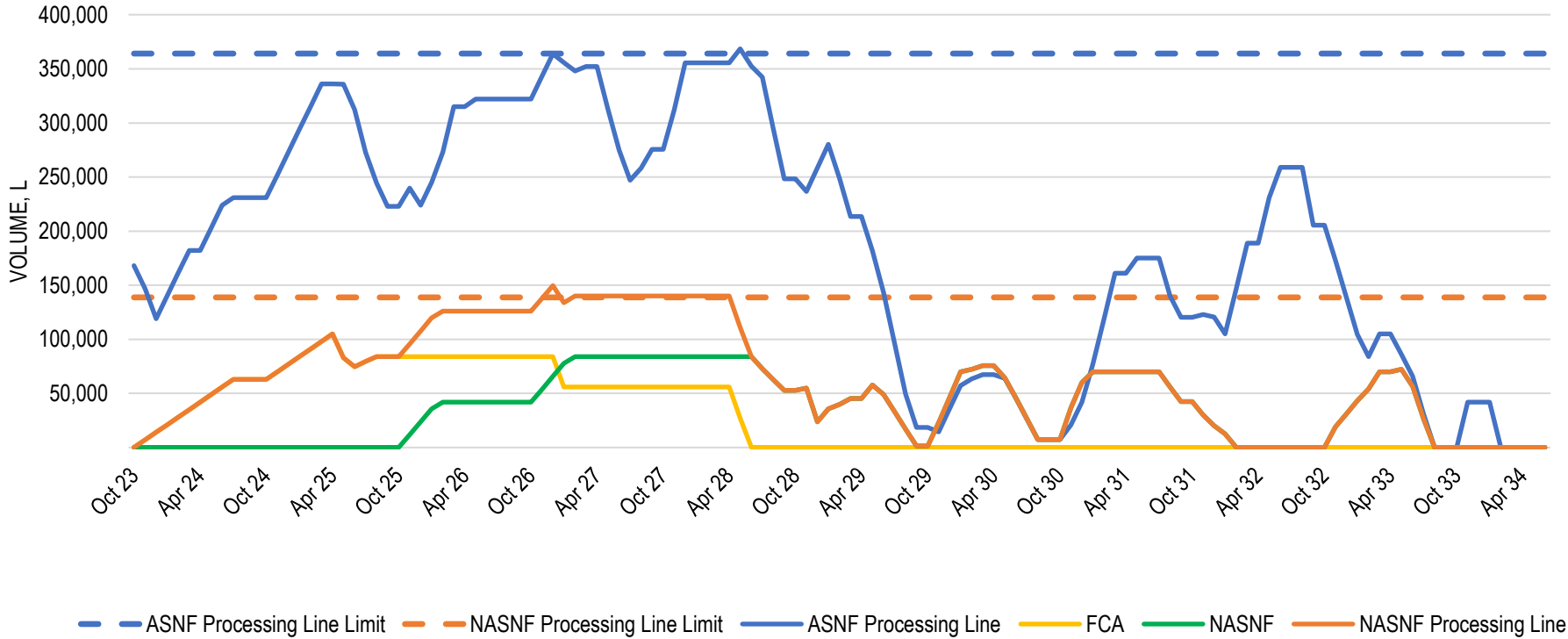


- Process over 70% of the SNF stored
- Create storage space for 67 HFIR cores and 2,680 bundles

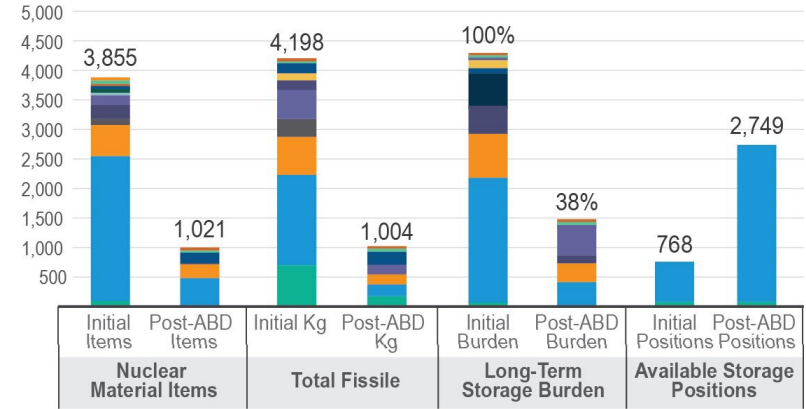
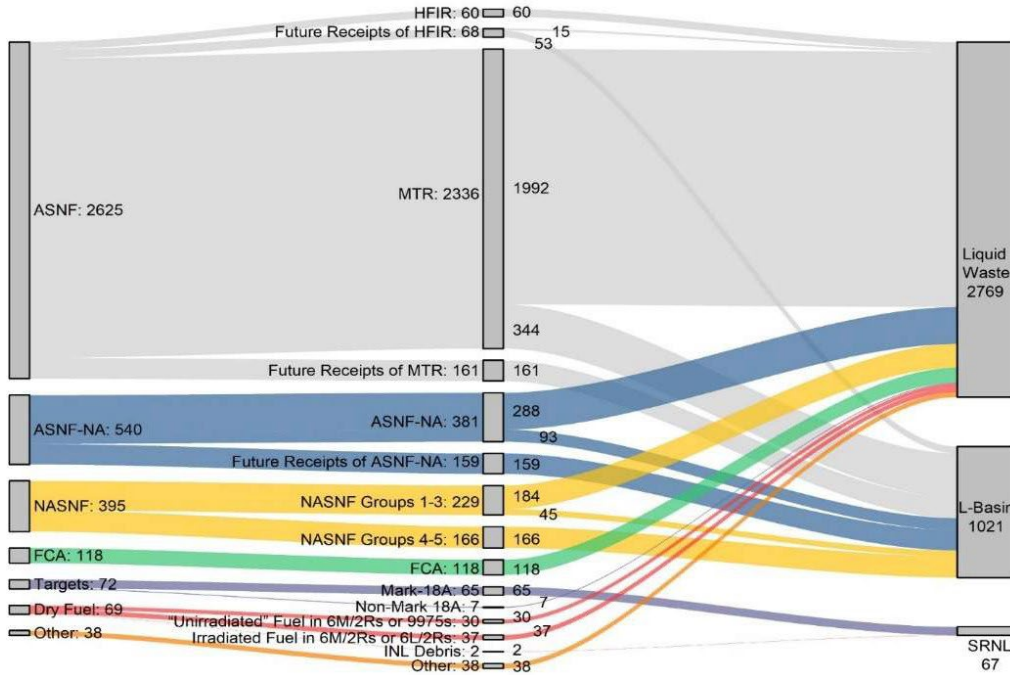
Key



Volume Storage in H Canyon

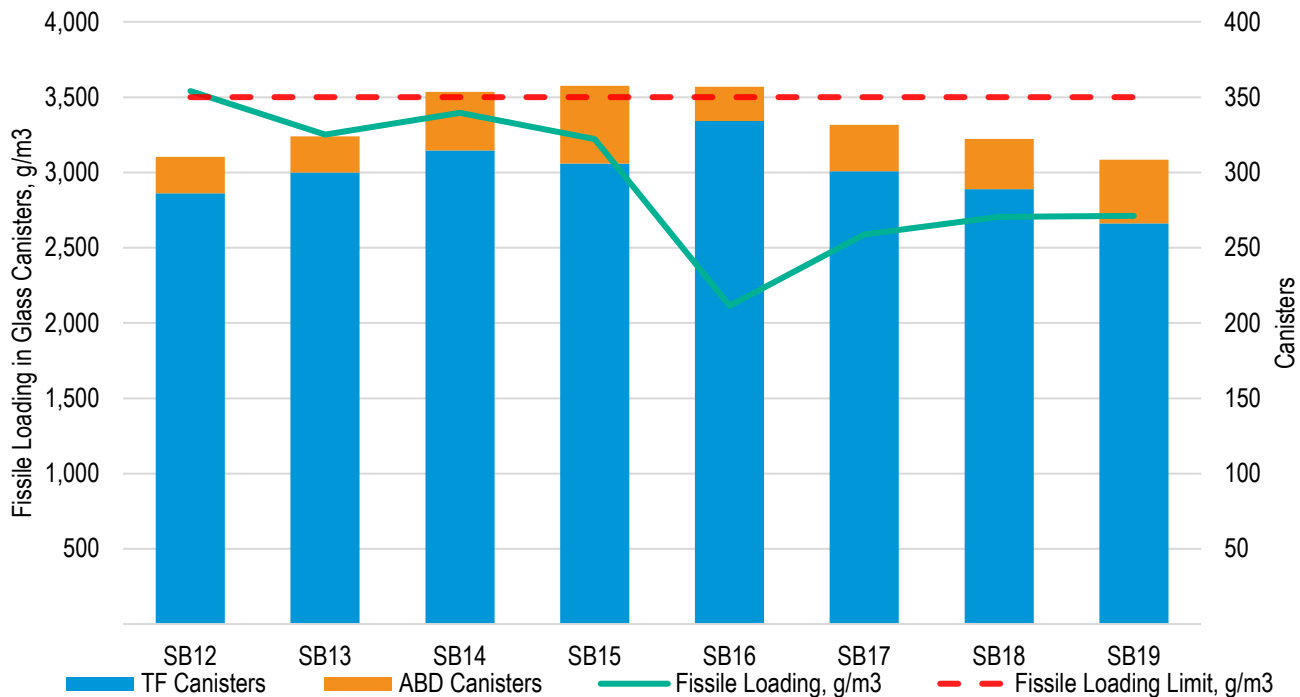


Summary of Results



Key

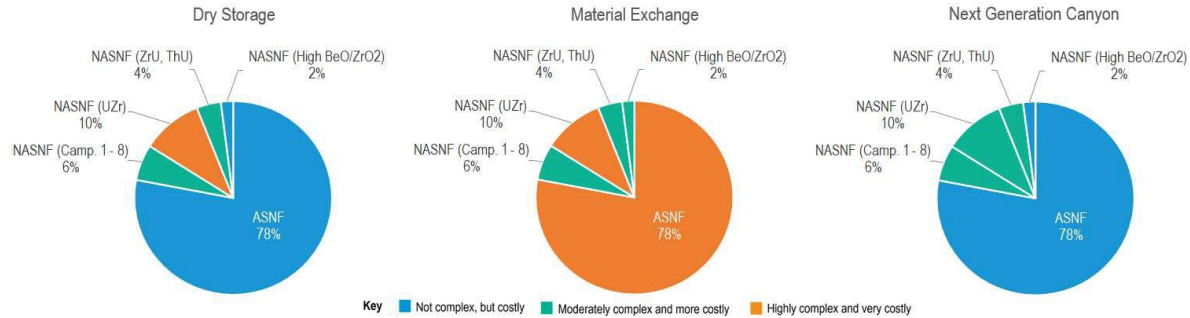




Projection of Remaining Materials

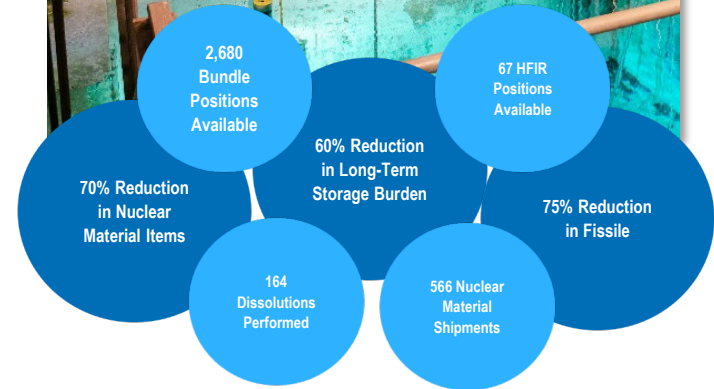
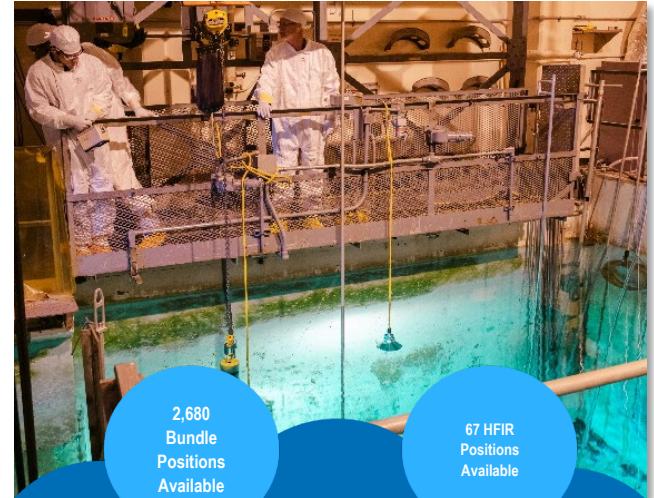


| Nuclear Material Category | | # of Items | Nuclear Material Category | | # of Items | Nuclear Material Category | | # of Items |
|---------------------------|-------------------------|------------|---------------------------|----------------------------|------------|---------------------------|--------------|------------|
| ASNf | MTR | 344 | ASNf-NA | ASNf-NA | 93 | NASNF | Groups 1 – 3 | 45 |
| | Future Receipts of HFIR | 53 | | Future Receipts of ASNf-NA | 159 | | Group 4 | 104 |
| | Future Receipts of MTR | 161 | | | | | Group 5 | 62 |



Conclusion

- **ABD expedites processing of SNF and couples the SRNS and Liquid Waste flowsheets**
- **The plan utilized processing limits and considered availability to develop an achievable reduction of 70% of the DOE-EM SNF designated for SRS**
- **Working to establish disposition of remaining SNF post-Liquid Waste**



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SRNS

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