

Problematic Mixed Waste from SRS Legacy TRU Program

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Legacy TRU at SRS – A Brief History

- From the early 1970s to April 2009, 13,750 m³ of TRU waste was stored
- Retrieval operations started in 1995
- First shipment to WIPP was in May 2001
- Over 1,650 shipments made to date
- Estimate 120 more shipments to complete legacy program
- ~30% of original waste dropped out into the LLW program for disposal



TRU Pads 7-13



September 2005



August 2008

Legacy TRU Storage over the years



Mixed Waste Challenges

- ~760 m³ of mixed low level waste generated during remediation of legacy TRU waste
- Substantial amount was “almost” TRU
- The more difficult TRU waste was processed at the end of the program and mixed waste drop-outs were equally more hazardous
 - Pu-238 (Much harder to manage than Pu-239)
 - High alpha contamination levels (>100 million dpm)
 - Compressed gas cylinders
 - Li batteries

Processing Concerns

- **Extremely high levels of alpha contamination due to PU-238**
 - Waste was challenging to deal with in a TRU processing environment
 - Commercial facilities typically not equipped, trained, or permitted to deal with higher levels of contamination
 - Planning with vendor required to ensure they could process
- **Certain prohibited items required changes or exemptions to commercial site permits to process (e.g. CO cylinder)**
- **Contamination event during processing would be damaging to the public trust of DOE**

Processing Concerns (cont)

Pu-238



A single grain of sand weighs ~1 milligram

- Is the most hazardous radioactive material at SRS; ~500 times more difficult to contain than Pu239
- An intake into the body, 1/ 1,000,000 of a grain of sand-sized particle delivers the annual legal dose (5 Rem)

- Pu-238 is 300 times more radioactive than Pu-239
- Extremely hard to contain when opening containers and processing
- Decontamination is difficult and time consuming

Summary

- Utilized NDA and RTR from TRU characterization process
- Worked container groupings as a “project” with a dedicated team which included the vendor
- Tried where possible to minimize or eliminate need to open legacy containers
- Have successfully processed 590 m³ without incident
- Remaining containers are challenging but will be processed with the same disciplined approach.