



Disposal Innovations for Large Components Onsite at Savannah River Site

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WM Symposia

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- **Licensed under DOE O 435.1 / Disposal Authorization Statement**
 - Performance Assessment drives most disposal requirements
 - *Generic disposal limits for each radionuclide of concern (specific to each disposal unit)*
 - *Packaging requirements and void space*
 - *Distribution of key radionuclides*
 - *Depth to groundwater*
- **ELLWF Disposal Units Include**
 - Low Activity Waste (LAW) Vaults
 - Intermediate Level Waste (ILV) Vaults
 - Component in Grout (CIG) Trenches
 - Engineered Trenches (ETs)
 - Slit Trenches (STs)

SRS E-Area Low Level Waste Disposal Facility



- **Proposed waste receipts into ELLWF**
 - Checked against the WAC and generic isotope PA limits
 - Then routed to the most optimal disposal unit.
 - > 75% of all waste disposed goes into the Slit Trenches.
- **Slit Trenches (STs)**
 - Multiple STs are operational at the same time
 - *Balance curie disposal within the trench volume*
 - *Avoid using all allowable curies within a small fraction of the trench volume*
 - Trench segments are excavated as needed to allow for disposal and placement of soil cover in short time frame.
 - Containerized waste is craned into trench.
 - Loose bulk waste is pushed into trench.

Aerial of Slit Trench Disposal



Normal Slit Trench Disposal



- **Not all proposed waste receipts meet the generic disposal limits**
 - Can the waste be disposed on site with additional analysis, or
 - Does the waste need to be disposed off site?
- **For on site disposal...**
 - a Unreviewed Disposal Question Evaluation (UDQE) and/or a Special Analysis (SA) is developed
 - UDQE or SA may determine waste meets existing PA limits
 - SA may set new limits (e.g., special waste form) and/or define mitigative actions such as grouting, additional containment, etc.
 - SA requires approval by DOE-SR

Examples of Non-Routine LLW Disposal

- HWCTR Process Vessel
- Tall Used Equipment Boxes
- Reactor Heat Exchangers



- **HWCTR Process Vessel – did not meet generic isotope disposal limits for multiple isotopes**
 - SA: new special waste form limits for the isotopes of concern
 - *Grout below and above the midpoint of the vessel required.*
- **Tall Boxes – met generic isotope limits, but boxes were too tall for dimensions of STs (20' deep = 16' waste + 4' soil cover).**
 - UDQE: allowed an additional 10' deeper in the ST footprint
 - *Did not challenge PA due to the geology in the area; sufficient depth to water table*
 - *Drive-in ramp had to be constructed to allow boxes to be driven in*
- **Heat Exchangers – multiple issues with on site disposal**
 - Initial characterization indicated they did not meet the WAC
 - Each ~25' long, ~12' dia. and weighed 120,000 - 190,000 lbs
 - Equipment stand off limits (25 ft) posed operational challenges

- **Heat Exchangers – continued**

- No funding was available for off site disposal
- Additional data was gathered and the heat exchangers were recharacterized (30 of 49 met generic disposal limits)
- SA for remaining 19 Heat Exchangers (H-3 and C-14):
 - *Generic PA limits were based on assumptions that...*
 - each contaminant is instantaneously available for transport by groundwater, and
 - no credit is taken for subsurface hydraulic barriers (e.g. the container)
 - *SA took credit for...*
 - the structure of the heat exchangers as a hydraulic barrier, and
 - that much of the contamination was embedded in the metal and would only become mobile through corrosion
 - *Some of the flanges and drain ports would require preparatory work before disposal*
- Was able to utilize the trench used for the Tall Box campaign

HWCTR Process Vessel Disposal



Tall Used Equipment Box Disposal



Reactor Heat Exchanger Disposal





Questions or Comments?

- **Contact information**

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