

# **Disposal Innovations for Large Components Onsite at Savannah River Site**

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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.

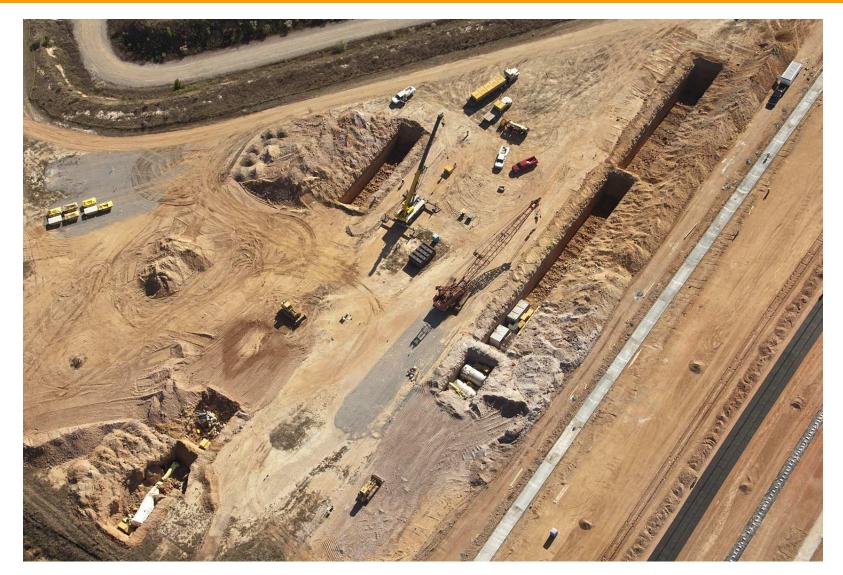
# • Slit Trenches (STs)

- 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**



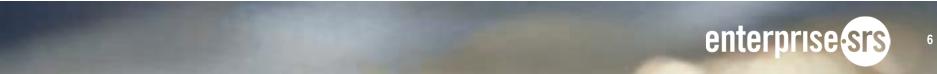




#### **Normal Slit Trench Disposal**









- 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

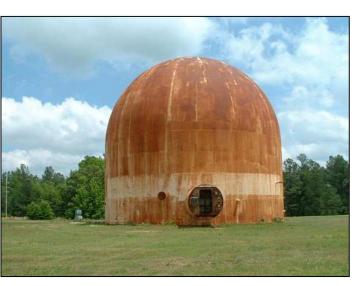


#### **Examples of Non-Routine LLW Disposal**



- 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?**



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