



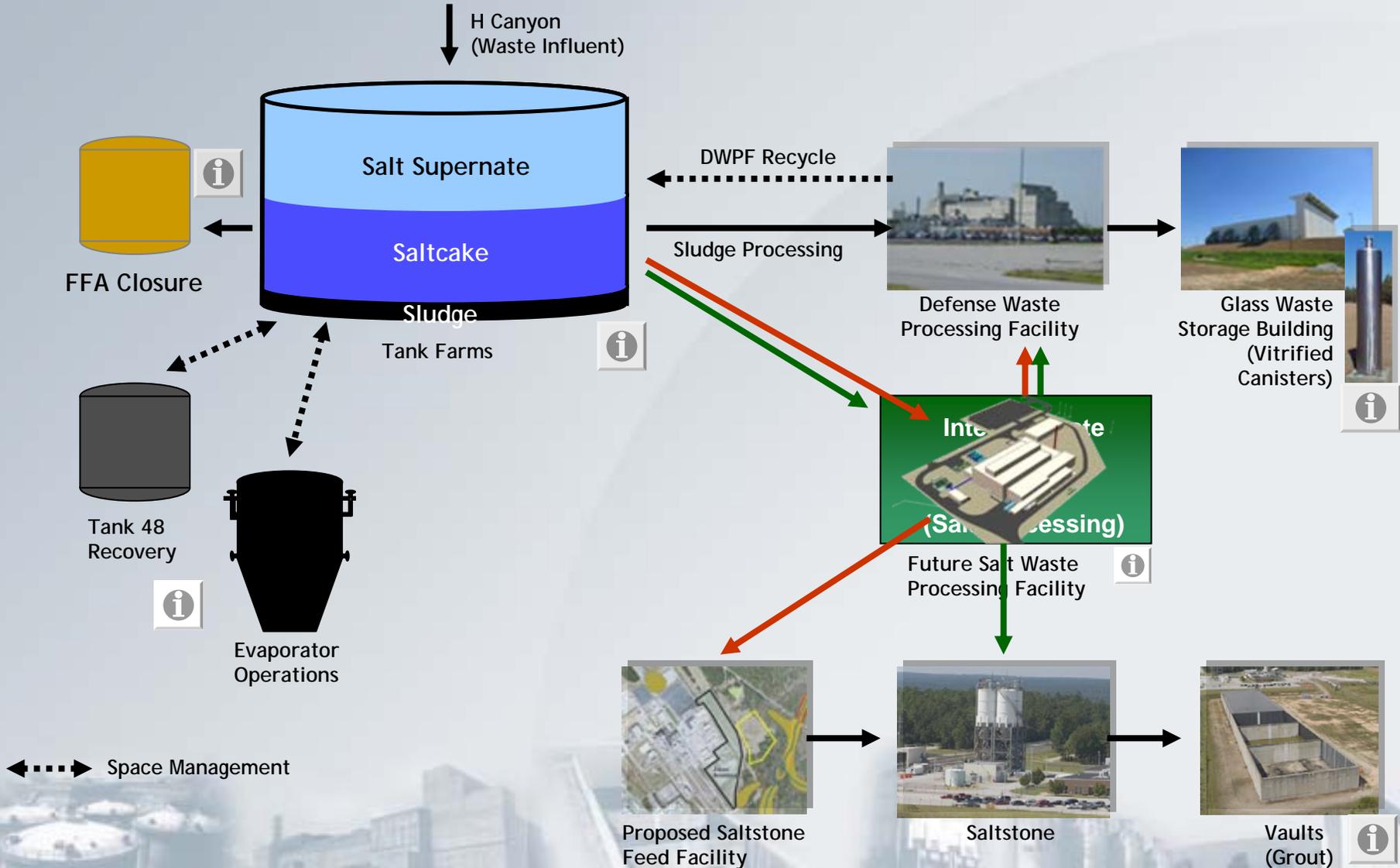
Liquid Waste Organization



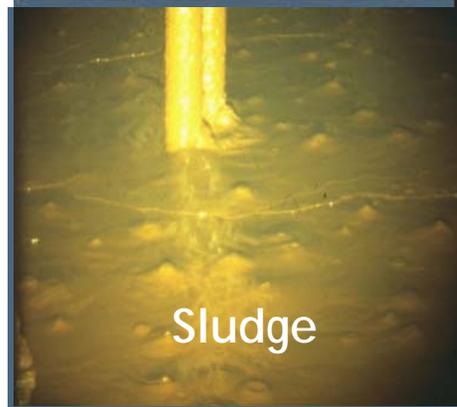
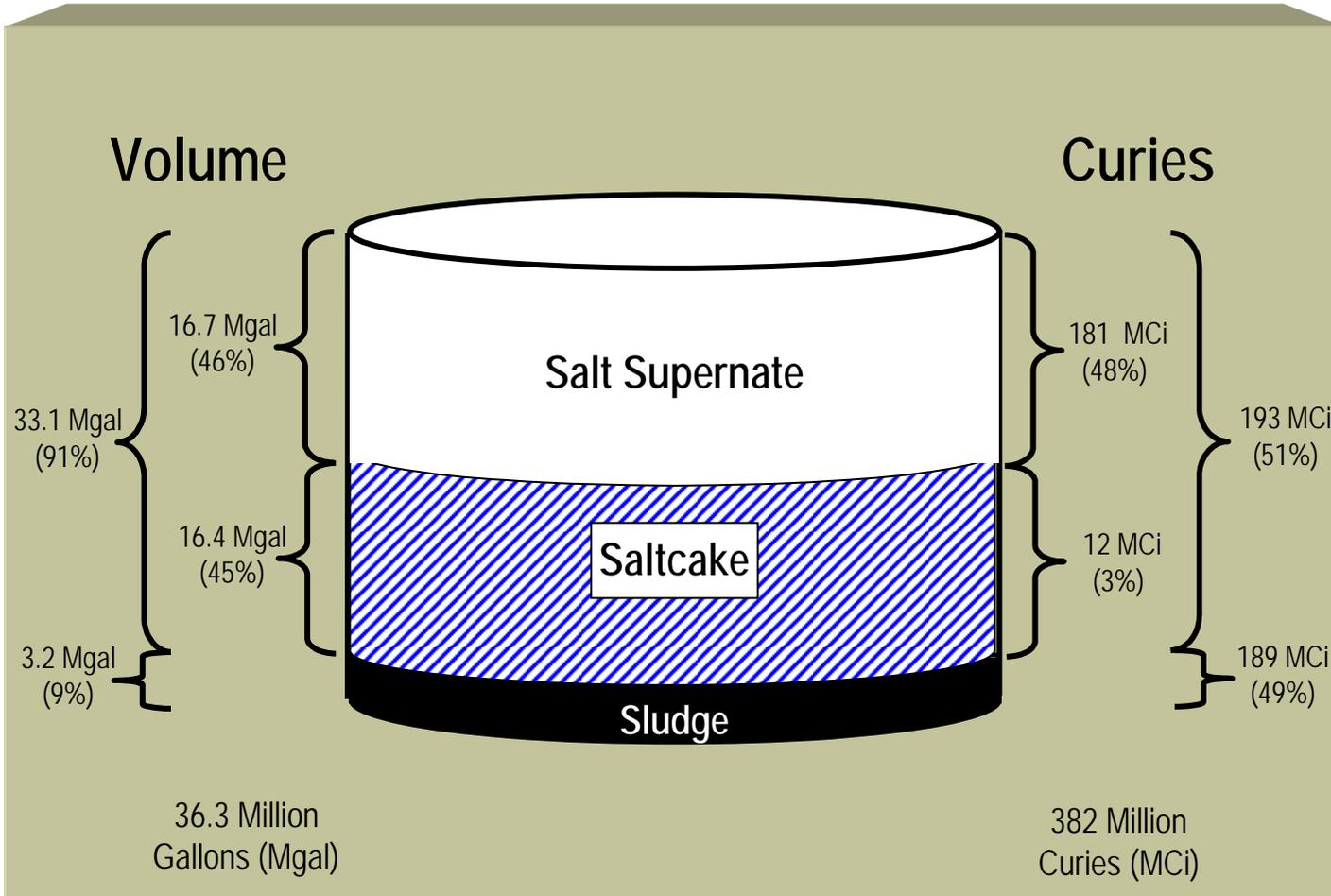
John E. Owen
Washington Savannah River Company
NSNFP / HLW Strategy Meeting
Las Vegas, NV
August 26, 2008

LWO-WSE-2008-00189

Savannah River Site Liquid Waste

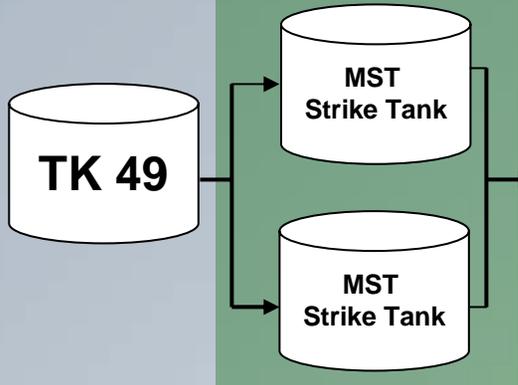


SRS Composite Inventory



Inventory values as of 2008-06-30

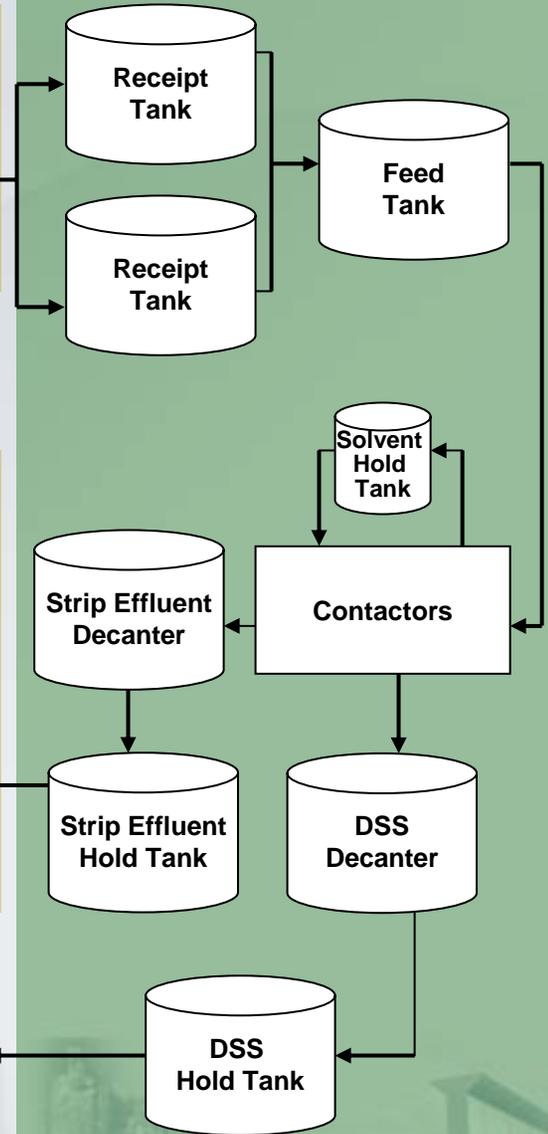
ARP (HTF: 96-H)



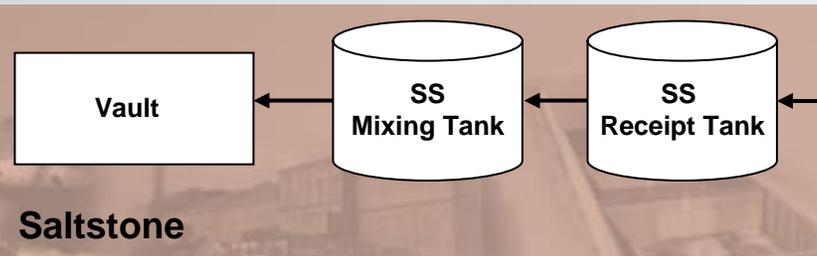
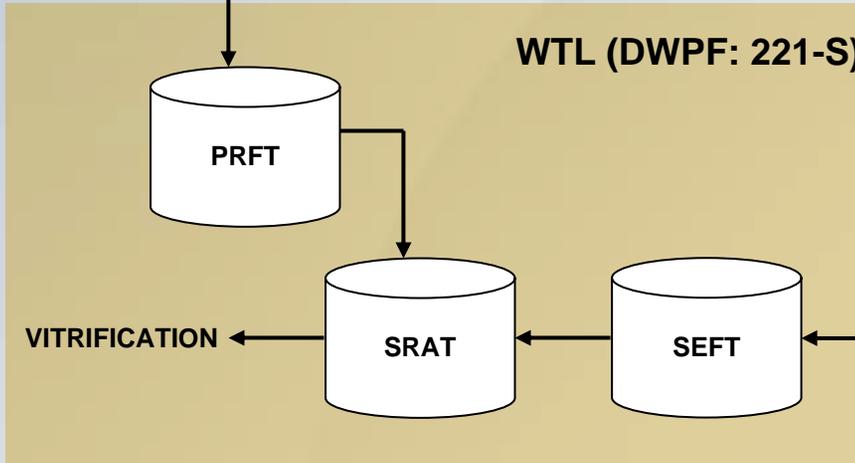
ARP (DWPF: 512-S)



MCU (HTF: 278-H)



WTL (DWPF: 221-S)



Interim Salt Processing

LWO Planning

- Liquid Waste Disposition System Plan Rev 14
 - Approved October 2007
 - Sludge and Salt Processing Plan through end of program
 - SWPF - Ready for Hot Ops date of Sept 2012

Saltstone Processing

- Processed 1.35 M gallons of DDA to date
- Outage – Low Organics Processing
- Resumption of Processing in mid-September 08.
- Processing Rate – 120K gallons / wk
- June 2009 - Mods for Ventilation Control and Temperature Monitoring of Vaults

HLW Processing Overview

- 2566 Canisters Produced (thru Aug 19)
- 192 Canisters – FY 08 (thru Aug 19)
- Over 10 Million Pounds of HLW Glass
- Processing Sludge Batch 4 – High Al
- Melter 2 – Operational Since March 2003
- Melter 3 – Ready as Spare
- Melter 4 - Components Construction Underway
 - Vessel and Frame contract has not been awarded
- Sludge Batch 5
 - Ready by September 2008
 - Low Temperature Al Dissolution

Salt Waste Processing Facility

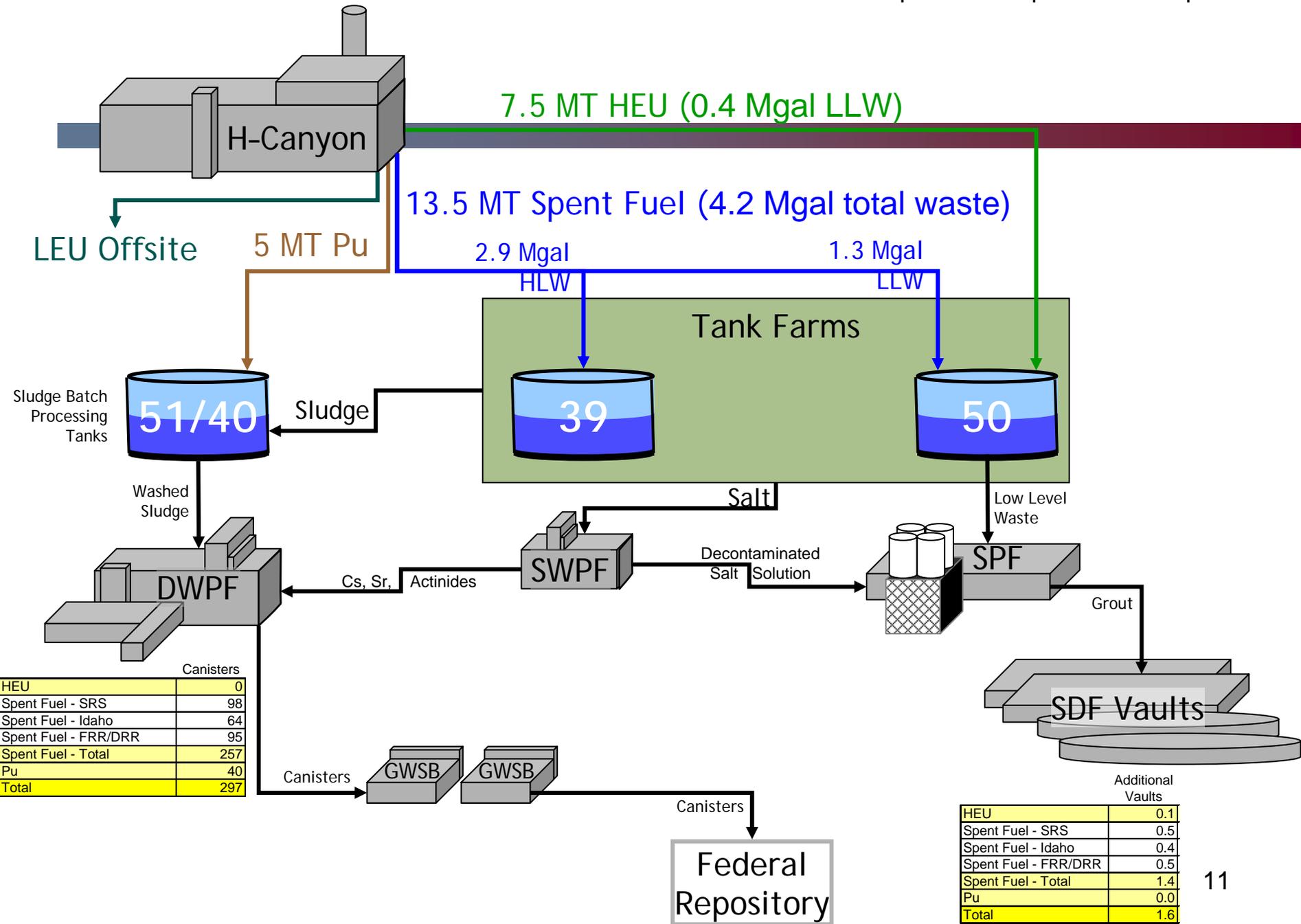
- 98M Gallons Salt Solution to be processed
- Processing Rate of 5.5M Gals / yr
- Critical Decision 3A approved for limited construction
 - Temporary Power and Utilities
 - Initiation of Site Grading Activities
 - Initiation of Fire Protection, Domestic Water, and Storm Drainage Piping
 - Demolition of Abandoned Rail Lines
- CD-3 Construction Approval scheduled for late 2008

S and J Area Aerial



Pu Disposition

- 2006 Baseline
 - Full Vitrification of 13 MT (can-in-canister)
 - Fill with HLW glass at DWPF
- Alternatives Evaluation
 - Vitrification (can-in-canister) at DWPF
 - MOX
 - Canyon Processing then to sludge batch to DWPF
 - Mix of above options



Issues and Challenges

- Tank Closure
- Tank Space Management Contingent Upon SWPF Startup
- Construction and Startup of SWPF
- Impact of High AI Sludge on Production Rates
- Total Canister Production
- Availability of Federal Repository

LA Recognition of Future Disposal Needs

A total of approximately 900 of the HLW canisters received from the Savannah River Site may also contain cans of vitrified glass containing plutonium arrayed within the vitrified HLW. This is the method currently proposed for disposal of 13 metric tons of weapons-usable plutonium. A vitrification technology utilizing a lanthanide borosilicate glass appears to be a viable option for dispositioning excess weapons-usable plutonium that is not suitable for processing into mixed oxide fuel. Nominally 8.4 wt % plutonium is vitrified in lanthanide borosilicate in cans with an outer diameter of 2.88 in. and a length of 19.25 in. Four cans, each containing about 920 g of bulk plutonium-containing material, will be loaded into a magazine, and seven magazines will be loaded into an HLW canister that is then filled with vitrified HLW. The resultant product is referred to as the vitrified plutonium waste form (Marra et al. 2005, Sections 3.2 and 3.7). The vitrified plutonium waste form has been evaluated for its likely bounding contribution to the TSPA results. The inventory characteristics of this waste form are discussed further in Section 2.3.7.4.1.1. Analyses associated with preclosure handling and dose analyses and detailed analysis of postclosure criticality screening have not been performed; therefore, this waste form is not fully analyzed and not acceptable for disposal at the repository at this time. However, this waste form is identified in order to demonstrate a future intent to include it in licensed operations.

LA SAR: Nuclear Criticality Safety

Table 1.14-1. Fissile Isotopes in High-Level Radioactive Waste Glass Canisters

Fissile Isotope	Hanford Canister	Idaho National Laboratory Canister	Savannah River Site Canister	West Valley Demonstration Project Canister
²³³ U Mass (g)	0.217	6.29 × 10 ⁻⁴	5.80	9.37
²³⁵ U Mass (g)	257	304	307	172
²³⁹ Pu Mass (g)	343	32.4	280	141
²⁴¹ Pu Mass (g)	1.18	0.208	8.16	3.01
Total Fissile Isotope Mass (g)	601	337	601	325
Nominal Glass Volume (L)	1,080	625	670	665
Fissile Isotope Concentration (g/L)	0.557	0.539	0.897	0.489

Source: BSC 2008b, Table 3.