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- Tank Retrieval Goal – Meet the Tri-Party Agreement (TPA) Commitments

Retrieve to residual tank volumes of:

- 100 Series (75 ft dia) Tanks to $\leq 360 \text{ ft}^3$ (~2,700 gallons)
 - 200 Series (20 ft dia) Tanks to $\leq 30 \text{ ft}^3$ (~225 gallons)
- Two retrieval technologies shall be deployed to their “limits of technology” to meet the TPA goals. An additional technology shall be deployed to its limits of technology unless DOE and the Washington State Department of Ecology believe it is not practicable.
- Current Status – **149 Total SSTs**
 - 7 retrievals completed to TPA requirements,
 - 4 have met the limits of technology ,
 - 2 retrievals in progress

Modified Sluicing

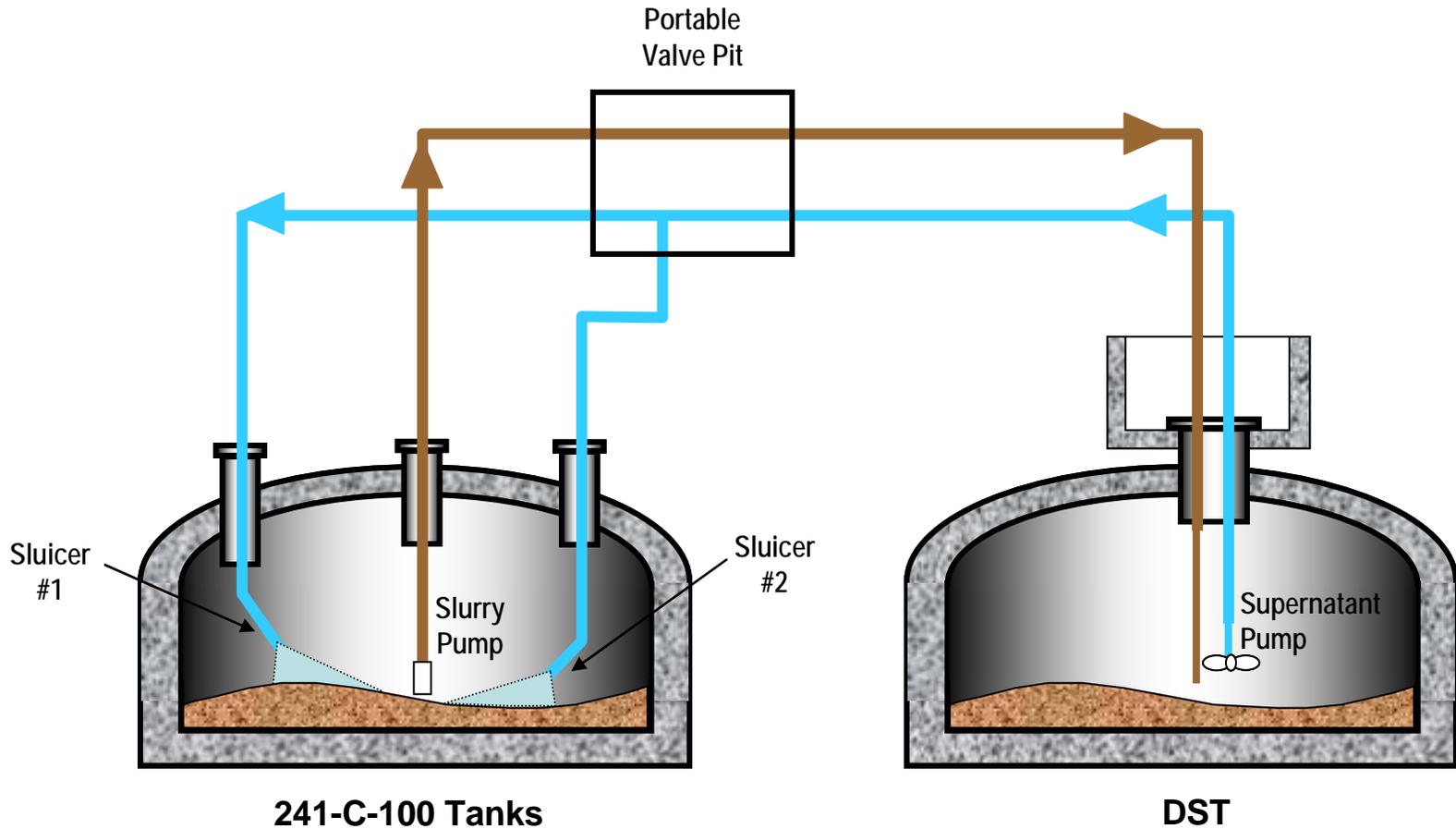
Modified sluicing is currently used on SOUND tanks. Modified sluicing uses low volumes of liquids at low pressures (~100 gpm/~100 psi) with concurrent removal with a retrieval pump. Modified sluicing can be performed with recycled supernatant in sludge tanks to conserve DST space while water is used for saltcake tanks.

Waste retrieval from SSTs using modified sluicing or saltcake dissolution has typically reached its “limit of technology” (diminishing effectiveness) prior to meeting the TPA goals. Typically ~10% of the initial waste volume is left in the tank due to the difficulty mobilizing solids to the pump and the pump’s ability to transfer the solids.

Vacuum Retrieval

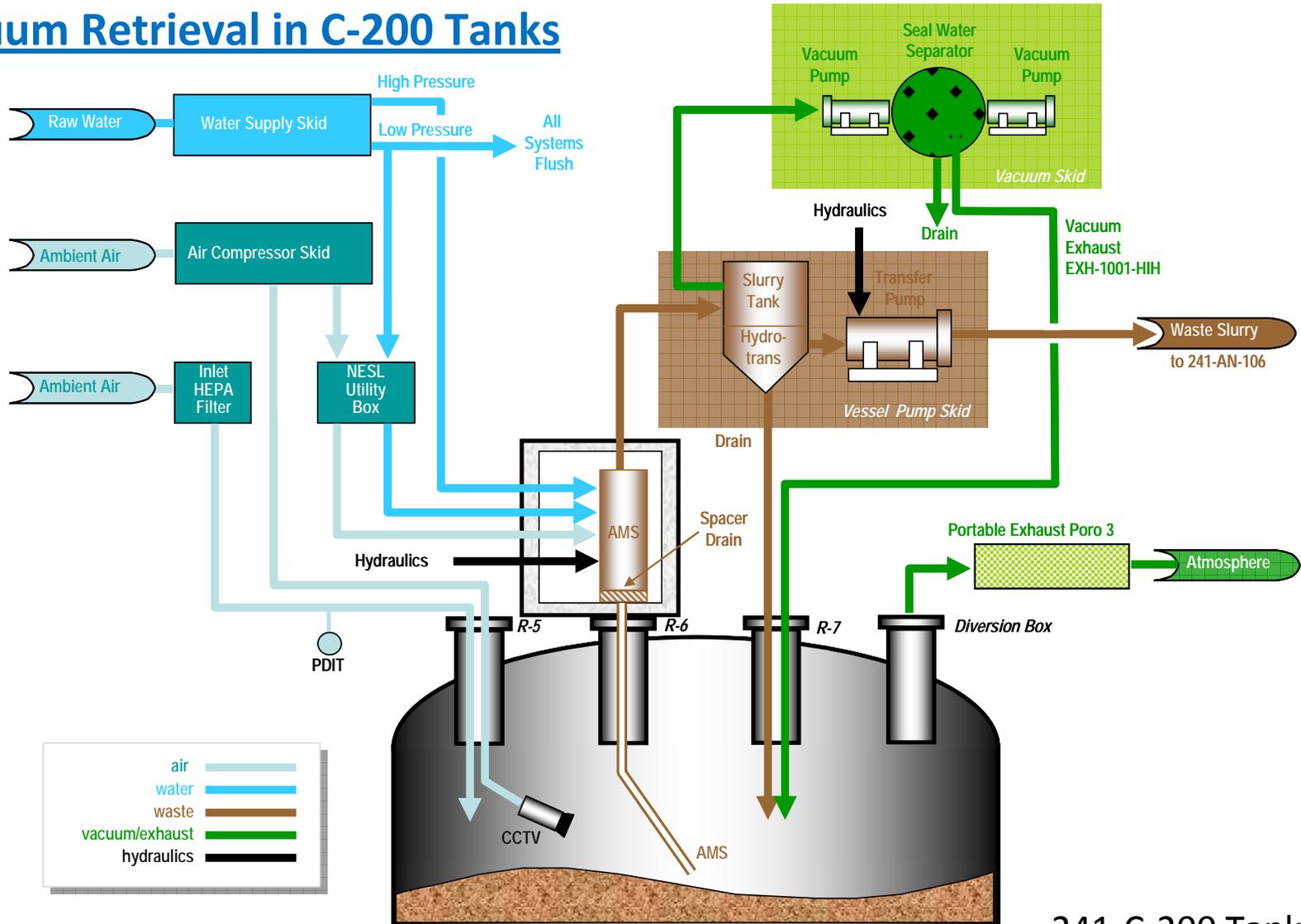
Vacuum retrieval has been used to complete retrieval of four 200-series ASSUMED LEAKING tanks. The system uses localized scarifying to assist in mobilizing the waste and vacuum pumps to draw the waste out through an articulating mast. **The vacuum retrieval system technology has not yet been implemented in 100-series tanks.**

Modified Sluicing in C-100 Tanks



Vacuum Retrieval System

Vacuum Retrieval in C-200 Tanks



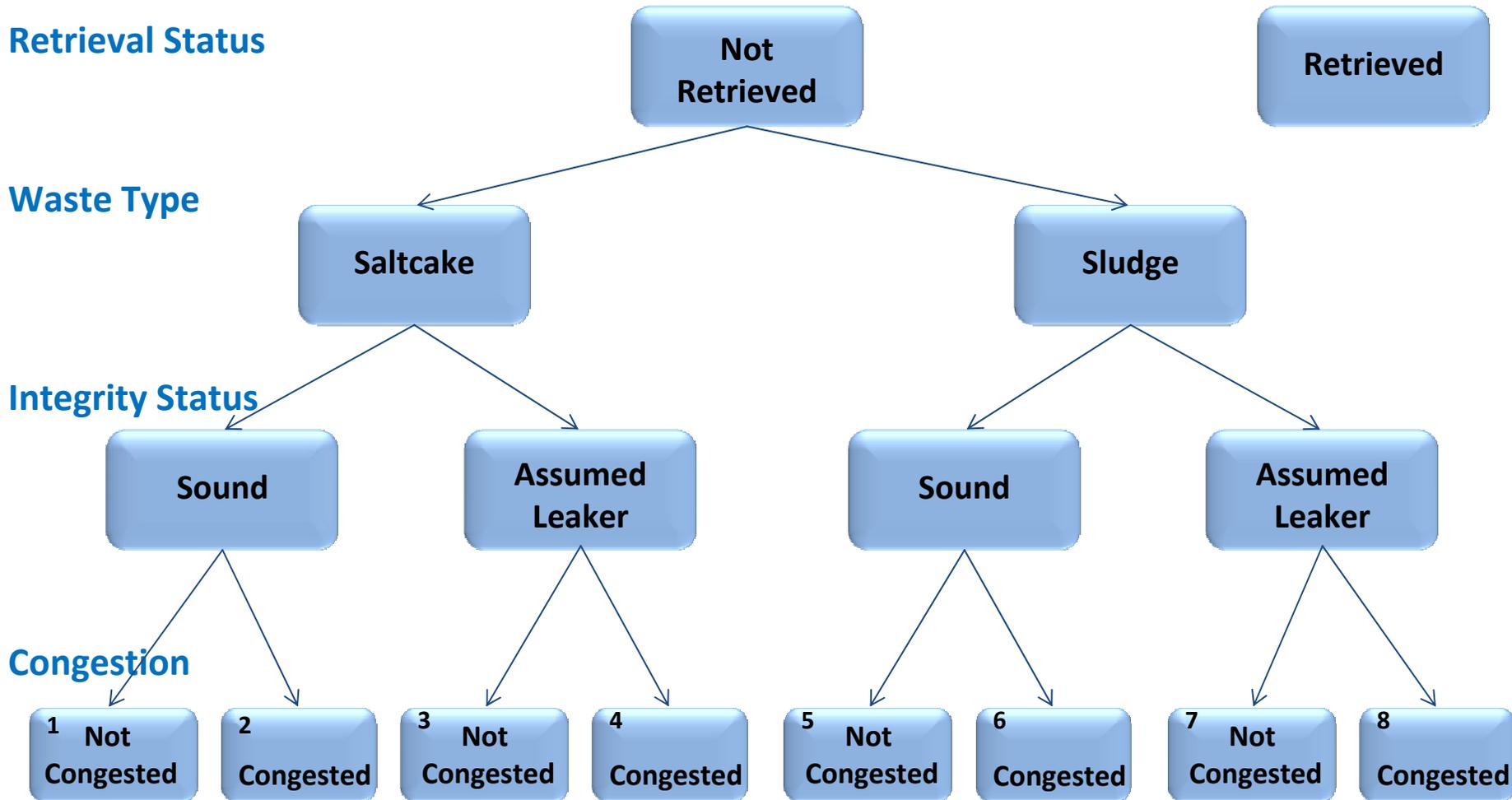
WRPS completed the “Hard Heel Waste Retrieval Technology Review and Roadmap” document in early 2010 which evaluated several SST retrieval options.

Selection of hard heel retrieval technologies depends on several factors including:

- Waste type (saltcake or sludge)
- Integrity (sound or assumed leaking)
- Tank Bottom Configuration (dished or flat)
- In-Tank Congestion

Eight groups of tanks were identified to characterize the retrieval challenge. Based on the particular challenge of each group of tanks, retrieval methods were chosen for development and implementation to assist current methods or completely replace them.

SST Retrieval Planning Grouping Methodology



Additional Considerations for Flat/Dished Bottom, Riser Size/Location

- **No one retrieval technology/method is appropriate for all tanks**
- Several technologies were identified for development and demonstration to improve retrieval system performance to meet the TPA requirements –
 - Caustic chemical cleaning for hard heel dissolution to assist retrieval
 - Articulating and/or telescoping sluicers to increase the area of influence, attack angles, and energy of the sluice stream on the waste
 - An improved next generation FoldTrack[®] vehicle to mobilize hard heel components to the retrieval pump
 - Mobile Arm Retrieval System (MARS) in both sluice and vacuum modes to perform both bulk retrieval and hard heel retrievals
 - Improved retrieval slurry pump system (e.g., pump , conditioner, and backstop) to enhance intake and transfer of the larger, higher-density waste solids

Chemical Cleaning

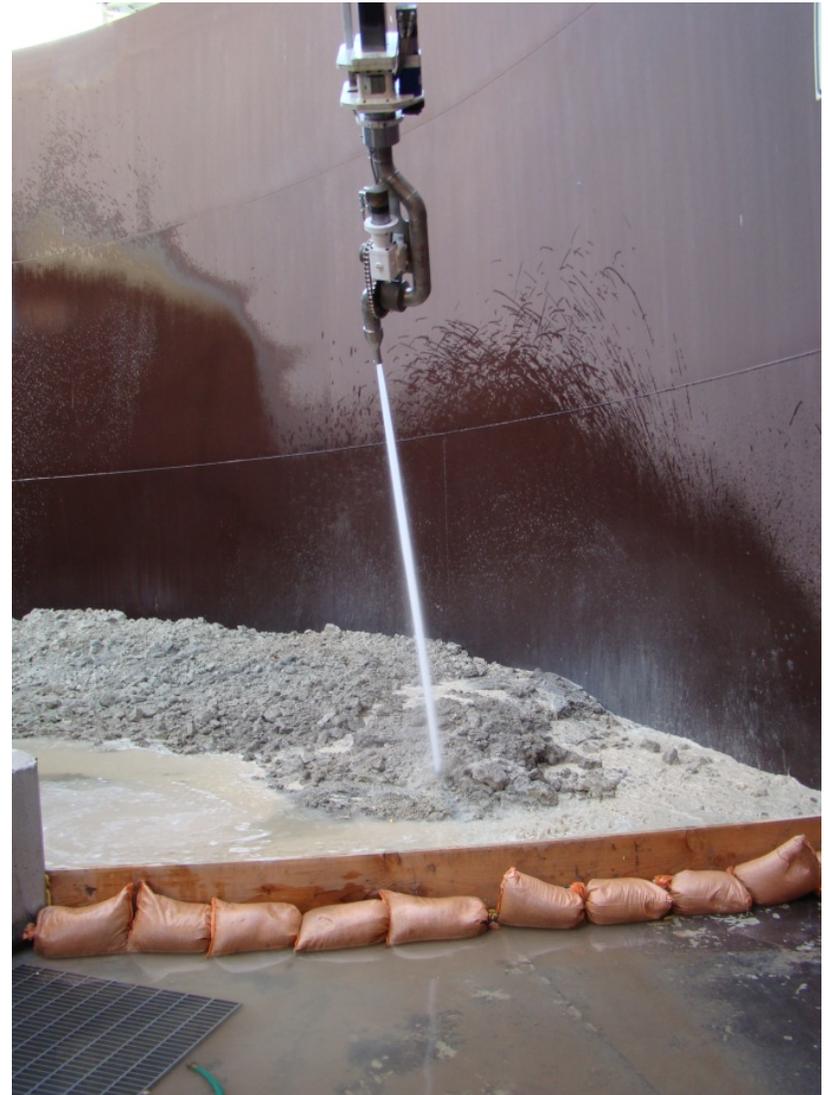
Chemical cleaning following modified sluicing in sound tanks will be evaluated to assist with dissolving the hard-to-retrieve heels.

(L. Sasaki to present additional information)

- **Caustic cleaning** - will use 19M caustic solution followed by water to dissolve the heels primarily composed of aluminum compounds (e.g. gibbsite) allowing the retrieval pumps to more effectively transfer the heel. Demonstration in tank C-108 is currently planned for late Spring 2011.
- **Oxalic Acid cleaning** – the use of oxalic acid to dissolve the heels composed of iron-based sludges will be evaluated for potential future use. This method may resemble what was successfully used in tank C-106 or may include an ex-tank system to destroy the oxalic acid (to eliminate down-stream adverse impacts) currently being developed by the Savannah River Site.

Enhanced Reach Sluicers have been developed to increase their effectiveness over current sluicers by incorporating an elbow and a 13-33 ft telescoping arm.

Proof of principle testing of these sluicers has been completed and improvements were identified. Enhanced sluicers may be deployed in tank C-112 in FY12.



Enhanced Sluicers allow improved waste mobilization 10

Crawler Development

A second generation Fold Track[®] vehicle has been developed and tested. The vehicle will be stored until needed.



FoldTrack[®] Plow Blade and Water Jetting Manifold



FoldTrack[®] Vehicle

Plow blade includes 4,000 psi sluicing nozzles and a 2,000 psi water cannon.

Mobile Arm Retrieval System

A Mobile Arm Retrieval System (MARS) is being developed for possible use in both sound and assumed leaker tanks by implementing both sluicing and vacuum retrieval methods.

The capabilities of the MARS include:

- Adjustable vertical positioning
- 180 degrees of vertical range travel
- 360 degrees of rotational travel
- Outward reach of 38 ft (to tank wall)
- Payload capacity at full extension of 300 lbs
- Confined sluicing and vacuum (using eductor) capabilities
- Requires installation of 42" riser near tank center

[\(Carl Hanson to present additional information\)](#)



- Efficient methods of installing new risers on tanks for deployment of larger equipment
- Mechanical methods of solids size reduction (both pre- and post- pumping system)
- Improved retrieval slurry pump system with better solids capture and transfer characteristics (e.g., backstop)

Q & A