

C-Farm Retrieval Update

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**Office of Waste Processing
Technical Exchange
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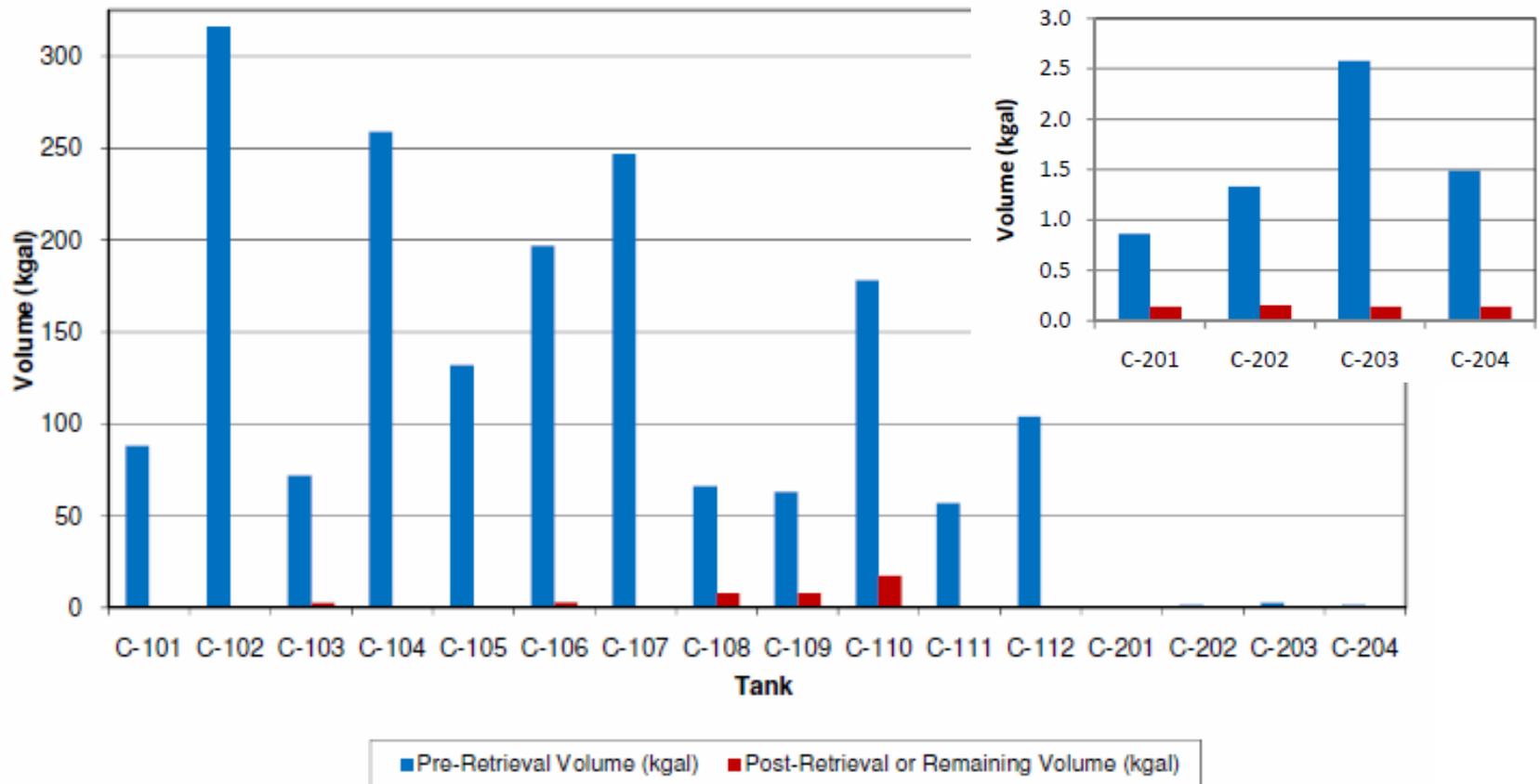
- **Retrieval Criteria**
- **Retrieval Summary**
- **Modified Sluicing**
- **Tank Updates**
 - Tank C-108
 - Tank C-109
 - Tank C-110
 - Tank C-104
- **Other Retrieval Technologies**
- **Q&A**



- **Milestone M-45-00 of the Tri-Party Agreement (TPA) sets retrieval criteria**
 - **Volume not to exceed:**
 - 360 ft³ (2,693 gal) for 100 Series tanks (75-ft diameter tanks)
 - 30 ft³ (224 gal) for 200 Series tanks (20-ft diameter tanks)
 - **Retrieve waste to the limit of waste retrieval technology capability**

Pre- and Post-Retrieval Volumes

- About 30% of the waste in C-Farm has been retrieved (544 kgal of 1,785 kgal)



- **Six C-Farm tanks retrieved (tank C-106 does not meet TPA residual volume requirement)**

Tank	Retrieval Method	Date Completed
C-106	Modified Sluicing and Oxalic Acid Dissolution	12/31/03
C-203	Vacuum Retrieval	3/24/05
C-202	Vacuum Retrieval	8/11/05
C-201	Vacuum Retrieval	3/23/06
C-103	Modified Sluicing	8/23/06
C-204	Vacuum Retrieval	12/11/06

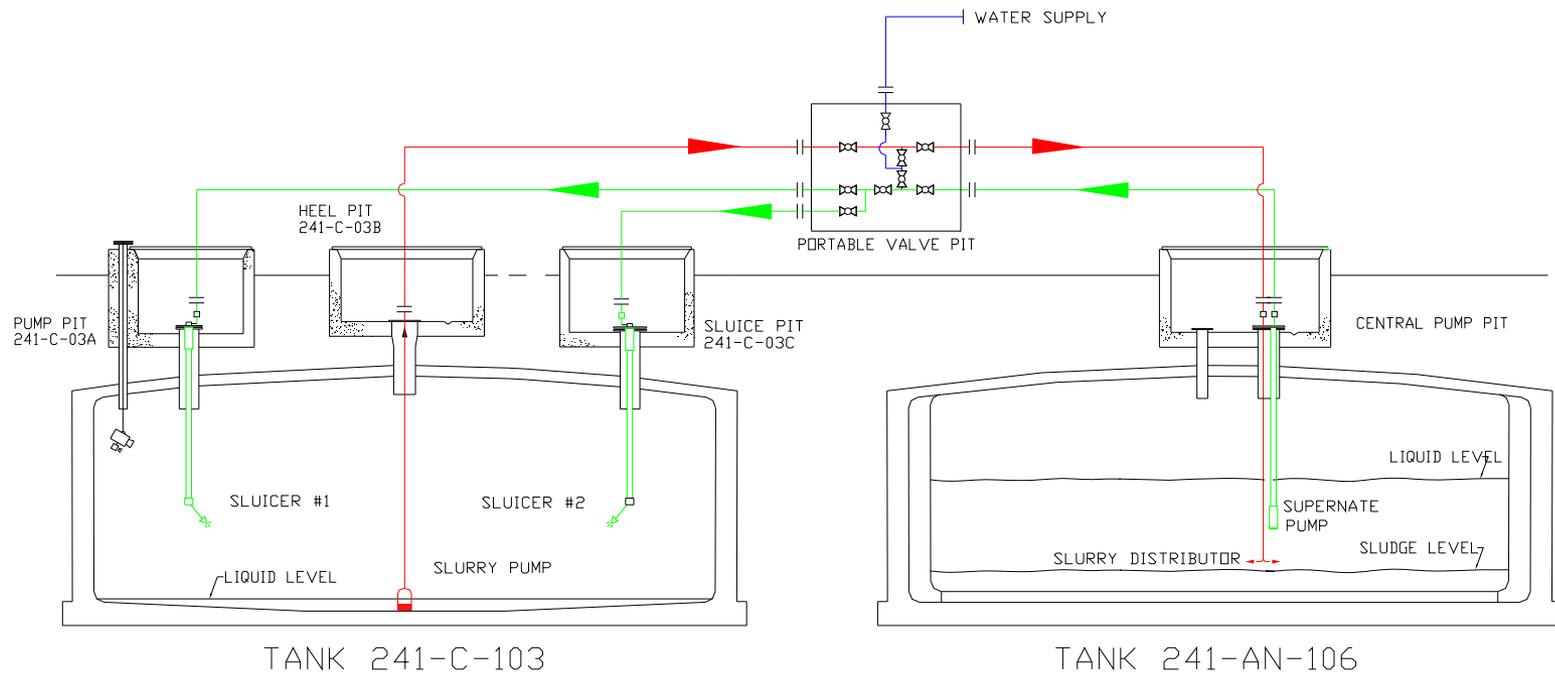
- **Three additional tanks have been retrieved to the limit of the modified sluicing technology**
- **With 6.8 to 17.2 kgal of waste remaining in the tanks, TPA residual volume requirements have not been met**

Tank	Retrieval Method	Date Ended
C-108	Modified Sluicing	4/27/07
C-109	Modified Sluicing	7/10/08
C-110	Modified Sluicing	4/27/09



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Modified Sluicing





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Modified Sluicing





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Modified Sluicing



- **Modified sluicing of tank C-108 was completed on April 27, 2007**
- **Limit of sluicing technology reached**
- **59.2 kgal (90%) of 66.0 kgal retrieved; 6.8 kgal remaining**
- **Residual waste is light-colored, sandy/gravel-like material with some larger chunks**



- **Sampling of residual waste is scheduled for the end of May**
 - Determine if caustic cleaning or other technology is applicable to tank C-108
 - Off-riser sampling system
 - Two samples from each of three locations



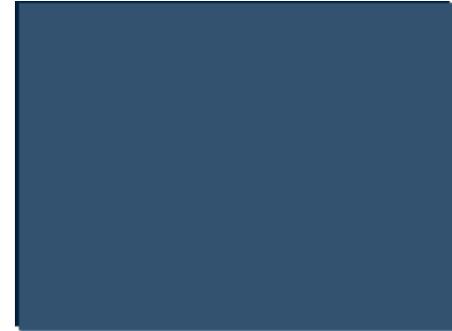
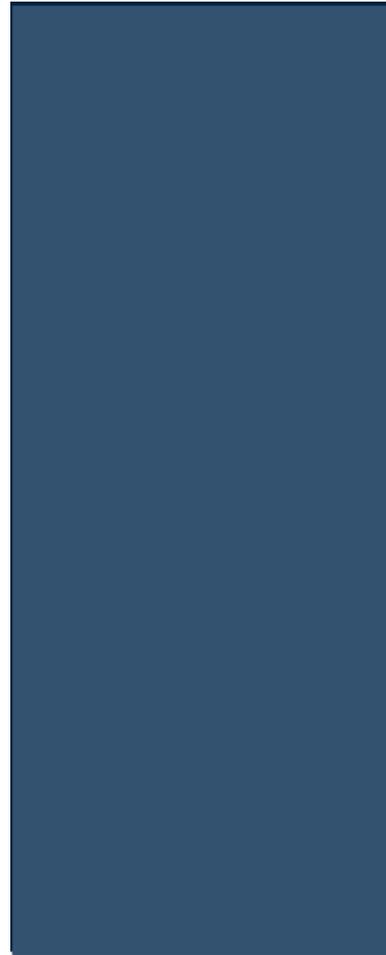


- **Modified sluicing of tank C-109 was completed on August 23, 2007**
- **Limit of sluicing technology reached**
- **53.5 kgal (84%) of 63.4 kgal retrieved; 9.9 kgal remaining**
- **Decision made to install FoldTrack Mobile Retrieval Tool in tank C-109**



FoldTrack Mobile Retrieval Tool

- **Folding tracked vehicle**
- **Can be installed in a 12-inch riser**
- **Plow blade to move waste to pump**
- **Solids size reduction using**
 - **Four water jet nozzles (scarifier) on plow blade**
 - **One water jet nozzle (cannon) through plow blade**
 - **Vehicle tracks**



- **Retrieval with FoldTrack started June 2, 2008**
 - Used to move waste toward slurry pump
 - Lost one of its tracks on the second day of operation
 - Continued FoldTrack operation until hydraulic fluid leak occurred
- **Continued sluicing solids**
- **Operations ended July 10, 2008**
- **Little additional waste removed**
- **Solids not easily suspended and pumped**





- **Residual waste is light-colored, sandy/gravel-like material with some larger chunks – similar to tank C-108**





Tank 241-C-110

- **Retrieval using modified sluicing began September 22, 2008 and ended April 27, 2009 when limit of technology was reached**
- **161 kgal (90%) of 178 kgal retrieved; 17.2 kgal remaining**
- **New 100-hp hydraulically-driven slurry pump**
 - Higher flow rates (~100 gpm vs. ~70 gpm)
 - Higher solids loading in slurry (initial loading of ~25 vol% vs. ~7 – 11 vol%)
- **Residual waste is similar in appearance to tanks C-108 and C-109, but more sand-like with fewer chunks**



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Tank 241-C-110

- Tank C-110 at completion of sluicing





Tank 241-C-104

- **Tank C-104 is the next tank that will be retrieved**
- **Modified sluicing technology will be used**
- **259 kgal sludge to be retrieved**
- **Construction ongoing, scheduled completion in early June**
- **Retrieval expected to begin in September**

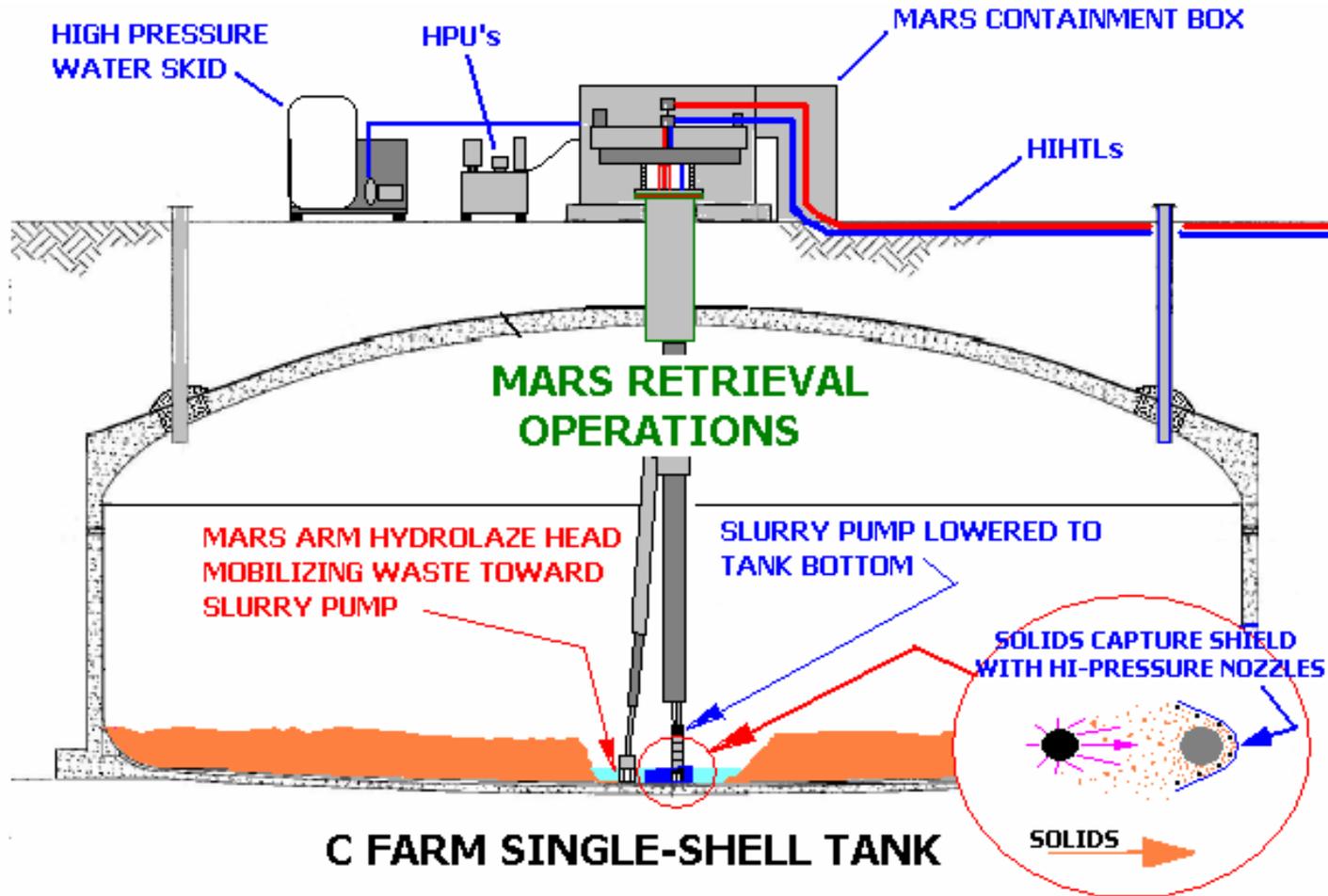
- **Process for retrieval of gibbsite waste heels**
- **Metathesis of insoluble gibbsite to soluble sodium aluminate:**



- **19 M NaOH**
- **Agitation and mixing is provided by slurry pump and sluicers**
- **Sodium aluminate is dissolved and pumped from the tank**
- **Tanks C-108, C-109, and C-110 may be candidates for caustic cleaning (sampling needed to evaluate applicability)**
- **Process test plan being for tank C-110 being developed**

- **Design and proof-of-principle testing underway**
- **Telescoping arm can extend across tank**
 - Same arm for retrieving either an assumed leaking tank or a sound tank
 - Various end-effectors
- **Installation of large, centrally-located riser required (~42-inch)**
- **Vacuum system (for assumed leaking tanks)**
 - Use existing vacuum skid
 - Vacuum Separator Tank (VST); tank in SST
- **Waste pumping system**
 - Centrifugal pump for both:
 - Vacuum system (assumed leaking tanks)
 - Sluicing system (sound tanks)

Mobile Arm Retrieval System (MARS)



MARS – Sound Tank System



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Q&A/Contact

- **Q&A**
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