Tanks 18 and 19 Mechanical Cleaning

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Tank 18 History

- **From 1959 thru 1985 Tank 18 was filled with approximately 1.3M gallons of sludge and salt high level waste.**
- **During 1986 and 1987 three standard slurry pumps and a telescoping transfer pump removed most of the salt and sludge leaving approximately 47K gallons of waste to be removed.**
- **In 2003 Advanced Design Mixer Pump (ADMP) was installed in the center riser to remove 47K gallons of remaining sludge.**
  - **Six (6) slurry campaigns were executed to remove the remaining waste leaving approximately 4.3K gallons of solids in Tank 18.**
- **Residual waste sampled and analyzed to verify Waste Incidental to Reprocessing (WIR) requirements were met IAW DOE Order 435.1.**

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Tank 18 Residual Waste

Tank 19 History

- From 1961 thru 1980 Tank 19 was filled with approximately 1.3M gallons of sludge, zeolite, and salt high level waste.
- During 1980 and 1981 two standard slurry pumps and approximately 2.3M gallons of water were used to transfer salt material to Tank 18. Approximately 33K gallons of solids remained.
- In 2000 three submersible turbine mixers were installed to remove remaining 33K gallons of solid waste.
  - Forty six (46) campaigns were executed to remove the remaining waste leaving approximately 15K gallons of solids in Tank 19.
- Residual waste sampled and analyzed to verify Waste Incidental to Reprocessing (WIR) requirements were met IAW DOE Order 435.1.

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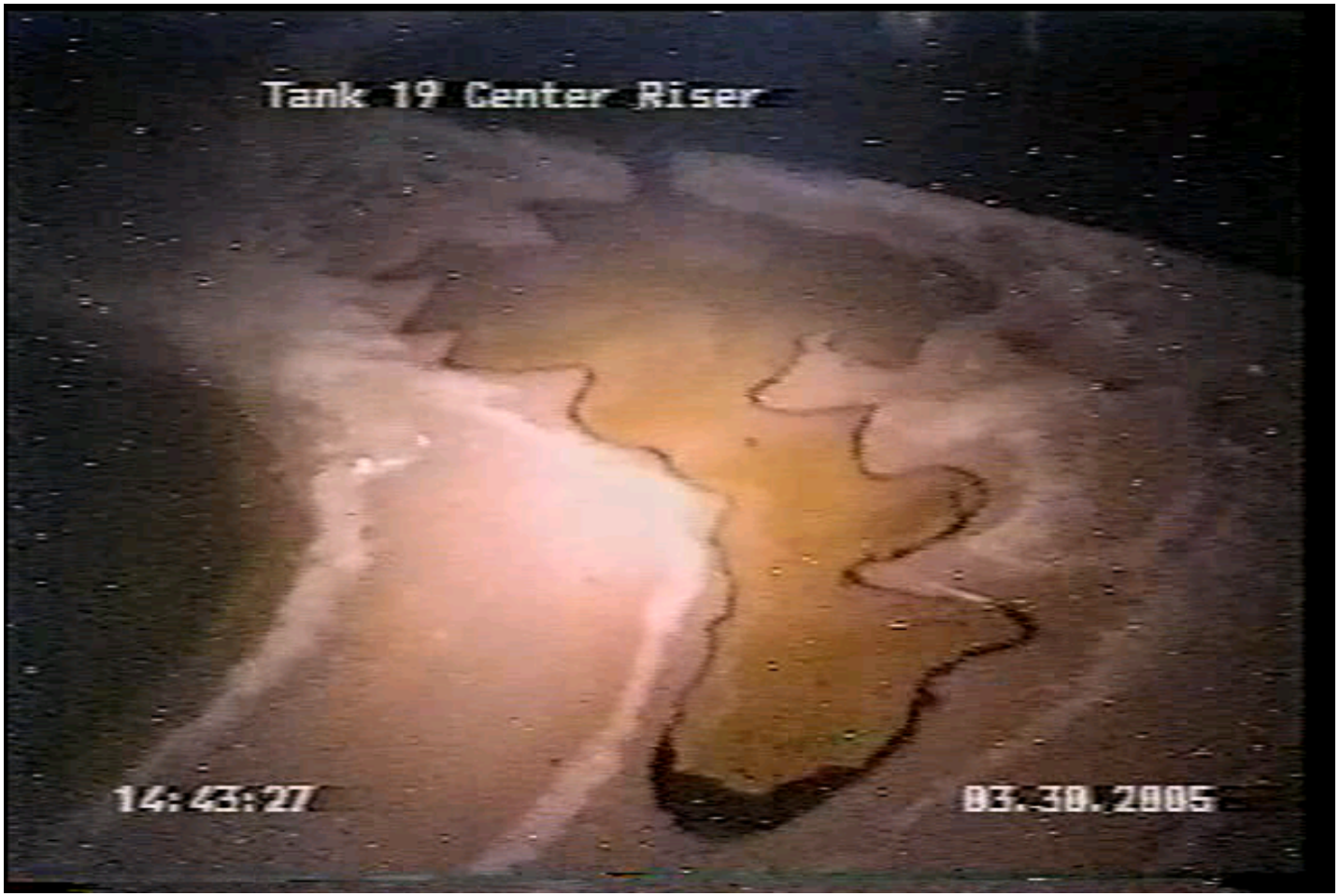
Tank 19 Residual Waste



Waste Incidental to Reprocessing

- DOE Order 435.1 governed Tank Closure during last waste removal efforts from Tanks 18 and 19
- DOE Order 435.1 required Waste Incidental to Reprocessing (WIR) Evaluation be performed
- If WIR requirements were met, waste could be managed as Low Level Waste
- WIR requirements:
  - Key radionuclides removed to maximum extent technically and economically practical
  - Meet safety requirements comparable to performance objectives in 10 CFR 61, Subpart C
  - Incorporated into a solid physical form at a concentration not exceeding NRC Class C Low Level Waste or alternative

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Waste Determination Section 3116

- National Defense Authorization Act signed into Law in 2004 and Section 3116 requires waste removal to Maximum Extent Practical (MEP)
- A promising technology was identified at the Tank Cleaning Technological Exchange in March 2006 and WSRC made commitment to DOE to evaluate technologies for the removal of additional waste from Tanks 18 & 19
- WSRC issued RFP for a fixed price contract to design, install and operate equipment to remove additional waste from Tanks 18 and 19
- Three vendors responded with proposals that were evaluated based on Best Value
- TMR was selected and contract awarded

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Statement of Work

- Work scope broken into three Phases:
  - Phase 1 – Proof of Concept
    - Provide conceptual design, drawings, and test setup for the demonstration of the waste removal concept
    - Fabricate and assemble concept waste removal system and perform demonstration at vendor's facility.
  - Phase 2 – Full Scale Demonstration
    - Provide final design, operating instructions and equipment for full scale waste removal system.
    - Fabricate and assemble actual system to be deployed and test the cleaning capabilities using mockup of tank and facility conditions and simulated waste at the vendor's facility.
  - Phase 3 – Tanks 18 and 19 Waste Removal
    - Transport waste removal system to SRS, install, and operate to remove waste from Tanks 18 and 19.

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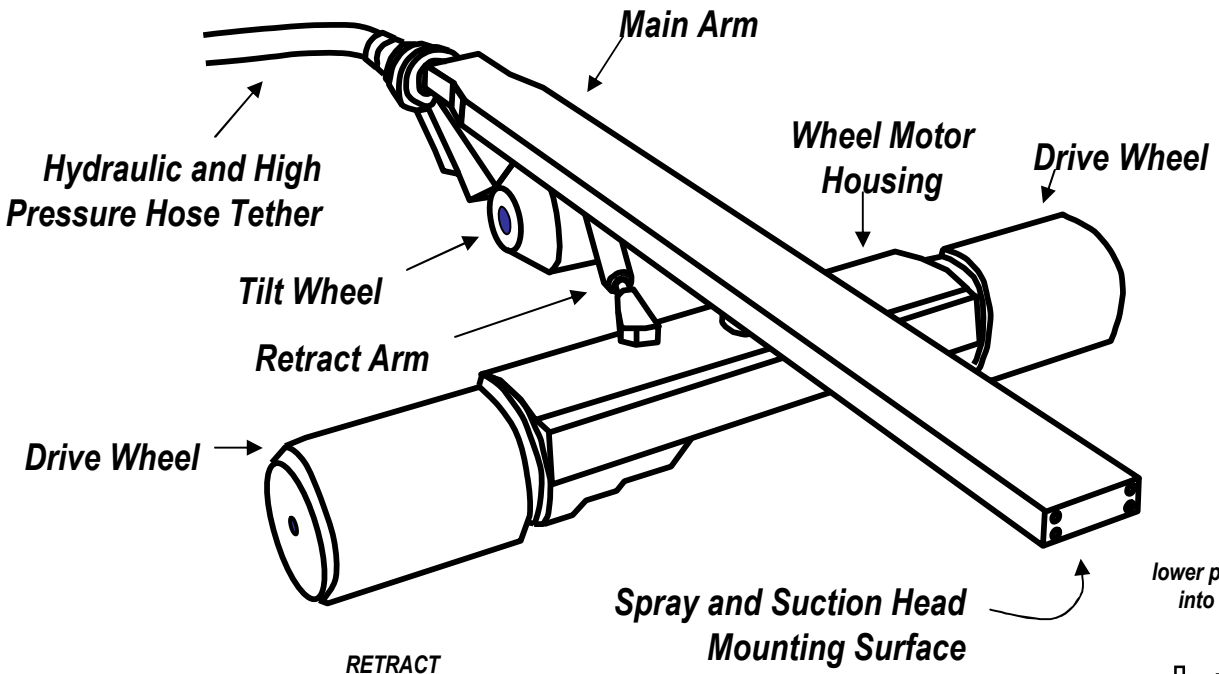
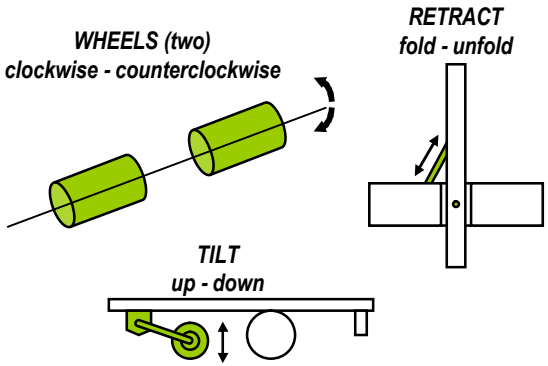
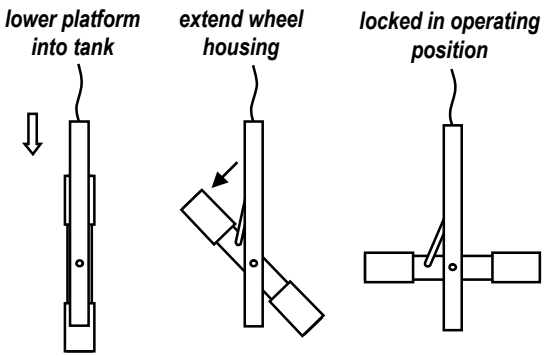
Sand Mantis Cleaning Device*

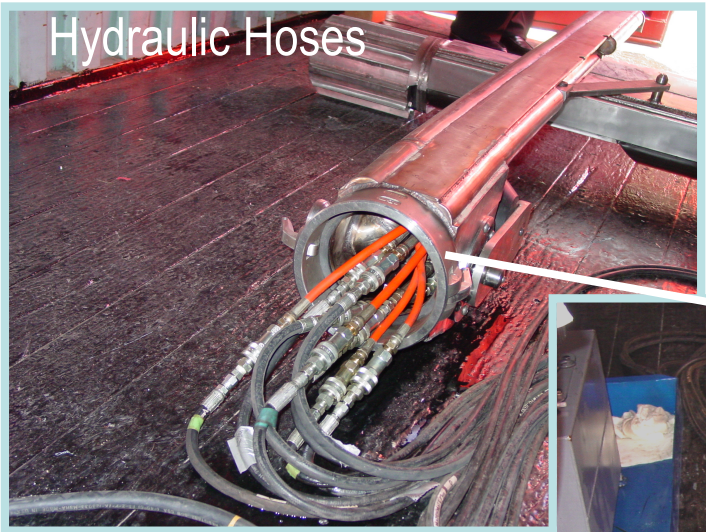


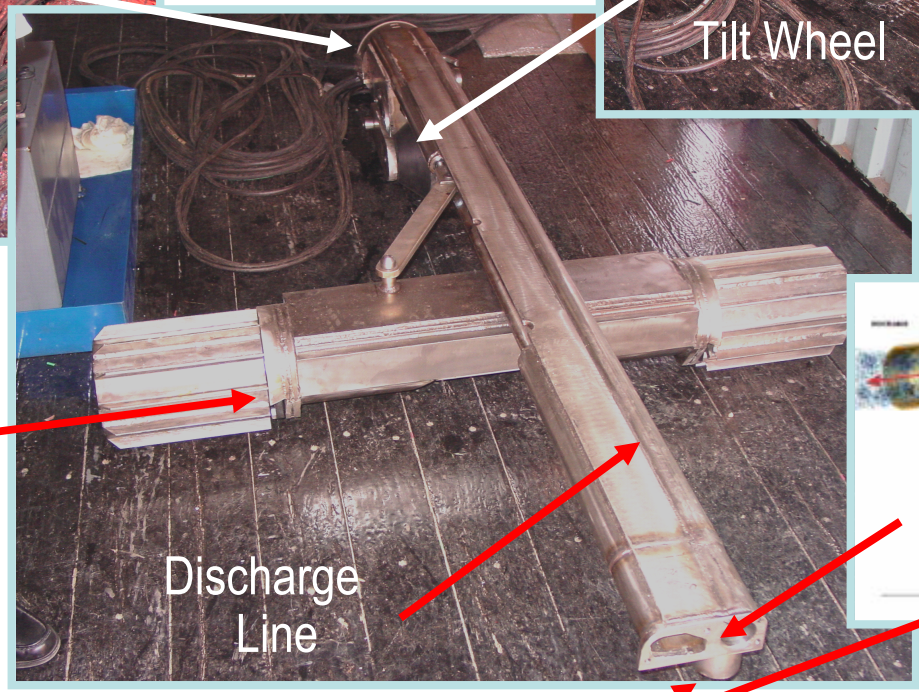


Tank Insertion



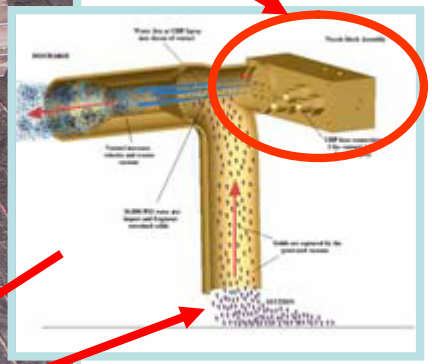
Sand Mantis*



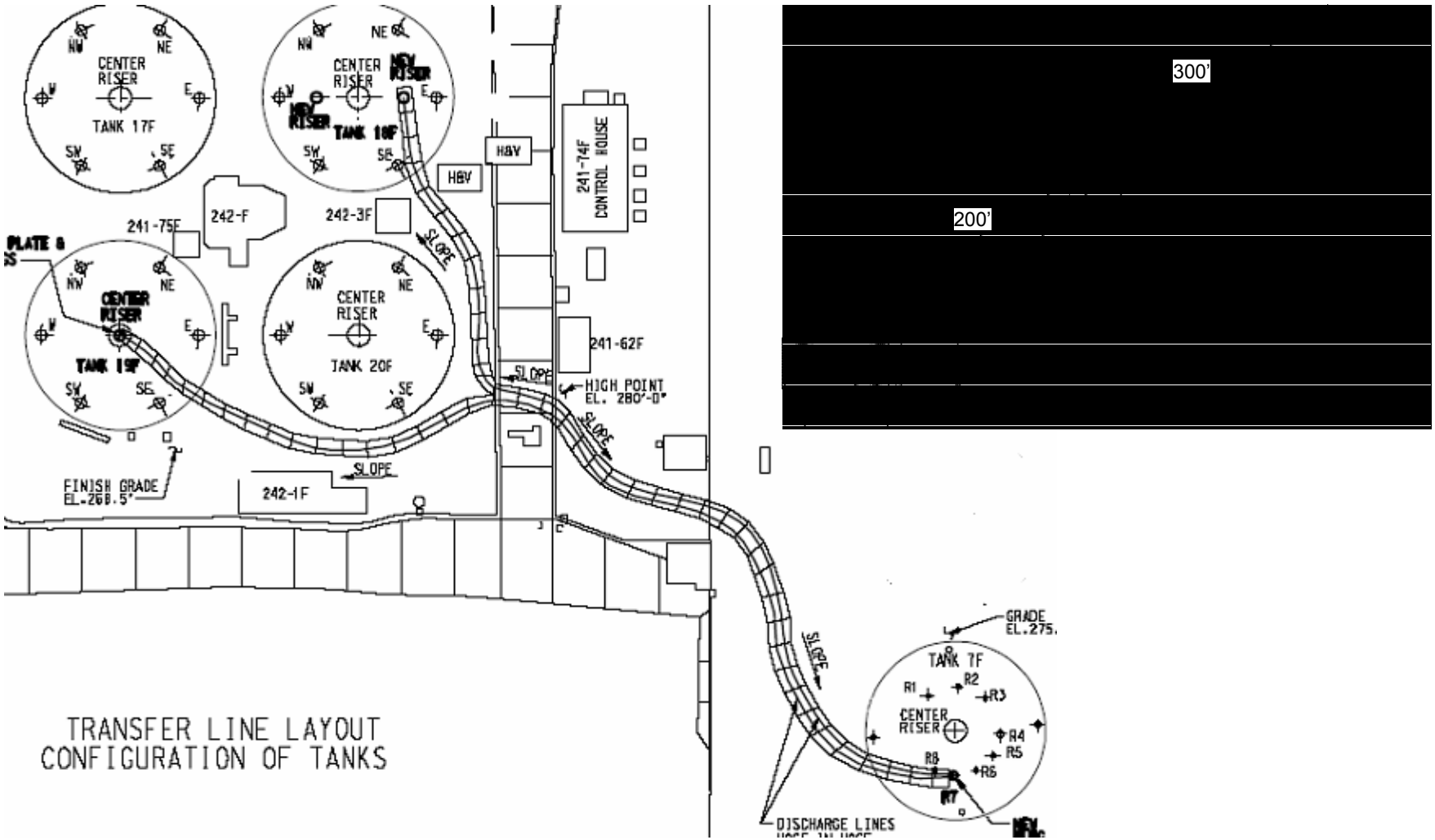


Cable Cutter

Eductor (not shown in picture)



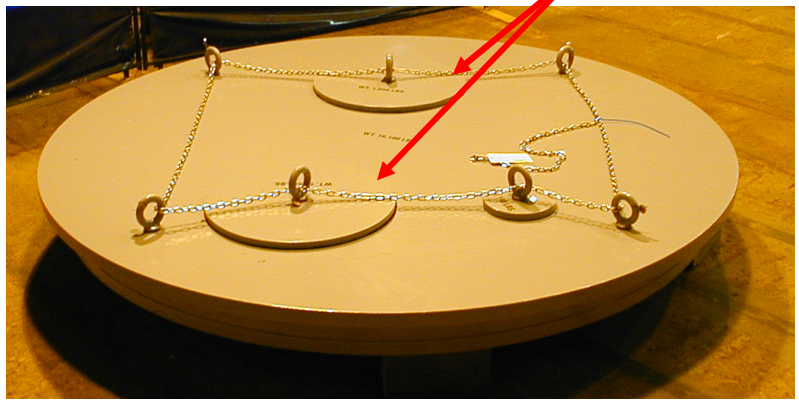
Proposed Transfer Route



Tank 19 D&R

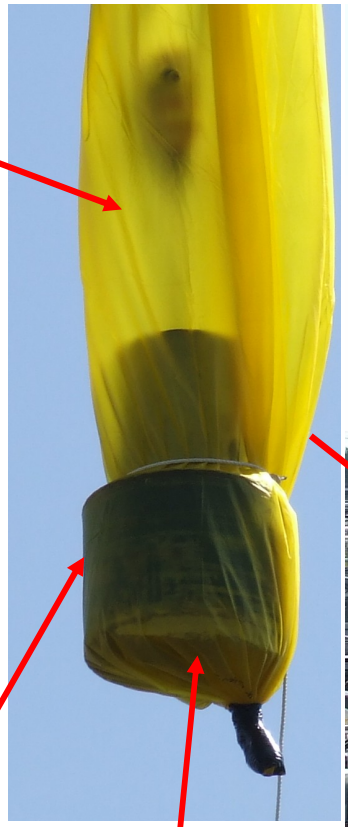
Tank 19 Center Riser With Structural Steel and BW Tank Removed

24" Riser Openings



Tank 19 Riser Cover Shield Plate

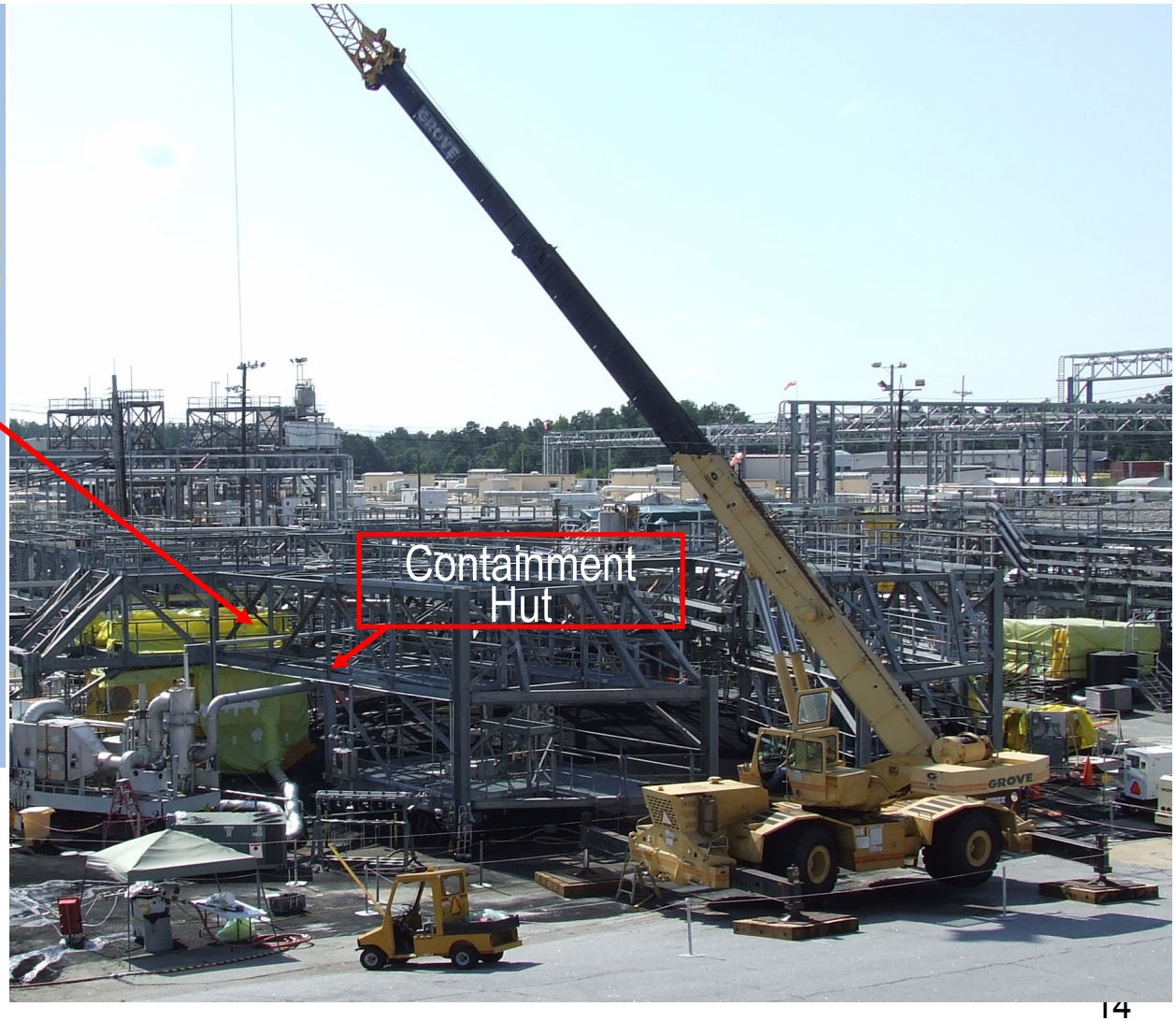
Tank 18 Core Drilling



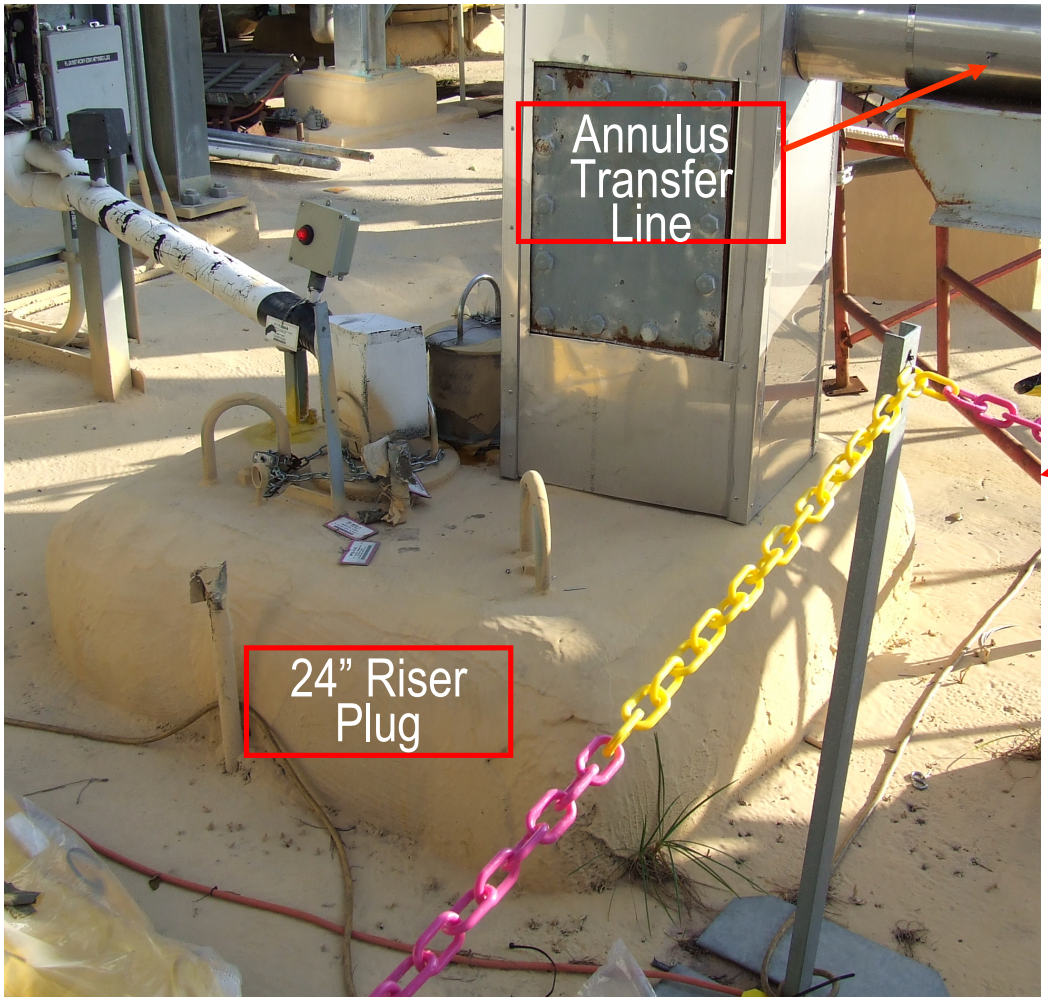
Core Drill Machine

Core Drill Bit

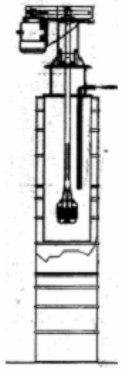
24”Concrete Core



Tank 7 D&R

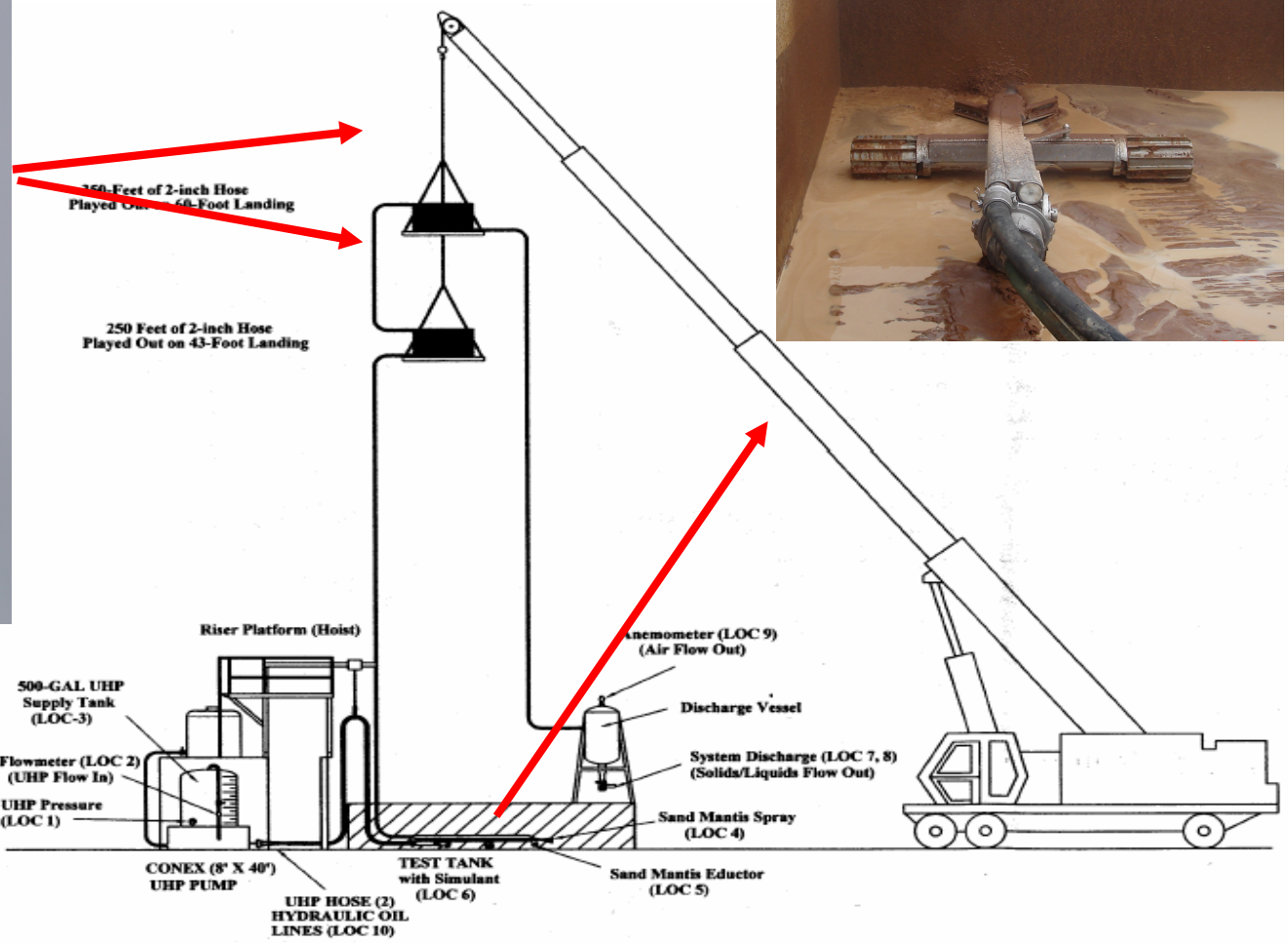


Particle Grinder will be placed in 24” Riser Opening



Particle Grinder

Phase 1 Test Setup*



Phase 1 Test – Zeolite Mound*

Phase 1 Test –Zeolite Layer*

Phase 1 Test – Transfer Line Segment*

Phase 1 Test – Transfer Line Segment*

Hockmeyer Mill*

Zeolite Prior to Grinding

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Hockmeyer Mill in Operation*

Project Status

- Phase 1 Field Testing Completed
- Phase 1 Demonstration Completion Report in review by WSRC
- WSRC release of TMR to proceed to Phase 2 imminent