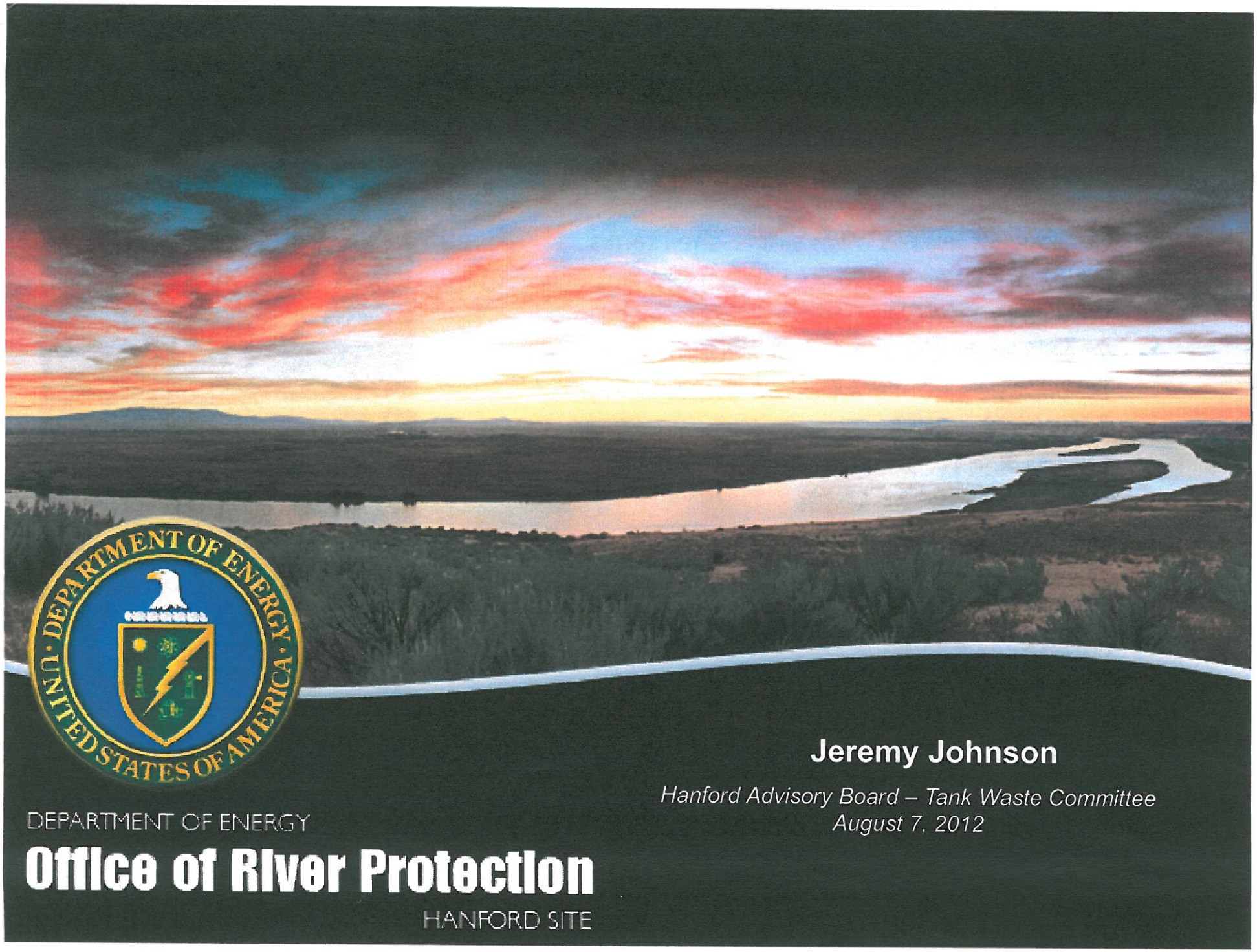
TWC ~~PAP~~ 8/7/12 (1)



DEPARTMENT OF ENERGY

Office of River Protection

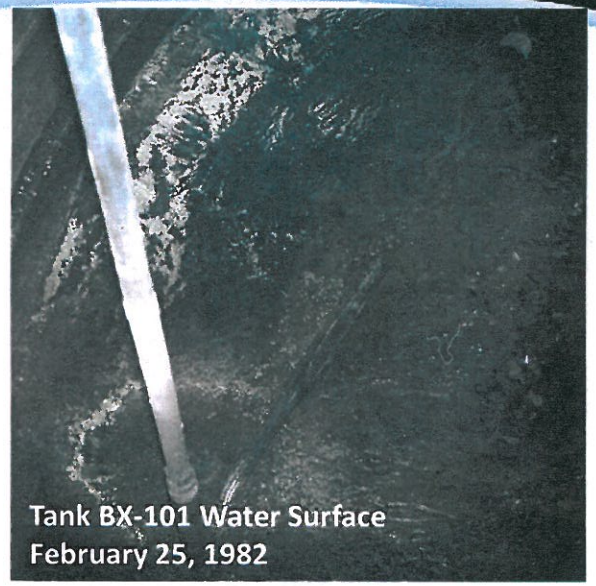
HANFORD SITE

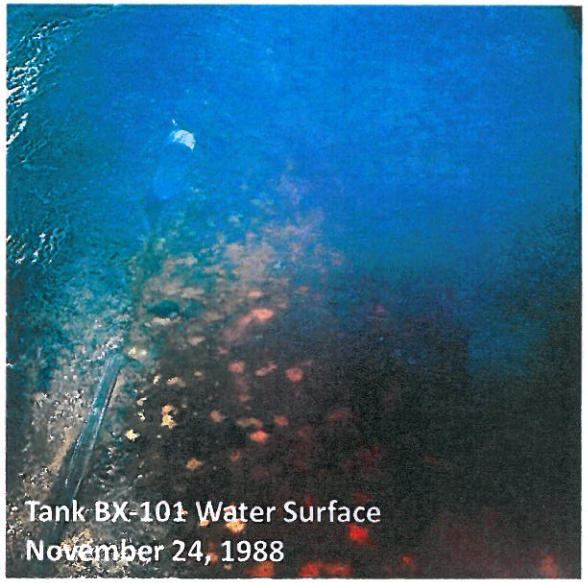
Jeremy Johnson

Hanford Advisory Board – Tank Waste Committee
August 7, 2012

Background

- Removal of liquids from single-shell tanks (SSTs) has been a priority since taken out of service in November 1980
- 29 SSTs were the subject of Interim Stabilization Consent Decree that was in place from 1999 – 2011
- BX-101 and BX-103 have history of water intrusion since the 1980s
- Intrusion can increase tank volume (supernatant and/or total drainable liquid) to a point that exceeds interim stabilization criteria
- intrusion prevention measures installed.


Tank BX-101 Water Surface
February 25, 1982


Tank BX-101 Water Surface
November 24, 1988

Background

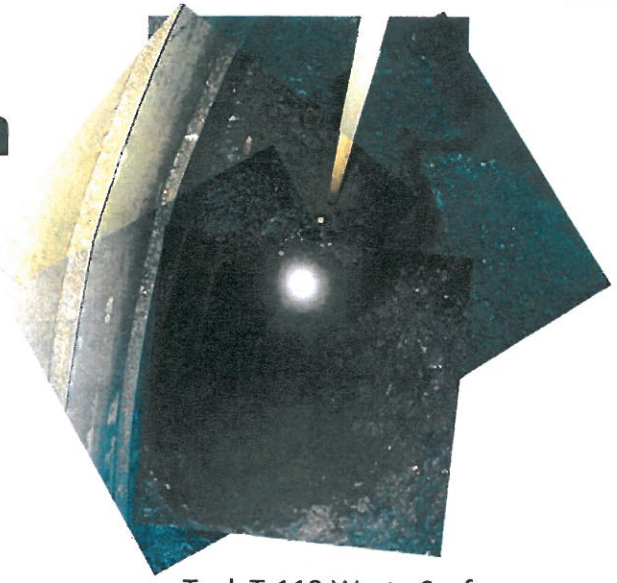
- Rationale for intrusion monitoring:
  - Raw water that enters a tank becomes waste, increasing the total waste volume
  - A significant intrusion could necessitate an increase in monitoring
  - Additional liquid increases the hydrostatic head, leading to a potentially higher leak rate
  - If there has been a leak in the sidewall above the existing liquid level, an intrusion could reactivate that leak

- Interim stabilization actions were thought to be complete when tanks were isolated from transfer lines, inlets sealed and other intrusion prevention measures installed.

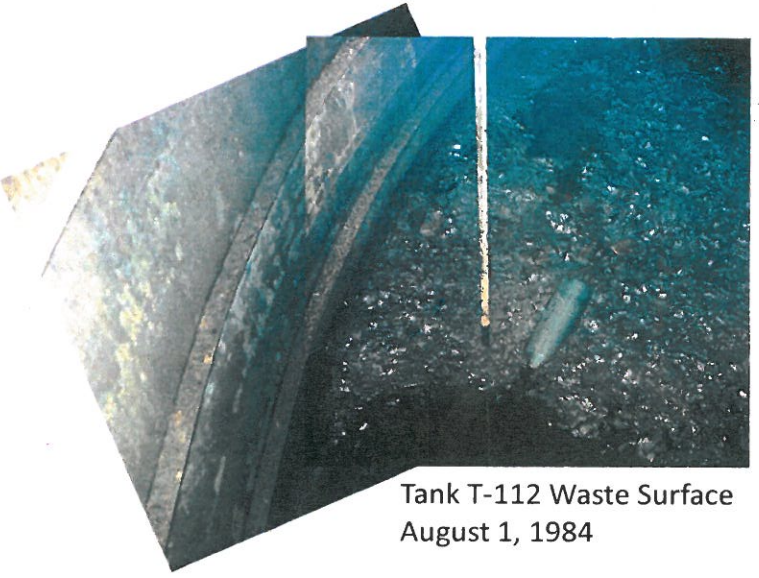
Single-Shell Tank Suspect Intrusion

- In 2011, Washington River Protection Solution (WRPS) initiated review of long-term behavior of liquid levels in single-shell tanks (SSTs) in B/BX/BY tank farms. Review expanded to all SSTs

- RPP-50799 (River Protection Project) reports result of review for all 149 SSTs
  - Holistic review of surface level monitoring data went well beyond standard leak/intrusion detection procedures
  - DOE Office of River Protection (ORP) has determined that 14 tanks could have reached supernatant interim stabilization criterion (>5,000 gallon) this year based on surface level trends in addition to 3 known tanks (BX-103, T-102, T-112); 4 more by about 2024
  - RPP-50799 provides detailed results, discussion, available photos for these 21 tanks



Tank T-112 Waste Surface
August 1, 1984



Tank T-112 Waste Surface
August 1, 1984

Single-Shell Tank Suspect Intrusion

- Volume estimates are very speculative without visual confirmation; assumes surface level increase is due to liquid covering entire tank surface (~2,750 gallon/inch). Confounding factors include:
  - Changes in measuring devices and/or locations
  - Changes in nature of waste (crystal structure, porosity, etc.)
  - Surface changes of sludge and saltcake
  - Localized liquid pools

Intrusion verification, like leak verification, requires careful evaluation of multiple data sources and factors – not just surface level trends

Follow-Up Actions

- WRPS issued engineering report RPP-50799, *Suspect Water Intrusion in Hanford Single-Shell Tanks, May 2012*

- Monitoring frequency to be increased to weekly for select tanks
  - WRPS confirmed weekly monitoring for tanks with highest suspect intrusion rate (BY-101 and S-109)
  - Priority for tanks with reasonable ability for detection of a trend (e.g., more than ~250 gallon/year)
  - Could change frequency for ~5-8 tanks

- WRPS continuing inspection of SST isolation / weather protection intrusion barriers

Follow-Up Actions (continued)

- Re-prioritize SSTs for visual inspection in Fiscal Year 2013. SST Integrity program scope includes 12 visual inspections annually of SSTs. Priorities based on:
  - Rate of apparent liquid accumulation (potential to observe intrusion)
  - Leak integrity status (potential to release to the environment)
  - Availability of post-stabilization benchmark photo (visual baseline for comparison)
  - Field accessibility
- Define information to be acquired by visual inspection and actions to be taken. Meet needs for both structural integrity and "intrusion" inspections

Tank T-102 Apparent Intrusion Site
July 26, 1983

Follow-Up Actions (continued)

- Revise intrusion specification/criteria
  - Define basis for updating RPP-9937 and OSD-T-151-00031 based on findings
- Tank waste inventory reporting – reconcile HNF-EP-0182 volume reporting

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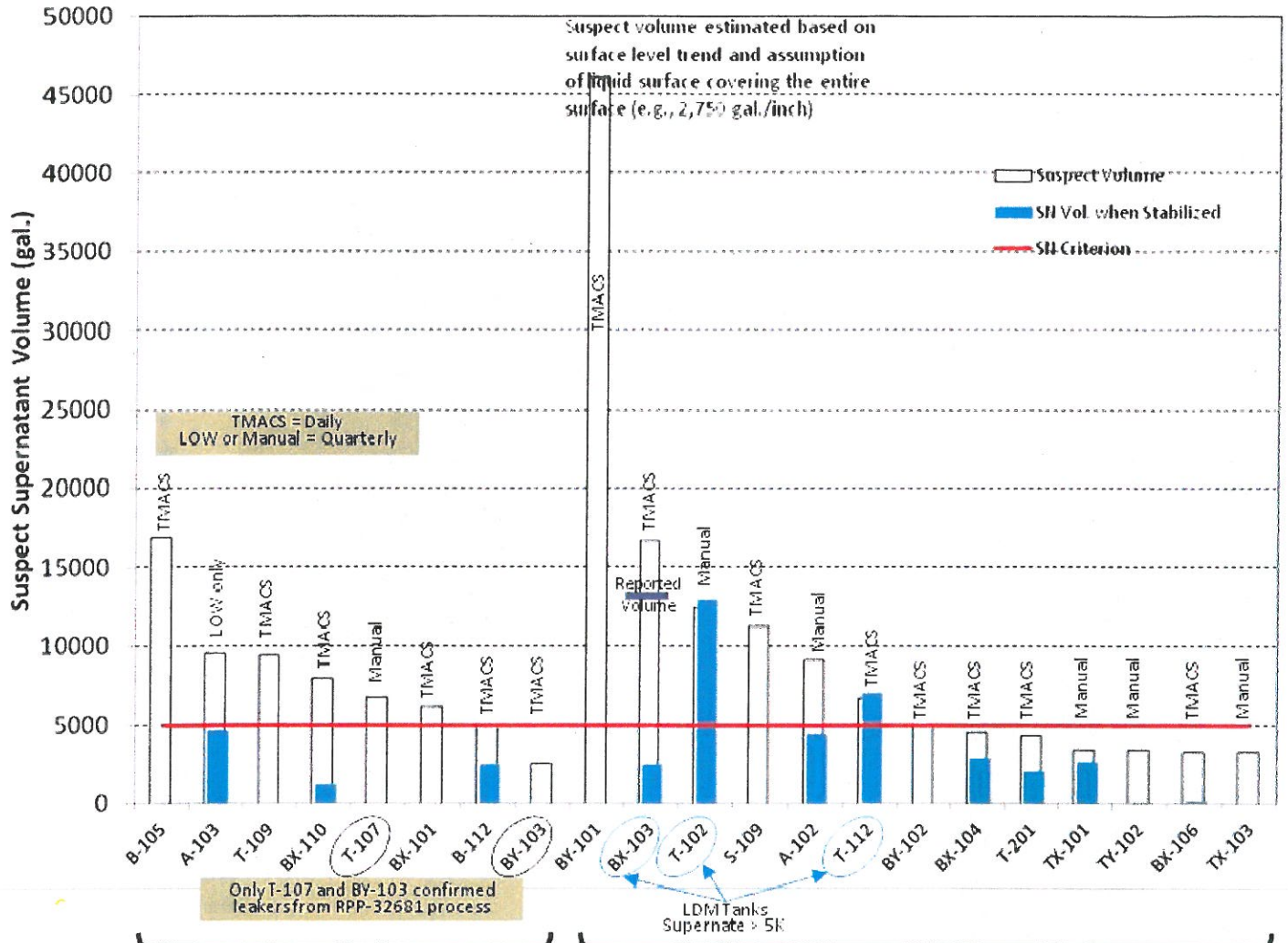
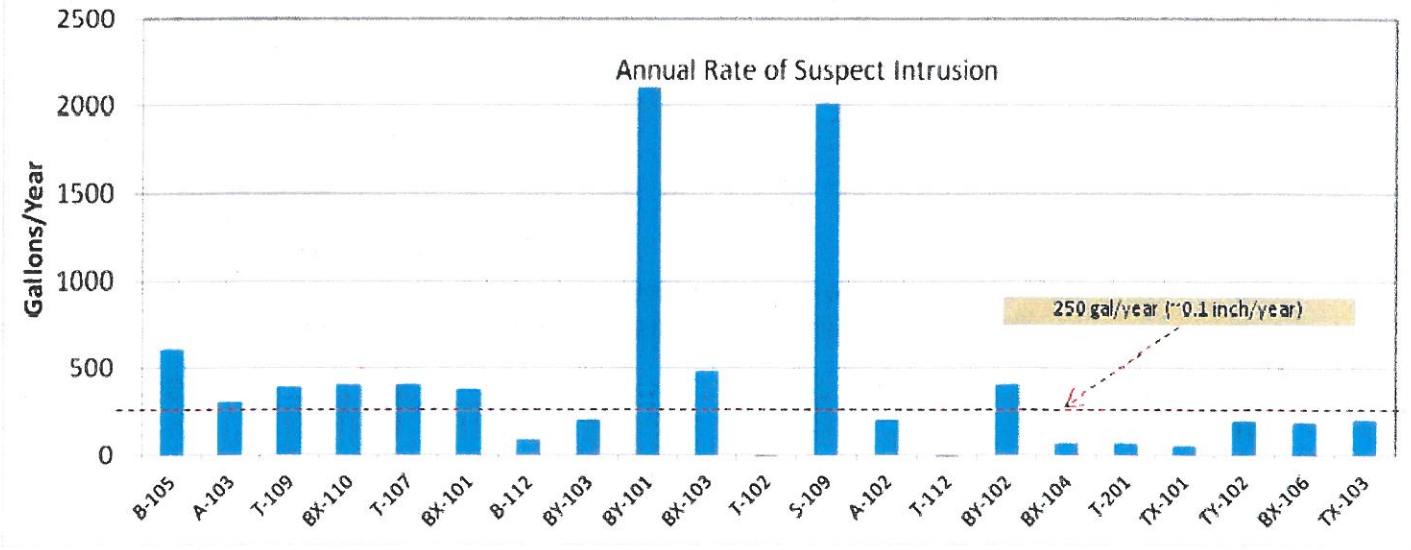
Backup Slides

Suspect Supernatant Volume (from RPP-RPT-50799, Rev. 0)

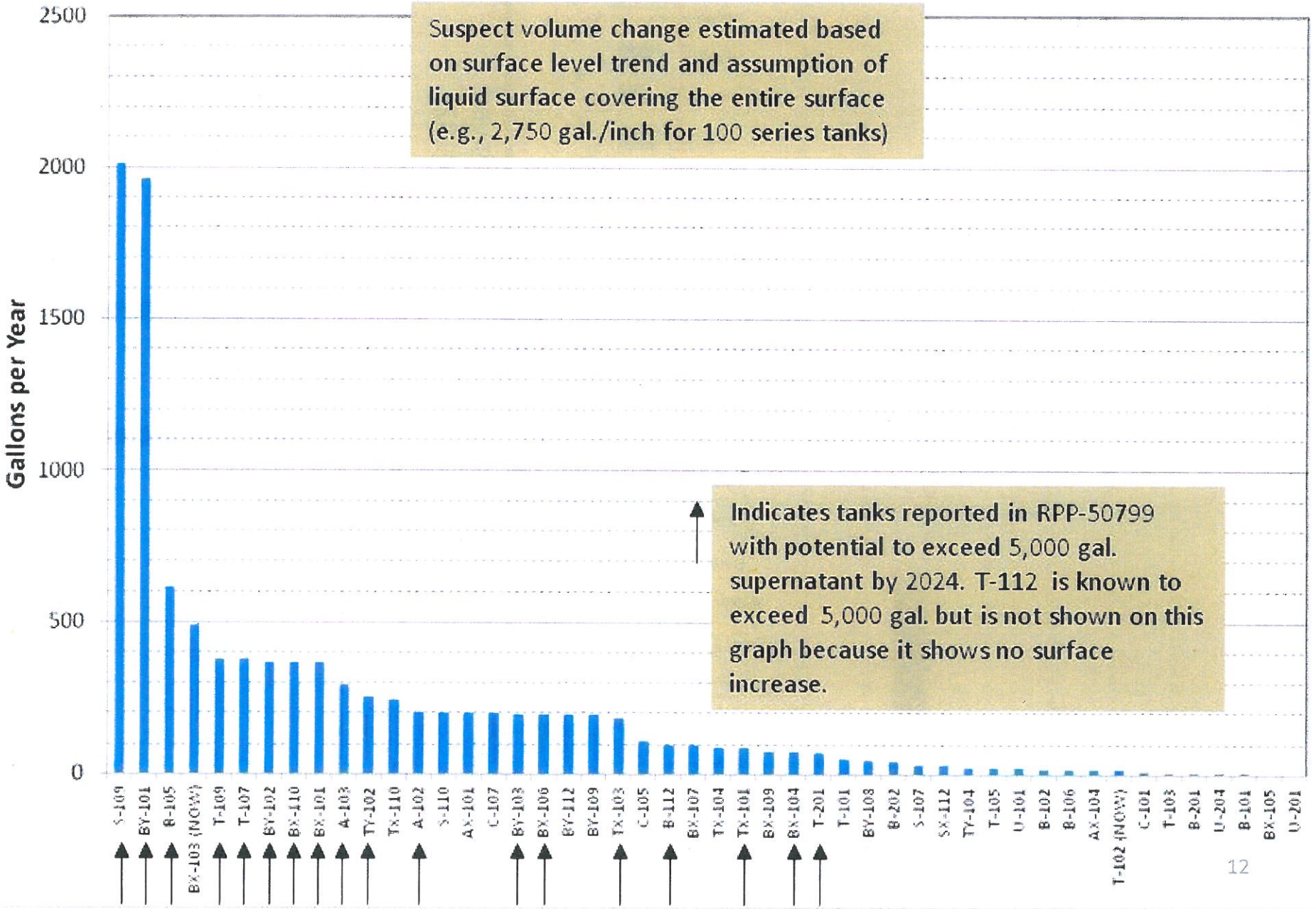
21 Tanks with Potential to Exceed 5,000 gal. supernatant by 2024





Suspect Intrusion Rate (Gallons/Year)

From RPP-RPT-50799, Rev. 0



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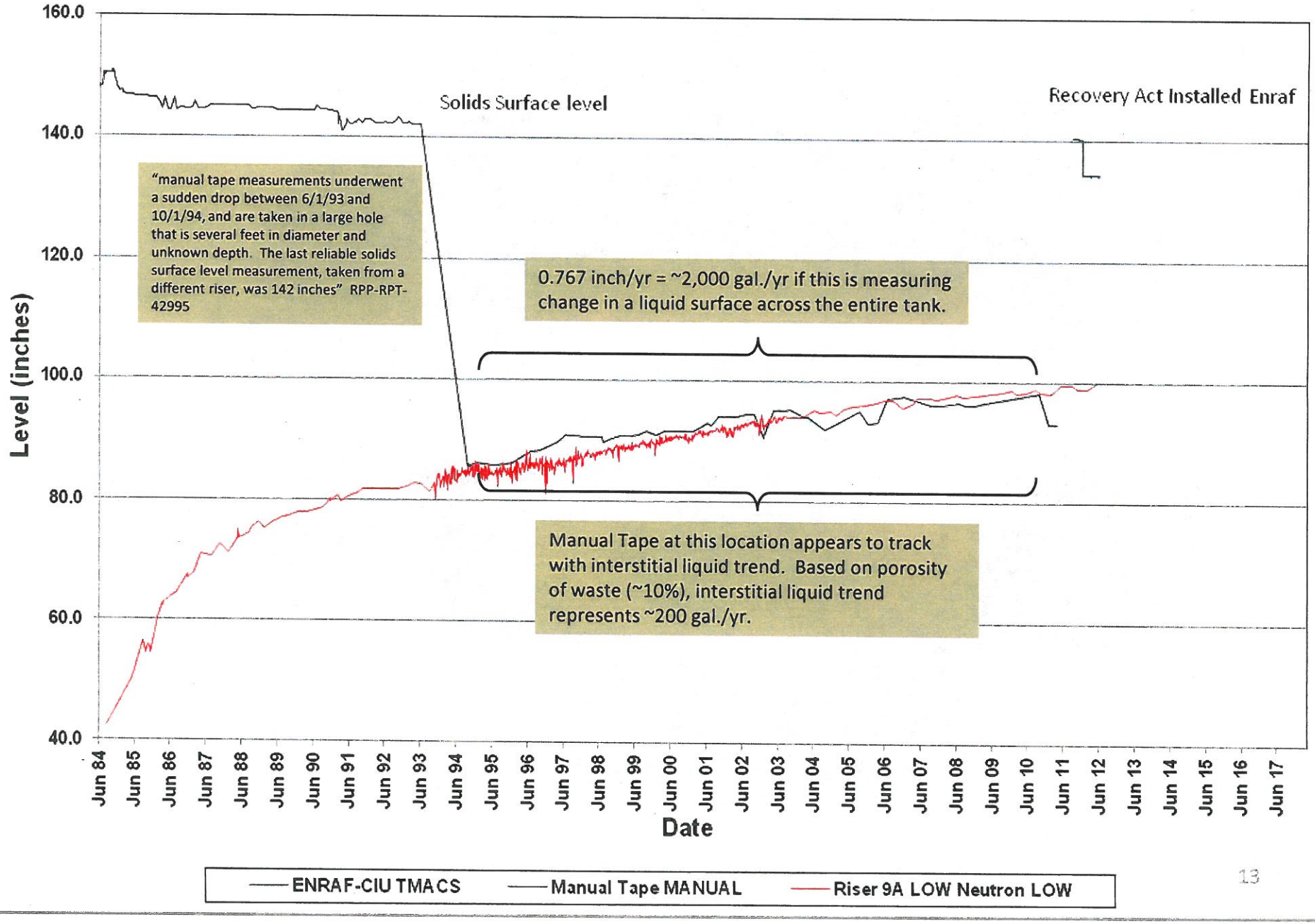
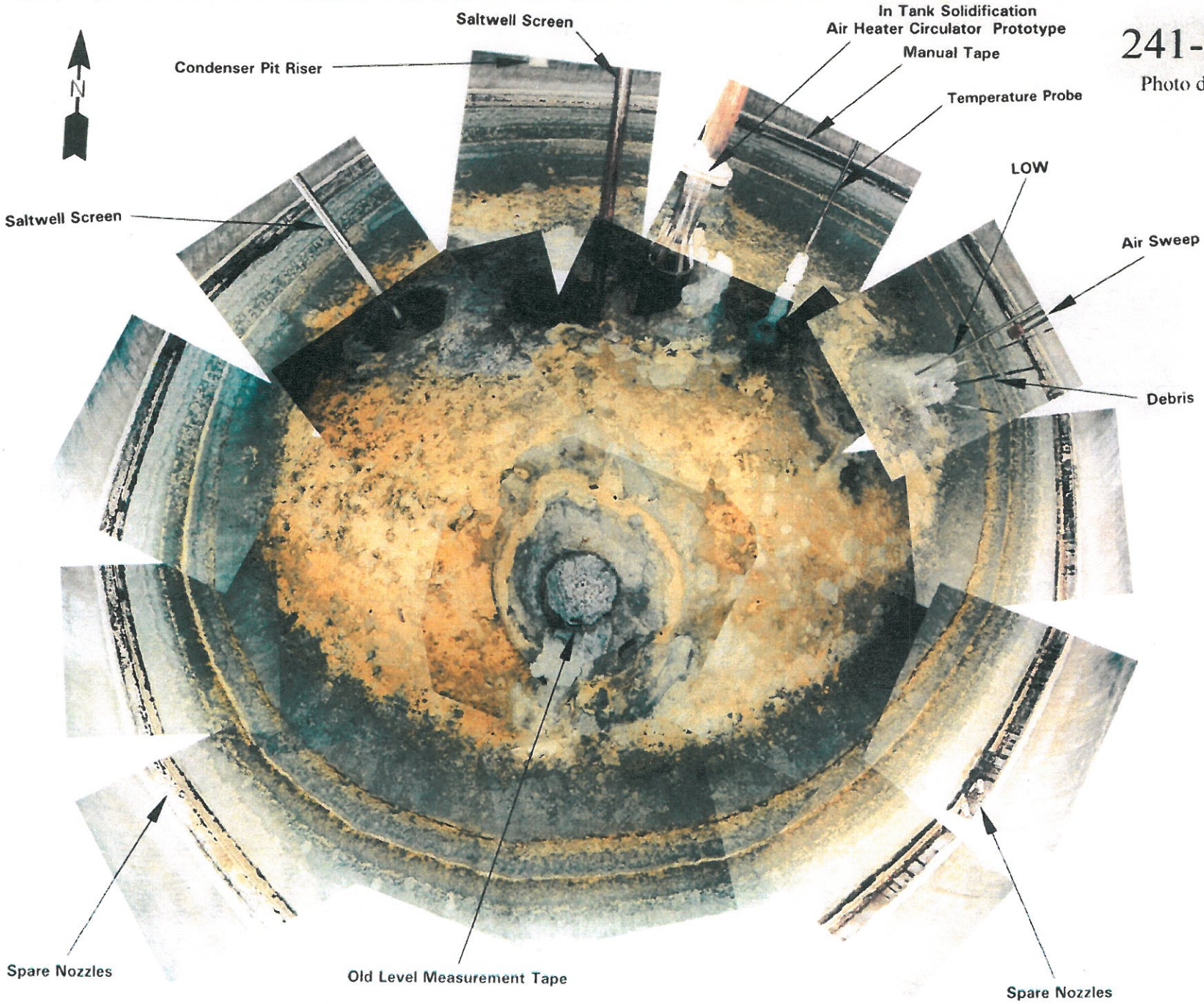
Start Date: 06/01/1984
End Date: 06/05/2012
Data Types: Good Transcribed

Structure BY101





241-BY-101

Photo date: 9-19-89