



**Savannah River
Remediation**

We do the right thing.

Enhanced Chemical Cleaning

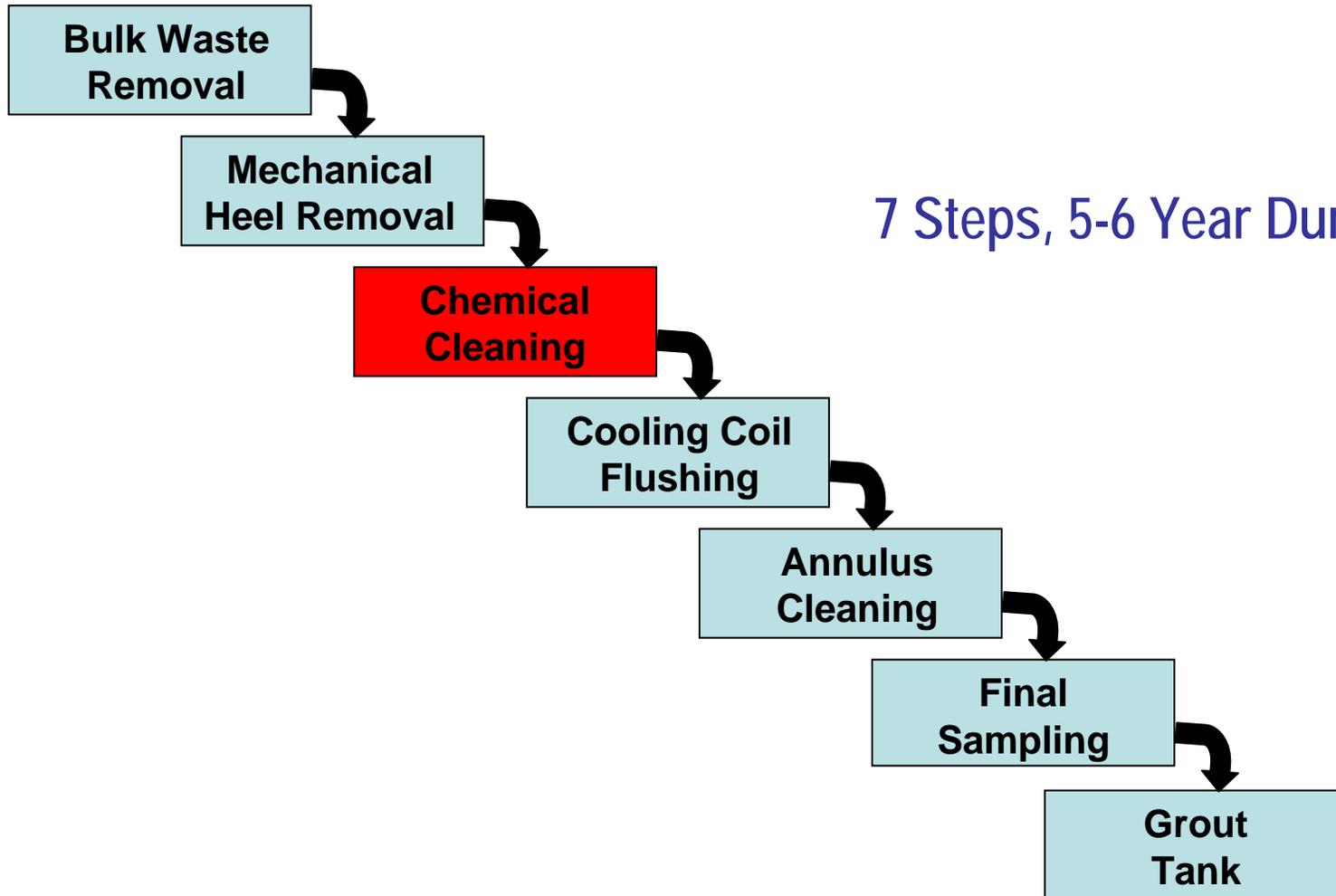
Presentation to:
EM Waste Processing Technical Exchange

11/16/2010

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Project Manager

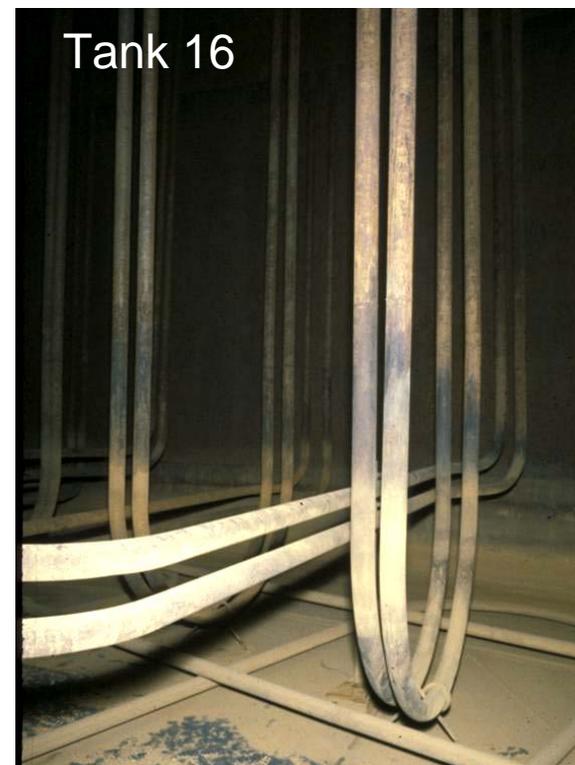
Savannah River Remediation



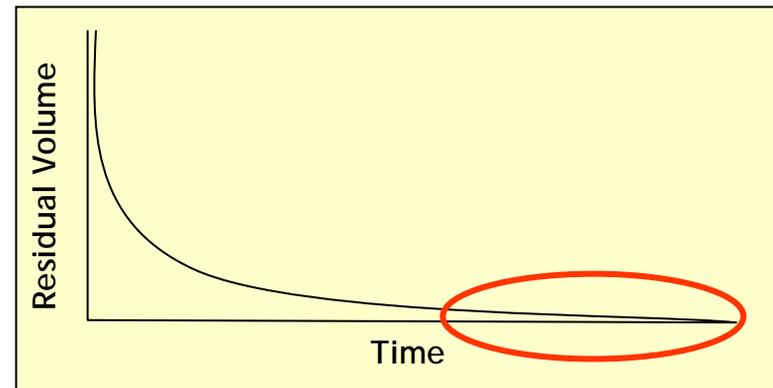
7 Steps, 5-6 Year Duration

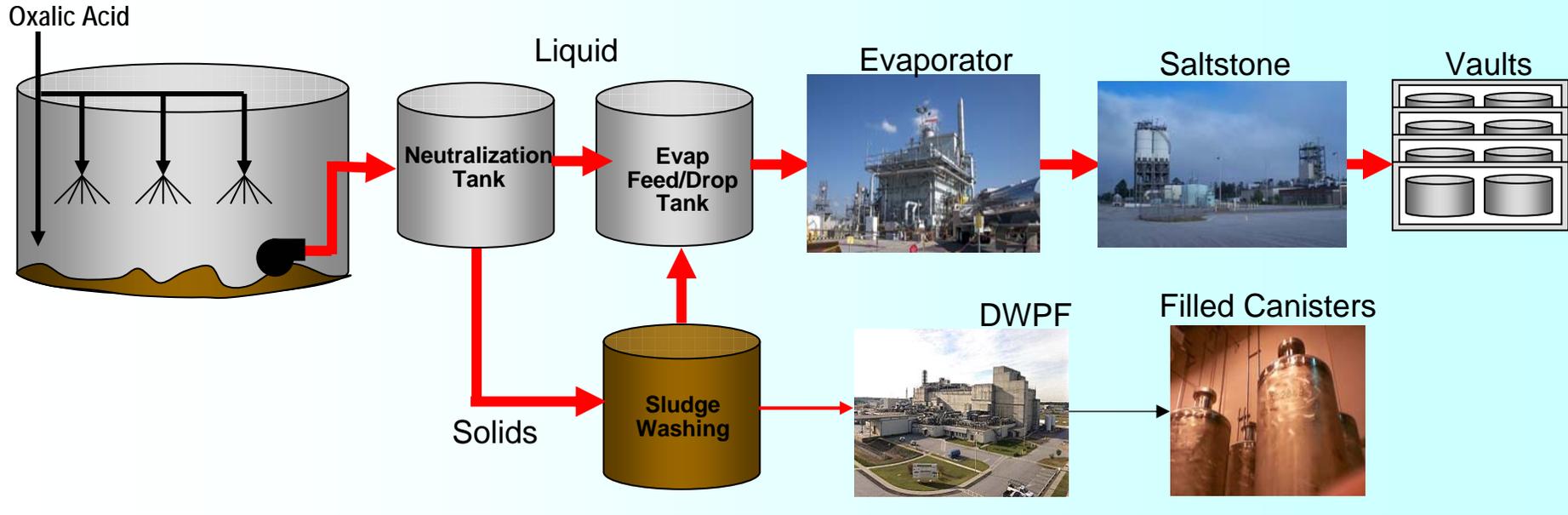


- Oxalic Acid is the best all-purpose acid for SRS carbon steel tanks
 - Dissolves sludge
 - Compatible with carbon steel
 - Used on Tanks 16, 5 and 6
- Bulk Oxalic Acid cleaning has worked well, but managing the spent acid is difficult
 - Prolongs sludge washing
 - Impacts evaporator operation
 - Adds to salt inventory
 - Extends processing life cycle
 - Impacts grout quality
 - Adds vaults



- Standard operations to get the residual waste volume down to $<5\%$
- Then it takes ~ 2 more years to get to $<1\%$
- ECC addresses the flat part of the curve
 - Final cleaning in 6 months
 - *Without* the spent acid management issues





- ***Oxalates from chemical cleaning impact salt processing***
- ***A process change was needed***



We do the right thing.

- Eliminate the impacts to the Tank Farm
- Dilute acid process to minimize material-at-risk
- Leverage commercial power industry processes and adapt them to our specialized application
- Portable, modular, temporary equipment like Waste on Wheels

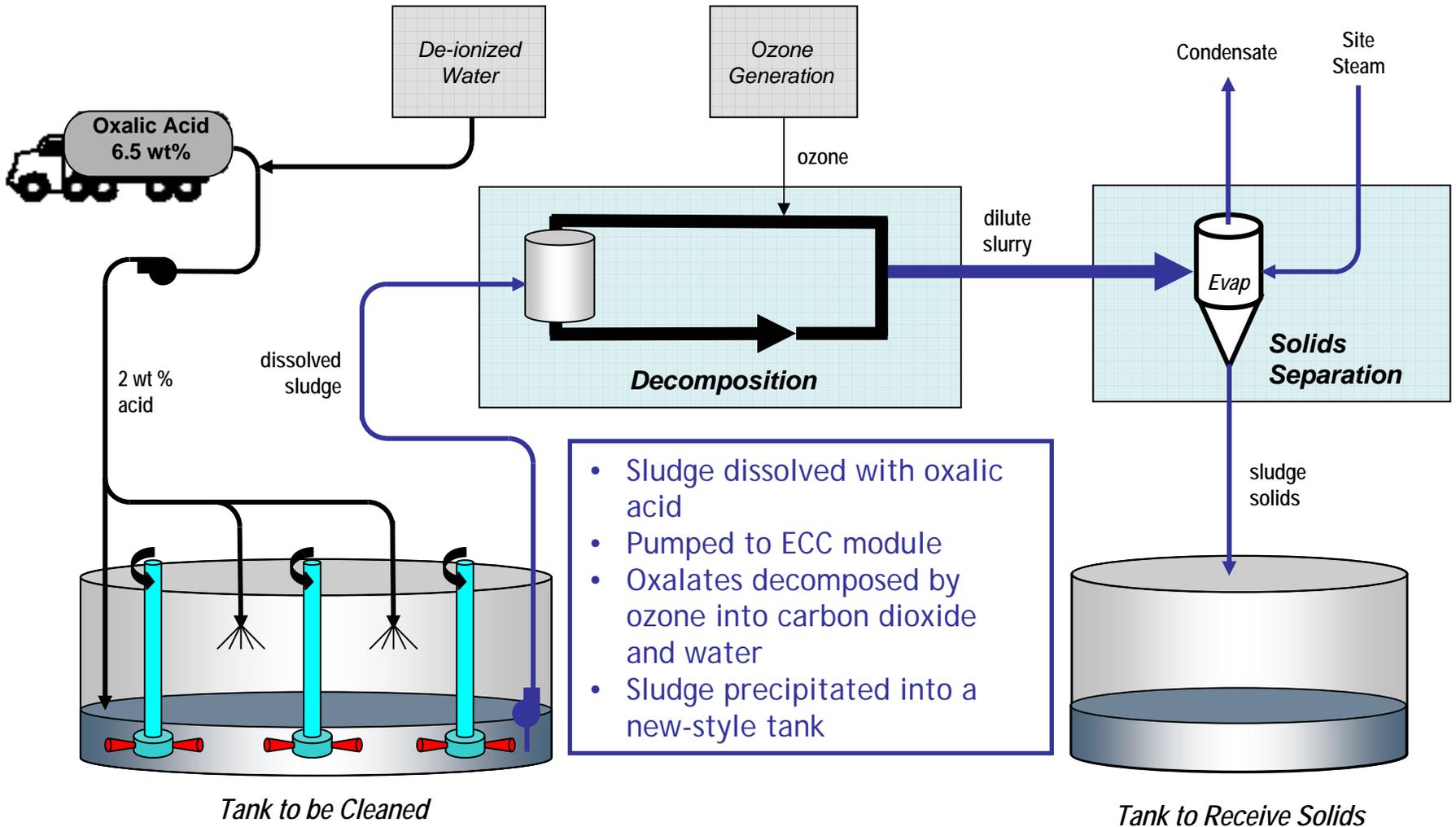


M Environmental Management

safety ❖ performance ❖ cleanup ❖ closure



We do the right thing.



- Sludge dissolved with oxalic acid
- Pumped to ECC module
- Oxalates decomposed by ozone into carbon dioxide and water
- Sludge precipitated into a new-style tank



EM Environmental Management

safety ❖ performance ❖ cleanup ❖ closure

We do the right thing.

- Testing
 - 2 of 4 tests are complete
 - Remaining tests are underway with results expected by 8/2011
- Design
 - Preliminary Design in progress
 - F Tank Farm Unit
 - F Tank Farm Tank 8 BOP
 - Procurement of Tank 8 mixer pumps
 - Design inputs for H Tank Farm Unit under development
 - Approved PCHA



EM Environmental Management

safety ❖ performance ❖ cleanup ❖ closure

We do the right thing.

- Sludge Simulant Test
 - Proof of principle
 - >90% sludge dissolved
 - >90% oxalates destroyed
- Salt Simulant Test
 - Proof of principle
 - 10 runs with >90% solids dissolved
 - 13 runs with >90% oxalates destroyed
- Hazardous Waste Test
 - Adds Cr and Hg
 - More prototypical
 - Decision basis for UV lights, wt % OA
 - Prelim results trickling in
- Real Waste Test
 - Test rig nearly complete
 - Actual sludge from Tank 5 and Tank 12
 - Start late Dec



Test Rig at AREVA



200 grams of Sludge Simulant at start of test



Sludge simulant dissolved at end of test

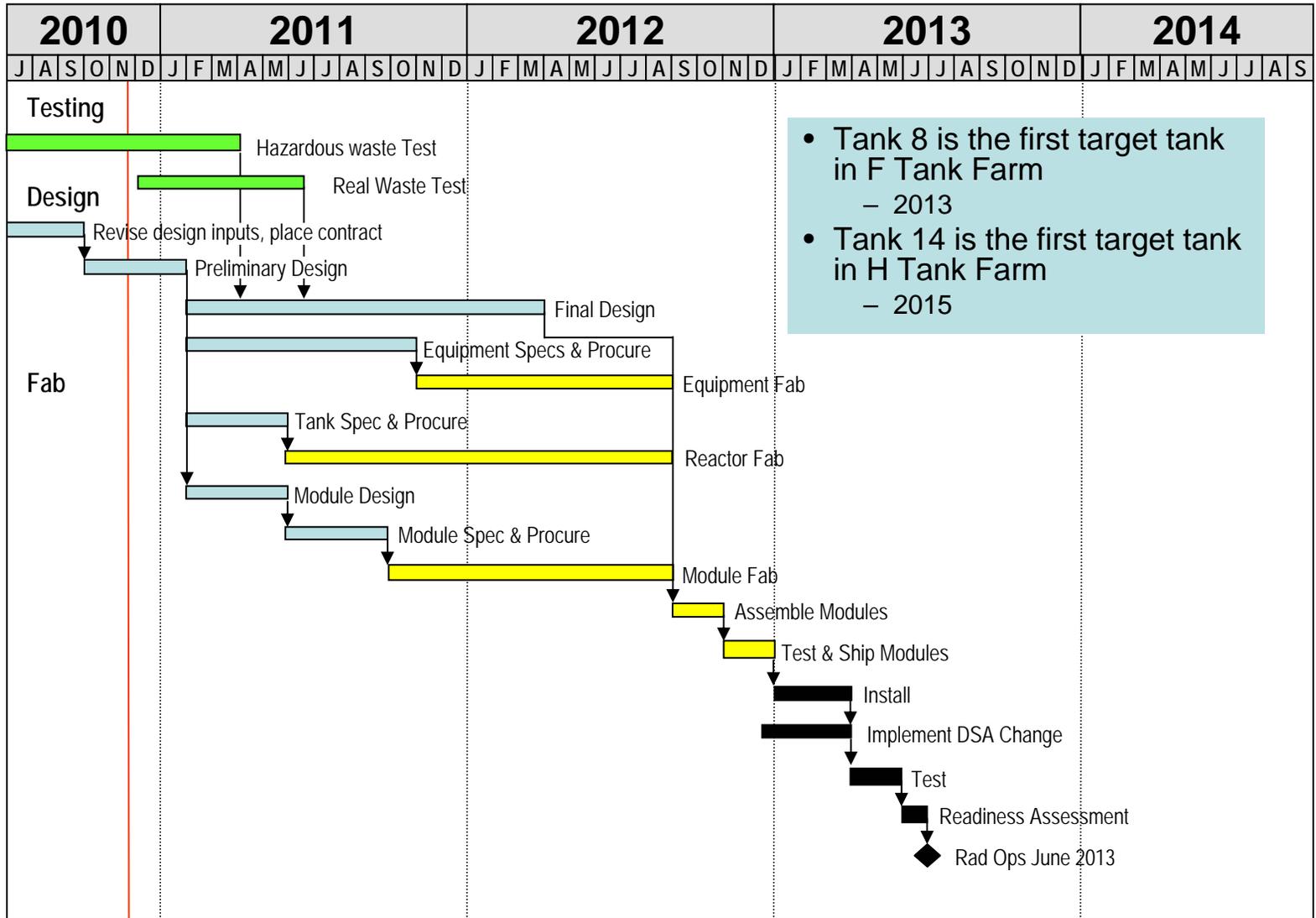


EM Environmental Management

safety ❖ performance ❖ cleanup ❖ closure

Target Tanks and Schedule

We do the right thing.



- Tank 8 is the first target tank in F Tank Farm – 2013
- Tank 14 is the first target tank in H Tank Farm – 2015



- Reduces SRS life cycle schedule
 - Less salt to process
- Reduces SRS life cycle cost
 - Fewer vaults
- Gets tanks cleaner
- Testing and design in progress



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EM *Environmental Management*

safety ❖ performance ❖ cleanup ❖ closure