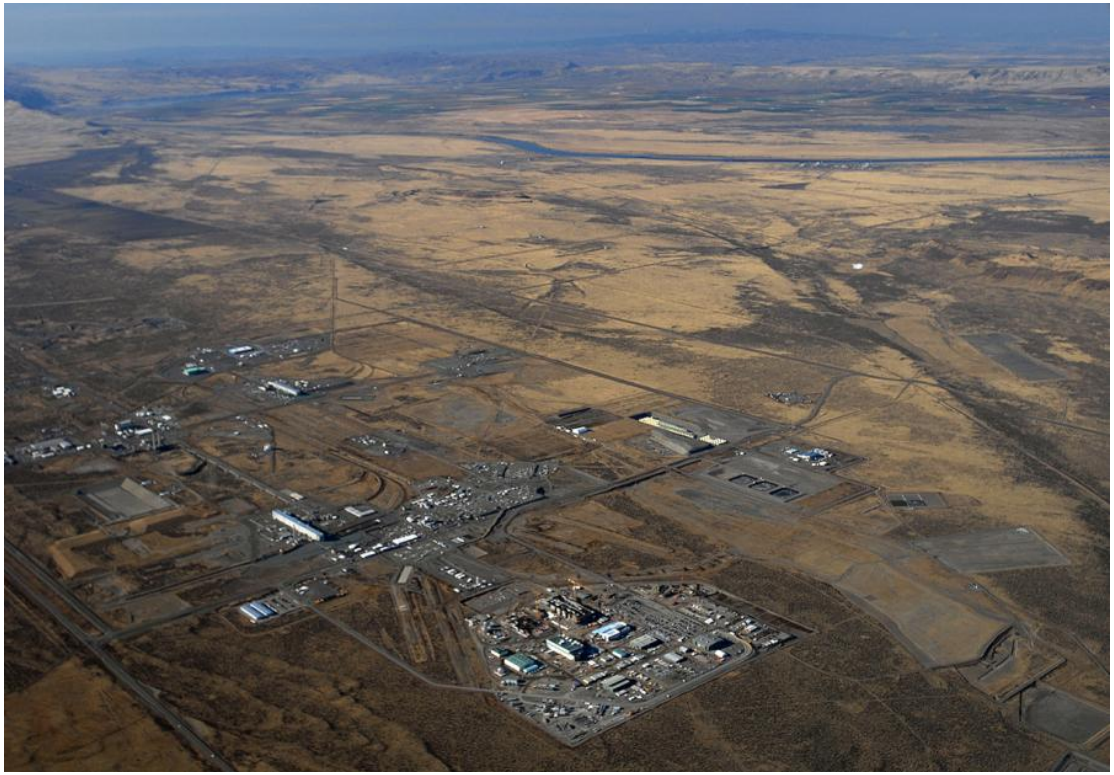
2009 Technical Exchange

Office of River Protection Update



Billie Mauss

May19, 2009

Office of River Protection

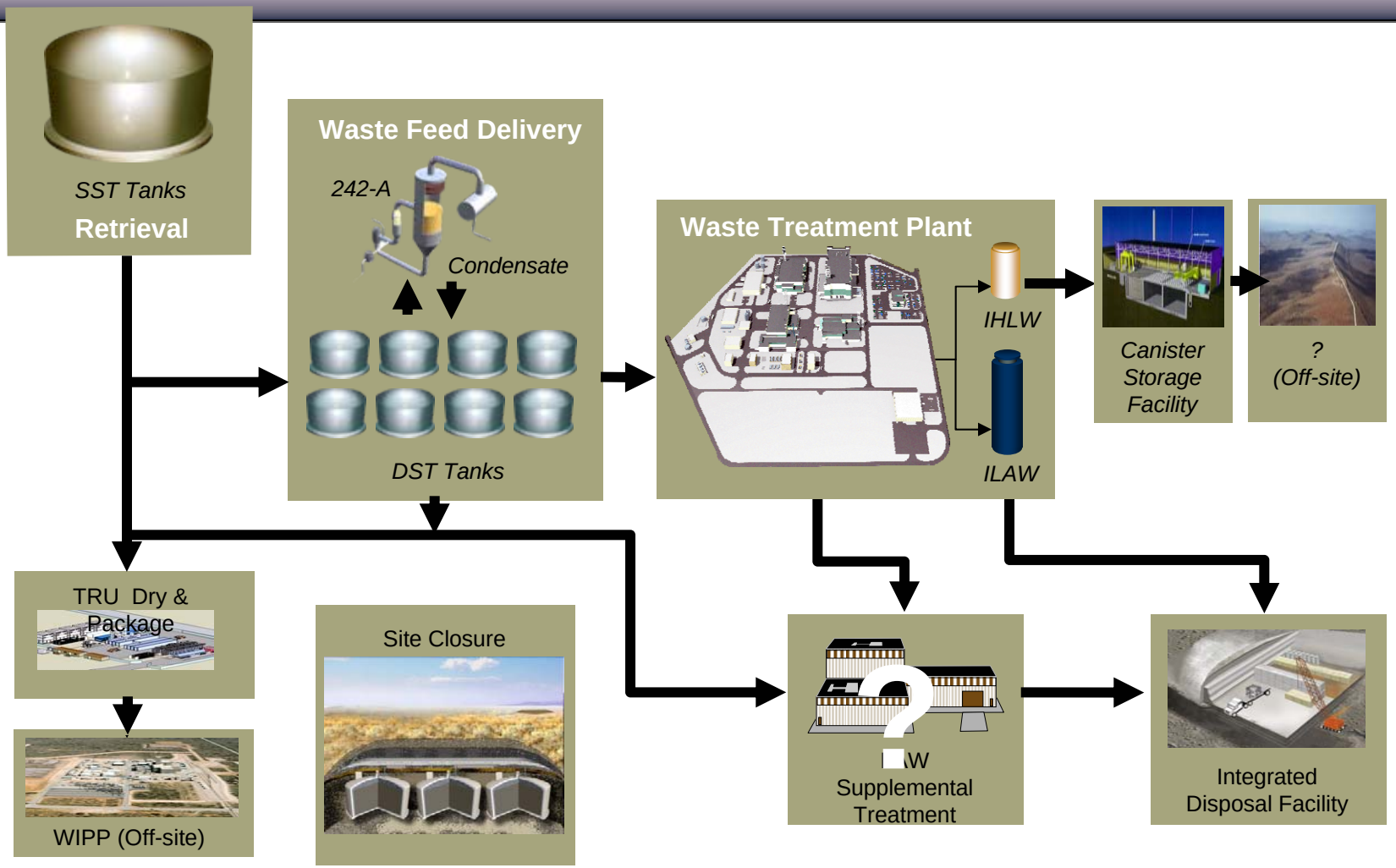
Hanford Site 200 East and West Area

Office of River Protection

ORP Objectives

- Maintain safe Tank Farm operations in SSTs and DSTs until retrieved/treated
- Complete WTP construction and start operations by FY 2019
- Ensure TF infrastructure and facility upgrades/new facilities to support FY 2019 WTP operations
- Enhance SST integrity program
- Continue to develop retrieval technology and retrieve tank waste
- Reduce treatment timeline by developing new technologies and enhancing current baseline

ORP Flow Sheet



Office of River Protection

Tank Farm
FY 2009 Planned Accomplishments

Retrieval/Closure

- Complete retrieval of C-110
- Complete construction and initiate retrieval operations on C-104
- Initiate Design of C-111
- Remove Hose-in-Hose Transfer Lines
- Conduct Proof-of-Concept for Enhanced Chemical Cleaning
- Complete Design, Fabrication and initial testing of Mobile Arm Retrieval System
- Complete liquid mitigation from UX-302A Catch Tank
- Complete 244-CR Vault Sump Pumping
- SST Integrity
- Complete Near Surface Characterization for TY Interim Barrier
- Complete Design of TY Farm Interim Barrier
- Complete Near Surface Characterization at SX Farm
- Deploy Surface Geophysical Exploration in S-SX and C Farm

Retrieval Toolbox

Documenting Lessons Learned

- **Sluicing to remove small residual volume of insoluble material depends on ability to move material to pump**
- **Single nozzle sluicing system has blind spots and lower efficiency areas**
- **Use of hose-in-hose transfer line in place of double-encased stainless**
- **Water temperature and pressure impacts saltcake dissolution kinetics**
- **Vacuum retrieval system suction impacted by hose length, bends, and low points**
- **Mock-up testing of retrieval systems in Hanford's Cold Test Facility important to future success**

Continue Technology Development/Evaluation

- **Mobile Arm Retrieval System**
- **Enhanced Chemical Cleaning**

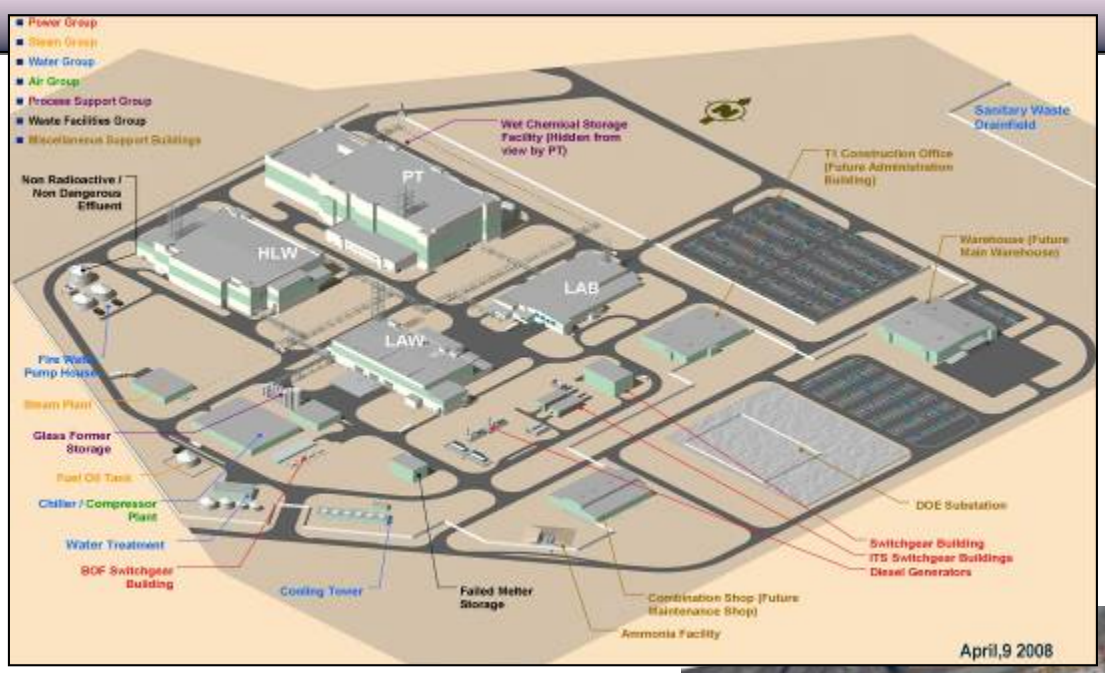
Vacuum Retrieval System

Office of River Protection

WTP Project Scope

- Design, build and commission processing facilities,
- Process facilities are,
  - Pretreatment,
  - Low-Activity Waste Vitrification
  - High-Level Waste Vitrification
- Also, design and build,
  - Analytical laboratory
  - 20 support buildings and facilities

WTP Site Layout



Office of River Protection

Engineering and Nuclear Safety ORP Integration

New ORP Organization that focuses on:

- **Emerging technical issues (i.e. Sodium Management)**
- **Engineering support**
- **Nuclear Safety**
- **Organizational and functional interfaces**
- **Technology Development**

Sodium Management

Issue: Current estimates for sodium hydroxide addition for aluminum dissolution in the pretreatment plant in addition to the sodium already in the tank waste shows that ~90,000 MT Na would need to be vitrified as LAW

Path Forward:

- **Sodium Management Plan has been developed that will evaluate technology options through a business case analysis**
- **Periodic External Reviews and evaluations**
- **Continued Technology Development and testing**
  - **Pretreatment Engineering Platform**
  - **Glass Formulation for higher aluminum and sodium loading**
  - **Tank-side Treatment**

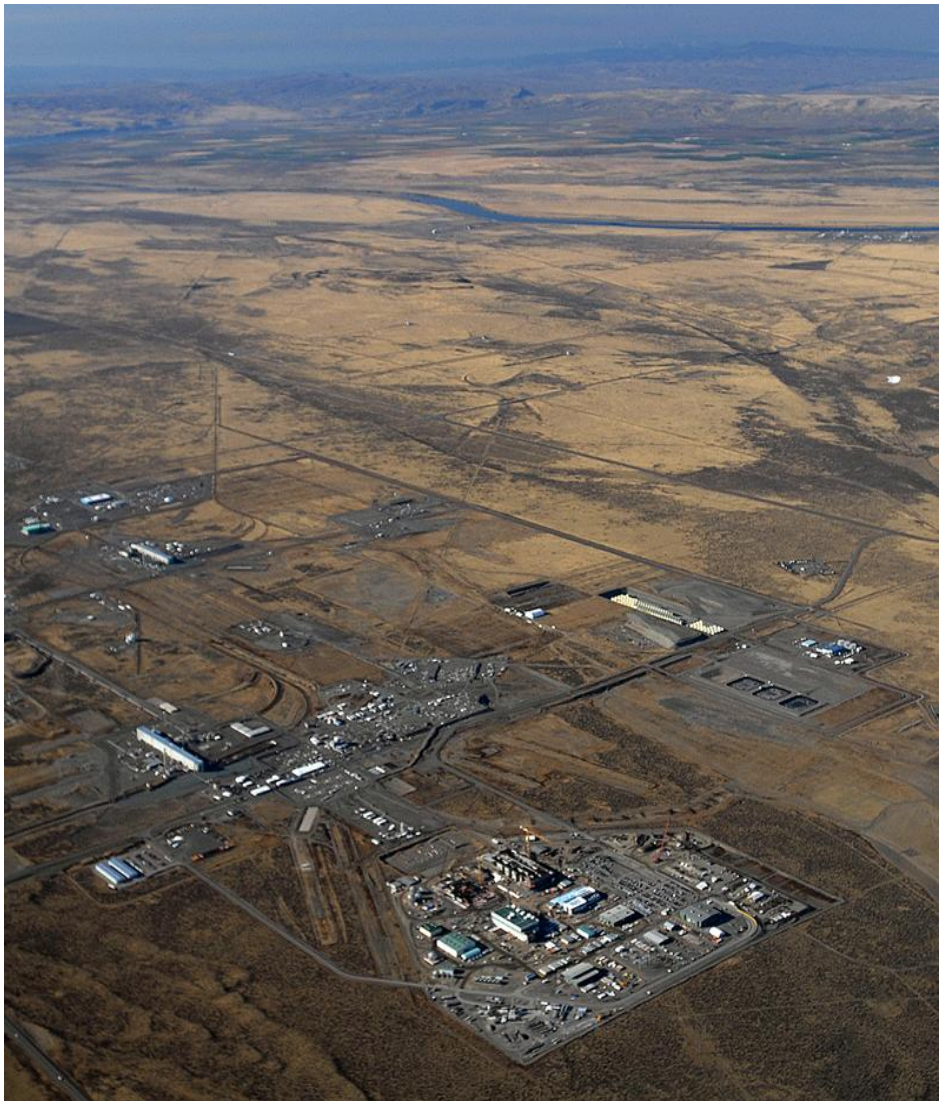
American Recovery and Reinvestment Act

- Initial RA scope planning started late February 2009
  - Started with retrieval focus
  - Realigned to TOC upgrades and waste feed readiness
- RA Readiness Plan – March 12, 2009
- April 7 – Notice to Proceed
  - $42.5M NTE for FY09
  - $326.3M total
- TOC Revised Risk plan with 180-day RA work scope – April 14, 2009
- Project Operating Plan resubmitted – April 27, 2009
- Full release of funds - September 2009
  - Certified cost and pricing proposal

Office of River Protection

Tank Farm ARRA Funding

- Waste feed delivery readiness for the WTP/Reduce Life Cycle Costs
  - Replace and/or upgrade of aging tank farm infrastructure and facilities
  - Secondary waste treatment
  - Tank waste mixing and sampling capability to ensure predictable and consistent waste feed to WTP



Office of River Protection

Tank Farm ARRA Funding Focus Areas

PROJECT	WORKSCOPE	$
ORP-1014	Tank Farm Infrastructure Upgrades to Support Waste Feed to the WTP	$326M

Tank, Infrastructure and Facility Upgrades ($192M)

- Tank Farm Infrastructure ~$100M
  - Double-shell tank (DST) ventilation, electrical, control system, instrumentation upgrades
  - Single-shell tank (SST) integrity and life extension
  - DST upgrades and life extension
- Other Infrastructure~$30M
  - Increased evaporator capability (wiped film evaporator)
  - Cross-site transfer line upgrade for slurry feed
  - Core sampling truck
- Facilities ~$62M
  - 222-S Laboratory upgrades and life extension
  - 242-A Evaporator upgrades and life extension

Waste Feed, Treatment and Storage ($134M)

- Waste Feed Infrastructure ~$80M
  - Design (AW/AY)
  - In-Farm Field Work (transfer and condensate line upgrades; clean out boxes isolation)
  - Support Facilities Construction
  - Tank waste mixing and sampling demo
  - Mixer pumps fabrication
- Effluent Treatment Facility (ETF) upgrades ~$44M
- High-Level Waste Canister Storage/Shipping Facility ~$10M

Tanks-DST Ventilation, Electrical, Control System Upgrades

- Ventilation upgrades (AP/SY)
- Electrical upgrades (AZ/AN/SY)
- Control System upgrades
- Valve Pit Jumpers (AP)
- Exhauster D&D (AN/AW)
- Remove obsolete equipment
- Spare parts inventory
- Replace tank level indicators

Office of River Protection

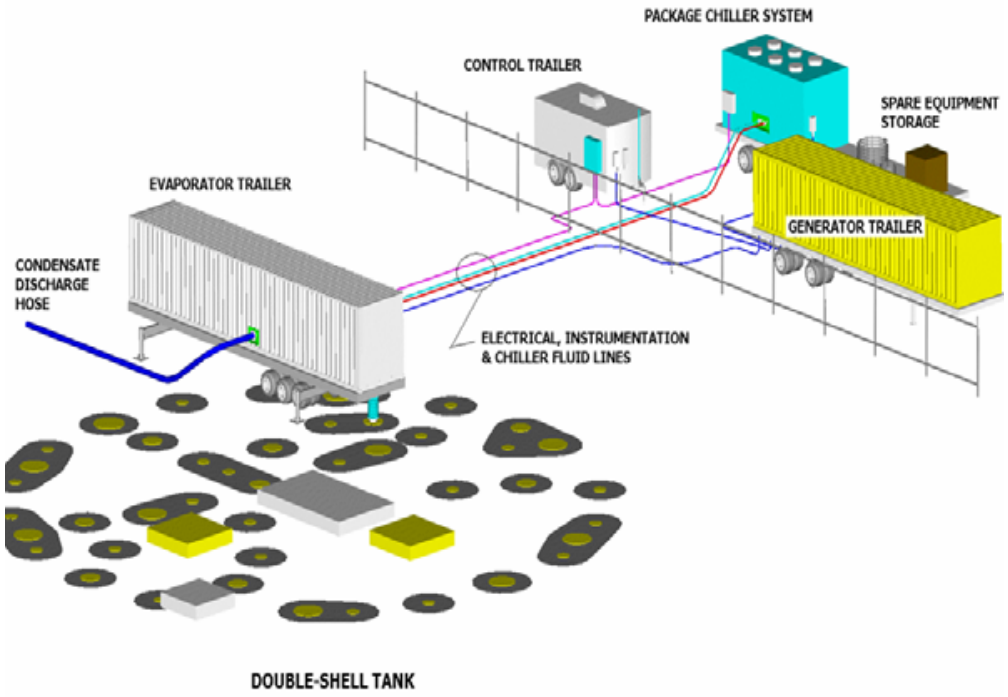
SST Integrity and Life Extension

- Integrity
  - Structural analysis
  - SST dome benchmark work
  - Follow-up to SST Integrity Expert Panel recommendations
- Life Extension
  - Replace radial filters (~100)
  - Remove obsolete equipment (saltwell pumping)

Office of River Protection

Other Infrastructure

- **Wiped film evaporator**
  - **Analysis**
  - **Testing**
- **Cross-site transfer line upgrade for slurry feed**
  - **Installation of booster pumps and equipment, piping, computer control system**
- **Core sampling truck**



Office of River Protection

222-S Laboratory Upgrades and Life Extension

- **Upgrade HVAC**
- **Replace Priority Laboratory Instruments**

Office of River Protection

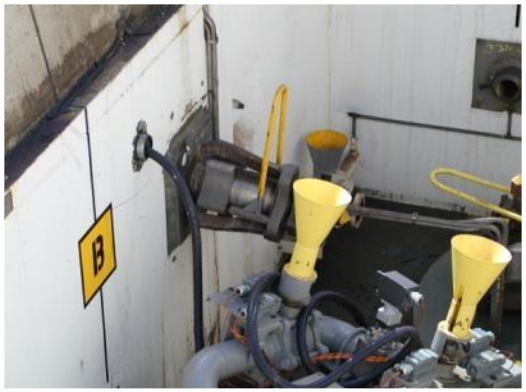
242-A Upgrades and Life Extension

- **Design, fabricate, install and test replacement for the 242-A Exhaust System**
- **Procure 242-A Spare Parts (backlog of spare parts and critical spares)**

Office of River Protection

Waste Feed Infrastructure

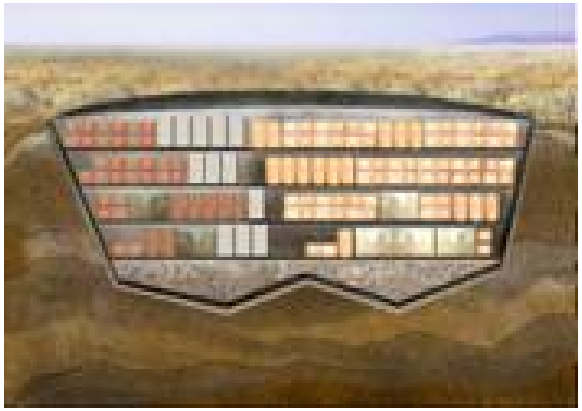
- In-Farm field work (transfer and condensate line upgrades; clean out boxes isolation)
  - Replacement of RCRA non-compliant transfer lines in SY DST farm; installation of new condensate line in AZ farm; isolation, removal of clean out boxes 3, 5, & 7 in AW farm
- Support
  - Equipment storage and centralized control capability between waste feed delivery systems and the WTP
- Tank waste mixing and sampling
  - Demos using various waste simulants
- Mixer pumps fabrication
  - Designs for in-tank mixing pumps



Office of River Protection

Effluent Treatment Facility Upgrades

- **Determination of method to treat and immobilize secondary waste from WTP and other potential tank farm sources that will be acceptable to Integrated Disposal Facility**
- **Preliminary design for immobilization annex facility and long-lead procurement for upgrades to Effluent Treatment Facility**



IDF

ETF

Office of River Protection