U.S. DEPARTMENT OF ENERGY

Office of River Protection

Congressional Nuclear Cleanup Caucus

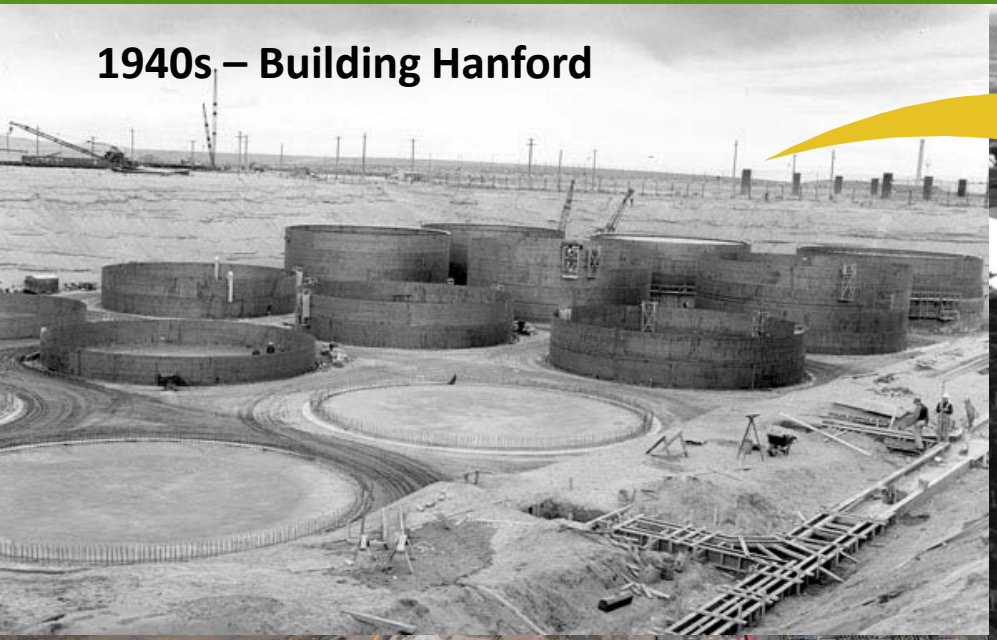
April 19, 2012

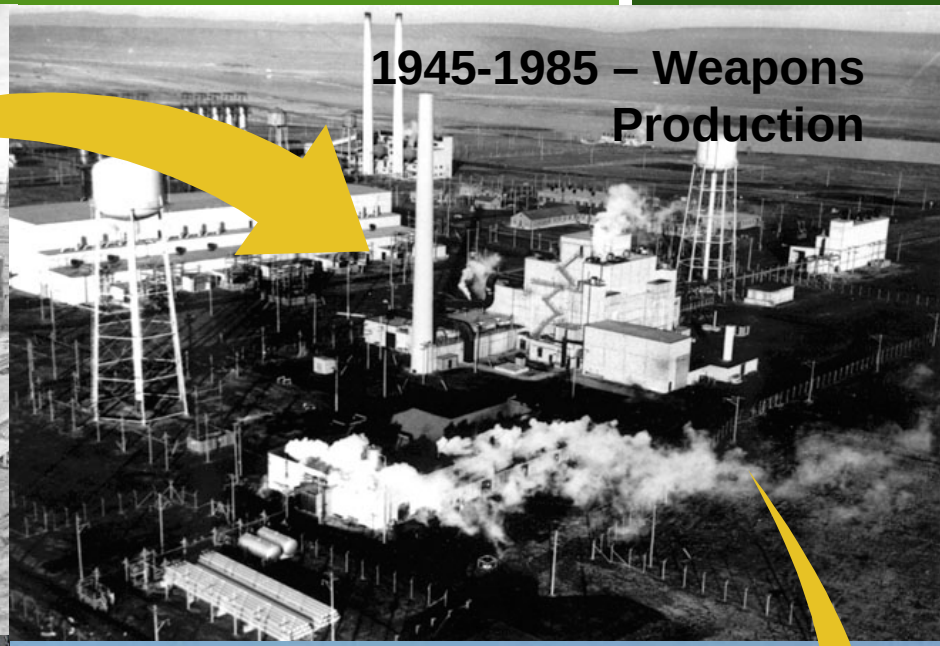
Scott Samuelson
Manager, ORP

Rick Kacich
Waste Treatment Plant
Assistant Project Director
Bechtel National, Inc.

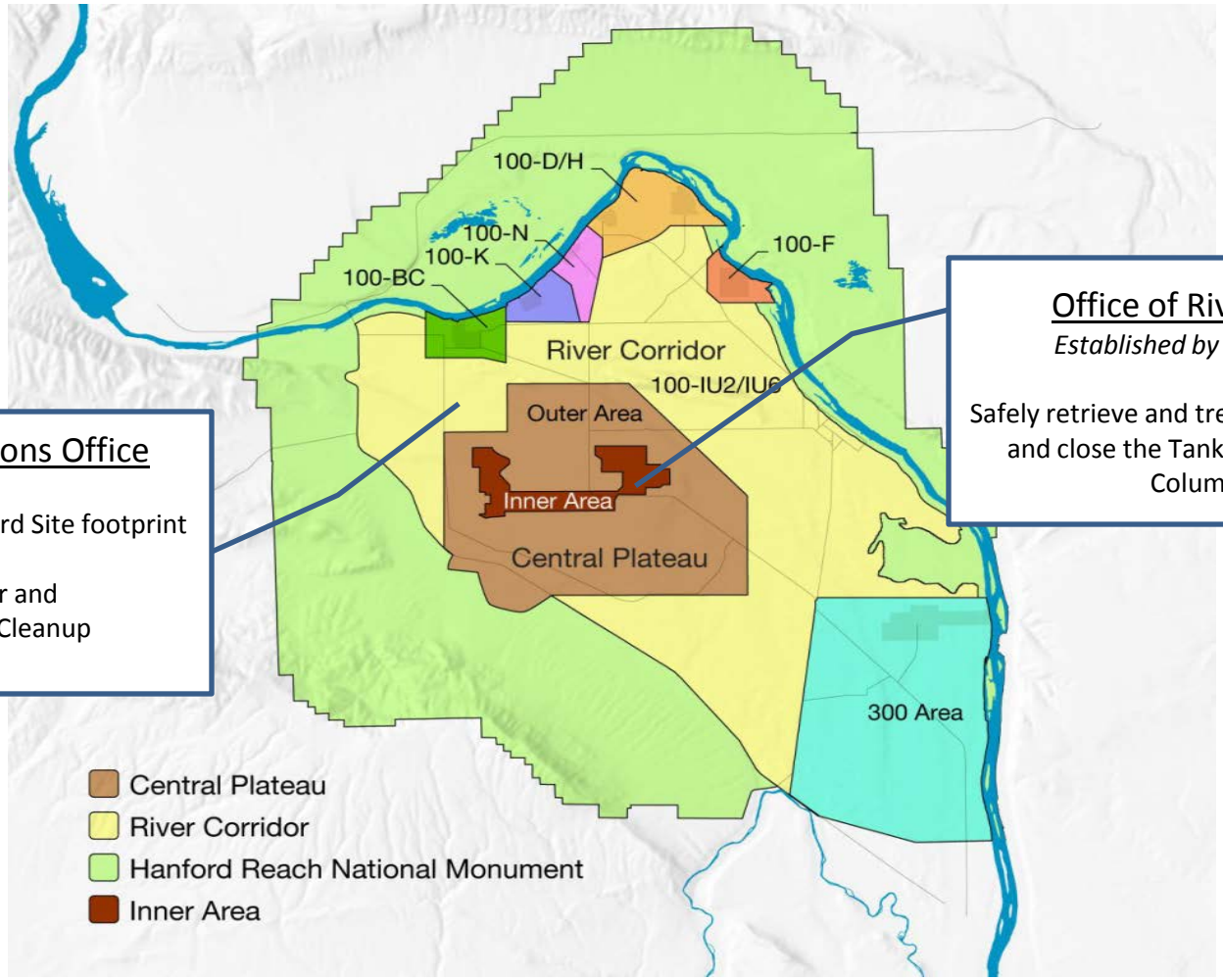
Michael Johnson
President and Project Manager
Washington River Protection
Solutions, LLC

Historical Overview of the Hanford Site





Twenty-two Years of Cleanup at Hanford Reducing or Eliminating Environmental Risks



Richland Operations Office

Reduce the active Hanford Site footprint

River Corridor and
Central Plateau Cleanup

Office of River Protection

Established by Congress in 1998

Safely retrieve and treat Hanford's tank waste and close the Tank Farms to protect the Columbia River

Office of River Protection Overview

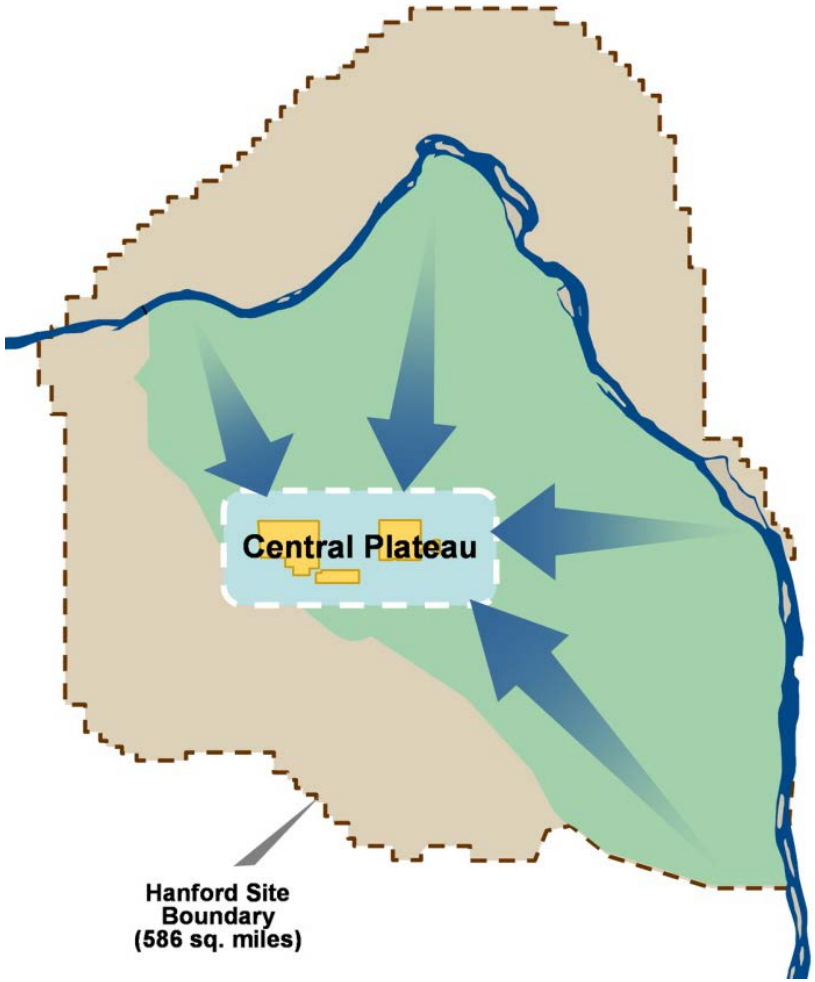
Retrieve and treat the radioactive and chemical tank waste and close Hanford's Tank Farms

Tank Farms

- 177 underground storage tanks
  - 149 Single Shell Tanks (SST)
  - 28 Double Shell Tanks (DST)
- 56 million gallons radioactive and chemical waste
- 176 million curies of radioactivity
- 240,000 tons of complex chemicals
- Current focus is on C-Farm retrieval activities

Waste Treatment Plant (WTP)

- Design/build
- Treat and immobilize in glass radioactive and chemical tank waste



Mission Status

- WTP 64% complete
- Waste from seven SSTs retrieved
- Completed Recovery Act work successfully within cost and schedule
- Three major areas of focus
  - Resolution of WTP technical issues
    - Large Scale Integrated Testing (LSIT)
  - Complete Analytical Laboratory (LAB), Balance of Facilities (BOF), and Low-Activity Waste Facility (LAW)
  - One System Integration

Waste Treatment Plant

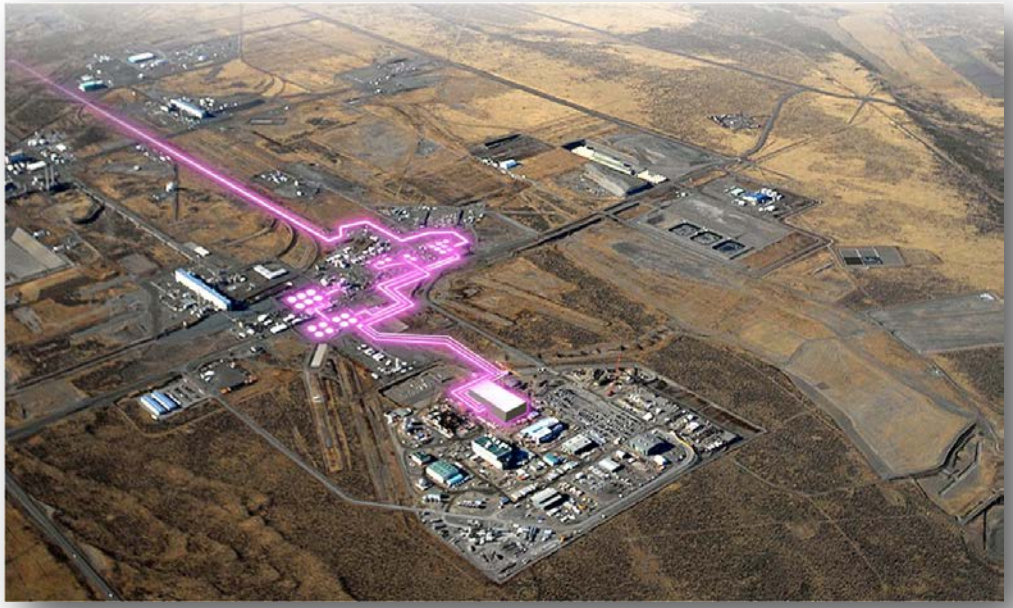
LAW melter

MARS testing

One System Goals and Objectives

One System is a summary of strategies and key actions intended to optimize the approach to startup, commissioning, and turnover of WTP facilities

- Focuses on integrating Tank Farms and the WTP to ensure end result of one system capable of performing the mission
  - Development of joint Integrated Project Team (IPT) for WTP and Tank Farms
- Phased Facility Start-up and Turnover



Depiction of Waste Feed Delivery to the WTP

FY 2013 Budget Request

	FY 2012 Appropriation	FY 2013 President's Budget
River Protection Budget Summary		
Defense Environmental Cleanup		
Tank Farm Activities	441,800	482,113
Waste Treatment and Immobilization Plant	740,000	690,000
Total, Office of River Protection	1,181,800	1,172,113

Dollars in Thousands

Recent Accomplishments

Tank Farms

- Deployed Mobile Arm Retrieval System (MARS)
- Simultaneous retrievals from two tanks
- Infrastructure upgrades

MARS mast installation in C-107

Waste Treatment Plant

- Completed installation of the Pretreatment Facility's fifth elevation (97' of 109') of concrete walls
- Installed 100-ton carbon bed adsorber in the LAW
- Received decontamination vessels for the High-Level Waste Facility (HLW)

Carbon bed adsorber

Tank Farms FY13 Planned Accomplishments

Base Operations

- DST/SST operations, surveillance, monitoring and maintenance
- 222-S Laboratory operations and upgrades
- Conduct 242-A Evaporator campaign and upgrades
- Conduct DST to DST transfers
- Perform SST Integrity evaluations
- Continue removal of Hose-in-Hose Transfer Lines
- Facility Management, Business and Site services
- Provide and manage electrical power to the WTP

242-A Evaporator

Tank Farms FY13 Planned Accomplishments

Tank Retrieval and Closure

- Complete Retrieval activities in 3 C Farm Single-Shell Tanks
- Conduct SX Interim Measures/Barrier

C Farm prior to start of retrievals

C Farm after start of retrievals

Tank Farms FY13 Planned Accomplishments

Projects

- Continue Technology Development activities to support Mixing and Sampling
- Conduct Technology Development to support a Supplemental Treatment Decision
- Waste Feed Delivery projects (AY and AZ Farm)
  - Ventilation upgrade design
  - Infrastructure construction projects
  - Sampling system preliminary design
  - AY-102 tank-specific safety significant instrumentation upgrades
  - Integrated Waste Feed Delivery Plan development
- Hanford Interim Storage Facility
- Secondary Liquid Waste Immobilization

WTP FY13 Planned Accomplishments

LAW, LAB, and BOF

- Complete construction of Steam Plant
- Analytical Lab construction substantially complete
- Startup and introduce power to the WTP via the Main Switchgear Building
- Turnover from construction to startup ten BOF buildings
- Complete welding of the shield doors onto the LAW melters

High-Level Waste Facility

- Receive submerged bed scrubber vessels
- Complete forming, rebar, and placement of concrete for 37-ft elevation facility walls
- Continue engineering and design efforts

Pretreatment Facility

- Resolve mixing, erosion and corrosion
- Work closely with DNFSB and National Labs to establish closure actions and achieve closure of technical issues
- Continue engineering and design efforts

Understanding Safety Culture

Safety Culture

- An organization's values and behaviors modeled by its leaders and internalized by its members, which serve to make safe performance of work the overriding priority to protect the workers, public, and the environment.
  - Questioning attitudes
  - Willingness to raise concerns
  - Capability to address concerns in a timely manner

ORP will design, construct, and operate the complete waste treatment system safely and successfully

Cleaning Up Hanford's Tank Farms

Presentation to Congressional Nuclear Cleanup Caucus

Michael Johnson, President and Project Manager

April 19, 2012

washington river protection solutions

Tank operations contract

- Washington River Protection Solutions (WRPS) is a prime contractor to DOE's Office of River Protection
- WRPS is a joint venture between URS Corporation and Energy Solutions, with integrated subcontractor AREVA
- FY-12 budget: $442 million
- ~1385 employees

washington river protection solutions

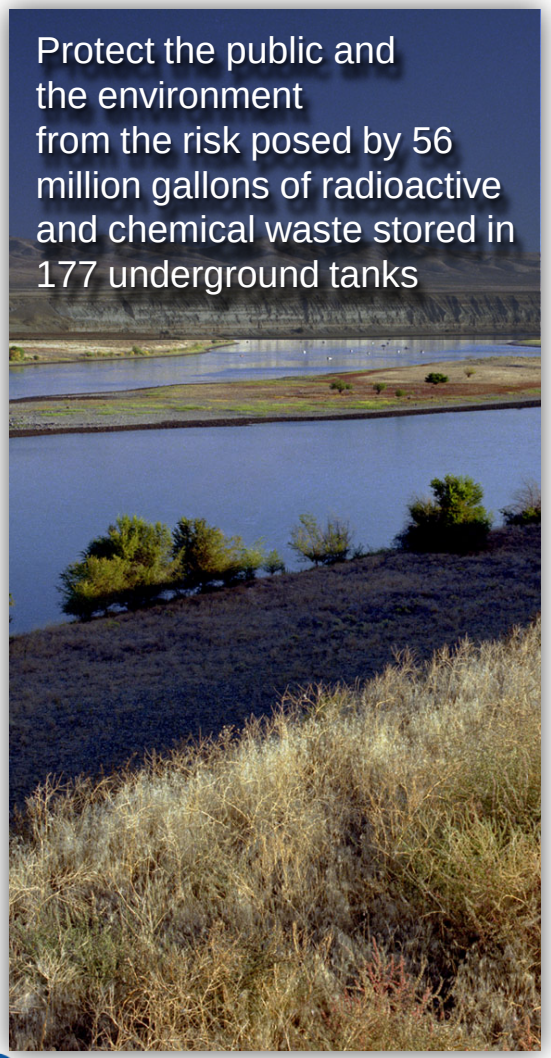
URS

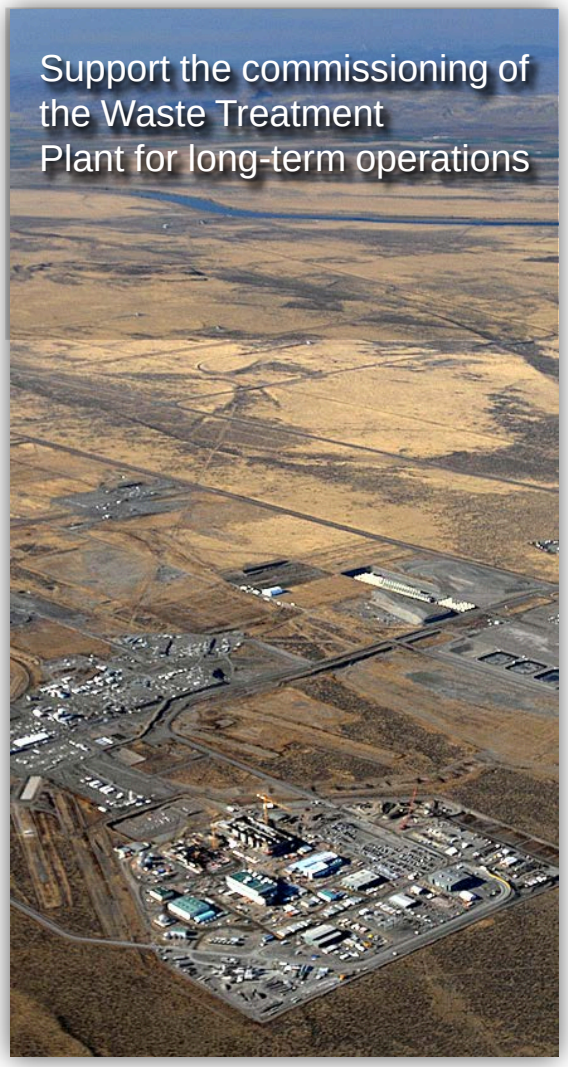
ENERGYSOLUTIONS

AREVA
AN INTEGRATED SUBCONTRACTOR

washington river protection solutions

Tank operations contractor mission





washington river protection solutions

C-Farm waste retrieval status

Six of 16 C-Farm tanks retrieved to Tri-Party Agreement requirements

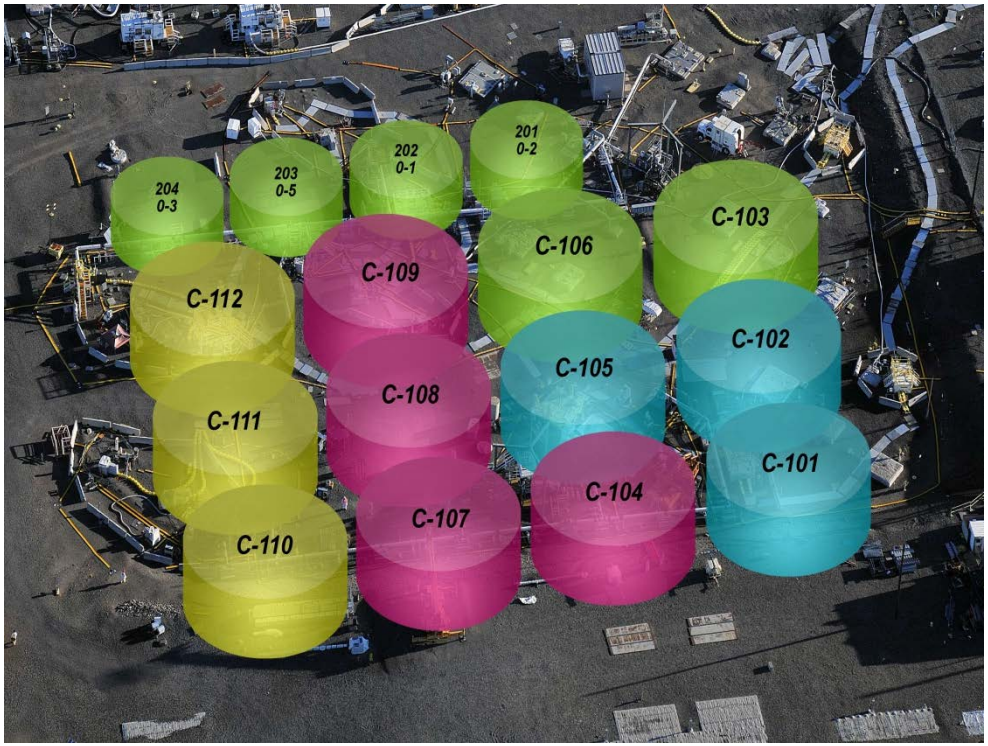
Consent Decree: Addresses 10 remaining C Farm tanks to be retrieved by end of FY 2014

Planned retrievals
- FY 2012: 4
- FY 2013: 3
- FY 2014: 3

FY-12 tanks
- C-108 currently in completion of retrieval evaluation process required by the Consent Decree
- C-109, C-104 remaining hard heel
- C-107 bulk retrieval and hard heel

Retrieving waste simultaneously from two tanks for the first time in a decade

Preparatory work (procurement, construction) on several other tanks is under way



RETRIEVED | 2012 | 2013 | 2014

washington river protection solutions

Retrieval technology update

Mobile Arm Retrieval System

- Began C-107 waste retrieval September 2011
- Operated as expected until retrieval was delayed by failed pump in receiving tank
- Waste retrieval to resume in April, with plans to empty the tank by the end of FY 2012

Enhanced Reach Sluicing

- Used in waste retrieval from Tank C-112
- Telescoping arm brings sluicer closer to waste vs. traditional sluicing methods
- Successfully broke through hardpan-like top layer to expose sludge below

Caustic Dissolution

- Obtained State approval to pre-soak hard heel waste
- Process improvement speeds retrieval schedule, improves efficiency
- Planned for C-109 hard heel waste removal

washington river protection solutions

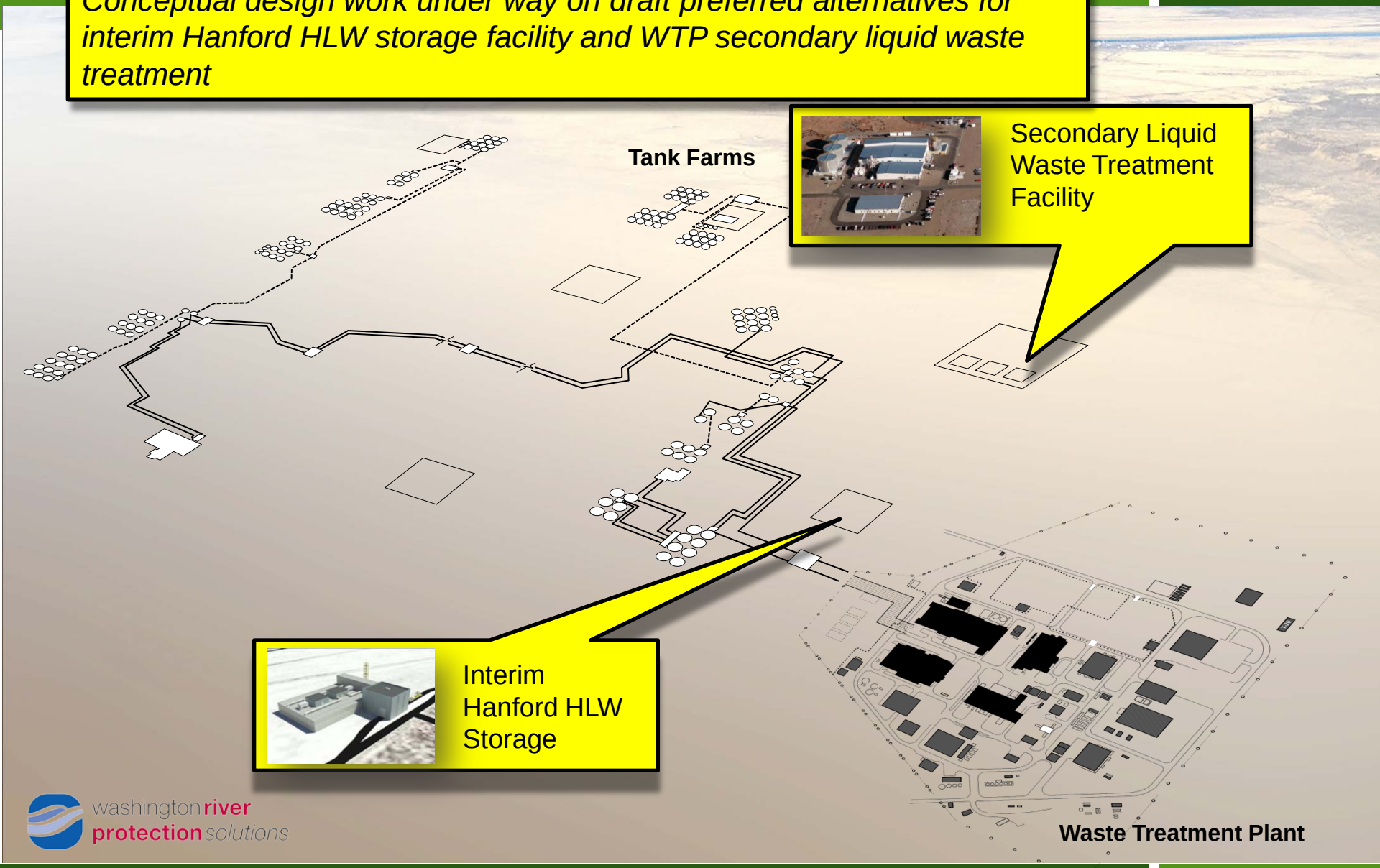
Waste Treatment Plant integration: One System approach

- Work begun on Defense Nuclear Facilities Safety Board (DNFSB) recommendation on tank farm waste mixing/sampling
- Obtained a joint WTP/Tank Operations Contract (TOC) site license for SmartPlant® Engineering and Configuration Management System
- Working on common requirements management flow down and safety management programs
- Updating interface control documents (e.g., waste acceptance criteria)

washington river protection solutions

Waste Treatment Plant support facilities work

Conceptual design work under way on draft preferred alternatives for interim Hanford HLW storage facility and WTP secondary liquid waste treatment



washington river protection solutions

Recovery Act complete; delivered major improvements

$326M in work on schedule, under budget; savings reinvested. (CPI = 1.06; SPI=1.0)

- Positive Office of Inspector General audit: 0 findings
- Nearly 600 jobs created
- More than 850 subcontracts worth $150 million offered to area small businesses

Safety:

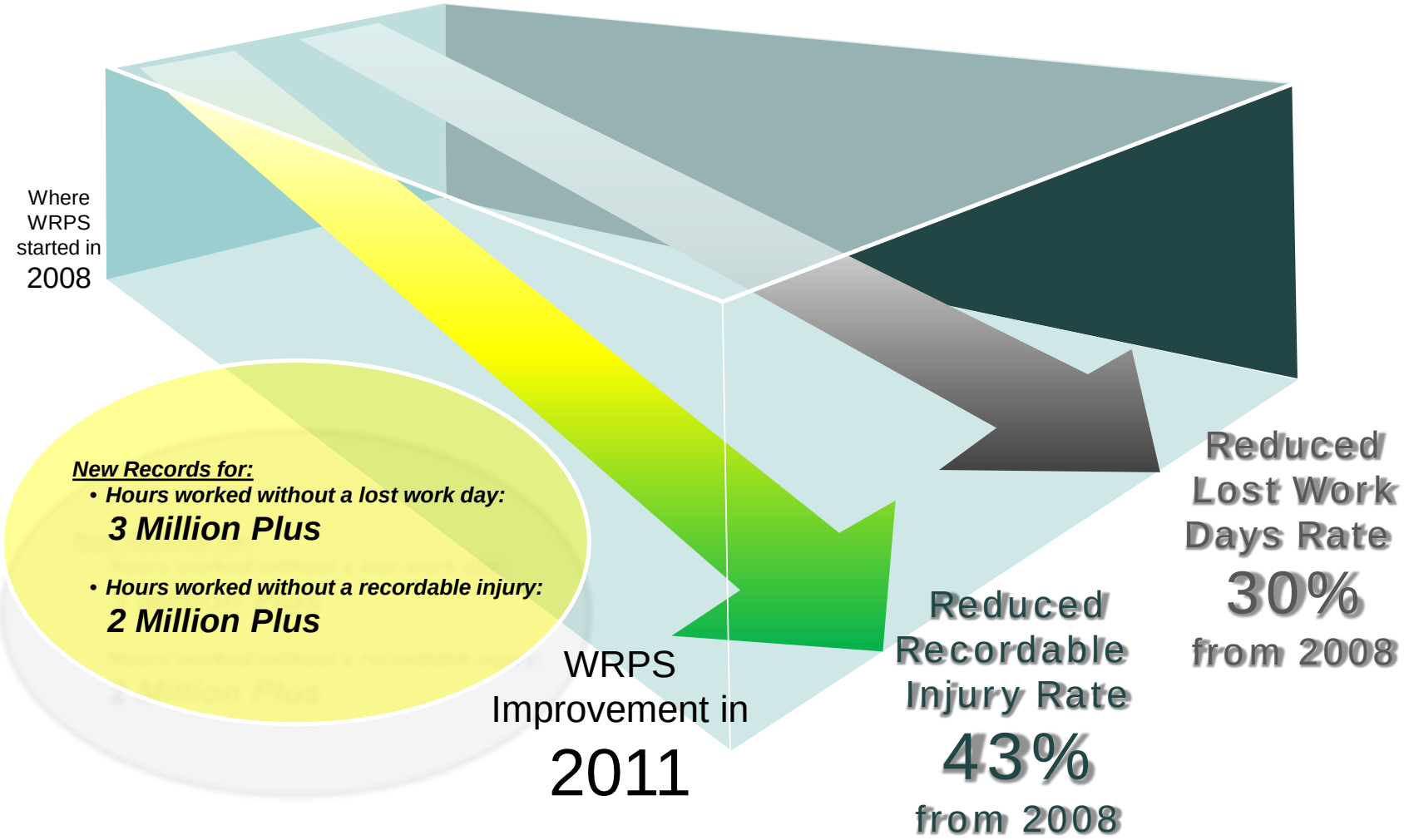
- 1.5 million hours worked on Recovery Act projects without a lost-time injury

Key projects:

- Upgrades to tank farm infrastructure, removal of obsolete equipment
- Renovations to operating facilities critical to WRPS' long-term mission
- Technologies and systems to help WRPS prepare to feed waste to the Waste Treatment Plant

washington river protection solutions

New safety records set



washington river protection solutions

Progress at the Hanford Waste Treatment Plant (WTP)

Presentation to Congressional Nuclear Waste Cleanup Caucus

Rick Kacich

Assistant Project Director

Bechtel National, Inc.

April 19, 2012

Waste Treatment Plant is 64% Complete

Embracing Safety as a Core Value

- **WTP worker risks and hazards are typical of large construction projects**
- **Safety programs must address all worker risks/hazards and include**
  - **Strong traditional safety programs**
  - **Behavior-based safety principles**
  - **Worker engagement and ownership**
- **Initiatives to sustain excellent safety performance**
  - **Natural safety leaders to improve safety performance**
  - **Craft Safety Representatives**
  - **Safety Leadership**
- **We guard against complacency and we're seeing positive indicators**

10M SAFE HOURS *without Lost Time Accident*

Department of Energy VPP STAR SITE *VPP Superior Star Site*

Safe-In-Sound Award

Strengthening Nuclear Safety & Quality Culture

Ongoing Nuclear Safety Quality Culture (NSQC) activities

- **Longstanding Nuclear Safety & Quality Imperative**
- **Annual employee surveys to encourage anonymous feedback**
- **Reinvigorating NSQC Program**
  - **3 independent reviews and 2 employee surveys in the last 18 months**
  - **Created senior management position**
  - **Implemented aggressive communications plan**
  - **Conducted independent Safety Conscious Work Environment Training for managers and supervisors**
  - **Conducted NSQC training for employees**
  - **Implemented the Nuclear Energy Institute safety culture process model**

Existing mechanisms and tools to raise and address concerns

Differing Professional Opinion

Nonconformance Reports

Employee Concerns Program

Engineering issues tracking processes
Technical Cut Sheets, Management Watch List, and Safety System Reconciliation Actions

Risk Management Program

Construction Deficiency Reports

PIERs (Project Issues Evaluation Reports)

Engineering Document Reviews

Action Tracking System

More than 4,000 issues have been identified, tracked, and managed since March 2011

Strengthening Nuclear Safety & Quality Culture

- **Accepting and acting upon independent assessment recommendations and employee survey results**
- **Taking appropriate steps to strengthen our NSQC**
- **Effectively managing change is an important aspect of NSQC**
  - **2011-1 Implementation Plan actions**
- **Renewed emphasis on senior leaders modeling NSQC behaviors and values**
- **A strong NSQC requires management and employee accountability**
  - **Clarifying roles, responsibilities, authorities and accountabilities**
  - **Working with DOE to clarify and communicate decision-making authorities**
  - **Ensuring accountability for performance of work in a safe, professional manner**
- **Employing corporate resources to drive results**

Continued Project Progress

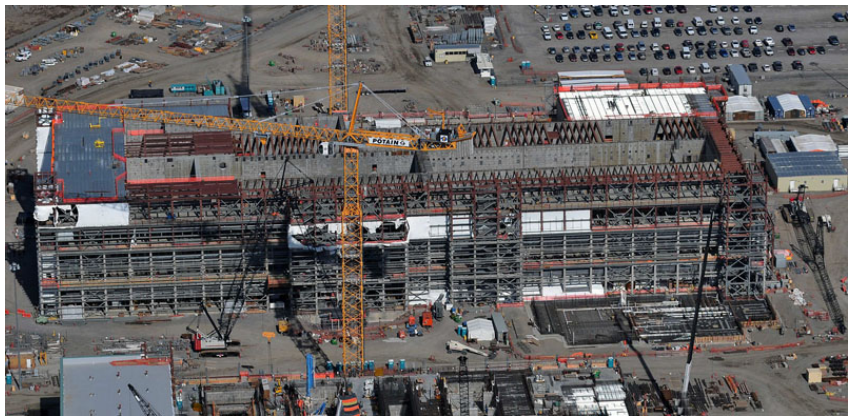
- **Sustained focus on schedule and cost performance with high quality and solid safety performance**
- **Accomplished significant physical progress in all areas of the plant**
- **Proactively managing design challenges**
- **Moving forward on large-scale integrated testing and design verification of in-process mixing vessels**
- **Working to strengthen WTP's Nuclear Safety and Quality Culture**

Large scale integrated test platform

Pretreatment Facility

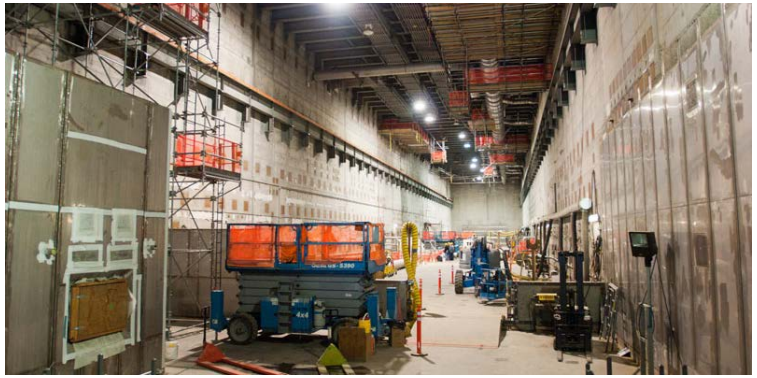
World's largest radioactive chemical separations facility

- **80% design complete**
- **51% equipment and material procurement complete**
- **42% construction complete**



Pretreatment Facility Exterior

Rebar and piping in Pretreatment control room



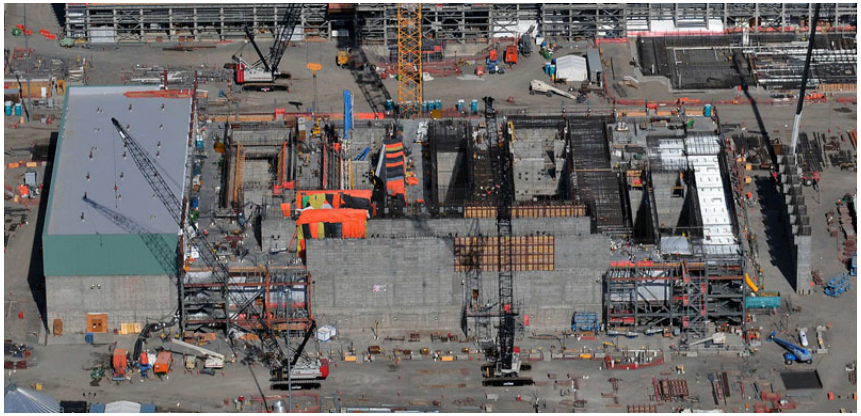
Pretreatment Facility hot cell

Pretreatment Facility piping module

High-Level Waste Vitrification Facility

Turns high-level waste into glass

- **88% design complete**
- **75% equipment and material procurement complete**
- **40% construction complete**



High-Level Waste Facility exterior

High-Level Waste Facility truck bay walls

High-Level Waste Facility bridge crane

High-Level Waste Facility melter bay

Low-Activity Waste Vitrification Facility

Turns low-activity waste into glass

- **87% design complete**
- **87% equipment and material procurement complete**
- **69% construction complete**

Low-Activity Waste Facility exterior

Overhead piperacks for steam and glass formers

Low-Activity Waste carbon bed adsorber

200-ton Low-Activity Waste melter

Low-Activity Waste transfer tunnel

Analytical Laboratory

Ensures glass meets regulatory requirements

- **81% design complete**
- **75% equipment and material procurement complete**
- **78% construction complete**

Analytical Laboratory exterior

Analytical Laboratory fumehoods

Analytical Laboratory air-handling systems

Balance of Facilities

Vast infrastructure to support operations

- **77% design complete**
- **48% equipment and material procurement complete**
- **63% construction complete**

18 support buildings for the Balance of Facilities

Glass former piping

Overhead pipe racks for steam and glass forming materials

Glass former silos

WTP Awarded $1.35 billion to Small Businesses

A Low-Activity Waste Facility carbon bed adsorber is stored on a truck flatbed before installation into the facility. The adsorber will operate as part of the facility's air-filtration system.

Implementing "One System" Vision

- **WTP and Tank Operations Contractor working together to integrate planning, scheduling and management of interface activities required to prepare Tank Farm infrastructure for seamless commissioning and operation of WTP**
- **A dedicated WTP/Tank Operations Integrated Project Team**
  - **Making risk-informed decisions**
  - **Developing mission-based solutions**
- **Tackling toughest issues and learning from each other**
- **Identifying cost savings and efficiencies from common approaches**
- **Strong support and endorsement from DOE customer**
- **Unified mission and perspective**

ORP is Critical to the Hanford Mission

Scott Samuelson, ORP Manager

- Absolutely committed to worker and public safety.
- Hanford is the largest environmental liability in the EM cleanup program.
- The risk is in the tank waste – ORP's mission is to eliminate this risk.
- Protecting the Columbia River is vital, urgent, and our obligation
- Strengthening our interactions with regulators, Tribal Nations, and stakeholders to ensure the successful completion of our mission.