

**Activities and Financial Status**  
**Waste Treatment and Immobilization Plant (WTP)**  
Line Item – 01-D-416

**Subprojects:**      **Low-Activity Waste Facility - 01-D-16A**  
                         **Analytical Laboratory            - 01-D-16B**  
                         **Balance of Facilities                - 01-D-16C**  
                         **High-Level Waste Facility        - 01-D-16D**  
                         **Pretreatment Facility            - 01-D-16E**

**Quarterly Report**

**Report 1: Period Ending December 2005**

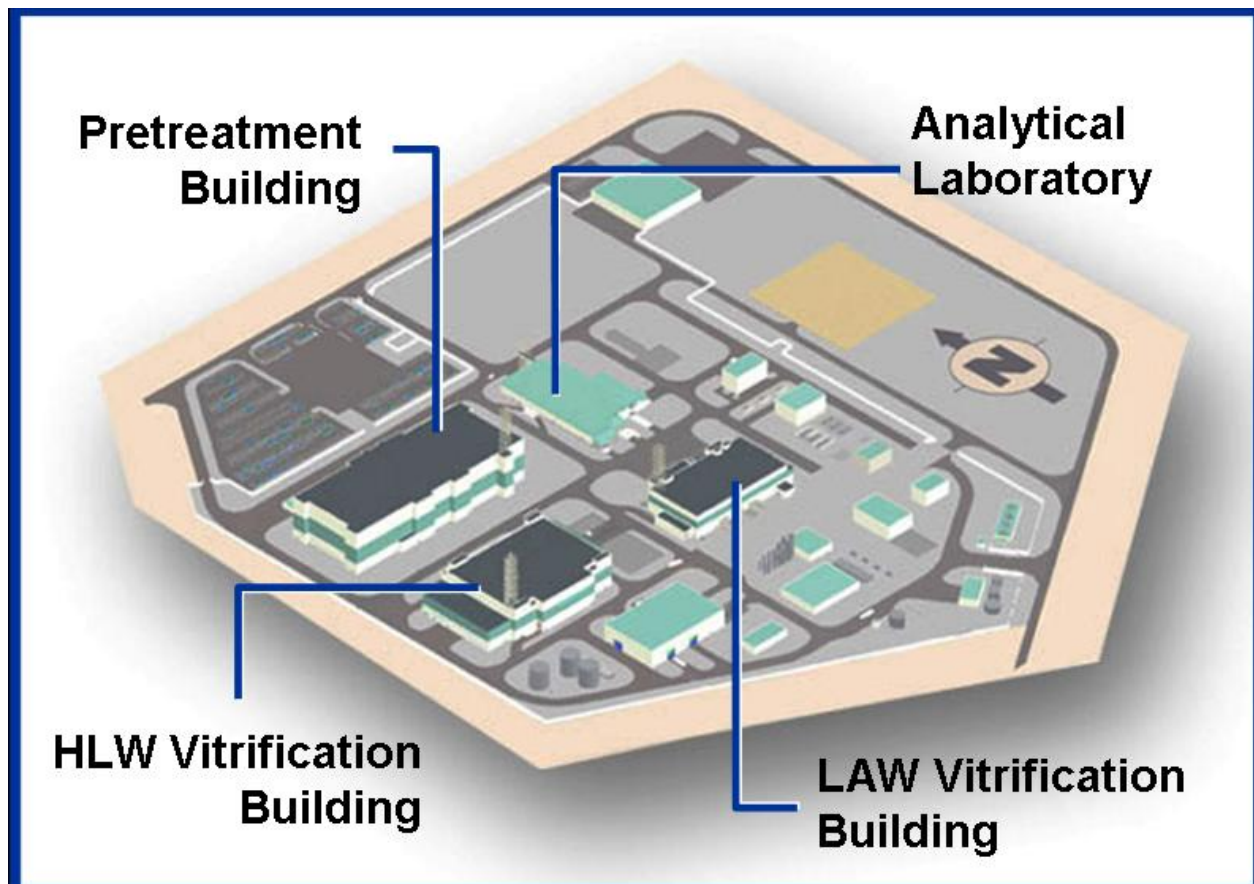
**Hanford Site, Washington**

## Requirement

The Appropriations Committee conferees in the appropriations for Energy and Water Development for FY 2006, Report 109-275, directed the Department of Energy “to report ... by December 1, 2005, on the actions taken to rectify the management failures of this project ...and to report quarterly, beginning on January 1, 2006, on the activities and financial status of each of the subprojects with WTP.” This report provides a highlight of the actions taken to address the management issues and is the first quarterly report submitted to satisfy this requirement.

## Waste Treatment and Immobilization Plant Project Objectives

The overall WTP project objective is to build a facility to treat and immobilize approximately 53 million gallons of radioactive waste at the Hanford Site. This waste is currently stored in 177 underground storage tanks. The WTP at Hanford Site is a massive enterprise made up of 5 separate facilities. Each facility has a forecast, schedule, and milestones associated with it. The facilities (shown in the diagram below) include: the Pretreatment (PT) Facility, the High-Level Waste (HLW) Facility, the Low-Activity Waste (LAW) Facility, the Analytical Laboratory (LAB), and the Balance of Facilities (BOF) which encompasses all the remaining elements of the WTP.



**Hanford's Waste Treatment Plant will be the world's largest chemical-radioactive waste treatment plant. It will solve the problem of radioactive waste stored in underground storage tanks on the Hanford Site.**

## Financial Status

The actual cost to date for the WTP (FY 2005 and prior years) is: \$2,873,989,000. These costs had been collected in a work breakdown structure which included a different set of elements than just the five facilities. The tables below portray the spending status at the end of FY 2005, total available WTP project funding for FY2006, the forecasted spending plan, and a breakdown of estimated spending for each of the five subprojects throughout the fiscal year. These numbers represent the best estimate at this time but may be adjusted to correlate with the updated Estimate-at-Completion (EAC). The EAC is presently on schedule to be validated by summer 2006.

Funding	Dollars (in millions)
FY 2006 New Budget Authority	\$521
FY 2005 Uncommitted Carryover	97
<b>Total</b>	<b>\$618</b>

Planned Spending	Dollars (in millions)
Bechtel National, Inc.	\$590
U.S. Army Corps of Engineers	\$10
Estimate at Completion reviews and seismic earthquake analysis • Pacific Northwest National Lab seismic analysis	\$8
Additional Seismic Analysis • Department Reviews/External Validations • Savannah River Technology Center	\$6 \$4
<b>Total</b>	<b>\$618</b>

### Forecasted Estimates of each Subproject Bechtel National Inc. FY 2006 Planned Spending (in millions)

Subproject	Actual 1 <sup>st</sup> Quarter costs	Planned 2 <sup>nd</sup> Quarter costs	Planned 3 <sup>rd</sup> Quarter costs	Planned 4 <sup>th</sup> Quarter costs	FY 2006 Total
Pretreatment	\$46	\$40	\$37	\$44	\$167
High-Level Waste	35	23	23	28	109
Low-Activity Waste	45	47	47	47	186
Balance of Facilities	18	17	14	18	67
Analytical Lab	13	15	15	18	61
<b>Total</b>	<b>\$157</b>	<b>\$142</b>	<b>136</b>	<b>155</b>	<b>\$590</b>

## Facility Design and Construction Status

### Low-Activity Waste Facility - 01-D-16A:

- Completed melter crane rail installation and set maintenance crane (10 ton capacity) at the west side of the building
- Installing girders for siding on the north, west and east sides of the main building
- Completing structural steel on the south side between +48 foot elevation to +68 foot elevation
- Installing metal decking on the roof (+68 foot elevation)
- Installing fan coil units, ductwork, piping, lighting, and receptacles
- Pouring the cave elevator at the +21 foot elevation
- Installing rails for the melter gallery cranes and process cell crane
- Completed pre-testing of the two process cranes at the fabricators facility

### Analytical Laboratory - 01-D-16B:

- Placed concrete at the slab level
- Installing wall sleeves, rebar, formwork and embeds for future concrete placements
- Installing rebar for the C5 pump pit slabs and walls

### Balance of Facilities - 01-D-16C:

- Backfilling activities completed for the overhead exterior pipe rack concrete pier supports
- Erecting structural steel door frames at the Chiller Compressor Plant
- Completed pulling electrical cable in the Switchgear Building for the Steam Plant and Pump House feeders

### High-Level Waste Facility - 01-D-16D:

- Successfully completed the Factory Acceptance Test for the canister lid welder
- Conceptual design is underway for the filter cave decontamination “portable spray shield”
- Completed demobilization of craft workers and material is being stored on the “-21” foot elevation or returned to warehouses for storage until work commences next fiscal year
- Installing special protective coatings in the secondary off-gas piping and blower space at the “-21” foot elevation

Activity	Total Concrete Placements To-Date	Percent Complete
Walls at the “-21” foot level	77	100%
Walls at the “0” foot level	16	35%
Slabs at the “0” foot level	28	70%

### Pretreatment Facility – 01-D-16E:

- Completed the 90% design review for the ion exchange columns
- Submitted the Dangerous Waste Permit package for secondary containment and leak detection to the Washington State Department of Ecology

Activity	Total Concrete Placements To-Date	Percent Complete
Walls at the “0” foot level	58	100%
Walls at the “28” foot level	55	98%
Walls at the “56” foot level	54	95%
Slabs	49	30%

**Issues Being Addressed:**

- Conducting a thorough review of the peeling of the intumescent structural steel fire coating installed in the Pretreatment Facility and the Low-Activity Waste Facility
- Pursuing analysis to better understand the circumstances for potential hydrogen build-up in the Pretreatment Facility and alternatives for resolution
- Developing the analysis and rationale for revising the structural design criteria, considering the basis for the interim seismic criteria based on the revised ground motion values
- Developing an alternative cesium ion exchange resin which has exceeded project requirements in all areas including hydraulic performance, cesium removal and spent resin de-contamination for disposal

**Actions Taken to Assess the Project**

The Department has been proactive in assessing the viability of the current design of the WTP to treat and immobilize the high-level radioactive waste at Hanford and a determination of the cost and schedule. The Secretary of Energy has met personally on several occasions with senior principals of Bechtel National, Inc. to convey DOE’s expectations concerning contractor performance for this project. Bechtel National, Inc. has initiated reviews of the WTP by three teams outlined in the following tables.

Industry Technical Review (External Best & Brightest)	
Scope	Talent
Assess the adequacy of process technology and technical design and risks to meeting throughput requirements.	<p><b>40 personnel total, 20 with PhDs</b>  <b>Retired personnel from:</b></p> <ul style="list-style-type: none"> <li>• Bechtel Group</li> <li>• DuPont</li> <li>• Owens Corning</li> <li>• Rohm Hass</li> <li>• Occidental</li> <li>• Battelle Laboratory</li> </ul> <p><b>Personnel from:</b></p> <ul style="list-style-type: none"> <li>• Parsons Engineering</li> <li>• BNG America</li> <li>• AREVA/Framatone-ANP</li> <li>• 3M</li> <li>• Washington State University</li> <li>• University of Maryland</li> <li>• Drexel University</li> </ul>

	<ul style="list-style-type: none"> <li>• University of Minnesota</li> <li>• Virginia Commonwealth University</li> <li>• Illinois Institute of Technology</li> <li>• Dominion Engineering</li> <li>• Westinghouse</li> <li>• Fluor Hanford</li> <li>• Shaw/Stone-Webster</li> <li>• CH2MHill Hanford</li> <li>• and more</li> </ul>
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Industry Estimate at Completion (EAC) Review (External Best & Brightest)	
Scope	Talent
<p>Assess the ability to complete the project within cost and schedule</p>	<p><b>Industry experts from:</b></p> <ul style="list-style-type: none"> <li>• commercial nuclear power industry</li> <li>• chemical industry</li> <li>• project management and engineering/procurement/construction firms</li> <li>• industry associations</li> <li>• leading consultants in cost/schedule analysis and earned value management system</li> </ul> <p><b>Specifically, 15 personnel:</b>  <i>Retired personnel from:</i></p> <ul style="list-style-type: none"> <li>• Bechtel Group</li> <li>• Tennessee Valley Authority</li> </ul> <p><i>Personnel from:</i></p> <ul style="list-style-type: none"> <li>• Shaw Group</li> <li>• Jacobs Engineering Group</li> <li>• BWXT services</li> <li>• University of California-Berkeley</li> <li>• and more</li> </ul>

Industry Oversight Team	
Scope	Talent
<p>Evaluate the Technical Review Team's and EAC Team's plans, provide in-process checks, review the final report(s), and provide comments.</p>	<p>Senior corporate executives from leading engineering, procurement, construction and commissioning firms including:</p> <ul style="list-style-type: none"> <li>• Bechtel Group</li> <li>• Jacobs Engineering Group</li> <li>• Washington Group</li> <li>• CH2MHill</li> </ul>

## Actions Taken to Validate the Project

The Department has engaged the U.S. Army Corps of Engineers (USACE) to validate the Estimate At Completion as well as several other reviews. This will provide the Department with additional confidence in the design, cost and schedule as proposed by Bechtel National, Inc.

U.S. Army Corps of Engineers Estimate at Completion Review	
Scope	Talent
Conduct an independent review of the updated 2005 Estimate at Completion. If acceptable, validate it.	<b>USACE experts in:</b> <ul style="list-style-type: none"> <li>• project management and scheduling</li> <li>• cost engineering</li> <li>• procurement</li> <li>• construction</li> <li>• cost/schedule analysis</li> <li>• earned value management system</li> </ul>

U.S. Army Corps of Engineers “Over the Shoulder” Structural Review	
Scope	Talent
Review the adequacy of the design to meet the interim seismic criteria.	<b>USACE experts in:</b> <ul style="list-style-type: none"> <li>• engineering</li> </ul>

U.S. Army Corps of Engineers Seismic Borehole Review	
Scope	Talent
<ul style="list-style-type: none"> <li>• Review the development and implementation of the revised seismic design criteria</li> <li>• Participate in the activities to gather additional geophysical data to confirm the revised seismic design criteria</li> </ul>	<b>USACE experts in:</b> <ul style="list-style-type: none"> <li>• engineering</li> <li>• geology</li> <li>• geophysics</li> </ul>

## Actions Taken to Address Management Issues

The Department has been proactive in addressing the management issues surrounding the WTP project and taking actions to get this project back on track. The Secretary of Energy and the Assistant Secretary for Environmental Management have directed aggressive initiatives to enhance project management, and business systems. These initiatives are to ensure that experienced and talented federal and contractor personnel with the correct skill set are in place to execute and oversee the project. The Department has commissioned several professional reviews by nationally recognized experts from private industry and the USACE. Teams of the best and brightest minds in the nation from across government and industry are implementing technical design reviews, cost and schedule reviews, project management reviews, and seismic earthquake reviews. As noted above, the

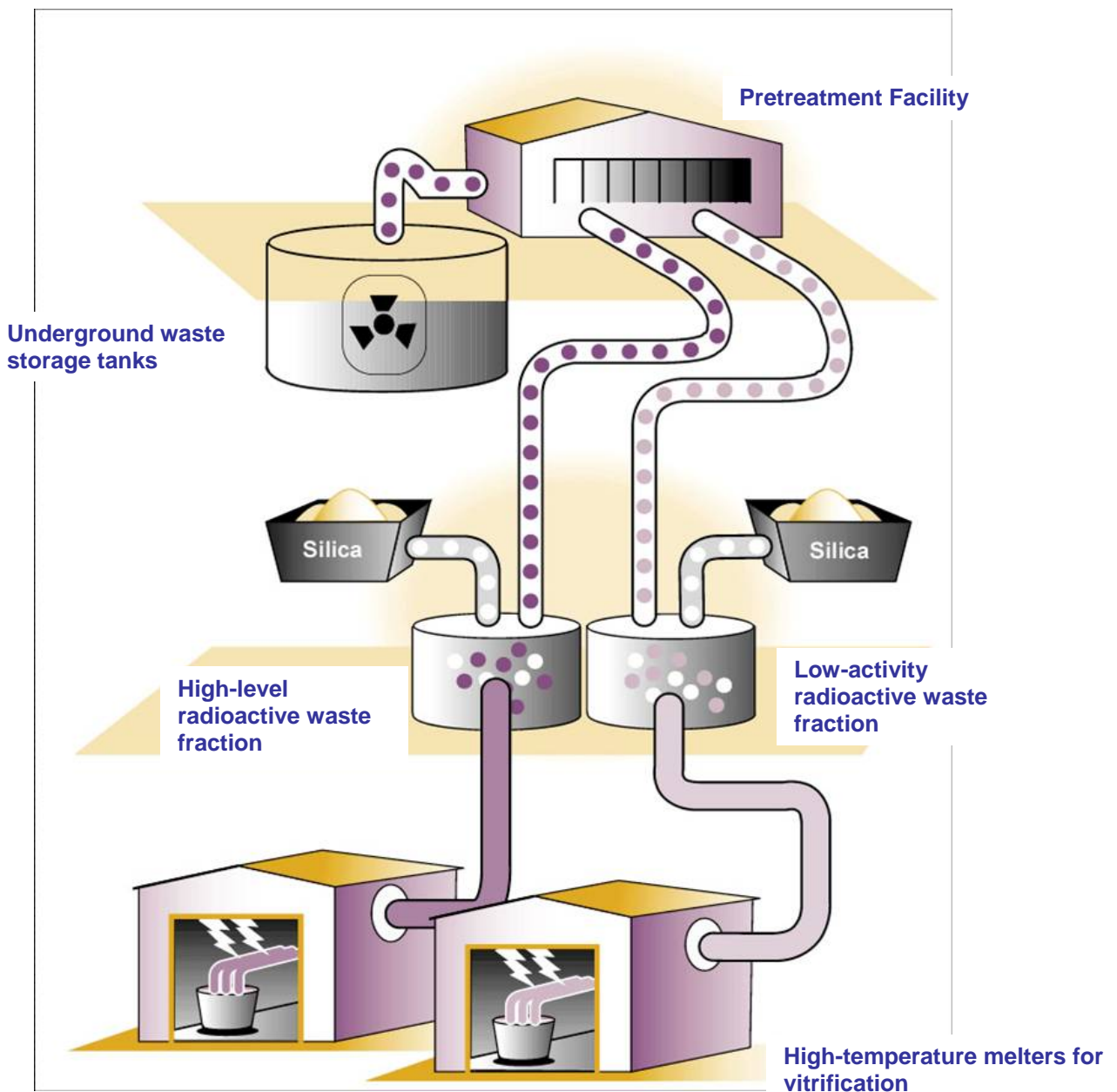
Department has fully engaged the USACE to perform an independent review of the updated Estimate-at-Completion, and if acceptable, to validate the WTP project baseline.

Key DOE Management Activities	Status
<b>Establish</b> a new Headquarters Senior Level WTP Oversight Team.	<b>Established</b> August 2005. Team is actively engaged in WTP initiatives.
<b>Commission</b> an After Action Fact Finding Review utilizing a reputable independent expert team.	<b>On schedule to be completed by January 2006.</b>
<b>Actively pursue</b> certification of the WTP Federal Project Director in accordance with DOE's Project Management Career Development Program.	<b>Complete.</b>
<b>Ensure</b> talented, experienced federal and contractor staff with needed skill sets.	<b>In process.</b> Additional technical, contracting and legal staff are being recruited.
<b>Implement</b> more aggressive and regular reporting requirements to senior HQ management.	<b>Implemented.</b> <ul style="list-style-type: none"> <li>• Weekly progress reports are submitted to the Principal Deputy Assistant Secretary for Environmental Management.</li> <li>• Federal Project Director submits bi-monthly reports to HQ senior management.</li> <li>• Regular updates provided to the senior leadership.</li> </ul>
<b>Direct</b> Bechtel National, Inc. to update project Estimate-at-Completion.	<b>Complete.</b> Bechtel submitted updated Estimate-at-Completion for all five facilities by December 31, 2005.
<b>Commission</b> the USACE to engage in the project with the following focus: <ul style="list-style-type: none"> <li>• <b>Assess</b> Bechtel EAC and validate if acceptable.</li> <li>• <b>Conduct</b> an "Over the Shoulder" review on the WTP seismic design.</li> <li>• <b>Manage</b> the seismic borehole drilling initiative.</li> </ul>	<b>On schedule.</b> The USACE is reviewing the EAC and is on track for a summer 2006 validation.  <b>Implemented.</b> The "Over the Shoulder" review is currently ongoing.  <b>Implemented.</b> A USACE team has been assembled and is preparing a planning and justification report with recommendations on a path forward.
<b>Commission</b> independent reviews utilizing private industry "Best and Brightest" experts to: <ul style="list-style-type: none"> <li>• <b>Assess</b> Bechtel's updated EAC.</li> <li>• <b>Assess</b> technical design/engineering/flowsheet.</li> </ul>	<b>On schedule.</b>  <b>Report</b> to be finalized March 2006.  <b>Report</b> to be finalized March 2006.
<b>Implement</b> effective Earned Value Management System (EVMS) to measure contractor performance.	<b>In progress.</b> EVMS system is in the process of being certified.
<b>Review</b> all of the WTP project management systems and processes to ensure compliance with DOE Order 413.3 (DOE Program and Project Management).	<b>Currently ongoing.</b> On schedule to be completed by April 2006.

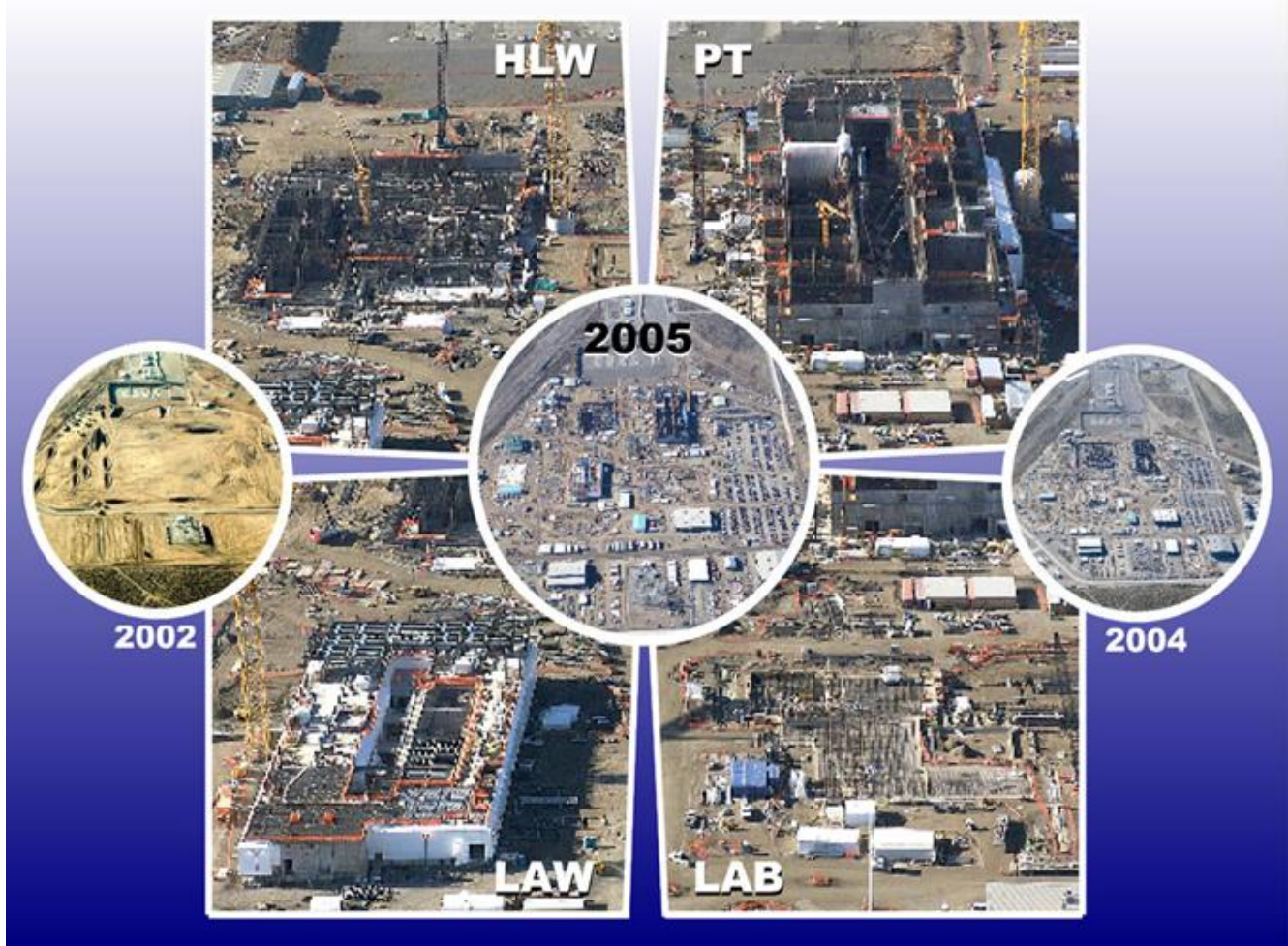


**The WTP will process and solidify radioactive waste currently stored in underground storage tanks. The WTP is the best approach for cleaning up the most dangerous radioactive waste site in the country.**

The concept for operation of the WTP is to treat the Hanford tank waste by separation into a high-level fraction and a low-activity fraction. Both fractions will be immobilized through vitrification into glass. The high-level fraction will be disposed in the national geologic repository. The low-activity fraction will be placed in a disposal facility on the Hanford Site. The diagram below illustrates the WTP process.



The photos below show the construction progress on the WTP since June 2002.



HLW - High-Level Waste Facility

PT – Pretreatment Facility

LAW - Low-Activity Waste Facility

LAB - Analytical Laboratory

## Marshalling Yard

Shown below is the marshalling yard at the WTP, covering over 100 acres, which is the laydown area for storing construction equipment. Construction materials include 7,000 tons of fabricated steel and 4,800 pipe hangers, among other things. In addition to the marshalling yard, WTP also has 140,000 square feet of indoor warehouse space and an additional 30 acres of outdoor laydown area.



7,000 tons of fabricated steel



4,800 Pipe Hangers  
17,900 Pipe Spools





Construction in the Pretreatment Facility (above) and the High-level Waste Facility (below).





**The Low Activity Waste Facility (above left) is progressing – shown above are workers raising steel to the building's final height.**

**Shown above right is the Analytical Laboratory.**

**Below left is Balance of Facilities, and below right is the Pipe Module for the Pretreatment Facility.**

