

Project Baseline Summary Report

Data Source: **EM CDB**
Operations/Field Office: **Richland**
Site Summary Level: **Hanford Site**
Project **RL-WM06 / Analytical Services**

Report Number: **GEN-01b**
Print Date: **3/9/2000**
HQ ID: **0398**

General Project Information

Project Description Narratives

Purpose, Scope, and Technical Approach:

Purpose: The Hanford Analytical Services Project supports the Hanford mission by providing analytical services to site programs. These services include waste and environmental sample analysis, process control support, field and sampling services, development services and site expertise in chemistry and data quality. The Analytical Services Project operates on-site analytical laboratories, contracts commercial services, establishes site laboratory quality standards, and integrates all Hanford analytical services. Cost effective, quality and timely services are provided utilizing a combination of government-contracted and commercial capabilities based on biannual site projections.

FY 2001 Work Scope - Analytical Services Project

FACILITIES

- Maintain and operate the 222-S complex in a compliant and ready-to serve condition.
- Maintain 222-S analytical systems operational, with accreditations and certifications current, to support Hanford project needs.
- Maintain and operate the WSCF complex in a compliant and ready-to serve condition.
- Maintain WSCF analytical systems operational, with accreditations and certifications current, to support Hanford project needs.
- Maintain essential services at a level matching Hanford project needs.
- Continue upgrades to critical laboratory systems (e.g. analytical instruments, computer systems) to maintain and improve efficiencies and to maintain analytical technologies current.
- Continue upgrades to 222-S and WSCF to assure the facilities will be available for the planned duration in the current site baseline (FY 2035 for 222-S and FY 2046 for WSCF).

BUSINESS MANAGEMENT

- Continue to reduce costs and improve efficiencies through integration of all site analytical services.
- Continue management of commercial laboratory contracts such that services are ready to support Hanford project needs.
- Maintain laboratory quality requirements current through maintenance of HASQARD.
- Continue interfacing with Hanford projects and clients to assess needs, integrate analytical capabilities, and route analytical work appropriately.

Scope: Specific project scope from the Hanford Site technical baseline is provided below in terms of the systems that the project has responsibility for.

222-S Laboratory

- Maintain 222-S Facility/Analytical Readiness: Ensure that the 222-S Laboratory Complex is available in a 'ready-to-serve' configuration that meets the capability and capacity requirements of the Hanford Mission. Workscope includes readiness for preparation and analyses of samples greater than 1 mR/hr. Workscope includes maintenance of the building and analytical equipment, engineering, quality assurance, health physics, waste disposal, and other activities required to ensure a safe, efficient operation of the Laboratory. This activity operates at a level that supports the

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monitoring and characterization activities of other projects in order to maintain their minimum safe level.

- Provide 222-S Operations Essential Services: Procurement of new, upgrade, or replacement analytical equipment and instrumentation for 222-S Laboratory. Equipment replacement/upgrade is required to keep abreast of new technologies and improve productivity.

- Provide 222-S Life Extensions/Upgrades: General facility upgrades are required to ensure laboratory facility compliance with regulations such as NFPA, NEC, OSHA. etc. In addition, room life extension upgrades to address safety and production issues in order to maintain the 222-S laboratory's viability to end of mission.

WSCF

- Maintain Safe & Compliant Waste Sampling and Characterization Facility in CP Areas: Maintain the Waste Sampling and Characterization facility structures, operating systems and equipment, and monitoring systems within the approved safety and compliance requirements until the facilities are made available for clean-up.

- Maintain WSCF Facility/Analytical Readiness: Provide for the operation and maintenance of the Waste Sample and Characterization Facility (WSCF) Complex in a ready-to-serve state. The mission of the WSCF is to provide general analytical chemistry services for samples less than 10 mR/hr in support of Hanford project missions. Workscope includes operation and maintenance of the building and analytical equipment, field and analytical sampling and analyses, support from engineering, quality assurance and health physics, performance evaluation programs, waste burial/disposal, etc., production control and material control support, and other activities required to ensure a safe, efficient operation. This activity operates at a level that supports the monitoring and characterization activities other projects perform in order to maintain their minimum safe level.

- Provide WSCF Essential Services: Procurement of new, upgrade, or replacement analytical equipment and instrumentation for WSCF. Equipment replacement/upgrade is required to keep abreast of new technologies and improve productivity.

- Provide WSCF Life Extensions/Upgrades: Replace/upgrade equipment in the Waste Sampling and Characterization Facility to keep abreast of new technologies, and improve productivity.

- Provide Mobile In-Field Analytical Services: Provide Hanford Site projects a mobile, in-the-field analytical laboratory capabilities for collecting and/or characterizing LL radioactive matrices and first-of-a-kind analytical procedure development.

- Provide Commercial Laboratory Services: Collect and/or receive generator's low-/nonradioactive sample(s) for analysis, prepare and ship sample to commercial laboratory, monitor the commercial analysis, and report (review, transmit) sample analysis results.

Technical Approach: The end point targets in the Hanford Strategic Plan addressed by this project include:

- The Hanford Site Infrastructure shall be optimized. Develop cost-competitive infrastructure commensurate with mission needs. Involve staff and

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community in the outsourcing process to assure the most cost competitive infrastructure.

- Protect worker health and safety; reduce accidents and radiological exposure; achieve voluntary protection program "star" status.
- Protect public health and the environment. Reduce or eliminate emissions and effluents. Regulatory and TPA compliance.

The technical approach and technology initiatives for the Project to accomplish the Hanford Strategic Plan end point targets are identified below.

- Technical Objectives - Analytical Services: The 222-S and Waste Sampling Characterization Facility complexes are maintained in a ready-to-serve configuration, which includes maintenance of the building and analytical equipment, engineering, quality assurance, environmental and safety compliance, and facility upgrades.

Project Status in FY 2006:

222-S Laboratory

- The 222-S Laboratory will continue to be maintained in a safe and compliant configuration and in a ready-to-serve configuration to provide high level radioactive sample analysis services to Hanford site projects.

WSCF

- The WSCF Laboratory will continue to be maintained in a safe and compliant configuration and in a ready-to-serve configuration to provide low level radioactive sample analysis services to Hanford site projects. Commercial laboratory contracts will be maintained.

Post-2006 Project Scope:

222-S Laboratory

- The 222-S Laboratory will continue to be maintained in a safe and compliant configuration and in a ready-to-serve configuration to provide high level radioactive sample analysis services to Hanford site projects. A major laboratory modernization project is planned from 10/1/2013 through 9/30/2015 to extend the life of 222-S out to transition in FY 2035.

WSCF

- The WSCF Laboratory will continue to be maintained in a safe and compliant configuration and in a ready-to-serve configuration to provide low level radioactive sample analysis services to Hanford site projects. Commercial laboratory contracts will be maintained. A major laboratory modernization project is planned from 10/1/2024 through 9/30/2025 to extend the life of WSCF to scheduled transition in FY 2046. Commercial laboratory contracts will be maintained until the cleanup mission is complete. It is expected these contracts will transfer to a "monitoring project" to support post-cleanup activities.

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Project End State

Specific work activities to close the facilities under this Project to be performed by others at the end of this Project's mission are identified below.

222-S Laboratory

Work associated with facility performed by Accelerated Deactivation:

Transition 222-S Laboratory Facility

Maintain Safe & Compliant 222-S Laboratory Facility in CP Areas

Work associated with facility performed by Decontamination & Decommissioning:

Decontaminate and Decommission (D&D) 222-S Laboratory Facility

WSCF

Work associated with facility performed by Decontamination & Decommissioning:

Decontaminate and Decommission (D&D) Waste Sampling and Characterization Facility

Cost Baseline Comments:

This cost baseline was developed using Activity Based Cost Estimating and resource loaded schedules. Escalation was applied in accordance with Fluor-Daniel Hanford budget guidance.

Safety & Health Hazards:

The Hanford Analytical Services Project operates and maintains the 222-S high-level laboratory complex and the low-level Waste Sampling and Characterization Facility (WSCF) complex. The project also is responsible for integrating all site analytical services, establishing and implementing a site Analytical Services quality system, and for managing commercial contracts. The project provides analytical services for all major site projects, including TWRS, Spent Fuels, Waste Management, and Environmental Restoration.

Project Stopped Risks

If this project were stopped, analytical services would not be available to support the requirements of a wide range of Hanford projects. Many important Hanford projects (e.g. retrieval and treatment of wastes from single and double shell tanks, clean out of spent nuclear fuel storage basins) could not proceed as planned. As a result, the hazards and activities of these Hanford projects would pose greater public health, worker, and environmental risks.

Waste retrieval and processing operations at the 200 area single and double shell tanks would be specifically impacted by the shutdown of analytical services. Delays in dealing with tank hazards would increase the probability of the failure of a waste tank and the release of contaminants to the environment. The probability of an incident that would release radioactive material to the atmosphere is estimated (based on best engineering judgment) to increase to over 0.01 per year. Impacts are estimated to involve overexposures to members of the public, serious overexposures to workers, and significant damage to the environment. The corresponding public, worker and environmental risks are estimated to be "2C-Medium." If the Analytical Services Project is instead halted in later years, after other projects finish work, risks of stopping this project would decrease to "3C-

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Low." Supporting information on this scenario (and references) can be found in the discussions of stopped project risk for the various TWRS projects.

Project Implemented Risks

During the implementation of the Analytical Services Project, a different set of risks are posed. Operation and maintenance of WSCF is comparable to that of commercial laboratories, where risks are from potential exposures to hazardous and low-level radioactive materials (less than 10mR/hr) and from common industrial hazards. Operation and maintenance of the 222-S laboratory involves a higher level of risk, mainly associated with inventories of highly radioactive (hundreds of R/hr) materials. Risks to the general public are low since release and dispersion of radioactive or hazardous materials outside of Hanford are not credible. Public health risk is estimated to be "3D-Low."

Risks are present to worker safety and the environment at both facilities, and are higher at 222-S due to the higher radioactive material inventory. The risk driver is overexposure to a radioactive or hazardous materials or an industrial injury resulting in limited disabilities of less than three months. The time until such an event (based on past operating experience) is less than one year. This corresponds to a worker risk of "3A-Medium." The probability of this occurrence reduces from once per year to once every ten years in FY 2035 when the 222-S laboratory is closed, reducing the worker risk to "3B-Medium."

Environmental risks are mainly associated with localized spills to the ground which would produce only moderate environmental damage over a small area. Such an event is estimated (based on best engineering judgment) to occur once between ten and one hundred years. This corresponds to an environmental risk of "3C-Low."

The resulting public, worker, and environmental risks of stopping the Analytical Services Project are estimated to be "2C-Medium." As the need for analytical services decreases as other projects finish their work, risks of stopping this project would decrease.

Risk reduction metrics specific to the Analytical Services Project are the completion of projects that require analytical services and the shutdown of the laboratories as the project work load diminishes. Risk data in Table C.1.1 are driven by TWRS risks, except for worker risks beyond FY 2035, which are driven by continued implementation of the Analytical Services Project.

Hazards are documented in the WSCF Complex Safety Analysis (WHC-SD-WM-ASA-001, Rev. 0, June 1996), the 222-S Laboratory Interim Safety Basis (HNF-SD-CP-ISB-002, Rev. 3, March 1998), the annual Baseline Hazard Assessment Report, and the annual Occupational Safety Assessment Report.

Safety & Health Work Performance:

Covered in PBS RL-WM03 for the Waste Management Project.

PBS Comments:

The target level funding reflected in section B.1 is different than the baseline budget contained in this PBS, and reflects reductions in scope that would be taken from this project if needed enhanced performance targets are not realized for the site to meet the overall anticipated funding level. Specific impacts in FY 1999 and their consequence would be:

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No funding for an activity that is required by a TPA milestone. The milestone that would be missed is M-32-02 "Secondary Containment at Analytical Services" which would be 90% complete by FY 99. This funding allows for final ORR and acceptance of the project (Project W-178, 219-S Secondary Containment, \$364K).

Baseline Validation Narrative:

During September 1998, the DOE conducted an exhaustive review of the project baseline. The purpose of the review was to ensure that Activity Based Cost Estimating methodologies were utilized, the planning bases were sound, and the results were adequately documented. Comprehensive interviews were also conducted with key members of the project team. Relatively minor changes have been included in routine baseline changes.

TECHNICAL APPROACH REFERENCE DOCUMENTS

- Waste Management Project Fiscal Year 1999 Multi-Year Work Plan WBS 1.2, HNF-SP-1229 Rev. 2
- Hanford Site Technical Database (HSTD)

General PBS Information

Project Validated? Yes **Date Validated:** 9/29/1998

Has Headquarters reviewed and approved project? Yes

Date Project was Added: 12/1/1997

Baseline Submission Date:

FEDPLAN Project? Yes

Drivers:	CERCLA	RCRA	DNFSB	AEA	UMTRCA	State	DOE Orders	Other
	Y	Y	Y			Y	Y	Y

Project Identification Information

DOE Project Manager: Helen E. (Beth) Bilson

DOE Project Manager Phone Number: 509-376-1366

DOE Project Manager Fax Number: 509-372-1926

DOE Project Manager e-mail address: Helen_E_Beth_Bilson@rl.gov

Is this a High Visibility Project (Y/N):

Planning Section

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Baseline Costs (in thousands of dollars)

	1997-2006 Total	2007-2070 Total	1997-2070 Total	1997	Actual 1997	1998	Actual 1998	1999	2000	2001	2002	2003	2004	2005	2006	
PBS Baseline (current year dollars)	289,121	1,398,319	1,687,440	31,227	34,802	31,221	28,341	28,423	29,001	27,596	27,112	27,708	28,315	28,941	29,577	
PBS Baseline (constant 1999 dollars)	272,836	813,592	1,086,428	31,227	34,802	31,221	28,341	28,423	28,405	26,447	25,423	25,423	25,421	25,423	25,423	
PBS EM Baseline (current year dollars)	289,121	1,398,319	1,687,440	31,227	34,802	31,221	28,341	28,423	29,001	27,596	27,112	27,708	28,315	28,941	29,577	
PBS EM Baseline (constant 1999 dollars)	272,836	813,592	1,086,428	31,227	34,802	31,221	28,341	28,423	28,405	26,447	25,423	25,423	25,421	25,423	25,423	
	2007	2008	2009	2010	2011- 2015	2016- 2020	2021- 2025	2026- 2030	2031- 2035	2036- 2040	2041- 2045	2046- 2050	2051- 2055	2056- 2060	2061- 2065	2066- 2070
PBS Baseline (current year dollars)	30,228	30,893	31,573	32,267	172,302	192,107	214,190	238,810	266,261	80,620	89,887	19,181				
PBS Baseline (constant 1999 dollars)	25,423	25,423	25,423	25,423	127,237	127,235	127,237	127,235	127,236	34,553	34,553	6,614				
PBS EM Baseline (current year dollars)	30,228	30,893	31,573	32,267	172,302	192,107	214,190	238,810	266,261	80,620	89,887	19,181				
PBS EM Baseline (constant 1999 dollars)	25,423	25,423	25,423	25,423	127,237	127,235	127,237	127,235	127,236	34,553	34,553	6,614				

Baseline Escalation Rates

1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
0.00%	0.00%	0.00%	2.10%	2.20%	2.20%	2.20%	2.20%	2.20%	2.20%	2.20%	2.20%	2.20%

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2010	2011-2015	2016-2020	2021-2025	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055	2056-2060	2061-2065	2066-2070
2.20%	2.20%	2.20%	2.20%	2.20%	2.20%	2.20%	2.20%	2.20%	2.20%	2.20%	2.20%	2.20%

Project Reconciliation

Project Completion Date Changes:

Previously Projected End Date of Project: 9/30/2046
 Current Projected End Date of Project: 9/30/2046
 Explanation of Project Completion Date Difference (if applicable):

Project Cost Estimates (in thousands of dollars)

Previously Estimated Lifecycle Cost (1997 - 2070, 1998 Dollars):	1,146,634	Actual 1997 Cost:	34,802	Actual 1998 Cost:	28,341
Previously Estimated Lifecycle Cost of Project (1999 - 2070, 1998 Dollars):	1,083,491	Inflation Adjustment (2.7% to convert 1998 to 1999 dollars):			29,254
Previously Estimated Lifecycle Cost (1999 - 2070, 1999 Dollars):	1,112,745				

Project Cost Changes

	Cost Adjustments	Reconciliation Narratives
Cost Change Due to Scope Deletions (-):		
Cost Reductions Due to Efficiencies (-):		
Cost Associated with New Scope (+):		
Cost Growth Associated with Scope Previously Reported (+):		
Cost Reductions Due to Science & Technology Efficiencies (-):		
Subtotal:	1,112,745	
Additional Amount to Reconcile (+):	-88,765	
Current Estimated Lifecycle Cost (1999 - 2070, 1999 Dollars):	1,023,980	

Milestones

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Milestone/Activity	Field Milestone Code	Original Date	Baseline Date	Legal Date	Forecast Date	Actual Date	EA	DNFSB	Mgmt. Commit.	Key Decision	Intersite
COMPLETE 219-S TANK INTERIM STATUS ACTIONS	AS-97-015	4/30/1999	4/30/1999	6/30/1999			Y				
COMPLETE CONSTRUCTION ON PROJECT W-178	AS-99-001	4/30/1999	4/30/1999								
Begin Analytical Services Project	PBS-97-013		2/28/1997								
PBS Mission Completion	PBS-MC-013		9/30/2046								
PBS Project End	PBS-PE-013		9/30/2046								

Milestones - Part II

Milestone/Activity	Field Milestone Code	Critical Decision	Critical Closure Path	Project Start	Project End	Mission Complete	Tech Risk	Work Scope Risk	Intersite Risk	Cancelled	Milestone Description
COMPLETE 219-S TANK INTERIM STATUS ACTIONS	AS-97-015										Submit the 219-S Tank interim status actions.
COMPLETE CONSTRUCTION ON PROJECT W-178	AS-99-001										Complete construction activities on 219-S secondary containment system.
Begin Analytical Services Project	PBS-97-013			Y							Administrative input to document the start of this PBS.
PBS Mission Completion	PBS-MC-013					Y					Administrative input to document the mission completion of this PBS.
PBS Project End	PBS-PE-013				Y						Administrative input to document the project end of this PBS.

Release Sites

Site Code	RSF ID	Change Flag	Description	Class/Subclass Name	Planned Assess. Year	Forecast Assess. Year	Actual Assess. Date	Planned Comp. Year	Forecast Comp. Year	Actual Comp. Date	Acc. Year	No Action	Comp. Status	RAD
HASI	8399	R	200-W-46, 222-S Laboratory Room 4-E 90-Day Waste Accumulation Area	/										
HASI	8400	R	200-W-49, 222-S Laboratory Room 2-D 90-Day Waste Accumulation Area	/										

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HASI	8401	R	207-SL, 222-S Retention Basin, REDOX Lab Retention Basin, 207-SL Retention Basin	/										
HASI	8402	R	219-S-101, 219-S-TK-101, TK-101 Crib Waste Receiver, 219-S, TK-101 Receiver Tank	/										
HASI	8403	R	219-S-102, 219-S-TK-102, 219-S Storage Tank 102, 219-S Primary Treatment Tank TK-102	/										
HASI	8404	R	219-S-103, 219-S-TK-103, 219-S Storage Tank 103, 219-S Backup Treatment Tank TK-103	/										
HASI	8405	R	222-SD, 222-S Laboratories Storage Pad, 222-SD, 222-S Storage Pad	/										
HASI	8406	R	2607-W6	/										
HASI	8407	R	296-S-13	/										
HASI	8408	R	296-S-16	/										
HASI	8409	R	296-S-21	/										
HASI	8410	R	600-215, 6265A 90-Day Waste Accumulation Area	/										
HASI	8411	R	6607-9, Septic Tank 6607-9 Large On-Site Sewage System, Project W-011H	/										
HASI	8412	R	UPR-200-W-87, UN-216-W-87, Radioactive Spill from Filter Housing, UN-200-W-87	/										

Technology Needs

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Technology Needs

Site Need Code: RL-MW024
Site Need Name: Screening of Materials for PCB Content
Focus Area Work Package ID: MW-01
Focus Area: MWFA
Benefits (Cost, Risk Reduction, Both): Both

Focus Area Work Package: Nondestructive Characterization for Treatment, Transportation, and Disposal of MLL and MTRU Waste.
Agree with Technology Link: Y

Technologies

Solutions for TRU Waste Streams without Disposition Options

Cost Savings (in thousands of dollars) Range of Estimate