Tank Waste Remediation System Multi-Year Work Plan

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Office of Environmental Restoration and
Waste Management

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Hanford Company

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Approved for Public Release

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This document was reviewed following the
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APPROVED FOR PUBLIC RELEASE

* * * * *

WHC Information Release Administration Specialist:

Kara Broz

(Signature)

September 29, 1994

(Date)

**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste (M&O Contractor)	2. DATE PREPARED August 18, 1994	3. IDENTIFICATION NUMBER DE-ACC06-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.04/IV	5. WBS ELEMENT TITLE Characterization	
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE August 31, 1994
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1130	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOED/RL-92-60-REV.1) 4.2.1.2 Characterize Waste	12. BUDGET AND REPORTING NUMBER Expense Capital Line Item EW3120074 35EW31207	

13. ELEMENT DESCRIPTION**A. COST CONTENT**

Total cost of Characterization is equal to \$937.8M for FY 1994 - FY 2015 (escalated dollars).

B. TECHNICAL BASESGoals and objectives:

The objective of the Characterization program is to provide physical and chemical properties of the tank waste as specified in data quality objectives prepared by the other TWRS elements.

Characterization has the responsibility for managing the tank waste characterization efforts necessary to support safe operations, storage, and disposal of tank wastes. The Characterization program provides leadership to establish technical bases, determine characterization requirements (data quality objectives [DQOs]), obtain samples for analysis, evaluate data, recommend actions, develop analytical equipment and processes, and manage technical activities associated with tank waste characterization which are needed to implement the TWRS Program mission.

Specific activities of the Characterization Program following:

1.1.1.2.04.01, Technical Integration and Planning

- Program element and baseline management
- Support for Quality Assurance Program Plan
- TWRS System Engineering Support
- Preparation of Tank Waste Analysis Plan (TWAP)
- Preparation of Tank Characterization Plans (TCPs)

1.1.1.2.04.02, Technology Development and Applied Engineering

- Hot Cell Instrumentation Development
- Analytical Procedures Development
- In-Situ Methods Development
- Field Sampling Improvements

1.1.1.2.04.03, Field Sampling and Measurement

- Screen Watch List and Non-Watch List tanks for safety DQOs
- Take core samples to support Tri-Party Agreement
- Collect samples to support waste processing
- Sample supernate from double-shell tanks to support RCRA/processing requirements
- Vapor Sampling to Support Rotary Mode Sampling/Flammable Gas & Organic Issue
- Auger Sampling to Screen for Safety Issues
- In-Situ Measurement to Support Cone Penetrometer/TPA and Waste Processing

1.1.1.2.04.04, Analytical Integration

- Maintain 222-S Laboratory in Ready-to-Serve Mode
- 300 Area Waste Assessment
- Analysis of Watch List and non-Watch List tanks for safety DQOs
- Analysis of core samples to support the Tri-Party Agreement
- Analysis of samples to support waste processing
- Analysis of samples to support RCRA/processing requirements
- Vapor sample analysis
- Auger sample analysis
- Upgrade/analysis of offsite laboratory
- Modify PAS-1 license and provide NCAW casks
- 222-S and 325 Laboratory upgrades

1.1.1.2.04.05, Data Evaluation and Reporting

- Coordination of TWRS DQO process
- Support of TWRS organizations in the development of DQOs
- Development of Tank Characterization Plans (TCPs)
- Completion of historical data evaluation
- Generation of Tank Characterization Reports (TCRs)
- Entry of characterization data into Tank Characterization Database (TCD)
- Development and improvements of Tank Characterization Database

Major end-item deliverables:

- The terminal deliverable is characterization of all tank waste to satisfy the needs of all other TWRS program elements.
- Tank Characterization Reports for all 177 high-level waste (HLW) tanks by September 1999 (Tri-Party Agreement M-44-00)
- Complete all sampling and analysis of Watch List tanks per applicable DQOs by October 1995 and safety screen all tanks by October 1996
- Characterization for waste processing activities
- Characterization for the resolution and mitigation of Watch List tanks
- Characterization of double-shell tank's supernate for Part B Permit/RCRA

The following deliverables support major Tri-Party Agreement milestones (M-44-00)

- Annual tank waste analysis plans
- Annual completion of Tank Characterization reports

The following items are major deliverables for the Defense Nuclear Facility Safety Board (DNFSB):

- Sampling and analysis of waste characterization tanks by October 1995
- Safety screening of all tanks by October 1996

Acceptance criteria:

- Data obtained fulfills DQOs
- Samples will be obtained and analyzed per Tank Characterization Plans
- Criteria as identified in the Hanford Analytical Services Quality Assurance Plan will be produced.

C. STATEMENT OF WORK

The Characterization program will provide guidance to other TWRS organizations in the development of DQOs to address specific issues.

Based on the DQOs, guidance will be provided to the Characterization Program for QA/QC protocol required for sampling and analysis activity. The Tank Characterization Plans will utilize this information when available and provide direction as appropriate.

The Tank Waste Analysis Plan provides direction for sampling activities which include: Part B Permit sampling for double-shell tanks and 242-A Evaporator sampling activities related to Tank Farm sampling, compatibility, grab sampling, auger, and core sampling. Samples that are individual tank samples are under the umbrella of the Characterization program. Blended samples that may need analysis are considered process development samples and are not Characterization samples.

The Laboratory and Characterization program must agree on the data format and validation criteria prior to collection of samples through approval of the Tank Characterization Plan. Data format and validation criteria will be specified for each tank in the respective Tank Characterization Plan.

The deliverable for data packages or data reports (i.e., laboratory analysis and QA documentation),

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including validation (if required) and transmittal to the regulators (if required), shall be specified in the Tank Waste Analysis Plans and Tank Characterization Plans.

Interfaces:

#	From This WBS To	Item Provided
1	All other TWRS program elements	This activity provides guidance in the Data Quality Objective (DQO) process. All other organizations provide the DQO documents to Characterization to form the basis for sampling and analysis. Tank Waste Analysis Plan (TWAP)/Tank Characterization Plans and Tank Characterization Reports (TCRs) that provide TWRS program elements with a planning process for determining programmatic characterization requirements; process for establishing prioritized list of tanks to be sampled; and, general description of programmatic needs. TCRs report current analytical results and review, summarize, and interpret the available historical knowledge regarding a waste tank.
	To This WBS From	
1	Operations & Maintenance 1.1.1.2.01	Safe operating and maintenance of plant systems necessary for the safe storage, treatment, and transfer of liquid waste in tank farms.
2	TWRS Program Elements	Data Quality Objectives (DQO) documents.
3	Waste Tank Safety 1.1.1.2.02	Resolution of Unreviewed Safety Questions (Ascus), safety issues, and timely mitigation of Watch List tanks.
4	Tank Farm Upgrades 1.1.1.2.03	Upgrades in tank farms to achieve compliance with operational and technical safety requirement parameters.

Technologies to be assessed:

Technology development needs are based on requirements in DQOs. See Level V Dictionaries for details.

Options to be considered:

Sampling and analysis options are controlled by individual tank conditions. See Level V Dictionaries.

D. OTHER LEGAL DRIVERS AND ORDER REQUIREMENTS

See constraints listed in the Functions and Requirements documents.

- Section 2 (System Function & Requirements Description constraints), Table F4.2.1.2, item V, paragraph B
- Section 3 (System Architecture constraints), Table A4.2.1.2, item VIII, paragraph C

**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.04 Characterization (M&O Contractor)	2. DATE PREPARED August 18, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.04.01/V	5. WBS ELEMENT TITLE Technical Integration and Planning	
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE August 31, 1994
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1130-0-OA	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60-REV.1) 4.2.1.2 Characterize Waste 4.2.1.2.2 Prepare Analyses Plans 4.2.1.2.7 Evaluate Generator Knowledge & Prepare Tank Characterization Reports	12. BUDGET AND REPORTING NUMBER Expense Capital Line Item EW31200074	

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)	FY 1998 \$(000)	FY 1999 \$(000)	FY 2000 \$(000)	FY 2001 \$(000)
OPERATING	1,600.3	1,759.3	1,583.7				
CENRTC							
GPP							
LINE ITEM							
TOTAL	1,600.3	1,759.3	1,583.7				

B. TECHNICAL BASES

Goals and objectives:

- Financial planning -- preparation of budgets
- Establishment of milestones and development of Milestone Control Log
- Preparation of Characterization Program's FY 1995 Activity Data Sheet (ADS) and Multi-Year Program Plan
- Regular/cost schedule and milestone progress reporting
- Support of meeting and presentations concerning stakeholders outside the Characterization Program
- Prepare Tank Waste Analysis Plans (TWAP) and Tank Characterization Plans (TCP)
- Prepare and issue quarterly status reports as to the status of the DNFSB 93-5 Implementation Plan
- Perform systems engineering analysis of the Characterization Program and input into the TWRS-wide and site-wide systems engineering documents.
- Prepare/update the Characterization Program Quality Assurance Program Plan
- Periodic Meeting Reports from the Tank Characterization Advisory Panel (TCAP)
- Program Plan Reviews from TCAP
- Technical Position Papers from TCAP
- Support for Unit Managers Meetings
- Worker health and safety training

Major end-item deliverables:

- Tri Party Agreement Milestone M-44-01 "Submit a draft copy of the TWRS Tank Waste Analysis Plan (TWAP) and M-44-02 "Submit TWAP annually to Ecology and Environmental Protection Agency (EPA)
- Defense Nuclear Facility Safety Board (DNFSB) commitment "Issue quarterly progress reports by 15th working day after the end of each quarter. Distribution of the progress reports shall include the DNFSB and DOE".

Acceptance Criteria: N/A

C. STATEMENT OF WORK

Required activities over lifetime:

- Prepare and maintain public involvement plan and provide information to TWRS-wide public involvement process to assure appropriate and adequate stakeholder involvement is planned and implemented to support Characterization activities/WHC
- Administratively support the planning, scheduling, and implementation of sampling and analysis within the Characterization Program utilizing System's Engineering Techniques/WHC
- The Tank Characterization Advisory Panel (TCAP) will provide review and recommendations associated with the Tank Characterization program/WHC-(External Advisory Panel)
- Provide support for the preparation of the Tank Waste Analytical Planning. The Tank Waste Analysis Plan (TWAP) will be a high-level document that established the framework and process for conducting the characterization of tank wastes/(WHC)
- Provide support for TWRS System Engineering activities/(WHC)
- Provide support to prepare and maintain necessary quality assurance documents that are specifically applicable to the Characterization Program (all activities). In addition, integration of schedules between the other characterization program elements and the preparation of the Tank Characterization Plans/WHC

Interfaces:

#	From This WBS To	Item Provided
1	TWRS Program Office	ADS/Multi-Year Work Plan documents
2	Business Management	Multi-Year Work Plan documents
3	1.1.1.2.04.04	Tank Characterization Plans (TCPs)
4	DNFSB	DNFSB Quarterly Reports
5	1.1.1.2.04.04	Tank Waste Analysis Plans (TWAP)
	To This WBS From	
1	1.1.1.2.04.05	Data Quality Objective Documents
2	1.1.1.2.04.03	Integrated Sampling Schedule
3	1.1.1.2.04.05	Tank Characterization Reports (TCRs)
4	1.1.1.2.04.05	TWAP/TCP

Technologies to be assessed: N/AOptions to be considered: N/A

D. OTHER LEGAL DRIVERS AND ORDER REQUIREMENTS

- RLPD 5000.1 (RL Policy Directive) on the Site Management System and the program management requirements
- WHC-CM-02-05 "Management Control System"
- *Hanford Federal Facility Agreement and Consent Order*, Fourth Amendment, January 1994
- DOE/RL 94-0001, Recommendation 93-5 Implementation Plan, January 1994Y

**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.04 Characterization 1.1.1.2.04.01 Technical Integration & Planning	2. DATE PREPARED September 14, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.04.01.01/VI	5. WBS ELEMENT TITLE Program Management & Administration							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1130-0-OA							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.1.2 Characterize Waste	12. BUDGET AND REPORTING NUMBER(S) <table border="0"> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3120074</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3120074		
Expense	Capital	Line Item						
EW3120074								

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	1,600.3	1,759.3	1,583.7
CENRTC			
GPP			
LINE ITEM			
TOTAL	1,600.3	1,759.3	1,583.7

B. TECHNICAL BASES

Goals & objectives:

The goal of Technical Integration & Planning is to perform financial planning and prepare budgets. Support meetings and presentations concerning stakeholders outside the Characterization Program. To administratively support the planning, scheduling, and implementation of sampling and analysis within the Characterization Program utilizing System's Engineering Techniques.

The Tank Characterization Advisory Panel (TCAP) will provide review and recommendations associated with the Tank Characterization Program. The TCAP will interface with WHC and PNL staff. They will also provide technical recommendations into the various associated areas such as laboratory, retrieval and pretreatment.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

Issue quarterly progress reports at the end of each quarter (DNFSB 1.10).

C. STATEMENT OF WORK

Required activities:

- Financial planning
- Establishment of milestones
- Support Unit Managers meetings
- Prepare and issue quarterly status reports
- provide regular/cost schedule and milestone progress reporting
- provide quality assurance support
- Tank Characterization Advisory Panel (TCAP)

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Program Element Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	S. R. Long <i>SR Long</i>	9/26/94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/26/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager <i>SR</i>	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	S. R. Long <i>SR Long</i>	9/26/94
Cost Account Manager	S. R. Long <i>SR Long</i>	9-26-94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/26/94

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1. TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.04 Characterization (M&O Contractor)	2. DATE PREPARED August 18, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.04.02/V	5. WBS ELEMENT TITLE Technology Development and Applied Engineering							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE August 31, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX -SUBACTIVITY NUMBER 1130-0-OB							
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Expense	Capital	Line Item						
EW3120074		35EW31207						

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)	FY 1998 \$(000)	FY 1999 \$(000)	FY 2000 \$(000)	FY 2001 \$(000)
OPERATING	4,692.4	5,607.9	4,672.8				
CENRTC	2,321.3	6,164.4	4,750.6				
GPP							
LINE ITEM							
TOTAL	7,013.7	11,772.3	9,423.4				

B. TECHNICAL BASES

Goals and objectives:

- Develop and implement new technologies to perform laboratory analyses in accordance with Tank Characterization Plans (TCPs)
- Develop and implement new technologies to acquire in-situ characterization data in accordance with Tank Characterization Plans (TCPs)
- Develop and implement cost effective improved methods for field sampling and laboratory analytical tasks

Major end-item deliverables:

- Defense Nuclear Facility Safety Board (DNFSB) commitment "Direct Drill Bit Temperature Monitoring"
- Defense Nuclear Facility Safety Board (DNFSB) commitment "Deploy Prototype Cone Penetrometer"
- Field measurement capabilities not currently available to satisfy Data Quality Objectives (DQOs)
- Laboratory analysis methods not currently available to satisfy Data Quality Objectives (DQOs)

Acceptance criteria: N/A

C. STATEMENT OF WORK

Required activities over lifetime:

- Design, demonstrate and procure equipment for deploying sensors in tank waste to acquire characterization data.
- Design, demonstrate and procure sensors for in-tank deployment to acquire data in accordance with Data Quality Objectives (DQOs).
- Design, demonstrate, procure and install laboratory instruments and develop procedures to analyze tank waste samples in accordance with Data Quality Objectives.
- Identify and implement new technologies to improve the cost effectiveness of laboratory and field operations.

Interfaces:

#	From This WBS To	Item Provided
1	1.1.1.2.04.03	Field Sampling Equipment and Methods
2	1.1.1.2.04.04	Laboratory Instrumentation and Procedures
3	Technology Development Program Office	Identification of Technology Improvements needed to meet DQO/TCP requirements
	To This WBS From	
1	1.1.1.2.04.05	Data Quality Objectives (DQO) documents
2	1.1.1.2.04.01	Tank Characterization Plans (TCPs)
3	Technology Development Program Office	New Technology from EM-50 and commercial sector

Technologies to be assessed:

- Remote sensing of chemical, physical and radiological components
- Spectroscopic scanning methods for acquiring data in hot cells and in tanks
- Application of "wet" chemistry methods to perform analyses not currently available in Hanford Laboratories
- Advanced sample removal and recovery equipment and methods

Options to be considered:

- Expansion of current analytical methods to accomplish characterization requirements documented in Data Quality Objectives (DQOs)
- Development and implementation of automated techniques for conducting laboratory analyses
- Installation of in-tank sensors to acquire characterization data

D. OTHER LEGAL DRIVERS AND ORDER REQUIREMENTS

- DOE/RL 94-0001, Recommendation 93-5 Implementation Plan, January 1994
- DOE Order 5820.2A - Radioactive Waste Management

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4. WBS ELEMENT CODE/LEVEL 1.1.1.2.04.02.01/VI	5. WBS ELEMENT TITLE Activity Program Management							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1130-0-OB							
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Expense	Capital	Line Item						
EW3120074								

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	204.8	260.3	268.2
CENRTC			
GPP			
LINE ITEM			
TOTAL	204.8	260.3	268.2

B. TECHNICAL BASES

Goals & objectives:

The objective of this activity is to coordinate all tasks related to the development of technology needed for fulfilling the Characterization Program mission and to assure implementation of that technology into routine operations.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

The deliverables for this activity are the management and administrative support to fulfill the objectives of the related technology development tasks. Specific items are the identification of new equipment, instrumentation, and procedures needed to satisfy Data Quality Objectives and the evaluation of existing equipment, instrumentation, procedures and facilities to identify potential major improvements in the effectiveness of characterization tasks.

C. STATEMENT OF WORK

Required activities:

Principal tasks related to this activity are:

- Coordinate all tasks related to the Characterization Technology Development
- Assign priority to tasks to achieve most effective use of available resources
- Evaluate progress toward completion of objectives and develop corrective actions when needed

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Program Element Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	G. D. Forehand <i>G. D. Forehand</i>	9-26-94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/26/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	G. D. Forehand <i>G. D. Forehand</i>	9-26-94
Cost Account Manager	G. D. Forehand <i>G. D. Forehand</i>	9-26-94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/26/94

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Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Task Waste 1.1.1.2.04 Characterization 1.1.1.2.04.02 Technology Development & Applied Engineering	2. DATE PREPARED September 14, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.04.02.02/VI	5. WBS ELEMENT TITLE Hot Cell Instrument Development							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1130-0-OB							
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Expense	Capital	Line Item						
EW3120074								

13. ELEMENT DESCRIPTION**A. COST CONTENT (Escalated Dollars)**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	465.0	1,485.4	1,067.1
CENTRC			
GPP			
LINE ITEM			
TOTAL	465.0	1,485.4	1,067.1

B. TECHNICAL BASES

Goals & objectives:

- Develop and implement new instrumentation technologies to perform laboratory analyses in hot cells to satisfy Tank Characterization Plans (TCPs) and Data Quality Objectives (DQOs)
- Develop and implement more cost effective instrumentation for laboratory analytical tasks

Status of Design Documentation:

The design documentation status varies for individual tasks. This activity includes several tasks with durations from several months to several years.

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

The basic deliverable of these activities is new instrumentation for routine use in laboratory hot cells. Acceptance for routine use means that any instrumentation development or modification has been completed for the initial installation; procedures are written, reviewed, and issued; personnel are trained to use the new instrumentation; readiness review, if required, is complete; and the Laboratory Manager has formally accepted the instrumentation for use.

- Laboratory instrumentation and related procedures not currently available to satisfy Data Quality Objectives (DQOs)
- Laboratory instrumentation and related procedures to achieve more cost effective laboratory operations
- Hot Cell core screening instrumentation, related equipment and procedures to improve laboratory operations (cost effectiveness, worker exposure, etc)

C. STATEMENT OF WORK

Required activities over lifetime:

- Identify and implement new technologies to improve the cost effectiveness of laboratory operations/(WHC-PNL)
- Design laboratory instruments to analyze tank waste samples in accordance with Data Quality Objectives (DQOs)/(WHC-PNL)
- Demonstrate new laboratory instruments to analyze tank waste samples in accordance with Data Quality Objectives (DQOs)/(WHC-PNL)
- Develop approved operating procedures for new laboratory instruments to analyze tank waste implemented under this activity
- Develop materials for training personnel and conduct training sessions for new instrumentation systems
- Determine the readiness review requirements and conduct reviews before transferring instrumentation to routine operations

Technologies to be assessed:

- Raman spectroscopy
- Laser ablation/mass spectroscopy
- Infrared spectroscopy
- Gamma energy analysis screening
- Automated sample removal and recovery equipment and methods

Options to be considered:

- Modification of current instrumentation to accomplish characterization requirements documented in Data Quality Objectives (DQOs)
- Development and implementation of automated techniques for preparing samples for analysis
- Development and implementation of spectroscopic scanning methods to screen samples to determine optimum analytical sequences

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Program Element Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	G. D. Forehand <i>G. D. Forehand</i>	9-26-94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/26/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	G. D. Forehand <i>G. D. Forehand</i>	9-26-94
Cost Account Manager	W. E. Winkleman <i>W. E. Winkleman</i>	9-26-94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/26/94

FDS Number

1N4B22

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Taske Waste 1.1.1.2.04 Characterization 1.1.1.2.04.02 Technology Development & Applied Engineering	2. DATE PREPARED September 14, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.04.02.03/VI	5. WBS ELEMENT TITLE Analytical Procedures Development							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1130-0-OB							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.1.2 Characterize Waste	12. BUDGET AND REPORTING NUMBER(S) <table border="0"> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3120074</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3120074		
Expense	Capital	Line Item						
EW3120074								

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	463.3	765.8	647.9
CENTRC			
GPP			
LINE ITEM			
TOTAL	463.3	765.8	647.9

B. TECHNICAL BASES

Goals & objectives:

- Develop and implement new analytical procedures to perform laboratory analyses in hot cells to satisfy Tank Characterization Plans (TCPs) and Data Quality Objectives (DQOs)
- Develop and implement more cost effective analytical procedures for laboratory analytical tasks

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

The basic deliverable of these activities is new procedures for routine use in laboratory hot cells. Acceptance for routine use means that any procedure development and related equipment modification has been completed for the initial installation; procedures are written, reviewed, and issued; personnel are trained to use the new instrumentation; readiness review, if required, is complete; and the Laboratory Manager has formally accepted the instrumentation for use.

- Laboratory analytical procedures not currently available to satisfy Data Quality Objectives (DQOs). Proposed methods (to be confirmed by review of DQOs) include:
 - Total Organic Carbon
 - Technetium Speciation
 - Energetics
 - Noble metals
 - Physical properties
- Laboratory analytical procedures to achieve more cost effective laboratory operations
- Laboratory analytical procedures to improve laboratory operations (cost effectiveness, worker exposure, etc)
- Modified or new instrumentation to utilize procedures developed under this activity

C. STATEMENT OF WORK

Required activities:

- Identify and implement new technologies to improve the cost effectiveness of laboratory operations/(WHC-PNL)
- Develop laboratory procedures to analyze tank waste samples in accordance with Data Quality Objectives (DQOs)/(WHC-PNL)
- Demonstrate new laboratory procedures to analyze tank waste samples in accordance with Data Quality Objectives (DQOs)/(WHC-PNL)
- Develop approved operating procedures for new laboratory instruments to analyze tank waste implemented under this activity develop materials for training personnel and conduct training sessions for new instrumentation systems
- Determine the readiness review requirements and conduct reviews before transferring instrumentation to routine operations

Technologies to be assessed:

- Automated (robotics) sample handling systems
- Delayed Neutron Activation Analysis
- Inductively Coupled Plasma/Mass Spectroscopy
- Mineralogical Assessments
- Micro-characterization techniques

Options to be considered:

- Modification of current procedures to accomplish characterization requirements documented in Data Quality Objectives (DQOs)
- Development and implementation of automated techniques for preparing samples for analysis
- Adaptation of analytical procedures for non-radioactive materials to analyze radioactive materials

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Program Element Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	G. D. Forehand <i>G. D. Forehand</i>	9-26-94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/26/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	G. D. Forehand <i>G. D. Forehand</i>	9-26-94
Cost Account Manager	C. T. Narquis	
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/26/94

FDS Number

1N4B23

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.04 Characterization 1.1.1.2.04.02 Technology Development & Applied Engineering	2. DATE PREPARED September 14, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.04.02.05/VI	5. WBS ELEMENT TITLE Field Sampling Improvements							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1130-0-OB							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.1.2 Characterize Waste	12. BUDGET AND REPORTING NUMBER(S) <table> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3120074</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3120074		
Expense	Capital	Line Item						
EW3120074								

13. ELEMENT DESCRIPTION**A. COST CONTENT (Escalated Dollars)**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	805.3	904.0	1,024.9
CENTRC			
GPP			
LINE ITEM			
TOTAL	805.3	904.0	1,024.9

B. TECHNICAL BASES

Goals & objectives:

- Develop and implement new sampling equipment and procedures to acquire samples to satisfy Tank Characterization Plans (TCPs) and Data Quality Objectives (DQOs)
- Develop and implement equipment, instrumentation and procedures to assure that samples effectively represent the waste matrices in tanks
- Develop and implement more cost effective sampling equipment and procedures

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

The basic deliverable of these activities is new equipment and instrumentation for routine use by field sampling crews. Acceptance for routine use means that any new or modified equipment, related instrumentation, and associated procedures have been completed for the initial field deployment; procedures are written, reviewed, and issued; personnel are trained to use the new equipment or instrumentation; readiness review, if required, is complete; and the Operations Manager has formally accepted the equipment for use. Specific activities include:

- Design and procurement of an instrumented cask for sample receipt and transportation
- Design and procurement of a new cask for transporting samples to off-site laboratories
- Evaluation of the "Savannah River 25 liter sampler" for use at Hanford and development procedures if suitable for use
- Development of procedures and instrumentation to determine "representativeness" of core samples collected from tanks
- Development and implementation of core bit temperature monitor and tank bottom proximity sensor (Started in FY 1994 by Sandia National Laboratory)
- Evaluation of sampler performance to establish "operating envelopes" for each sampling tool (Sampler Performance Evaluation started in FY 1994)
- Procurement of vapor sampling equipment and instrumentation for routine characterization use
- Identification and evaluation of techniques acquiring multiple samples from one access port

C. STATEMENT OF WORK

Required activities:

- Identify new technologies to improve the effectiveness of sampling operations
- Evaluate candidate technologies and equipment modifications to improve sampling operations
- Develop and issue operating procedures for new or modified equipment
- Demonstrate new technology for potential application in tank sampling
- Develop materials for training personnel and conduct training sessions for new equipment and systems
- Determine the readiness review requirements and conduct reviews before transferring equipment or systems to routine operations

Technologies to be assessed:

Technologies to be assessed will be determined by the specific problem being investigated. Potential technologies include remote sensing of radiation levels, mass, temperature or other physical and chemical characteristics.

Options to be considered:

- Design, development, and fabrication of new sampling devices and preparation of associated procedures
- Modification of existing sampling devices and associated procedures
- Modification of existing procedures for sampler operation

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Program Element Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	G. D. Forehand <i>G. D. Forehand</i>	9-26-94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/26/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	G. D. Forehand <i>G. D. Forehand</i>	9-26-94
Cost Account Manager	P. A. Young <i>P. A. Young</i>	9/27/94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/26/94

FDS Number

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.04 Characterization 1.1.1.2.04.02 Technology Development and Applied Engineering	2. DATE PREPARED September 14, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.04.02.06/VI	5. WBS ELEMENT TITLE Direct Bit Temperature Monitoring Development (Sandia)							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1130-0-OB							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.1.2 Characterize Waste	12. BUDGET AND REPORTING NUMBER(S) <table border="0"> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3120074</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3120074		
Expense	Capital	Line Item						
EW3120074								

13. ELEMENT DESCRIPTION**A. COST CONTENT (Escalated Dollars)**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	600.0		
CENRTC			
GPP			
LINE ITEM			
TOTAL	600.0		

B. TECHNICAL BASES

Goals & objectives:

The objective of this activity is to complete the development of on-line monitoring systems for the sampling core bit. Specific monitors are bit temperature and bit proximity to the tank bottom.

Status of Design Documentation:

Detailed design of prototype temperature monitor components began in FY 1994. A feasibility evaluation and recommendation for tank bottom monitoring will be completed in FY 1995.

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

The major deliverables for this activity are:

- Core bit temperature monitor design
- Core Bit monitor components for initial sampling truck installation
- Recommendation on development of tank bottom proximity sensors

C. STATEMENT OF WORK

Required activities:

The required activities for this activity are:

- Preparation of functional criteria for the monitoring system(s)
- Conceptual design of monitor components and systems
- Fabrication and testing of prototypes
- Detailed design of systems for installation on the core sampling trucks

All tasks in this activity must be closely coordinated with the Field Sampling Improvements activity (1.1.1.2.04.02.050).

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Program Element Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	G. D. Forehand <i>G. D. Forehand</i>	9-26-94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/26/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	G. D. Forehand <i>G. D. Forehand</i>	9-26-94
Cost Account Manager	G. D. Forehand <i>G. D. Forehand</i>	9-26-94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/26/94

FDS Number

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Taske Waste 1.1.1.2.04 Characterization 1.1.1.2.04.02 Technology Development & Applied Engineering	2. DATE PREPARED September 14, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.04.02.07/VI	5. WBS ELEMENT TITLE Characterization Methods Development (PNL)							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1130-0-OB							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.1.2 Characterization	12. BUDGET AND REPORTING NUMBER(S) <table border="0"> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3120074</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3120074		
Expense	Capital	Line Item						
EW3120074								

13. ELEMENT DESCRIPTION**A. COST CONTENT (Escalated Dollars)**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	1,153.1	1,503.6	1,664.7
CENRTC			
GPP			
LINE ITEM			
TOTAL	1,153.1	1,503.6	1,664.7

B. TECHNICAL BASES

Goals & objectives:

- Develop and implement new analytical procedures to perform laboratory analyses in hot cells to satisfy Tank Characterization Plans (TCPs) and Data Quality Objectives (DQOs)
- Develop and implement more cost effective analytical procedures for laboratory analytical tasks
- Develop and implement new instrumentation technologies to perform laboratory analyses in hot cells to satisfy Tank Characterization Plans (TCPs) and Data Quality Objectives (DQOs)
- Develop and implement more cost effective instrumentation for laboratory analytical tasks
- Develop and implement new sampling equipment and procedures to acquire samples to satisfy Tank Characterization Plans (TCPs) and Data Quality Objectives (DQOs)
- Develop and implement equipment, instrumentation and procedures to assure that samples effectively represent the waste matrices in tanks
- Develop and implement more cost effective sampling equipment and procedures

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

The basic deliverable of these activities is new equipment, instruments and procedures for routine use in laboratory hot cells. Acceptance for routine use means that any procedure development and related equipment modification has been completed for the initial installation; procedures are written, reviewed, and issued; personnel are trained to use the new instrumentation; readiness review, if required, is complete; and the Laboratory Manager has formally accepted the instrumentation for use.

- Laboratory analytical procedures not currently available to satisfy Data Quality Objectives (DQOs). Proposed methods (to be confirmed by review of DQOs) include (potential outyear tasks):
 - Total Organic Carbon
 - Technetium Speciation
 - Energetics
 - Noble metals
 - Physical properties
- Laboratory analytical procedures to achieve more cost effective laboratory operations
- Laboratory analytical procedures to improve laboratory operations (cost effectiveness, worker exposure, etc)
- Modified or new instrumentation to utilize procedures developed under this activity

C. STATEMENT OF WORK

Required activities:

This activity is closely linked with Hot Cell Instrument Development (1.1.1.2.04.02.02), Analytical Procedures Development (1.1.1.2.04.02.03), and Field Sampling Improvements (1.1.1.2.04.02.05).

- Identify and implement new technologies to improve the cost effectiveness of laboratory operations/(WHC-PNL)
- Develop laboratory procedures to analyze tank waste samples in accordance with Data Quality Objectives (DQOs)/(WHC-PNL)
- Demonstrate new laboratory procedures to analyze tank waste samples in accordance with Data Quality Objectives (DQOs)/(WHC-PNL)
- Develop approved operating procedures for new laboratory instruments to analyze tank waste implemented under this activity
- Develop materials for training personnel and conduct training sessions for new instrumentation systems
- Determine the readiness review requirements and conduct reviews before transferring instrumentation to routine operations

Technologies to be assessed (FY 1995):

- Hot Cell Instrumentation Development
 - Laser Ablation/Mass Spectrometry
- Analytical Procedures Development
 - Thermal Analyses
 - Supercritical Fluid Extraction
 - Microwave Digestion
 - Particle Density and Settling Rate
- In Situ Methods Development
 - Cu activation Moisture Probe
 - Acoustic Waveguide
- Field Sampling Improvements
 - Sampler Performance Evaluation

Technologies to be assessed (Outyears):

- Automated (robotics) sample handling systems
- Inductively Coupled Plasma/Mass Spectroscopy
- Micro-characterization techniques
- Spectroscopic analytical techniques

Options to be considered:

- Modification of current equipment, instrumentation and procedures to accomplish characterization requirements documented in Data Quality Objectives (DQOs)
- Development and implementation of automated techniques for preparing samples for analysis
- Adaptation of analytical procedures for non-radioactive materials to analyze radioactive materials

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Program Element Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	G. D. Forehand <i>G. D. Forehand</i>	9-26-94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/26/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	G. D. Forehand <i>G. D. Forehand</i>	9-26-94
Cost Account Manager	P. J. Mellinger <i>P. J. Mellinger</i>	9/27/94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/26/94

FDS Number

1N4B27

**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.04 Characterization 1.1.1.2.04.02 Technology Development & Applied Engineering	2. DATE PREPARED September 14, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.04.02.08/VI	5. WBS ELEMENT TITLE Analytical Procedures Development (LANL)							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1130-0-OB							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.1.2 Characterize Waste	12. BUDGET AND REPORTING NUMBER(S) <table border="0"> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3120074</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3120074		
Expense	Capital	Line Item						
EW3120074								

13. ELEMENT DESCRIPTION**A. COST CONTENT (Escalated Dollars)**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	325.0		
CENRTC			
GPP			
LINE ITEM			
TOTAL	325.0		

B. TECHNICAL BASES

Goals & objectives:

- Develop and implement new analytical procedures to perform laboratory analyses in hot cells to satisfy Tank Characterization Plans (TCPs) and Data Quality Objectives (DQOs)
- Develop and implement more cost effective analytical procedures for laboratory analytical tasks

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

This activity is closely linked to Analytical Procedures Development (1.1.1.2.04.02.03).

The basic deliverable of these activities is new procedures for routine use in laboratory hot cells. Acceptance for routine use means that any procedure development and related equipment modification has been completed for the initial installation; procedures are written, reviewed, and issued; personnel are trained to use the new instrumentation; readiness review, if required, is complete; and the Laboratory Manager has formally accepted the instrumentation for use.

- Laboratory analytical procedures not currently available to satisfy Data Quality Objectives (DQOs). Proposed methods (to be confirmed by review of DQOs) include:
 - Total Organic Carbon
 - Technetium Speciation
 - Energetics
 - Noble metals
 - Physical properties
- Laboratory analytical procedures to achieve more cost effective laboratory operations
- Laboratory analytical procedures to improve laboratory operations (cost effectiveness, worker exposure, etc)
- Modified or new instrumentation to utilize procedures developed under this activity

C. STATEMENT OF WORK

Required activities:

- Identify and implement new technologies to improve the cost effectiveness of laboratory operations/(WHC-LANL)
- Develop laboratory procedures to analyze tank waste samples in accordance with Data Quality Objectives (DQOs)/(WHC-LANL)
- Demonstrate new laboratory procedures to analyze tank waste samples in accordance with Data Quality Objectives (DQOs)/(WHC-LANL)
- Develop approved operating procedures for new laboratory instruments to analyze tank waste implemented under this activity (WHC-LANL)
- Develop materials for training personnel and conduct training sessions for new instrumentation systems (WHC-LANL)

- Determine the readiness review requirements and conduct reviews before transferring instrumentation to routine operations(WHC-LANL)

Technologies to be assessed:

- Automated (robotics) sample handling systems
- Delayed Neutron Activation Analysis
- Inductively Coupled Plasma/Mass Spectroscopy
- Mineralogical Assessments
- Micro-characterization techniques

Options to be considered:

- Modification of current procedures to accomplish characterization requirements documented in Data Quality Objectives (DQOs)
- Development and implementation of automated techniques for preparing samples for analysis
- Adaptation of analytical procedures for non-radioactive materials to analyze radioactive materials

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Program Element Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	G. D. Forehand <i>G. D. Forehand</i>	9-26-94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/26/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	G. D. Forehand <i>G. D. Forehand</i>	9-26-94
Cost Account Manager	G. D. Forehand <i>G. D. Forehand</i>	9-26-94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/26/94

FDS Number

1N4B28

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Taske Waste 1.1.1.2.04 Characterization 1.1.1.2.04.02 Technology Development & Applied Engineering	2. DATE PREPARED September 14, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.04.02.09/VI	5. WBS ELEMENT TITLE Technology Development Program Office							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1130-0-OB							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.1.2 Characterize Waste	12. BUDGET AND REPORTING NUMBER(S) <table border="0"> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3120074</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3120074		
Expense	Capital	Line Item						
EW3120074								

13. ELEMENT DESCRIPTION**A. COST CONTENT (Escalated Dollars)**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	675.8	688.7	
CENRTC			
GPP			
LINE ITEM			
TOTAL	675.8	688.7	

B. TECHNICAL BASES

Goals & objectives:

The principal goal of this activity is to develop and implement instrumentation, equipment and procedures for routine in-tank characterization to satisfy Tank Characterization Plans (TCPs) and Data Quality Objectives (DQOs). Objectives include development and implementation of the following:

- In situ procedures for acquiring data that cannot be obtained by extractive sampling and analysis
- Procedures that are faster, cheaper and cause less personnel exposure than extractive sampling and analysis.
- Technology for acquiring samples from multiple locations from a single access point.
- Equipment, instrumentation, and procedures to assure that samples effectively represent the tank waste matrices.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

The basic deliverable of these activities is new equipment and procedures for routine use by field sampling crews. Acceptance for routine use means that any procedure development and related equipment modification has been completed for the initial installation; procedures are written, reviewed, and issued; personnel are trained to use the new system(s); readiness review, if required, is complete; and the Operations Manager has formally accepted the system(s) for use. The equipment and procedures to be delivered are not currently available to satisfy some Data Quality Objectives (DQOs) and are intended to replace extractive sampling and laboratory analysis methods with faster, cheaper, more effective methods involving less personnel exposure. Specific activities include:

- Cone Penetrometer platform for sensor deployment.
- Techniques for acquiring samples from multiple locations within the tank from a single access point.
- In-situ moisture and chemical speciation.
- In-situ physical and rheological properties.

C. STATEMENT OF WORK

Required activities:

- Identify and evaluate candidate in situ technologies in accordance with Data Quality Objectives (DQOs) and Tank Characterization Plans (TCPs)
- Evaluate equipment and methods for deploying in-tank sensors which can improve effectiveness of characterization activities prescribed by DQOs and TCPs
- Perform field demonstration of in situ technology

- Interface with end users to complete deployment for routine operation. Includes assistance as appropriate in developing and issuing approved operating procedures, training, and operations reviews

Technologies to be assessed:

- Cone penetrometer platform
- Spatial sampling methods
- Raman/infrared spectroscopy
- Fission chamber analysis
- Electromagnetic induction
- Wave guide sensors
- Radiation monitors
- Physical properties methods
- Rheological properties methods

Options to be considered:

- Evaluation, development, and implementation of characterization technology to replace current extractive methods
- Implemention of sceening instrumentation to supplement extractive analysis methods

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Program Element Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	G. D. Forehand <i>G. D. Forehand</i>	9-26-94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/26/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	G. D. Forehand <i>G. D. Forehand</i>	9-26-94
Cost Account Manager	P. G. Eller <i>P. G. Eller</i>	9-27-94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/26/94

FDS Number

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.04 Characterization 1.1.1.2.04.02 Technology Development & Applied Engineering	2. DATE PREPARED September 14, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.04.02.10/VI	5. WBS ELEMENT TITLE Hot Cell Instrument Development (CENRTC)							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1130-0-OB							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.1.2 Characterize Waste	12. BUDGET AND REPORTING NUMBER(S) <table> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td></td> <td></td> <td>35EW31207</td> </tr> </table>		Expense	Capital	Line Item			35EW31207
Expense	Capital	Line Item						
		35EW31207						

13. ELEMENT DESCRIPTION**A. COST CONTENT (Escalated Dollars)**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING			
CENRTC	176.9	182.2	97.1
GPP			
LINE ITEM			
TOTAL	176.9	182.2	97.1

B. TECHNICAL BASES

Goals & objectives:

Provide the capital equipment to support the

- Development and implementation of new instrumentation technologies to perform laboratory analyses in hot cells to satisfy Tank Characterization Plans (TCPs) and Data Quality Objectives (DQOs)
- Development and implementation of more cost effective instrumentation for laboratory analytical tasks

Status of Design Documentation:

The design documentation status varies for individual tasks. This activity includes several tasks with durations from several months to several years.

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

The basic deliverable of these activities is new instrumentation for routine use in laboratory hot cells. Acceptance for routine use means that any instrumentation development or modification has been completed for the initial installation; procedures are written, reviewed, and issued; personnel are trained to use the new instrumentation; readiness review, if required, is complete; and the Laboratory Manager has formally accepted the instrumentation for use.

- Laboratory instrumentation and related procedures not currently available to satisfy Data Quality Objectives (DQOs)
- Laboratory instrumentation and related procedures to achieve more cost effective laboratory operations
- Hot Cell core screening instrumentation, related equipment and procedures to improve laboratory operations (cost effectiveness, worker exposure, etc)

C. STATEMENT OF WORK

Required activities over lifetime:

- Identify and implement new technologies to improve the cost effectiveness of laboratory operations/(WHC-PNL)
- Design laboratory instruments to analyze tank waste samples in accordance with Data Quality Objectives (DQOs)/(WHC-PNL)
- Demonstrate new laboratory instruments to analyze tank waste samples in accordance with Data Quality Objectives (DQOs)/(WHC-PNL)

Technologies to be assessed:

- Raman spectroscopy
- Laser ablation/mass spectroscopy
- Infrared spectroscopy
- Gamma energy analysis screening
- Automated sample removal and recovery equipment and methods

Options to be considered:

- Modification of current instrumentation to accomplish characterization requirements documented in Data Quality Objectives (DQOs)
- Development and implementation of automated techniques for preparing samples for analysis
- Development and implementation of spectroscopic scanning methods to screen samples to determine optimum analytical sequences

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Program Element Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	G. D. Forehand <i>G. D. Forehand</i>	9-26-94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/26/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	G. D. Forehand <i>G. D. Forehand</i>	9-26-94
Cost Account Manager	W. E. Winkelman <i>W. E. Winkelman</i>	9-26-94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/26/94

FDS Number

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Taske Waste 1.1.1.2.04 Characterization 1.1.1.2.04.02 Technology Development & Applied - Engineering	2. DATE PREPARED September 14, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.04.02.11/VI	5. WBS ELEMENT TITLE Analytical Procedures Development (CENRTC)							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1130-0-OB							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.1.2 Characterize Waste	12. BUDGET AND REPORTING NUMBER(S) <table border="0"> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td></td> <td></td> <td>35EW31207</td> </tr> </table>		Expense	Capital	Line Item			35EW31207
Expense	Capital	Line Item						
		35EW31207						

13. ELEMENT DESCRIPTION**A. COST CONTENT (Escalated Dollars)**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING			
CENRTC	85.4	188.5	64.7
GPP			
LINE ITEM			
TOTAL	85.4	188.5	64.7

B. TECHNICAL BASES

Goals & objectives:

Provide capital equipment to support the:

- Development and implementation of new analytical procedures to perform laboratory analyses in hot cells to satisfy Tank Characterization Plans (TCPs) and Data Quality Objectives (DQOs)
- Development and implementation of more cost effective analytical procedures for laboratory analytical tasks

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

The basic deliverable of these activities is new procedures for routine use in laboratory hot cells. Acceptance for routine use means that any procedure development and related equipment modification has been completed for the initial installation; procedures are written, reviewed, and issued; personnel are trained to use the new instrumentation; readiness review, if required, is complete; and the Laboratory Manager has formally accepted the instrumentation for use.

- Laboratory analytical procedures not currently available to satisfy Data Quality Objectives (DQOs). Proposed methods (to be confirmed by review of DQOs) include:
 - Total Organic Carbon
 - Technetium Speciation
 - Energetics
 - Noble metals
 - Physical properties
- Laboratory analytical procedures to achieve more cost effective laboratory operations
- Laboratory analytical procedures to improve laboratory operations (cost effectiveness, worker exposure, etc)
- Modified or new instrumentation to utilize procedures developed under this activity

C. STATEMENT OF WORK

Required activities:

- Identify and implement new technologies to improve the cost effectiveness of laboratory operations/(WHC-PNL)
- Develop laboratory procedures to analyze tank waste samples in accordance with Data Quality Objectives (DQOs)/(WHC-PNL)
- Demonstrate new laboratory procedures to analyze tank waste samples in accordance with Data Quality Objectives (DQOs)/(WHC-PNL)
- Develop approved operating procedures for new laboratory instruments to analyze tank waste implemented under this activity

- Develop materials for training personnel and conduct training sessions for new instrumentation systems
- Determine the readiness review requirements and conduct reviews before transferring instrumentation to routine operations

Technologies to be assessed:

Automated (robotics) sample handling systems
 Delayed Neutron Activation Analysis
 Inductively Coupled Plasma/Mass Spectroscopy
 Mineralogical Assessments
 Micro-characterization techniques

Options to be considered:

- Modification of current procedures to accomplish characterization requirements documented in Data Quality Objectives (DQOs)
- Development and implementation of automated techniques for preparing samples for analysis
- Adaptation of analytical procedures for non-radioactive materials to analyze radioactive materials

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Program Element Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	G. D. Forehand <i>G. D. Forehand</i>	9-26-94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/26/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	G. D. Forehand <i>G. D. Forehand</i>	9-26-94
Cost Account Manager	C. T. Narquis	
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/26/94

FDS Number

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Taske Waste 1.1.1.2.04 Characterization 1.1.1.2.04.02 Technology Development & Applied Engineering	2. DATE PREPARED September 14, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.04.02.13/VI	5. WBS ELEMENT TITLE Characterization Methods Development (PNL)(CENRTC)							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1130-0-OB							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.1.2 Characterize Waste	12. BUDGET AND REPORTING NUMBER(S) <table border="0"> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td></td> <td></td> <td>35EW31207</td> </tr> </table>		Expense	Capital	Line Item			35EW31207
Expense	Capital	Line Item						
		35EW31207						

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING			
CENRTC	815.0	2,832.5	4,588.8
GPP			
LINE ITEM			
TOTAL	815.0	2,832.5	4,588.8

B. TECHNICAL BASES

Goals & objectives:

This activity provides capital equipment support to:

- Develop and implement new analytical procedures to perform laboratory analyses in hot cells to satisfy Tank Characterization Plans (TCPs) and Data Quality Objectives (DQOs)
- Develop and implement more cost effective analytical procedures for laboratory analytical tasks
- Develop and implement new instrumentation technologies to perform laboratory analyses in hot cells to satisfy Tank Characterization Plans (TCPs) and Data Quality Objectives (DQOs)
- Develop and implement more cost effective instrumentation for laboratory analytical tasks
- Develop and implement new sampling equipment and procedures to acquire samples to satisfy Tank Characterization Plans (TCPs) and Data Quality Objectives (DQOs)
- Develop and implement equipment, instrumentation and procedures to assure that samples effectively represent the waste matrices in tanks
- Develop and implement more cost effective sampling equipment

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

The basic deliverable of these activities is new equipment, instruments and procedures for routine use in the Characterization Program. Acceptance for routine use means that any procedure development and related equipment modification has been completed for the initial installation; procedures are written, reviewed, and issued; personnel are trained to use the new instrumentation; readiness review, if required, is complete; and the operations Manager has formally accepted the instrumentation for use.

- Laboratory analytical procedures not currently available to satisfy Data Quality Objectives (DQOs). Proposed methods (to be confirmed by review of DQOs) include (potential outyear tasks):
 - Total Organic Carbon
 - Technetium Speciation
 - Energetics
 - Noble metals
 - Physical properties
- Laboratory analytical procedures to achieve more cost effective laboratory operations
- Laboratory analytical procedures to improve laboratory operations (cost effectiveness, worker exposure, etc)
- Modified or new instrumentation to utilize procedures developed under this activity
- Sampling equipment and instruments to improve field operations

C. STATEMENT OF WORK

Required activities:

This activity is closely linked with Hot Cell Instrument Development (1.1.1.2.04.02.02), Analytical Procedures Development (1.1.1.2.04.02.03), and Field Sampling Improvements (1.1.1.2.04.02.05).

- Identify and implement new technologies to improve the cost effectiveness of laboratory and field operations/(WHC-PNL)
- Develop laboratory equipment and instrumentation to analyze tank waste samples in accordance with Data Quality Objectives (DQOs)/(WHC-PNL)
- Demonstrate new laboratory equipment and instrumentation to analyze tank waste samples in accordance with Data Quality Objectives (DQOs)/(WHC-PNL)
- Develop and demonstrate equipment to improve field sampling operations

Technologies to be assessed (FY 1995):

- Hot Cell Instrumentation Development
 - Laser Ablation/Mass Spectrometry
- Analytical Procedures Development
 - Thermal Analyses
 - Supercritical Fluid Extraction
 - Microwave Digestion
 - Particle Density and Settling Rate
- In Situ Methods Development
 - Cu activation Moisture Probe
 - Acoustic Waveguide
- Field Sampling Improvements
 - Sampler Performance Evaluation

Technologies to be assessed (Outyears):

- Automated (robotics) sample handling systems
- Inductively Coupled Plasma/Mass Spectroscopy
- Micro-characterization techniques
- Spectroscopic analytical techniques

Options to be considered:

- Modification of current equipment, instrumentation and procedures to accomplish characterization requirements documented in Data Quality Objectives (DQOs)
- Development and implementation of automated techniques for collecting and preparing samples for analysis
- Adaptation of analytical procedures for non-radioactive materials to analyze radioactive materials

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Program Element Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	G. D. Forehand <i>G. D. Forehand</i>	9-26-94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/26/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	G. D. Forehand <i>G. D. Forehand</i>	9-26-94
Cost Account Manager	P. J. Mellinger <i>P. J. Mellinger</i>	9/27/94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/26/94

FDS Number

2N4B2D

**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.04 Characterization 1.1.1.2.04.02 Technology Development & Applied Engineering	2. DATE PREPARED September 14, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.04.02.15/VI	5. WBS ELEMENT TITLE Technology Development Program Office (TDPO) (CENRTC)							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1130-0-OB							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER 4.2.1.2 Characterize Waste	12. BUDGET AND REPORTING NUMBER(S) <table> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td></td> <td></td> <td>35EW31207</td> </tr> </table>		Expense	Capital	Line Item			35EW31207
Expense	Capital	Line Item						
		35EW31207						

13. ELEMENT DESCRIPTION**A. COST CONTENT (Escalated Dollars)**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING			
CENRTC	1,000.0	2,961.3	
GPP			
LINE ITEM			
TOTAL	1,000.0	2,961.3	

B. TECHNICAL BASES

Goals & objectives:

The principal goal of this activity is to provide capital equipment to develop and implement instrumentation, equipment and procedures for routine in-tank characterization to satisfy Tank Characterization Plans (TCPs) and Data Quality Objectives (DQOs). Objectives include development and implementation of the following:

- In situ procedures for acquiring data that cannot be obtained by extractive sampling and analysis
- Procedures that are faster, cheaper and cause less personnel exposure than extractive sampling and analysis.
- Technology for acquiring samples from multiple locations from a single access point.
- Equipment, instrumentation, and procedures to assure that samples effectively represent the tank waste matrices.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

The basic deliverable of these activities is new equipment and procedures for routine use by field sampling crews. Acceptance for routine use means that any procedure development and related equipment modification has been completed for the initial installation; procedures are written, reviewed, and issued; personnel are trained to use the new system(s); readiness review, if required, is complete; and the Operations Manager has formally accepted the system(s) for use. The equipment and procedures to be delivered are not currently available to satisfy some Data Quality Objectives (DQOs) and are intended to replace extractive sampling and laboratory analysis methods with faster, cheaper, more effective methods involving less personnel exposure. Specific activities include:

- Cone Penetrometer platform for sensor deployment.
- Techniques for acquiring samples from multiple locations within the tank from a single access point.
- In-situ moisture and chemical speciation.
- In-situ physical and rheological properties.

C. STATEMENT OF WORK

Required activities:

- Identify and evaluate candidate in situ technologies in accordance with Data Quality Objectives (DQOs) and Tank Characterization Plans (TCPs)
- Evaluate equipment and methods for deploying in-tank sensors which can improve effectiveness of characterization activities prescribed by DQOs and TCPs
- Perform field demonstration of in situ technology

- Interface with end users to complete deployment for routine operation. Includes assistance as appropriate in developing and issuing approved operating procedures, training, and operations reviews

Technologies to be assessed:

- Cone penetrometer platform
- Spatial sampling methods
- Raman/infrared spectroscopy
- Fission chamber analysis
- Electromagnetic induction
- Wave guide sensors
- Radiation monitors
- Physical properties methods
- Rheological properties methods

Options to be considered:

- Evaluation, development, and implementation of characterization technology to replace current extractive methods
- Implementation of screening instrumentation to supplement extractive analysis methods

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Program Element Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	G. D. Forehand <i>G. D. Forehand</i>	9-26-94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/26/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	G. D. Forehand <i>G. D. Forehand</i>	9-26-94
Cost Account Manager	P. G. Eller <i>P. G. Eller, for PGE</i>	9-27-94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/26/94

FDS Number

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.04 Characterization (M&O Contractor)	2. DATE PREPARED August 18, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.04.03/V	5. WBS ELEMENT TITLE Field Sampling and Measurement							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE August 31, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1130-0-OC							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.1.2 Characterize Waste 4.2.1.2.2 Prepare Analysis Plans 4.2.1.2.4 Analyze Samples	12. BUDGET AND REPORTING NUMBER <table> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3120074</td> <td></td> <td>35EW31207</td> </tr> </table>		Expense	Capital	Line Item	EW3120074		35EW31207
Expense	Capital	Line Item						
EW3120074		35EW31207						

13. ELEMENT DESCRIPTION**A. COST CONTENT (Escalated dollars)**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)	FY 1998 \$(000)	FY 1999 \$(000)	FY 2000 \$(000)	FY 2001 \$(000)
OPERATING	24,248.3	26,780.2	24,625.7				
CENRTC	3,426.9						
GPP							
LINE ITEM							
TOTAL	27,675.2	26,780.2	24,625.7				

B. TECHNICAL BASES

Goals and objectives:

- Collect double-shell tank (DST) core samples, single-shell tank (SST) core samples
- Collect auger surface samples (to support sampling of flammable gas tanks or for full characterization if less than 12 inches of waste in tanks)
- Supernatant samples and all in-tank vapor samples will be collected during FY 1994-95 and transported to a laboratory for analysis
- Scheduled activities shall match the integrated schedule to meet the requirements of the DNFSB 93-5 Implementation Plan
- All Watch List tanks shall be sampled by the end of FY 1995
- Remaining non-Watch List tanks shall be sampled by the end of FY 1996
- Tanks core will be collected utilizing push mode or rotary mode sampling methods
- Characterization data gathered as a result of SST, DST, and auger sampling will be used to address the resolution of tank safety concerns and to support Safety, HWVP, and Pretreatment Programs
- Procurement and fabrication of Rotary Mode Core Sampling Systems (RMCS)
- Procurement and replacement of spares
- Decontamination activities for trucks, drill strings, casks etc. at PNL

Major end-item deliverables:

- Defense Nuclear Facility Safety Board (DNFSB) commitment "Complete Sampling and Analysis of all Watch List tanks per the applicable DQOs
- Defense Nuclear Facility Safety Board (DNFSB) commitment "Hire, Train, and Qualify 4 Additional Rotary Mode Crews"
- Defense Nuclear Facility Safety Board (DNFSB) commitment "Develop Means for Measuring Sample Recovery"

Acceptance criteria:

C. STATEMENT OF WORK

Required activities over lifetime:

- Obtain, using push mode and rotary mode sampling systems, and deliver for analysis, core samples from Watch List and non-Watch List tanks as identified on the Integrated Sampling Schedule.
- Support the retrieval of cores from both single and double shell waste tanks.

WHC-SP-1101

- Provide service support for decontamination of equipment and the material and labor required for fabrication of consumable core sampling equipment.
- Develop the Integrated Sampling Schedule utilizing input and prioritization from TWRS program elements.
- Identify replacement core sampling equipment and the time required for decontamination of existing equipment in support of sampling activities.
- Experimentally establish the performance capabilities of sampling mechanisms used to acquire tank waste samples from the Hanford tanks including their ability to acquire representative samples.
- Collect samples from DSTs where sufficient liquid exists for this technique. This is necessary to characterize the supernate to meet RCRA Part B Permit requirements for DSTs, to support evaporator operations, and other operational needs.
- Take vapor samples to support operational needs, Waste Tank Safety program needs, and other characterization operations, such as vapor sampling prior to rotary mode core sampling to meet the requirements of the Clean Air Permit. Vapor characterization is defined here as flammability, total organic carbon, and selected toxic gas analysis.
- Collect auger surface samples to augment core sampling capability and to accelerate priority one screening of waste tanks, per the integrated schedule established to meet DNFSB 93-5 Implementation Plan.
- Manage field deployment of any in-tank characterization device, including deployment of the cone penetrometer as the in-situ deployment platform, and the fabrication of equipment developed to hold the analytical system in the tank waste. The purpose of this effort is to gather accurate key data, such as moisture and total alpha, and atomic and molecular analysis in tank on real time basis and with sufficient quality to meet data quality objective needs of the TWRS functions.
- Provide supplemental or replacement equipment to field operations to support field sampling activities. This includes providing replacement or additional vapor sampling units and rotary mode core sampling systems, including drill rigs, exhausters, nitrogen trailers, generators, breathing air compressors, and ancillary support systems. Procurement of critical spare parts and other materials necessary to support long term tank sampling activities.

Interfaces:

#	From This WBS To	Item Provided
1	WHC & PNL laboratories	Physical Waste Samples
2	TWRS, WHC & PNL laboratories	Integrated Sampling Schedule
	To This WBS From	
1	1.1.1.2.04.01	Tank Waste Analysis Plan (TWAP)
2	1.1.1.2.04.01	Data Quality Objective documents

1.1.1.2.04.03

A5-67

Technologies to be assessed:

- Instrumented casks (sample recovery validation)
- Sampler performance validation

Options to be considered:

- In situ characterization of waste within the tank without pulling sample and delivering it to a laboratory

D. OTHER LEGAL DRIVERS AND ORDER REQUIREMENTS

- 40 CFR 265.196 - Response to Leaks & Spills and Disposition of Leaking of Unfit-for-Use Tanks Systems
- WAC 173-303-640 - Tank Systems
- DNFSB, Recommendation 93-5 to the Secretary of Energy, July 19, 1993
- DOE Order 5820-2A - Radioactive Waste Management
- *Hanford Federal Facility Agreement and Consent Order*, Fourth Amendment, January 1994
- DOE/RL 94-0001, Recommendation 93-5 Implementation Plan, January 1994

**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.04 Characterization 1.1.1.2.04.03 Field Sampling & Measurement	2. DATE PREPARED September 14, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.04.03.01/V1	5. WBS ELEMENT TITLE Activity Program Management							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1130-0-OC							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.1.2 Characterize Waste	12. BUDGET AND REPORTING NUMBER(S) <table> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3120074</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3120074		
Expense	Capital	Line Item						
EW3120074								

13. ELEMENT DESCRIPTION**A. COST CONTENT (Escalated Dollars)**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	1,691.5	1,773.7	1,827.0
CENRTC			
GPP			
LINE ITEM			
TOTAL	1,691.5	1,773.7	1,827.0

B. TECHNICAL BASES

Goals & objectives:

The objective of this activity is to provide the resources necessary for the waste sampling activity management and personnel training. Management categories include sampling engineering, sampling operations, and program activity management.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

Defense Nuclear Facility Safety Board (DNFSB) commitment "Complete Sampling and Analysis of all Watch List tanks per the applicable DQOs".

C. STATEMENT OF WORK

Required activities:

Provide management and secretarial support for core, auger, vapor, supernate sampling and directly related activities.

Develop the Integrated Sampling Schedule utilizing input and prioritization from TWRS program elements (WHC).

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Program Element Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	G. A. Stanton <i>G. A. Stanton</i>	9/26/94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/26/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	G. A. Stanton <i>G. A. Stanton</i>	9/26/94
Cost Account Manager	G. A. Stanton <i>G. A. Stanton</i>	9/26/94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/26/94

FDS Number

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Tank Waste Remediation System Work Breakdown Structure Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.04 Characterization 1.1.1.2.04.03 Field Sampling & Measurement	2. DATE PREPARED September 14, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930				
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.04.03.02/VI	5. WBS ELEMENT TITLE Core Sampling					
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO 0	8. EFFECTIVE REVISION DATE September 23, 1994				
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1130-0-OC					
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.1.2 Characterize Waste	12. BUDGET AND REPORTING NUMBER(S) <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">Expense Capital</td> <td style="width: 50%;">Line Item</td> </tr> <tr> <td>EW3120074</td> <td></td> </tr> </table>		Expense Capital	Line Item	EW3120074	
Expense Capital	Line Item					
EW3120074						

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	12,956.2	16,721.7	18,162.0
CENRTC			
GPP			
LINE ITEM			
TOTAL	12,956.2	16,721.7	18,162.0

B. TECHNICAL BASES

Goals & objectives:

The objective of this activity is to provide the necessary resources to collect core samples from single-shell (SST) and double-shell (DST) waste tanks. Scheduled activities shall match the integrated schedule to meet the requirement of the DNFSB 93-5 Implementation Plan. All Watch List tanks shall be sampled by the end of FY 1995. Tank core samples will be collected utilizing push mode or rotary mode sampling methods. Characterization data gathered as a result of SST and DST sampling, will be used to address the resolution of tank safety concerns and to support Safety, HWVP, and Pretreatment Programs.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

Defense Nuclear Facility Safety Board (DNFSB) commitment "Complete Sampling and Analysis of all Watch List tanks per the applicable DQOs".

Defense Nuclear Facility Safety Board (DNFSB) commitment "Hire, Train, and Qualify 4 Additional Rotary Mode Crews".

C. STATEMENT OF WORK

Required activities:

Obtain, using push mode and rotary mode sampling systems, and deliver for analysis, core samples from Watch list and Non-Watch list tanks as identified on the Integrated Sampling Schedule (WHC).

Provide service support for decontamination of equipment and the material and labor required for fabrication of consumable core sampling equipment.

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Program Element Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	G. A. Stanton <i>G. A. Stanton</i>	9/26/94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/26/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	G. A. Stanton <i>G. A. Stanton</i>	9/26/94
Cost Account Manager	P. A. Young <i>P. A. Young</i>	09/26/94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/26/94

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.04 Characterization 1.1.1.2.04.03 Field Sampling & Measurement	2. DATE PREPARED September 14, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.04.03.03/VI	5. WBS ELEMENT TITLE Auger Sampling							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1130-0-OC							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.1.2 Characterize Waste	12. BUDGET AND REPORTING NUMBER(S) <table> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3120074</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3120074		
Expense	Capital	Line Item						
EW3120074								

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	2,402.6	2,435.9	
CENRTC			
GPP			
LINE ITEM			
TOTAL	2,402.6	2,435.9	

B. TECHNICAL BASES

Goals & objectives:

The objective of this activity is to provide the necessary resources to collect auger surface samples single-shell and double-shell waste tanks. Scheduled activities shall match the integrated schedule to meet the requirements of the DNFSB 93-5 Implementation Plan. Characterization data gathered as a result of auger sampling will be used to address the resolution of tank safety concerns and to support the Safety, HWVP Program. Additionally, auger surface sampling will be used as a prerequisite for push-mode core sampling to enhance core recovery potential.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

Defense Nuclear Facility Safety Board (DNFSB) commitment "Complete Sampling and Analysis of all Watch List tanks per the applicable DQOs".

C. STATEMENT OF WORK

Required activities:

Collect auger surface samples and transport to the laboratory for analysis.

Provide service support for decontamination of equipment and the material and labor required for fabrication of consumable auger sampling equipment (PNL).

Identify the replacement auger sampling equipment and the time required for decontamination of existing equipment in support of sampling activities (WHC):

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Program Element Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	G. A. Stanton <i>G. A. Stanton</i>	9/26/94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/26/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	G. A. Stanton <i>G. A. Stanton</i>	9/26/94
Cost Account Manager	P. A. Young <i>P. A. Young</i>	09/26/94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/26/94

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Tank Waste Remediation System Work Breakdown Structure Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.04 Characterization 1.1.1.2.04.03 Field Sampling & Measurement	2. DATE PREPARED September 14, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.04.03.04/VI	5. WBS ELEMENT TITLE Vapor Sampling							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1130-0-OC							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.1.2 Characterize Waste	12. BUDGET AND REPORTING NUMBER(S) <table style="width: 100%; border: none;"> <tr> <td style="text-align: left;">Expense</td> <td style="text-align: left;">Capital</td> <td style="text-align: left;">Line Item</td> </tr> <tr> <td colspan="3">EW3120074</td> </tr> </table>		Expense	Capital	Line Item	EW3120074		
Expense	Capital	Line Item						
EW3120074								

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	3,264.3	3,545.1	3,629.6
CENRTC			
GPP			
LINE ITEM			
TOTAL	3,264.3	3,545.1	3,629.6

B. TECHNICAL BASES

Goals & objectives:

Collect Single-shell tank (SST) vapor samples. In-tank vapor samples will be collected and transported to a laboratory for analysis. Scheduled activities shall match the integrated schedule to meet the requirement of the DNFSB 93-5 Implementation Plan. Characterization data gathered as a result of SST vapor sampling will be used to address the resolution of tank Safety and Pretreatment Programs as well as a prerequisite when need for core sampling activities.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

Defense Nuclear Facility Safety Board (DNFSB) commitment "Complete Sampling and Analysis of all Watch List tanks per the applicable DQOs".

C. STATEMENT OF WORK

Required activities:

Perform type 2 vapor sampling (by Sampling and Mobil Laboratory personnel) prior to rotary mode sampling.

Perform Type 3 vapor sampling using the VSS (Vapor Sampling System) operated by the Sampling and Mobil Laboratory. These samples support the safety vapor program.

Report and document vapor sampling analyses to support additional intrusive activities in single shell tanks.

Vapor samples will be taken to support operational needs, Waste Tank Safety program needs, and to support other characterization operations, such as vapor sampling prior to rotary mode core sampling to meet the requirement of the Clean Air Permit. Vapor characterization is defined here as flammability, total organic carbon, and selected toxic gas analysis (WHC-PNL).

Technologies to be assessed:

Adiabatic versus non-adiabatic vapor sampling systems.

Gas flow control technology.

Options to be considered:

Temporary versus long term vapor sampling equipment installations.

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Program Element Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	G. A. Stanton <i>G. A. Stanton</i>	9/26/94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/26/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	G. A. Stanton <i>G. A. Stanton</i>	9/26/94
Cost Account Manager	P. A. Young <i>P. A. Young</i>	9/26/94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/26/94

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.04 Characterization 1.1.1.2.04.03 Field Sampling & Measurement	2. DATE PREPARED September 14, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.04.03.05/VI	5. WBS ELEMENT TITLE Supernate Sampling							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1130-0-OC							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.1.2 Characterize Waste	12. BUDGET AND REPORTING NUMBER(S) <table> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3120074</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3120074		
Expense	Capital	Line Item						
EW3120074								

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	1,823.4	1,356.4	
CENRTC			
GPP			
LINE ITEM			
TOTAL	1,823.4	1,356.4	

B. TECHNICAL BASES

Goals & objectives:

Supernatant samples will be collected during FY 1995-96 and transported to a laboratory for analysis. Scheduled activities shall match the integrated schedule to meet the requirement of the DNFSB 93-5 Implementation Plan.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

Defense Nuclear Facility Safety Board (DNFSB) commitment "Complete Sampling and Analysis of all Watch List tanks per the applicable DQOs.

C. STATEMENT OF WORK

Required activities:

Collect samples from SSTs and DSTs where sufficient liquid exists for this technique. These samples support evaporator operations, stabilization efforts, RCRA, and other operational needs.

Provide service support for material and labor required for fabrication of consumable supernatant sampling equipment (PNL).

Identify the replacement supernatant sampling equipment and the time required for decontamination of existing equipment in support of sampling activities (WHC).

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Program Element Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	G. A. Stanton <i>G. A. Stanton</i>	9/26/94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/26/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	G. A. Stanton <i>G. A. Stanton</i>	9/26/94
Cost Account Manager	P. A. Young <i>P. A. Young</i>	9/26/94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/26/94

FDS Number

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.04 Characterization 1.1.1.2.04.03 Field Sampling & Measurement	2. DATE PREPARED September 14, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.04.03.06/VI	5. WBS ELEMENT TITLE Riser Preparation							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1130-0-OC							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.1.2 Characterize Waste	12. BUDGET AND REPORTING NUMBER(S) <table> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3120074</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3120074		
Expense	Capital	Line Item						
EW3120074								

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	432.1	498.7	513.7
CENRTC			
GPP			
LINE ITEM			
TOTAL	432.1	498.7	513.7

B. TECHNICAL BASES

Goals & objectives:

The objective of this activity is to provide the resources required to prepare waste tank risers for sampling activities. Additionally, the possibility of adding risers to existing tanks will be examined.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS): N/A

C. STATEMENT OF WORK

Required activities:

Inspect and prepare risers to be used for sampling access conduits. Riser preparation will include 1) researching drawings, photographs and other records, 2) preparing engineering change notices, unresolved safety question screenings and work packages to remove existing equipment, install riser adapters, 3) inspect risers for straightness and suitability for intrusive activities.

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Program Element Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	G. A. Stanton <i>G. A. Stanton</i>	9/27/94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/27/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	G. A. Stanton <i>G. A. Stanton</i>	9/27/94
Cost Account Manager	P. A. Young <i>P. A. Young</i>	9-27-94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/27/94

FDS Number
<u>1N4C36</u>

**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.04 Characterization 1.1.1.2.04.03 Field Sampling & Measurement	2. DATE PREPARED September 14, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.04.03.07/VI	5. WBS ELEMENT TITLE Equipment Replacement (PAS-1, NCAW, Spares)							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10 ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1130-0-OC							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.1.2 Characterize Waste	12. BUDGET AND REPORTING NUMBER(S) <table border="0"> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3120074</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3120074		
Expense	Capital	Line Item						
EW3120074								

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	600.3	448.7	493.2
CENRTC			
GPP			
LINE ITEM			
TOTAL	600.3	448.7	493.2

B. TECHNICAL BASES

Goals & objectives:

Complete the fabrication of 3 Neutralized Current Acid Waste (NCAW) transport casks. The NCAW cask has been designed to replace the EBR-II storage container for shipping NCAW samples to PNL's 325 laboratory. The NCAW cask meets DOE specifications for shipment of type B waste. Complete the Nuclear Regulatory Commission license effort necessary to prepare PAS-1 cask for use.

The PAS-1 transfer cask will allow shipments of radioactive liquid and solid sample material to be shipped to off-site laboratories for analysis.

Provide spares equipment/parts for the Push Mode, Rotary Mode, Auger, and Vapor Sampling Systems.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

Receipt of NCAW casks.

C. STATEMENT OF WORK

Required activities:

Support the fabrication of 3 NCAW transport casks. Support will include fabrication services, packaging and safety engineering.

Provide engineering liaison support between WHC and the Nuclear Regulatory Commission to follow progress toward PAS-1 cask licensing.

Procure spares equipment/parts for the Push Mode and Rotary Mode Core Sampling Systems.

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Program Element Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	G. A. Stanton <i>G. A. Stanton</i>	9/27/94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/27/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	G. A. Stanton <i>G. A. Stanton</i>	9/27/94
Cost Account Manager	P. A. Young <i>P. A. Young</i>	09/27/94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/27/94

FDS Number

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.04 Characterization 1.1.1.2.04.03 Field Sampling & Measurement	2. DATE PREPARED September 14, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.04.03.08/VI	5. WBS ELEMENT TITLE Field Sampling Readiness							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1130-0-OC							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.1.2 Characterize Waste	12. BUDGET AND REPORTING NUMBER(S) <table> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3120074</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3120074		
Expense	Capital	Line Item						
EW3120074								

13. ELEMENT DESCRIPTION**A. COST CONTENT (Escalated Dollars)**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	.1	.1	.1
CENRTC			
GPP			
LINE ITEM			
TOTAL	.1	.1	.1

B. TECHNICAL BASES

Goals & objectives:

The objective of this activity is to provide a structure for continuity of service in the event field sampling activities are not possible.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS): N/A

C. STATEMENT OF WORK

Required activities: TBD

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Program Element Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	G. A. Stanton <i>G. A. Stanton</i>	9/27/94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/27/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	G. A. Stanton <i>G. A. Stanton</i>	9/27/94
Cost Account Manager	P. A. Young <i>P. A. Young</i>	09-27-94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/27/94

FDS Number

1N4C38

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.04 Characterization 1.1.1.2.04.03 Field Sampling & Measurement	2. DATE PREPARED September 14, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.04.03.09/VI	5. WBS ELEMENT TITLE 3rd & 4th Sampling Trucks - CENRTC	
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1130-0-OB	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.1.2 Characterize Waste	12. BUDGET AND REPORTING NUMBER(S) <div style="display: flex; justify-content: space-between;"> Expense Capital Line Item </div> 35EW31207	

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING			
CENRTC	2,825.5		
GPP			
LINE ITEM			
TOTAL	2,825.5		

B. TECHNICAL BASES

Goals & objectives:

The objective of this activity is to fabricate and test two Rotary Mode Core Sampling Systems (RMCS). The new systems are duplicates of the present rotary mode core sampling system.

Status of Design Documentation:

The fabrication drawings are released, the procurement packages for all provided equipment have been issued.

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

The deliverables associated with this activity are itemized in WHC-SD-ETP-029 Revision 1. The major items are:

- 3 cask trucks, 50 casks, 10 cask stands, 2 drum heaters, 4 drill rod washers, 4 spray washers, 4 riser adapters, 4 change out assemblies (ancillary equipment fabricated) plus the following procured equipment; 2 longyear drill rigs, 1 F-800 Truck, two axilliary generators, 2 crew support trailers, two nitrogen purge gas trailers, 2 crew vans, and two electrical distribution trailers.

C. STATEMENT OF WORK

Required activities:

- Monitor ICF-KH fabrication of the two Rotary Mode Core Sample trucks
- Monitor ICF-KH fabrication of WHC designed ancillary equipment noted in WHC-SD-ETP-029
- Place procurement order for two portable exhausters units

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Program Element Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	G. A. Stanton <i>G. A. Stanton</i>	9/27/94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/27/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	G. A. Stanton <i>G. A. Stanton</i>	9/27/94
Cost Account Manager	B. A. Kendall <i>BA Kendall</i>	9/27/94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/27/94

FDS Number

2N4C39

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.04 Characterization 1.1.1.2.04.03 Field Sampling and Measurement	2. DATE PREPARED September 15, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.04.03.10/VI	5. WBS ELEMENT TITLE Instrumented Casks - CENRTC							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1130-0-OC							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.1.2 Characterize Waste	12. BUDGET AND REPORTING NUMBER(S) <table border="0"> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td></td> <td></td> <td>35EW31207</td> </tr> </table>		Expense	Capital	Line Item			35EW31207
Expense	Capital	Line Item						
		35EW31207						

13. ELEMENT DESCRIPTION**A. COST CONTENT (Escalated Dollars)**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING			
CENRTC	601.5		
GPP			
LINE ITEM			
TOTAL	601.5		

B. TECHNICAL BASES

Goals & objectives:

The goal of this cost area is to procure three Sample Verification Instrumented Casks. These casks will be used to determine core sampler tool fill prior to being transported to the laboratory for extrusion.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

Receipt of three Sample Verification Instrumented Casks.

C. STATEMENT OF WORK

Required activities:

Complete WHC procurement documentation for three Sample Verification Instrumented Casks.

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Program Element Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	G. A. Stanton <i>G. A. Stanton</i>	9/27/94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/27/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	G. A. Stanton <i>G. A. Stanton</i>	9/27/94
Cost Account Manager	P. A. Young <i>P. A. Young</i>	9/27/94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/27/94

FDS Number

2N4C3A

**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.04 Characterization 1.1.1.2.04.03 Field Sampling & Measurement	2. DATE PREPARED September 14, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.04.03.11/VI	5. WBS ELEMENT TITLE 3rd & 4th Sampling Trucks	
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1130-0-OB	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.1.2 Characterize Waste	12. BUDGET AND REPORTING NUMBER(S) Expense Capital Line Item EW3120074	

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	1,077.7		
CENRTC			
GPP			
LINE ITEM			
TOTAL	1,077.7		

B. TECHNICAL BASES

Goals & objectives:

The objective of this activity is to fabricate and test two Rotary Mode Core Sampling Systems (RMCS). The new systems are duplicates of the present rotary mode core sampling system.

Status of Design Documentation:

TBD

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

C. STATEMENT OF WORK

Required activities:

Complete the acquisition of two rotary mode core sampling (RMCS) systems. This will include the following:

- Finalize the design for the systems
- Complete the assembly drawings for the RMCS vehicles
- Complete drawings for shop component fabrication
- Complete procurement of ancillary equipment
- Perform acceptance test procedures
- Finalize overall documentation

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Program Element Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	G. A. Stanton <i>G. A. Stanton</i>	9/27/94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/27/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	G. A. Stanton <i>G. A. Stanton</i>	9/27/94
Cost Account Manager	B. A. Kendall <i>BA Kendall for telecon</i>	9/27/94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/27/94

FDS Number

1N4C3B

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.04 Characterization (M&O Contractor)	2. DATE PREPARED August 18, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.04.04/V	5. WBS ELEMENT TITLE Analytical Integration							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE August 31, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1130-0-OD							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.1.2 Characterize Waste 4.2.1.2.6 Manage Data	12. BUDGET AND REPORTING NUMBER <table> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3120074</td> <td></td> <td>35EW31207</td> </tr> </table>		Expense	Capital	Line Item	EW3120074		35EW31207
Expense	Capital	Line Item						
EW3120074		35EW31207						

13. ELEMENT DESCRIPTION**A. COST CONTENT (Escalated dollars)**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)	FY 1998 \$(000)	FY 1999 \$(000)	FY 2000 \$(000)	FY 2001 \$(000)
OPERATING	39,527.8	42,064.0	26,871.8				
CENRTC	219.0						
GPP							
LINE ITEM							
TOTAL	39,746.8	42,064.0	26,871.8				

B. TECHNICAL BASES

Goals and objectives:

- Analysis of core and auger samples obtained from single-shell tanks (SSTs) and double-shell tanks (DSTs)
- Analysis of supernate samples obtained from SSTs and DSTs
- Laboratories upgrades
- Analysis of vapor samples obtained from SSTs and DSTs
- Offsite laboratories capability

Major end-item deliverables:

- Defense Nuclear Facility Safety Board (DNFSB) commitment "Complete Sampling and Analysis of all Watch List tanks per the DQOs
- Defense Nuclear Facility Safety Board (DNFSB) commitment "Complete Upgrades of Off Site Characterization Laboratory to Ready-to-Serve Mode
- Defense Nuclear Facility Safety Board (DNFSB) commitment "Two Pas-1 Transfer Casks Will Be Ready for Use"

C. STATEMENT OF WORK

Required activities over lifetime:

As required for DST and SST core samples, receive, analyze and issue letter reports documenting results of selected high priority safety screening analyses within 45 days receipt at the laboratory of the last segment from the core.

As required for auger samples, receive/analyze and issue letter reports documenting results of selected high priority safety screening analytes within 45 days of receipt at the laboratory of the last auger from each tank.

As required for DST and SST core samples, receive, analyze and issue letter reports documenting results of selected high priority safety screening analysis and issue data reports per requirements of tank specific Tank Characterization Plans within 216 days of the sampling of the last segment of the last core from the tank.

As required for auger and supernatant samples, receive/analyze and issue letter reports documenting results of selected high priority safety screening analytes and issue data reports per requirements of tank specific Tank Characterization Plans with 176 days (or as defined by the TCPs) of obtaining the last sample from the tank.

Prepare offsite laboratory (INEL or LANL) to receive and analyze.

Purchase or lease shipping casks, including NRC licensing, needed to ship samples to off-site laboratories (PAS-1 cask) and to ship high activity core samples onsite.

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Provide base funding to maintain the 340 Facility (FY 1995 only) and 222-S Laboratory ready to support TWRS analytical needs.

Complete laboratory upgrades to expand capabilities for supporting TWRS needs.

Analyze vapor samples at the 325 Facility to the required instructions of the Tank Waste Analysis Plan. The prime focus is to provide health (OSHA), flammability or permitting data to support other activities.

Support for TWRS laboratory data management, procedure maintenance, training, inter-Laboratory sample exchange, etc. Provide 222-S Laboratory ready-to-serve support in order to meet TWRS requirements for analysis.

Interfaces:

#	From This WBS To	Item Provided
1	1.1.1.2.04.05	Tank waste sample analytical data for inclusion in Tank Characterization Reports and leading into Tank Characterization Database (TCD)
2	1.1.1.2.04.03	NCAW casks
	To This WBS From	
1	1.1.1.2.04.03	Tank waste samples for analysis
2	1.1.1.2.04.01	Tank Waste Analysis Plan (TWAP)/Tank Characterization Plans (TCP)
3	1.1.1.2.04.03	Integrated Sampling Schedule
4	1.1.1.2.04.05	Data Quality Objective (DQO) documents

Technologies to be assessed:

- Analytical needs, with long lead times, as identified through the Data Quality Objective (DQO) process, will be developed within 1.1.1.2.04.02 "Technology Development & Applied Engineering"

Options to be considered:

- In situ (characterization of waste within the tank without pulling sample and delivering it to a laboratory)

D. OTHER LEGAL DRIVERS AND ORDER REQUIREMENTS

- WAC 173-303 - Dangerous Waste Regulations
- Hanford Federal Facility Agreement and Consent Order*, Fourth Amendment, January 1994
- DOE/RL 94-0001, Recommendation 93-5 Implementation Plan, January 1994
- Defense Authorization Act, Public Law 101-510, "Safety Measures for Waste Tanks at

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Hanford Nuclear Reservation," Section 3137

**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.04 Characterization 1.1.1.2.04.04 Analytical Integration	2. DATE PREPARED September 14, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.04.04.01/VI	5. WBS ELEMENT TITLE Activity Program Management	
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1130-0-OD	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.1.2 Characterize Waste	12. BUDGET AND REPORTING NUMBER(S) Expense Capital Line Item EW3120074	

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	551.5	568.0	585.1
CENRTC			
GPP			
LINE ITEM			
TOTAL	551.5	568.0	585.1

B. TECHNICAL BASES

Goals & objectives:

The goal is to provide program management support to the Analytical Integration activity.

The objective is to perform those program management activities which are necessary for the performance of laboratory readiness activities in support of all cost accounts under the Analytical Integration activity.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

Activities within this cost account are level-of-effort; there are no milestones for this cost account.

C. STATEMENT OF WORK

Required activities:

Perform level-of-effort support to the Analytical Integration activity. This support includes tasks related to Activity Management. Activity Management includes (1) performing cost account manager responsibilities for Analytical Integration cost accounts; (2) performing activity manager responsibilities for the Analytical Integration activity; (3) estimating and planning laboratory capacities and workload; and (4) responding to review groups and audits/surveillances as necessary.

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Program Element Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	D. R. Bratzel <i>P. Segall for</i>	9-26-94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/27/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	D. R. Bratzel <i>P. Segall for</i>	9-26-94
Cost Account Manager	D. R. Bratzel <i>P. Segall for</i>	9-26-94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/27/94

FDS Number

1N4D41

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.04 Characterization 1.1.1.2.04.04 Analytical Integration	2. DATE PREPARED September 14, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.04.04.02/VI	5. WBS ELEMENT TITLE Lab Readiness							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1130-0-OD							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.1.2 Characterize Waste	12. BUDGET AND REPORTING NUMBER(S) <table> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3120074</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3120074		
Expense	Capital	Line Item						
EW3120074								

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	6,270.2	6,785.7	4,064.0
CENRTC			
GPP			
LINE ITEM			
TOTAL	6,270.2	6,785.7	4,064.0

B. TECHNICAL BASES

Goals & objectives:

Alternative tasks will be performed by 222-S and 325 laboratory if a standdown occurs. Alternative tasks are required when a condition (such as an inability to provide the laboratories with samples) results in a reduction in laboratory workload to a point that laboratory readiness cannot be maintained. Alternative tasks will consist of housekeeping, cross training, procedures development/review and other activities to be identified in support of the TWRS Characterization Program. This activity will also supplement the 222-S Laboratory assessment from ADS 7100 is for maintaining the laboratories in a ready-to-serve mode to perform analysis. This activity will also include the Sample Exchange Evaluation (SEE) program which will complete phases each fiscal year to compare analytical laboratory performance on sample materials unique to the Hanford Nuclear Reservation. The laboratories shall archive segments, core composites and facies as required by the TWRS Characterization Program. The activity will support sample re-analyses based on evaluation of data by the TWRS Characterization Program or additional analyses requests.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

The Quality Triad (QT); composed of Technical, Quality Assurance and Management staff members from the PNL Analytical Chemistry Laboratory (ACL), and the WHC Analytical Services (AS), will compile a quarterly status report presenting the status of each phase of the SEE program. INEL WINCO Laboratory will be included as a participant in the SEE Program. The quarterly report will be presented to Analytical Services manager, TWRS Characterization Program manager, Analytical Chemistry Laboratory Manager, and managers of any other participating laboratories.

Transmittal of a letter report to Analytical Services, ACL Laboratory, INEL Laboratory and TWRS Characterization Program office on the issuance of each Phase Test Plan and completion of each Phase Report.

C. STATEMENT OF WORK

Required activities:

Alternative tasks will be setup if standdown activities become necessary during a fiscal year. Alternative tasks are required when a condition (such as an inability to provide the laboratories with samples) results in a reduction in laboratory workload to a point that laboratory readiness cannot be maintained. These tasks will consist of housekeeping, cross-training, procedure development/review and other activities to be identified as appropriate to support the TWRS Characterization Program.

This activity will provide supplementary funding to 222-S Assessment fee from ADS 7100 in order for the laboratory to meet TWRS Characterization needs. The ADS 7100 provides funding for the Laboratory to maintain the laboratory in a ready to serve mode to accept samples to support Laboratory customers.

The SEE program strategy fulfills dual roles as a methods comparison/performance evaluation tool and as a continuous improvement vehicle via the time-phased blind sample exchanges between the participating laboratories. These exchanges are phased to test comparability of analytical methods, sample preparation procedures, and sample homogenization procedures. Besides the exchange of single blind sample materials, single blind QC standards are traded to benchmark analytical performance on the various methods being evaluated. Data from the blind sample and QC standard exchanges are used to evaluate method comparability between the participating laboratories.

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The SEE Program is directed by a collaborative called the Quality Triad (QT). The QT is composed of Technical, Quality Assurance and Management staff members from the PNL Analytical Chemistry Laboratory (ACL), and the WHC Analytical Services (AS) and the INEL WINCO Laboratory as a participant in the SEE Program. The start of the SEE Phase III is predicated by the startup of 325 Laboratory to participate on the SEE Program by 11/15/95.

Documentation of each phase of the SEE Program is maintained in a test plan. The test plan describes phase objectives (i.e. compare radiochemical methods, compare inorganic methods, compare preparation methods, etc...) and provides guidance for evaluation criteria for each method. The SEE program is scheduled to run an average of two phases, including blind samples, each fiscal year. Each phase will provide additional data points which can then be used to identify problems and trend progress on each method evaluated.

The laboratories shall archive segments, core composites and facies as required by the TWRS Characterization Program. After the six month waiting period, if enough core composite material is available (~60 grams), the remaining segments and facie will be disposed of as waste or provided to other programs for development purposes. The archive sample will be the core composite that was prepared initially for the analyses performed for the customer. If insufficient sample material is available from the core composite, a sample will be composited into a 100 to 125 ml container.

Re-analyses of samples will be performed based on evaluation of data by TWRS Characterization Program or additional analyses requests.

Milestones:

Prepare Quarterly status report

Issue SEE Phase Test Plan

Phase III/VI - FY 1995

Phase V/VI - FY 1996

Phase VII/VIII - FY 1997

Complete SEE Phase Report

Phase III - FY 1995

Phase IV/V/VI - FY 1996

Phase VII/VIII - FY 1997

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Program Element Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	D. R. Bratzel <i>P. Segall for</i>	9-26-94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/27/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	D. R. Bratzel <i>P. Segall for</i>	9-26-94
Cost Account Manager	P. Segall <i>P. Segall</i>	9/26/94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/27/94

FDS Number

1N4D42

**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.04 Characterization 1.1.1.2.04.04 Analytical Integration	2. DATE PREPARED September 14, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.04.04.03/VI	5. WBS ELEMENT TITLE Safety Screening DQO Analysis							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1130-0-OD							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.1.2 Characterize Waste	12. BUDGET AND REPORTING NUMBER(S) <table> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3120074</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3120074		
Expense	Capital	Line Item						
EW3120074								

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	9,357.1	12,010.0	12,955.2
CENRTC			
GPP			
LINE ITEM			
TOTAL	9,357.1	12,010.0	12,955.2

B. TECHNICAL BASES

Goals & objectives:

The goal is to receive, extrude, package, ship, analyze, and provide 45 day data reports for samples received from each sampling event as defined by the Tank Characterization Plans (TCPs) which incorporates the Safety Screening Data Quality Objective (DQO). The Safety Screening DQO will require a 45 day report as identified by approved Tank Characterization Plans (TCPs). When required, secondary screening analyses will be completed and reported within 90 days of the sampling event.

The objective of this activity is that the work will comply with the requirements of the Tank Characterization Plans (TCPs) and the Hanford Analytical Services Quality Assurance Plan (HASQAP).

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

Transmittal from the laboratories to the TWRS Characterization Program will include 45 day reports containing a narrative of the preliminary results and short description of the high safety screening analyses received at the laboratory by August 15, 1995/1996/1997. These reports will be issued within 45 days after the last segment from the last core is received at the laboratory. Samples received after this date will require carryover of analyses and/or data reports into the following fiscal year.

Transmittal from the Laboratories to DOE-RL via the TWRS Characterization Program, of a letter report which will documents the completion of the DNFSB commitment "Complete Sampling and Analysis of all Watchlist tanks per the DQO's"

Transmittal from the Laboratories to DOE-RL via the TWRS Characterization Program, of a letter report which will documents the completion of the DNFSB commitment "Complete Sampling and Analysis of all Nonwatchlist tanks per the DQO's."

C. STATEMENT OF WORK

Required activities:

Analyze samples (full segment, half segment, or quarter segment) for the selected Safety Screening primary analytes and secondary analytes as required by the Tank Characterization Plans developed using the Safety Screening Data Quality Objective.

It is currently not projected that any Safety Screening analyses will be performed at off-site laboratories (INEL) due to 45 day turnaround requirements for sample results. If required, however, the extrusion and packaging samples for shipment to INEL will be performed by 222-S and 325 Laboratory. The 222-S Laboratory will provide coordination and support for these offsite samples, will integrate all data into a single data package, and issue the package per the requirements of tank specific Tank Characterization Plan.

Waste tank samples from single-shell and double shell tanks will be analyzed for Safety Screening DQO primary analytes. Secondary analyses will be performed based on the results from the primary screening analyses as required by action limits defined in Tank Characterization Plans.

Safety Screening will not apply to all supernatant samples but only those sampled in sufficient quantities to provide statistically significant results (e.g. following RCRA Part B Tank Characterization Plans and/or Waste Analysis Plan for DST sampling locations.)

Laboratory analysis cost will be collected under the following categories: sample preparation; each analysis performed; and data reporting. If analyses are identified under several DQOs, charges will be collected under the highest priority DQO (as prioritized in the Analytical Integration Work Breakdown Structure (WBS)).

Milestones:

Transmit a 45 day data report for all sampling events based on Safety Screening DQOs as identified in the tank specific Tank Characterization Plan. (FY 1995, FY 1996, FY 1997)

Defense Nuclear Facility Safety Board (DNFSB) commitment "Complete Sampling and Analysis of all Watchlist tanks per the DQO's"

Complete Sampling and Analysis of all Non Watchlist tanks per the DQO's

Technologies to be assessed:

Analytical needs, with long lead times as identified through the Data Quality Objective (DQO) process, will be developed within 1.1.1.2.04.02 "Technology Development & Applied Engineering".

Options to be considered:

In Situ (characterization of waste within the tank without pulling sample and delivering it to a laboratory).

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Program Element Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	D. R. Bratzel <i>P. Segall for</i>	9-26-94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/27/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	D. R. Bratzel <i>P. Segall for</i>	9-26-94
Cost Account Manager	P. Segall <i>P. Segall</i>	9/26/94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/27/94

FDS Number

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.04 Characterization 1.1.1.2.04.04 Analytical Integration	2. DATE PREPARED September 14, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.04.04.04/VI	5. WBS ELEMENT TITLE Safety Resolution DQO Analysis							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1130-0-OD							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.1.2 Characterize Waste	12. BUDGET AND REPORTING NUMBER(S) <table> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3120074</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3120074		
Expense	Capital	Line Item						
EW3120074								

13. ELEMENT DESCRIPTION**A. COST CONTENT (Escalated Dollars)**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	3,549.5	4,319.7	5,236.2
CENRTC			
GPP			
LINE ITEM			
TOTAL	3,549.5	4,319.7	5,236.2

B. TECHNICAL BASES

Goals & objectives:

The goal is to analyze, and provide a 216 day validated report for samples received from each sampling event as defined by the Tank Characterization Plans (TCPs) which incorporates the Safety Resolution related Data Quality Objectives (DQOs). The organic, ferrocyanide, flammable gas and high heat DQOs are included as part of the Safety Resolution activity. Safety Resolution analyses will require a 216 day data validation report per approved Tank Characterization Plans (TCPs).

The objective of this activity is that the work will comply with the requirements of the Tank Characterization Plans (TCPs) and the Hanford Analytical Services Quality Assurance Plans (HASQAP).

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

Transmittal from the laboratories to the TWRS Characterization Program will include a 216 day validated data report for Safety Resolution (DQO) samples received at the laboratory by February 15, 1995/1996/1997. These reports will be issued within 216 days after the removal of the last segment from the last core from the tank. Samples received after this date will require carryover of analyses and/or data reports into the following fiscal year.

C. STATEMENT OF WORK

Required activities:

Analyze samples (full segment, half segment, or quarter segment) for the selected Safety Resolution primary analytes as required by the Tank Characterization Plans developed using the Safety Resolution Data Quality Objectives. Selected samples will be sent to the offsite laboratory (INEL) for analysis.

The extrusion and packaging of samples for shipment to INEL will be performed by 222-S and 325 Laboratory. The 222-S Laboratory will provide coordination and support for these offsite samples, integration of all data into a single data package, and issue the data package per the requirements of the tank specific Tank Characterization Plans.

Analytical work shall be disbursed between the laboratories based on analytical capacity projections performed by Program Management and Integration.

Laboratory analysis cost will be collected under the following categories: each analysis performed; and data reporting/validation. If an analyses are identified under several DQOs, charges will be collected under the higher priority DQO (as prioritized in the Analytical Integration Work Breakdown Structure (WBS)). Safety Resolution shall be the second highest priority in the WBS.

Milestones:

Transmit a 216 day validated data report for all sampling events based on Safety Resolution DQOs as identified in the tank specific Tank Characterization Plan. (FY 1995, FY 1996, FY 1997)

Technologies to be assessed:

Analytical needs, with long lead times as identified through the Data Quality Objective (DQO) process, will be developed within 1.1.1.2.04.02 "Technology Development & Applied Engineering".

Options to be considered:

In Situ (characterization of waste within the tank without pulling sample and delivering it to a laboratory).

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Program Element Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	D. R. Bratzel <i>P. Segall</i>	9-26-94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/27/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	D. R. Bratzel <i>P. Segall</i>	9/26/94
Cost Account Manager	P. Segall <i>P. Segall</i>	9/26/94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/27/94

FDS Number

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.04 Characterization 1.1.1.2.04.04 Analytical Integration	2. DATE PREPARED September 14, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.04.04.05/VI	5. WBS ELEMENT TITLE Compatibility DQO Analysis							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1130-0-OD							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.1.2 Characterize Waste	12. BUDGET AND REPORTING NUMBER(S) <table border="0"> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3120074</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3120074		
Expense	Capital	Line Item						
EW3120074								

13. ELEMENT DESCRIPTION**A. COST CONTENT (Escalated Dollars)**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	847.9	1,289.5	
CENRTC			
GPP			
LINE ITEM			
TOTAL	847.9	1,289.5	

B. TECHNICAL BASES

Goals & objectives:

The goal is to receive, package, ship, analyze, and provide analytical data within 136 days of each sampling event as defined by the Tank Characterization Plans (TCPs) which incorporates the Compatibility related Data Quality Objective (DQO). The Compatibility DQO will require 136 day report as identified by approved Tank Characterization Plans (TCPs).

The objective of this activity is that the work will comply with the requirements of the Tank Characterization Plans (TCPs) and Hanford Analytical Services Quality Assurance Plan (HASQAP).

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

Transmittal of a data package report from the laboratories to the TWRS Characterization Program will include analytical results of the tank sampling event (including the Compatibility DQO results) on samples received at the laboratory by May 15, 1995/1996. These reports will be issued within 136 days (annual average, but not exceeding 176 days) after receipt of the last sample from the last core from the tank. Samples received after this date will require carryover of analyses and/or data reports into the following fiscal year.

C. STATEMENT OF WORK

Required activities:

Analyze samples for all analyses identified in the Compatibility DQO and issue results as required by the Tank Characterization Plans developed using the Compatibility Data Quality Objective.

Laboratory Analysis cost will be collected under the following categories: sample preparation; each analysis performed; and data reporting. If analyses are identified in several DQOs, charges will be collected under the highest priority DQO (as prioritized in the Analytical Integration Work Breakdown Structure (WBS)). Compatibility DQO shall be the third highest priority in the WBS.

Milestones:

Transmit an analytical data report from each sampling event within 136 days specific to the Compatibility DQO. (FY 1995, FY 1996)

Technologies to be assessed:

Analytical needs, with long lead times as identified through the Data Quality Objective (DQO) process, will be developed within 1.1.1.2.04.02 "Technology Development & Applied Engineering".

Options to be considered:

In Situ (characterization of waste within the tank without pulling sample and delivering it to a laboratory).

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Program Element Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	D. R. Bratzel <i>P. Segall for</i>	9-26-94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/27/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	D. R. Bratzel <i>P. Segall for</i>	9-26-94
Cost Account Manager	P. Segall <i>P. Segall</i>	9/26/94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/27/94

FDS Number

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.04 Characterization 1.1.1.2.04.04 Analytical Integration	2. DATE PREPARED September 14, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.04.04.06/VI	5. WBS ELEMENT TITLE Operations DQO Analysis							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1130-0-OD							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.1.2 Characterize Waste	12. BUDGET AND REPORTING NUMBER(S) <table border="0"> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3120074</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3120074		
Expense	Capital	Line Item						
EW3120074								

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	2,268.5	2,683.3	
CENRTC			
GPP			
LINE ITEM			
TOTAL	2,268.5	2,683.3	

B. TECHNICAL BASES

Goals & objectives:

The goal is to receive, analyze, and provide a 172 day validated data report for samples received from each sampling event for Operations related Data Quality Objectives (DQO).

The objective of this activity is that the work will comply with the requirements of the Tank Characterization Plans (TCPs) and Hanford Analytical Services Quality Assurance Plan (HASQAP).

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

Transmittal of a data package report from the laboratories to the TWRS Characterization Program will include 172 day validated data reports of the tank sampling event containing results of the Operations DQO analyses received at the laboratory by April 15, 1995/1996. These reports will be issued within 172 days after removal of the last sample from the last core from the tank. Samples received after this date will require carryover of analyses and/or data reports into the following year.

C. STATEMENT OF WORK

Required activities:

Analyze Evaporator analytes from (6) feed runs and RCRA analytes from (6) double shell tanks as required by the Tank Characterization Plans developed using the Operations related Data Quality Objectives.

The Operations DQOs will consist of Evaporator and RCRA (DST) Data Quality Objectives (DQOs).

Laboratory analyses cost will be collected under the following categories: sample preparation; each analysis performed; and data reporting/validation. If an analysis is identified in several DQOs, the costs will be collected under the highest priority DQO (as prioritized in the Analytical Integration Work Breakdown Structure (WBS)). The Operation's DQO shall be the fourth highest priority in the WBS.

Milestones:

Transmit a 172 day validated data report from each sampling event specific to Operations related DQOs.. (FY 1995, FY 1996)

Technologies to be assessed:

Analytical needs, with long lead times as identified through the Data Quality Objective (DQO) process, will be developed within 1.1.1.2.04.02 "Technology Development & Applied Engineering".

Options to be considered:

In Situ (characterization of waste within the tank without pulling sample and delivering it to a laboratory).

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Program Element Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	D. R. Bratzel <i>P. Segall for</i>	9-26-94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/27/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	D. R. Bratzel <i>P. Segall for</i>	9-26-94
Cost Account Manager	P. Segall <i>P. Segall</i>	9/26/94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/27/94

FDS Number

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.04 Characterization 1.1.1.2.04.04 Analytical Integration	2. DATE PREPARED August 27, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.04.04.07/VI	5. WBS ELEMENT TITLE Disposal DQO Analysis							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE August 31, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1130-0-OD							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.1.2 Characterize Waste	12. BUDGET AND REPORTING NUMBER(S) <table> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3120074</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3120074		
Expense	Capital	Line Item						
EW3120074								

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	3,559.1	3,911.7	4,031.1
CENRTC			
GPP			
LINE ITEM			
TOTAL	3,559.1	3,911.7	4,031.1

B. TECHNICAL BASES

Goals & objectives:

The goal is to receive, extrude, package, ship, analyze, and provide a 216 day validated report for samples received from each sampling event for the Disposal related Data Quality Objectives (DQOs). The Disposal DQO will require a 216 day validated data report per approved Tank Characterization Plans (TCPs). Development support for the Disposal programs includes the receipt, extrusion, special analysis, and packaging of samples for shipment.

The objective is that the work will comply with the requirements of the Tank Characterization Plans (TCPs) and Hanford Analytical Services Quality Assurance Plan (HASQAP).

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

Transmittal of a data package report from the laboratories to the TWRS Characterization Program will include 216 day validated data reports containing results on samples analyses received at the laboratory by February 15, 1995/1996/1997. These reports will be issued within 216 days after the removal of the last segment from the last riser of the tank. Samples received after this date will require carryover of analyses and/or data reports into the following year.

C. STATEMENT OF WORK

Required activities:

Analyze samples (liquid, full segment, half segment, or quarter segment) for the selected analytes as required by the Tank Characterization Plans developed using the Disposal related Data Quality Objectives.

Analytical work shall be disbursed between the laboratories according to the analytical capacity as determined by Program Management and Integration.

The 222-S Laboratory will receive, extrude, perform special analysis, package and set aside the packaged samples based on guidance from the Disposal programs for shipment and further development support.

The 216 Day validated data report for the Disposal related DQOs will be assumed as a requirement until the DQO is finalized and Tank Characterization Plans are issued.

Laboratory analyses cost will be collected under the following categories: sample preparation; each analysis performed; and data reporting/validation. If analyses are identified under several DQOs, charges will be collected under the highest priority DQO (as prioritized in the Analytical Work Breakdown Structure (WBS)). The Disposal DQO is the fifth highest Priority in the WBS.

Milestones:

Transmit a 216 day validated data report from each sampling event specific to the Disposal related DQOs. (FY 1995, FY 1996, FY 1997)

Technologies to be assessed:

Analytical needs, with long lead times as identified through the Data Quality Objective (DQO) process, will be developed within 1.1.1.2.04.02 "Technology Development & Applied Engineering".

Options to be considered:

In Situ (characterization of waste within the tank without pulling sample and delivering it to a laboratory).

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Program Element Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	D. R. Bratzel <i>P. Segall for</i>	9-26-94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/27/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	D. R. Bratzel <i>P. Segall for</i>	9-26-94
Cost Account Manager	P. Segall <i>P. Segall</i>	9/26/94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/27/94

FDS Number

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.04 Characterization 1.1.1.2.04.04 Analytical Integration	2. DATE PREPARED September 14, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.04.04.08/VI	5. WBS ELEMENT TITLE Vapor Analysis - PNL							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1130-0-OD							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.1.2 Characterize Waste	12. BUDGET AND REPORTING NUMBER(S) <table> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3120074</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3120074		
Expense	Capital	Line Item						
EW3120074								

13. ELEMENT DESCRIPTION**A. COST CONTENT (Escalated Dollars)**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	1,300.0		
CENRTC			
GPP			
LINE ITEM			
TOTAL	1,300.0		

B. TECHNICAL BASES

Goals & objectives:

Resolution of tank vapor issues will require development of a vapor characterization methodology. The strategy is to employ a phased approach to resolving the technical problems associated with tank vapor characterization.

The overall goal of waste tank vapor characterization activities has been broken down into logically distinct phases, with the tasks and goals of each phase being in part determined by the success and results of previous phases. Phases 1 and 2 are analytical, scientific, and/or engineering development phases. Phases 3 and 4 are tank characterization phases.

Characterization of the waste tank vapors is a key element of the Vapor Program's strategy to resolve the health and safety issues associated with noxious vapors in the tank farms. Once the adequacy of selected characterization methods has been established, these methods will be applied to study the remaining 35 suspect waste tanks at the Hanford Site. This effort has been divided into Phases 3 (FY 1994) and 4 (FY 1995).

One of the goals of Phase 3 will be to characterize, to an appropriate extent, the noxious vapors in 16 suspect waste tanks. In Phase 3, the Vapor Program will advance both its technical and procedural bases, with the goal of converting what is now an arduous and novel sampling process into an established and routine procedure.

Characterization of vapors in the remaining 28 suspect waste tanks will be performed in Phase 4 (FY 1995). though each waste tank has unique features, the tank-by-tank vapor characterization should not involve major developmental efforts in Phase 4. Exhaustive characterization is not a goal in and of itself, and the extent to which sampling and analysis must be performed in any given tank to meet Vapor Program objectives cannot be determined *a priori*. It is anticipated that many waste tanks will have little or no vapors of concern, and that this can be ascertained from relatively inexpensive preliminary sampling.

Samples collected will be sent to an external national laboratory (PNL) qualified in the selected SUMMA™ sample collection and analytical method. A sufficient number of samples, as dictated by the sample and analysis plan, will be collected by SUMMA™ canister technology and analyzed to allow estimation of precision on a statistical basis.

Specifically, PNL will provide SUMMA™ canister sampling media to WHC Field Analytical Services to collect vapor samples from Hanford tanks. These SUMMA™ canisters are typically 6 liter stainless steel evacuated canisters. The canister is then taken to a laboratory for subsequent analysis by a gas chromatograph with a mass spectrometer detector (GC/MS), or by a gas chromatograph with a flame ionization detector (GC/FID) to determine semi-volatile organics, volatile organics, and permanent gas constituents. PNL will provide sorbent tubes for collection of vapor samples for analysis of inorganic constituents.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

11/30/95	TPA 1N2H810A	Complete Vapor Headspace Characterization of All Ferrocyanide Watch List Tanks (M-40-03)
11/30/95	TPA 1N2H810A	Complete Vapor Headspace Characterization of All Organic Watch List Tanks (M-40-08)
6/30/95	TPA 1N2H810A	Sample and Characterize All Remaining Suspect Tanks (SI-2o)

C. STATEMENT OF WORK

WORKSCOPEPROJECT MANAGEMENT (Characterization Program)

PNL is tasked to provide project management support to the Tank Vapor Program. This will include maintenance of existing statements of work, laboratory quality assurance plans, project management plan, development of monthly and weekly progress reports, and management oversight of all related analytical chemistry. Project Management will also include the oversight of reports of qualitative, semi-quantitative, and quantitative analyses of SUMMA™ canister vapor samples and various inorganic gas and vapor samples collected by a variety of standard methods.

The project manager will be responsible to the WHC Tank Vapor Issues Resolution Manager for reporting project status. Project Management will oversee the analysis and evaluation of data of the vapor phase of the various Hanford waste storage tanks. This task will include evaluation of data of the vapor phase of the various Hanford waste storage tanks. This task will include Data Quality Objectives (DQO) support throughout the program and will work to keep analytical tasks in compliance with the sampling and analysis plan, the Hanford Analytical Services Quality Assurance Plan (HASQAP), as well as guidance from DOE Methods for Evaluating Environmental and Waste Management Samples.

All communications between PNL and WHC are to pass through the project manager to keep him (her) comprised of all sampling and analysis as necessary. When sample priorities are modified beyond the structure of the FIN Plan, due dates for reports will also be adjusted accordingly. Throughout FY 1995, project management will operate within PNL impact level II requirements. All report delivery dates in this FIN Plan are for uncleared copies. Analytical reports will first be delivered to WHC as draft copies for comment. The second delivery to WHC of the report will be for signature during the clearance process.

In the event that a substance has been identified which appears to be of concern, the WHC Program Manager will be notified immediately. This will be done even if the results are preliminary and unreviewed. This action will be taken in the interest of placing safety first. In these events, updated information on that analyte of concern will be also forwarded immediately to the WHC Program Manager.

Each final data report will be submitted individually for each sampled tank and will include the following:

1. Quantities of analytes found in the sampling apparatus (sorbent tubes and SUMMA canisters), and the quantitation methodology.
2. Recoveries of analytes from surrogates and trip blanks.
3. Calculated concentrations of analytes using "as-measured" sampling volumes.
4. Calculated concentrations of analytes using volumes corrected to standard temperatures and pressure (STP).

Deliverables

Weekly status reports delivered to the Program Manager on Tuesday of the following week.

Weekly

Monthly status reports delivered to the Program Manager on or before the 15th of each following month. In addition, PNL shall prepare and submit a detailed FY 1995 work plan.

Monthly

ORGANIC ANALYTICAL SUPPORT (Characterization Program)

The goal of this task is to support the Tank Waste Vapor Project by providing organic analytical support and by analyzing vapor samples from various Hanford waste tanks. This includes the analysis of vapor space samples from tanks on the organic and ferrocyanide Watch Lists. Samples will be collected via SUMMA canisters and analyzed by gas chromatography (GC)/flame ionization detector, GC/mass spectrometry, GC/thermal conductivity detector and GC/atomic emissions detector. Continue methods development to validate the applicability of SUMMA canister samples to semi-volatile and polar compounds in tank headspace.

With this level of effort, support should be adequate for analyzing a large number of samples, but reporting and sample throughput will depend on staff ability to handle sample load. Sample complexity may also impact analysis and reporting. It is expected that there will be changes in analytes from sample to sample, but that major changes in analytical technology are not expected. The budget was developed on the assumption that samples will contain less than 100 pCi/g alpha, and less than 400 pCi/g beta and gamma radioactivity. If samples contain detectable levels of radioactivity, they will be delivered to PNL with data describing the level detected. The budget was also developed on the assumption that QA will be at PNL impact level II, HASQAP procedures have not been budgeted. It is also assumed that funding and samples will be available continuously and uniformly throughout the fiscal year. However, initial throughput of samples may be slower than the optimal ration of 12 samples per week (2 tanks per week). It is assumed that no OVS tube samples will be analyzed.

Regarding planning for laboratory operation and support it is assumed that:

- PNL will receive samples from 30 tanks per year.
- Sample throughput will not exceed 3 tanks per month.
- No more than 1 tank will be processed in any given week.
- PNL will not be required to clean, validate, and supply more than 12 SUMMA™ canisters per week.
- Five (± 3) SUMMA™ samples will be analyzed from each tank.

Within two weeks of receiving a letter of instruction, PNL will provide equipment/supplies for shipment of samples. After the last sample is received from each tank, the following schedule will be used for submitting data reports.

- A draft data report is due five weeks after the last tank sample and necessary WHC data is received.
- PNL will receive WHC comments on the draft data report within two weeks
- PNL will submit the final data report to PNL clearance within two weeks of receipt of WHC comments

WHC will be notified immediately if delays in this schedule are anticipated.

DeliverablesDue

Interim Data Report

Five weeks after receipt of sample

INORGANIC ANALYTICAL AND SAMPLING SUPPORT (Characterization Program)

The goal of this task is to support the Tank Waste Vapor Project by providing sampling methods and inorganic analytical chemistry support of waste tank headspace samples. Support will be provided for sampling jobs performed by WHC using both the truck-based vehicle sampling system (VSS) and the in-situ sampling system (ISS). Inorganic components from tank vapor samples will be analyzed. Headspace vapor sampling and analyses will specifically be for ammonia, hydrogen cyanide, nitrogen oxide, nitrogen dioxide, sulfur oxides, and water, as required for each specific tank. Activities will be performed to maintain analytical capabilities, support detailed planning of VSS and ISS tank sampling and to prepare, analyze, and report on a large number of tank headspace vapor samples.

Planning for this level-of-effort support task is intended to accommodate activities necessary to meet the scope description (and is based in part on experience gained in FY 1994). Changes in analytes from job to job are anticipated, but major changes in analytical technology are not expected. The rate and complexity of tank sample jobs, radioactive contamination, needed analytical instrumentation repair or maintenance, or staff availability may affect the planned accomplishment of deliverables, however, resources are being scheduled and the purchase of supporting instrumentation is proposed that will preclude many potential difficulties. Planning was based on laboratory operations and support required for 30 tank sampling jobs (28 VSS and 2 ISS) at a rate of up to 3 tanks per month, with 10 to 20 samples per tank, and with portions of the analytical and report activities for 11 jobs anticipated to extend into FY 1996. The QA impact level is II.

Regarding report and evaluation of data it is assumed that:

- PNL will receive samples from 30 tanks.
- 15 (+5) inorganic samples will be analyzed from each tank.

Within two weeks of receiving a letter of instruction, PNL will provide equipment/supplies for shipment of samples. After the last sample is received from each tank the following schedule will be used for submitting data reports.

- The draft report will be due five weeks after the last tank sample and necessary WHC data is received.
- PNL will receive WHC comments on the draft data report within two weeks.

Deliverables

Submit FY 1995 Inorganic Summary Report for Technical Review	09/29/95
Receive WHC Comments on Inorganic Summary	10/20/95
Issue FY 1995 Inorganic Summary Report	11/17/95
Interim Data Report	Four weeks after receipt of sample

DATABASE SUPPORT (Characterization Program)

PNL will maintain and expand the capabilities of the VAPORNET database that stores, retrieves, and analyzes data collected from the vapor phase of the various waste tanks. Activities to be performed under this task are database server and database management system operation and maintenance; training WHC staff on data management (including data entry and verification) for published information related to sample events, analyses, and results; enhancement of database capabilities for on-line report storage and retrieval; user connection, training, and support; database capabilities for on-line report storage and retrieval; user connection, training, and support; database interface expansion and enhancement based upon user feedback; and electronic connection with Oak Ridge National Laboratory (ORNL) for transmitting tank vapor analysis results and for read-only access to the VAPORNET database.

Database enhancement and expansion will occur within the context of Vapor Database Data Model 2.0. Enhancements will be incremental and subject to funding levels. Electronic connection with ORNL will occur using the Tank Waste Information Network System (TWINS) technology. Electronic equipment for ORNL will be provided or procured directly by ORNL, and will need to be operational by February 28, 1995, to meet the deliverable scheduled below. PNL standards and conventions for computer system development and operation will be used. PNL impact level III (Good Practices Standards and associated Software Control Procedures applies.

Data to be input into the database will be from published sources provided to the task by WHC.

WHC-SP-1101

Deliverables

Presentation to Hanford Data Administration Board	12/31/94
Electronic Connection with ORNL Established	03/31/94
System Turnover Readiness Review with WHC IRM	08/31/94

RADIOCHEMISTRY ANALYTICAL SUPPORT (Characterization Program)

This task will provide radiological screening and speciation of samples including SUMMA™ canisters, HEPA filter material, sorbents, and possibly others. Less than 300 samples will be randomly selected and analyzed in FY 1995. This screening will initially be for gamma-ray emitting nuclides only, but can be extended to beta and alpha emitters as well. Levels of radionuclides will not exceed 400 pCi/g. The screening will determine the level of radioactive contaminants present in samples to be processed in on- or off-site laboratories.

10-50% of the sorbent tube samples taken in FY 1994 had measurable levels of radionuclides. Efforts have since been made to reduce levels to background. This task will evaluate the effectiveness of radionuclide reduction efforts and will include screening activities only. Extensive quantitation of all radionuclides will not be carried out.

This task will remain at impact level III throughout the duration of the task.

1. Work will be performed according to PNL Good Practice Standards.
2. Picocurie sensitivity is assumed to be sufficient for gamma-ray measurements.
3. It is assumed that samples will be available for 12-24 hours for screening counts.
4. Sufficient warning (12-24 hours) must be given before receipt of unscheduled samples.
5. PNL assumes that no sample will be delivered from WHC which will cause an acute radiation dose to personnel.

Approximately 0.5 FTE will be required to execute gamma-ray analysis on the expected sample load of three samples every other week during FY 1995. If development of a beta/alpha detection program is required, 0.2 FTE will be needed to develop a system for scavenging radioactive material from a canister and into a sensitive scintillation counter. Thereafter, the cost per sample will be identical to the gamma-ray analysis. In principal, then, an additional 0.5 FTE would be needed to process all samples for beta and alpha analysis.

Deliverables

Due

Reports will be generated to describe the quantification of isotopes in the samples. These will be generated on a sample by sample basis and in a timely fashion to facilitate further vapor analysis. Periodic briefings will be held as needed to discuss intermediate results.

As required

GENERAL

In general, PNL is responsible for the procurement, setup, calibration, maintenance, and continued operation of any and all analytical equipment identified in support of the Vapor Program which has not been previously addressed.

The deliverables and associated milestone dates outlined in the following section are contingent upon timely delivery of vapor samples to the laboratory for analysis. It is assumed that the laboratories can control receipt

on-dock time, and internal laboratory schedules to support sample analysis and submit a report within 30 calendar days of receipt of samples and support data. If samples are delayed due to reasons beyond the control of the laboratory, then the laboratory will not be held responsible for the prescribed delivery dates.

MILESTONES/DELIVERABLES

In addition to milestones and deliverables listed in text above, see attached Milestone Description Sheets.

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Program Element Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	D. R. Bratzel	
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/27/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	D. R. Bratzel	
Cost Account Manager	J. W. Osborne <i>J. W. Osborne</i>	9-28-94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/27/94

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.04 Characterization 1.1.1.2.04.04 Analytical Integration	2. DATE PREPARED August 29, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.04.04.09/VI	5. WBS ELEMENT TITLE Off-Site Laboratory							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE August 31, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1130-0-OD							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.1.2 Characterize Waste	12. BUDGET AND REPORTING NUMBER(S) <table border="0"> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3120074</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3120074		
Expense	Capital	Line Item						
EW3120074								

13. ELEMENT DESCRIPTION**A. COST CONTENT (Escalated Dollars)**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	5,150.2	4,995.5	
CENRTC			
GPP			
LINE ITEM			
TOTAL	5,150.2	4,995.5	

B. TECHNICAL BASES

Goals & objectives:

The goal and objective is to complete upgrades of INEL WINCO operated laboratories; and receive, analyze and report analytical results. INEL will perform analyses at a rate of capacity for 9 AEU/s for FY 1995 and FY 1996. All of these activities will be performed per TWRS specifications, as specified in the Tank Characterization Plans, INEL Upgrade Plan or letters of instructions.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

Transmittal of a letter from Analytical Services (cosigned by INEL) via the Characterization Program to DOE-RL, documenting completion of laboratory upgrades and WHC Quality Assessment for analyzing safety resolution samples by 10/31/94.

Transmittal from the Idaho National Engineering Laboratory to WHC Analytical Services, characterization reports which contain the results of analyses performed at INEL in support of the TWRS Characterization Program. Deliverables are to be provided in accordance with requirements and schedules provided in Tank Characterization Plans, letters of instruction, INEL Upgrade Plan or other documentation used to acquire and specify laboratory services.

C. STATEMENT OF WORK

Required activities:

Complete INEL upgrades to bring the laboratory to ready-to-serve mode to receive and analyze Hanford Site Tank Waste samples in support of the Characterization Program. The upgrades will be performed in accordance with the upgrade plan issued in January 1994.

INEL will receive, analyze and report analytical results as required in the Tank Characterization Plan(s) (TCPs). A statement of work (TWAP and associated TCPs) will be provided to INEL which will identify FY 1995 and FY 1996 type of samples, required analyses, schedule and quality requirements. Analytical turnaround time will be in accordance with Tank Characterization Plans. The 216 day turnaround time starts with the removal of the last segment from the last core from the tank.

Secondary waste disposal will be at INEL. Remaining tank waste samples will be returned from INEL to 222-S or 325 Laboratories.

All core samples sent to INEL Laboratory will be extruded and packaged for shipment at the Hanford Laboratories.

Nominal sample receiving rate should be planned at two casks/month. Each cask will contain an average of less than 1 core.

INEL'S participation in the Sample Exchange Evaluation will be funded in this activity.

The INEL funding will be in a Financial Plan to the Laboratory.

Milestones:

DNFSB Commitment 5.12, Complete Upgrades of INEL Laboratory to Ready-to-Serve mode for safety screening and safety resolution sample characterization support (10/31/94)

Complete all scheduled TWRS analytical support for the TWRS Characterization Program per the TWRS Characterization Sampling Plan (FY 1995, FY 1996)

Technologies to be assessed:

Analytical needs for TWRS pretreatment/disposal characterization have not been completed. Through the Data Quality Objective (DQO) process these needs will be established and INEL upgrades identified to the TWRS program for funding.

Options to be considered:

In Situ (characterization of waste within the tank without pulling sample and delivering it to a laboratory).

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Program Element Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	D. R. Bratzel <i>P. Segall for</i>	9-26-94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/27/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	D. R. Bratzel <i>P. Segall for</i>	9-26-94
Cost Account Manager	C. Stroup <i>Curtis Stroup</i>	9/27/94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/27/94

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1. TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.04 Characterization 1.1.1.2.04.04 Analytical Integration	2. DATE PREPARED September 15, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.04.04.10/VI	5. WBS ELEMENT TITLE 300 Area Waste Assessment							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 15, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1130-0-OD							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.1.2 Characterize Waste	12. BUDGET AND REPORTING NUMBER(S) <table border="0"> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3120074</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3120074		
Expense	Capital	Line Item						
EW3120074								

13. ELEMENT DESCRIPTION**A. COST CONTENT (Escalated Dollars)**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	379.8		
CENRTC			
GPP			
LINE ITEM			
TOTAL	379.8		

B. TECHNICAL BASES

Goals & objectives:

Complete expense maintenance project W-345, 307 Basin Maintenance Upgrades, to allow continued operations of the 340 Facility and startup of the 300 Area TEDF. 340 Facility operations are required to support 300 Area PNL labs.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

Project W-345 is complete and operational to provide 307 Basin operations at the 340 Facility and to allow TEDF startup by 12/31/94 as required by TPA milestone M-17-09.

C. STATEMENT OF WORK

Required activities:

Complete approximately final one third of Project W-345, 307 Basin Upgrade construction activities by November 1994. Includes ICF KH construction forces labor as well as final procurement and project engineer oversight. W-345 provides for relining the 307 Basins and reworking piping, electrical conduits and ladders/platforms. Operability of the 307 Basins is required to support TPA milestone M-17-09, 300 Area TEDF hot startup as of December 31, 1994.

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Program Element Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	D. R. Bratzel <i>P. Segall for</i>	9-26-94
Program Business Administration	C. M. Welch <i>C. M. Welch</i>	9/27/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	D. R. Bratzel <i>P. Segall for</i>	9-26-94
Cost Account Manager	B. W. Lindsey <i>B. W. Lindsey</i>	9/27/94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/27/94

FDS Number

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1. Manage Tank Waste 1.1.1.2.04 Characterization 1.1.1.2.04.04 Analytical Operations	2. DATE PREPARED August 27, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.04.04.11/VI	5. WBS ELEMENT TITLE 222-S Lab Upgrades/LIMS Development							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE August 31, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1130-0-OD							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.1.2 Characterize Waste	13. BUDGET AND REPORTING NUMBER(S) <table border="0"> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW310074</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW310074		
Expense	Capital	Line Item						
EW310074								

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	2,631.2	2,360.2	
CENTRC			
GPP			
LINE ITEM			
TOTAL	2,631.2	2,360.2	

B. TECHNICAL BASES

Goals & objectives:

The goals are to provide upgrades to existing Hanford facilities to meet the analytical capabilities and capacities for the analysis of Hanford Site samples obtained as part of TWRS Characterization Program activities. Continue implementation of new LABCORE features and functionality in support of TWRS through system configuration and development activities.

The objective is to complete renovations for 222-S Laboratories to comply with TWRS Characterization Program needs.

The objective for LIMS is to provide the 222-S Laboratory with; electronic data transfer of sample analysis data to TCD to meet the changes in Secified Electronic Format deliverables; phase-out of the LCCS and LMCS information system at 222-S laboratory; additional integrated calculations; and electronic data transfer from laboratory instrumentation; sample tracking support with bar coding through the 222-S new hot cells; and support implementation of LIMS program in the PNL Analytical Chemistry laboratory.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

Transmittal from 222-S Laboratory to the Characterization Program, of a letter report which documents completion of the upgrades by 09/30/95.

Transmittal from Analytical Services to the Characterization Program, a quarterly report providing status on LIMS development activity report to the TWRS Characterization Program by 09/30/95.

Transmittal from Analytical Services to the Characterization Program, of a letter reporting on the continuation of electronic instruments downloading by 09/30/96.

C. STATEMENT OF WORK

Required activities:

Complete laboratory upgrades including Laboratory Information Management Systems (LIMS) to expand capabilities for supporting TWRS needs.

The 222-S Laboratory upgrades will be fully funded through ADS 7100 in FY 1997.

222-S Laboratory Upgrades:

The renovations work will be performed by Kaiser Engineering Hanford (KEH).

ICPMS/AA Installation - The ICPMS/AA room will be renovated for the installation of the equipment to support of the Tank Waste Remediation Systems. In addition to the ICPMS, the upgrade will provide for casework, lighting and services designed for enhanced lab productivity. Completion of Design on 05/01/95, demo on 07/01/95, and construction on 09/30/95.

Sample Preparation - The sample preparation lab renovation will include larger hoods to allow for new microwave digestion technology with increased productivity. Completion of design/demo on 03/31/95, procurement on 06/01/95 and construction on 09/30/95.

Complete general specifications, typical plans for room upgrades on 12/15/94.

Perform Renovation of Rooms 4C, 4H, and 4J multi-purpose Lab rooms for FY 1996 to support the TWRS Characterization Program.

LIMS Development:

222-S TCD SEF Deliverable - The Tank Characterization Database (TCD) program has required that electronic data being transmitted to the TCD be in a specified electronic format (SEF).

222-S Instrument Interface - For FY 1995 one laboratory instruments will be given the capability electronically transmit analysis data to LABCORE LIMS. This link will reduce transcription errors and improve turnaround time for sample analysis by reducing the time spent entering data into the LIMS. The interface will use the ACE spreadsheet program to provide the scientist the ability to download data to their personal computer, select the sample and quality control data to be reported, transmit it to the LABCORE LIMS, and print a summary report for the scientist.

222-S Hotcell Integration - To improve operating efficiency in the new hotcell complex, two tasks will be automated. Implementation of barcode sample identification labeling to improve data entry to LABCORE LIMS and automation of balance data recording and entry into LABCORE LIMS to reduce data transcription errors and reduce the item spent entering data into the LIMS.

222-S Counting Room - For FY 1995 four laboratory systems will be given the capability to electronically transmit analysis data to LABCORE LIMS. This link will reduce transcription errors and improve turnaround time for sample analysis by reducing the time spent entering data into the LIMS. Depending on the system the interface will require a modification of the either the existing systems or use the ACE spreadsheet program to provide the scientist the ability to download data to their personal computer, select the sample and quality control data to be reported, transmit it to the LABCORE LIMS, and print a summary report for the scientist.

222-S TWRS 180 Day Report - The TWRS 180 day report is the final data report issued by LABCORE LIMS for the TWRS program. This report only covers the data stored within LIMS and does not include data records such as instrument print-outs and traveler cards.

Milestones:

222-S Laboratory:

Complete renovation for ICPMS/AA installation, Sample Preparation and Sample Receiving rooms in the 222-S Facility (09/30/95)

Complete renovation of Rooms 4C, 4H, and 4J in the 222-S Facility (09/30/96)

LIMS:

Quarterly LIMS Development Activity report (09/30/95 / 09/30/96)

Complete LIMS Development Activity (FY 1995)

222-S TCD SEF Deliverable (12/29/94)

222-S LABCORE LIMS Test completion (09/30/95)

222-S Hotcell Integration Test completion (05/30/95)

222-S Counting Room laboratory systems completion (05/01/95)

222-S TWRS 180 Day Report (01/31/95)

Continued implementation of LABCORE features and functionality in support of TWRS (09/30/96)

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Program Element Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	D. R. Bratzel <i>P. Segall for</i>	9-26-94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/27/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	D. R. Bratzel <i>P. Segall for</i>	9-26-94
Cost Account Manager	R. P. Marshall Jr.	
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/27/94

FDS Number

1N4D4B

**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.1. Manage Tank Waste 1.1.1.2.04 Characterization 1.1.1.2.04.04 Analytical Operations	2. DATE PREPARED September 15, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.04.04.12/VI	5. WBS ELEMENT TITLE 325 Laboratory Upgrades - PNL							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1130-0-OD							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.1.2 Characterize Waste	1. BUDGET AND REPORTING NUMBER(S) <table border="0"> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW310074</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW310074		
Expense	Capital	Line Item						
EW310074								

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	2,735.0	2,523.5	
CENRTC			
GPP			
LINE ITEM			
TOTAL	2,735.0	2,523.5	

B. TECHNICAL BASES

Goals & objectives:

The goals are to provide upgrades to existing 325 Laboratory facilities to meet the analytical capabilities and capacities for the analysis of Hanford Site samples obtained as part of Tank Waste Remediation activities.

The objective is to complete renovations for 325 Laboratory to comply with TWRS Characterization needs.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

Transmittal from 325 Laboratory to the Characterization Program, of a letter report which documents completion of the Hot Cell upgrades by 09/30/95 and 09/30/96.

Transmittal from 325 Laboratory to the TWRS Characterization program, of a letter report which documents completion of the Laboratory upgrades by 09/30/95 and 09/30/96.

Transmittal from Analytical Chemistry Laboratory to the TWRS Characterization Program Office to DOE-RL, a letter report documenting the completion of the DNFSB Commitment 5.2, "Cleanout and Refurbishing of "A-Cell" by 05/01/95.

Transmittal from Analytical Chemistry Laboratory to the TWRS Characterization Program Office, a letter report documenting the completion of the cleanout and refurbishing of "B-Cell" by 05/01/96.

C. STATEMENT OF WORK

Required activities:

This activity covers three types of upgrades: the renovation of existing laboratories to convert from nuclear fuels analysis and reactor support labs to contemporary chemistry labs that support current Hanford mission areas; the acquisition of chemical analysis instrumentation that brings new analytical capabilities to the labs and that replaces outdated equipment with state-of-the-art, more automated equipment which has greatly enhanced sample throughput capacities; and the renovation of the two 325 Building hot cell complexes to increase the sample processing capabilities and capacities of these cell areas.

The 325 Laboratory funding will be via Financial Plan transfer.

These laboratory renovations are co-funded by ADS 1130 and ADS 7100 through FY 1996. The 325 Laboratory upgrades will be fully funded through ADS 7100 in FY 1997.

Hot Cell Upgrades:

Completion of installation of new shielded ICP - A new instrument which will be devoted to the analysis of Hanford tank waste samples is being procured, with delivery in Mid FY 1994. The siting of this instrument, including the provision of utility services, will be completed on 09/30/95.

Program Management - This covers all aspects of program management for the hot cell related and laboratory upgrade activities.

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Renovation of Shielded Analytical Laboratory Operating and Rear Galleries - This workscope will include reconfiguration of the front operating gallery and a complete reconfiguration of the rear operating gallery to be completed by 09/30/95.

Completion of Cleanout and Refurbishing of the High Level Radiochemistry Facility (HLRF) "A-Cell" - The new cell equipment will be installed in preparation for takeover of the cell by TWRs Programmatic activities by 05/01/95.

Cleanout and Refurbishing of "B-Cell" - The design, relocation of the extrusion/analysis equipment and removal of the in-cell equipment will be completed by 09/30/95 and the B-Cell decontamination and installation of new equipment will be completed on 05/01/96.

325 laboratory Upgrades:

Completion of the Radiochemical Analysis Laboratory Upgrades - The focus of the development of this lab is on achieving dramatic improvements in analytical productivity within the building space available through the design of this lab space around specific chemistry function on 09/30/96.

Completion of the Inorganic Analysis Laboratory upgrades - These laboratories will be utilized for the siting of additional analytical instrumentation and gloveboxes for processing TRU-contaminated samples. This will involve the laboratory renovations for rooms 404, 406, and 416 by 09/30/96.

Complete Standards Laboratory Expansion - This area is required for the storage and inventorying of additional standard materials used in support of Hanford characterization efforts to be completed by 09/30/96.

Milestones:

Completion of DNFSB Commitment 5.2, Cleanout and Refurbishing of "A-Cell" by 05/01/95

Completion of shielded Analytical Laboratory gallery renovations by 09/30/95

Completion of shielded ICP installation by 09/30/95

Completion of Cleanout and Refurbishing of "A-Cell" by 05/01/95

Completion of DNFSB Commitment 5.2, Cleanout and Refurbishing of HLRF "B-Cell and
HLRF "A-Complex by 09/30/96

Completion of the Radiochemical Analysis Laboratory Upgrades by 09/30/96

Completion of the Inorganic Analysis Laboratory Upgrades by 09/30/96

Complete Standards Laboratory Expansion by 09/30/96

Completion of the Laboratory Upgrades by 09/30/96

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Program Element Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	D. R. Bratzel <i>P. Segall for</i>	9-26-94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/27/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	D. R. Bratzel <i>P. Segall for</i>	9-26-94
Cost Account Manager	W. Weimer <i>W. Weimer per fax</i>	9/27/94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/27/94

FDS Number

1N4D4C

**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.04 Characterization 1.1.1.2.04.04 Analytical Integration	2. DATE PREPARED September 15, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.04.13/VI	5. WBS ELEMENT TITLE Off-Site Repackaging and Shipping							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1130-0-OD							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.1.2 Characterize Waste	12. BUDGET AND REPORTING NUMBER(S) <table border="0"> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3120074</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3120074		
Expense	Capital	Line Item						
EW3120074								

13. ELEMENT DESCRIPTION**A. COST CONTENT (Escalated Dollars)**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	427.6	616.8	
CENRTC			
GPP			
LINE ITEM			
TOTAL	427.6	616.8	

B. TECHNICAL BASES

Goals & objectives:

The goal and objective for this cost account includes the offsite repackaging and shipping of waste tank samples performed by the 222-S and 325 Laboratories to the Idaho National Engineering Laboratory to support the TWRS Characterization Program.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS): N/A

C. STATEMENT OF WORK

Required activities:

This activity includes the repackaging of samples at the 222-S and 325 laboratories for shipment to the INEL Laboratory for subsequent analysis. Repackaging and shipment of waste tank samples is required since waste tank core samples cannot be directly shipped to INEL.

Milestones:

Repackage and ship an equivalent of 12 AEUs in FY 1995 and 20 AEUS in FY 1996.

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Program Element Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	D. R. Bratzel <i>P Segall for</i>	9-26-94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/27/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	D. R. Bratzel <i>P Segall for</i>	9-26-94
Cost Account Manager	C. Stroup <i>Curtis Stroup</i>	9/27/94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/27/94

FDS Number

1N4D4D

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.04 Characterization 1.1.1.2.04.04 Analytical Integration	2. DATE PREPARED September 15, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.04.04.14/VI	5. WBS ELEMENT TITLE Organic Analytical Support - ORNL							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1130-0-OD							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.12 Characterize Waste	12. BUDGET AND REPORTING NUMBER(S) <table border="0"> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3120074</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3120074		
Expense	Capital	Line Item						
EW3120074								

13. ELEMENT DESCRIPTION**A. COST CONTENT (Escalated Dollars)**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	500.0		
CENRTC			
GPP			
LINE ITEM			
TOTAL	500.0		

B. TECHNICAL BASES

Goals & objectives:

Resolution of tank vapor issues will require development of a vapor characterization methodology. The strategy is to employ a phased approach to resolving the technical problems associated with tank vapor characterization.

The overall goal of waste tank vapor characterization activities has been broken down into logically distinct phases, with the tasks and goals of each phase being in part determined by the success and results of previous phases. Phases 1 and 2 are analytical, scientific, and/or engineering development phases. Phases 3 and 4 are tank characterization phases.

Characterization of the waste tank vapors is a key element of the Vapor Program's strategy to resolve the health and safety issues associated with noxious vapors in the tank farms. Once the adequacy of selected characterization methods has been established, these methods will be applied to study the remaining 35 suspect waste tanks at the Hanford Site. This effort has been divided into Phases 3 (FY 1994) and 4 (FY 1995).

One of the goals of Phase 3 will be to characterize, to an appropriate extent, the noxious vapors in 16 suspect waste tanks. In Phase 3, the Vapor Program will advance both its technical and procedural bases, with the goal of converting what is now an arduous and novel sampling process into an established and routine procedure.

Characterization of vapors in the remaining 28 suspect waste tanks will be performed in Phase 4 (FY 1995). though each waste tank has unique features, the tank-by-tank vapor characterization should not involve major developmental efforts in Phase 4. Exhaustive characterization is not a goal in and of itself, and the extent to which sampling and analysis must be performed in any given tank to meet Vapor Program objectives cannot be determined *a priori*. It is anticipated that many waste tanks will have little or no vapors of concern, and that this can be ascertained from relatively inexpensive preliminary sampling.

Samples collected will be sent to an external national laboratory (ORNL) qualified in the selected sorbent tube sample collection and analytical method. A sufficient number of samples, as dictated by the sample and analysis plan, will be taken by sorbent methods and analyzed to allow estimation of precision on a statistical basis.

Specifically, ORNL will provide sorbent tube sampling media to WHC Field Analytical Services to collect vapor samples from Hanford tanks. These sorbent traps are typically small, pencil-sized stainless steel or glass tubes packed with a collection (sorbent) medium. A pump is used to pull an air sample through the tube, and specific analytes in the are adsorbed by the sorbent packing. The sample is then taken to a laboratory for desorption of the analytes and subsequent analysis by a gas chromatograph with a mass spectrometer detector (GC/MS), or by a gas chromatograph with a flame ionization detector (GC/FID). The term "multi-sorbent tube" refers to a sorbent tube specifically designed with more than one kind of sorbent to collect a wider range of chemical compounds.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

11/30/95	TPA 1N2H810A	Complete Vapor Headspace Characterization of All Ferrocyanide Watch List Tanks (M-40-03)
11/30/95	TPA 1N2H810A	Complete Vapor Headspace Characterization of All Organic Watch List Tanks (M-40-08)
6/30/95	TPA 1N2H810A	Sample and Characterize All Remaining Suspect Tanks (SI-2o)

C. STATEMENT OF WORK

Introduction

ORNL is tasked by WHC to support the characterization of USTs at the Hanford Site, through the analysis of headspace vapors collected on solid sorbent traps. Major tasks in this effort include project management, analysis of sorbent traps, quality assurance implementation, and conduct of specialty studies. Individual tasks are described in detail below.

1. PROJECT MANAGEMENT

ORNL will provide project management to include development of work statements, task descriptions, and provision of reports related to the determination of target and non-target species in the tank headspace vapors. ORNL staff will ensure compliance with the WHC Quality Assurance plan, and see that the project is staffed in a manner to provide timely results to WHC. ORNL staff will participate in the Tank Vapor Conference committee. A key aspect of the project management function is to ensure the high technical quality of the program and associated data. ORNL will provide monthly financial and technical progress status reports to WHC personnel. In addition, ORNL staff will inform WHC Program Management of any unusual findings regarding identification of unknown or unsuspected species in the tank headspaces within two working days of confirmation of species identity.

DeliverablesDue

Monthly financial and technical status reports to WHC

Second Thursday after the last Sunday of the month

Notification of unusual findings

Within two working days of confirmation

2. ANALYSIS OF TANK HEADSPACE ORGANICS

ORNL will be responsible for the characterization of volatile and semi-volatile organics in the headspace of sampled tanks through the analyses of multi-sorbent traps retrieved from the Vapor Sampling System or from in-situ sampling. ORNL will be responsible for trap fabrication, conditioning, and pre-shipment spiking with surrogate standards as appropriate, to meet WHC and/or ORNL needs. ORNL will ship the multi-sorbent traps to WHC with sample custody sheets. Traps will be logged in upon return to ORNL, and spiked with target analytes for recovery studies if needed as directed by the WHC Program Officer. Multi-sorbent traps will be subjected to gas chromatographic/mass spectrometric analysis, or other techniques, as appropriate. Analyses will be conducted according to the WHC Quality Assurance Plan. ORNL will archive unused or split samples for a period of time not to exceed nine months, to be specified by the WHC Program Officer. Multi-sorbent traps will be reconditioned and reused, if their condition warrants. ORNL will develop and maintain an electronic database for tracking the history of each sorbent trap used for the tank analyses. ORNL will compile analytical data and issue an initial letter report to the WHC Program Officer regarding levels of the target analytes within fifteen (15) working days (three weeks) of the receipt of a set of multi-sorbent traps from a given tank. A final report, including notation of tentatively identified compounds, will be issued within thirty (30) working days (six weeks) of trap receipt for a given tank.

DeliverablesDue

Electronic database for tracking sorbent trap status

December 15, 1994

Letter report containing target analyte levels

Fifteen working days following receipt of traps

Final report containing target analytes and tentatively identified compounds

Thirty working days following receipt of traps

3. ENHANCED QUALITY ASSURANCE IMPLEMENTATION

In FY 1995, it will be a requirement that all contractors for WHC be in compliance with the WHC QA requirements. ORNL will undertake those activities required to extend QA operation to ensure compliance. These will include, but are not limited to, documentation of all pertinent analytical methods, including control/decision points, training of personnel as to QA practices where appropriate, and determination of pre-analytical holding times for multi-sorbent traps routinely used. Standard compounds used in these studies will be documented and tracked. Standardized, updated procedures for trap fabrication and reconditioning will be established. All Standard Operating Procedures related to this project shall be updated, and reviewed on an annual basis to ensure congruence with actual practice. Use of surrogate standards as a process control system will be formalized, and the level of loss which constitutes unacceptable recovery will be established.

DeliverableDue

Letter report to Program Officer indicating full compliance

November 22, 1994

4. SPECIALTY STUDIES

There are likely to be unanticipated findings which arise as a result of the tank headspace characterization efforts. These findings could include unexpected chemical species which require detailed identification efforts prior to quantification, unexpected matrix effects which necessitate resolution, or species whose stability on conventional sampling media may be questionable. The purpose of this task is for ORNL to support the headspace characterization efforts through the conduct of studies, the exact nature of which cannot be specified at this time. In addition, core activities under this task will be conducted by ORNL to address issues identified during previous characterization efforts. These studies include, but are not limited to:

- Confident identification of unknown chemical species.
- Development and validation of new or modified analytical methods as required for new target species.
- Conduct pre-analytical holding time studies of selected target analytes on multi-sorbent traps.
- Support efforts to enhance in-situ vapor sampling of tank headspace, through consultation regarding sampling methodology and systems.

DeliverablesDue

Modified report on tank vapor components to include confident identification of tentatively identified species

Eight weeks following filing of original report

Report on completed 90-day pre-analytical holding time study of selected target analysis collected on triple sorbent traps.

March 31, 1995*

*Note: Milestone dates assume receipt of FY 1995 funding on October 1, 1994.

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	8-26-94
Program Element Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	D. R. Bratzel	
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/28/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	D. R. Bratzel	
Cost Account Manager	J. W. Osborne <i>J. W. Osborne</i>	9-28-94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/28/94

FDS Number

1N4D4G

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.04 Characterization 1.1.1.2.04.04 Analytical Integration	2. DATE PREPARED September 15, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.04.04.16/VI	5. WBS ELEMENT TITLE ORNL CENTRC PLAN ACTIVITY (Enhance Trap Lab)							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1130-0-OD							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.12 Characterize Waste	12. BUDGET AND REPORTING NUMBER(S) <table border="0"> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td></td> <td></td> <td>35EW31207</td> </tr> </table>		Expense	Capital	Line Item			35EW31207
Expense	Capital	Line Item						
		35EW31207						

13. ELEMENT DESCRIPTION**A. COST CONTENT (Escalated Dollars)**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING			
CENRTC	219.0		
GPP			
LINE ITEM			
TOTAL	219.0		

B. TECHNICAL BASES

Goals & objectives:

The development of validated analytical methods for the characterization of Hanford tanks was completed 6/30/95. The use of sorbent tube technology and GC/MS analysis was peer reviewed and approved by the Vapor Conference Committee. The aggressive WHC sampling schedule, the increased number of samples to ORNL, and the relative vulnerability of a single dedicated GC/MS instrument requires enhanced capability in the ORNL lab in order to successfully support the Vapor Program. Specifically, ORNL needs a backup GC/MS (with an instrument services contract) and additional automated equipment to ensure a 45-day turnaround of vapor analysis results.

The technical strategy is based on the following:

- A. A representative sample of the tank headspace will be taken in a manner that has been shown to effectively address any documented concerns and the DQOs for that tank (via sorbent tubes). Standard, accepted, ambient air analysis methodologies such as chemical class detectors (hydrocarbon, halogen, etc.), gas chromatography, mass spectrometry, ion chromatography or colorimetry will be employed to determine concentrations above one part per billion (volume). The analysis will specify by chemical the concentration detected and the confidence of that measurement. Historically-achieved performance can be substituted for non-standard gases. If the list of identified gases contains any analytes that are of concern to the program, e.g., toxicity, those concerns will be judged with respect to the data and a determination made as to the adequacy of the sampling and analysis or whether additional work needs to be done. This may require special studies and expanded laboratory equipment to perform such analysis. These special studies will be performed on the back-up instrument.
- B. The lack of an accepted procedure like EPA toxic organic analysis method, which has been validated for the chemicals of interest found in the headspace of the Hanford waste tanks, will require a limited "validation-like" regime that is acceptable to the analytical community. A procedure involving a standard addition spike has been recommended by the Vapor Conference Committee (VCC) for this application. A schematic of the validation process logic is given in Figure 4-3. This procedure is commonly used when repeated analysis is needed for a changing matrix. This validation work can be performed on the back-up instrument.

In the standard addition spike method, known amounts (spikes) of the analytes of interest are added to a real sample, and the analytical responses to these added amounts are compared to those expected. This validation method will be performed for all analytes of interest identified by a panel of toxicologists. A standard gas mixture of the chosen analytes will be prepared that is traceable to a known standard. This gas mixture will have analyte vapor concentrations three (3) to four (4) times greater than those expected in the tank sample. Analysis of this mixture will yield a response factor for each chemical in the standard. The standard mixture will be analyzed separately, and a response factor tabulated. The two response factors will be compared for significant deviations. Generation of spike and neat standards is based accomplished on automated equipment.

As a part of the validation strategy, the standard gas mixture, tank sample, and spiked sample will be analyzed periodically to determine any holding time effects. Conclusions from this study will then be incorporated into the analytical methodology. This approach to validation of the sampling and analytical methods will be required for each tank's unique chemical matrix. This "validation-like" effort is not an attempt to expand the list of analytes associated with the EPA protocols.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

11/30/95	TPA	1N2H810A	Complete Vapor Headspace Characterization of All Ferrocyanide Watch List Tanks (M-40-03)
11/30/95	TPA	1N2H810A	Complete Vapor Headspace Characterization of All Organic Watch List Tanks (M-40-08)
6/30/95	TPA	1N2H810A	Sample and Characterize All Remaining Suspect Tanks (SI-2o)

C. STATEMENT OF WORKIntroduction

ORNL is tasked by WHC to support the characterization of USTs at the Hanford Site, through the analysis of headspace vapors collected on solid sorbent traps. One of the major tasks in this effort is laboratory facilities upgrading to support the turnaround of trap analysis.

UPGRADE OF LABORATORY FACILITIES

ORNL will upgrade its laboratory facilities to enhance response to WHC needs in the area of tank headspace characterization. Upgrading will consist of equipment procurement and installation, upgrading of computer facilities to interface with the Tank Waste Information Network System (TWINS), improvement of analytical methods where required, and training of personnel. Specific upgrading tasks are specified below.

1. Equipment

- a. ORNL will install the GC/MS with infrared detector system ordered in FY 1994, and have the unit fully functional within six (6) weeks of initial installation by the manufacturer. This system will be the primary quantification system employed for headspace characterization.
- b. ORNL will procure a GC/MS system as a backup for that described above, and will also provide for more confident identification of unknown species. An order will be placed within six (6) weeks of receipt of funds from WHC.
- c. ORNL will procure and install an enhanced chromatography data station for electronic data acquisition and reporting of those analyses conducted by systems other than GC/MS. The data system shall be Windows-compatible, and capable of providing electronic copies of chromatograms suitable for direct introduction into standard reporting formats.
- d. ORNL will procure a gas chromatograph with a dual flame ionization and thermionic specific detectors (GC/FID/NPD), to replace an outdated system. The GC/FID/NPD will be used for the quantification of non-target nitrogen and phosphorus-containing species, as appropriate.
- e. ORNL will procure and install an automated thermal desorption unit for the unattended analysis of blank and QA traps.

2. Analytical Methods

As new analytical methods are developed in response to specific needs, ORNL will validate them as standard operating procedures, and document their utilization by producing Standard Analytical Methods (SAM). Copies of the SAMs will be provided to the WHC Program Manager in a timely fashion.

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3. Personnel Training

A minimum of two individuals will be trained and certified by ORNL as proficient for each new GC/MS system installed and utilized for analysis of WHC-supplied headspace samples. Formal training, if required, will be conducted at the manufacturer's training center within twelve (12) weeks of system installation by the manufacturer.

4. Computer System Upgrade

ORNL will procure a computerized server system capable of interfacing with the TWINS system. The system will be configured so that data produced by ORNL can be transferred electronically from individual workstations. Data developed for this project will be resident on the server within seven (7) weeks of receipt of samples for analysis from WHC. Specifications for the specific unit(s) to be procured will be developed in collaboration with personnel from Pacific Northwest Laboratory, as designated by the WHC Program Officer.

Deliverables

Due

Initiate equipment procurement process for GC/MS, automated thermal desorber, GC/FID/NPD, and chromatography data system

November 15, 1994*

Letter report to Program Officer on status of laboratory upgrade

January 31, 1995*

SOP for any new analytical methods filed with WHC Program Officer

Within ten (10) days of internal ORNL approval

Two operators trained and certified on both GC/MS systems procured for this project

Within twelve (12) weeks of manufacturer installation

Initiate procurement of server for linkage with TWINS

November 15, 1994*

Data transfer link with TWINS fully operational

March 31, 1995

*Note: Milestone dates assume receipt of FY 1995 funding on October 1, 1994.

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	C. Defigh-Price <i>C. Defigh-Price</i>	9-26-94
Activity Manager	D. R. Bratzel	
Cost Account Manager	J. W. Osborne <i>J. W. Osborne</i>	9-28-94
Project Control Analyst	C. M. Welch <i>C. M. Welch</i>	9/28/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	C. Defigh-Price <i>C. Defigh-Price</i>	9-26-94
Activity Manager	D. R. Bratzel	
Cost Account Manager	J. W. Osborne <i>J. W. Osborne</i>	9-28-94
Project Control Analyst	C. M. Welch <i>C. M. Welch</i>	9/28/94

FDS Number

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Tank Waste Remediation System Work Breakdown Structure Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.04 Characterization (M&O Contractor)	2. DATE PREPARED August 18, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.04.05/V	5. WBS ELEMENT TITLE Data Evaluation and Reporting							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8.EFFECTIVE REVISION DATE August 31, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1130-0-OE							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.1.2 Characterize Waste 4.2.1.2.2 Prepare Analysis Plans 4.2.1.2.1 Perform Data Quality Objective Activities 4.2.1.2.6 Manage Data	12. BUDGET AND REPORTING NUMBER <table style="width: 100%; border: none;"> <tr> <td style="width: 33%;">Expense</td> <td style="width: 33%;">Capital</td> <td style="width: 33%;">Line Item</td> </tr> <tr> <td colspan="3">EW3120074</td> </tr> </table>		Expense	Capital	Line Item	EW3120074		
Expense	Capital	Line Item						
EW3120074								

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)	FY 1998 \$(000)	FY 1999 \$(000)	FY 2000 \$(000)	FY 2001 \$(000)
OPERATING	9,107.2	10,482.5	8,133.0				
CENRTC							
GPP							
LINE ITEM							
TOTAL	9,107.2	10,482.5	8,133.0				

B. TECHNICAL BASES

Goals and objectives:

- Establishing Data Quality Objectives (DQOs), evaluating historical and analytical data and TWRS Tank Waste Characterization Planning
- Gathering, consolidating and evaluating historical characterization data to enhance the understanding of the Hanford waste tank contents.
- Statistical data analysis of tank waste sample analysis and issuance of Tank Waste Characterization Reports (TCRs) based on DQO provided by Hanford Waste Tank Characterization, Treatment and Disposal Programs.
- TWRS Tank Waste Characterization planning will serve as the primary interface between the TWRS program elements and Hanford Analytical Services (HAS) to define the characterization specific needs of TWRS.

Major end-item deliverables:

- Tri Party Agreement Milestone (M-44) "Issue Tank Characterization Reports in Accordance with the Approved Tank Characterization Plans. Complete Input of Characterization Information for HLW Tanks to Electronic Database(s)"
- Defense Nuclear Facility Safety Board (DNFSB) commitment "Identify Bounding Tanks for Disposal"
- Defense Nuclear Facility Safety Board (DNFSB) commitment "Develop Statistical Tools Necessary to Support Decisions Relative to the Amount of Samples Needed"
- Defense Nuclear Facility Safety Board (DNFSB) commitment "Historical Tank Content Estimate Reports for the Northwest and Southeast Quadrants"

Acceptance criteria: N/A

C. STATEMENT OF WORK

Required activities over lifetime:

- Support to TWRS Data Quality Objectives (DQO) guidance document for application in the Characterization Program, implementation of the process for the major issues with prioritized emphasis on tank safety
- Development of statistical decision simulation models to help define the relationships between decision quality and data quality which will drive acceptable tolerance for error in the data acquired by the characterization program
- The DQO process will identify what questions/decisions must be made to resolve programmatic issues, identify the potential answers/alternatives to those questions/decisions, and identify measure that can be taken to choose a particular answer or alternative
- The DQO will also define a decision rule and associated error tolerance and will provide the

technical basis for the characterization program

- Development of Historical Tank Content Estimate Reports. These content estimates will be based upon quantitative transaction analysis, layering models, nominal waste type compositions, and historical sample data. Includes involvement of multi-contractor team to develop tank layering models, nominal waste type compositions, and final reports presenting estimates of the contents of all 177 waste tanks
- Identification of bounding tanks to provide samples for specific issues, based on historical information about tank contents and DQOs identifying limiting criteria driving decision. The identification of bounding tanks will allow the characterization program to develop the most cost effective sampling and analysis strategies.
- Development of Tank Characterization Reports (TCRs). TCRs will be generated and issued for public release. TCRs will integrate historical knowledge concerning the fill history and waste type present in DSTs and SSTs with analytical results data and statistical data analysis of samples from the current and on-going characterization effort. Maintenance of key reference documents that support the development of the Tank Characterization Reports and updating existing reports as new data is generated
- Manual data entry of existing core sample data packages, manual data entry of historical data, and electronic data loading of new analytical data
- Continuing the effort to collect relevant characterization data from various site sources, assessing the quality of that information, and consolidating that information in a central location
- Development of enhancements to the Tank Characterization Database (TCD) as approved by the TCD Configuration Control Board (CCB)

Interfaces:

#	From This WBS To	Item Provided
1	TWRS	Tank Characterization Reports (TCRs)
2	TWRS	Historical Tank Content Estimate Reports
3	TWRS	Data Quality Objective (DQO) Guidance
	To This WBS From	
1	WHC & PNL laboratories	Validated Data Packages
2	1.1.1.2.04.01	Tank Characterization Plan (TCP)
3	1.1.1.2.04.01	Tank Waste Analysis Plan (TWAP)

Technologies to be assessed: N/A

Options to be considered: N/A

D. OTHER LEGAL DRIVERS AND ORDER REQUIREMENTS

- *Hanford Federal Facility Agreement and Consent Order*, Fourth Amendment, January 1994
- DOE/RL 94-0001, Recommendation 93-5 Implementation Plan, January 1994

**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.04 Characterization 1.1.1.2.04.05 Data Evaluation & Reporting	2. DATE PREPARED September 15, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.04.05.01/VI	5. WBS ELEMENT TITLE Activity Program Management							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER\ 1130-0-OE							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.1.2 Characterize Waste	12. BUDGET AND REPORTING NUMBER(S) <table border="0"> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3120074</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3120074		
Expense	Capital	Line Item						
EW3120074								

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	123.3	127.6	131.4
CENRTC			
GPP			
LINE ITEM			
TOTAL	123.3	127.6	131.4

B. TECHNICAL BASES

Goals & objectives:

Coordinate and oversee all data evaluation work to ensure proper use of resources, timely completion of commitments and quality products.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS): N/A

C. STATEMENT OF WORK

Required activities:

Coordinate and oversee all data evaluation work to ensure proper use of resources, timely completion of commitments and quality products. Facilitate communication among activities. Transmit deliverables to proper organization.

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Program Element Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	S. J. Eberlein <i>S. J. Eberlein</i>	9-26-94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/27/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	S. J. Eberlein <i>S. J. Eberlein</i>	9-26-94
Cost Account Manager	S. J. Eberlein <i>S. J. Eberlein</i>	9-26-94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/27/94

FDS Number

1N4E51

**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.04 Characterization 1.1.1.2.04.05 Data Evaluation & Reporting	2. DATE PREPARED September 15, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.04.05.02/VI	5. WBS ELEMENT TITLE Data Definition Planning							
6 WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1130-0-OE							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.1.2 Characterize Waste	12. BUDGET AND REPORTING NUMBER(S) <table border="0"> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3120074</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3120074		
Expense	Capital	Line Item						
EW3120074								

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	192.6	252.2	197.1
CENRTC			
GPP			
LINE ITEM			
TOTAL	192.6	252.2	197.1

B. TECHNICAL BASES

Goals & objectives:

Establish Data Quality Objectives (DQOs), evaluating historical and analytical data and TWRS Tank Waste Characterization Planning. Develop the tank characterization technical basis and strategy. Identify bounding tanks, tank grouping strategies and means for integrating historical and analytic data.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

Defense Nuclear Facility Safety Board (DNFSB) commitment 1.19 "Develop Statistical Tools Necessary to Support Decision Relative to the Amount of Samples Needed".

Defense Nuclear Facility Safety Board (DNFSB) commitment 1.23 "Identify Bounding Tanks for Disposal".

Provide historical model verification DQO.

Develop Characterization strategy and technical basis.

C. STATEMENT OF WORK

Required activities:

Determine the requirements for characterization as defined by other TWRS programs and support the definition of a characterization strategy to meet those requirements. Provide documentation of the Characterization Program technical basis, including the necessary analysis of existing data packages and historical data. Support other programs in the development of Data Quality Objectives (DQO) defining their needs. Provide statistical support during the development of DQOs and training to DQO teams as needed. Review and update the DQO Strategy and Guidance documents to ensure that they continue to address the needs of the TWRS DQO program. Integrate work with PNL statistical support (WBS 1.1.1.2.4.05.08) and LANL historical work (WBS 1.1.2.4.05.03) to support development of tank grouping and bounding tank concepts.

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Program Element Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	S. J. Eberlein <i>S. J. Eberlein</i>	9-26-94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/27/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	S. J. Eberlein <i>S. J. Eberlein</i>	9-26-94
Cost Account Manager	S. J. Eberlein <i>S. J. Eberlein</i>	9-26-94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/27/94

FDS Number
<u>1N4E52</u>

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.04 Characterization 1.1.1.2.04.05 Data Evaluation & Reporting	2. DATE PREPARED September 15, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.04.05.03/VI	5. WBS ELEMENT TITLE Historical Data Development - LANL							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1130-0-OE							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.1.2 Characterize Waste	12. BUDGET AND REPORTING NUMBER(S) <table> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3120074</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3120074		
Expense	Capital	Line Item						
EW3120074								

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	1,800.0	1,905.5	212.2
CENRTC			
GPP			
LINE ITEM			
TOTAL	1,800.0	1,905.5	212.2

B. TECHNICAL BASES

Goals & objectives:

Gather, consolidate and evaluate historical characterization data to enhance the understanding of the Hanford waste tank contents.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

Waste Transaction Records Summaries, Tank Layering Model and Inventory Estimates for the Northwest and Southeast Quadrants".

Qualitative and Quantitative tank laydown models.

C. STATEMENT OF WORK

Required activities:

Provide quantitative transaction analysis, layering models, nominal waste type compositions, and integrate historical sample data to develop Historical Tank Content Estimate Reports. Work with WHC task in WBS 1.1.1.4.05.09 to integrate these inputs into final reports presenting estimates of the contents of all 177 waste tanks.

Note* The full scope of work presented in the Milestone Description Sheets requires a revised outyear cost estimate of \$1,700K in 1996 and \$600K in 1997.

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Program Element Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	S. J. Eberlein <i>S. J. Eberlein</i>	9-26-94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/27/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	S. J. Eberlein <i>S. J. Eberlein</i>	9-26-94
Cost Account Manager	S. Agnew	
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/27/94

FDS Number

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.04 Characterization 1.1.1.2.04.05 Data Evaluation & Reporting	2. DATE PREPARED September 15, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.04.05.04/VI	5. WBS ELEMENT TITLE Tank Characterization Reports							
6. WBS INDEX LINE NO Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1130-0-OE							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.1.2 Characterize Waste	12. BUDGET AND REPORTING NUMBER(S) <table border="0"> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3120074</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3120074		
Expense	Capital	Line Item						
EW3120074								

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	1,673.9	2,905.5	3,539.5
CENTRC			
GPP			
LINE ITEM			
TOTAL	1,673.9	2,905.5	3,539.5

B. TECHNICAL BASES

Goals & objectives:

Perfor, statistical data analysis of tank waste sample analysis and issue Tank Waste Characterization Reports (TCRs) based on DQO provided by Hanford Waste Tank Characterization, Treatment and Disposal Programs.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

Tri Party Agreement Milestone (M-44-08 through M-44-12) "Issue Tank Characterization Reports in Accordance with the Approved Tank Characterization Plans. Complete Input of Characterization Information for HLW Tanks to Electronic Database (s)".

C. STATEMENT OF WORK

Required activities:

Develop of Tank Characterization Reports (TCRs). TCRs will be generated and issued for public release. TCRs will integrate historical knowledge concerning the fill history and waste type present in DSTs and SSTs with analytical results data and statistical data characterization effort. Maintain key reference documents that support the development of the Tank Characterization Reports and updating existing reports as new data is generated (WHC, PNL, LATA).

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Program Element Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	S. J. Eberlein <i>S. J. Eberlein</i>	9-26-94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/27/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	S. J. Eberlein <i>S. J. Eberlein</i>	9-26-94
Cost Account Manager	^{FOR} C. S. Haller <i>Jedd Brown</i>	9/27/94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/27/94

FDS Number

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.04 Characterization 1.1.1.2.04.05 Data Evaluation & Reporting	2. DATE PREPARED September 15, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.04.05.05/VI	5. WBS ELEMENT TITLE Data Dissemination							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1130-0-OE							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.1.2 Characterize Waste	12. BUDGET AND REPORTING NUMBER(S) <table> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3120074</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3120074		
Expense	Capital	Line Item						
EW3120074								

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	630.9	449.8	474.9
CENRTC			
GPP			
LINE ITEM			
TOTAL	630.9	449.8	474.9

B. TECHNICAL BASES

Goals & objectives:

Integrate historical data, analytic data packages and Tank Characterization Reports into a common, readily accessible electronic database to support all programs and users. Improve management of characterization data to ensure accessibility and document readability. Prepare and distribute catalogs of available characterization data.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

Tri Party Agreement Milestone (M-44-08 through M-44-12) "Issue Tank Characterization Reports in Accordance with the Approved Tank Characterization Plans. Complete Input of Characterization Information for HLW Tanks to Electronic Database(s)".

C. STATEMENT OF WORK

Required activities:

Manual data entry of existing core sample data packages, manual data entry of historical data, and electronic data loading of new analytical data (WHC-PNL).

Continuing the effort to collect relevant characterization data from various site sources assessing the quality of that information, and consolidating that information in a central location (WHC, PNL, ICF-KEH)

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Program Element Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	S. J. Eberlein <i>S. J. Eberlein</i>	9-26-94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/27/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	S. J. Eberlein <i>S. J. Eberlein</i>	9-26-94
Cost Account Manager	^{FOR} C. S. Haller <i>John Brown</i>	9/27/94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/27/94

FDS Number

1N4E55

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.04 Characterization 1.1.1.2.04.05 Data Evaluation & Reporting	2. DATE PREPARED September 15, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.04.05.06/VI	5. WBS ELEMENT TITLE Data Access Improvements - PNL							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1130-0-OE							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.1.2 Characterize Waste	12. BUDGET AND REPORTING NUMBER(S) <table> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3120074</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3120074		
Expense	Capital	Line Item						
EW3120074								

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	957.0	748.9	721.5
CENTRC			
GPP			
LINE ITEM			
TOTAL	957.0	748.9	721.5

B. TECHNICAL BASES

Goals & objectives:

Improve accessibility of historical data, analytic data packages and Tank Characterization Reports in electronic or other databases to support all programs and end users.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

Supports Tri Party Agreement Milestone (M-44) "Issue Tank Characterization Reports in Accordance with the Approved Tank Characterization Plans. Complete Input of Characterization Information for HLW Tanks to Electronic Database(s)".

Provide enhanced data access and analysis capability by releasing and supporting upgraded Tank Characterization Database.

C. STATEMENT OF WORK

Required activities:

Perform user requirements survey to determine needs for improved Tank Characterization Database (TCD) capability. Develop enhancement to the TCD as approved by the TCD configuration Control Board (CCB)/(WHC-PNL).

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Program Element Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	S. J. Eberlein <i>S. J. Eberlein</i>	9-26-94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/27/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	S. J. Eberlein <i>S. J. Eberlein</i>	9-26-94
Cost Account Manager	S. Bobrowski <i>S. J. Eberlein</i> <i>signed per revision.</i>	9-27-94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/27/94

FDS Number

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.04 Characterization 1.1.1.2.04.05 Data Evaluation & Reporting	2. DATE PREPARED September 15, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.04.05.07/VI	5. WBS ELEMENT TITLE Tank Characterization Planning							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1130-0-OE							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.1.2 Characterize Waste	12. BUDGET AND REPORTING NUMBER(S) <table border="0"> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3120074</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3120074		
Expense	Capital	Line Item						
EW3120074								

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	1,158.9	1,504.3	1,549.6
CENRTC			
GPP			
LINE ITEM			
TOTAL	1,158.9	1,504.3	1,549.6

B. TECHNICAL BASES

Goals & objectives:

Prepare the Tank Waste Analysis Plan (TWAP) annual update to describe sampling and analysis activities for the following year. Prepare Tank Characterization Plans (TCPs) for each tank sampling and analysis event.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

Tri Party Agreement Milestone (M-44-01) "Submit a Draft Copy of the TWRS Tank Waste Analysis Plans (TWAP) and Tank Characterization Plans (TCP) revisions, updates and additions annually to Ecology".

Tri Party Agreement Milestone (M-44-02) "Submit TWAP Annually to Ecology and EPA for Approval".

C. STATEMENT OF WORK

Required activities:

Prepare and issue draft and final annual updated to the TWAP to describe sampling and analysis activities projected for the following year, and integrated TWRS programmatic requirements for the tank waste analytic data. The TWAP will describe the TCPs and TCRs projected for the following year. Prepare and issue tank characterization plans to support all tank sampling and analysis events, based on the sampling schedule. Each TCP will integrated technical requirements from Data Quality Objectives and specify required tank sampling and Analytical Services activities. The TWAP and TCPs will be developed by a DQO process. The DQO process will involve Ecology, EPA and USDOE.

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Program Element Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	S. J. Eberlein <i>S. J. Eberlein</i>	9-26-94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/27/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	S. J. Eberlein <i>S. J. Eberlein</i>	9-26-94
Cost Account Manager	^{for} C. S. Haller <i>Jodd Brown</i>	9/27/94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/27/94

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.04 Characterization 1.1.1.2.04.05 Data Evaluation & Reporting	2. DATE PREPARED September 15, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.04.05.08/VI	5. WBS ELEMENT TITLE Data Definition Support - PNL							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1130-0-OE							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.1.2 Characterize Waste	12. BUDGET AND REPORTING NUMBER(S) <table> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3120074</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3120074		
Expense	Capital	Line Item						
EW3120074								

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	580.0	798.3	822.3
CENRTC			
GPP			
LINE ITEM			
TOTAL	580.0	798.3	822.3

B. TECHNICAL BASES

Goals & objectives:

Provide statistical tools and support for definition of technical basis, evaluating and integrating historical and analytic results and providing tank grouping and bounding tank determinations.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

Report on tank grouping analysis.

Report on integration of historical and analytic data.

C. STATEMENT OF WORK

Required activities:

Provide statistical support during the development of DQOs and training to DQO teams as needed. Support the TWRS Data Quality Objectives (DQO) guidance document for application in the Characterization Program, implementation of the process for the major issues with prioritized emphasis on tank safety. Develop statistical decision simulation models to help define the relationships between decision quality and data quality which will drive acceptable tolerance for error in the data acquired by the characterization program. Work with LANL in WBS 1.1.1.2.4.05.03 to address tank grouping and integration of historical and analytic data.

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Program Element Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	S. J. Eberlein <i>S. J. Eberlein</i>	9-27-94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/27/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	S. J. Eberlein <i>S. J. Eberlein</i>	9-27-94
Cost Account Manager	P. Mellinger <i>Signed per telefax P. Mellinger</i>	9-27-94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/27/94

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.04 Characterization 1.1.1.2.04.05 Data Evaluation & Reporting	2. DATE PREPARED September 15, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.04.05.09/VI	5. WBS ELEMENT TITLE Historical Data Development							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1130-0-OE							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS* DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.1.2 Characterize Waste	12. BUDGET AND REPORTING NUMBER(S) <table> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3120074</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3120074		
Expense	Capital	Line Item						
EW3120074								

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997. \$(000)
OPERATING	1,990.8	1,790.5	484.6
CENRTC			
GPP			
LINE ITEM			
TOTAL	1,990.8	1,790.5	484.6

B. TECHNICAL BASES

Goals & objectives:

Gather, consolidate and evaluate historical characterization data to enhance the understanding of the Hanford waste tank contents.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

Defense Nuclear Facility Safety Board (DNFSB) commitment 1.18 "Historical Tank Content Estimate Reports for the Northwest and Southeast Quadrants".

Supporting documents for the HTCEs.

C. STATEMENT OF WORK

Required activities:

Develop Historical Tank Content Estimate Reports. These content estimates will be based upon quantitative transaction analysis, layering models, nominal waste type compositions, and historical sample data. Work with LANL task in WBS 1.1.1.4.05.03 to develop tank layer models, nominal waste type compositions. Integrate these inputs into final reports presenting estimates of the contents of all 177 waste tanks (LANL, ICF-KEH, LATA, WHC).

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Program Element Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	S. J. Eberlein <i>S. J. Eberlein</i>	9-26-94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/27/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager	C. DeFigh-Price <i>C. DeFigh-Price</i>	9-26-94
Activity Manager	S. J. Eberlein <i>S. J. Eberlein</i>	9-26-94
Cost Account Manager	^{for} C. S. Haller <i>John Brown</i>	9/27/94
Program Business Representative	C. M. Welch <i>C. M. Welch</i>	9/27/94

FDS Number

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Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste (M&O Contractor)	2. DATE PREPARED September 16, 1994	3. IDENTIFICATION NUMBER DE-ACC06-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.05/IV	5. WBS ELEMENT TITLE Waste Retrieval	
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1210	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER / TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60-REV.1) 4.2.1.3 Retrieve Waste	12. BUDGET AND REPORTING NUMBER Expense Capital Line Item EW3130010	

13. ELEMENT DESCRIPTION

A. COST CONTENT

Total cost of Waste Retrieval is \$5,445,158,000.

B. TECHNICAL BASES

The Waste Retrieval Program Element is responsible for retrieving waste from Underground Storage Tanks (USTs) to the degree required for tank closure. To this end, activities are necessary to mobilize and remove waste from the USTs and enable transport of the waste to various facilities for storage, treatment, or disposal; conduct all activities necessary to develop and demonstrate methodologies to retrieve the waste; and retrieve the waste contained in double-shell tanks (DSTs), single-shell tanks (SSTs), and the designated miscellaneous underground storage tanks (MUSTs).

The strategy for UST waste retrieval is to implement the best demonstrated available technology in a time frame that supports overall TWRS mission objectives, and minimizes additional waste retrieval operations during the closure process. The retrieval operations will be initiated with known, proven technologies in order to support rapid closure of tank safety issues and statutory commitments. Additional technology will be developed and deployed as available to meet the TWRS mission requirements.

The key risks associated with Waste Retrieval are (1) adequate storage to support negotiated Tri-Party Agreement retrieval schedule - flow sheet development; (2) acceptable leakage during retrieval - performance assessment or TWRS EIS; and (3) capability to provide infrastructure and resources for simultaneous retrieval from multiple tank farms.

1.1.1.2.05

A6-1

Goals and objectives:

1. Mobilize and remove waste from the Underground Storage Tanks (USTs) and enable transport of the waste to various facilities for storage, treatment, or disposal. Included is the
 - Design, installation, and operation of the equipment required to remove waste from the USTs.
 - Related upgrades and/or replacement of the tank farm infrastructure and local transfer lines not provided by the Tank Farm Upgrades program element (WBS 1.1.1.2.03) when required to support retrieval.
2. Conduct all activities necessary to develop and demonstrate methodologies to retrieve the waste; and retrieve the waste contained in double-shell tanks (DSTs), single-shell tanks (SSTs), and the designated miscellaneous underground storage tanks (MUSTs) in compliance with tank closure requirements.
3. Priority is given to resolution of tank safety issues.

This work element is part of the Level III WBS element, Manage Tank Waste, and comprises the following Level V WBS elements:

- Technical Integration and Planning (WBS 1.1.1.2.05.01)
- Technical Development and Applied Engineering (WBS 1.1.1.2.05.02)
- Facility Operations (WBS 1.1.1.2.05.03)
- Systems Definition (WBS 1.1.1.2.05.04)
- W-151 101-AZ Retrieval (WBS 1.1.1.2.05.05)
- W-211 Initial Retrieval System (WBS 1.1.1.2.05.06)
- Final DST Retrieval System (WBS 1.1.1.2.05.07)
- Pilot Scale Retrieval System (WBS 1.1.1.2.05.08)
- W-320 106-C Sluicing (WBS 1.1.1.2.05.09)
- SST Training and Test Facility (WBS 1.1.1.2.05.10)
- W-340 Long Reach Arm (WBS 1.1.1.2.05.11)
- SST Closure Demonstration (WBS 1.1.1.2.05.12)
- SST Closure (WBS 1.1.1.2.05.13)
- Miscellaneous Underground Storage Tank Retrieval Systems (WBS 1.1.1.2.05.14)

Major end-item deliverables:

The end-item deliverable for this WBS Element is the following Tri-Party Agreement Major Milestone:

- M-45-00 Complete Closure of all SST Farms

Supporting deliverables includes the following Tri-Party Agreement Interim Milestones:

- M-45-01 Develop SST Retrieval Technology
- M-45-02 Submit Annual Updates to SST Retrieval Sequence Document
- M-45-03A Initiate Sluicing Retrieval of C-106
- M-45-03 Initiate Final Retrieval Demonstration of C-106
- M-45-04 Provide Initial SST Retrieval Systems
- M-45-05 Retrieve Waste from all remaining SST
- M-45-06 Complete Closure of all SST Farms
- M-45-07 Complete Evaluations and Demonstration Testing of small scale Sub-Surface Barriers

Additional supporting deliverables include the follow HQ Safety Initiatives:

- SI 5g Accelerate Demonstration of Sub-Surface Barriers Technologies
- SI 6 Accelerate Retrieval of High Heat Tank 106-C

Acceptance criteria:

- Resolve Watch List Tank safety issues through retrieval actions
- Waste Retrieval Systems operated to achieve the established treatment and waste disposal goals
- Performance measurement of work achieved is accurately reported
- Turnover all retrieval facilities to ER for closure
- Regulatory and DOE Orders that require compliance in the design and operation of waste retrieval systems

C. STATEMENT OF WORK

Required activities over lifetime:

The Waste Retrieval program element will accomplish the necessary UST retrieval technology development and demonstration; engineering for the tank waste retrieval program; process tests; and design, procurement, construction, installation, startup, and operation of tank equipment and facilities during waste retrieval operation.

The following activities are to be performed by Waste Retrieval.

1.1.1.2.05.01, Technical Integration and Planning

- Provide integration of waste retrieval activities, including:
 - Program element management
 - Program planning (Multi-Year Work Plan, Activity Data Sheets)
 - Tank Waste Remediation System (TWRS) Baseline implementation, establish projects justifications to install retrieval systems in DSTs, SSTs, and MUSTs
- Provide the retrieval program related systems and process engineering in support of the TWRS Program; develop retrieval program-specific functions and requirements and related architecture; establish the technical requirements for the DST, SST, and MUST retrieval activities; initiate design requirements for retrieval projects; perform trade studies and required analyses to resolve tank retrieval options for remediation of tank safety issues, permanent disposal, and tank closure; and establish retrieval process requirements (e.g., establish a waste retrieval tank sequence schedule that accommodates all TWRS objectives) and program integration.

1.1.1.2.05.02, Technical Development and Applied Engineering

- Establish the design basis for tank waste retrieval projects by performing the technical development and applied engineering required for design and implement waste retrieval systems (e.g., mixer pump design for DSTs, SST retrieval equipment development and demonstration, sluicing and arm-based waste retrieval systems enhancements and alternatives; and tank closure).
- Integrate all aspects of technology development within the retrieval projects (e.g., EM-50 and Industry).

WHC-SP-1101

- Evaluate and demonstrate technologies to minimize the environmental impact due to waste tank remediation and underground waste leak mitigation, (e.g., subsurface barriers and leak detection instrumentation).

1.1.1.2.05.03, Facility Operations

- Operate the retrieval systems to transfer waste to provide tank storage volume and supply waste to treatment and disposal facilities.

1.1.1.2.05.04, Systems Definition

- Perform project definition tasks for DSTs, SSTs, and MUSTs, including:
 - Establishment of design requirements
 - Criteria development
 - Formal engineering studies
 - NEPA and safety documentation
 - Conceptual designs.
- Interchange concepts and information with other TWRS program elements to support closure of safety issues, obtain necessary waste characterization data, and define upgrades necessary for retrieval activities.
- Prepare tank closure plans, for waste tank closure.

1.1.1.2.05.05, W-151 101-AZ Retrieval

- Demonstrate mixer pump operation and sludge mobilization of neutralized current acid waste in tank 101-AZ.
 - Develop equipment and procedures for removal of tank internal components.
 - Obtain test data on tank parameters during mixer pump operations.

1.1.1.2.05.06, W-211 Initial Retrieval System

- Provide retrieval systems for the first 10 DSTs after tank 241-AZ-101.
 - Support resolution of tank safety issues.
 - Provide tank waste feed for ultimate disposal as low-level or high-level waste.

1.1.1.2.05.07, Final DST Retrieval System

- Provide retrieval systems for the DSTs not included in WBS elements 1.1.1.2.05.05 and 1.1.1.2.05.06.
 - Provide feed and interim storage for ultimate disposal as low-level or high-level waste.
 - Retire retrieval facilities and turn over to ER for closure.

1.1.1.2.05.08, Pilot Scale Retrieval System

- Provide equipment to retrieve testing quantities of tank waste suitable for pilot-scale pretreatment process development tests and for treatment (high-level and low-level waste) waste form qualification.

1.1.1.2.05.09, W-320 106-C Sluicing

- Provide facilities and equipment to retrieve waste from tank 241-C-106 employing sluicing for remediation of the SST high-heat safety issue.

1.1.1.2.05.10, SST Training and Test Facility

- Provide for training of retrieval operations and maintenance staff and implementation of testing capability of SST retrieval systems.

1.1.1.2.05.11, W-340 Long Reach Arm

- Provide a long reach arm waste retrieval system as a demonstration of an alternate retrieval system. This demonstration is necessary to support Tri-Party Agreement to evaluate an alternate retrieval system. Current efforts are to implement this alternate to retrieve waste that can not be removed by sluicing in tank 241-C-106.

1.1.1.2.05.12, SST Closure Demonstration

- Perform design, procurement, construction, and startup of retrieval systems and supporting systems to meet Tri-Party Agreement milestone M-45-04, "Initial SST Retrieval Systems".
 - Retire retrieval facilities and turn over to Environmental Restoration (ER) for closure.

1.1.1.2.05.13, SST Closure

- Provide facilities and equipment to retrieve wastes from SSTs not included in WBS element 1.1.1.2.05.12.
 - Retire retrieval facilities and turn over to ER for closure.

1.1.1.2.05.14, Miscellaneous Underground Storage Tank Retrieval Systems

- Provide facilities and equipment to retrieve wastes from MUSTs.
 - Retire retrieval facilities and turn over to ER for closure.

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Interfaces:

#	From This WBS To	Item Provided
1	All other TWRS program elements	This activity directly or indirectly supports all other TWRS program elements through retrieving tank waste as part of the actions necessary for the safe storage, treatment, and transfer of liquid waste in tank farms.
2	Tank Farm Operations & Maintenance 1.1.1.2.01	Retrieval systems to mitigate/resolve tank safety issues and retrieve tank waste.
3	Tank Farm Upgrades 1.1.1.2.03	Upgrade requirements to achieve retrieval of tank waste.
4	Characterization 1.1.1.2.04	Data Quality Objective documents; Data (on tank waste behavior); Reusable Materials for Characterization (developmental instruments for testing of tank waste properties).
5	Solid Waste Disposal	Manage Tank Waste (MTW) System Generated (SG) solid waste (contaminated equipment removed from tanks).
6	Enviromental Restotation Program (EM-40)	SST Closure Plan
	To This WBS From	Item Provided
1	Tank Farm Operations & Maintenance 1.1.1.2.01	Operation and maintenance of waste retrieval systems.
2	Waste Tank Safety 1.1.1.2.02	Mitigating and resolving tank safety issues to achieve remediation through retrieval.
3	1.1.1.2.03 Tank Farm Upgrades	Upgrades in tank farms in order to achieve retrieval actions.
4	Characterization 1.1.1.2.04	Characterization of all double- and single-shell tanks, and Miscellaneous Underground Storage Tanks for waste retrieval operations.
5	Enviromental Restoration Program (EM-40)	Input to SST Closure Plan relative to alternatives for tank closure, ancillary, equipment disposal, contaminated soil cleanup. Definition of waste retrieval criteria support closure, based on performance assessment of closed tank farms.

Technologies to be assessed:

- Develop and test enhanced and alternate waste retrieval systems
 - SST sluicing retrieval systems
 - DST mixer pump performance
 - Assess/develop MUST waste retrieval technologies
- Evaluate and demonstrate alternative waste retrieval technologies and systems
 - SST arm retrieval systems
 - SST mixer pump systems
- Evaluate and test SST leak detection methods deployed during retrieval operations
 - Evaluate and demonstrate subsurface barriers
 - Evaluate and demonstrate leak detection instrumentation.

Options to be considered:

- Alternate waste retrieval systems
 - Arm-based SST and DST waste retrieval systems
 - Closure requirements options (From EM-40)

D. OTHER LEGAL DRIVERS AND ORDER REQUIREMENTS

Tank Waste Remediation System Functions and Requirements, DOE/RL-92-60 Rev. 1, dated March 1994: Section 2.0 Tank Waste Remediation System Function and Requirement Descriptions, Table F4.2.1 Retrieve Waste, Item V Function Requirements, Paragraphs A and B; and Section 3, Tank Waste Remediation System Architecture, Table A4.2.1.3 Waste Retrieval System Item VIII Requirements Satisfied, Paragraphs B and C.

**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.05 Waste Retrieval (M&O Contractor)	2. DATE PREPARED August 28, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.05.01/V	5. WBS ELEMENT TITLE Technical Integration and Planning	
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1210-0-0A	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOED/RL-92-60 REV.1) 4.2.1.1 Store Waste 4.2.1.2 Characterize Waste 4.2.1.3 Retrieve Waste 4.2.1.4 Transfer Waste 4.2.2.1 Pretreat Waste 4.2.3.1 Immobilize & Dispose LLW 4.2.3.2 Disposition Gaseous Effluents 4.2.3.4 Disposition Solid Waste	12. BUDGET AND REPORTING NUMBER Expense Capital Line Item EW3130010	

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)	FY 1998 \$(000)	FY 1999 \$(000)	FY 2000 \$(000)	FY 2001 \$(000)
OPERATING	4,411	4,081	3,950				
CENRTC	320	320	320				
GPP							
LINE ITEM							
TOTAL	4,731	4,401	4,270				

B. TECHNICAL BASES

Goals and objectives:

- Provide the management and planning for the Waste Retrieval Program, which includes:
 - Providing program direction
 - Baseline planning development
 - Monitoring and control of baseline plans
 - Tracking of schedules and budgets
 - Coordination and overseeing development and tracking of Five-Year Plan efforts
 - Quality Assurance for the program
 - Integration of waste retrieval activities within the Tank Waste Remediation System and with programs external to the TWRS Program (this includes Public Involvement).
- Provide the retrieval program-related systems and process engineering in support of the TWRS Program
 - Develop retrieval program-specific functions and requirements and technical requirements; initiate design requirements for retrieval projects; perform trade studies and required analyses to resolve tank retrieval options for remediation of tank safety issues, permanent disposal, and tank closure; and establish retrieval process requirements (e.g., establish a waste retrieval tank sequence schedule that accommodates all TWRS objectives) and program integration.

Major end-item deliverables:

Establish planning and requirements to resolve Watch List tank safety issues through retrieval actions to complete M-45-00; "Complete Closure of all Single-Shell Tank Farms"

Acceptance criteria:

Achieving and maintaining regulatory and DOE Order compliance in the design and operation of waste retrieval systems.

C. STATEMENT OF WORK

Required activities over lifetime:

- Provide near-term and long-term planning and program coordination for waste retrieval (PNL/WHC);
 - Schedule tracking and assessment of the Fiscal Year Work Plans, Multi-Year Program Plans, and Activity Data Sheets for budget submittal and baseline schedule coordination.
 - Enact, monitor, and control baseline program plans, integrated planning for DST, SST, and MUST retrieval.
- Establish waste retrieval functions and requirements, technical requirements, trade studies and required analyses on waste retrieval options; initiate design requirements and architecture of projects to retrieve tank wastes, process requirements (e.g., tank retrieval sequence); and evaluate options for tank closure. (WHC)

Interfaces:

#	From This WBS To	Item Provided
1	All other TWRS program elements	This activity directly supports the planning and functional requirements of all other TWRS program elements through establishing the strategy, baseline planning, and process to retrieve tank waste as part of the actions necessary for the safe storage, treatment, and transfer of liquid waste in tank farms through the system engineering process.
	To This WBS From	
1	1.1.1.2.02 Waste Tank Safety	Planning and functional breakdown for integration of mitigating and resolving tank safety issues through retrieval.
2	1.1.1.2.04 Characterization	Identifying and providing direction for characterization of all double- and single-shell tanks for waste retrieval operations.
3	1.1.1.2.03 Tank Farm Upgrades	Providing requirements for upgrades in tank farms in order to achieve retrieval actions.

Technologies to be assessed:

Establish the functional requirements and trade studies for technologies to be assessed.

Options to be considered:

Alternate Waste Retrieval Systems

D. OTHER LEGAL DRIVERS AND ORDER REQUIREMENTS

Reference "Tank Waste Remediation System Functions and Requirements", DOE/RL-92-60 Rev. 1, dated March 1994: Section 2.0 Tank Waste Remediation System Function and Requirement Descriptions, Table F4.2.1 Retrieve Waste, Item V Function Requirements, Paragraphs A and B; and Section 3 Tank Waste Remediation System Architecture, Table A4.2.1.3 Waste Retrieval System Item VIII Requirements Satisfied, Paragraphs B and C.

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste (M&O Contracotr) 1.1.1.2.05 Waste Retrieval 1.1.1.2.05.01 Technical Integration & Planning	2. DATE PREPARED August 28, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.05.01.01/VI	5. WBS ELEMENT TITLE Program Element Management							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1210-0-OA							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.1.3	12. BUDGET AND REPORTING NUMBER(S) <table border="0"> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3130010</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3130010		
Expense	Capital	Line Item						
EW3130010								

13. ELEMENT DESCRIPTION**A. COST CONTENT (Escalated Dollars)**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	3,420	3,440	3,437
CENRTC	320	320	320
GPP			
LINE ITEM			
TOTAL	3,740	3,760	3,757

B. TECHNICAL BASES

Goals & objectives:

Goal is to provide management and planning base for the Waste Retrieval. Objectives include baseline planning development, monitoring and control of baseline plans, tracking of schedules and budgets, coordination and overseeing development, integration of Waste Retrieval activities within TWRS, and Quality Assurance for the program element.

(R00100) Define, Plan & Integrate WR Program

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

1. Issue annual budget requests
2. Issue & maintain program strategic plan

C. STATEMENT OF WORK

Required activities:

Program Element Management
Retrieval Engineering Management
Updates to the Retrieval Strategy Plan
Performance Reporting
Technical Coordination & Program Direction
ADS/MYWP Submittals

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager		
Program Element Manager		
Activity Manager		
Program Business Representative		

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager		
Activity Manager		
Cost Account Manager		
Program Business Representative		

FDS Number _____

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste (M&O Contractor) 1.1.1.2.05 Waste Retrieval 1.1.1.2.05.01 Technical Integration & Planning	2. DATE PREPARED August 28, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.05.01.02/VI	5. WBS ELEMENT TITLE Retrieval System Engineering							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1210-0-OA							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.1.3	12. BUDGET AND REPORTING NUMBER(S) <table border="0"> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3130010</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3130010		
Expense	Capital	Line Item						
EW3130010								

13. ELEMENT DESCRIPTION**A. COST CONTENT (Escalated Dollars)**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	991	641	513
CENRTC			
GPP			
LINE ITEM			
TOTAL	991	641	513

B. TECHNICAL BASES

Goals & objectives:

Goal is to provide system engineering for the Retrieval Program in accordance with the TWRS System Engineering Management Plan. Objectives include applying the system engineering fundamental elements; Mission Analysis, Functions & Requirements Analysis and Allocations, Alternative Solution Development, Trade Study/Decision Analysis, and Risk Management to the technical requirements level. Also included is the programmatic and technical integration of Retrieval with the TWRS process engineering and flow sheet; SST Retrieval Sequence document.

(R00100) Define, Plan & Integrate WR Program

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

1. Submit initial SST Retrieval Sequence document (M-45-02A)
2. Submit annual update of SST Retrieval Sequence (45-02B-V)
3. Issue maintain waste retrieval technical requirements baseline document
4. Issue retrieval program trade studies/decision analyses and risk assessment

C. STATEMENT OF WORK

Required activities:

Retrieval technical requirements baseline document
Mission Analyses,
Functions & Requirements Analysis and Allocations,
Alternative Solution Development,
Trade Study/Decision Analysis, and
Retrieval Program Risk Assessment

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager		
Program Element Manager		
Activity Manager		
Program Business Representative		

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager		
Activity Manager		
Cost Account Manager		
Program Business Representative		

FDS Number

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.05 Waste Retrieval (M&O Contractor)	2. DATE PREPARED September 16, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.05.02/V	5. WBS ELEMENT TITLE Technical Development and Applied Engineering							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1210-0-0B							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV.1) 4.2.1.1 Store Waste 4.2.1.2 Characterize Waste 4.2.1.3 Retrieve Waste 4.2.1.4 Transfer Waste 4.2.2.1 Pretreat Waste 4.2.3.1 Immobilize & Dispose LLW 4.2.3.2 Disposition Gaseous Effluents 4.2.3.4 Disposition Solid Waste	12. BUDGET AND REPORTING NUMBER <table> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3130010</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3130010		
Expense	Capital	Line Item						
EW3130010								

13. ELEMENT DESCRIPTION**A. COST CONTENT (Escalated dollars)**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)	FY 1998 \$(000)	FY 1999 \$(000)	FY 2000 \$(000)	FY 2001 \$(000)
OPERATING	8,471	19,756	6,911				
CENRTC	184	185	154				
GPP							
LINE ITEM							
TOTAL	8,655	19,941	7,065				

B. TECHNICAL BASES

Goals and objectives:

- Provide the technology development and applied engineering required to implement tank waste retrieval.
- Identify waste characterization data requirements; review waste characterization data, general laboratory testing, bench-scale testing, equipment development (SST retrieval equipment development and demonstration; sluicing and arm-based waste retrieval systems enhancements and alternatives); computer modeling; technology integration with the retrieval projects; establish initial design basis; resolve design and concept development issues; integrate the technology with the retrieval projects.
- Evaluate the capability of subsurface barriers as a method to minimize the environmental impact due to waste tank remediation and underground waste leak mitigation and leak detection instrumentation.

Major end-item deliverables:

- Establish technologies and requirements to retrieve waste from all USTs
- Complete M-45-00; "Complete Closure of all Single-shell Tank Farms"

Acceptance criteria:

Achieving and maintaining regulatory and DOE Order compliance in the design and operation of waste retrieval systems.

C. STATEMENT OF WORK

Required activities over lifetime:

- Provide retrieval technologies development and engineering that includes:
 - Identification and specification of characterization data requirements
 - Development of simulated waste
 - Analytical investigations
 - Scale tests to determine retrieval performance requirements for mobilization, condition the waste for transport, and mixing uniformity
 - Engineering development of retrieval waste recovery systems
 - Demonstration of waste retrieval system(s) required to support retrieval systems deployment
 - Development and demonstration supporting systems required for retrieval options
 - Establishment of the feasibility of subsurface barriers, and if required,
 - Preparation of procurement specifications and procurement for vendor design and installation of the preferred sub-surface barrier options in a controlled test site at Hanford
 - Laboratory or bench-scale prototype equipment development for quantifying the volume of residual waste

Interfaces:

#	From This WBS To	Item Provided
1	All other TWRS program elements	This activity directly or indirectly supports all other TWRS program elements through developing and demonstrating technologies for retrieving tank waste as part of the actions necessary for the safe storage, treatment, and transfer of liquid waste in tank farms.
	To This WBS From	
1	1.1.1.2.02 Waste Tank Safety	Evaluating mitigating and resolving tank safety issues to achieve remediation through retrieval.
2	1.1.1.2.04 Characterization	Characterization requirements of all double- and single-shell tanks and miscellaneous underground storage tanks for waste retrieval operations.
3	1.1.1.2.03 Tank Farm Upgrades	Identifying upgrades in tank farms to achieve retrieval actions.

Technologies to be assessed:

- Develop and test enhanced alternate waste retrieval systems
 - SST sluicing retrieval systems
 - DST mixer pump performance
 - Assess/develop MUST waste retrieval technologies
- Evaluate and demonstrate alternative waste retrieval technologies and systems
 - SST arm retrieval systems
 - SST mixer pump systems
- Evaluate and test SST leak detection methods deployed during retrieval operations
- Evaluate and demonstrate subsurface barriers

Options to be considered:

- Alternate waste retrieval systems
 - Arm-based SST and DST waste retrieval systems
 - Closure requirements options

D. OTHER LEGAL DRIVERS AND ORDER REQUIREMENTS

Reference "Tank Waste Remediation System Functions and Requirements", DOE/RL-92-60 Rev. 1, dated March 1994: Section 2.0 Tank Waste Remediation System Function and Requirement Descriptions, Table F4.2.1 Retrieve Waste, Item V Function Requirements, Paragraphs A and B; and Section 3 Tank Waste Remediation System Architecture, Table A4.2.1.3 Waste Retrieval System Item VIII Requirements Satisfied, Paragraphs B and C.

1.1.1.2.05.02

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Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste (M&O Contractor) 1.1.1.2.05 Waste Retrieval 1.1.1.2.05.02 Technical Development & Applied Engineering	2. DATE PREPARED August 30, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.05.02.01/VI	5. WBS ELEMENT TITLE Double Shell Tanks							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1210-0-OB							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1)	12. BUDGET AND REPORTING NUMBER(S) <table style="width: 100%; border: none;"> <tr> <td style="text-align: left;">Expense</td> <td style="text-align: left;">Capital</td> <td style="text-align: left;">Line Item</td> </tr> <tr> <td style="text-align: left;">EW3130010</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3130010		
Expense	Capital	Line Item						
EW3130010								

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	3,889	3,002	1,932
CENRTC	184	185	154
GPP			
LINE ITEM			
TOTAL	4,073	3,187	2,086

B. TECHNICAL BASES

Goals & objectives:

Develop fundamental relationships between waste properties and physical performance parameters of waste retrieval equipment/processes. Identify physical parameters which characterize performance requirements for

1.1.1.2.05.02.01

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waste retrieval equipment and processes. Develop simulants which match the selected physical and/or chemical properties selected to characterize the performance of retrieval equipment/processes.

(R00110) Define WR Characterization Needs/Dev Simulants

Define test program to demonstrate mixer pump performance, including ability to mobilize waste in DSTs and ability to maintain a uniform waste slurry mixture after the waste is mobilized. Develop analytical models to provide basis for predicting performance of waste retrieval equipment for various types of waste. Predict retrieval performance using the analytical models. Provide appropriate scale test facilities to demonstrate retrieval equipment performance including the ability to meet waste transport requirements. Identify and/or develop instrumentation systems necessary to monitor and control the retrieval operation. Perform tests and analyze test data generated by this activity. Based on the results of the test program, define additional test requirements, and complete those tests. Provide data to develop and/or verify designs of DST waste retrieval projects as well as information to support start-up and operation of waste retrieval systems.

(R00111) Test/Analyze Mixer Pump Performance

Define requirements for retrieval of high shear strength DST sludges. Identify candidate systems to retrieve the high shear strength sludges, as well as candidate systems to improve the performance, cost, or operational efficiency over existing mixer pump based systems. Perform engineering trade studies to compare alternatives. Utilize results of test program and retrieval performance for actual waste to assess the need for alternate system development. Define, develop, and procure improved mixer pump designs as a cooperative activity based on utilizing the operating and design experience at Savannah River site. Define instrumentation systems which will permit the control of the retrieval equipment and process parameters, and which will be consistent with measurements of physical properties and performance made in the characterization program, and in the simulant testing program. Develop alternate systems as required and define a test program to verify alternate systems designs. Provide data to support design of DST retrieval projects.

(R00112) Develop/Test Enhanced and Alternate DST Retrieval Systems

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

1. Issue document to link the characterization needs w/ simulant development activity
2. Issue characterization document which identifies characterization need to support Ret.
3. Determine number & types of simulant properties within the required range
4. Procure simulants & verify simulant properties are within the required range
5. Develop instr. necessary to measure/verify simulant properties & correlate with
1. Issue test plan for mixer pump mobilization testing
2. Complete mixer pump mobilization test per test plan
3. Issue test plan for mix. pump uniformity, aerosol, & other test. identified to support retrieval program needs
4. Complete testing per test plan
5. Construct 1/4 scale test facility & prepare for test program
6. Define & perform other technology demonstration testing necessary to support retrieval system needs.
7. Provide design verification data for Project W-151, Phase 1
8. Provide design verification data for Project W-211, Phase 1
9. Provide design input data for Project W-211, Phase 2
10. Provide design input data for final DST retrieval systems project.

C. STATEMENT OF WORK

Required activities: N/ATechnologies to be assessed: N/AOptions to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager		
Program Element Manager		
Activity Manager		
Program Business Representative		

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager		
Activity Manager		
Cost Account Manager		
Program Business Representative		

FDS Number _____

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.2.05 Waste Retrieval (M&O Contractor) 1.1.1.2.05.02 Technical Development & Applied Engineering	2. DATE PREPARED August 30, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.05.02.02/VI	5. WBS ELEMENT TITLE Single Shell Tanks	
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1210-0-OB	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1)	12. BUDGET AND REPORTING NUMBER(S) EW3130010	

13. ELEMENT DESCRIPTION**A. COST CONTENT (Escalated Dollars)**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	1,756	3,548	2,656
CENRTC			
GPP			
LINE ITEM			
TOTAL	1,756	3,548	2,656

B. TECHNICAL BASESGoals & objectives:

Develop & evaluate feasibility of arm based retrieval technologies. The scope includes; deployment systems, control systems, sensor systems, evaluation of software modeling packages. Development results will be

1.1.1.2.05.02.02

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incorporated into W-340 project.

(R00200) Develop 1st Generation Arm Based Systems (EM-50)

Identify, and evaluate alternate retrieval systems to challenge the reference approaches for the recovery of wastes from the SST's. The program will establish a competitive development of system concepts through an industry fly off concept/development versus concepts established by on-site engineering, versus concepts from other DOE labs and universities. A strong emphasis will be placed upon developing systems capable of tackling specific or logical subsets of tanks. Complete initial development efforts to down-select to the most promising candidates as potential candidates for the initial SST retrieval systems.

(R00201) Evaluate Alternate SST Technology

Identify, develop, and evaluate end effectors and conveyance systems applicable to the retrieval of wastes from C-106 using an arm-based retrieval system. The scope includes sludge and hard pan mobilization end effectors and waste conveyance systems. The development tests focus specifically on developing parametric data and investigation of performance phenomena.

(R00210) Develop SST WR End Effectors (EM-50)

Develop the selected alternate retrieval systems that have the potential to be significantly better and/or cost effective when compared to reference approaches for SST Retrieval. Development will include testing at vendor or government sites to select candidates for demonstration testing. This activity will also include the evaluation of promising new retrieval concepts that may be identified following the initial evaluation of alternatives.

(R00211) Develop Alternate SST WR Technologies

Identify, develop, and evaluate enhancements to the reference SST retrieval systems to proceed with the recovery of wastes from SSTs that present greater challenges than C-106. In particular, arm based retrieval systems will require expanded capabilities to address tanks with saltcake and in-tank hardware. The need for sluicing enhancements will be evaluated to improve sluicing retrieval performance, reduce cost, and reduce tank leakage potential during sluicing operations.

(R00212) Develop Enhanced SST WR Technologies

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

1. Complete specification input to the W-340 project
 2. Complete evaluation criteria for W-340 procurement
 3. Develop SST retrieval technology (M-45-01)
-
1. Establish RFQ for industry fly off concept/develop. procurement.
 2. Complete first evaluation of alternative concepts from industry, on-site & workshops.
-
1. Complete development studies & spec input for W-340
 2. Complete W-340 related evaluation criteria
 3. Develop SST retrieval technology (M-45-01)
-
1. Issue development test plan for alternate systems.
 2. Begin partial-scale testing of alternate systems.
 3. Complete partial-scale testing of alternate systems.

1. Define tanks to be recovered by arm-based retrieval.
2. Identify development focuses for EM-50 efforts.
3. Determine need for and areas requiring enhanced sluicing development.

C. STATEMENT OF WORK

Required activities: N/A

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager		
Program Element Manager		
Activity Manager		
Program Business Representative		

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager		
Activity Manager		
Cost Account Manager		
Program Business Representative		

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.05 Waste Retrieval 1.1.1.2.05.02 Technical Development & Applied Engineering	2. DATE PREPARED August 30, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.05.02.04/VI	5. WBS ELEMENT TITLE Leak Detection							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1210-0-OB							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1)	12. BUDGET AND REPORTING NUMBER(S) <table border="0"> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3130010</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3130010		
Expense	Capital	Line Item						
EW3130010								

13. ELEMENT DESCRIPTION

A. COST CONTENT

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	1,429	1,893	2,191
CENRTC			
GPP			
LINE ITEM			
TOTAL	1,429	1,893	2,191

B. TECHNICAL BASES

Goals & objectives:

This activity identifies the leak detection and monitoring system functions and requirements, evaluates the available technologies, and selects the most promising technologies for engineering development/testing. It will also test the selected technologies to confirm their ability to meet the requirements and to provide engineering

1.1.1.2.05.02.04

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data needed to evaluate and select a technology and find design for the leak detection and monitoring system.

(R00213) Evaluate and Test WR SST Leak Detection Methods

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

1. Issue letter report of available and emerging leak detection and monitoring system technologies.
2. Issue approved leak detection monitoring system F & R.
3. Issue decision analysis report (DAR) for initial testing.
4. Issue leak detection monitoring system test report.
5. Issue leak detection monitoring system analysis report (DAR) for initial deployment.
6. Initiate construction for initial SST leak detection monitoring system.
7. Issue enhanced leak detection monitoring system test report
8. Initiate construction deployment for enhanced SST leak detection monitoring system.

C. STATEMENT OF WORK

Required activities: N/A

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager		
Program Element Manager		
Activity Manager		
Program Business Representative		

COST ACCOUNT AUTHORIZATION		
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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.05 Waste Retrieval (M&O Contractor) 1.1.1.2.05.02 Technical Development & Applied Engineering	2. DATE PREPARED August 30, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.05.02.05/VI	5. WBS ELEMENT TITLE Barriers							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1210-0-OB							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1)	12. BUDGET AND REPORTING NUMBER(S) <table> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3130010</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3130010		
Expense	Capital	Line Item						
EW3130010								

13. ELEMENT DESCRIPTION**A. COST CONTENT (Escalated Dollars)**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	1,397	11,313	132
CENRTC			
GPP			
LINE ITEM			
TOTAL	1,397	11,313	132

B. TECHNICAL BASESGoals & objectives:

This activity provides the engineering evaluation of sub-surface barrier feasibility. The scope includes a systems engineering task, development of functions and requirements, development of performance criteria, performance

1.1.1.2.05.02.05

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risk analysis, regulatory assessment, permitting strategy, trade studies, and a decision analysis resulting in a final document supporting barrier evaluation and feasibility.

(R00300) Evaluate Feasibility of Barriers

Complete DOE and Washington State Department of Ecology review of the barrier feasibility assessment and reach a decision on whether or not to proceed with the barrier demonstration test.

(R00310) Prepare Decision - Proceed with Barrier Demo

This activity provides the design, development, procurement, site modification, construction, installation, and performance testing of small scale sub-surface barriers in order to demonstrate the performance of barriers as a leak confinement system for SSTs. The preparation of test plans, safety analysis, environmental permitting, construction inspection, quality assurance, training, test data analysis and documentation are also included in this work scope.

(R00311) D/C & Perform SST Barrier Feature Tests/Demo

Complete DOE and Washington State Department of Ecology review of the barrier demonstration test results and reach a decision on whether or not to proceed with implementation of sub-surface barriers under the SSTs.

(R00312) Prepare Decision on Proceeding with Barriers

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

1. Complete Performance Risk Analysis
2. Complete Evaluation of Sub-Surface Barrier Feasibility)
M-45-07A
1. Reach decision on whether to proceed with demonstration (M-45-07B)
1. Issue RFP for Sub-surface barrier technical proposals
2. Issue RFQ for Sub-surface barrier cost proposals
3. Establish Performance criteria and test specifications (M-45-07-T01)
4. Initiate demonstration testing of selected sub-surface barrier technologies (M-45-07-T02)
5. Complete evaluation of sub-surface barrier demonstration test results (M-45-07-T03)
6. Complete evaluation and demonstration testing of small scale sub-surface barriers (M-45-07)
1. Decision on whether to proceed with sub-surface barrier program (M-45-07-T04)
2. Establish new milestones for subsurface barrier implementation (M-45-07C)

C. STATEMENT OF WORK

Required activities: N/A

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager		
Program Element Manager		
Activity Manager		
Program Business Representative		

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager		
Activity Manager		
Cost Account Manager		
Program Business Representative		

FDS Number _____

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Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.05 Waste Retrieval (M&O Contractor)	2. DATE PREPARED September 16, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.05.03/V	5. WBS ELEMENT TITLE Facility Operations							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1210-0-0C							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOED/RL-92-60 REV.1) 4.2.1.1 Store Waste 4.2.1.2 Characterize Waste 4.2.1.3 Retrieve Waste 4.2.1.4 Transfer Waste 4.2.2.1 Pretreat Waste 4.2.3.1 Immobilize & Dispose LLW 4.2.3.2 Disposition Gaseous Effluents 4.2.3.4 Disposition Solid Waste	12. BUDGET AND REPORTING NUMBER <table style="width: 100%; border: none;"> <tr> <td style="text-align: left;">Expense</td> <td style="text-align: left;">Capital</td> <td style="text-align: left;">Line Item</td> </tr> <tr> <td colspan="3">EW3130010</td> </tr> </table>		Expense	Capital	Line Item	EW3130010		
Expense	Capital	Line Item						
EW3130010								

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)	FY 1998 \$(000)	FY 1999 \$(000)	FY 2000 \$(000)	FY 2001 \$(000)
OPERATING			1,175				
CENRTC							
GPP							
LINE ITEM							
TOTAL	0	0	1,175				

B. TECHNICAL BASES

Goals and objectives:

- Operate tank waste retrieval systems installed under the various retrieval system projects to perform the following:
 - Demonstrate retrieval systems
 - Retrieve tank wastes for resolution of tank safety issues
 - Provide feeds for disposal treatment
 - Prepare DSTs, SSTs, and MUSTs for transition to closure (includes removal of retrieval equipment and preparation of the Tank Farm Operable Units for transfer to the ERC for closure).
- Included is the operations of tank waste retrieval systems installed by projects W-151, W-211, 106-C Sluicing; 106-C Long Reach Arm Project; Tri-Party Agreement M-45-05, Tank Farm Closure Project; Tri-Party Agreement milestone M-45-06, SST Closure and the Final DST Retrieval System. Incremental tank farm operations support during the initial operation of the retrieval systems is required along with the monitoring and control the retrieval operations. Retrieval data collection and analysis of results will also be provided. Subsequent to retrieval tank operations (interim DST storage) and monitoring of the all the tank farms until closure will be a function of Tank Farm Operations.

Major end-item deliverables:

- Resolve Watch List tank safety issues through retrieval actions.
- Operate the Waste Retrieval Systems, achieving the established treatment and waste disposal goals.
- Complete M-45-00, "Complete Closure of all Single-shell Tank Farms."
- Turnover all retrieval facilities to ERC for closure.

Acceptance criteria:

Achieving and maintaining regulatory and DOE Order compliance in the operation of waste retrieval systems.

C. STATEMENT OF WORK

Required activities over lifetime:

The operation and maintenance of retrieval systems equipment, instrumentation, and facilities and the maintenance of supporting documentation such as the facility Safety Analysis Reports is provided. Encompassed is the disposition of equipment removed from the tanks. This equipment will be packaged for interim storage and eventual treatment for disposal. Included is the design of storage/transport containers, fixtures, etc.; the replacement retrieval systems for continued processing of wastes through the DST systems for treatment and disposal.

Interfaces:

#	From This WBS To	Item Provided
1	All other TWRS program elements	This activity directly supports other TWRS program elements through retrieving tank waste as part of the actions necessary for the safe storage, treatment, and transfer of liquid waste in tank farms.
	To This WBS From	
1	1.1.1.2.02 Waste Tank Safety	Through retrieval the mitigation and resolution of tank safety issues are achieved.
2	1.1.1.2.04 Characterization	Characterization of all double- and single-shell tanks, and Miscellaneous Underground Storage Tanks for waste retrieval operations.
3	1.1.1.2.03 Tank Farm Upgrades	Upgrades in tank farms in order to achieve retrieval actions.

Technologies to be assessed:

- Operability assessments to ensure that Waste Retrieval Systems meet operation requirements
- Evaluate and test SST leak detection methods deployed during retrieval operations

Options to be considered:

Closure Requirements

D. OTHER LEGAL DRIVERS AND ORDER REQUIREMENTS

Reference "Tank Waste Remediation System Functions and Requirements", DOE/RL-92-60 Rev. 1, dated March 1994: Section 2.0 Tank Waste Remediation System Function and Requirement Descriptions, Table F4.2.1 Retrieve Waste, Item V Function Requirements, Paragraphs A and B; and Section 3 Tank Waste Remediation System Architecture, Table A4.2.1.3 Waste Retrieval System Item VIII Requirements Satisfied, Paragraphs B and C.

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.05 Waste Retrieval (M&O Contractor) 1.1.1.2.05.03 Facility Operations	2. DATE PREPARED August 30, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.05.03.01/VI	5. WBS ELEMENT TITLE Double Shell Tanks							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1210-0-OC							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1)	12. BUDGET AND REPORTING NUMBER(S) <table> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3130010</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3130010		
Expense	Capital	Line Item						
EW3130010								

13. ELEMENT DESCRIPTION**A. COST CONTENT (Escalated Dollars)**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	0	0	1,144
CENRTC			
GPP			
LINE ITEM			
TOTAL	0	0	1,144

B. TECHNICAL BASESGoals & objectives:

Prepare the test plan for the retrieval process test in tank 101-AZ. Determine the test objectives in relation to retrieval program needs, and develop test procedures to achieve the test objectives. Train the personnel that will perform the tests. Perform the operational readiness reviews and other activities necessary to support the

1.1.1.2.05.03.01

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testing activity. Correlate the test results with the results from the analytical model development and simulant testing results (development demonstration testing) to validate these programs. Assess the test results to identify additional model development and/or simulant testing necessary to extrapolate results to retrieval of other waste types.

(R00115) Perform DST WR Process Test

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

1. Issue engineering assessment and test plan for the process test.
2. Perform training of personnel to perform test.
3. Perform ORR and other required preparations for testing activity.
4. Issue final test report, including assessment of correlation of test results with analytical predictions.
5. Identify additional model development and/or testing necessary to extrapolate results to retrieval of other waste types.

C. STATEMENT OF WORK

Required activities: N/A

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager		
Program Element Manager		
Activity Manager		
Program Business Representative		

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager		
Activity Manager		
Cost Account Manager		
Program Business Representative		

FDS Number _____

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.05 Waste Retrieval (M&O Contractor) 1.1.1.2.05.03 Facility Operations	2. DATE PREPARED August 30, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.05.03.02/VI	5. WBS ELEMENT TITLE Single Shell Tanks							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1210-0-OC							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1)	12. BUDGET AND REPORTING NUMBER(S) <table> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3130010</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3130010		
Expense	Capital	Line Item						
EW3130010								

13. ELEMENT DESCRIPTION**A. COST CONTENT (Escalated Dollars)**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	0	0	31
CENRTC			
GPP			
LINE ITEM			
TOTAL	0	0	31

B. TECHNICAL BASESGoals & objectives:

Perform operations necessary to sluice the high heat-generating sludge from Tank C-106. These operations are expected to resolve the high heat safety issue associated with this tank. Activities include preparing procedures and training operating personnel to perform the sluicing retrieval demonstration from Tank C-106, completing

1.1.1.2.05.03.02

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the operational readiness review, and performing operations and maintenance activities necessary to remove the high heat sludge from the tank. This activity also includes removal of the retrieval system and decontamination of the hardware once the waste retrieval operations are completed. Dispose of solid waste generated during retrieval operations and maintenance.

(R00223) Perform Sluicing WR Demo C-106

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

1. Complete operational readiness review.
2. Complete operating procedures.
3. Initiate sluicing retrieval of C-106 (M-45-03A)

C. STATEMENT OF WORK

Required activities: N/A

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager		
Program Element Manager		
Activity Manager		
Program Business Representative		

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager		
Activity Manager		
Cost Account Manager		
Program Business Representative		

FDS Number

Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.05 Waste Retrieval (M&O Contractor)	2. DATE PREPARED September 16, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.05.04/V	5. WBS ELEMENT TITLE Systems Definition							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1210-0-0D							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOED/RL-92-60 REV.1) 4.2.1.1 Store Waste 4.2.1.2 Characterize Waste 4.2.1.3 Retrieve Waste 4.2.1.4 Transfer Waste 4.2.2.1 Pretreat Waste 4.2.3.1 Immobilize & Dispose LLW 4.2.3.2 Disposition Gaseous Effluents 4.2.3.4 Disposition Solid Waste	12. BUDGET AND REPORTING NUMBER <table style="width: 100%; border: none;"> <tr> <td style="text-align: left;">Expense</td> <td style="text-align: left;">Capital</td> <td style="text-align: left;">Line Item</td> </tr> <tr> <td colspan="3">EW3130010</td> </tr> </table>		Expense	Capital	Line Item	EW3130010		
Expense	Capital	Line Item						
EW3130010								

13. ELEMENT DESCRIPTION**A. COST CONTENT (Escalated dollars)**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)	FY 1998 \$(000)	FY 1999 \$(000)	FY 2000 \$(000)	FY 2001 \$(000)
OPERATING	3,150	2,813	1,854				
CENRTC							
GPP							
LINE ITEM							
TOTAL	3,150	2,813	1,854				

B. TECHNICAL BASES

Goals and objectives:

- Establish the design requirements (project specific requirements) needed to define the SST, DST, and MUST waste retrieval projects. This includes the definition of the waste retrieval projects; engineering studies to establish project definitions and design criteria; conduct the necessary documentation for NEPA and regulatory compliance; and perform conceptual designs for waste retrieval projects. Such efforts are needed to define the DST, SST, and MUST retrieval projects needed to meet the Tri-Party Agreement and to implement tank waste retrieval options for remediation of tank safety issues, permanent disposal, and tank closure.
- Interchange concepts and information with other TWRS program elements to support closure of safety issues, obtain necessary waste characterization data, and define upgrades necessary to support retrieval.
- Prepare tank closure plans for waste tank closure.

Major end-item deliverables:

- Resolve Watch List tank safety issues through retrieval actions.
- Operate the Waste Retrieval Systems, achieving the established treatment and waste disposal goals.
- Complete M-45-00; "Complete Closure of all Single-shell Tank Farms."
- Turnover all retrieval facilities to ERC for closure.

Acceptance criteria:

Achieving and maintaining regulatory and DOE Order compliance in the design of waste retrieval systems.

C. STATEMENT OF WORK

Required activities over lifetime:

Providing the development, monitoring, and control of baseline project specific plans, integrated planning for DST, SST, and MUST retrieval (incorporating the TWRS process flowsheet), definition of waste retrieval project design requirements, identification of project technology development and demonstration needs, characterization requirements, project specific trade studies on DST, SST, and MUST waste retrieval options, and closure alternatives. (WHC/PNL)

Interfaces:

#	From This WBS To	Item Provided
1	All other TWRS program elements	This activity directly or indirectly supports all other TWRS program elements through establishing retrieving tank waste projects as part of the actions necessary for the safe storage, treatment, and transfer of liquid waste in tank farms.
	To This WBS From	
1	1.1.1.2.02 Waste Tank Safety	Provides engineering support (project definition and process requirements) to mitigate and resolve tank safety issues through retrieval.
2	1.1.1.2.04 Characterization	Characterization of all double- and single-shell tanks, and Miscellaneous Underground Storage Tanks are necessary to establish project definition for waste retrieval operations.
3	1.1.1.2.03 Tank Farm Upgrades	Information is provided to ensure upgrades in tank farms are in place to achieve retrieval actions.

Technologies to be assessed:

- Development and testing of enhanced alternate Waste Retrieval Systems
 - SST sluicing retrieval systems
 - DST mixer pump performance
 - Assess/develop MUST waste retrieval technologies
- Evaluation of alternative waste retrieval technologies and systems
 - SST arm retrieval systems
 - SST mixer pump systems
- SST leak detection methods deployed during retrieval operations

Options to be considered:

- Alternate waste retrieval systems
- Closure requirements

D. OTHER LEGAL DRIVERS AND ORDER REQUIREMENTS

Reference "Tank Waste Remediation System Functions and Requirements", DOE/RL-92-60 Rev. 1, dated March 1994: Section 2.0 Tank Waste Remediation System Function and Requirement Descriptions, Table F4.2.1 Retrieve Waste, Item V Function Requirements, Paragraphs A and B; and Section 3 Tank Waste Remediation System Architecture, Table A4.2.1.3 Waste Retrieval System Item VIII Requirements Satisfied, Paragraphs B and C.

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.05 Waste Retrieval (M&O Contractor) 1.1.1.2.05.04 System Definition1	2. DATE PREPARED August 30, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.05.04.01/VI	5. WBS ELEMENT TITLE Double Shell Tanks	
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1210-0-OD	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1)	12. BUDGET AND REPORTING NUMBER(S) Expense Capital Line Item EW3130010	

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	427	357	0
CENRTC			
GPP			
LINE ITEM			
TOTAL	427	357	0

B. TECHNICAL BASES

Goals & objectives:

Prepare engineering trade studies, assessments, project definition, and project level functions and requirements for initial DST retrieval systems designs and operation. Perform systems engineering assessments of needs and interfaces with other TWRS elements. Assess available technologies, and issue a trade study which provides the

1.1.1.2.05.04.01

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basis for the chosen technology. Prepare a test and evaluation plan which outlines the determination of needed testing during project design, construction, and startup. Prepare project documentation required to obtain Key Decision 0.

(R00114) Define Initial DST WR Systems Project

This activity will define the tank farm supporting infrastructure requirements necessary to support the retrieval mission and objectives. These requirements will be provided and integrated with the Tank Farms Upgrades Program. The requirements will include electrical power, lighting, compressed air, tank ventilation systems, waste transfer interfaces, and other systems needed to support waste retrieval.

(R00205) Define WR Infrastructure Requirements

Status of Design Documentation:

1. Issue enrg. assessment which identifies selection of init. DST ret. sys. architecture
 2. Issue test and evaluation plan which identifies testing requirements for the project.
 3. Issue project level functions and requirements for initial DST retrieval system designs and operation.
 4. Prepare project documentation to obtain Key Decision 0.
-
1. Complete preliminary study of infrastructure requirements for reference retrieval methods.
 2. Identify specific interfaces between Waste Retrieval and Tank Farm Upgrades.
 3. Finalize infrastructure requirements which are responsibility of Tank Farm Upgrades.
 4. Define infrastructure requirements which are responsibility of Waste Retrieval for initial SST retrieval systems.
 5. Define infrastructure requirements which are responsibility of Waste Retrieval for remaining SST retrieval systems.

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS): N/A

C. STATEMENT OF WORK

Required activities: N/A

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager		
Program Element Manager		
Activity Manager		
Program Business Representative		

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager		
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Cost Account Manager		
Program Business Representative		

FDS Number _____

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Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.05 Waste Retrieval (M&O Contractor) 1.1.1.2.05.04 System Definition	2. DATE PREPARED August 30, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.05.04.02/VI	5. WBS ELEMENT TITLE Single Shell Tanks	
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1210-0-OD	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1)	12. BUDGET AND REPORTING NUMBER(S) Expense Capital Line Item EW3130010	

3. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	2,318	2,049	1,447
CENRTC			
GPP			
LINE ITEM			
TOTAL	2,318	2,049	1,447

B. TECHNICAL BASES

Goals & objectives:

Complete the activities necessary to define and establish the initial SST retrieval systems. The scope includes the engineering trade studies necessary to bound project scope and select which retrieval technologies will be used in specific tanks. Establish functional requirements, and complete the engineering study and project

1.1.1.2.05.04.02

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documentation necessary to obtain key decision O. This project will provide retrieval systems for an entire SST farm or an equivalent number of tanks.

(R00216) Define Initial SST WR System Project

This activity will define and develop the SST retrieval systems training and test requirements to support retrieval of all 149 SSTs. A functions and requirements document will be prepared, facility options will be evaluated against the requirements, trade studies will be performed, and an engineering study will be completed to establish a recommended approach for the SST Retrieval training and test facilities.

(R00217) Define SST WR Training/Test Requirements

Complete the activities necessary to define and establish the first arm based retrieval project. The scope includes the engineering trade studies necessary to bound project scope, establish functional requirements, and complete the engineering study and project documentation necessary to obtain key decision O. This project will provide the arm based retrieval system for C-106 clean out.

(R00218) Define Arm-Based SST WR Project

Complete the activities necessary to define and establish the support facilities necessary to support the SST retrieval system maintenance and support retrieval operations for the first tank farm or equivalent number of tanks. The scope includes the engineering trade studies necessary to bound project scope, establish functional requirements, and complete the engineering study and project documentation necessary to obtain key decision O. This project(s) will provide the maintenance facilities, laydown/set-up areas, support buildings, etc. necessary to maintain/support SST retrieval systems for one of the 200 Areas (East or West). The resultant project will include a tank waste transfer vault to accumulate waste in batches prior to transferring the waste to DSTs. It also includes support systems which are necessary to remove the waste from the tanks and support the retrieval operations.

(R00220) Define Initial SST WR Support Service Facility

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

1. Complete engineering trade study for initial SST retrieval systems.
 2. Complete functions and requirements for initial SST retrieval systems.
 3. Prepare project documentation to obtain Key Decision O.
 4. Submit initial SST retrieval sequence document for Ecology approval (M-45-02A)
-
1. Complete Functions and Requirements Document
 2. Complete Engineering Study
 3. Complete Letter Report on Facility Options
-
1. Complete engineering trade study for arm-based SST retrieval demo.
 2. Complete functions and requirements for arm-based SST retrieval demo.
 3. Complete project documentation to obtain Key Decision O.
-
1. Complete functions and requirements document.
 2. Complete engineering trade studies.
 3. Complete project documentation to obtain Key Decision O.

C. STATEMENT OF WORK

Required activities: N/ATechnologies to be assessed: N/AOptions to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager		
Program Element Manager		
Activity Manager		
Program Business Representative		

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager		
Activity Manager		
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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.05 Waste Retrieval (M&O Contractor) 1.1.1.2.05.04 System Definition	2. DATE PREPARED August 30, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.05.04.04/VI	5. WBS ELEMENT TITLE Tank Closure							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1210-0-OD							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1)	12. BUDGET AND REPORTING NUMBER(S) <table> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3130010</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3130010		
Expense	Capital	Line Item						
EW3130010								

13. ELEMENT DESCRIPTION**A. COST CONTENT (Escalated Dollars)**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	405	407	407
CENRTC			
GPP			
LINE ITEM			
TOTAL	405	407	407

B. TECHNICAL BASESGoals & objectives:

Prepare analysis of federal and state regulations to identify issues requiring additional regulatory definition. Included would be regulations providing sufficient basis for categorizing residual waste in SSTs as to HLW, LLW, TRU, mixed, and hazardous; promulgation of disposal criteria for each applicable waste type, and

1.1.1.2.05.04.04

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definition of jurisdictional authority of federal and state agencies. Support informational exchanges with regulators, as required. This activity will likely be level of effort-based, until issues are resolved.

(R00313) Prepare Tank Closure Reg Rqmts Assessment

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

1. Issue assessment of regulator requirements applicable to closure.

C. STATEMENT OF WORK

Required activities: N/A

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager		
Program Element Manager		
Activity Manager		
Program Business Representative		

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager		
Activity Manager		
Cost Account Manager		
Program Business Representative		

FDS Number

WHC-SP-1101

Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.05 Waste Retrieval (M&O Contractor)	2. DATE PREPARED August 28, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.05.05/V	5. WBS ELEMENT TITLE W-151 101-AZ Retrieval	
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE August 31, 1994
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1210-0-0E	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOED/RL-92-60 REV.1) 4.2.1.1 Store Waste 4.2.1.2 Characterize Waste 4.2.1.3 Retrieve Waste 4.2.2.1 Pretreat Waste 4.2.3.2 Disposition Gaseous Effluents 4.2.3.4 Disposition Solid Waste	12. BUDGET AND REPORTING NUMBER Expense Capital Line Item EW3130010	

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)	FY 1998 \$(000)	FY 1999 \$(000)	FY 2000 \$(000)	FY 2001 \$(000)
OPERATING	468	114	0				
CENRTC	2,230	451	0				
GPP							
LINE ITEM	9,085	776	0				
TOTAL	11,783	1,341	0				

B. TECHNICAL BASES

Goals and objectives:

- Demonstrate mixer pump operation and sludge mobilization of NCAW waste in Tank 101-AZ,
 - Develop equipment and procedures for removal of tank internal components
 - Obtain test data on tank parameters during mixer pump operations.
- Mixer pumps are identified as the baseline retrieval technology for DSTs. Information obtained during this first demonstration of mixer pump operations will provide the basis for subsequent DST retrieval activities. Operation of mixer pumps in Tank 101-AZ will start the double-shell tank NCAW process test in FY 1997.

Major end-item deliverables:

Operate the Waste Retrieval Systems, achieving the established treatment and waste disposal goals

Acceptance criteria:

Demonstration of mixer pump operation and sludge mobilization as the baseline technology for DST waste retrieval systems.

C. STATEMENT OF WORK

Required activities over lifetime:

Provide design, procurement, construction, installation and startup of sludge mobilization and tank monitoring equipment and facilities for sludge mobilization operations in Tank 101-AZ. This also provides overall project management, project-specific technology development, safety analysis, environmental permitting, operational readiness review, construction inspection, Quality Assurance, and training. (WHC/PNL)

Interfaces:

#	From This WBS To	Item Provided
1	All other TWRS program elements	This activity directly or indirectly supports other TWRS program elements through demonstrating mixer pump technology as the retrieval method for DST retrieval.
	To This WBS From	
1	1.1.1.2.04 Characterization	Characterization of Tank 101-AZ to support mixer pump demonstration.

Technologies to be assessed:

DST mixer pump performances
42" flex receiver

Options to be considered: N/A

D. OTHER LEGAL DRIVERS AND ORDER REQUIREMENTS

Reference "Tank Waste Remediation System Functions and Requirements", DOE/RL-92-60 Rev. 1, dated March 1994: Section 2.0 Tank Waste Remediation System Function and Requirement Descriptions, Table F4.2.1 Retrieve Waste, Item V Function Requirements, Paragraphs A and B; and Section 3 Tank Waste Remediation System Architecture, Table A4.2.1.3 Waste Retrieval System Item VIII Requirements Satisfied, Paragraphs B and C.

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.05 Waste Retrieval (M&O Contractor) 1.1.1.2.05.05 W-151 101-AZ Retrieval	2. DATE PREPARED August 30, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.05.05.01/YI	5. WBS ELEMENT TITLE Project Management							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1210-2-OE							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1)	12. BUDGET AND REPORTING NUMBER(S) <table> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3130010</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3130010		
Expense	Capital	Line Item						
EW3130010								

13. ELEMENT DESCRIPTION**A. COST CONTENT**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	468	114	0
CENRTC			
GPP			
LINE ITEM			
TOTAL	468	114	0

B. TECHNICAL BASESGoals & objectives:

Provide two 300 horsepower mixer pumps in Tank 241-AZ-101 for the purposes of demonstrating sludge mobilization in Hanford's double-shell tanks. Upgrade the electrical power and water supply as required to support the activities necessary to prepare the tank as well as providing power for the mixers. Remove or

1.1.1.2.05.05.01

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reinforce tank internal components to withstand the mixer pump forces. Provide a sludge mobilization monitoring system which will measure the gamma energy profile inside the drywells and the new profile thermocouples. Fabricate jumpers for the purpose of future routing of the slurry. The scope of this project includes: project management; technology development specific to this project; conceptual design; definitive design; safety and environmental permitting analysis and documentation; procurement of equipment and materials; modifications to the tanks and their service systems to support installation and operation of the retrieval systems; installation of the retrieval systems; start-up preparations, training, and testing; inspection; and quality assurance. Dispose of solid waste generated during the tank modifications and installation of the retrieval hardware.

(R00113) D/C DST WR Process Test

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

1. TDB-94-255, Award burial/storage container procurement
2. TDB-94-256, Complete equipment development work
3. TDB-94-257, Release NCAW Process Test Plan
4. TDB-94-236, Complete Definitive Design
5. TDB-94-258, Complete fabrication of drywell inspection system
6. TBD, Complete run-in test of the mixer pumps
7. TBD, Complete W-151 construction
8. TBD, Official Acceptance of Construction, Part III signed off

C. STATEMENT OF WORK

Required activities: N/A

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager		
Program Element Manager		
Activity Manager		
Program Business Representative		

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager		
Activity Manager		
Cost Account Manager		
Program Business Representative		

FDS Number _____

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Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.05 Waste Retrieval (M&O Contractor) 1.1.1.2.05.05 W-151 101-AZ Retrieval	2. DATE PREPARED August 30, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.05.05.02/VI	5. WBS ELEMENT TITLE Detail Design							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1210-2-OE							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1)	12. BUDGET AND REPORTING NUMBER(S) <table style="width: 100%; border: none;"> <tr> <td style="text-align: left;">Expense</td> <td style="text-align: left;">Capital</td> <td style="text-align: left;">Line Item</td> </tr> <tr> <td>EW3130010</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3130010		
Expense	Capital	Line Item						
EW3130010								

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	0	0	0
CENRTC			
GPP			
LINE ITEM			
TOTAL	0	0	0

B. TECHNICAL BASES

Goals & objectives:

Provide two 300 horsepower mixer pumps in Tank 241-AZ-101 for the purposes of demonstrating sludge mobilization in Hanford's double-shell tanks. Upgrade the electrical power and water supply as required to support the activities necessary to prepare the tank as well as providing power for the mixers. Remove or

1.1.1.2.05.05.02

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enforce tank internal components to withstand the mixer pump forces. Provide a sludge mobilization monitoring system which will measure the gamma energy profile inside the drywells and the new profile thermocouples. Fabricate jumpers for the purpose of future routing of the slurry. The scope of this project includes: project management; technology development specific to this project; conceptual design; definitive design; safety and environmental permitting analysis and documentation; procurement of equipment and materials; modifications to the tanks and their service systems to support installation and operation of the retrieval systems; installation of the retrieval systems; start-up preparations, training, and testing; inspection; and quality assurance. Dispose of solid waste generated during the tank modifications and installation of the retrieval hardware.

(R00113) D/C DST WR Process Test

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

1. TDB-94-255, Award burial/storage container procurement
2. TDB-94-256, Complete equipment development work
3. TDB-94-257, Release NCAW Process Test Plan
4. TDB-94-236, Complete Definitive Design
5. TDB-94-258, Complete fabrication of drywell inspection system
6. TBD, Complete run-in test of the mixer pumps
7. TBD, Complete W-151 construction
8. TBD, Official Acceptance of Construction, Part III signed off

C. STATEMENT OF WORK

Required activities: N/A

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager		
Program Element Manager		
Activity Manager		
Program Business Representative		

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager		
Activity Manager		
Cost Account Manager		
Program Business Representative		

FDS Number

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.05 Waste Retrieval (M&O Contractor) 1.1.1.2.05.05 W-151 101-AZ Retrieval	2. DATE PREPARED August 30, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.05.05.03/VI	5. WBS ELEMENT Title Field Engineering & Inspection	
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1210-2-OE	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1)	12. BUDGET AND REPORTING NUMBER(S) Expense Capital Line Item EW3130010	

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING			
CENRTC			
GPP			
LINE ITEM	1,332	325	0
TOTAL	1,332	325	0

B. TECHNICAL BASES

Goals & objectives:

Provide two 300 horsepower mixer pumps in Tank 241-AZ-101 for the purposes of demonstrating sludge mobilization in Hanford's double-shell tanks. Upgrade the electrical power and water supply as required to support the activities necessary to prepare the tank as well as providing power for the mixers. Remove or

1.1.1.2.05.05.03

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reinforce tank internal components to withstand the mixer pump forces. Provide a sludge mobilization monitoring system which will measure the gamma energy profile inside the drywells and the new profile thermocouples. Fabricate jumpers for the purpose of future routing of the slurry. The scope of this project includes: project management; technology development specific to this project; conceptual design; definitive design; safety and environmental permitting analysis and documentation; procurement of equipment and materials; modifications to the tanks and their service systems to support installation and operation of the retrieval systems; installation of the retrieval systems; start-up preparations, training, and testing; inspection; and quality assurance. Dispose of solid waste generated during the tank modifications and installation of the retrieval hardware.

(R00113) D/C DST WR Process Test

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

1. TDB-94-255, Award burial/storage container procurement
2. TDB-94-256, Complete equipment development work
3. TDB-94-257, Release NCAW Process Test Plan
4. TDB-94-236, Complete Definitive Design
5. TDB-94-258, Complete fabrication of drywell inspection system
6. TBD, Complete run-in test of the mixer pumps
7. TBD, Complete W-151 construction
8. TBD, Official Acceptance of Construction, Part III signed off

C. STATEMENT OF WORK

Required activities: N/A

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager		
Program Element Manager		
Activity Manager		
Program Business Representative		

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager		
Activity Manager		
Cost Account Manager		
Program Business Representative		

FDS Number _____

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.05 Waste Retrieval (M&O Contractor) 1.1.1.2.05.05 W-151 101-AZ Retrieval	2. DATE PREPARED August 30, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.05.05.04/VI	5. WBS ELEMENT TITLE Procurement							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1210-2-OE							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1)	12. BUDGET AND REPORTING NUMBER(S) <table> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3130010</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3130010		
Expense	Capital	Line Item						
EW3130010								

13. ELEMENT DESCRIPTION**A. COST CONTENT (Escalated Dollars)**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING			
CENRTC	2,230		
GPP	3,624		
LINE ITEM			
TOTAL	5,854		

B. TECHNICAL BASESGoals & objectives:

Provide two 300 horsepower mixer pumps in Tank 241-AZ-101 for the purposes of demonstrating sludge mobilization in Hanford's double-shell tanks. Upgrade the electrical power and water supply as required to support the activities necessary to prepare the tank as well as providing power for the mixers. Remove or

1.1.1.2.05.05.04

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reinforce tank internal components to withstand the mixer pump forces. Provide a sludge mobilization monitoring system which will measure the gamma energy profile inside the drywells and the new profile thermocouples. Fabricate jumpers for the purpose of future routing of the slurry. The scope of this project includes: project management; technology development specific to this project; conceptual design; definitive design; safety and environmental permitting analysis and documentation; procurement of equipment and materials; modifications to the tanks and their service systems to support installation and operation of the retrieval systems; installation of the retrieval systems; start-up preparations, training, and testing; inspection; and quality assurance. Dispose of solid waste generated during the tank modifications and installation of the retrieval hardware.

(R00113) D/C DST WR Process Test

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

1. TDB-94-255, Award burial/storage container procurement
2. TDB-94-256, Complete equipment development work
3. TDB-94-257, Release NCAW Process Test Plan
4. TDB-94-236, Complete Definitive Design
5. TDB-94-258, Complete fabrication of drywell inspection system
6. TBD, Complete run-in test of the mixer pumps
7. TBD, Complete W-151 construction
8. TBD, Official Acceptance of Construction, Part III signed off

C. STATEMENT OF WORK

Required activities: N/A

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager		
Program Element Manager		
Activity Manager		
Program Business Representative		

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager		
Activity Manager		
Cost Account Manager		
Program Business Representative		

FDS Number _____

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Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.05 Waste Retrieval (M&O Contractor) 1.1.1.2.05.05 W-151 101-AZ Retrieval	2. DATE PREPARED August 30, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.05.05.05/VI	5. WBS ELEMENT TITLE Construction	
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1210-2-OE	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1)	12. BUDGET AND REPORTING NUMBER(S) Expense Capital Line Item	

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING			
CENRTC			
GPP			
LINE ITEM	3,884	42	
TOTAL	3,884	42	0

B. TECHNICAL BASES

Goals & objectives:Status of Design Documentation:

1.1.1.2.05.05.05

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Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

C. STATEMENT OF WORK

Required activities:

Technologies to be assessed:

Options to be considered:

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager		
Program Element Manager		
Activity Manager		
Program Business Representative		

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager		
Activity Manager		
Cost Account Manager		
Program Business Representative		

FDS Number

**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.05 Waste Retrieval (M&O Contractor) 1.1.1.2.05.05 W-151 101-AZ Retrieval	2. DATE PREPARED August 30, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.05.05.06/VI	5. WBS ELEMENT TITLE Start-Up	
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1210-2-OE	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1)	12. BUDGET AND REPORTING NUMBER(S) Expense Capital Line Item EW3130010	

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING			
CENRTC			
GPP			
LINE ITEM	245	409	
TOTAL	245	409	

B. TECHNICAL BASES

Goals & objectives:

Provide two 300 horsepower mixer pumps in Tank 241-AZ-101 for the purposes of demonstrating sludge mobilization in Hanford's double-shell tanks. Upgrade the electrical power and water supply as required to support the activities necessary to prepare the tank as well as providing power for the mixers. Remove or reinforce tank internal components to withstand the mixer pump forces. Provide a sludge mobilization

1.1.1.2.05.05.06

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monitoring system which will measure the gamma energy profile inside the drywells and the new profile thermocouples. Fabricate jumpers for the purpose of future routing of the slurry. The scope of this project includes: project management; technology development specific to this project; conceptual design; definitive design; safety and environmental permitting analysis and documentation; procurement of equipment and materials; modifications to the tanks and their service systems to support installation and operation of the retrieval systems; installation of the retrieval systems; start-up preparations, training, and testing; inspection; and quality assurance. Dispose of solid waste generated during the tank modifications and installation of the retrieval hardware.

(R00113) D/C DST WR Process Test

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

1. TDB-94-255, Award burial/storage container procurement
2. TDB-94-256, Complete equipment development work
3. TDB-94-257, Release NCAW Process Test Plan
4. TDB-94-236, Complete Definitive Design
5. TDB-94-258, Complete fabrication of drywell inspection system
6. TBD, Complete run-in test of the mixer pumps
7. TBD, Complete W-151 construction
8. TBD, Official Acceptance of Construction, Part III signed off

C. STATEMENT OF WORK

Required activities: N/A

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager		
Program Element Manager		
Activity Manager		
Program Business Representative		

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager		
Activity Manager		
Cost Account Manager		
Program Business Representative		

FDS Number _____

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.05 Waste Retrieval (M&O Contractor)	2. DATE PREPARED August 28, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.05.06/V	5. WBS ELEMENT TITLE W-211 Initial Retrieval System							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE August 31, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1210-0-0F							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOED/RL-92-60 REV.1) 4.2.1.1 Store Waste 4.2.1.2 Characterize Waste 4.2.1.3 Retrieve Waste 4.2.1.4 Transfer Waste 4.2.2.1 Pretreat Waste 4.2.3.1 Immobilize & Dispose LLW 4.2.3.2 Disposition Gaseous Effluents 4.2.3.4 Disposition Solid Waste	12. BUDGET AND REPORTING NUMBER <table> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3130010</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3130010		
Expense	Capital	Line Item						
EW3130010								

13. ELEMENT DESCRIPTION**A. COST CONTENT (Escalated dollars)**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)	FY 1998 \$(000)	FY 1999 \$(000)	FY 2000 \$(000)	FY 2001 \$(000)
OPERATING	1,863	1,660	2,730				
CENRTC							
GPP							
LINE ITEM	6,364	14,181	27,679				
TOTAL	8,227	15,841	30,409				

B. TECHNICAL BASES

Goals and objectives:

Provide retrieval systems for the first 10 double-shell tanks (DST) after tank 101-AZ.

- Support resolution of tank safety issues (with the first designated tank as 101-SY).
- Provide tank waste feed for ultimate disposal as low-level or high-level waste and make available tank space to facilitate waste transfer logistics for disposal.

Major end-item deliverables:

- Resolve Watch List tank safety issues through retrieval actions.
- Operate the Waste Retrieval Systems, achieving the established treatment and waste disposal goals.
- Turnover all retrieval facilities to ERC for closure.

Acceptance criteria:

Achieving and maintaining regulatory and DOE Order compliance in the design and operation of waste retrieval systems.

C. STATEMENT OF WORK

Required activities over lifetime:

Provide design, procurement, construction, installation and startup of equipment and facilities for retrieval operations in the ten DSTs to be retrieved. This activity also provides overall project management, project-specific technology development, safety analysis, environmental permitting, operational readiness review, construction inspection, Quality Assurance, and training. (WHC/PNL)

Interfaces:

#	From This WBS To	Item Provided
1	All other TWRS program elements	This activity directly or indirectly supports all other TWRS program elements through retrieving tank waste as part of the actions necessary for the safe storage, treatment, and transfer of liquid waste in tank farms.
	To This WBS From	
1	1.1.1.2.02 Waste Tank Safety	Mitigating and resolving tank safety issues to achieve remediation through retrieval.
2	1.1.1.2.04 Characterization	Characterization of double-shell tanks for waste retrieval operations.
3	1.1.1.2.03 Tank Farm Upgrades	Upgrades in tank farms in order to achieve retrieval actions.

Technologies to be assessed:

- DST mixer pump performance
- Transfer line requirements, waste conditioning

Options to be considered:

- Merging safety mitigation mixer pump systems with initial DST retrieval actions
- Closure requirements

D. OTHER LEGAL DRIVERS AND ORDER REQUIREMENTS

Reference "Tank Waste Remediation System Functions and Requirements", DOE/RL-92-60 Rev. 1, dated March 1994: Section 2.0 Tank Waste Remediation System Function and Requirement Descriptions, Table F4.2.1 Retrieve Waste, Item V Function Requirements, Paragraphs A and B; and Section 3 Tank Waste Remediation System Architecture, Table A4.2.1.3 Waste Retrieval System Item VIII Requirements Satisfied, Paragraphs B and C.

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.05 Waste Retrieval (M&O Contractor) 1.1.1.2.05.06 W-211 Initial Retrieval System	2. DATE PREPARED August 30, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.05.06.01/VI	5. WBS ELEMENT TITLE Project Management/Integration							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1210-3-OF							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1)	12. BUDGET AND REPORTING NUMBER(S) <table> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3130010</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3130010		
Expense	Capital	Line Item						
EW3130010								

13. ELEMENT DESCRIPTION**A. COST CONTENT (Escalated Dollars)**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	1,863	1,660	2,235
CENRTC			
GPP	0	0	
LINE ITEM	2,124	1,040	1,332
TOTAL	3,987	2,700	3,567

B. TECHNICAL BASESGoals & objectives:

Project W-211, "Initial Tank Retrieval Systems" will provide systems for the retrieval of radioactive wastes stored in ten underground double-shell tanks (DSTs). This APF is for the first phase which includes tanks 241-SY-101 and 241-SY-103 only. Two 300 horsepower mixer pumps will be placed in each tank to mobilize the

1.1.1.2.05.06.01

AL-93

settled solids. An in line dilution and flush system will be provided to condition the waste to meet the transfer line parameters. The scope of work includes transfer pumps, operator instrumentation and control station, instrumentation upgrades, utility upgrades for retrieval (electrical power, water, telecommunications), site prep and tank modifications, a tank cooling system, if required. The scope of this project includes: project management; technology development specific to this project; conceptual design; definitive design; safety and environmental permitting analysis and documentation; procurement of equipment and materials; modifications to the tanks and their service systems to support installation and operation of the retrieval systems; installation of the retrieval systems; startup preparations, training, and testing; inspection; and quality assurance. Dispose of solid waste generated during the tank modifications and installation of the retrieval hardware.

(R00116) D/C Initial DST WR System - Phase I

Provide the retrieval systems for the remaining 8 tanks covered by Project W-211. Emphasis will be placed on DST watchlist tanks and those which have limited amounts of sludge suitable of LLW immobilization after pretreatment. The scope of this project includes: project management; technology development specific to this project; definitive design; safety and environmental permitting analysis and documentation; procurement of equipment and materials; modifications to the tanks and their service systems to support installation and operation of the retrieval systems; installation of the retrieval systems; startup preparations, training, and testing; inspection; and quality assurance. Dispose of solid waste generated during the tank modifications and installation of the retrieval hardware.

(R00118) D/C Initial DST WR System - Phase II

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

1. TDB-94-264 Submit NEPA ADM to RL for Project W-211
2. TDB-94-237 HQ approval of Key Decision 1 for 101-SY only.
3. TDB-93-079 Issue final approved PSE for Project W-211.
4. TDB-93-076 Issue final Permitting Plan for Project W-211
5. TDB-94-215 Complete Conceptual Design for Project W-211.
6. TDB-94-259 Issue Project Management Plan for Project W-211
7. TDB-93-093 Complete support Key Decision 1 for Project W-211
8. TDB-94-260 Issue CAA estimate of emissions for retrieval OPS on 101-SY
9. TDB-94-261 Complete WHC - QAPP remaining tanks identified in Project W-211
10. TDB-94-262 Submit RCRA Part A permit, MOI for Project W-211
11. TDB-94-263 Complete 101-SY Soil Sample Analysis and issue results
12. TDB-94-266 Submit NEPA EA to RL for Project W-211
13. TDB-94-265 Complete Preparation of Clean Air Act Permit application for Project W-211
14. TDB-94-238 Complete Project W-211 Title I Design for 101-SY.
15. TDB Complete Construction 101-SY.
16. TDB Readiness Review completion 101-SY.
17. TBD Approval of Key Decision 4.
18. TDB Complete construction 103-SY.
19. TBD Readiness review completion 103-SY.
20. TDB Approval of Key Decision 4 103-SY.

1. Initiate definite design
2. Initiate procurement
3. Complete definitive design
4. Complete construction

C. STATEMENT OF WORK

Required activities: N/ATechnologies to be assessed: N/AOptions to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager		
Program Element Manager		
Activity Manager		
Program Business Representative		

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager		
Activity Manager		
Cost Account Manager		
Program Business Representative		

FDS Number

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.05 Waste Retrieval (M&O Contractor) 1.1.1.2.05.06 W-211 Initial Retrieval System	2. DATE PREPARED August 30, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.05.06.02/VI	5. WBS ELEMENT TITLE Design							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1210-3-OF							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1)	12. BUDGET AND REPORTING NUMBER(S) <table> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3130010</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3130010		
Expense	Capital	Line Item						
EW3130010								

13. ELEMENT DESCRIPTION**A. COST CONTENT (Escalated Dollars)**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING			
CENRTC			
GPP			
LINE ITEM	3,810	10,105	7,608
TOTAL	3,810	10,105	7,608

B. TECHNICAL BASES

Goals & objectives:

Project W-211, "Initial Tank Retrieval Systems" will provide systems for the retrieval of radioactive wastes stored in ten underground double-shell tanks (DSTs). This APF is for the first phase which includes tanks 241-SY-101 and 241-SY-103 only. Two 300 horsepower mixer pumps will be placed in each tank to mobilize the settled solids. An in line dilution and flush system will be provided to condition the waste to meet the transfer line parameters. The scope of work includes transfer pumps, operator instrumentation and control station, instrumentation upgrades, utility upgrades for retrieval (electrical power, water, telecommunications), site prep and tank modifications, a tank cooling system, if required. The scope of this project includes: project management; technology development specific to this project; conceptual design; definitive design; safety and environmental permitting analysis and documentation; procurement of equipment and materials; modifications to the tanks and their service systems to support installation and operation of the retrieval systems; installation of the retrieval systems; startup preparations, training, and testing; inspection; and quality assurance. Dispose of solid waste generated during the tank modifications and installation of the retrieval hardware.

(R00116) D/C Initial DST WR System - Phase I

Provide the retrieval systems for the remaining 8 tanks covered by Project W-211. Emphasis will be placed on DST watchlist tanks and those which have limited amounts of sludge suitable of LLW immobilization after pretreatment. The scope of this project includes: project management; technology development specific to this project; definitive design; safety and environmental permitting analysis and documentation; procurement of equipment and materials; modifications to the tanks and their service systems to support installation and operation of the retrieval systems; installation of the retrieval systems; startup preparations, training, and testing; inspection; and quality assurance. Dispose of solid waste generated during the tank modifications and installation of the retrieval hardware.

(R00118) D/C Initial DST WR System - Phase II

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

1. TDB-94-264 Submit NEPA ADM to RL for Project W-211
2. TDB-94-237 HQ approval of Key Decision 1 for 101-SY only.
3. TDB-93-079 Issue final approved PSE for Project W-211.
4. TDB-93-076 Issue final Permitting Plan for Project W-211
5. TDB-94-215 Complete Conceptual Design for Project W-211.
6. TDB-94-259 Issue Project Management Plan for Project W-211
7. TDB-93-093 Complete support Key Decision 1 for Project W-211
8. TDB-94-260 Issue CAA estimate of emissions for retrieval OPS on 101-SY
9. TDB-94-261 Complete WHC - QAPP remaining tanks identified in Project W-211
10. TDB-94-262 Submit RCRA Part A permit, MOI for Project W-211
11. TDB-94-263 Complete 101-SY Soil Sample Analysis and issue results
12. TDB-94-266 Submit NEPA EA to RL for Project W-211
13. TDB-94-265 Complete Preparation of Clean Air Act Permit application for Project W-211
14. TDB-94-238 Complete Project W-211 Title I Design for 101-SY.
15. TDB Complete Construction 101-SY.
16. TDB Readiness Review completion 101-SY.
17. TBD Approval of Key Decision 4.
18. TDB Complete construction 103-SY.
19. TBD Readiness review completion 103-SY.
20. TDB Approval of Key Decision 4 103-SY.

1. Initiate definite design
2. Initiate procurement
3. Complete definitive design
4. Complete construction

C. STATEMENT OF WORK

Required activities: N/A

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager		
Program Element Manager		
Activity Manager		
Program Business Representative		

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager		
Activity Manager		
Cost Account Manager		
Program Business Representative		

FDS Number

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Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.05 Waste Retrieval (M&O Contractor) 1.1.1.2.05.06 W-211 Initial Retrieval System	2. DATE PREPARED August 31, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.05.06.03/VI	5. WBS ELEMENT TITLE Procurement							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1210-0-OF							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1)	12. BUDGET AND REPORTING NUMBER(S) <table style="width: 100%; border: none;"> <tr> <td style="text-align: left;">Expense</td> <td style="text-align: left;">Capital</td> <td style="text-align: left;">Line Item</td> </tr> <tr> <td>EW3130010</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3130010		
Expense	Capital	Line Item						
EW3130010								

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING			
CENRTC			
GPP			
LINE ITEM	430	3,036	3,573
TOTAL	430	3,036	3,573

B. TECHNICAL BASES

Goals & objectives:

Project W-211, "Initial Tank Retrieval Systems" will provide systems for the retrieval of radioactive wastes stored in ten underground double-shell tanks (DSTs). This APF is for the first phase which includes tanks 241-SY-101 and 241-SY-103 only. Two 300 horsepower mixer pumps will be placed in each tank to mobilize the settled solids. An in line dilution and flush system will be provided to condition the waste to meet the transfer line parameters. The scope of work includes transfer pumps, operator instrumentation and control station, instrumentation upgrades, utility upgrades for retrieval (electrical power, water, telecommunications), site prep and tank modifications, a tank cooling system, if required. The scope of this project includes: project management; technology development specific to this project; conceptual design; definitive design; safety and environmental permitting analysis and documentation; procurement of equipment and materials; modifications to the tanks and their service systems to support installation and operation of the retrieval systems; installation of the retrieval systems; startup preparations, training, and testing; inspection; and quality assurance. Dispose of solid waste generated during the tank modifications and installation of the retrieval hardware.

(R00116) D/C Initial DST WR System - Phase I

Provide the retrieval systems for the remaining 8 tanks covered by Project W-211. Emphasis will be placed on DST watchlist tanks and those which have limited amounts of sludge suitable of LLW immobilization after pretreatment. The scope of this project includes: project management; technology development specific to this project; definitive design; safety and environmental permitting analysis and documentation; procurement of equipment and materials; modifications to the tanks and their service systems to support installation and operation of the retrieval systems; installation of the retrieval systems; startup preparations, training, and testing; inspection; and quality assurance. Dispose of solid waste generated during the tank modifications and installation of the retrieval hardware.

(R00118) D/C Initial DST WR System - Phase II

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

1. TDB-94-264 Submit NEPA ADM to RL for Project W-211
2. TDB-94-237 HQ approval of Key Decision 1 for 101-SY only.
3. TDB-93-079 Issue final approved PSE for Project W-211.
4. TDB-93-076 Issue final Permitting Plan for Project W-211
5. TDB-94-215 Complete Conceptual Design for Project W-211.
6. TDB-94-259 Issue Project Management Plan for Project W-211
7. TDB-93-093 Complete support Key Decision 1 for Project W-211
8. TDB-94-260 Issue CAA estimate of emissions for retrieval OPS on 101-SY
9. TDB-94-261 Complete WHC - QAPP remaining tanks identified in Project W-211
10. TDB-94-262 Submit RCRA Part A permit, MOI for Project W-211
11. TDB-94-263 Complete 101-SY Soil Sample Analysis and issue results
12. TDB-94-266 Submit NEPA EA to RL for Project W-211
13. TDB-94-265 Complete Preparation of Clean Air Act Permit application for Project W-211
14. TDB-94-238 Complete Project W-211 Title I Design for 101-SY.
15. TDB Complete Construction 101-SY.
16. TDB Readiness Review completion 101-SY.
17. TBD Approval of Key Decision 4.
18. TDB Complete construction 103-SY.
19. TBD Readiness review completion 103-SY.
20. TDB Approval of Key Decision 4 103-SY.

1. Initiate definite design
2. Initiate procurement
3. Complete definitive design
4. Complete construction

C. STATEMENT OF WORK

Required activities: N/A

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager		
Program Element Manager		
Activity Manager		
Program Business Representative		

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager		
Activity Manager		
Cost Account Manager		
Program Business Representative		

FDS Number

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.05 Waste Retrieval (M&O Contractor) 1.1.1.2.05.05 W-211 Initial Retrieval System	2. DATE PREPARED August 30, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930			
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.05.06.04/VI	5. WBS ELEMENT TITLE Construction				
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994			
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1210-2-OE				
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1)	12. BUDGET AND REPORTING NUMBER(S) <table border="0"> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> </table>		Expense	Capital	Line Item
Expense	Capital	Line Item			

13. ELEMENT DESCRIPTION**A. COST CONTENT (Escalated Dollars)**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING			
CENRTC			
GPP			
LINE ITEM	0	0	15,166
TOTAL	0	0	15,166

B. TECHNICAL BASESGoals & objectives:Status of Design Documentation:

1.1.1.2.05.06.04

Ak-105

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

C. STATEMENT OF WORK

Required activities:

Technologies to be assessed:

Options to be considered:

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager		
Program Element Manager		
Activity Manager		
Program Business Representative		

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager		
Activity Manager		
Cost Account Manager		
Program Business Representative		

FDS Number _____

**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.05 Waste Retrieval (M&O Contractor) 1.1.1.2.05.06 W-211 Initial Retrieval System	2. DATE PREPARED August 29, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.05.06.05/VI	5. WBS ELEMENT TITLE Start-Up							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE August 31, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1210-3-OF							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1)	12. BUDGET AND REPORTING NUMBER(S) <table> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3130010</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3130010		
Expense	Capital	Line Item						
EW3130010								

13. ELEMENT DESCRIPTION**A. COST CONTENT (Escalated Dollars)**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	0	0	495
CENRTC			
GPP			
LINE ITEM			
TOTAL	0	0	495

B. TECHNICAL BASES

Goals & objectives:

Project W-211, "Initial Tank Retrieval Systems" will provide systems for the retrieval of radioactive wastes stored in ten underground double-shell tanks (DSTs). This APF is for the first phase which includes tanks 241-SY-101 and 241-SY-103 only. Two 300 horsepower mixer pumps will be placed in each tank to mobilize the settled solids. An in line dilution and flush system will be provided to condition the waste to meet the transfer line parameters. The scope of work includes transfer pumps, operator instrumentation and control station, instrumentation upgrades, utility upgrades for retrieval (electrical power, water, telecommunications), site prep and tank modifications, a tank cooling system, if required. The scope of this project includes: project management; technology development specific to this project; conceptual design; definitive design; safety and environmental permitting analysis and documentation; procurement of equipment and materials; modifications to the tanks and their service systems to support installation and operation of the retrieval systems; installation of the retrieval systems; startup preparations, training, and testing; inspection; and quality assurance. Dispose of solid waste generated during the tank modifications and installation of the retrieval hardware.

(R00116) D/C Initial DST WR System - Phase I

Provide the retrieval systems for the remaining 8 tanks covered by Project W-211. Emphasis will be placed on DST watchlist tanks and those which have limited amounts of sludge suitable of LLW immobilization after pretreatment. The scope of this project includes: project management; technology development specific to this project; definitive design; safety and environmental permitting analysis and documentation; procurement of equipment and materials; modifications to the tanks and their service systems to support installation and operation of the retrieval systems; installation of the retrieval systems; startup preparations, training, and testing; inspection; and quality assurance. Dispose of solid waste generated during the tank modifications and installation of the retrieval hardware.

(R00118) D/C Initial DST WR System - Phase II

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

1. TDB-94-264 Submit NEPA ADM to RL for Project W-211
2. TDB-94-237 HQ approval of Key Decision 1 for 101-SY only.
3. TDB-93-079 Issue final approved PSE for Project W-211.
4. TDB-93-076 Issue final Permitting Plan for Project W-211
5. TDB-94-215 Complete Conceptual Design for Project W-211.
6. TDB-94-259 Issue Project Management Plan for Project W-211
7. TDB-93-093 Complete support Key Decision 1 for Project W-211
8. TDB-94-260 Issue CAA estimate of emissions for retrieval OPS on 101-SY
9. TDB-94-261 Complete WHC - QAPP remaining tanks identified in Project W-211
10. TDB-94-262 Submit RCRA Part A permit, MOI for Project W-211
11. TDB-94-263 Complete 101-SY Soil Sample Analysis and issue results
12. TDB-94-266 Submit NEPA EA to RL for Project W-211
13. TDB-94-265 Complete Preparation of Clean Air Act Permit application for Project W-211
14. TDB-94-238 Complete Project W-211 Title I Design for 101-SY.
15. TDB Complete Construction 101-SY.
16. TDB Readiness Review completion 101-SY.
17. TBD Approval of Key Decision 4.
18. TDB Complete construction 103-SY.
19. TBD Readiness review completion 103-SY.
20. TDB Approval of Key Decision 4 103-SY.

1. Initiate definite design
2. Initiate procurement
3. Complete definitive design
4. Complete construction

C. STATEMENT OF WORK

Required activities: N/A

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager		
Program Element Manager		
Activity Manager		
Program Business Representative		

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager		
Activity Manager		
Cost Account Manager		
Program Business Representative		

FDS Number

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Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.05 Waste Retrieval (M&O Contractor)	2. DATE PREPARED August 286, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.05.07/V	5. WBS ELEMENT TITLE Final DST Retrieval System							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE August 31, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1210-0-0G							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOED/RL-92-60 REV.1) 4.2.1.1 Store Waste 4.2.1.2 Characterize Waste 4.2.1.3 Retrieve Waste 4.2.1.4 Transfer Waste 4.2.3.1 Immobilize & Dispose LLW 4.2.3.2 Disposition Gaseous Effluents 4.2.3.4 Disposition Solid Waste	12. BUDGET AND REPORTING NUMBER <table style="width: 100%; border: none;"> <tr> <td style="text-align: left;">Expense</td> <td style="text-align: left;">Capital</td> <td style="text-align: left;">Line Item</td> </tr> <tr> <td>EW3130010</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3130010		
Expense	Capital	Line Item						
EW3130010								

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)	FY 1998 \$(000)	FY 1999 \$(000)	FY 2000 \$(000)	FY 2001 \$(000)
OPERATING							
CENRTC							
GPP							
LINE ITEM							
TOTAL	0	0	0				

B. TECHNICAL BASES

Goals and objectives:

Provide retrieval systems for the DSTs not included in WBS elements 1.1.1.2.05.05 and 1.1.1.2.05.06.
Provide feed and interim storage for ultimate disposal as low-level or high-level waste.

Major end-item deliverables:

- Operate the Waste Retrieval Systems, achieving the established treatment and waste disposal goals.
- Turnover all retrieval facilities to ERC for closure.

Acceptance criteria:

Achieving and maintaining regulatory and DOE Order compliance in the design and operation of waste retrieval systems.

C. STATEMENT OF WORK

Required activities over lifetime:

Provide design, procurement, construction, installation, and startup of equipment and facilities for retrieval operations in the remaining 17 DSTs to be retrieved. This activity also provides overall project management, project-specific technology development, safety analysis, environmental permitting, construction inspection, Quality Assurance, and training. (WHC/PNL)

Interfaces:

#	From This WBS To	Item Provided
1	All other TWRS program elements	This activity directly or indirectly supports all other TWRS program elements through retrieving tank waste as part of the actions necessary for the safe storage, treatment, and transfer of liquid waste in tank farms.
	To This WBS From	
1	1.1.1.2.04 Characterization	Characterization of all double-shell tanks for waste retrieval operations.
2	1.1.1.2.03 Tank Farm Upgrades	Upgrades in tank farms in order to achieve retrieval actions.

Technologies to be assessed:

- DST mixer pump performance
- Transfer line requirements, waste conditioning

Options to be considered:

- Closure requirements

D. OTHER LEGAL DRIVERS AND ORDER REQUIREMENTS

Reference "Tank Waste Remediation System Functions and Requirements", DOE/RL-92-60 Rev. 1, dated March 1994: Section 2.0 Tank Waste Remediation System Function and Requirement Descriptions, Table F4.2.1 Retrieve Waste, Item V Function Requirements, Paragraphs A and B; and Section 3 Tank Waste Remediation System Architecture, Table A4.2.1.3 Waste Retrieval System Item VIII Requirements Satisfied, Paragraphs B and C.

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Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.05 Waste Retrieval (M&O Contractor)	2. DATE PREPARED August 28, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.05.08/V	5. WBS ELEMENT TITLE W-315 Pilot Scale Retrieval	
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE August 31, 1994
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1210-0-0H	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOED/RL-92-60 REV.1) 4.2.1.2 Characterize Waste 4.2.1.4 Transfer Waste 4.2.2.1 Pretreat Waste 4.2.3.1 Immobilize & Dispose LLW	12. BUDGET AND REPORTING NUMBER Expense Capital Line Item EW3130010	

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)	FY 1998 \$(000)	FY 1999 \$(000)	FY 2000 \$(000)	FY 2001 \$(000)
OPERATING	1,242	729	562				
CENRTC							
GPP							
LINE ITEM							
TOTAL	1,242	729	562				

B. TECHNICAL BASES

Goals and objectives:

Provide equipment to retrieve quantities of tank waste suitable for pilot-scale pretreatment process development tests and for treatment (HLW and LLW) waste form qualification. Included is the development of requirements, equipment development, design, procurement, construction, startup, regulatory permitting, and safety analysis necessary for this effort.

Major end-item deliverables:

- Provide quantities of tank waste suitable for pilot-scale pretreatment process development tests and for treatment (HLW and LLW) waste form qualification.

Acceptance criteria:

Quantities of tank waste suitable for pilot-scale pretreatment process development tests.

C. STATEMENT OF WORK

Required activities over lifetime:

Design, develop, and construct a Pilot-Scale Retrieval System to provide small volumes (10 to 50 liters) of tank waste material for planned pilot-scale test facilities supporting waste pretreatment process testing, bench-scale melter testing, in-tank sludge washing tests, and other pretreatment/disposal activities, and maintain the system throughout these activities. The schedule will be consistent with the needs of the above activities. The number and frequency of sampling and waste transfers are to be determined as part of this activity. (WHC/PNL)

Interfaces:

#	From This WBS To	Item Provided
1	All other TWRS program elements	This activity directly supports the TWRS program by providing large samples of tank waste for characterization, process development, and transfer assessments of liquid waste in tank farms.
	To This WBS From	
	N/A	N/A

Technologies to be assessed:

- SRS Sludge Sampler System

Options to be considered:

Enhancement/modifications to the SRS Sludge Sampler System

D. OTHER LEGAL DRIVERS AND ORDER REQUIREMENTS

Reference "Tank Waste Remediation System Functions and Requirements", DOE/RL-92-60 Rev. 1, dated March 1994: Section 2.0 Tank Waste Remediation System Function and Requirement Descriptions, Table F4.2.1 Retrieve Waste, Item V Function Requirements, Paragraphs A and B; and Section 3 Tank Waste Remediation System Architecture, Table A4.2.1.3 Waste Retrieval System Item VIII Requirements Satisfied, Paragraphs B and C.

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.05 Waste Retrieval. (M&O Contractor) 1.1.1.2.05.08 Pilot Retrieval System	2. DATE PREPARED August 29, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.05.08.01/VI	5. WBS ELEMENT TITLE Project Management	
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE August 31, 1994
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1210-0-OH	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1)	12. BUDGET AND REPORTING NUMBER(S) Expense Capital Line Item EW3130010	

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	1,242	729	562
CENRTC			
GPP			
LINE ITEM			
TOTAL	1,242	729	562

B. TECHNICAL BASES

Goals & objectives:

This activity provides the engineering studies, trade studies, design, procurement, and testing of the small volume retrieval systems. These systems will remove and provide 25-50 liter samples of tank wastes to be used in testing of pretreatment and waste immobilization processes. The scope of this project includes: project management; technology development specific to this project; conceptual design; definitive design; safety and

1.1.1.2.05.08.01

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environmental permitting analysis and documentation; procurement of equipment and materials; modifications to the tanks and their service systems to support installation and operation of the retrieval systems; installation of the retrieval systems; startup preparations, training, and testing; inspection; and quality assurance. Dispose of solid waste generated during the tank modifications and installation of the retrieval hardware.

(R00124) D/C Small Volume WR System

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

1. Develop requirements for small volume retrieval system.
2. Procure SRS small volume retrieval system
3. Initiate SRS small volume retrieval system testing
4. Procure prototype small volume retrieval system
5. Initiate prototype small volume retrieval system hot testing
6. Procure first production small volume retrieval system
7. Procure small volume retrieval system batch transfer system

C. STATEMENT OF WORK

Required activities: N/A

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager		
Program Element Manager		
Activity Manager		
Program Business Representative		

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager		
Activity Manager		
Cost Account Manager		
Program Business Representative		

FDS Number _____

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Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.05 Waste Retrieval (M&O Contractor) 1.1.1.2.05.08 Pilot Retrieval System	2. DATE PREPARED August 29, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.05.08.02/VI	5. WBS ELEMENT TITLE Engineering	
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE August 31, 1994
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1210-0-OH	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1)	12. BUDGET AND REPORTING NUMBER(S) Expense Capital Line Item EW3130010	

13. ELEMENT DESCRIPTION

A. COST CONTENT

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING			
CENRTC			
GPP			
LINE ITEM			
TOTAL	0	0	0

B. TECHNICAL BASES

Goals & objectives:

This activity provides the engineering studies, trade studies, design, procurement, and testing of the small volume retrieval systems. These systems will remove and provide 25-50 liter samples of tank wastes to be used in testing of pretreatment and waste immobilization processes. The scope of this project includes: project management; technology development specific to this project; conceptual design; definitive design; safety and environmental permitting analysis and documentation; procurement of equipment and materials; modifications to the tanks and their service systems to support installation and operation of the retrieval systems; installation of the retrieval systems; startup preparations, training, and testing; inspection; and quality assurance. Dispose of solid waste generated during the tank modifications and installation of the retrieval hardware.

(R00124) D/C Small Volume WR System

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

1. Develop requirements for small volume retrieval system.
2. Procure SRS small volume retrieval system
3. Initiate SRS small volume retrieval system testing
4. Procure prototype small volume retrieval system
5. Initiate prototype small volume retrieval system hot testing
6. Procure first production small volume retrieval system
7. Procure small volume retrieval system batch transfer system

C. STATEMENT OF WORK

Required activities: N/A

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager		
Program Element Manager		
Activity Manager		
Program Business Representative		

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager		
Activity Manager		
Cost Account Manager		
Program Business Representative		

FDS Number

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.05 Waste Retrieval (M&O Contractor) 1.1.1.2.05.08 Pilot Retrieval System	2. DATE PREPARED August 29, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.05.08.03/VI	5. WBS ELEMENT TITLE Procurement							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE August 31, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1210-0-OH							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1)	12. BUDGET AND REPORTING NUMBER(S) <table> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3130010</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3130010		
Expense	Capital	Line Item						
EW3130010								

13. ELEMENT DESCRIPTION**A. COST CONTENT**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING			
CENRTC			
GPP			
LINE ITEM			
TOTAL	0	0	0

B. TECHNICAL BASES

Goals & objectives:

This activity provides the engineering studies, trade studies, design, procurement, and testing of the small volume retrieval systems. These systems will remove and provide 25-50 liter samples of tank wastes to be used in testing of pretreatment and waste immobilization processes. The scope of this project includes: project management; technology development specific to this project; conceptual design; definitive design; safety and environmental permitting analysis and documentation; procurement of equipment and materials; modifications to the tanks and their service systems to support installation and operation of the retrieval systems; installation of the retrieval systems; startup preparations, training, and testing; inspection; and quality assurance. Dispose of solid waste generated during the tank modifications and installation of the retrieval hardware.

(R00124) D/C Small Volume WR System

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

1. Develop requirements for small volume retrieval system.
2. Procure SRS small volume retrieval system
3. Initiate SRS small volume retrieval system testing
4. Procure prototype small volume retrieval system
5. Initiate prototype small volume retrieval system hot testing
6. Procure first production small volume retrieval system
7. Procure small volume retrieval system batch transfer system

C. STATEMENT OF WORK

Required activities: N/A

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager		
Program Element Manager		
Activity Manager		
Program Business Representative		

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager		
Activity Manager		
Cost Account Manager		
Program Business Representative		

FDS Number _____

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Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT	2. DATE PREPARED	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.05.08.04	5. WBS ELEMENT TITLE Construction	
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1)	12. BUDGET AND REPORTING NUMBER(S) Expense Capital Line Item	

DATA NOT AVAILABLE FOR THIS SUBMITTAL

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.05 Waste Retrieval (M&O Contractor) 1.1.1.2.05.08 Pilot Retrieval System	2. DATE PREPARED August 29, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.05.08.05/VI	5. WBS ELEMENT TITLE Start-Up & Operation							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE August 31, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1210-0-OH							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1)	12. BUDGET AND REPORTING NUMBER(S) <table> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3130010</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3130010		
Expense	Capital	Line Item						
EW3130010								

13. ELEMENT DESCRIPTION**A. COST CONTENT**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING			
CENRTC			
GPP			
LINE ITEM			
TOTAL	0	0	0

B. TECHNICAL BASES

Goals & objectives:

This activity provides the engineering studies, trade studies, design, procurement, and testing of the small volume retrieval systems. These systems will remove and provide 25-50 liter samples of tank wastes to be used in testing of pretreatment and waste immobilization processes. The scope of this project includes: project management; technology development specific to this project; conceptual design; definitive design; safety and environmental permitting analysis and documentation; procurement of equipment and materials; modifications to the tanks and their service systems to support installation and operation of the retrieval systems; installation of the retrieval systems; startup preparations, training, and testing; inspection; and quality assurance. Dispose of solid waste generated during the tank modifications and installation of the retrieval hardware.

(R00124) D/C Small Volume WR System

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

1. Develop requirements for small volume retrieval system.
2. Procure SRS small volume retrieval system
3. Initiate SRS small volume retrieval system testing
4. Procure prototype small volume retrieval system
5. Initiate prototype small volume retrieval system hot testing
6. Procure first production small volume retrieval system
7. Procure small volume retrieval system batch transfer system

C. STATEMENT OF WORK

Required activities: N/A

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager		
Program Element Manager		
Activity Manager		
Program Business Representative		

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager		
Activity Manager		
Cost Account Manager		
Program Business Representative		

FDS Number _____

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Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.05 Waste Retrieval (M&O Contractor)	2. DATE PREPARED August 28, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.05.09/V	5. WBS ELEMENT TITLE W-320 106-C Sluicing							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE August 31, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1210-0-0J							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOED/RL-92-60 REV.1) 4.2.1.1 Store Waste 4.2.1.2 Characterize Waste 4.2.1.3 Retrieve Waste 4.2.1.4 Transfer Waste 4.2.3.2 Disposition Gaseous Effluents 4.2.3.4 Disposition Solid Waste	12. BUDGET AND REPORTING NUMBER <table style="width: 100%; border: none;"> <tr> <td style="text-align: left;">Expense</td> <td style="text-align: left;">Capital</td> <td style="text-align: left;">Line Item</td> </tr> <tr> <td>EW3130010</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3130010		
Expense	Capital	Line Item						
EW3130010								

13. ELEMENT DESCRIPTION

A. COST CONTENT

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)	FY 1998 \$(000)	FY 1999 \$(000)	FY 2000 \$(000)	FY 2001 \$(000)
OPERATING	21,918	7,694	1,743				
CENRTC							
GPP							
LINE ITEM							
TOTAL	21,918	7,694	1,743				

B. TECHNICAL BASES

Goals and objectives:

Provide facilities and equipment to retrieve waste from tank 241-C-106 employing sluicing techniques. Sluicing has been proposed as the technique to initiate retrieval of the strontium-loaded waste from tank 241-C-106. Retrieval of waste from tank 241-C-106 is proposed to address the requirements of Tri-Party Agreement milestone M-45-03A, "Initiate Sluicing Retrieval of C-106." Selection of the SST for demonstration of retrieval technology was approved by Washington State Department of Ecology. The objective of this activity is to provide facilities and equipment to retrieve waste from tank 241-C-106 employing sluicing techniques.

Major end-item deliverables:

- Resolve Watch List tank safety issues through retrieval actions.
- Operate the Waste Retrieval Systems, achieving the established treatment and waste disposal goals.
- Complete M-45-03A; "Initiate Sluicing Retrieval of C-106."

Acceptance criteria:

Achieving and maintaining regulatory and DOE Order compliance in the design and operation of the initial sluicing retrieval of tank C-106 waste retrieval system.

C. STATEMENT OF WORK

Required activities over lifetime:

The 106-C Sluicing project scope includes the following: (1) engineering studies and criteria development; (2) tank structural analysis; (3) design, checkout, testing, installation, and startup of retrieval systems for 241-C-106; (4) design, construction, and startup of all support systems, including a RCRA compliant transfer piping system for 241-C-106; (5) NEPA documentation specific to 241-C-106 waste retrieval; (6) environmental permits and safety analysis required to construct and operate retrieval systems for 241-C-106 wastes; and (7) project management and engineering. (WHC/PNL)

Interfaces:

#	From This WBS To	Item Provided
1	All other TWRS program elements	This activity directly or indirectly supports all other TWRS program elements through demonstrating SST waste retrieval as part of the actions necessary for the safe storage, treatment, and transfer of liquid waste in tank farms.
	To This WBS From	
1	1.1.1.2.02 Waste Tank Safety	Mitigation of the high-heat tank safety issue through retrieval.

Technologies to be assessed:

Demonstration of SST sluicing retrieval systems

Options to be considered:

Alternate waste retrieval systems

D. OTHER LEGAL DRIVERS AND ORDER REQUIREMENTS

Reference "Tank Waste Remediation System Functions and Requirements", DOE/RL-92-60 Rev. 1, dated March 1994: Section 2.0 Tank Waste Remediation System Function and Requirement Descriptions, Table F4.2.1 Retrieve Waste, Item V Function Requirements, Paragraphs A and B; and Section 3 Tank Waste Remediation System Architecture, Table A4.2.1.3 Waste Retrieval System Item VIII Requirements Satisfied, Paragraphs B and C.

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.05 Waste Retrieval (M&O Contractor) 1.1.1.2.05.09 W-320 106-C Sluicing	2. DATE PREPARED August 29, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.05.09.01/VI	5. WBS ELEMENT TITLE Project Management							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE August 31, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1210-4-OJ							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1)	12. BUDGET AND REPORTING NUMBER(S) <table border="0"> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3130010</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3130010		
Expense	Capital	Line Item						
EW3130010								

13. ELEMENT DESCRIPTION**A. COST CONTENT**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	2,142	1,122	620
CENRTC			
GPP			
LINE ITEM			
TOTAL	2,142	1,122	620

B. TECHNICAL BASESGoals & objectives:

Provide a water sluicing based retrieval system to remove the high-heat generating sludge from Tank C-106 to resolve the associated tank safety issue. The equipment provided by this project will also demonstrate and verify the performance of high-volume waste sluicing systems for retrieval of SST waste. The scope of this project includes: project management; technology development specific to this project; definitive design; safety

1.1.1.2.05.09.01

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and environmental permitting analysis and documentation; procurement of equipment and materials; modifications to the tank and its service systems to support installation and operation of the sluicing retrieval system; installation of the retrieval system; startup preparations, training, and testing; inspection; and quality assurance. This project will also provide transfer lines as required to transport the retrieved wastes to a double-shell tank (DST), as well as upgrades to the DST receipt tank as required to receive and store the retrieved sludge from C-106. Disposal of solid waste generated during the tank modifications and installation of the retrieval hardware is also included.

(R00219) D/C Sluicing WR demo C-106

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

1. Complete design of sluicing retrieval system
2. Complete field modifications and installation of retrieval hardware

C. STATEMENT OF WORK

Required activities: N/A

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager		
Program Element Manager		
Activity Manager		
Program Business Representative		

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager		
Activity Manager		
Cost Account Manager		
Program Business Representative		

FDS Number _____

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Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.05 Waste Retrieval (M&O Contractor) 1.1.1.2.05.09 W-320 106-C Sluicing	2. DATE PREPARED August 29, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.05.09.02/VI	5. WBS ELEMENT TITLE Engineering	
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE August 31, 1994
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1210-4-OJ	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1)	12. BUDGET AND REPORTING NUMBER(S) Expense Capital Line Item EW3130010	

13. ELEMENT DESCRIPTION

A. COST CONTENT

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	4,975	101	33
CENRTC			
GPP			
LINE ITEM			
TOTAL	4,975	101	33

1.1.1.2.05.09.02

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B. TECHNICAL BASES

Goals & objectives:

Provide a water sluicing based retrieval system to remove the high-heat generating sludge from Tank C-106 to resolve the associated tank safety issue. The equipment provided by this project will also demonstrate and verify the performance of high-volume waste sluicing systems for retrieval of SST waste. The scope of this project includes: project management; technology development specific to this project; definitive design; safety and environmental permitting analysis and documentation; procurement of equipment and materials; modifications to the tank and its service systems to support installation and operation of the sluicing retrieval system; installation of the retrieval system; startup preparations, training, and testing; inspection; and quality assurance. This project will also provide transfer lines as required to transport the retrieved wastes to a double-shell tank (DST), as well as upgrades to the DST receipt tank as required to receive and store the retrieved sludge from C-106. Disposal of solid waste generated during the tank modifications and installation of the retrieval hardware is also included.

(R00219) D/C Sluicing WR demo C-106

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

1. Complete design of sluicing retrieval system
2. Complete field modifications and installation of retrieval hardware

C. STATEMENT OF WORK

Required activities: N/A

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager		
Program Element Manager		
Activity Manager		
Program Business Representative		

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager		
Activity Manager		
Cost Account Manager		
Program Business Representative		

FDS Number _____

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Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.05 Waste Retrieval (M&O Contractor) 1.1.1.2.05.09 W-320 106-C Sluicing	2. DATE PREPARED August 29, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.05.09.03/VI	5. WBS ELEMENT TITLE CENRTC	
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE August 31, 1994
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1210-0-OL	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1)	12. BUDGET AND REPORTING NUMBER(S) Expense Capital Line Item EW3130010	

13. ELEMENT DESCRIPTION

A. COST CONTENT

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING			
CENRTC	600	0	0
GPP			
LINE ITEM			
TOTAL	600	0	0

B. TECHNICAL BASES

Goals & objectives:

Provide a water sluicing based retrieval system to remove the high-heat generating sludge from Tank C-106 to resolve the associated tank safety issue. The equipment provided by this project will also demonstrate and verify the performance of high-volume waste sluicing systems for retrieval of SST waste. The scope of this project includes: project management; technology development specific to this project; definitive design; safety and environmental permitting analysis and documentation; procurement of equipment and materials; modifications to the tank and its service systems to support installation and operation of the sluicing retrieval system; installation of the retrieval system; startup preparations, training, and testing; inspection; and quality assurance. This project will also provide transfer lines as required to transport the retrieved wastes to a double-shell tank (DST), as well as upgrades to the DST receipt tank as required to receive and store the retrieved sludge from C-106. Disposal of solid waste generated during the tank modifications and installation of the retrieval hardware is also included.

(R00219) D/C Sluicing WR demo C-106

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

1. Complete design of sluicing retrieval system
2. Complete field modifications and installation of retrieval hardware

C. STATEMENT OF WORK

Required activities: N/A

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager		
Program Element Manager		
Activity Manager		
Program Business Representative		

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager		
Activity Manager		
Cost Account Manager		
Program Business Representative		

FDS Number

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.05 Waste Retrieval (M&O Contractor) 1.1.1.2.05.09 W-320 106-C Sluicing	2. DATE PREPARED August 29, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.05.09.04/VI	5. WBS ELEMENT TITLE Construction							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1210-0-OL							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1)	12. BUDGET AND REPORTING NUMBER(S) <table> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3130010</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3130010		
Expense	Capital	Line Item						
EW3130010								

13. ELEMENT DESCRIPTION**A. COST CONTENT**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	11,685	4,132	1,086
CENRTC			
GPP			
LINE ITEM			
TOTAL	11,685	4,132	1,086

B. TECHNICAL BASES

Goals & objectives:

Provide a water sluicing based retrieval system to remove the high-heat generating sludge from Tank C-106 to resolve the associated tank safety issue. The equipment provided by this project will also demonstrate and verify the performance of high-volume waste sluicing systems for retrieval of SST waste. The scope of this project includes: project management; technology development specific to this project; definitive design; safety and environmental permitting analysis and documentation; procurement of equipment and materials; modifications to the tank and its service systems to support installation and operation of the sluicing retrieval system; installation of the retrieval system; startup preparations, training, and testing; inspection; and quality assurance. This project will also provide transfer lines as required to transport the retrieved wastes to a double-shell tank (DST), as well as upgrades to the DST receipt tank as required to receive and store the retrieved sludge from C-106. Disposal of solid waste generated during the tank modifications and installation of the retrieval hardware is also included.

(R00219) D/C Sluicing WR demo C-106

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

1. Complete design of sluicing retrieval system
2. Complete field modifications and installation of retrieval hardware

C. STATEMENT OF WORK

Required activities: N/A

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager		
Program Element Manager		
Activity Manager		
Program Business Representative		

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager		
Activity Manager		
Cost Account Manager		
Program Business Representative		

FDS Number _____

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.05 Waste Retrieval (M&O Contractor) 1.1.1.2.05.09 W-320 106-C Sluicing	2. DATE PREPARED August 29, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.05.09.05/VI	5. WBS ELEMENT TITLE Start-Up							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1210-0-OL							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1)	12. BUDGET AND REPORTING NUMBER(S) <table border="0"> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3130010</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3130010		
Expense	Capital	Line Item						
EW3130010								

13. ELEMENT DESCRIPTION**A. COST CONTENT**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	3,116	2,339	4
CENRTC			
GPP			
LINE ITEM			
TOTAL	3,116	2,339	4

B. TECHNICAL BASES

Goals & objectives:

Provide a water sluicing based retrieval system to remove the high-heat generating sludge from Tank C-106 to resolve the associated tank safety issue. The equipment provided by this project will also demonstrate and verify the performance of high-volume waste sluicing systems for retrieval of SST waste. The scope of this project includes: project management; technology development specific to this project; definitive design; safety and environmental permitting analysis and documentation; procurement of equipment and materials; modifications to the tank and its service systems to support installation and operation of the sluicing retrieval system; installation of the retrieval system; startup preparations, training, and testing; inspection; and quality assurance. This project will also provide transfer lines as required to transport the retrieved wastes to a double-shell tank (DST), as well as upgrades to the DST receipt tank as required to receive and store the retrieved sludge from C-106. Disposal of solid waste generated during the tank modifications and installation of the retrieval hardware is also included.

(R00219) D/C Sluicing WR demo C-106

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

1. Complete design of sluicing retrieval system
2. Complete field modifications and installation of retrieval hardware

C. STATEMENT OF WORK

Required activities: N/A

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager		
Program Element Manager		
Activity Manager		
Program Business Representative		

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager		
Activity Manager		
Cost Account Manager		
Program Business Representative		

FDS Number

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Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.05 Waste Retrieval (M&O Contractor)	2. DATE PREPARED August 28, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.05.10/V	5. WBS ELEMENT TITLE SST Training and Test Facility	
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1210-0-0K	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOED/RL-92-60 REV.1) 4.2.1.1 Store Waste 4.2.1.3 Retrieve Waste 4.2.1.4 Transfer Waste	12. BUDGET AND REPORTING NUMBER Expense Capital Line Item EW3130010	

13. ELEMENT DESCRIPTION

A. COST CONTENT

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)	FY 1998 \$(000)	FY 1999 \$(000)	FY 2000 \$(000)	FY 2001 \$(000)
OPERATING							
CENRTC							
GPP							
LINE ITEM							
TOTAL	0	0	0				

B. TECHNICAL BASES

Goals and objectives:

Provide for training of retrieval operations and maintenance staff and testing of SST retrieval systems. The following items are included:

- Check out and qualify the waste retrieval equipment, including the control system, in a nonradioactive simulated waste environment before using the equipment on radioactive and hazardous waste.
- Develop, check out, and qualify the waste retrieval equipment operating procedures prior to retrieving actual waste.
- Train and qualify operators to use the equipment and procedures to retrieve waste. The SST training and test facility is needed by approximately FY 1999 to enable setup, debugging, checkout, qualification, and training activities to be completed as a prerequisite for meeting Tri-Party Agreement Milestone M-45-03-T02, "Initiate Final Retrieval Demonstration of C-106" by 6/2002.

Major end-item deliverables:

- Operate the Waste Retrieval Systems, achieving the established treatment and waste disposal goals.
- Complete M-45-03T02; "Initiate Final Retrieval Demonstration of 106-C."

Acceptance criteria:

Achieving the operation of the initial arm retrieval of tank C-106 waste retrieval system.

C. STATEMENT OF WORK

Required activities over lifetime:

Provide for the evaluation of alternatives for meeting the SST retrieval training and testing requirements; design, procurement, equipment installation, and construction of SST retrieval training test facility(ies). (WHC/PNL)

Interfaces:

#	From This WBS To	Item Provided
1	All other TWRS program elements	This activity directly or indirectly supports all other TWRS program elements through providing a training and test facility(ies) for tank maintenance and operations in the tank farms.
	To This WBS From	
	N/A	N/A

Technologies to be assessed:

- Evaluate and demonstrate SST arm retrieval systems
- Develop and test enhanced alternate waste retrieval systems
 - SST sluicing retrieval systems
 - Assess/develop MUST waste retrieval technologies

Options to be considered:

Alternate Waste Retrieval Systems

- Arm-based SST and DST waste retrieval systems
- Closure requirements options

D. OTHER LEGAL DRIVERS AND ORDER REQUIREMENTS

Reference "Tank Waste Remediation System Functions and Requirements", DOE/RL-92-60 Rev. 1, dated March 1994: Section 2.0 Tank Waste Remediation System Function and Requirement Descriptions, Table F4.2.1 Retrieve Waste, Item V Function Requirements, Paragraphs A and B; and Section 3 Tank Waste Remediation System Architecture, Table A4.2.1.3 Waste Retrieval System Item VIII Requirements Satisfied, Paragraphs B and C.

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.05 Waste Retrieval (M&O Contractor)	2. DATE PREPARED August 28, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.05.11/V	5. WBS ELEMENT TITLE W-340 Long Reach Arm							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1210-0-0L							
11. SYSTEM ENGINEERING - ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOED/RL-92-60 REV.1) 4.2.1.1 Store Waste 4.2.1.2 Characterize Waste 4.2.1.3 Retrieve Waste 4.2.1.4 Transfer Waste 4.2.3.2 Disposition Gaseous Effluents 4.2.3.4 Disposition Solid Waste	12. BUDGET AND REPORTING NUMBER <table border="0"> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3130010</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3130010		
Expense	Capital	Line Item						
EW3130010								

13. ELEMENT DESCRIPTION**A. COST CONTENT**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)	FY 1998 \$(000)	FY 1999 \$(000)	FY 2000 \$(000)	FY 2001 \$(000)
OPERATING	4,000	8,440	14,431				
CENRTC							
GPP							
LINE ITEM			3,000				
TOTAL	4,000	8,440	17,431				

B. TECHNICAL BASES

Goals and objectives:

Provide the waste retrieval systems necessary to complete retrieval of wastes from tank 241-C-106, following sluicing operations in tank 241-C-106 installed under the 106-C sluicing project (WBS 1.1.1.2.05.09), deployment of long-reach manipulators. It is anticipated that to meet tank 241-C-106 closure requirements, deployment of long-reach manipulators will be required and Tri-Party Agreement Milestone M-45-03-T02, "Initiate Final Retrieval Demonstration of C-106" by 6/2002, is to demonstrate deployment of long-reach manipulator retrieval systems.

Major end-item deliverables:

- Resolve Watch List tank safety issues through retrieval actions.
- Operate the Waste Retrieval Systems, achieving the established treatment and waste disposal goals.
- Complete M-45-03T02; "Initiate Final Retrieval Demonstration of 106-C.
- Turnover all retrieval facilities to ERC for closure.

Acceptance criteria:

- Achieving and maintaining regulatory and DOE Order compliance in the design and operation of waste retrieval systems.

C. STATEMENT OF WORK

Required activities over lifetime:

The project scope includes the following: (1) engineering studies, criteria development, and conceptual design; (2) structural analysis of 241-C-106; (3) procurement, checkout, testing, installation, and startup of the in-tank retrieval system; (4) modification of the tank dome to facilitate the deployment of the retrieval system; (5) design and construction of supporting systems; (6) environmental permits and safety analysis required for long reach manipulator retrieval of tank 241-C-106 waste; (7) project management and engineering. This activity also provides project-specific development, demonstration testing in support of the operational readiness review and system training. (WHC/PNL)

Interfaces:

#	From This WBS To	Item Provided
1	All other TWRS program elements	This activity directly or indirectly supports all other TWRS program elements through retrieving tank waste as part of the actions necessary for the safe storage, treatment, and transfer of liquid waste in tank farms.
	To This WBS From	
1	1.1.1.2.02 Waste Tank Safety	Mitigating and resolving tank safety issues to achieve remediation through retrieval.

Technologies to be assessed:

- Evaluate and demonstrate SST arm retrieval systems
- Develop and test enhanced alternate waste retrieval systems
 - SST sluicing retrieval systems

Options to be considered:

- Alternate waste retrieval systems
 - Arm-based SST and DST waste retrieval systems
 - Closure requirements options

D. OTHER LEGAL DRIVERS AND ORDER REQUIREMENTS

Reference "Tank Waste Remediation System Functions and Requirements", DOE/RL-92-60 Rev. 1, dated March 1994: Section 2.0 Tank Waste Remediation System Function and Requirement Descriptions, Table F4.2.1 Retrieve Waste, Item V Function Requirements, Paragraphs A and B; and Section 3 Tank Waste Remediation System Architecture, Table A4.2.1.3 Waste Retrieval System Item VIII Requirements Satisfied, Paragraphs B and C.

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.05 Waste Retrieval (M&O Contractor) 1.1.1.2.05.11 W-340 Long Reach Arm	2. DATE PREPARED August 29, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.05.11.01/VI	5. WBS ELEMENT TITLE Project Management							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1210-0-OL							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1)	12. BUDGET AND REPORTING NUMBER(S) <table> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3130010</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3130010		
Expense	Capital	Line Item						
EW3130010								

13. ELEMENT DESCRIPTION**A. COST CONTENT**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	4,000	8,440	14,431
CENRTC			
GPP			
LINE ITEM			3,000
TOTAL	4,000	8,440	17,431

B. TECHNICAL BASESGoals & objectives:

Provide an arm-based retrieval system to demonstrate and verify the performance of long-reach manipulator systems for retrieval of SST waste. This project will provide the retrieval hardware and support systems necessary to remove the hard sludge heel which is expected to remain in Tank C-106 after completion of sluicing retrieval operations. The scope of this project includes: project management; technology development

1.1.1.2.05.11.01

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specific to this project; conceptual design; definitive design; safety and environmental permitting analysis and documentation; procurement of equipment and materials; modifications to the tank and its service systems to support installation and operation of the arm-based retrieval system; installation of the retrieval system; startup preparations, training, and testing; inspection; and quality assurance. This system is intended to demonstrate the capability to meet or exceed the TPA criteria to remove a minimum of 99% of the waste from this tank. Dispose of solid waste generated during the tank modifications and installation of the retrieval hardware.

(R00222) D/C TestArm-Based SST WR Demo

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

1. Place Contract for Retrieval System Supplier
2. Complete Conceptual Design
3. Complete Definitive Design
4. Complete Field Modifications and Installation of Retrieval System

C. STATEMENT OF WORK

Required activities: N/A

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager		
Program Element Manager		
Activity Manager		
Program Business Representative		

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager		
Activity Manager		
Cost Account Manager		
Program Business Representative		

<div style="border: 1px solid black; padding: 2px;">FDS Number</div> <div style="border: 1px solid black; height: 20px; margin-top: 5px;"></div>
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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.05 Waste Retrieval (M&O Contractor) 1.1.1.2.05.11 W-340 Long Reach Arm	2. DATE PREPARED August 29, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.05.11.02/VI	5. WBS ELEMENT TITLE Engineering							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1210-0-OL							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1)	12. BUDGET AND REPORTING NUMBER(S) <table border="0"> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3130010</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3130010		
Expense	Capital	Line Item						
EW3130010								

13. ELEMENT DESCRIPTION**A. COST CONTENT (Escalated Dollars)**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING			
CENRTC			
GPP			
LINE ITEM			
TOTAL	0	0	0

B. TECHNICAL BASES

Goals & objectives:

Provide an arm-based retrieval system to demonstrate and verify the performance of long-reach manipulator systems for retrieval of SST waste. This project will provide the retrieval hardware and support systems necessary to remove the hard sludge heel which is expected to remain in Tank C-106 after completion of sluicing retrieval operations. The scope of this project includes: project management; technology development specific to this project; conceptual design; definitive design; safety and environmental permitting analysis and documentation; procurement of equipment and materials; modifications to the tank and its service systems to support installation and operation of the arm-based retrieval system; installation of the retrieval system; startup preparations, training, and testing; inspection; and quality assurance. This system is intended to demonstrate the capability to meet or exceed the TPA criteria to remove a minimum of 99% of the waste from this tank. Dispose of solid waste generated during the tank modifications and installation of the retrieval hardware.

(R00222) D/C TestArm-Based SST WR Demo

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

1. Place Contract for Retrieval System Supplier
2. Complete Conceptual Design
3. Complete Definitive Design
4. Complete Field Modifications and Installation of Retrieval System

C. STATEMENT OF WORK

Required activities: N/A

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager		
Program Element Manager		
Activity Manager		
Program Business Representative		

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager		
Activity Manager		
Cost Account Manager		
Program Business Representative		

FDS Number _____

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.05 Waste Retrieval (M&O Contractor) 1.1.1.2.05.11 W-340 Long Reach Arm	2. DATE PREPARED August 29, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.05.11.03/VI	5. WBS ELEMENT TITLE Regulatory/Compliance							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1210-0-OL							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1)	12. BUDGET AND REPORTING NUMBER(S) <table> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3130010</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3130010		
Expense	Capital	Line Item						
EW3130010								

13. ELEMENT DESCRIPTION

A. COST CONTENT

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING			
CENRTC			
GPP			
LINE ITEM			
TOTAL	0	0	0

B. TECHNICAL BASES

Goals & objectives:

Provide an arm-based retrieval system to demonstrate and verify the performance of long-reach manipulator systems for retrieval of SST waste. This project will provide the retrieval hardware and support systems necessary to remove the hard sludge heel which is expected to remain in Tank C-106 after completion of sluicing retrieval operations. The scope of this project includes: project management; technology development specific to this project; conceptual design; definitive design; safety and environmental permitting analysis and documentation; procurement of equipment and materials; modifications to the tank and its service systems to support installation and operation of the arm-based retrieval system; installation of the retrieval system; startup preparations, training, and testing; inspection; and quality assurance. This system is intended to demonstrate the capability to meet or exceed the TPA criteria to remove a minimum of 99% of the waste from this tank. Dispose of solid waste generated during the tank modifications and installation of the retrieval hardware.

(R00222) D/C TestArm-Based SST WR Demo

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

1. Place Contract for Retrieval System Supplier
2. Complete Conceptual Design
3. Complete Definitive Design
4. Complete Field Modifications and Installation of Retrieval System

C. STATEMENT OF WORK

Required activities: N/A

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager		
Program Element Manager		
Activity Manager		
Program Business Representative		

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager		
Activity Manager		
Cost Account Manager		
Program Business Representative		

FDS Number _____

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Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.05 Waste Retrieval (M&O Contractor) 1.1.1.2.05.11 W-340 Long Reach Arm	2. DATE PREPARED August 29, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.05.11.04/VI	5. WBS ELEMENT TITLE LRM Procurement	
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1210-0-OL	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1)	12. BUDGET AND REPORTING NUMBER(S) Expense Capital Line Item EW3130010	

13. ELEMENT DESCRIPTION

A. COST CONTENT

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING			
CENRTC			
GPP			
LINE ITEM			
TOTAL	0	0	0

B. TECHNICAL BASES

Goals & objectives:

Provide an arm-based retrieval system to demonstrate and verify the performance of long-reach manipulator systems for retrieval of SST waste. This project will provide the retrieval hardware and support systems necessary to remove the hard sludge heel which is expected to remain in Tank C-106 after completion of sluicing retrieval operations. The scope of this project includes: project management; technology development specific to this project; conceptual design; definitive design; safety and environmental permitting analysis and documentation; procurement of equipment and materials; modifications to the tank and its service systems to support installation and operation of the arm-based retrieval system; installation of the retrieval system; startup preparations, training, and testing; inspection; and quality assurance. This system is intended to demonstrate the capability to meet or exceed the TPA criteria to remove a minimum of 99% of the waste from this tank. Dispose of solid waste generated during the tank modifications and installation of the retrieval hardware.

(R00222) D/C TestArm-Based SST WR Demo

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

1. Place Contract for Retrieval System Supplier
2. Complete Conceptual Design
3. Complete Definitive Design
4. Complete Field Modifications and Installation of Retrieval System

C. STATEMENT OF WORK

Required activities: N/A

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager		
Program Element Manager		
Activity Manager		
Program Business Representative		

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager		
Activity Manager		
Cost Account Manager		
Program Business Representative		

FDS Number _____

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.05 Waste Retrieval (M&O Contractor) 1.1.1.2.05.11 W-340 Long Reach Arm	2. DATE PREPARED August 29, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.05.11.05/VI	5. WBS ELEMENT TITLE Construction							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1210-0-OL							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1)	12. BUDGET AND REPORTING NUMBER(S) <table> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3130010</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3130010		
Expense	Capital	Line Item						
EW3130010								

13. ELEMENT DESCRIPTION

A. COST CONTENT

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING			
CENRTC			
GPP			
LINE ITEM			
TOTAL	0	0	0

B. TECHNICAL BASES

Goals & objectives:

Provide an arm-based retrieval system to demonstrate and verify the performance of long-reach manipulator systems for retrieval of SST waste. This project will provide the retrieval hardware and support systems necessary to remove the hard sludge heel which is expected to remain in Tank C-106 after completion of sluicing retrieval operations. The scope of this project includes: project management; technology development specific to this project; conceptual design; definitive design; safety and environmental permitting analysis and documentation; procurement of equipment and materials; modifications to the tank and its service systems to support installation and operation of the arm-based retrieval system; installation of the retrieval system; startup preparations, training, and testing; inspection; and quality assurance. This system is intended to demonstrate the capability to meet or exceed the TPA criteria to remove a minimum of 99% of the waste from this tank. Dispose of solid waste generated during the tank modifications and installation of the retrieval hardware.

(R00222) D/C TestArm-Based SST WR Demo

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

1. Place Contract for Retrieval System Supplier
2. Complete Conceptual Design
3. Complete Definitive Design
4. Complete Field Modifications and Installation of Retrieval System

C. STATEMENT OF WORK

Required activities: N/A

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager		
Program Element Manager		
Activity Manager		
Program Business Representative		

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager		
Activity Manager		
Cost Account Manager		
Program Business Representative		

FDS Number _____

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.05 Waste Retrieval (M&O Contractor) 1.1.1.2.05.11 W-340 Long Reach Arm	2. DATE PREPARED August 29, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.05.11.06/VI	5. WBS ELEMENT TITLE Start-Up							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1210-0-OL							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1)	12. BUDGET AND REPORTING NUMBER(S) <table> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3130010</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3130010		
Expense	Capital	Line Item						
EW3130010								

13. ELEMENT DESCRIPTION**A. COST CONTENT**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING			
CENRTC			
GPP			
LINE ITEM			
TOTAL	0	0	0

B. TECHNICAL BASES

Goals & objectives:

Provide an arm-based retrieval system to demonstrate and verify the performance of long-reach manipulator systems for retrieval of SST waste. This project will provide the retrieval hardware and support systems necessary to remove the hard sludge heel which is expected to remain in Tank C-106 after completion of sluicing retrieval operations. The scope of this project includes: project management; technology development specific to this project; conceptual design; definitive design; safety and environmental permitting analysis and documentation; procurement of equipment and materials; modifications to the tank and its service systems to support installation and operation of the arm-based retrieval system; installation of the retrieval system; startup preparations, training, and testing; inspection; and quality assurance. This system is intended to demonstrate the capability to meet or exceed the TPA criteria to remove a minimum of 99% of the waste from this tank. Dispose of solid waste generated during the tank modifications and installation of the retrieval hardware.

(R00222) D/C TestArm-Based SST WR Demo

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

1. Place Contract for Retrieval System Supplier
2. Complete Conceptual Design
3. Complete Definitive Design
4. Complete Field Modifications and Installation of Retrieval System

C. STATEMENT OF WORK

Required activities: N/A

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager		
Program Element Manager		
Activity Manager		
Program Business Representative		

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager		
Activity Manager		
Cost Account Manager		
Program Business Representative		

FDS Number _____

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WHC-SP-1101

Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.05 Waste Retrieval (M&O Contractor)	2. DATE PREPARED August 28, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.05.12/V	5. WBS ELEMENT TITLE SST Closure Demonstration	
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1210-0-0M	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOED/RL-92-60 REV.1) 4.2.1.1 Store Waste 4.2.1.2 Characterize Waste 4.2.1.3 Retrieve Waste 4.2.1.4 Transfer Waste 4.2.3.2 Disposition Gaseous Effluents 4.2.3.4 Disposition Solid Waste	12. BUDGET AND REPORTING NUMBER Expense Capital Line Item EW3130010	

13. ELEMENT DESCRIPTION

A. COST CONTENT

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)	FY 1998 \$(000)	FY 1999 \$(000)	FY 2000 \$(000)	FY 2001 \$(000)
OPERATING							
CENRTC							
GPP							
LINE ITEM							
TOTAL	0	0	0				

1.1.1.2.05.12

AL - 191

B. TECHNICAL BASES

Goals and objectives:

- Perform design, procurement, construction, and startup of retrieval systems and supporting systems to meet Tri-Party Agreement milestone M-45-04, "Initial SST Retrieval Systems" (field deployment and startup of retrieval system(s) in Hanford single-shell tank (SST) farm by June 2004, as part of an overall closure demonstration).
- Supporting technology evaluations are being performed under the TD program (EM-50) to provide data and performance requirements for the retrieval systems and closure systems. Supplemented support for enhanced technologies such as subsurface barriers, tank leak detection systems, and tank modification systems is provided in a SST Retrieval Development component of the WBS Activity 1.1.1.2.05.02. Potentially, alternate systems developed under WBS Activity 1.1.1.2.05.02 will be deployed in support of this demonstration.

Major end-item deliverables:

- Resolve Watch List tank safety issues through retrieval actions.
- Operate the Waste Retrieval Systems, achieving the established treatment and waste disposal goals.
- Complete M-45-00; "Complete Closure of all Single-Shell Tank Farms."
- Turnover all retrieval facilities to ERC for closure.

Acceptance criteria:

Achieving and maintaining regulatory and DOE Order compliance in the design and operation of waste retrieval systems.

C. STATEMENT OF WORK

Required activities over lifetime:

By providing design, procurement, construction, installation and site preparation, startup of equipment and facilities for retrieval operations permits the retrieval of waste from an SST tank farm (or equivalent number of tanks). Also provided is the overall project management, safety analysis, environmental permitting, operational readiness review, construction inspection, Quality Assurance, and training. (WHC/PNL)

Interfaces:

#	From This WBS To	Item Provided
1	All other TWRS program elements	This activity directly or indirectly supports all other TWRS program elements through retrieving tank waste as part of the actions necessary for the safe storage, treatment, and transfer of liquid waste in tank farms.
	To This WBS From	
1	1.1.1.2.02 Waste Tank Safety	Mitigating and resolving tank safety issues to achieve remediation through retrieval.
2	1.1.1.2.04 Characterization	Characterization of all single-shell tanks for waste retrieval operations.
3	1.1.1.2.03 Tank Farm Upgrades	Upgrades in tank farms in order to achieve retrieval actions.

Technologies to be assessed:

- Develop and test enhanced alternate waste retrieval systems
 - SST sluicing retrieval systems
- Evaluate and demonstrate alternative waste retrieval technologies and systems
 - SST arm retrieval systems
 - SST mixer pump systems
- Evaluate and test SST leak detection methods deployed during retrieval operations
- Evaluate and demonstrate subsurface barriers

Options to be considered:

- Alternate waste retrieval systems
 - Arm-based SST waste retrieval systems
 - Closure requirements options

D. OTHER LEGAL DRIVERS AND ORDER REQUIREMENTS

Reference "Tank Waste Remediation System Functions and Requirements", DOE/RL-92-60 Rev. 1, dated March 1994: Section 2.0 Tank Waste Remediation System Function and Requirement Descriptions, Table F4.2.1 Retrieve Waste, Item V Function Requirements, Paragraphs A and B; and Section 3 Tank Waste Remediation System Architecture, Table A4.2.1.3 Waste Retrieval System Item VIII Requirements Satisfied, Paragraphs B and C.

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Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.05 Waste Retrieval (M&O Contractor) 1.1.1.2.05.12 SST Closure Demonstration	2. DATE PREPARED August 29, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.05.12.01/VI	5. WBS ELEMENT TITLE Project Management	
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1210-0-OM	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1)	12. BUDGET AND REPORTING NUMBER(S) Expense Capital Line Item BW3130010	

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	0	0	0
CENRTC			
GPP			
LINE ITEM			
TOTAL	0	0	0

B. TECHNICAL BASES

Goals & objectives:

Provide the systems necessary to retrieve the waste from all tanks in a SST farm, or an equivalent number of tanks in multiple farms. This project will provide the retrieval hardware and support systems necessary to remove the waste from the tanks to a sufficient level to meet or exceed the 99% retrieval criteria specified in the TPA. The scope of this project includes: project management; technology development specific to this project; conceptual design; definitive design; safety and environmental permitting analysis and documentation; procurement of equipment and materials; modifications to the tanks and their service systems to support installation and operation of the retrieval systems; installation of the retrieval systems; startup preparations, training, and testing; inspection; and quality assurance. Dispose of solid waste generated during the tank modifications and installation of the retrieval hardware.

(R00227) D/C SST WR System

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

1. Complete conceptual design for the initial SST retrieval systems
2. Complete design for the initial SST retrieval systems (M-45-04-T02)
3. Complete construction for the initial SST retrieval systems (M-45-04-T03)
4. Provide initial single-shell tank retrieval systems (M-45-04-T01)

C. STATEMENT OF WORK

Required activities: N/A

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager		
Program Element Manager		
Activity Manager		
Program Business Representative		

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager		
Activity Manager		
Cost Account Manager		
Program Business Representative		

FDS Number _____

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.05 Waste Retrieval (M&O Contractor) 1.1.1.2.05.12 SST Closure Demonstration	2. DATE PREPARED August 29, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.05.12.02/VI	5. WBS ELEMENT TITLE Engineering							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1210-0-OM							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1)	12. BUDGET AND REPORTING NUMBER(S) <table border="0"> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3130010</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3130010		
Expense	Capital	Line Item						
EW3130010								

13. ELEMENT DESCRIPTION**A. COST CONTENT (Escalated Dollars)**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING			
CENRTC			
GPP			
LINE ITEM			
TOTAL	0	0	0

B. TECHNICAL BASES

Goals & objectives:

Provide the systems necessary to retrieve the waste from all tanks in a SST farm, or an equivalent number of tanks in multiple farms. This project will provide the retrieval hardware and support systems necessary to remove the waste from the tanks to a sufficient level to meet or exceed the 99% retrieval criteria specified in the TPA. The scope of this project includes: project management; technology development specific to this project; conceptual design; definitive design; safety and environmental permitting analysis and documentation; procurement of equipment and materials; modifications to the tanks and their service systems to support installation and operation of the retrieval systems; installation of the retrieval systems; startup preparations, training, and testing; inspection; and quality assurance. Dispose of solid waste generated during the tank modifications and installation of the retrieval hardware.

(R00227) D/C SST WR System

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

1. Complete conceptual design for the initial SST retrieval systems
2. Complete design for the initial SST retrieval systems (M-45-04-T02)
3. Complete construction for the initial SST retrieval systems (M-45-04-T03)
4. Provide initial single-shell tank retrieval systems (M-45-04-T01)

C. STATEMENT OF WORK

Required activities: N/A

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager		
Program Element Manager		
Activity Manager		
Program Business Representative		

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager		
Activity Manager		
Cost Account Manager		
Program Business Representative		

FDS Number _____

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.05 Waste Retrieval (M&O Contractor) 1.1.1.2.05.12 SST Closure Demonstration	2. DATE PREPARED August 29, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.05.12.03/VI	5. WBS ELEMENT TITLE Procurement							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1210-0-OM							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1)	12. BUDGET AND REPORTING NUMBER(S) <table border="0"> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3130010</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3130010		
Expense	Capital	Line Item						
EW3130010								

13. ELEMENT DESCRIPTION**A. COST CONTENT (Escalated Dollars)**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING			
CENRTC			
GPP			
LINE ITEM			
TOTAL	0	0	0

B. TECHNICAL BASES

Goals & objectives:

Provide the systems necessary to retrieve the waste from all tanks in a SST farm, or an equivalent number of tanks in multiple farms. This project will provide the retrieval hardware and support systems necessary to remove the waste from the tanks to a sufficient level to meet or exceed the 99% retrieval criteria specified in the TPA. The scope of this project includes: project management; technology development specific to this project; conceptual design; definitive design; safety and environmental permitting analysis and documentation; procurement of equipment and materials; modifications to the tanks and their service systems to support installation and operation of the retrieval systems; installation of the retrieval systems; startup preparations, training, and testing; inspection; and quality assurance. Dispose of solid waste generated during the tank modifications and installation of the retrieval hardware.

(R00227) D/C SST WR System

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

1. Complete conceptual design for the initial SST retrieval systems
2. Complete design for the initial SST retrieval systems (M-45-04-T02)
3. Complete construction for the initial SST retrieval systems (M-45-04-T03)
4. Provide initial single-shell tank retrieval systems (M-45-04-T01)

C. STATEMENT OF WORK

Required activities: N/A

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager		
Program Element Manager		
Activity Manager		
Program Business Representative		

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager		
Activity Manager		
Cost Account Manager		
Program Business Representative		

FDS Number _____

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.05 Waste Retrieval (M&O Contractor) 1.1.1.2.05.12 SST Closure Demonstration	2. DATE PREPARED August 29, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.05.12.04/VI	5. WBS ELEMENT TITLE Construction							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1210-0-OM							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1)	12. BUDGET AND REPORTING NUMBER(S) <table> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3130010</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3130010		
Expense	Capital	Line Item						
EW3130010								

13. ELEMENT DESCRIPTION**A. COST CONTENT (Escalated Dollars)**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING			
CENRTC			
GPP			
LINE ITEM			
TOTAL	0	0	0

B. TECHNICAL BASES

Goals & objectives:

Provide the systems necessary to retrieve the waste from all tanks in a SST farm, or an equivalent number of tanks in multiple farms. This project will provide the retrieval hardware and support systems necessary to remove the waste from the tanks to a sufficient level to meet or exceed the 99 % retrieval criteria specified in the TPA. The scope of this project includes: project management; technology development specific to this project; conceptual design; definitive design; safety and environmental permitting analysis and documentation; procurement of equipment and materials; modifications to the tanks and their service systems to support installation and operation of the retrieval systems; installation of the retrieval systems; startup preparations, training, and testing; inspection; and quality assurance. Dispose of solid waste generated during the tank modifications and installation of the retrieval hardware.

(R00227) D/C SST WR System

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

1. Complete conceptual design for the initial SST retrieval systems
2. Complete design for the initial SST retrieval systems (M-45-04-T02)
3. Complete construction for the initial SST retrieval systems (M-45-04-T03)
4. Provide initial single-shell tank retrieval systems (M-45-04-T01)

C. STATEMENT OF WORK

Required activities: N/A

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager		
Program Element Manager		
Activity Manager		
Program Business Representative		

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager		
Activity Manager		
Cost Account Manager		
Program Business Representative		

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.05 Waste Retrieval (M&O Contractor) 1.1.1.2.05.12 SST Closure Demonstration	2. DATE PREPARED August 29, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.05.12.05/VI	5. WBS ELEMENT TITLE Start-Up							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1210							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1)	12. BUDGET AND REPORTING NUMBER(S) <table> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3130010</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3130010		
Expense	Capital	Line Item						
EW3130010								

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING			
CENRTC			
GPP			
LINE ITEM			
TOTAL	0	0	0

B. TECHNICAL BASES

Goals & objectives:

Provide the systems necessary to retrieve the waste from all tanks in a SST farm, or an equivalent number of tanks in multiple farms. This project will provide the retrieval hardware and support systems necessary to remove the waste from the tanks to a sufficient level to meet or exceed the 99% retrieval criteria specified in the TPA. The scope of this project includes: project management; technology development specific to this project; conceptual design; definitive design; safety and environmental permitting analysis and documentation; procurement of equipment and materials; modifications to the tanks and their service systems to support installation and operation of the retrieval systems; installation of the retrieval systems; startup preparations, training, and testing; inspection; and quality assurance. Dispose of solid waste generated during the tank modifications and installation of the retrieval hardware.

(R00227) D/C SST WR System

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

1. Complete conceptual design for the initial SST retrieval systems
2. Complete design for the initial SST retrieval systems (M-45-04-T02)
3. Complete construction for the initial SST retrieval systems (M-45-04-T03)
4. Provide initial single-shell tank retrieval systems (M-45-04-T01)

C. STATEMENT OF WORK

Required activities: N/A

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Manager		
Program Element Manager		
Activity Manager		
Program Business Representative		

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager		
Activity Manager		
Cost Account Manager		
Program Business Representative		

FDS Number _____

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.05 Waste Retrieval (M&O Contractor)	2. DATE PREPARED August 28, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.05.13/V	5. WBS ELEMENT TITLE SST Closure							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1210-0-0N							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOED/RL-92-60 REV.1) 4.2.1.1 Store Waste 4.2.1.2 Characterize Waste 4.2.1.3 Retrieve Waste 4.2.1.4 Transfer Waste 4.2.3.2 Disposition Gaseous Effluents 4.2.3.4 Disposition Solid Waste	12. BUDGET AND REPORTING NUMBER <table> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3130010</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3130010		
Expense	Capital	Line Item						
EW3130010								

13. ELEMENT DESCRIPTION

A. COST CONTENT

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)	FY 1998 \$(000)	FY 1999 \$(000)	FY 2000 \$(000)	FY 2001 \$(000)
OPERATING							
CENRTC							
GPP							
LINE ITEM							
TOTAL	0	0	0				

B. TECHNICAL BASES

Goals and objectives:

- Provide facilities and equipment to retrieve wastes from SSTs not included in WBS element 1.1.1.2.05.12.
- SSTs to be retrieved and retrieval methods will be evaluated along with the degree of waste removal to allow turnover of SSTs for closure will be established during development and regulatory approval of the SST closure plan.

Major end-item deliverables:

- Operate the Waste Retrieval Systems, achieving the established treatment and waste disposal goals.
- Complete M-45-00; "Complete Closure of all Single-Shell Tank Farms."
- Turnover all retrieval facilities to ERC for closure.

Acceptance criteria:

Achieving and maintaining regulatory and DOE Order compliance in the design and operation of waste retrieval systems.

C. STATEMENT OF WORK

Required activities over lifetime:

Provide project management, engineering studies, design criteria development, conceptual design, definitive design, procurement, construction, engineering inspection, equipment installation, startup, safety analysis, and environmental permitting for retrieval of wastes from SSTs not included in the Tank Farm selected for initial closure to satisfy Tri-Party Agreement milestone M-45-05. (WHC/PNL)

Interfaces:

#	From This WBS To	Item Provided
1	All other TWRS program elements	This activity directly or indirectly supports all other TWRS program elements through retrieving tank waste as part of the actions necessary for the safe storage, treatment, and transfer of liquid waste in tank farms.
	To This WBS From	
1	1.1.1.2.02 Waste Tank Safety	Mitigating and resolving tank safety issues to achieve remediation through retrieval.
2	1.1.1.2.04 Characterization	Characterization of all single-shell tanks for waste retrieval operations.
3	1.1.1.2.03 Tank Farm Upgrades	Upgrades in tank farms in order to achieve retrieval actions.

Technologies to be assessed:

- Develop and test enhanced alternate waste retrieval systems
 - SST sluicing retrieval systems
- Evaluate and demonstrate alternative waste retrieval technologies and systems
 - SST arm retrieval systems
 - SST mixer pump systems
- Evaluate and test SST leak detection methods deployed during retrieval operations
- Evaluate and demonstrate subsurface barriers

Options to be considered:

- Alternate waste retrieval systems
 - Arm-based SST waste retrieval systems
 - Closure requirements options

D. OTHER LEGAL DRIVERS AND ORDER REQUIREMENTS

Reference "Tank Waste Remediation System Functions and Requirements", DOE/RL-92-60 Rev. 1, dated March 1994: Section 2.0 Tank Waste Remediation System Function and Requirement Descriptions, Table F4.2.1 Retrieve Waste, Item V Function Requirements, Paragraphs A and B; and Section 3 Tank Waste Remediation System Architecture, Table A4.2.1.3 Waste Retrieval System Item VIII Requirements Satisfied, Paragraphs B and C.

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.2 Manage Tank Waste 1.1.1.2.05 Waste Retrieval (M&O Contractor)	2. DATE PREPARED August 28, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.2.05.14/V	5. WBS ELEMENT TITLE Miscellaneous Underground Storage Tank Retrieval Systems							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1210-0-0P							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER / TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOED/RL-92-60 REV.1) 4.2.1.1 Store Waste 4.2.1.2 Characterize Waste 4.2.1.3 Retrieve Waste 4.2.1.4 Transfer Waste 4.2.3.2 Disposition Gaseous Effluents 4.2.3.4 Disposition Solid Waste	12. BUDGET AND REPORTING NUMBER <table> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3130010</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3130010		
Expense	Capital	Line Item						
EW3130010								

13. ELEMENT DESCRIPTION**A. COST CONTENT**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)	FY 1998 \$(000)	FY 1999 \$(000)	FY 2000 \$(000)	FY 2001 \$(000)
OPERATING							
CENRTC							
GPP							
LINE ITEM							
TOTAL	0	0	0				

B. TECHNICAL BASES

Goals and objectives:

Provide facilities and equipment to retrieve wastes from MUSTs. MUSTs to be retrieved and retrieval methods will be evaluated along with the degree of waste removal to allow turnover of MUSTs for closure will be established during development and regulatory approval of the MUST closure plan.

Major end-item deliverables:

- Operate the Waste Retrieval Systems, achieving the established treatment and waste disposal goals.
- Turnover all retrieval facilities to ERC for closure

Acceptance criteria:

Achieving and maintaining regulatory and DOE Order compliance in the design and operation of waste retrieval systems.

C. STATEMENT OF WORK

Required activities over lifetime:

By providing project management, technology development, engineering studies, design criteria development, conceptual design, definitive design, procurement, construction, engineering inspection, equipment installation, startup, safety analysis, and environmental permitting for retrieval of wastes from MUSTs for closure. (WHC/PNL)

Interfaces:

#	From This WBS To	Item Provided
1	All other TWRS program elements	This activity directly or indirectly supports all other TWRS program elements through retrieving tank waste as part of the actions necessary for the safe storage, treatment, and transfer of liquid waste in tank farms.
	To This WBS From	
1	1.1.1.2.04 Characterization	Characterization of all Miscellaneous Underground Storage Tanks for waste retrieval operations.
2	1.1.1.2.03 Tank Farm Upgrades	Upgrades in tank farms in order to achieve retrieval actions.

Technologies to be assessed:

- Assess/develop **MUST** waste retrieval technologies
 - Sluicing retrieval systems
 - Arm retrieval systems
- Evaluate and demonstrate alternative waste retrieval technologies and systems
- Evaluate and test leak detection methods deployed during retrieval operations

Options to be considered:

Closure requirements

D. OTHER LEGAL DRIVERS AND ORDER REQUIREMENTS

Reference "Tank Waste Remediation System Functions and Requirements", DOE/RL-92-60 Rev. 1, dated March 1994: Section 2.0 Tank Waste Remediation System Function and Requirement Descriptions, Table F4.2.1 Retrieve Waste, Item V Function Requirements, Paragraphs A and B; and Section 3 Tank Waste Remediation System Architecture, Table A4.2.1.3 Waste Retrieval System Item VIII Requirements Satisfied, Paragraphs B and C.

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Tank Waste Remediation System
Work Breakdown Structure Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1 Tank Waste Remediation System 1.1.1 TWRS Program/M&O Contractor	2. DATE PREPARED August 30, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.3/III	5. WBS ELEMENT TITLE Process Tank Waste	
6. WBS INDEX LINE NO. Not Used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1220-0, 1230-0, 1240-0, 1280-0-AB	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENT DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.2 Process Waste 4.2.3 Manage Systems Generated Waste & Excess Facilities	12. BUDGET AND REPORTING NUMBER Expense Capital Line Item EW3130010 35EW31301 39EW31301	

13. ELEMENT DESCRIPTION

The total WBS element cost is \$24,223,106,000.

The Process Tank Waste element consists of elements that pretreat tank waste (including double- and single-shell tank waste, line waste, and cesium and strontium capsules, if required) to separate the low-level, high-level, and transuranic (TRU) waste, and reusable materials fractions; immobilize the high-level waste and TRU fractions; and certify the immobilized wastes for disposal in a geologic repository. This includes interim storage of and load out capability for the immobilized high-level waste and TRU waste prior to offsite shipment. Waste excluded from processing is the underground storage tanks and support structures, production reactor fuel, radioactive waste at reactors, disposal facilities, transfer lines, and cribs, ponds, and ditches. The Process Tank Waste function is initiated upon waste retrieval for treatment and will continue until the last immobilized high-level waste/TRU package is shipped to a geologic repository.

Also included in the Process Tank Waste element is the management of waste and excess facilities generated during the process of remediating TWRS tank waste. Activities to be managed include immobilization of the low-level waste components, disposition of liquid and gaseous effluent, as well as solid waste and excess facilities, and the disposition of reusable materials. This effort includes management of miscellaneous waste and processing to transfer failed equipment like pumps and melters to the organization responsible for ultimate disposal. This activity will terminate when all tank waste is remediated and all excess facilities have been turned over to the site-level Deactivate Facilities for final cleanup and closure.

Process Tank Waste is comprised of the following elements:

- Waste Pretreatment (1.1.1.3.01)
- Low-Level Waste (1.1.1.3.02)
- High-Level Waste (1.1.1.3.03).

Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste (M&O Contractor)	2. DATE PREPARED August 22, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.01/IV	5. WBS ELEMENT TITLE Waste Pretreatment	
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1220	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER / TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV.1) 4.2.2 Process Waste 4.2.2.1 Pretreat Waste 4.2.2.1.1 Pretreat Sludges/Solids 4.2.2.1.2 Pretreat Supernatants	12. BUDGET AND REPORTING NUMBER Expense Capital Line Item EW3130010	

13. ELEMENT DESCRIPTION

A. COST CONTENT

Total cost of Waste Pretreatment is \$3,812,943,000.

B. TECHNICAL BASES

The functional products of Waste Pretreatment are pretreated supernatants and pretreated sludges/solids which meet the feed specifications of the low-level waste (LLW) and high-level waste (HLW) vitrification facilities, respectively. This program element is scheduled for completion in March 2022, six years and nine months ahead of the scheduled date of December 2028, contained in the Fourth Amendment of the Hanford Federal Facility Agreement and Consent Order (Tri-Party Agreement). Early completion of Waste Pretreatment is driven by the schedule needs of the Waste Retrieval program element to retrieve all single-shell tanks (SSTs) by September 2018 (M-45-05). Additional double-shell tank (DST) space would be needed to accumulate retrieved SST waste for the period between completion of waste retrieval and completion of waste pretreatment if the Tri-Party Agreement schedule of December 2028 were used. After the supernatants and sludges/solids have been pretreated, the respective facilities will be cleaned out and placed in a shutdown mode in preparation for decommissioning. The standard for cleanup of the facilities for decommissioning will be established by the Environmental Restoration Program. Initial standards for pretreatment of supernatants and sludges/solids will

be provided as preliminary feed specifications for the LLW and HLW vitrification facilities by the end of fiscal year 1994. Since a definitive feed specification is not available to meet the requirements of a low-shielded LLW vitrification facility and LLW disposal, the program element is proceeding at high risk in the near-term. The risk to HLW pretreatment is the uncertainty of the processing requirements to achieve a "reasonable" volume of HLW. The foregoing risks are increased due to the lack of sufficient characterization data on tank waste. Actions are being taken to reduce the risk by accelerating laboratory and bench-scale testing using actual waste and providing a hot pilot-scale testing capability for testing unit operations. The results of hot testing will be fed into trade studies to assist in validating the technical baseline assumed.

With respect to pretreated sludges/solids, two approaches bound the possible methods for separation of Hanford tank waste into low-activity and high-activity fractions for disposal. These approaches are minimum separations (in-tank sludge washing and enhanced sludge washing), which is the planning technical baseline selected, and minimum HLW/transuranic (TRU) volume (advanced sludge separations), which is an alternative. The selection of a waste separation approach is influenced requirements for deep geologic disposal of HLW and disposal of LLW. Geologic repository volume limitations have not been established. Therefore, uncertainty exists as to the acceptability of either approach for separation of tank waste. The planning baseline of minimum separations will be validated by laboratory and bench-scale testing using actual waste, parametric studies, and trade studies. An evaluation of the decision on whether advanced sludge separation processes are required to further minimize HLW/TRU volume is expected to be completed in March 1998 (TPA M-50-03). No risk to the cost or schedule baselines will be experienced if it is decided that minimum separations will result in a reasonable HLW/TRU volume. Significant risk to both the cost and schedule baseline would result from a decision to pursue advanced separations to minimize HLW/TRU volume.

With respect to pretreated supernatants, two approaches have been identified for removal of radionuclides from supernatant streams. These approaches are removal of cesium only, which is the planning technical baseline in the Tri-Party Agreement, and removal of other radionuclides, which is the alternative. The selection of a radionuclide removal approach is influenced by the design of the LLW vitrification facility and the requirements set forth in the performance assessment for disposal of LLW which are currently being prepared. The design concept of a low-shielded LLW vitrification facility influences the degree of cesium and strontium removal that must be achieved in the LLW pretreatment facility. The performance assessment for disposal of LLW influences the degree of technetium and TRU removal that must be achieved in the LLW pretreatment facility. If it is determined that strontium and/or TRU removal is needed, the plan for retrieval of tank waste can be adjusted to first retrieve and process waste requiring cesium removal only, while deferring retrieval of waste requiring strontium and/or TRU removal. This will provide additional time to develop and incorporate strontium and/or TRU removal processes into the LLW pretreatment facility. On the other hand, if technetium removal is required, it must be accomplished at the start of supernatant pretreatment because double-shell slurry feed (DSSF), the first waste to be pretreated, contains higher levels of technetium than wastes to be processed later. The tanks containing DSSF must be retrieved and processed first to free up DST space for storing/blending retrieved SST waste prior to pretreatment and for storing/blending pretreated supernatants prior to vitrification in the LLW vitrification facility. The risk to the technical baseline associated with strontium and/or TRU removal involves cost risk only. It is anticipated that the baseline schedule could be achieved because only a portion of the waste would require strontium and/or TRU removal. The risk to the technical baseline associated with technetium removal is a risk to both cost and schedule since this would require modifications to the LLW pretreatment facility and delay startup.

There are additional uncertainties that may result in technical, cost, or schedule risk. These include:

- Regulatory "creep," which may add requirements to the design, construction and operation of pretreatment facilities
- Ability of the Tank Farm infrastructure to support the numerous waste transfer and processing activities to support tank cleanup (e. g., retrieval, LLW pretreatment, HLW pretreatment, LLW vitrification, HLW vitrification, liquid evaporation, liquid effluent treatment and disposal, etc.).

- Maintaining design basis total operating efficiency (TOE) due to technical and conduct of operations issues
- Lack of sufficient tank space and/or waste transfer capability to blend waste feed to pretreatment facilities and vitrification facilities
- The possible need for one or more additional LLW forms to handle potential problems with the disposal of some chemicals in the pretreated supernatant
- Disposal of large quantities of radioactive solid waste and ion-exchange resins

The Waste Pretreatment Program Element is part of the Level III WBS element, Process Tank Waste, and is comprised of six Level V activities:

- 1.1.1.3.01.01, Technical Planning and Integration
- 1.1.1.3.01.02, Technology Development and Applied Engineering
- 1.1.1.3.01.03, Facility Operations
- 1.1.1.3.01.04, System Definition
- 1.1.1.3.01.05, W-236B LLW Pretreatment Facility
- 1.1.1.3.01.06, HLW Pretreatment

Goals and objectives:

Waste pretreatment will be required to partition HLW and TRU wastes stored in DSTs and SSTs. Product streams from waste pretreatment provide feed for LLW and HLW immobilization facilities. Waste pretreatment will develop required technologies, operate pretreatment facilities, and provide and operate hot test facilities for pretreatment technology development as well as provide feed materials for HLW vitrification waste form qualification. A strategy for liquid effluent treatment will be selected and implemented.

Major end-item deliverables:

- Design, construction and operation of LLW pretreatment facilities (Modules 1 and 2) and pretreatment of supernatants to provide feed to the LLW vitrification facility.
- Operation of in-tank processes to pretreat sludges/solids to provide feed to the HLW vitrification facility.
- Design, construction and operation of HLW pretreatment facility to process sludges/solids requiring additional pretreatment to meet HLW vitrification feed specifications and/or to further reduce the volume of HLW.
- Evaluation of enhanced sludge washing.
- Complete pretreatment processing of Hanford tank waste (TPA M-50-00), clean out and shut down pretreatment facilities, and turn over facilities to the Environmental Restoration Program for decontamination and decommissioning (D & D).

Acceptance criteria:

- Pretreated supernatants will meet the feed specifications of the LLW vitrification facility and the processing schedule requirements of Waste Retrieval and LLW vitrification.
- Pretreated sludges/solids will meet the feed specifications of the HLW vitrification facility and the processing schedule requirements of Waste Retrieval and HLW vitrification.

C. STATEMENT OF WORK

Activities leading to the completion of pretreatment processing of Hanford tank waste include the processing of the waste from the 149 SSTs, 28 DSTs, new DSTs, and liquid radioactive waste generated during tank cleanup operations.

Required activities over lifetime:

The Decision 4.2 "Determine Disposition of Tank Waste" will be documented in the Record of Decision to the TWRS Environmental Impact Statement, estimated to be available in October, 1996.

The Decision 4.2.2 "Determine Waste Processing Strategy" currently assumes that the alternative "Separate Waste Into Fractions" has been selected. That is the baseline utilized in the Waste Tank Pretreatment. The choice of this alternative is documented in the Hanford Federal Facility Agreement and Consent Order Tank Waste Decision Analysis WHC-EP-0617. The decision to select a waste processing strategy is predicated upon selecting retrieval of "all waste" from all Hanford radioactive tanks (or the majority of waste) as the preferred alternative for the decision "Determine Disposition of Hanford Tank Waste".

The Decision 4.2.3 "Determine System Generated Waste Disposal Strategy" has also been allocated to the Tank Waste Pretreatment Program Element. A decision is needed whether the treatment and disposition of system generated waste (e.g. low-activity fraction of tank waste, gaseous effluents, liquid effluents and solid waste) and excess facilities is part of the TWRS scope. If treatment and disposition of system generated waste and excess facilities is not part of the TWRS scope, then this scope needs to be assigned to other Hanford Site programs. The current planning basis for the technical baseline is that TWRS will treat the waste and then transfer it to the interfacing Hanford Site program. The choice of this alternative is documented in the TWRS Mission Analysis WHC-EP-0627, "Waste Minimization".

Pretreatment processing includes operation of the facilities described below. The functions executing the work include National Laboratories needed that develop processes used in the facilities; process and system engineers who establish the functions and requirements, develop process flowsheets, and prepare process specifications; Architect Engineer(s) who design and inspect facilities to be constructed; construction contractor(s) who construct facilities; and operations, maintenance, and engineering staff who operate, clean out and shut down the facilities for turnover to the Environmental Restoration Program for D & D.

- LLW Pretreatment Facility Module 1. This facility will be operated for approximately 16 years (December 2004 to March 2021) to remove cesium, and if required, technetium and strontium from tank waste. The resulting liquid LLW will be blended and stored to feed the LLW vitrification facility scheduled to initiate hot operations in June 2005 (TPA M-60-05). The liquid HLW separated from tank waste in the LLW pretreatment facility will be blended and stored to feed the HLW vitrification facility scheduled to initiate hot operations in December 2009 (TPA M-51-03). After completion of waste pretreatment the facility will be cleaned out and placed in a shutdown mode over a period of 12 months during which it will be prepared for decommissioning. At the end of this activity the facility will be turned over to the Environmental Restoration Program for decommissioning in approximately March 2022.
- LLW Pretreatment Facility Module 2. This facility will be operated for approximately 14 years (December 2005 to June 2020) to provide an increased processing capability. Module 2 will include additional separations capability to remove strontium and TRU from complexed waste, if required, for disposal of LLW. The resulting liquid LLW and HLW streams will be handled as described for Module 1. Facility cleanout and shut down will be handled as described above for Module 1, except turnover to the Environmental Restoration Program for decommissioning will occur approximately June 2021.

- **In-Tank Processing.** Preparations for in-tank processing are currently planned for September 1997 to October 1998. In-tank processing will be operated for approximately 21 years (November 1998 to June 2020). In-tank processing deals with separating the insoluble solids (containing most of the radionuclides) from the liquids (containing most of the cesium and other soluble compounds) using the existing and future underground waste tanks and Tank Farms infrastructure. The resulting pretreated solids will be blended and stored to feed the HLW vitrification facility, and the liquid LLW, including water used to wash the solids, and will be fed to the LLW pretreatment facilities (Modules 1 and 2) for removal of cesium and other radionuclides. Selected sludge/solids that may require additional pretreatment to reduce the volume of HLW or to meet HLW vitrification facility feed specifications, will be transferred to a HLW pretreatment facility for additional processing. Cleanout and turnover of the Tank Farm facilities to the Environmental Restoration Program is the responsibility of other program elements, Waste Pretreatment and Tank Farms Operations and Maintenance.
- **HLW Pretreatment Facility.** This facility will be operated for approximately 12 years (June 2008 to June 2020) to provide additional capability to pretreat HLW waste, if required. The resulting liquid LLW and HLW streams will be handled as describe for the LLW pretreatment facility (Module 1). After completion of HLW waste pretreatment, the facility will be cleaned out and placed in a shutdown mode over a period of 12 months during which is will be prepared for decommissioning. At the end of this activity the facility will be turned over to the Environmental Restoration Program for decommissioning in June 2021.

Interfaces:

#	From This WBS To	Item Provided
2	Low Level Waste (1.1.1.3.02)	Product stream from LLW Pretreatment
3	High Level Waste (1.1.1.3.03)	Product stream from HLW Pretreatment
	To This WBS From	Item Provided
1	Waste Tank Retrieval (1.1.1.2.05)	Tank waste for pretreatment
2	Characterization (1.1.1.2.04)	Sample data characterization for all Hanford tanks

Technologies to be assessed:

Technologies are being assessed to validate planning assumptions used to select technical baselines for the functional products, pretreated sludges/solids and pretreated supernatants. The main avenues used for assessing technologies are laboratory- and bench-scale testing of various technology options followed by pilot-scale testing of selected unit operations. Testing will be accomplished using both waste simulants and actual waste.

- **Pretreated Sludges/Solids.** Two approaches for pretreating sludges/solids are being investigated; minimum separations (sludge washing and enhanced sludge washing) and minimum HLW/TRU volume (advanced sludge separations). With respect to minimum separation, which is the planning baseline, the following technologies are being assessed in order of importance.
 - Washing HLW/TRU solids
 - Enhanced sludge washing (alkaline leach)

- Removing organics from sludge

With respect to minimum HLW/TRU volume, which is the alternative to the baseline, the following technologies are being assessed in order of importance, but not the level for the planning baseline above.

- Acid leach of sludge
 - Acid dissolution of sludge
 - Reconstitution of sludge
 - Removing HLW and TRU from acidic solutions
- Pretreated Supernatants. Two approaches for pretreating supernatants are being investigated: removal of cesium only and removal of cesium plus other radionuclides (strontium, technetium, TRU, etc.). With respect to cesium removal, which is the planning baseline, the following technologies are being investigated in order of importance.
 - Cesium ion-exchange
 - Separation HLW solids from liquids

With respect to other radionuclides, which is the alternative to the baseline, the following technologies are being assessed in order of importance, but not to the level for the planning baseline above.

- Removal of technetium from alkaline solutions
- Removing strontium and TRU from alkaline solutions

Other technologies which may merit assessment are recycling chemicals and decontaminating chemicals. If trade studies indicate a potential for cost savings, funding will be pursued for these technologies.

Options to be considered:

Major areas of the program where options have been identified are processing, facility configuration, and processing strategy.

- Processing. Options for processing to provide pretreated supernatants and pretreated sludges/solids as feed to the LLW and HLW vitrification facilities, respectively, are discussed below.

With respect to pretreatment of supernatants, the processing options being considered are listed below. All options include separation of solids from supernatant. Options for strontium and TRU removal may require removal of organics from the supernatant as well.

- Cesium removal (planning baseline)
- Cesium and strontium removal
- Cesium and technetium removal
- Cesium, technetium and strontium removal.

With respect to pretreatment of sludges/solids, the processing options being considered are listed below. All options to the planning baseline include sludge washing and enhanced sludge washing (caustic leach) as a precursor. These options may require removal of organics from the sludge as well.

- Sludge washing (planning baseline)
- Enhanced sludge washing (planning baseline)
- Acid leach of sludge
- Reconstitution of sludge

- Acid dissolution of sludge
- Removal of radionuclides from acid solutions
- Facility Configurations. The optional facility configurations being considered are documented in the TWRS Facility Configuration Study, WHC-SD-WM-ES-295, Rev. 0, trade study. The options are listed below. This study addresses decision 4.2.2.1.1 "Select Supernatant Pretreatment Facility Concept."
 - Combined LLW pretreatment and LLW vitrification (includes two cases: modules in a centralized configuration and a centralized location)
 - Combined LLW pretreatment and HLW vitrification
 - Combined LLW pretreatment, LLW vitrification and HLW vitrification
 - Standalone LLW pretreatment (includes three cases: modules in a centralized configuration; a centralized location; and dispersed modules)
- Processing Strategies. Optional processing strategies being considered include:
 - Number of LLW feed blends
 - Number of HLW feed blends
 - Water recycle

D. OTHER LEGAL DRIVERS AND ORDER REQUIREMENTS

Refer to DOE/RL-92-60, Rev 1, 31 March 1994, Tank Waste Remediation System Functions and Requirements:

- Section 2, item V, paragraph B, table F4.2.2.1
- Section 3, item VIII, paragraph C, table A4.2.2.1
- Page 2-155, table F4.2.2.

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WHC-SP-1101

Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.01 Waste Pretreatment (M&O Contractor)	2. DATE PREPARED September 23, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.01.01/Level V	5. WBS ELEMENT TITLE Technical Integration and Planning	
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1220-0-AA	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER / TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE-RL-92-60 REV.1) N/A	12. BUDGET AND REPORTING NUMBER Expense Capital Line Item EW3130010	

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)	FY 1998 \$(000)	FY 1999 \$(000)	FY 2000 \$(000)	FY 2001 \$(000)
OPERATING	1,916	1,969	2,028				
CENRTC							
GPP							
LINE ITEM							
TOTAL	1,916	1,969	2,028				

B. TECHNICAL BASES

Technical Integration and Planning provides overall program element planning for Waste Pretreatment through the end of waste pretreatment, which is currently scheduled to occur in FY 2022. This activity includes program element management, planning, and waste pretreatment support activities that are not project specific, including clerical and administrative support. Program financial control analysis and program scheduling are included in this activity.

Program element management and planning includes the following: development of baseline schedules, budgets, activity data sheets, multi-year program plan, and multi-year work plan (3 year plan). Also included are development of cost account authorizations and plans, program business management; budget, quality assurance, and safety review; and external review including DOE review committees, regulators and oversight groups. Pretreatment programmatic risk assessment is performed and maintained by this activity to assist in the prioritization and funding of tasks.

The Technical Integration and Planning activity is comprised of one level VI cost account:

- 1.1.1.3.1.01.01, Pretreatment Program Management

Goals and objectives:

Waste Pretreatment Technical Integration and Planning will be required to provide overall element management and planning for Tank Waste Pretreatment. Products that are included are Pretreatment program element input for the different required TWRS program planning documents including the multi-year (3 year) work plan and the multi-year program plan. The activity planning form is generated for the top level pretreatment program element (ADS 1220) and separate activity planning forms for pretreatment projects as needed and agreed upon with DOE. ADS 1280 is an example of this for the W-236B project. A Programmatic Risk Assessment will be performed in FY 1995 and maintained in subsequent years.

- Provide overall element management and planning for Tank Waste Pretreatment
- Develop Multi-Year program plan for Program Element
- Develop Multi-Year Work Plan (3 year plan) for Program Element
- Develop Activity Data Sheets for Program Element
- Programmatic Risk Assessment
- Monthly, quarterly, midyear reports
- Coordinate Sub-TAP

Major end-item deliverables:

- WHC milestones
- Pretreatment Input to TWRS Multi-Year Work Plan (3 year plan)
- Pretreatment Input to TWRS Multi-Year Program Plan (Technical, Schedule, and Cost Baseline)
- Completion of annual Pretreatment Activity Data Sheets
- Programmatic Risk Assessment
- Pretreatment Program Plan updates as needed
- Change Requests to maintain baseline

Acceptance criteria:

- Planning input shall be sufficient to support TWRS transmittal, DOE review and approval of technical, schedule, and cost baselines.
- Baselines shall be maintained and change requests prepared and implemented in a timely manner.

C. STATEMENT OF WORK

Required activities over lifetime:

- Perform Technical Integration & Planning (WHC)

Interfaces:

#	From This WBS To	Item Provided
1	1.1.1.1.01/Program Mgmt & Administration	Input to develop TWRS planning documents
2	1.1.1.1.01/Program Mgmt & Administration	Support to Cost Estimating Methodology
3	Technology Development Program Office	Integration of pretreatment technology development activities
	To This WBS From	
1	Pretreatment Sub-TAP (Technical Advisory Panel)	Input to incorporate into program strategy
2	1.1.1.01/Program Mgmt & Administration	Input from TWRS Program Office

Technologies to be assessed: N/A

Options to be considered:

- Technical Integration and Planning will consider privatization of some of the waste pretreatment activities.

D. OTHER LEGAL DRIVERS AND ORDER REQUIREMENTS

- Hanford Federal Facility Agreement and Consent Order, Tri-Party Agreement (TPA) Fourth Amendment, Washington State Department of Ecology, U.S. Environmental Protection Agency, and U.S. Department of Energy, Olympia, Washington, January, 1994, Milestones M-50-00.
- DOE, 1988 "Final Environmental Impact Statement for the Disposal of Hanford Defense High-Level, Transuranic and Tank Waste, Hanford Site, Richland, Washington, Record of Decision," Federal Register V 53(7.2) pp 12449-12453, U.S. Department of Energy, Washington D.C.
- Refer to DOE/RL-92-60, Rev 1, 31 March 1994, "TWRS Functions and Requirements"

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Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.01 Waste Pretreatment 1.1.1.3.01.01 Technical Integration & Planning (M&O Contractor)	2. DATE PREPARED September 23, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.01.01.01/VI	5. WBS ELEMENT TITLE Pretreatment Program Management	
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1220-0-AA	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV.1) 4.2.2 Process Waste 4.2.2.1 Pretreat Waste	12. BUDGET AND REPORTING NUMBER(S) Expense Capital Line Item EW3130010	

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	1,916	1,969	2,028
CENRTC			
GPP			
LINE ITEM			
TOTAL	1,916	1,969	2,028

B. TECHNICAL BASES

Goals & objectives:

Waste pretreatment program management will provide overall program element management and planning. This includes development of program plans and strategy documents that define the course of the program. Baseline schedules and budgets will be developed in support of the development of the TWRS business related planning documents, including the multi-year (3 year) work plans, the Program Master Schedule (PMS), i.e., multi-year program plan, and the annual Activity Data Sheet (ADS) submittal. In addition to providing inputs to these deliverables, cost account plans and schedules will be developed and maintained, and support to budget, quality assurance, safety, regulator and various oversight reviews will be provided. Ongoing pretreatment technical, schedule and cost baseline management will be performed. The pretreatment programmatic risk assessment will be developed and maintained to assist in the prioritization and funding of work activities. Participation in the public involvement program is included to obtain comments and public input on key activities and decisions affecting the Pretreatment program. Efforts to develop a cost estimating model and a cost estimating historical data base for TWRS will be supported. In addition, a basis of cost estimate study will be performed on the Pretreatment Facility Operations cost estimates in FY95 to account for new facility concepts and technology improvements. This planning includes contingency for a second cost account to facilitate anticipated rate adjustments throughout the year with no applicable deliverables (1D3102).

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

- Prepare and submit to the TWRS Program Office the following business plans for the Tank Waste Pretreatment Program:
 - Multi-year work plan for FYs 1996, 1997, and 1998.
 - Updates to the TWRS Program Master Schedule (PMS), i.e., multi-year program plans/baseline (technical, schedule and cost baseline).
 - The FY 1997, 1998, and 1999 ADSs, preparation of this activity is driven by the baseline data from the PMS.
 - Prepare and submit Pretreatment Facility Operations Cost Estimating Basis Report in FY 1995.
 - Develop and update the Programmatic Risk Assessment.
 - Pretreatment Program Plan/Technical Strategy updates as needed.
 - Schedule and conduct external review meetings with regulators, oversight groups and the public, to include participation in the Public Involvement Program.
 - Prepare monthly reporting documentation and submit to TWRS Program Office the following weekly/monthly reports:
 - Site Management System
 - Critical Issues
 - Monthly Performance Review
 - Prepare special presentations for financial, schedule, and technical issues.

C. STATEMENT OF WORK

Required activities:

This activity provides for the development of program plans and strategy documents that define the scope of the program as well as aid in the management and integration of the program element. Work scope that support this activity is as follows:

- Business plan preparation:
 - Provide guidance to Cost Account Managers (CAMs) in the preparation of the Pretreatment Program's business documentation.
 - Provide schedule and financial resources to prepare schedules and financial information supporting the CAMs in plan preparation.
 - Provide the Pretreatment Program integration prior to submittal of business plans to include reviews and incorporation of comments.
 - Submit business plans to the TWRS Program Office for submittal to RL and other customers.
 - Milestones
 - Prepare and submit the Multi-year work plan for FYs 1996, 1997, and 1998.
 - Prepare and submit annual updates to the TWRS Program Master Schedule.
 - Prepare and submit the FY 1997, 1998, and 1999 ADSs.
- Program Administration:
 - Prepare monthly reporting documentation and submit to TWRS Program Office, to include Site Management System data, Critical Issues, Monthly Performance Review, and various technical, financial, and schedule data for special presentations.
 - Participate in various external reviews, e.g., safety reviews, regulators and oversight groups such as SubTap and DNFSB, to include development of required information, coordinating and conducting meetings.
 - Develop and maintain cost account plans and schedules, status the Pretreatment integrated schedule and provide schedule and financial baseline status to WHC reporting systems, e.g., SMS, PTS, and MPR.
 - Review and comment on program deliverables, i.e, reports, engineering studies, and other milestone media.
- Planning/Guidance:
 - Develop key strategy documents (Pretreatment Program Plan and Programmatic Risk Assessment) to define the course of the program in terms of management risks, issues, and stakeholder interaction.
 - Review documentation produced in FY 1994 and make any required adjustments.
 - Resolve comments from reviewers.

- Milestones:
 - Develop and update the Programmatic Risk Assessment.
 - Pretreatment Program Plan/Technical Strategy updates as needed.
- Public Involvement:
 - Assist in the development of the TWRS public involvement plan, to include scheduling decision and status meetings with various stakeholders and the public.
- Cost Estimating:
 - Provide support to TWRS Program Management & Integration for the development of a method for generating cost estimates and the compilation of a cost estimating historical data base.
 - Perform additional study on the basis for cost estimates for the facility operations estimates including facility startup.
 - Milestones:
 - Provide continued support to TWRS Program Management & Integration for development of Cost Estimating Methodology for FY's 1995, 1996, and 1997. (10/03/94-09/29/95, 10/02/95-09/30/96, 10/01/96-09/30/97)
 - Prepare Analysis of LLW Pretreatment Facility Operations Costs (10/03/94).
 - Prepare Analysis of HLW Pretreatment Facility Operations Costs (11/01/94).
 - Prepare Analysis of In-Tank Processing Operations Costs (12/01/94).
 - Issue Waste Pretreatment Facility Operations Costs Study (03/01/95)

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	K. A. Gasper <i>KAGasper</i>	9/23/94
Activity Manager	K. A. Gasper <i>KAGasper</i>	9/23/94
Cost Account Manager	K. A. Gasper <i>KAGasper</i>	9/23/94
Project Control Analyst	P. R. Weinman <i>P.R. Weinman</i>	9/23/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	K. A. Gasper <i>KAGasper</i>	9/23/94
Activity Manager	K. A. Gasper <i>KAGasper</i>	9/23/94
Cost Account Manager	K. A. Gasper <i>KAGasper</i>	9/23/94
Project Control Analyst	P. R. Weinman <i>P.R. Weinman</i>	9/23/94

FDS Number

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Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.01 Waste Pretreatment 1.1.1.3.01.01 Technical Integration & Planning (M&O Contractor)	2. DATE PREPARED August 23, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.01.01.02/VI	5. WBS ELEMENT TITLE Pretreatment Program Management: Accounting Adjustments	
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1220-0-AA	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV.1) 4.2.2 Process Waste 4.2.2.1 Pretreat Waste	12. BUDGET AND REPORTING NUMBER(S) Expense Capital Line Item EW3130010	

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	N/A	N/A	N/A
CENRTC			
GPP			
LINE ITEM			
TOTAL	N/A	N/A	N/A

1.1.1.3.01.01.02

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B. TECHNICAL BASES

Goals & objectives:

The Pretreatment Program Management: Accounting Adjustments activity provides a cost account for collection of costs associated with accounting adjustments (passbacks) separate from the activities contained in the performance measurement baseline. Passbacks result from various rate adjustments that typically occur during the fiscal year.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS): N/A

C. STATEMENT OF WORK

Required activities:

There is no work scope associated with this activity. This activity exists to accommodate for accounting adjustments.

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	K. A. Gasper	
Activity Manager	K. A. Gasper	
Cost Account Manager	K. A. Gasper	
Project Control Analyst	P. R. Weinman	

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	K. A. Gasper	
Activity Manager	K. A. Gasper	
Cost Account Manager	K. A. Gasper	
Project Control Analyst	P. R. Weinman	

FDS Number
<u>1D3102</u>

Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.01 Waste Pretreatment (M&O Contractor)	2. DATE PREPARED September 23, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.01.02/V	5. WBS ELEMENT TITLE Technology Development & Applied Engineering	
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1220-0-AB	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER / TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.2.1	12. BUDGET AND REPORTING NUMBER Expense Capital Line Item EW3130010	

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)	FY 1998 \$(000)	FY 1999 \$(000)	FY 2000 \$(000)	FY 2001 \$(000)
OPERATING	16,702	16,026	15,493				
CENRTC	560	93	93				
GPP							
LINE ITEM							
TOTAL	17,262	16,119	15,586				

B. TECHNICAL BASES

The functional products of the Technology Development and Applied Engineering are essentially technical laboratory data on LLW and HLW pretreatment alternatives that will be used in trade studies to evaluate alternatives and provide information for the design of the selected alternatives. Priority will be given to developing data for the reference LLW and HLW pretreatment process and alternatives or enhancements that might reduce areas of high programmatic risk. This WBS activity is scheduled for completion in September, 2003.

With respect to developing data for the LLW pretreatment processes, laboratory work is focused on the development of the reference process - cesium ion exchange. In addition laboratory work is focused on the development of processes to remove strontium, technetium, and TRU from alkaline supernate. These are judged to be areas where there is high programmatic risk. The strontium and TRU are soluble to a relatively high degree in Hanford's highly complexed waste. Strontium may be at too high a level even in the Hanford waste that is less complexed. Technetium and neptunium (one specific TRU) may need to be removed to meet the performance assessment criteria for the final waste form due to their long half life and their mobility in the environment.

With respect to developing data for the HLW pretreatment processes, laboratory work is focused on the development of the reference process - enhanced sludge washing which consists of in-tank water washing and alkaline leaching. Since the reference process uses settle/decant as the primary solid/liquid separation method, laboratory work is also focused on this unit operation. One of the areas of significant risk is that the volume of high level waste produced from these reference processes is too high. To address this risk limited development of methods to improve the separation are being evaluated. These include thermal and non thermal methods to reconstitute the sludge and make selective non radioactive elements more soluble in alkaline waste so that they would report to the low level waste rather than the high level waste. Selective leaching on the acid side will also be evaluated on a limited basis. Dissolution in acid and subsequent removal of TRU, Sr and Cs from acid waste is also considered as an alternate sludge treatment approach.

Goals & objectives:

The objective for waste pretreatment technology is to establish the technical and process design baselines for the low-level waste (LLW) pretreatment facility (Project W-236B, Initial Pretreatment Module), high-level waste (HLW) pretreatment facility, and in-tank processing to ensure the Waste Pretreatment Program element fulfills the TWRS mission requirements. The development objective for pretreatment technology includes assuring processes for acceptable feeds are available in a timely and cost effective manner to meet the following goals:

- Use of low shielding when constructing and operating the LLW vitrification facility and producing a LLW vitrified waste form meeting the requirements for disposal as a LLW.
- Production of a HLW vitrified waste form meeting the requirements for geologic disposal.

Major end-item deliverables:

- Report on Non-thermal sludge reconstitution
- Report on laboratory tests of heat and digest process for in-tank complexant destruction
- Report on batch and column testing of candidate resins for strontium & technetium removal using actual and simulant waste.
- Report on carrier precipitation laboratory tests
- Engineered form of CST
- Report on sludge dissolution of actual sludges
- Report on results of continuation bench scale solvent extraction tests
- Report on batch CST IX media for cesium removal using actual waste
- Reports on sludge washing and alkaline leaching of actual waste

- Report on sludge settling of actual waste

Acceptance criteria:

- Laboratory verification that the processes, products, systems, and operating parameters developed under this element will be an acceptable product at the required capacity.

C. STATEMENT OF WORK

Required activities over lifetime:

- LLW Pretreatment
 - An engineered form of crystalline silicotitanate will be developed and tested in small laboratory batches using actual waste.
 - Limited testing on the effect of destroying complexants by chemical oxidation will be performed on actual highly complexed waste.
 - Small scale laboratory batch tests will be conducted on carrier precipitation (ferric and ferrous hydroxide), sodium titanate, and CST to remove TRU from supernate. These tests will be carried out for all TRU on highly complexed waste and for neptunium on the less complexed DSS/DSSF.
 - Small scale laboratory batch tests will be conducted on ion exchange for strontium removal using synthetic and actual waste on highly complexed waste. If these tests demonstrate promise column tests will be conducted on simulant and actual waste. Precipitation of strontium from DSS/DSSF as well as highly complex waste will be tested in small batches using actual waste.
 - Technetium removal tests using small laboratory columns will be conducted on synthetic and actual waste using Reillex resin and/or promising anion exchange resins. Enhanced elution techniques will be explored to minimize secondary waste generation.
- HLW pretreatment
 - Liter size settling tests will be conducted on actual sludges to determine settling rate, degree of compaction, and particle size distribution of suspended solids after settling. Tests will be performed after each washing step and alkaline leach step. If settling proves unacceptable flocculents will be explored.
 - Gram size washing tests will be conducted on actual sludges to determine material balances of this process step.
 - Gram size alkaline leaching tests will be conducted on actual sludges to determine material balances for this process step. If specific components are identified as problematic, attempts will be made to enhance this leaching effort. For example, insoluble Chromium (III) might be oxidized with potassium permanganate to soluble Chromium (VI) to enhance the leaching of this limiting glass constituent. Limited acid leaching tests or other selective leaching tests will be conducted on actual sludges if other problematic constituents are identified.
 - Gram size non thermal reconstitution tests will be conducted on actual sludges if problematic components are identified in the alkaline leaching tests. These non thermal tests will consist of acidification and reneutralization followed by additional alkaline leaching.
 - Small scale batch and continuous tests will be performed on dissolved sludge to remove

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radionuclides from acid waste.

Interfaces:

#	From This WBS To	Item Provided
1	Systems Definition (1.1.1.3.01.04)	Data on Sludge Treatment to Support completion of TPA M-50-03
2	HLW Pretreatment (1.1.1.3.01.06)	Data on Sludge treatment alternatives
3	W236B Pretreatment Facility (1.1.1.3.01.05)	Data on Organic complexant destruction technologies
4	HLW Pretreatment (1.1.1.3.01.06)	Data on Organic complexant destruction technologies
5	W236B Pretreatment Facility (1.1.1.3.01.05)	Data on Cesium Ion Exchange technologies
6	W236B Pretreatment Facility (1.1.1.3.01.05)	Data on Separation technologies for other LLW processes
	To This WBS From	
	Characterization (1.1.1.2.04)	Data on Characterization and samples of tank waste

Technologies to be assessed:

- Separating HLW solids from liquids.
- Removing cesium from alkaline solutions.
- Removing strontium from alkaline solutions.
- Removing transuranics from alkaline solutions.
- Removing technetium from alkaline solutions.
- Washing HLW/TRU solids.
- Alkaline leach of sludge.
- Acid leach of sludge.
- Thermal & Non-thermal Reconstitution of sludge.
- Dissolution of sludge followed by radionuclide removal on acid side

Options to be considered:

- Options for separating sludge from solutions include:
 - Solids settling (Flocculents will be tested if settling rate is low)
 - Filtering solution
- Options for removing cesium from alkaline solutions include:
 - Crystalline Silicotitanates
- Options for destroying organic complexants for LLW processing include:
 - Chemical oxidation
 - Heat and digest

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- Options for removing strontium from alkaline solutions include:
 - Ion exchange using either elutable or non-elutable resins
 - Other solid sorbents
- Options for removing TRU from alkaline solutions include:
 - Carrier precipitation
 - Chromatographic column
- Options for removing technetium from alkaline solutions include:
 - Column separation using commercially available ion exchange resin
- Options for reconstituting sludge include:
 - Acidification and reneutralization
- Options for washing sludge include:
 - Water washing
 - Leaching and metathesis with basic solutions
 - Leaching and metathesis with dilute acidic solutions

D. OTHER LEGAL DRIVERS AND ORDER REQUIREMENTS

- (a) Hanford Federal Facility Agreement and Consent Order, Tri-Party Agreement (TPA) Fourth Amendment, Washington State Department of Ecology, U.S. Environmental Protection Agency, and U.S. Department of Energy, Olympia, Washington, January, 1994, Milestones M-50-00.
- (b) DOE, 1988 "Final Environmental Impact Statement for the Disposal of Hanford Defense High-Level, Transuranic and Tank Waste, Hanford Site, Richland, Washington, Record of Decision," Federal Register V 53(7.2) pp 12449-12453, U.S. Department of Energy, Washington D.C.

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Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.01 Waste Pretreatment 1.1.1.3.01.02 Technology Dev & Applied Engineering (M&O Contractor)	2. DATE PREPARED September 23, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.01.02.01/Level VI	5. WBS ELEMENT TITLE LLW Pretreatment Development for Reference Process							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1220-0-AB							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT(DOE/RL-92-60 REV. 1) 4.2.2 Process Waste 4.2.2.1.2 Pretreat Waste	12. BUDGET AND REPORTING NUMBER(S) <table style="width: 100%; border: none;"> <tr> <td style="text-align: left;">Expense</td> <td style="text-align: left;">Capital</td> <td style="text-align: left;">Line Item</td> </tr> <tr> <td>EW3130010</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3130010		
Expense	Capital	Line Item						
EW3130010								

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	2,493	1,045	435
CENRTC			
GPP			
LINE ITEM			
TOTAL	2,493	1,045	435

B. TECHNICAL BASES

Goals & objectives:

The primary goal of this Cost Account is to develop the reference LLW pretreatment process. The primary function of the reference process is cesium removal using an ion exchange process. The specific objective of this cost account is to develop a third higher capacity non-regenerable IX media-crystalline silicotitanate and subsequently develop preliminary engineering data for this new IX material, and to provide engineering data on the electrochemical elution for the two regenerable organic IX resins (phenol-formaldehyde and resorcinol-formaldehyde). Small scale batch testing and column testing will be used on simulants and actual waste to provide this engineering data. Early focus will be given to testing with actual DSSF the first supernate that will be processed through the LLW pretreatment facility.

The removal of cesium may be required to allow the LLW melter to be "lightly-shielded", and is currently required to make the LLW a Class C waste. Furthermore, precedents have been set at West Valley and Savannah River for producing a Class A LLW waste for disposal. If the Class A limit is required at Hanford, or if a "lightly-shielded" low level melter is selected, cesium removal requirements will be more stringent. For development purposes it is conservatively assumed that Cs-137 removal must lower its concentration to less than 0.1 Curies per cubic meter in the final waste form. Final decision on the type of cesium-removal process must be made prior to initiating Title I design for Module 1 of the LLW pretreatment facility--scheduled to start December 1996 (Driver TPA M-50-01-T02 by 12/31/96). The decision will compare the relative effectiveness and efficiency of removing cesium-137 (and in some cases other radionuclides: strontium-90, TRU) and efficacy of disposing of the spent resin, as appropriate, in the HLW glass or elsewhere. A decontamination factor of 2,000-3,000 is needed to meet the 0.1 Currie per cubic meter target. A decontamination factor of near 10,000 may be required on some waste types.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

- Manufacture 1.0 Kg of the engineered form of CST at UOP facilities. 6/30/95
- Issue a report on batch testing of engineered form of CST using actual DSS/DSSF waste. 9/30/95
- Issue a report on electrochemical elution of R-F and CS-100 resin after loading with synthetic waste. 9/30/95 .
- Issue a report on electrochemical elution of R-F or CS-100 resin after loading with actual waste. 9/30/96

C. STATEMENT OF WORK

Required activities:

- Develop engineered form of CST (SNL).

The crystalline silicotitanate (CST) has shown promise at having a higher capacity than existing resins, however, it is available only in a powder form which is unacceptable for column operation. This task continues FY 94 work to develop an engineered form at UOP. Pilot size quantities (nominally 1.0 Kg) of engineered form will be produced at UOP. After verification of performance by SNL, samples will be provided to PNL for radioactive testing (PTW0635).

- Conduct batch tests of engineered form of CST using DSS/DSSF feed (PNL).

PNL will conduct batch tests of the engineered form using actual waste. The first waste to be tested is DSS/DSSF. These tests will verify the cesium capacity of the resin (PTW0640 and PTW0610).

- Conduct column tests loaded with R-F & CS-100 resin using simulated waste.

Proof of principal test will be conducted for electrochemical elution. Simulated waste will be loaded on columns of R-F and CS-100 resin and eluted with the aid of electrochemical means (PTW0600).

- Conduct column tests loaded with either R-F or CS-100 resin using actual waste.

The applicability of using electrochemical elution will be verified with these tests. Actual waste will be loaded on columns of either R-F or CS-100 resin and eluted with the aid of electrochemical means. Engineer design data will be obtained from these tests. (PTW0605)

Technologies to be assessed:

Cesium removal by ion exchange for CST.

Electrochemical elution of CS-100 and R-F resin.

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	K. A. Gasper <i>KAGasper</i>	9/23/94
Activity Manager	J. N. Appel <i>John N. Appel</i>	9/23/94
Cost Account Manager	J. T. Slankas <i>John T Slankas</i>	9/23/94
Project Control Analyst	P. R. Weinman	

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	K. A. Gasper <i>KAGasper</i>	9/23/94
Activity Manager	J. N. Appel <i>John N. Appel</i>	9/23/94
Cost Account Manager	J. T. Slankas <i>John T Slankas</i>	9/23/94
Project Control Analyst	P. R. Weinman <i>Paul R Weinman</i>	9/23/94

FDS Number
<u>1D3201</u>

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Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Waste 1.1.1.3.01 Waste Pretreatment 1.1.1.3.01.02 Technology Development & Applied Engineering (M&O Contractor)	2. DATE PREPARED August 23, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.01.02.02/Level VI	5. WBS ELEMENT TITLE LLW Pretreatment Development for Enhancements and Alternates	
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1220-0-AB	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV.1) 4.2.2 Process Waste 4.2.2.1 Pretreat Waste 4.2.2.1.2 Pretreat Supernates	12. BUDGET AND REPORTING NUMBER(S) Expense Capital Line Item EW3130010 35EW31301	

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	3,984	2,411	1,467
CENRTC	50	93	93
GPP			
LINE ITEM			
TOTAL	4,034	2,504	1,560

1.1.1.3.01.02.02

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B. TECHNICAL BASES

Goals & objectives:

The primary goal of this cost account is to develop enhancements and alternatives to the reference LLW pretreatment process. The specific objective of this cost account is to select the most promising technologies and develop engineering data for these processes which will remove strontium, TRU and technetium from supernate or dissolved salt cake.

The removal of strontium may be required to (1) allow the LLW melter to be "lightly-shielded", and (2) make the LLW a Class C waste. The first constraint is believed to be much tighter. It is assumed that strontium removal must lower its concentration to one Curie per cubic meter in the final waste form. The decision on the need to remove Sr from noncomplexed wastes and, if needed, the process to remove Sr must be made prior to initiating Title 1 design for module 1 of the LLW pretreatment facility, scheduled to start December 1996 (Driver TPA M-50-01-T02 by 12/31/96). The similar decision on the need to remove Sr from highly complexed (CC) waste and the removal process, if needed, must be made for module 2 by January 1998.

The removal of transuranic (TRU) radionuclides from the supernatant and the solutions from sludge leaching/metathesis and washing may be required to (1) make the LLW a Class C waste and (2) alleviate performance assessment problems for the LLW glass due to migration of TRU, primarily NpO_2^+ ion, into the environment. The decision on the need to remove neptunium (most probably in the +5 valence state as $\text{NpO}_2^+ + 5$ ion) from the DSSF waste and, if needed, the process to remove neptunium must be made prior to initiating Title 1 design for module 1 of the LLW pretreatment facility scheduled to start December 1996 (submission required by Driver TPA M-50-01-T02 by 12/31/96). Developments for these modules will be based on (1) the relative effectiveness, efficiency, and robustness of the systems for removing not only TRU, but also, in some cases, Sr-90 and/or Cs-137 (a potential strength of the crystalline silicotitanate), and (2) the disposition of the product after treatment. The need to remove total TRU from CC waste and the process for removal must be complete before the initiation of Title I. of module 2 scheduled for January 1998.

The removal of technetium from the supernatant and the solutions from sludge leaching/metathesis and washing may be required to meet performance assessment problems for the LLW glass due to migration of technetium. Technetium has a long half life (210,000 years) and is mobile in the environment. The decision on the need to remove technetium from waste must be made prior to initiating Title 1 design for module 1 of the LLW pretreatment facility scheduled to start December 1996 (submission required by Driver TPA M-50-01-T02 by 12/31/96). Process selection and development should be completed by 12/31/97 so that Driver TPA M-50-01, Start Construction of LLW Pretreatment Facility, can be met by 11/30/98.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

- Issue reports on Strontium removal tests using IX. 9/95, 9/97
- Issue a report for removing Strontium and TRU from actual waste using the following processes:
 - Heat and Digest 9/95
 - Permanganate Oxidation 9/95
- Issue a report on alternate Strontium removal tests. 9/95
- Issue draft reports for Technetium removal tests using Reillex™ anion exchange resin. 9/95, 9/97
- Issue a draft report for alternate Technetium removal techniques. 9/95

C. STATEMENT OF WORK

Required activities:

1. Conduct batch and column IX tests for Strontium removal from synthetic and actual DSS/DSSF waste that has had the Cesium removed (LANL).

In a continuation of work, experimental investigations will address the feasibility/utility of using promising resins (identified in the FY94 work) for ion exchange removal of strontium from waste solutions. Batch and column tests will be conducted on actual supernatant waste, most probably double shell slurry feed and complexant concentrate wastes that have had the cesium removed in previous ion exchange tests at PNL. Column tests with synthetic waste will be done to verify the process (PTW0300 & PTW0305).

2. Conduct batch tests with actual CC waste of heat and digest process and permanganate oxidation (PNL).

Experimental investigations will address the feasibility/utility of destroying complexants using heat-and-digest and permanganate oxidation. Emphasis should be on using actual complexant concentrate (CC) tank waste in small batch modes (PTW0700).

3. Conduct batch and column solid sorbent tests with synthetic and actual DSS/DSSF and CC waste to remove Strontium.

Experimental investigations will address the feasibility/utility of using solid sorbents. Batch and column sorbent tests for strontium removal will be conducted on actual supernatant waste, most probably double shell slurry feed and complexant concentrate wastes that have the cesium removed at PNL. This will probably not occur until the second half of the year when samples are expected to be available. Available quantities should be in the range of several hundred or more milliliters. In preparation for these tests, cold batch testing should be conducted during the first half of the year with sodium titanate, pillared clays, or complexants bound on solid supports. DSSF-7 and CC waste simulants should be used for these cold tests (PTW0315 & PTW0320).

4. Conduct batch carrier precipitation tests and sodium Titanate adsorption tests to remove TRU from actual DSSF and CC wastes (LANL).

Precipitation tests for Np removal will be conducted on diluted actual DSS/DSSF that has had the cesium removed at PNL. These precipitation tests will occur during the second half of the year when actual waste samples in quantities of several hundred milliliters or more should be available from PNL. In preparation for these tests, simulant testing should be conducted during the first half of the year with ferrous/ferric hydroxide as the carrier precipitant. Sodium titanate should also be tested to determine its effectiveness at absorbing TRU from actual DSSF and CC wastes (PTW0325).

5. Conduct column IX tests for Technetium removal using synthetic and actual DSSF waste.

Batch and column tests for technetium removal will be conducted on diluted actual DSS/DSSF that has had the cesium removed at PNL. These technetium removal tests will occur during the second half of the year when actual waste samples in the

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quantities of several hundred milliliters should be available. In preparation for these tests, simulant testing should be conducted during the first half of the year with Reillex™ resin. Emphasis should be placed on both loading and eluting the ion exchange column, using enhanced techniques developed in 1994 (PTW0330 & PTW0335).

6. Conduct batch tests on alternate techniques for Technetium removal using synthetic and actual DSSF waste.

Alternate techniques suitable for technetium removal should be investigated. Limited tests will be conducted on diluted actual DSS/DSSF that has had the cesium removed at PNL. Only batch tests will be run. This will occur during the second half of the year when actual waste samples in quantities of several hundred milliliters should be available. In preparation for these tests, DSSF-7 simulant testing should be conducted during the first half of the year with candidate materials. This work will merge with technetium removal efforts in FY96 (PTW0340 & PTW0345).

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	K. A. Gasper	
Activity Manager	I. E. Reep	
Cost Account Manager	J. N. Appel	
Project Control Analyst	P. R. Weinman	

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	K. A. Gasper	
Activity Manager	I. E. Reep	
Cost Account Manager	J. N. Appel	
Project Control Analyst	P. R. Weinman	

FDS Number
<u>1D3202</u>

**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.01 Waste Pretreatment 1.1.1.3.01.02 Technology Dev & Applied Engineering (M&O Contractor)	2. DATE PREPARED September 23, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.01.02.03/VI	5. WBS ELEMENT TITLE HLW Pretreatment Development for Reference Process							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1220-0-AB							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV.1) 4.2.2 Process 4.2.2.1 Pretreat Waste	12. BUDGET AND REPORTING NUMBER(S) <table border="0"> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3130010</td> <td>35EW31301</td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3130010	35EW31301	
Expense	Capital	Line Item						
EW3130010	35EW31301							

13. ELEMENT DESCRIPTION**A. COST CONTENT (Escalated Dollars)**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	8,920	7,267	7,275
CENRTC	510	0	
GPP			
LINE ITEM			
TOTAL	9,430	7,267	7,275

B. TECHNICAL BASES

Goals & objectives:

The primary goal of this cost account is to develop the reference high level waste pretreatment process. The primary functions of the reference process are solid/liquid separations, sludge washing, and alkaline leaching. This cost account will develop engineering data for processes used to accomplish these functions.

The separation of high-level waste (HLW) tank liquid supernates, sludge leaching/metathesis solutions, and washing solutions from sludge is necessary for subsequent processing of these liquids to a low-level waste (LLW) glass. The solid/liquid separations is required not only to achieve adequate decontamination of the liquid phase from transuranics (TRUs) and Sr, which are concentrated in the solid phase, but also to provide a solids-free feed stream to Cs and possibly Sr separation processes, most probably solid sorbents, so that those processes can operate properly. The primary solid/liquid separation will be made in-tank by settling solids and decanting the liquid phase. This will provide a gross separation of phases; however, the liquid phase will still contain some suspended solids and require additional solids removal. This second "polishing" phase separation will probably use filtration technology. Development of solid/liquid methods must complete to support Title I design for module 1 and module 2 of the LLW pretreatment facility. Driver TPA M-50-01-T02 requires submission of conceptual design and initiation of definitive design (Title I of module 1) of the LLW Pretreatment Facility by 12/31/96. Title I of module 1 will be initiated in December 1996 and Title I of module 2 will be initiated in January 1998. This effort also provides data for the design of the HLW Pretreatment Facility. Title 1 of the HLW Pretreatment Facility will be initiated in November 1998 (TPA M-50-04-T02).

Washing of sludge with water, leaching, and metathesis of sludge with caustic is necessary to dissolve salts and recover the interstitial liquid, containing dissolved salts from the water-insoluble sludge components. In this manner these dissolved salt components do not contribute to the volume of the HLW glass produced on vitrification of the sludge. Leaching and metathesis steps may be performed both (1) after initial washing of the sludge and (2) as part of enhanced sludge washing operations that include a series of washing/leaching and metathesis steps. Data on the effectiveness of washing, leaching and metathesis must be representative for all waste types and must be in place 6 months before the evaluation of the effectiveness of enhanced sludge washing (M-50-03, March 1998). Consequently these data are required by September 1997. Effectiveness and efficiency of removing sludge components must be specified to allow estimate of resulting HLW volumes. Reagent concentrations, operating conditions, and equipment must also be specified then. Data on the effectiveness for enhanced sludge washing (including alkaline leaching and metathesis) for all cores should be available prior to or shortly after starting Title 1 design on the HLW Pretreatment Facility scheduled to start November 1998 (Driver TPA M-50-04-T02).

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

- Issue draft reports on sludge washing/alkaline leaching tests at PNL 9/30/95, 9/30/96, 9/30/97
- Issue draft reports on sludge washing/alkaline leaching tests at LANL 9/30/95, 9/30/96, 9/30/97
- Issue a report on findings from the sludge science and chemistry program (PNL)
- Issue a report on the selective leaching of actual tank sludges (PNL)
- Issue reports on settling tests

C. STATEMENT OF WORK

Required activities:

- Conduct sludge wash/alkaline leach tests of actual tank waste for 94-95 sample cores and for 95-outyears cores (available cores split between PNL & LANL).

This activity will consist of conducting laboratory tests on small samples (approximately 5 grams) of actual waste from a variety of sludges to determine the extent of removal of water soluble components when washed with inhibited (for corrosion) water. Component material balances will be determined after this water wash step. Laboratory bench top testing will continue over a wide range of experimental conditions that will include both varying the concentrations of caustic and varying the periods of time for reaction. Operating temperature will be nominally 100 degrees Celsius. Studies will determine the effects on solubilizing phosphates, aluminum, and chromium. Test-tube level experiments will again be the major focus of this caustic leach. Component material balances should also be determined as part of caustic leach investigation. (Includes schedule activities PTW5000, PTW5005, PTW5010, and PTW5015).

- Evaluate sludge processing science for actual sludge, 94-95 and 95 - outyears.

Basic understanding of the chemical and physical properties which govern the leaching and metathesis of Hanford tank waste sludges is critical to evaluation and optimization of the technique. Processes ranging from chemical kinetics to ion interactions in solutions and on surfaces to transport processes governing solubility mechanism are only some of the considerations which must be made. Both experimental test and theoretical modelling efforts will be involved. (Includes schedule activities PTW5040 and PTW5045).

- Conduct selective leaching experiments of actual sludges 94-95 and 95 - outyears (PNL).

Laboratory bench top testing on a variety of sludges will be necessary over a wide range of experimental conditions. Investigations will include use of specific reagents, varying the periods of time for reaction, and varying temperature. Studies will determine the effects on solubilizing phosphates, aluminum and chromium. Reagents include dilute acid mixes, alkaline oxidants such as potassium permanganate, carbonate/hydroxide mixes, etc. Determination of the effects of processing conditions on the leaching of all sludge components will be a major goal. Test-tube level experiments will be the major focus of activities; however, larger scale experiments will be necessary to the later phases (definitely in 1997). Component material balances should be determined as part of this effort. (Includes schedule activities PTW5050 and PTW5055).

- Conduct sludge settling tests of actual waste, 94-95 and 95 - outyears cores.

Focus on activities will be on the characterization of real sludges, washed alkaline leached, and re-washed to characterize settling times, compaction and particle-size density/distribution in the supernate. Sample size has nominally been established as 1.0 liter sludge to ensure proper scaling behavior. Effectiveness of settling agents will also be assessed to determine effects on settling times and compaction, if settling times are less than 1 to 2 inches per day. Characterization of the particles in the supernate is necessary to evaluate/test techniques to remove the suspended particle matter. (Includes schedule activities PTW5060 and PTW5065).

- Establish a Radioactive Colloid Test Capability and conduct radioactive colloid tests (FY96, 97).

A capability for radioactive colloid studies will be established and investigations of colloid

formation/behavior in the supernatant will be performed. The goal is to determine the significance of sludge components going into or being in colloids that can not be readily separated because of their extremely small size. Additionally colloids and radionuclides often attach to each other, making the separation/isolation/extraction of radionuclides more difficult. (Includes scheduled activities PTW5080 and PTW5085).

- **Program management 95 and 96-97.**

This account specifically provides for oversight program management at both PNL and LANL where a number of diverse pretreatment projects will be performed by a number of different investigators. (Includes scheduled activities PPTW5070z and PTW5075z).

- **Infrastructure support.**

This account provides the support for special shipping of radioactive materials on and off the Hanford site, support for specific pretreatment development sampling and handling, purchase of shipping containers both Type A and Type B as necessary, etc. (Includes scheduled activities PTW5090z).

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	K. A. Gasper <i>K.A. Gasper</i>	9/23/94
Activity Manager	J. N. Appel <i>John N. Appel</i>	9/23/94
Cost Account Manager	J. T. Slankas <i>John T. Slankas</i>	9/23/94
Project Control Analyst	P. R. Weinman <i>Paul R. Weinman</i>	9/23/94

COST ACCOUNT AUTHORIZATION		
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Program Manager	K. A. Gasper <i>K.A. Gasper</i>	9/23/94
Activity Manager	J. N. Appel <i>John N. Appel</i>	9/23/94
Cost Account Manager	J. T. Slankas <i>John T. Slankas</i>	9/23/94
Project Control Analyst	P. R. Weinman <i>Paul R. Weinman</i>	9/23/94

FDS Number

1D3203

Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.01 Waste Pretreatment 1.1.1.3.01.02 Technology Dev & Applied Engineering (M&O Contractor)	2. DATE PREPARED September 23, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.01.02.04/VI	5. WBS ELEMENT TITLE HLW Pretreatment Development for Enhancements and Alternatives							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1220-0-AB							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.2 Process Waste 4.2.2.1	12. BUDGET AND REPORTING NUMBER(S) <table border="0"> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3130010</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3130010		
Expense	Capital	Line Item						
EW3130010								

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	1,305	5,303	6,316
CENRTC			
GPP			
LINE ITEM			
TOTAL	1,305	5,303	6,316

1.1.1.3.01.02.04

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B. TECHNICAL BASES

Goals & objectives:

The primary goal of this cost account is to develop enhancements and alternatives to the reference HLW pretreatment process. The specific objective of this cost account is to select the most promising technologies and develop engineering data for these processes which will remove radionuclides from sludge so that a smaller portion of the sludge may be disposed in the HLW. Potential alternatives being investigated include reconstitution of the sludge by acid dissolution, reneutralization and subsequent alkaline leaching; and acid dissolution followed by separation of radionuclides by solvent extraction or ion exchange.

The current U.S. Department of Energy (DOE) planning basis for TWRS assumes that alkaline leaching and metathesis of sludges can be done effectively. The plan assumes that only a reasonable volume of HLW glass will result from the vitrification of the treated sludges. This, however, may not be what really happens. Some important HLW-glass-volume-limiting components of the sludge may not be sufficiently removed by simple sludge washing followed by alkaline leaching and metathesis. These components are present in chemical forms that may not be sufficiently soluble in typical wash/alkaline solutions. These components are expected to be soluble in acid media, leading to the thesis that solubilities can be enhanced by acid dissolution followed by reneutralization (reconstitution of sludge). This could destroy "aged" crystals that are much less easy to dissolve. Technologies for additional acid leaching and reneutralization must be complete to support Title I design for HLW pretreatment facility scheduled to start in November 1998.

Even after reconstitution, the HLW volumes may be too large and require further reduction. Thus the entire sludge may need to be dissolved in concentrated acids. Technologies for total dissolution must be developed to the point that they are representative for all waste types so that their benefits and tradeoffs can be assessed for their addition/revision to the base case 3 months before the milestone to evaluate the effectiveness of such treatment (M-50-02, March 1998), therefore by December 1997. It is assumed that this 3/98 decision will support the planning assumption, and therefore this work will terminate after the 3/98 decision.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

- Issue a report on acid dissolution tests with actual sludge
- Issue a report on non-thermal reconstitution tests
- Issue a report on batch solvent extraction tests for strontium and TRU removal
- Complete construction of cold bench scale solvent extraction process
- Issue reports on:
 - Alternatives to acid side solvent extraction
 - Acid side cesium solvent extraction batch testing
 - Continuous simulant testing of a TRUEX/SREX/CSEX solvent extraction process
 - Acid side CST tests

C. STATEMENT OF WORK

Required activities:

- Conduct acid dissolution tests with actual sludges, FY94-95 cores and FY95 - outyears cores (PNL).

Laboratory batch testing on a variety of sludges will be necessary over a wide range of experimental conditions. Investigation will include use of specified reagents, varying the periods of time for reaction, and varying temperature. Studies will determine the effects on total sludge. Reagents will include nitric acid, nitric/oxalic acid mixes, and nitric/hydrofluoric mixes. Determination of the effects of processing conditions on the dissolution of all sludge components will be a major goal. Results of these tests will allow the necessary optimizations/tradeoffs necessary to determine operating conditions for sludge dissolutions and will allow accurate projection of HLW volume. Test-tube level experiments will be the major focus of this activity. These studies will provide feed material for subsequent batch solvent extraction and ion exchange tests. Component material balances should be determined as part of this effort. (Includes scheduled activities PTW0500 and PTW0505).

- Conduct non-thermal reconstitution tests, FY94-95 cores and FY95 - outyears cores (PNL).

Laboratory bench top testing on a variety of sludges will be necessary over a wide range of experimental conditions. Investigations will include use of specific reagents, varying the periods of time for reaction, and varying temperature. Reagents will include varying concentrations of nitric acid. Test-tube level experiments will be the major focus of this activity. (Includes scheduled activities PTW0525 and PTW0530).

- Conduct solvent extraction (SX) tests for strontium and TRU removal (PNL).

Laboratory batch testing on a variety of sludges will be necessary over a wide range of experimental conditions. Investigations will include use of specific immiscible (second liquid phase) chemical and chemical mixtures for extracting strontium and TRUs from acidic solutions. Separation/partitioning coefficients will be determined. Results of these tests will allow accurate projection of HLW volume. Test-tube level experiments will be the major focus of this activity. (Includes scheduled activity PTW0515).

- Conduct bench scale solvent extraction system (PNL).

Laboratory bench scale testing on a variety of acid-dissolved sludges will be necessary over a wide range of experimental conditions. Continuous cold testing should start in FY96 on simulated waste. (Includes scheduled activity PTW0540).

- Conduct tests on alternatives to acid side solvent extraction (PNL).

Laboratory batch testing on acid-dissolved sludges will be necessary over a range of experimental conditions. Emphasis will be on alternative methods to solvent extraction techniques for removal of Cs, Sr, Tc and/or TRUs. Test-tube level experiments will be the major focus of this activity. (Includes scheduled activity PTW0520).

- Develop acid side cesium solvent extraction system (ANL).

A new solvent extraction process for extraction cesium from solutions whose compositions are similar to acid-dissolved Hanford sludges shall be developed. (Includes scheduled activity PTW0560).

- Conduct acid side cesium extraction system (PNL).

Test the solvent extraction process system developed at ANL for cesium from solutions whose compositions are similar to acid-dissolved Hanford sludges. (Includes scheduled activity PTW0565).

- Update generic TRUEX model (ANL).

The generic TRUEX model must be updated to accommodate technical revisions/updates to properly consider the case of Hanford tank waste sludges that are dissolved in acid and subsequently extracted. Emphasis should be placed on both TRUEX, SREX and CSEX. This effort will permit accurate modelling and thus allow accurate tradeoffs in basic design/approach for pretreating sludge wastes. Results of this effort will allow the necessary optimizations/tradeoffs necessary to determine operating conditions for solvent extraction and will facilitate projections of HLW volume. (Includes scheduled activity PTW0580).

- Conduct acid side cesium removal test using CST and actual waste for both batch and column (PNL).

Laboratory batch testing on a variety of acid dissolved sludges will be necessary. Investigations will determine the effectiveness of crystalline silicotitanates (CSTs) in removing cesium from acid dissolved sludge solutions. Effectiveness in removing strontium and transuranic elements will also be assessed. Separation/partitioning coefficients (Kds) will be determined. Results of these tests will allow the necessary optimizations/tradeoffs necessary to determine operating conditions for sludge dissolution and will allow accurate projection of HLW volumes. Test-tube level experiments will be the major focus of this activity. (Includes schedule activity PTW0570 and PTW0575).

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	K. A. Gasper <i>KAGasper</i>	9/23/94
Activity Manager	J. N. Appel <i>John N. Appel</i>	9/23/94
Cost Account Manager	J. T. Slankas <i>John T. Slankas</i>	9/23/94
Project Control Analyst	P. R. Weinman <i>Paul R. Weinman</i>	9/23/94

COST ACCOUNT AUTHORIZATION		
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Program Manager	K. A. Gasper <i>KAGasper</i>	9/23/94
Activity Manager	J. N. Appel <i>John N. Appel</i>	9/23/94
Cost Account Manager	J. T. Slankas <i>John T. Slankas</i>	9/23/94
Project Control Analyst	P. R. Weinman <i>Paul R. Weinman</i>	9/23/94

FDS Number

1D3204

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Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.01 Waste Pretreatment (M&O Contractor)	2. DATE PREPARED September 23, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.01.03/Level V	5. WBS ELEMENT TITLE Facility Operations	
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1220-0-AC	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER / TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.2.1	12. BUDGET AND REPORTING NUMBER Expense Capital Line Item EW3130010	

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)	FY 1998 \$(000)	FY 1999 \$(000)	FY 2000 \$(000)	FY 2001 \$(000)
OPERATING							
CENRTC							
GPP							
LINE ITEM							
TOTAL	0	0	0				

B. TECHNICAL BASES

Facility Operations provides overall processing of waste for Waste Pretreatment through the end of waste pretreatment, which is currently scheduled to occur in FY 2022. This activity includes facility operations from the time of Key Decision 4: Approval to Commence Operation production per DOE Order 4700.1 and the completion of all start up requirements per DOE Order 5480.31, Startup and Restart of Nuclear Facilities and receipt of operating licenses from the regulatory agencies. This activity will be completed for pretreatment facilities with the completion of processing waste, flushing the facilities, and turning them over to the Environmental Restoration Program for decontamination and decommissioning.

Activities leading to the completion of pretreatment processing of Hanford tank waste include the processing of the waste from the 149 SSTs, 28 DSTs, new DSTs, and the liquid radioactive waste generated during tank cleanup operations. Pretreatment processing includes operation of the following facilities:

- LLW Pretreatment Facility Module 1. This facility will be operated for 16 years and 3 months (December 2004 to March 2021) to remove cesium and strontium from tank waste. The resulting liquid LLW will be blended and stored to feed the LLW vitrification facility scheduled to initiate hot operations in June 2005 (TPA M-60-05). The liquid HLW separated from tank waste in the LLW pretreatment facility will be blended and stored to feed the HLW vitrification facility scheduled to initiate hot operations in December 2009 (TPA M-51-03). After completion of waste pretreatment the facility will be cleaned out and placed in a shut down mode over a period of 12 months in preparation for decommissioning. At the end of this activity the facility will be turned over to the Environmental Restoration Program for decommissioning in March 2022.
- LLW Pretreatment Facility Module 2. This facility will be operated for 14 years and 6 months (December 2005 to June 2020) to provide an increased processing capability. Module 2 will include additional separations capability to remove strontium and TRU from complexed waste as well as technetium removal, if required for disposal of LLW. The resulting liquid LLW and HLW streams will be handled as described above for Module 1. Facility clean out and shut down will be handled as described above for Module 1 except turn over to the Environmental Restoration Program for decommissioning will be June 2021.
- In-Tank Processing. Preparations for in-tank processing will take place from September 1997 to October 1998. In-tank processing will be operated for 21 years and 8 months (November 1998 to June 2020). In-tank processing deals with separating the insoluble solids (containing most of the radionuclides) from the liquids (containing most of the cesium and other soluble compounds) using the existing and future underground waste tanks and Tank Farms infrastructure. The resulting pretreated solids will be blended and stored to feed the HLW vitrification facility. The liquid LLW, including water used to wash the solids, will be fed to the LLW pretreatment facilities (Modules 1 and 2) for removal of cesium and other radionuclides. Clean out and turn over of the Tank Farm facilities to the Environmental Restoration Program is the responsibility of Tank Farm Operations and Maintenance Program Element.
- HLW Pretreatment Facility. This facility will be operated for 12 years (June 2008 to June 2020) to provide additional capability to pretreat HLW waste, if required. The resulting liquid LLW and HLW streams will be handled as describe above for the LLW pretreatment facility (Module 1). After completion of HLW waste pretreatment the facility will be cleaned out and placed in a shut down mode over a period of 12 months in preparation for decommissioning. At the end of this activity the facility will be turned over to the Environmental Restoration Program for decommissioning in June 2021.

The operation of hot testing capabilities on an ongoing basis is also included in this activity. As the different wastes are retrieved from the different tanks farms over the years and these wastes blended, hot testing will be conducted to establish pretreatment processing plant operational parameters. These tests will identify the process steps and operating parameters for such auxiliary or supplementary

processes as complexant destruction (for example, for complexed concentrate wastes) and additional radionuclide removal.

The final operation that is included in this activity is providing tank farm operations support to for concentrating waste by evaporation. This will provide a replacement capability after the year 2004 for the 242A Evaporator.

Operations uncertainties that must be addressed by the Pretreatment program includes the LLW and HLW immobilization facilities feed specifications and associated flow sheets. How much of the radionuclides can remain will need to be translated into how much has to be removed from the many different waste streams. Not only must radionuclides be dealt with but other key chemical constraints; For example, some of the waste streams have significant chloride or fluoride or another difficult anions to immobilize. Blending of such streams must be accommodated by supporting schedules and infrastructure within the tank farms. If the criteria for what constitutes an acceptable waste feed to the immobilization facilities changes, this can have significant impact on the facility operations objectives of delivering the required feed on the required schedule. Facility operations will result not only in feed streams to the HLW and LLW immobilization facilities, but also large quantities of waste water to the Liquid Effluent Treatment Facility and failed equipment for disposal. Other solid waste resulting from the pretreatment operation include the spent ion exchange resin. A satisfactory method of disposing of this material must be established and utilized.

The Waste Pretreatment Facility Operations activity is comprised of five Level VI cost accounts:

- 1.1.1.3.1.03.01, LLW Pretreatment Facility Hot Operations
- 1.1.1.3.1.03.02, HLW Pretreatment Facility Hot Operations
- 1.1.1.3.1.03.03, CDU Operations
- 1.1.1.3.1.03.04, Pretreatment Hot Test Operations
- 1.1.1.3.1.03.05, In-Tank Processing Operations

Goals and objectives:

Waste Pretreatment Facility Operations will perform ongoing waste pretreatment operations to separate HLW and TRU wastes from the LLW; it will provide product streams to feed LLW and HLW immobilization facilities; and evaporate tank wastes to current waste requirements.

Major end-item deliverables:

TPA M-50-00
M-50-02
M-50-04

Acceptance criteria:

- Pretreated supernatants will meet the feed specifications of the LLW vitrification facility and the processing schedule requirements of Waste Retrieval and LLW vitrification.
- Pretreated sludges/solids will meet the feed specifications of the HLW vitrification facility and the processing schedule requirements of Waste Retrieval and HLW vitrification.

C. STATEMENT OF WORK

Operation of pretreatment processing of Hanford tank waste including the processing of the waste from the 149 SSTs, 28 DSTs, and liquid radioactive waste generated during tank cleanup operations.

1.1.1.3.01.03

47-47

Required activities over lifetime:

Pretreatment processing includes operations of the facilities described in the technical basis section.

Interfaces :

#	From This WBS To	Item Provided
2	Low Level Waste (1.1.1.3.02)	Product stream from LLW Pretreatment
3	High Level Waste (1.1.1.3.03)	Product stream from HLW Pretreatment
	To This WBS From	Item Provided
1	Waste Tank Retrieval (1.1.1.2.05)	Tank waste for pretreatment
2	Characterization (1.1.1.2.04)	Sample data characterization for all Hanford tanks

Technologies to be assessed: N/A

Options to be considered: N/A

D. OTHER LEGAL DRIVERS AND ORDER REQUIREMENTS

- Hanford Federal Facility Agreement and Consent Order, Tri-Party Agreement (TPA) Fourth Amendment, Washington State Department of Ecology, U.S. Environmental Protection Agency, and U.S. Department of Energy, Olympia, Washington, January, 1994, Milestones M-50-00.
- DOE, 1988 "Final Environmental Impact Statement for the Disposal of Hanford Defense High-Level, Transuranic and Tank Waste, Hanford Site, Richland, Washington, Record of Decision," Federal Register V 53(7.2) pp 12449-12453, U.S. Department of Energy, Washington D.C.
- Refer to DOE/RL-92-60, Rev 1, 31 March 1994, "TWRS Functions and Requirements"

Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.01 Waste Pretreatment (M&O Contractor)	2. DATE PREPARED September 23, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.01.04/Level V	5. WBS ELEMENT TITLE Systems Definition							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1220-0-AD							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.2 Process Waste 4.2.2.1 Pretreat Waste	12. BUDGET AND REPORTING NUMBER <table style="width: 100%; border: none;"> <tr> <td style="text-align: left;">Expense</td> <td style="text-align: left;">Capital</td> <td style="text-align: left;">Line Item</td> </tr> <tr> <td colspan="3">EW3130010</td> </tr> </table>		Expense	Capital	Line Item	EW3130010		
Expense	Capital	Line Item						
EW3130010								

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)	FY 1998 \$(000)	FY 1999 \$(000)	FY 2000 \$(000)	FY 2001 \$(000)
OPERATING	7,111	6,685	10,828				
CENRTC							
GPP							
LINE ITEM							
TOTAL	7,111	6,685	10,828				

B. TECHNICAL BASES

Goals and objectives:

The objective of Systems Definition activity is to establish the technical and process design baselines for the low-level waste (LLW) pretreatment facility (Project W-236B, Initial Pretreatment Module), high-level waste (HLW) pretreatment facility, and in-tank processing to ensure that the Waste Pretreatment Program Element fulfills the TWRS mission requirements. The objective of Systems Definition includes assuring that processes are developed in a timely and cost effective manner to meet the following Program goals:

- Construction and operation of a low-shielded LLW vitrification facility and producing a LLW vitrified waste form which will meet the requirements for disposal as a LLW.
- Production of a HLW vitrified waste form meeting the requirements for geologic disposal.

Major end-item deliverables:

- Functions and Requirements (F&Rs) for Hot Testing, LLW Pretreatment Facility, HLW Pretreatment Facility, and In-Tank Processing
- Evaluation of enhanced sludge washing to determine if advanced sludge separations processes are required
- In-tank sludge washing demonstration
- Trade studies to support process and facility selection
- Flowsheets for Cs, Sr, Tc, TRU, Al, Cr, PO4 removal, for sludge washing, for enhanced sludge washing, by tank, by waste group, and overall

Acceptance criteria:

- Verification that the processes, products, systems, and operating parameters developed under this element will be produce feed streams acceptable to the LLW and HLW immobilization facilities at the capacity required to cleanup the Hanford tank waste within the TPA schedule.

C. STATEMENT OF WORK

Required activities over lifetime:

- Define functions and requirements for:
 - Hot testing (WHC)
 - LLW Pretreatment Facility (WHC)
 - HLW Pretreatment Facility (WHC)
 - In-Tank Processing (WHC)
- Conduct System Engineering & Trade Studies (WHC)
- Develop Flowsheets & Applied Technology Evaluation (A-E/WHC)

Interfaces:

#	From This WBS To	Item Provided
1	1.1.1.2.04/Characterization	Input into Waste Retrieval DQO
2	1.1.1.3.03/High Level Waste	HLW feed specification
3	1.1.1.1.01/Program Mgmt & Administration	Input to develop TWRS EIS
	To This WBS From	
1	1.1.1.2.01/Tank Farms Operations & Maintenance	Input from 242A evaporator & AW/AP farms
2	1.1.1.2.05/Waste Retrieval	Input from program definition
3	1.1.1.3.01.05/W-236B LLW Pretreatment Facility	Input from LLW Pretreatment Facility CDR

Technologies to be assessed:

- Refer to WBS element 1.1.1.3.01.02, Technology Development and Applied Engineering ADS/TDD 1220-00-AB, Technology Development
- Applied engineering for technologies to be assessed

Options to be considered:

- Pretreatment facility options include:
 - Centralized LLW and HLW pretreatment facility
 - Standalone LLW and HLW pretreatment facilities
 - Dispersed pretreatment module
 - Collocated with the LLW and HLW vitrification facilities
 - Collocated with either the LLW or HLW vitrification facility
- Blending options include:
 - Blending by tank farm
 - Blending by waste type
 - Blending to provide minimal number of feeds to LLW and HLW vitrification facilities
- Single tank sludge washing versus multiple (co-tank) sludge washing options
- Elutable versus non-elutable resins options
- Recycle versus non-recycling of chemicals options
- Enhanced sludge washing (caustic and/or acid leach) versus advanced radionuclides separations from acidic solutions options

D. OTHER LEGAL DRIVERS AND ORDER REQUIREMENTS

- Hanford Federal Facility Agreement and Consent Order, Tri-Party Agreement (TPA) Fourth Amendment, Washington State Department of Ecology, U.S. Environmental Protection Agency, and U.S. Department of Energy, Olympia, Washington, January, 1994, Milestones M-50-00.
- DOE, 1988 "Final Environmental Impact Statement for the Disposal of Hanford Defense High-Level, Transuranic and Tank Waste, Hanford Site, Richland, Washington, Record of Decision," Federal Register V 53(7.2) pp 12449-12453, U.S. Department of Energy, Washington D.C.

**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.01 Waste Pretreatment 1.1.1.3.01.04 Systems Definition (M&O Contractor)	2. DATE PREPARED September 23, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.01.04.01/VI	5. WBS ELEMENT TITLE NEPA & Regulatory Compliance							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1220-0-AF							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV.1) 4.2.2 Process Waste 4.2.2.1 Pretreat Waste	12. BUDGET AND REPORTING NUMBER(S) <table> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3130010</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3130010		
Expense	Capital	Line Item						
EW3130010								

13. ELEMENT DESCRIPTION**A. COST CONTENT (Escalated Dollars)**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	341	301	100
CENRTC			
GPP			
LINE ITEM			
TOTAL	341	301	100

1.1.1.3.01.04.01

H1-53

B. TECHNICAL BASES

Goals & objectives:

The objective of the NEPA & Regulatory Compliance activity is to prepare environmental, permitting, and safety reports/evaluations necessary for the high-level waste (HLW) pretreatment facility and in-tank processing to ensure that the Waste Pretreatment Program Element supports the Tank Waste Remediation System (TWRS) mission requirement. All permitting activities will provide additional assurance that processes and facility designs and operations are developed in a timely and cost effective manner to support the following:

- Design, construction, and operations of a HLW pretreatment facility to treat the high level waste form which will meet the requirements for geologic disposal.
- Sludge washing process tests in Tanks AZ-101 and AZ-102.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

09/96	Complete Environmental Assessment (if required) on sludge washing process test of tank 101-AZ.
11/95	Complete Unreviewed Safety Questions (USQ) evaluation and comment
Complete Safety Assessments in support of Pretreatment Trade Studies

C. STATEMENT OF WORK

Required activities:

Activities included in this cost account provide for NEPA coverage and Safety Analysis support for the 101-AZ tank preparation, installation, and functional testing. This will include provision of technical information and support to the TWRS Environmental Impact Statement (EIS) during preparation, to include comment resolution. This activity (TWRS EIS) is being supported as well by other TWRS Programs. It is also required by the aggressive schedule of activities, that an in-depth evaluation of permit requirements must be completed and included in future planning. Provisions for an Environmental Assessment is also made, if warranted, in FY 1997.

Technologies to be assessed:

New technologies will be addressed in the Technology Development & Applied Engineering Activity. Support will be provided as required.

Options to be considered: N/A

Authorization of Work Activities

Initiation of work on the following activities is not yet authorized pending further review and approval by RL:

- Activities PSW04570-PSW04590 - A clear description of the role of the A/E, process engineering, and WHC project management should be provided and agreed to prior to initiating this work along with the rationale for using Fluor-Daniel for conducting pretreatment work scope.
- Activities PSW04610-PSW04615 - Uncertain why the environmental assessment for Tank 101-AZ is not included in the retrieval program WBS.

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	K. A. Gasper <i>KAGasper</i>	9/23/94
Activity Manager	I. E. Reep <i>I E Reep</i>	9/23/94
Cost Account Manager	W. B. Barton <i>W B Barton</i>	9/25/94
Project Control Analyst	P. R. Weinman <i>P R Weinman</i>	9/23/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	K. A. Gasper <i>KAGasper</i>	9/23/94
Activity Manager	I. E. Reep <i>I E Reep</i>	9/23/94
Cost Account Manager	W. B. Barton <i>W B Barton</i>	9/23/94
Project Control Analyst	P. R. Weinman <i>P R Weinman</i>	9/23/94

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Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.01 Waste Pretreatment 1.1.1.3.01.04 Systems Definition (M&O Contractor)	2. DATE PREPARED September 23, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.01.04.02/VI	5. WBS ELEMENT TITLE Engineering Studies and Functions and Requirements (F&R)	
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1220-00-AF	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.2 Process Waste 4.2.2.1 Pretreat Waste	12. BUDGET AND REPORTING NUMBER(S) Expense Capital Line Item EW3130010	

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	4,468	4,528	8,747
CENRTC			
GPP			
LINE ITEM			
TOTAL	4,468	4,528	8,747

1.1.3.01.04.02

H1-57

B. TECHNICAL BASES

Goals & objectives:

The objective of the Engineering Studies and Functions and Requirements (F&R) activity is to establish the technical and process design baselines for the low-level waste (LLW) pretreatment facility (Project W-236B, Initial Pretreatment Module), the high-level waste (HLW) pretreatment facility, and in-tank processing to ensure that the Waste Pretreatment Program Element supports the Tank Waste Remediation System (TWRS) mission requirements. All engineering studies and F&R's will provide additional assurance that processes are developed in a timely and cost effective manner to support the following Program goals:

- Design, construction, and operation of a LLW pretreatment facility and production of acceptable feed for treatment in a LLW vitrified waste form which will meet all requirements for disposal as a low level waste form.
- Design, construction, and operation of a HLW pretreatment facility to treat the high level waste form which will meet the requirements for geologic disposal.
- Evaluation of enhanced sludge washing.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

Detailed deliverables for this activity are:

01/95	Decant and Fill Tank 101-AZ
12/94	Prepare LLW Facility Functions and Requirements to reflect the results of the Facility Options Studies.
02/95	Prepare HLW Pretreatment Facility Functions and Requirements
02/95	Determine Liquid Effluent Treatment Concept (4.2.3.3)
03/95	Select Supernate Pretreatment Facility Concept (4.2.2.1.1)
04/95	Issue Evaluation of Water Re-use and Implementation Strategy
06/95	Determine Waste Concentration Mechanism
06/95	Determine Waste Processing Strategy (4.2.2) and Determine Waste Separations Strategy (4.2.2.1)
08/95	Issue Progress Report on Sludge Washing Demonstration
10/96	Initiate AZ-101 Sludge Washing Process Test
09/96	Issue Progress Report on Sludge Washing Process Test
10/96	Update LLW Functions and Requirements based on completion of the LLW Pretreatment Conceptual Design Report - Updates (FY96 & FY97)
07/97	Complete Sludge Washing Process Test and Issue Report
10/97	Issue In-Tank Processing Functions and Requirements (F&R)
03/95	Determine System Generated Waste Disposal Strategy (4.2.3)
01/95	Determine Liquid Effluent Treatment Concept (4.2.3.3)
05/95	Determine Waste Concentration Mechanism (4.2.1.5 support)

Required Activities:

This activity provides for the organizational integration and the definition of functions/tasks/projects prior to the initiation of the CDR. The ongoing awareness of progress/plans at other DOE sites and similar non-DOE projects worldwide will be included in this cost account and will serve as a means to effectively control to the pretreatment strategy. Pretreatment system models will be prepared as needed.

This activity includes performance of the necessary engineering evaluations to support:

1. Preparation of a LLW pretreatment F&R in support of CDR completion in FY 1996. The milestones are based on the logic that development of good F&R documents is an iterative process requiring intensive engineering support. The manpower associated with this workscope would be split about 1.2 man years per year to the F&R document with the balance performing preconceptual trade studies specific to the LLW pretreatment function. In FY 1995, approximately \$1,300,000 is planned for tasks with the selected architect/engineer (A/E) or to use for engineering support under the TWRS Basic Ordering Agreement (BOA) established in FY 1994.
2. Preparation of a HLW pretreatment F&R in support of a FY 1998 completion of the HLW pretreatment facility CDR as well as the performance of a process test of sludge washing in tank 101-AZ using the mixer pumps installed under project W-151. The milestones for the engineering evaluations are based on the logic that development of good F&R documents is an iterative process requiring intensive engineering support. The in-tank sludge washing tests are expected to be completed in FY 1997. Based upon the results of these tests and overall systems response modeling done in Block 00, the Functions and Requirements for in-tank processing would be prepared. It is expected that further process tests will be developed for enhanced sludge washing (caustic leach) in other tanks. The cost of the HLW F&R is estimated to be about \$500K. The manpower associated with the engineering evaluations task would be split about 1.2 manyears per year to the F&R document with the balance performing preconceptual trade studies specific to the HLW pretreatment function. The \$500K budget for process test supplies expense equipment, consumable and operating labor to perform the tasks as well as the engineering necessary support to lead and support the tasks.

The scope of this activity also includes the following:

1. Conduct Systems Engineering & Trade Studies

Identify alternate facility configuration options for LLW and HLW pretreatment and vitrification processes, identify advantages and disadvantages of the various options, and recommend preferred options. These activities are performed by identifying facility functions and requirements, identifying and reviewing alternate options, and preparing preliminary cost estimates for each option. Engineering studies will be performed to comply with the criteria for the option selection process. In addition, assessments of specific systems, subsystems, and component implementations will be conducted to optimize plant performance and adapt to changing operating conditions and/or requirements.

2. Define F&R for LLW Pretreatment Facility

Develop LLW pretreatment process and facility requirements identify necessary engineering studies, and identify the technology development needs for LLW pretreatment.

3. Define F&R for In-Tank Processes

Provide all necessary engineering support to evaluate and implement in-tank washing. Included are trade activities, including program element management, planning, studies, technical evaluations, process tests, and other necessary activities to ensure that in-tank washing is implemented to support HLW pretreatment as scheduled.

4. Define F&R for the HLW Pretreatment Facility

Develop HLW pretreatment process and facility functions and requirements, identify and

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perform necessary engineering studies, prepare process and facility design criteria, and identify technology development needs for HLW pretreatment. Provide engineering support during the conceptual design and advanced conceptual design phases of the HLW pretreatment facility(ies).

Technologies to be assessed:

Applied engineering for technologies to be assessed as they are identified. Specific technology development activities are addressed in WBS 1.1.1.3.01.02.

Options to be considered:

Waste pretreatment facility options include:

- Centralized LLW and HLW pretreatment facility
- Standalone LLW and HLW pretreatment facilities
- Dispersed pretreatment module
- Co-located with the LLW and HLW vitrification facilities
- Co-located with either the LLW or the HLW vitrification facility

Authorization of Work Activities:

Initiation of work on the following activities is not yet authorized pending further review and approval by DOE-RL:

- Activities PSW00060-PSW00115 - Justification for pretreatment funding of this crosscutting study should be provided and an RL decision reached.
- Activities PSW00120-PSW00170A - A description on how this study relates to the facility options study completed in FY 1994 and the IPM conceptual design efforts is to be provided to DOE-RL and a decision reached on whether this activity should be approved.
- Activities PSW00300-PSW00350A - This activity is a planning package and DOE-RL approval of the scope and estimates is required before authorization is given.
- Activity PSW00420 - The relationship of this scope to that included for the A/E as part of conceptual design as well as a clear definition of the deliverable must be identified to DOE-RL before approval is given to initiate work.
- Activity PSW00430 - This activity is a planning package and DOE-RL approval of the scope and estimates is required before authorization is given to initiate work.
- Activity PSW00440 - This activity is a planning package and DOE-RL approval of the scope and estimates is required before authorization is given to initiate work.
- Activities PSW00505-PSW00530A - This activity is a planning package and DOE-RL approval of the scope and estimates is required before authorization is given to initiate work.
- Activity PSW04850 - The rationale for conducting this trade study must be provided and a DOE-RL decision reached prior to initiating work.

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	K. A. Gasper <i>KAGasper</i>	9/23/94
Activity Manager	I. E. Reep <i>I E Reep</i>	9/23/94
Cost Account Manager	W. B. Barton <i>W B Barton</i>	9/23/94
Project Control Analyst	P. R. Weinman <i>PR Weinman</i>	9/23/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	K. A. Gasper <i>KAGasper</i>	9/23/94
Activity Manager	I. E. Reep <i>I E Reep</i>	9/23/94
Cost Account Manager	W. B. Barton <i>W B Barton</i>	9/23/94
Project Control Analyst	P. R. Weinman <i>PR Weinman</i>	9/23/94

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Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.01 Waste Pretreatment 1.1.1.3.01.04 Systems Definition (M&O Contractor)	2. DATE PREPARED September 23, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.01.04.03/VI	5. WBS ELEMENT TITLE Develop Flowsheets & Applied Technology Evaluation	
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1220-0-AF	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.2 Process Waste 4.2.2.1 Pretreat Waste	12. BUDGET AND REPORTING NUMBER(S) Expense Capital Line Item EW3130010	

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	2,302	1,856	1,981
CENRTC			
GPP			
LINE ITEM			
TOTAL	2,302	1,856	1,981

B. TECHNICAL BASES

Goals & objectives:

The objective of the Develop Flowsheets & Applied Technology Evaluation activity is to support establishment of the technical baselines for the low level waste (LLW) pretreatment facility (Project W-236B, Initial Pretreatment Module), the high-level waste (HLW) pretreatment facility, and in-tank processing to ensure that the Waste Pretreatment Program Element supports the Tank Waste Remediation System (TWRS) mission requirements. All flowsheet development and applied technology evaluation activities will provide additional assurance that processes are developed in a timely and cost effective manner to support the following Program goals:

- Design, construction, and operation of a LLW pretreatment facility and production of acceptable feed for treatment in a LLW vitrified waste form which will meet all requirements for disposal as a low level waste form.
- Design, construction, and operation of a HLW pretreatment facility to treat the high level waste form which will meet the requirement for geologic disposal.
- Evaluation of enhanced sludge washing.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

Detailed deliverables for this activity include:

- 10/94 Issue Status Report on Enhanced Sludge Washing (M-50-03-T01)
- 12/94 Issue Reports on Cesium Removal Performance of Resorcinol & CS-100 Resins on Multiple Feeds (M-50-01-T01)
- 12/94 Issue Time Phased Retrieval Flowsheet Focusing on Feed Variability
- 01/95 Issue Preliminary Report on Tc Removal
- 05/95 Issue Prototype Decision Model Status Report (supports M-50-03A)
- 05/95 Issue TWRS Technology Needs for FY 1996
- 06/95 Issue Revision to Pretreatment DQO
- 06/95 Issue TWRS Process Flowsheet, Rev 1
- 09/95 Issue Status Report on Enhanced Sludge Washing (M-50-03-T2A)
- 09/95 Issue Progress Report on Retrieval Order and Blending Plan
- 09/95 Issue Results of Decision Analysis for Advanced Sludge Separations Processes Document (supports M-50-03)
- 05/96 Issue TWRS Technology Needs for FY 1997
- 06/96 Issue TWRS Process Flowsheet, Rev 2
- 09/96 Preliminary Recommendation of Requirements for Advanced Sludge Separation Processes (supports M-50-03)
- 09/96 Issue Status Report on Enhanced Sludge Washing (M-50-03-T2B)
- 05/97 Issue TWRS Technology Needs for FY 1998
- 06/97 Issue TWRS Process Flowsheet, Rev 3
- 09/97 Draft Recommendation of Requirements for Advanced Sludge Separation Processes (supports M-50-03)
- 09/97 Issue Status Report on Enhanced Sludge Washing (M-50-03-T2C)

C. STATEMENT OF WORK

Required activities:

This activity provides for the applied technology evaluations necessary to direct technology development and understand the chemistry impacts on the processes, and develop process flowsheets. Included within the activity are identification of technology needs, process trade studies, and establishment of process baselines. As technical information develops, the flowsheets and process basis documents are updated.

The scope of this level of the work breakdown structure (WBS) is to perform process studies and prepare process flowsheets for pretreatment of Hanford tank wastes to provide feed streams to the LLW and HLW vitrification facilities. Studies to be performed include, but are not limited to, waste blending and waste pretreatment process optimization. Operating strategies will be prepared for the LLW and HLW pretreatment facilities and pretreatment process development needs will be identified. Ongoing pretreatment technology development work will be followed to ensure that information needed for performing process studies and preparing process flowsheets is obtained. Pretreatment process flowsheets and process mass balance will be prepared for removing either radionuclides or chemicals from supernatant liquids or sludges to prepare LLW or HLW waste feed streams. Personnel will interface with other functional areas to identify, negotiate, and resolve process impacts identified by process studies and during preparation of process flowsheets; with the program office to plan and report against the Program; and with the Technology Development to define and negotiate their workscope and deliverables and review their progress. Applied technology evaluations based on progress in technology development will also be conducted.

Technologies to be assessed:

Applied engineering for technologies to be assessed as they are identified. Specific technology development activities are addressed in WBS 1.1.1.3.01.02.

Options to be considered:

- Blending options include:
 - Blending by tank farm
 - Blending by waste type
 - Blending to provide minimal number of feeds to LLW and HLW vitrification facilities
- Single tank sludge washing versus multiple (co-tank) sludge washing options
- Elutable versus non-elutable resins options
- Recycle versus non-recycling of chemicals options
- Enhanced sludge washing (caustic and/or acid leach) versus advanced radionuclides separations from acidic solutions options.

Authorization of Work Activities:

Initiation of work on the following activities is not yet authorized pending further review and approval by DOE-RL:

- Activities PSW04005-PSW04025 - Justification of the need for conducting this activity in FY 1995 based on the level of technology work funded as well as decision analysis in support of M-50-03A must be provided and approved by DOE-RL before authorization is given to initiate work.
- Activities PSW04085-PSW04085A - Since Cs ion exchange resin selection for the supernate pretreatment facility is scheduled to occur in the FY 1996-1997 time frame, justification of the value of this activity must be provided and approved by DOE-RL before authorization is given to initiate work.

1.1.1.3.01.04.03

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- Activities PSW04185-PSW04195 - Agreement needs to be reached between the Pretreatment Program Office and DOE-RL on whether this activity belongs in this WBS or should be included in the Technology Development WBS before authorization is given to initiate work.
- Activities PSW04235-PSW04235A - Agreement needs to be reached between the Pretreatment Program Office and DOE-RL on whether this activity belongs in this WBS or should be included in the Project WBS before authorization is given to initiate work.
- Activities PSW04240-PSW04250 - Agreement needs to be reached between the Pretreatment Program Office and DOE-RL on whether this activity belongs in this WBS or should be included in the Technology Development WBS before authorization is given to initiate work.
- Activities PSW04345-PSW04350 and PSW04375-PSW04385 - Agreement needs to be reached between the Pretreatment Program Office and DOE-RL on whether thermal reconstitution technology development work is to be pursued before authorization is given to initiate work.
- Activities PSW04505-PSW04535 - Work has been rescoped, per DOE-RL comments, to include development of a decision model for Pretreatment only. However, agreement needs to be reached between the LLW and HLW programs not to include the decision model scope for these programs. Before authorization is given to initiate work, DOE-RL must concur with the rescoped activities.

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	K. A. Gasper <i>K.A. Gasper</i>	9/23/94
Activity Manager	I. E. Reep <i>I.E. Reep</i>	9/23/94
Cost Account Manager	W. B. Barton <i>W.B. Barton</i>	9/23/94
Project Control Analyst	P. R. Weinman <i>P.R. Weinman</i>	9/23/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	K. A. Gasper <i>K.A. Gasper</i>	9/23/94
Activity Manager	I. E. Reep <i>I.E. Reep</i>	9/23/94
Cost Account Manager	W. B. Barton <i>W.B. Barton</i>	9/23/94
Project Control Analyst	P. R. Weinman <i>P.R. Weinman</i>	9/23/94

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Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.01 Waste Pretreatment (M&O Contractor)	2. DATE PREPARED September 23, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.01.05/V	5. WBS ELEMENT TITLE W-236B Pretreatment Facility (IPM)	
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1280-0-AB	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER / TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.2.1	12. BUDGET AND REPORTING NUMBER Expense Capital Line Item EW3130010	

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)	FY 1998 \$(000)	FY 1999 \$(000)	FY 2000 \$(000)	FY 2001 \$(000)
OPERATING	30,600	33,265	19,672				
CENRTC	4,978	360					
GPP							
LINE ITEM			22,783				
TOTAL	35,578	33,625	42,455				

1.1.1.3.01.05

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B. TECHNICAL BASES

The product of the W-236B, the Low-Level Waste (LLW) Pretreatment Facility, is a processing facility for pretreating HLW supernatants/liquids to meet the feed specifications of the LLW vitrification facility and produce a sidestream containing more concentrated radionuclides for ultimate disposal with HLW materials in the HLW Vitrification facility. The LLW Pretreatment Facility is comprised of two modules which flattens the funding profile. Specific processing capabilities will be divided into a Module I and Module II. Construction of the LLW Pretreatment Facility Module I is scheduled for completion in December 2003 with completion of preparations for startup scheduled for December 2004. The standards for turning the facility over to operations for hot startup (TPA M-50-02) by December 2004 include receiving Key Decision 4, Approval to Commence Operation/Production per DOE Order 4700.1; DOE standard 3006-93, Planning and Conduct of Operational Readiness Reviews; DOE Order 5480.31, Startup and Restart of Nuclear Facilities; and requirements for receiving operating licenses and permits from regulatory agencies. The LLW Pretreatment Facility Module II will provide additional processing capacity and/or processing functions for liquid treatment depending on the results of planned TWRS testing and trade studies.

The LLW Pretreatment Facility will remove cesium along with other radionuclides. While the Tri-Party Agreement assumed additional radionuclide removal is not needed, the project will maintain the capability for other radionuclide removal until the testing and/or trade studies determine that this capability isn't needed. The selection of radionuclide removal approaches is influenced by the design of the LLW vitrification facility and the requirements set forth in the performance assessment for disposal of LLW. The LLW waste performance assessment is currently being prepared. In addition, the design concept of a low-shielded LLW vitrification facility will influence the degree of cesium and strontium removal that must be achieved in the LLW pretreatment facility. Technetium removal, if required based on the LLW performance assessment, must be accomplished at the start of supernatant pretreatment since double-shell slurry feed (DSSF), the first waste to be pretreated, contains higher levels of technetium than wastes to be processed later. It is anticipated that the baseline schedule can be achieved only if a portion of the waste requires strontium and/or TRU removal.

Goals and objectives:

The primary goal of this activity is to provide processing facility capable of pretreating tank supernatants and process liquids from the HLW pretreatment facility, the HLW vitrification facility, and the LLW vitrification facility to meet the feed specifications of the LLW vitrification facility. A secondary goal is to provide a processing facility for pretreating supernatants/liquids which will minimize the amount of HLW byproduct produced while producing a product stream that meets the LLW vitrification feed specifications. The objective is to provide a facility with the required capability to support LLW vitrification facility feed volume requirements by December 2004. A secondary objective is to provide additional capabilities to pretreat liquid streams created by sludge/solids processing for LLW vitrification disposal prior to January 2008.

Major end-item deliverables:

- Design, construction and startup of LLW pretreatment facilities (Modules I and II) for the pretreatment of supernatants and other process liquids generated by the tank waste retrieval, HLW pretreatment, LLW vitrification, and HLW vitrification facilities.
- All appropriate nuclear facility licenses, environmental, and operating permits for the LLW pretreatment facilities.

Acceptance criteria:

- Key Decision 4, Approval to Commence Operation/ Production per DOE Order 4700.1
- DOE Standard 3006-93, Planning and Conduct of Operational Readiness Reviews

- DOE Order 5480.31, Startup and Restart of Nuclear Facilities
- Receipt of appropriate nuclear facility licenses and permits.
- Pretreated supernatants and other liquids will meet the feed specifications (chemical and physical characteristics and flowrate) of the LLW vitrification facility as defined in the approved LLW Pretreatment Functions and Requirements Document.

C. STATEMENT OF WORK

The scope contained in this WBS includes all management, testing, design, construction, and startup activities leading to the completion of pretreatment processing of Hanford tank waste supernatants include the processing of the waste from the 149 SSTs, 28 DSTs, new DSTs and liquid radioactive waste generated during tank cleanup operations as defined in the approved LLW Pretreatment Functions and Requirements Document.

Required activities over lifetime:

The LLW pretreatment facility activity is responsible for the design, procurement, construction, and startup of the facility. The functions of the delivered facilities and performance time frames are described below.

- LLW Pretreatment Facility Module I. This facility will remove cesium, strontium, transuranics, and technetium from tank waste (unless deleted due to testing/trade studies recommendations). The facility will be completed by December 2003 (TPA M-51-02-T01) to support hot operations (TPA M-51-02). The resulting liquid LLW will be blended and stored to feed the LLW vitrification facility. The liquid HLW separated from tank waste in the LLW Pretreatment facility will be blended and stored to feed the HLW vitrification facility.
- LLW Pretreatment Facility Module II. This facility will provide increased capacity and/or additional processing functions for removal of cesium, strontium, transuranics, and technetium to further treat supernatant streams as required by the LLW glass performance assessment or as needed by specific waste tanks, such as organic destruction for tanks with high organic contents. The resulting liquid LLW and HLW streams will be handled as described above for Module I. Module II construction will be completed in December 2005.

The Hanford Maintenance and Operating (M&O) Contractor, Architect Engineer, the construction contractor(s) activities/responsibilities are described below.

- Conduct Project Management--maintenance and operations (M&O) contractor
- Perform Systems Engineering--M&O contractor
- Perform Design Reviews--M&O contractor
- Perform Quality Assurance--M&O contractor
- Perform Applied Engineering--M&O contractor, other DOE and outside laboratories
- Design, fabricate, and install Pretreatment Hot Testing Capability (e.g. CDU/CPU)--M&O contractor, A-E, Construction Contractor (to be determined)
- Perform Hot Testing--M&O contractor
- Prepare Conceptual Design (CDR)--architect engineer (A-E)
- Prepare Advanced Conceptual Design (ACDR)--A-E
- Perform Title I Design--A-E
- Perform Title II Design--A-E
- Perform Title III Design--A-E
- Prepare Preliminary Safety Evaluation (PSE)--M&O contractor
- Prepare Preliminary Safety Analysis Report (PSAR)--M&O contractor
- Prepare Final Safety Analysis Report (FSAR)--M&O contractor

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- Prepare National Environmental Protection Act (NEPA) documentation--M&O contractor
- Prepare Regulatory Permits--M&O contractor
- Construct LLW Pretreatment Facility(s)--Construction Contractor
- Perform Startup of LLW Pretreatment Facility(s)--M&O contractor

Interfaces:

#	From This WBS To	Item Provided
1	Characterization	Process supernatants characterization requirements.
2	LLW Vitrification Facility	Expected compositions, flowrates, and processing schedule for LLW pretreated liquids.
3	Blend High Activity Streams	Expected compositions, flowrates, and processing schedule for separated HLW streams.
	To This WBS From	Item Provided
1	Technology Develop. and Applied Engineering (1.1.1.3.01.02)	Cesium resin technology.
2	Same as above.	Separation technology for other radionuclides.
3	System Definition (1.1.1.3.01.04)	Functions & requirements for LLW pretreatment facility.
4	Same as above.	Pretreatment flowsheet.
5	Same as above.	Select organic destruction option for LLW pretreatment facility.
6	Same as above.	Select facility option for LLW pretreatment facility.
7	Same as above.	Functions & requirements for hot test facility.
8	Same as above.	Basis for incorporating organic destruction for safe storage in LLW facility design.
9	Characterization	Updated data for LLW pretreatment facility CDR.
10	Same as above	Various liquid and sludge samples as needed for hot testing in support of applied engineering activities.
11	LLW Vitrification Facility	Initial LLW immobilization feed specification.
12	Same as above	Updated LLW immobilization feed specification.
13	Same as above	Characteristics and volume of LLW plant generated streams.
14	HLW Vitrification Facility	Characteristics and volume of HLW plant generated streams.

Technologies to be assessed:

Technologies are being assessed to develop engineering design data to provide a basis for process and equipment selection and sizing for the LLW pretreatment facility. The main avenues for developing applied engineering data are laboratory, bench-scale, and pilot-scale testing of selected unit operations and/or processes. Testing

will be accomplished using both waste simulants and actual waste depending on the technical or training need of the project.

- Pretreated Supernatants. The approach for pretreating supernatants being investigated is removal of cesium plus other radionuclides (i.e. strontium, technetium, and TRU). To support process selection and design the following areas of testing have been identified.

- Coarse separation of HLW solids from liquids
- Polishing filtration to remove fines and colloids
- Cesium ion-exchange, selection of resin and equipment configuration
- Removal of technetium from alkaline solutions, selection of process and other supporting design information
- Removing strontium and TRU from alkaline solutions, selection of process and other supporting design information
- Development and testing of process control equipment

Other technologies which may require testing to determine engineering design parameters involve recycling and decontaminating chemicals. If trade studies indicate a potential for cost savings, these processes will be included in the project scope. The necessary engineering design information will be developed for these processes.

Options to be considered:

Major areas of the program where options have been identified are processing, facility configuration, and processing strategy.

- Processing. The processing options being considered for the pretreatment of supernatants are listed below. All options include separation of solids from supernatant and concentration of various liquid streams by evaporation. Options for strontium and TRU removal may require destruction or removal of organic complexants from the supernatant as well.

- Cesium removal (TPA case beta planning baseline)
- Cesium, strontium, and TRU removal
- Cesium and technetium removal
- Cesium, technetium, strontium, and TRU removal.

The processing options being considered for pretreatment of sludges/solids are listed below. These options are being evaluated to determine the probable composition and flowrates of streams that are expected to be added to tank supernatants and be then treated by the LLW Pretreatment facility. These streams are expected to have a large impact on the throughput requirements of the LLW pretreatment facility. All options to the planning baseline include sludge washing and enhanced sludge washing (caustic leach) as a precursor.

- Sludge washing (TPA case beta planning baseline)
- Enhanced sludge washing (TPA case beta planning baseline)
- Other leaching of sludge

- Facility Configurations. The optional facility configurations being considered are documented in the draft Facility Configuration Evaluation, Phase 1 Study trade study. This report is under review by DOE at this time. The options are:

- Combined LLW pretreatment and LLW vitrification (includes two subcases: facilities in a centralized location; and modules in a centralized facility);

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- Combined LLW pretreatment and HLW vitrification;
- Combined LLW pretreatment, LLW vitrification and HLW vitrification;
- Stand alone LLW pretreatment (includes three subcases: modules in a centralized configuration; centralized facility; and, dispersed modules); and
- Processing Strategies. Optional processing strategies being considered which will affect the LLW Pretreatment facility are:
 - Number of LLW feed blends,
 - Water recycle.

D. OTHER LEGAL DRIVERS AND ORDER REQUIREMENTS

- Hanford Federal Facility Agreement and Consent Order, Tri-Party Agreement (TPA) Fourth Amendment, Washington State Department of Ecology, U.S. Environmental Protection Agency, and U.S. Department of Energy, Olympia, Washington, January, 1994, Milestones M-50-00.
- DOE, 1988 "Final Environmental Impact Statement for the Disposal of Hanford Defense High-Level, Transuranic and Tank Waste, Hanford Site, Richland, Washington, Record of Decision," Federal Register V 53(7.2) pp 12449-12453, U.S. Department of Energy, Washington D.C.

Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.01 Waste Pretreatment 1.1.1.3.01.05 W-236B Pretreatment Facility 1.1.1.3.01.05.01 Project Management 1.1.1.3.01.05.01.01 Management & Integration (M&O Contractor)	2. DATE PREPARED September 23, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.01.05.01.01.01/VIII	5. WBS ELEMENT TITLE IPM Management							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1280-0-AB							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.2 Process Waste 4.2.2.1 Pretreat Waste	12. BUDGET AND REPORTING NUMBER(S) <table border="0" style="width: 100%;"> <tr> <td style="text-align: left;">Expense</td> <td style="text-align: left;">Capital</td> <td style="text-align: left;">Line Item</td> </tr> <tr> <td>EW3130010</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3130010		
Expense	Capital	Line Item						
EW3130010								

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	806	812	
CENRTC			
GPP			
LINE ITEM			
TOTAL	806	812	

B. TECHNICAL BASES

The primary mission for the IPM Management and Integration, IPM Management, is to provide overall project management guidance, direction, support and interface for the IPM project during Conceptual Design. IPM management will support the project in the areas of general management, business management, engineering management, permitting and safety management, architect/engineering (A/E) contract management and applied engineering management. This provides the minimum staffing level necessary to provide continued project direction and operations.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS): N/A

C. STATEMENT OF WORK

Required activities:

1. **General Project Management.**
This provides the general project management direction, guidance and support.
2. **Project Business Management.**
This provides the project business and scheduling management direction, guidance and support.
3. **Project A/E Resident Engineering Management.**
This provides the project A/E resident engineering management direction, guidance and support.

4. **Project Engineering Integration Management.**
This provides the project engineering integration management direction, guidance and support.
5. **Project Permitting and Safety Management.**
This provides the project permitting and safety management direction, guidance and support.
6. **Project Applied Engineering/Management.**
This provides the project applied engineering/management direction, guidance and support.

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	R. R. Gadd <i>RRGadd</i>	9/22/94
Activity Manager	D. F. Mulderig <i>DFMulderig</i>	9/22/94
Cost Account Manager	D. F. Mulderig <i>DFMulderig</i>	9/22/94
Project Control Analyst	Dante L. Montoya D. L. Montoya	09/22/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	R. R. Gadd <i>RRGadd</i>	9/22/94
Activity Manager	D. F. Mulderig <i>DFMulderig</i>	9/22/94
Cost Account Manager	D. F. Mulderig <i>DFMulderig</i>	9/22/94
Project Control Analyst	Dante L. Montoya D. L. Montoya	09/22/94

<p>FDS Number</p> <p>1) _____</p> <p>2) _____</p>

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Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.01 Waste Pretreatment 1.1.1.3.01.05 W-236B Pretreatment Facility 1.1.1.3.01.05.01 Project Management 1.1.1.3.01.05.01.01 Management & Integration (M&O Contractor)	2. DATE PREPARED September 23, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.01.05.01.01.02/VIII	5. WBS ELEMENT TITLE IPM Management (Capital)							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1280-0-AB							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.2 Process Waste 4.2.2.1 Pretreat Waste	12. BUDGET AND REPORTING NUMBER(S) <table border="0" style="width: 100%;"> <tr> <td style="text-align: center;">Expense</td> <td style="text-align: center;">Capital</td> <td style="text-align: center;">Line Item</td> </tr> <tr> <td></td> <td></td> <td style="text-align: center;">39EW31301</td> </tr> </table>		Expense	Capital	Line Item			39EW31301
Expense	Capital	Line Item						
		39EW31301						

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING			
CENRTC			
GPP			
LINE ITEM			777
TOTAL			777

B. TECHNICAL BASES

Goals and objectives:

The primary mission for the IPM Management and Integration, IPM Management, is to provide overall project management guidance, direction, support and interface for the IPM project (W-236B) during Title I design. IPM management will support the project in the areas of general management, business management, engineering management, permitting and safety management, architect/engineer contract (A/E) management, and applied engineering management. This provides the minimum staffing level necessary to provide continued project direction and operations.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS): N/A

C. STATEMENT OF WORK

Required activities:

1. **General Project Management.**
This provides the general project management direction, guidance and support.
2. **Project Business Management.**
This provides the project business and scheduling management direction, guidance and support.

3. **Project A/E Resident Engineering Management.**
This provides the project A/E resident engineering management direction, guidance and support.
4. **Project Engineering Integration Management.**
This provides the project engineering integration management direction, guidance and support.
5. **Project Permitting and Safety Management.**
This provides the project permitting and safety management direction, guidance and support.
6. **Project Applied Engineering/Management.**
This provides the project applied engineering/management direction, guidance and support.

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	R. R. Gadd <i>R.R. Gadd</i>	9/22/94
Activity Manager	D. F. Mulderig <i>D.F. Mulderig</i>	9/22/94
Cost Account Manager	D. F. Mulderig <i>D.F. Mulderig</i>	9/22/94
Project Control Analyst	D. L. Montoya <i>Dante L. Montoya</i>	09/22/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	R. R. Gadd <i>R.R. Gadd</i>	9/22/94
Activity Manager	D. F. Mulderig <i>D.F. Mulderig</i>	9/22/94
Cost Account Manager	D. F. Mulderig <i>D.F. Mulderig</i>	9/22/94
Project Control Analyst	D. L. Montoya <i>Dante L. Montoya</i>	09/22/94

FDS Number

Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.01 Waste Pretreatment 1.1.1.3.01.05 W-236B Pretreatment Facility 1.1.1.3.01.05.01 Project Management 1.1.1.3.01.05.01.01 Management & Integration (M&O Contractor)	2. DATE PREPARED September 23, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.01.05.01.01.03\VIII	5. WBS ELEMENT TITLE Project Control and Administration							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1280-0-AB							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.2 Process Waste 4.2.2.1 Pretreat Waste	12. BUDGET AND REPORTING NUMBER(S) <table border="0"> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3130010</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3130010		
Expense	Capital	Line Item						
EW3130010								

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	282	284	134
CENRTC			
GPP			
LINE ITEM			
TOTAL	282	284	134

B. TECHNICAL BASES

Goals & objectives:

The primary mission of project control and administration is to provide staffing support for the project financial and administrative controls, reporting and analysis functions during the Conceptual Design period of the project. Staffing will be required for project performance, fiscal, scheduling and reporting management. The staffing is the minimum required to support the continued effective operations and viability of the project mission.

Technical editing and document control services will be provided to support the overall Management, Financial, Design Engineering, Applied Engineering, Systems Engineering and Regulatory Compliance work activities during the Conceptual Design period of the project.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

- Annual Multi-Year Program Plan
- Annual Activity Data Sheets
- Annual Fiscal Year Work Plans
- Monthly Performance Reporting: SMS, PTS & MRM
- Change Control Documents

C. STATEMENT OF WORK

Required activities:

Provide fiscal and scheduling activities to support the project management control requirements. Provide technical editing and document control activities to support the overall project mission.

1.1.1..3.01.05.01.01.03

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Provide fiscal and scheduling activities to support the project management control requirements.
Provide technical editing and document control activities to support the overall project mission.

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	R. R. Gadd <i>RR Gadd</i>	9/22/94
Activity Manager	D. F. Mulderig <i>DF Mulderig</i>	9/22/94
Cost Account Manager	D. F. Mulderig <i>DF Mulderig</i>	9/22/94
Project Control Analyst	D. L. Montoya <i>Daniel L. Montoya</i>	09/22/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	R. R. Gadd <i>RR Gadd</i>	9/22/94
Activity Manager	D. F. Mulderig <i>DF Mulderig</i>	9/22/94
Cost Account Manager	D. F. Mulderig <i>DF Mulderig</i>	9/22/94
Project Control Analyst	D. L. Montoya <i>Daniel L. Montoya</i>	09/22/94

FDS Number

Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.01 Waste Pretreatment 1.1.1.3.01.05 W-236B Pretreatment Facility 1.1.1.3.01.05.01 Project Management 1.1.1.3.01.05.01.01 Management & Integration (M&O Contractor)	2. DATE PREPARED September 23, 1994	13. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.01.05.01.01.04\Level VIII	5. WBS ELEMENT TITLE Project Control and Administration (Capital)							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1280-0-AB							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.2 Process Waste 4.2.2.1 Pretreat Waste	12. BUDGET AND REPORTING NUMBER(S) <table border="0" style="width: 100%;"> <tr> <td style="width: 33%;">Expense</td> <td style="width: 33%;">Capital</td> <td style="width: 33%;">Line Item</td> </tr> <tr> <td></td> <td></td> <td>39EW31301</td> </tr> </table>		Expense	Capital	Line Item			39EW31301
Expense	Capital	Line Item						
		39EW31301						

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING			
CENRTC			
GPP			
LINE ITEM			229
TOTAL			229

B. TECHNICAL BASES

Goals & objectives:

The primary mission of project control and administration is to provide staffing support for the project financial and administrative controls, reporting and analysis functions for the Title I Design period of the project. Staffing will be required for project performance, fiscal, scheduling and reporting management. The staffing is the minimum required to support the continued effective operations and viability of the project mission.

Technical editing and document control services will be provided to support the overall Management, Financial, Design Engineering, Applied Engineering, Systems Engineering and Regulatory Compliance work activities during the Conceptual Design period of the project.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

- Annual Multi-Year Program Plan
- Annual Activity Data Sheets
- Annual Fiscal Year Work Plans
- Monthly Performance Reporting : SMS, PTS & MRM
- Change Control Documents

C. STATEMENT OF WORK

Required activities:

- Provide fiscal and scheduling activities to support the project management control requirements.
Provide technical editing and document control activities to support the overall project mission.

Technologies to be assessed: N/A

Options to be considered: N/A

1.1.1.3.01.05.01.01.04

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	R. R. Gadd <i>RR Gadd</i>	9/22/94
Activity Manager	D. F. Mulderig <i>DF Mulderig</i>	9/22/94
Cost Account Manager	D. F. Mulderig <i>DF Mulderig</i>	9/22/94
Project Control Analyst	D. L. Montoya <i>Dante Lee Montoya</i>	09/22/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	R. R. Gadd <i>RR Gadd</i>	9/22/94
Activity Manager	D. F. Mulderig <i>DF Mulderig</i>	9/22/94
Cost Account Manager	D. F. Mulderig <i>DF Mulderig</i>	9/22/94
Project Control Analyst	D. L. Montoya <i>Dante Lee Montoya</i>	09/22/94

<p>FDS Number</p> <p>_____</p>

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Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.01 Waste Pretreatment 1.1.1.3.01.05 W-236B Pretreatment Facility 1.1.1.3.01.05.01 Project Management 1.1.1.3.01.05.01.01 Management & Integration (M&O Contractor)	2. DATE PREPARED September 23, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.01.05.01.01.05\VIII	5. WBS ELEMENT TITLE Resource Management							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1280-0-AB							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.2 Process Waste 4.2.2.1 Pretreat Waste	12. BUDGET AND REPORTING NUMBER(S) <table border="0" style="width: 100%;"> <tr> <td style="text-align: left;">Expense</td> <td style="text-align: center;">Capital</td> <td style="text-align: right;">Line Item</td> </tr> <tr> <td style="text-align: left;">EW3130010</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3130010		
Expense	Capital	Line Item						
EW3130010								

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	521	576	221
CENRTC			
GPP			
LINE ITEM			
TOTAL	521	576	221

B. TECHNICAL BASES

Goals & objectives:

The primary mission of resource management is to provide support for the project management, financial, engineering and administrative staffing in the areas of training and education, travel, relocation assistance, procurement of ADP hardware and software, and operating supplies. The resource management to support staffing is the minimum required for the continued effective operations and viability of the project mission.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS): N/A

C. STATEMENT OF WORK

Required activities: N/A

Technologies to be assessed: N/A.

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	R. R. Gadd <i>RRGadd</i>	9/22/94
Activity Manager	D. F. Mulderig <i>DFMulderig</i>	9/22/94
Cost Account Manager	D. F. Mulderig <i>DFMulderig</i>	9/22/94
Project Control Analyst	D. L. Montoya <i>Dante L. Montoya</i>	09/22/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	R. R. Gadd <i>RRGadd</i>	9/22/94
Activity Manager	D. F. Mulderig <i>DFMulderig</i>	9/22/94
Cost Account Manager	D. F. Mulderig <i>DFMulderig</i>	9/22/94
Project Control Analyst	D. L. Montoya <i>Dante Lee Montoya</i>	09/22/94

<p>FDS Number</p> <p>1) _____</p> <p>2) _____</p>

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Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.01 Waste Pretreatment 1.1.1.3.01.05 W-236B Pretreatment Facility 1.1.1.3.01.05.01 Project Management 1.1.1.3.01.05.01.01 Management & Integration (M&O Contractor)	2. DATE PREPARED September 23, 1994	3. IDENTIFICATION NUMBER DE-AC06-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.01.05.01.01.06/VIII	5. WBS ELEMENT TITLE Design/Construction Oversight	
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1280-0-AB	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.2 Process Waste 4.2.2.1 Pretreat Waste	12. BUDGET AND REPORTING NUMBER(S) Expense Capital Line Item EW3130010	

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	417	420	
CENRTC			
GPP			
LINE ITEM			
TOTAL	417	420	

1.1.1.3.01.05.01.01.06

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B. TECHNICAL BASES

Goals & objectives:

Provide management oversight of the A/E and Construction Contractor in all technical matters, serve as the Buyer's Technical Representative for these contracts, and function as the Point-of-Contact (POC) for the A/E and Construction Contractor interfaces with other affected WHC organizations.

Status of Design Documentation:

The Functions & Requirements (F&Rs) document for Initial Pretreatment Module has been prepared, reviewed, and approved by WHC. It is currently in the review and approval cycle at DOE-RL. A Statement of Work has also been prepared and approved by WHC. The documents have been transmitted to the A/E and will form the basis for their cost proposal submittal and the detailed planning for the Conceptual Design phase of this project. These documents will be updated as requirements of the project become more precisely defined.

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

Deliverables will primarily consist of transmittal letters of technical direction, reviews of invoices, assessments of A/E and Contractor work plans and schedules, and evaluations of the technical content of SF1411 Cost Proposals prepared by the contractors. No specific milestones have been identified.

C. STATEMENT OF WORK

Required activities:

WHC will perform technical monitoring of the A/E and Construction Contractor and will provide technical assessments of their work as required to assure contract performance. This project element will also provide letters of technical direction to the contractors, provide the Point-of-Contact for technical issues between other WHC organizations and the contractors, and perform other related duties as directed by the Project Manager in fulfilling the responsibility to serve as the Buyer's Technical Representative.

Technologies to be assessed:

The technologies to be assessed are addressed by another element of this project. The F&Rs will delineate the functional requirements which the A/E must meet in development of the Conceptual Design. Trade studies to support development of the Conceptual Design will be identified in the Conceptual Design Plan and negotiated scope of work. Implementation of technologies beyond those identified in the negotiated scope of work will be implemented only to the extent that they are approved and provide improved performance within the budget and schedule constraints of the project.

Options to be considered:

Options to perform the subsequent design phases of the project (Title I, Title II, and Title III Design) will be exercised upon agreement with DOE-RL, as funding and continued project justification are available.

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	R. R. Gadd <i>R.R. Gadd</i>	9/22/94
Activity Manager	L. D. Swenson <i>Leon D Swenson</i>	09/22/94
Cost Account Manager	L. D. Swenson <i>Leon D Swenson</i>	09/22/94
Project Control Analyst	D. L. Montoya <i>Dante L Montoya</i>	09/22/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	R. R. Gadd <i>R.R. Gadd</i>	9/22/94
Activity Manager	L. D. Swenson <i>Leon D Swenson</i>	09/22/94
Cost Account Manager	L. D. Swenson <i>Leon D Swenson</i>	09/22/94
Project Control Analyst	D. L. Montoya <i>Dante L. Montoya</i>	09/22/94

FDS Number

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Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.01 Waste Pretreatment 1.1.1.3.01.05 W-236B Pretreatment Facility 1.1.1.3.01.05.01 Project Management 1.1.1.3.01.05.01.01 Management & Integration (M&O Contractor)	2. DATE PREPARED September 23, 1994	3. IDENTIFICATION NUMBER DE-AC06-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.01.05.01.01.07/VIII	5. WBS ELEMENT TITLE Design/Construction Oversight							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1280-0-AB							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.2 Process Waste 4.2.2.1 Pretreat Waste	12. BUDGET AND REPORTING NUMBER(S) <table border="0"> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td></td> <td></td> <td>39EW31301</td> </tr> </table>		Expense	Capital	Line Item			39EW31301
Expense	Capital	Line Item						
		39EW31301						

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING			
CENRTC			
GPP			
LINE ITEM			644
TOTAL			644

1.1.1.3.01.05.01.01.07

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B. TECHNICAL BASES

Goals & objectives:

Provide management oversight of the Architect & Engineer (A/E) and Construction Contractor in all technical matters, serve as the Buyer's Technical Representative for these contracts, and function as the Point-of-Contact (POC) for the A/E and Construction Contractor interfaces with other affected WHC organizations.

Status of Design Documentation:

The Functions & Requirements (F&Rs) document for Initial Pretreatment Module has been prepared, reviewed, and approved by WHC. It will be modified and updated as the Conceptual and Advanced Conceptual Designs progress. The Conceptual Design Report, supplemented by the Advanced Conceptual Design, will form the technical basis for the Title I Design activities. Those documents, with a Statement of Work to be prepared and issued for this phase of work, will form the basis for the cost proposal to perform the capital-funded design scope of work. The A/E has been selected to perform this design work at the option of DOE-RL as negotiated during the project. The Construction Contractor will be chosen by a competitive bid process.

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

Deliverables will primarily consist of transmittal letters of technical direction, reviews of invoices, assessments of A/E and Construction Contractor work plans and schedules, and evaluations of the technical content of SF1411 Cost Proposals prepared by the contractors. No specific milestones have been identified.

C. STATEMENT OF WORK

Required activities:

WHC will perform technical monitoring of the A/E and Construction Contractor, and will provide technical assessments of their work as required to assure contract performance. This program element will also provide letters of technical direction to the contractors, provide the Point-of-Contact for technical issues between other WHC organizations and the contractors, and perform other related duties as directed by the Project Manager in fulfilling the obligation to serve as the Buyer's Technical Representative. The Construction Contractor will be monitored to assure construction conforms to the approved design.

Technologies to be assessed:

The technologies to be assessed are addressed by another element of this project. The F&Rs will delineate the functional requirements which the A/E must meet in development of the Conceptual Design. Trade studies to be completed during the Title I Design will be identified in the negotiated scope of work. Implementation of technologies beyond those identified in the negotiated scope of work will be pursued only to the extent that they are approved and provide improved performance within the budget and schedule constraints of the project.

Options to be considered:

Title I, Title II, and Title III engineering will be performed at the discretion of DOE-RL, as funding and continued project justification are available.

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	R. R. Gadd <i>R. R. Gadd</i>	9/22/94
Activity Manager	L. D. Swenson <i>L. D. Swenson</i>	09/22/94
Cost Account Manager	L. D. Swenson <i>L. D. Swenson</i>	09/22/94
Project Control Analyst	D. L. Montoya <i>Dante L. Montoya</i>	09/22/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	R. R. Gadd	
Activity Manager	L. D. Swenson <i>L. D. Swenson</i>	09/22/94
Cost Account Manager	L. D. Swenson <i>L. D. Swenson</i>	09/22/94
Project Control Analyst	D. L. Montoya <i>Dante L. Montoya</i>	09/22/94

FDS Number

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Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.01 Waste Pretreatment 1.1.1.3.01.05 W-236B Pretreatment Facility 1.1.1.3.01.05.01 Project Management 1.1.1.3.01.05.01.01 Management & Integration (M&O Contractor)	2. DATE PREPARED September 23, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.01.05.01.01.08\VIII	5. WBS ELEMENT TITLE Resource Management (Capital)							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1280-0-AB							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.2 Process Waste 4.2.2.1 Pretreat Waste	12. BUDGET AND REPORTING NUMBER(S) <table> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td></td> <td></td> <td>39EW31301</td> </tr> </table>		Expense	Capital	Line Item			39EW31301
Expense	Capital	Line Item						
		39EW31301						

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING			
CENRTC			
GPP			
LINE ITEM			163
TOTAL			163

B. TECHNICAL BASES

Goals & objectives:

The primary mission of resource management is to provide support for the project management, financial, engineering and administrative staffing in the areas of travel, relocation assistance, procurement of ADP hardware and software. The resource management to support staffing is the minimum required for the continued effective operations and viability of the project mission.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS): N/A

C. STATEMENT OF WORK

Required activities: N/A

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	R. R. Gadd <i>RR Gadd</i>	9/22/94
Activity Manager	D. F. Mulderig <i>DF Mulderig</i>	9/22/94
Cost Account Manager	D. F. Mulderig <i>DF Mulderig</i>	9/22/94
Project Control Analyst	D. L. Montoya <i>Dante L. Montoya</i>	09/22/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	R. R. Gadd <i>RR Gadd</i>	9/22/94
Activity Manager	D. F. Mulderig <i>DF Mulderig</i>	9/22/94
Cost Account Manager	D. F. Mulderig <i>DF Mulderig</i>	9/22/94
Project Control Analyst	D. L. Montoya <i>Dante L. Montoya</i>	09/22/94

FDS Number

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Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.01 Waste Pretreatment 1.1.1.3.01.05 W-236B Pretreatment Facility 1.1.1.3.01.05.01 Project Management 1.1.1.3.01.05.01.02 Engineering Support (M&O Contractor)	2. DATE PREPARED September 23, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.01.05.01.02.01/VIII	5. WBS ELEMENT TITLE Systems Engineering Interface							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1280-0-AB							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.2 Process Waste 4.2.2.1 Pretreat Waste	12. BUDGET AND REPORTING NUMBER(S) <table border="0"> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3130010</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3130010		
Expense	Capital	Line Item						
EW3130010								

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	186	187	
CENRTC			
GPP			
LINE ITEM			
TOTAL	186	187	

1.1.1.3.01.05.01.02.01

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B. TECHNICAL BASES

Goals & objectives:

The objective of this cost element is to maintain a close interface with TWRS systems engineering to ensure that the project is in consonance with the overall TWRS systems. The objective is also, through lower level systems engineering, to produce approved Functions and Requirements (F&R's), approved Project Design Criteria (PDC), and an approved Interface Control Plan.

Status of Design Documentation:

At the current time the only completed design documentation is a F&R Document for pretreat supernatant. This document has been reviewed and approved by WHC and is currently in the review and approval stage by RL. Conceptual Design has been awarded to the Architect & Engineer firm of Raytheon/BNFL and is in the very early stages.

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

- Completed and approved F&R Document
- Completed and approved PDC
- Completed and approved Interface Control Plan

C. STATEMENT OF WORK

Required activities:

The F&R Document is prepared by the TWRS Systems Engineering organization. This activity provides for performing reviews of that document to ensure consistency and completeness of project needs and coordinating the project review and comment resolution.

This activity will also provide for preparation of the PDC by the project. Input will be provided to the project A&E who will prepare the actual document. This cost element provides for coordination of that preparation and reviews of that document for consistency with the F&R, DOE orders, natural phenomena hazards criteria etc.

This activity also provides for the preparation of the interface control plan. Initially this plan will identify all interfaces with existing site utilities and services, other projects, and other organizations. The plan will describe these interfaces in enough detail so that all parties can agree on the interface. The plan will also describe how these interfaces will be managed, especially regarding other projects which are in various phases of planning, design or construction. The plan will be issued at various times such as after completion of conceptual design and at the completion of Title I, but it will be finalized during detailed design. The final document will contain a depiction of each interface, identifying each valve, switchgear, motor control center etc. where an interface exists and physically identifying the point where the responsibilities of the W-236B project end and the other entity begins.

Technologies to be assessed:

Technology assessment is covered under WBS 1.1.1.3.01.05.0123/4 within the W-236B Pretreatment Facility (LLW), 1.1.1.3.01.05/level IV.

Options to be considered:

Options to be considered are covered under WBS 1.1.1.3.01.05.0123/4 within the W-236B Pretreatment Facility (LLW), 1.1.1.3.01.05/level IV.

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	R. R. Gadd <i>R.R. Gadd</i>	9-22-94
Activity Manager	B. K. Horsager <i>BK Horsager</i>	9-22-94
Cost Account Manager	B. K. Horsager <i>BK Horsager</i>	9-22-94
Project Control Analyst	D. L. Montoya <i>Dante L. Montoya</i>	9/22/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	R. R. Gadd <i>R.R. Gadd</i>	9/22/94
Activity Manager	B. K. Horsager <i>BK Horsager</i>	9-22-94
Cost Account Manager	B. K. Horsager <i>BK Horsager</i>	9-22-94
Project Control Analyst	D. L. Montoya <i>Dante L. Montoya</i>	9/22/94

FDS Number

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Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.01 Waste Pretreatment 1.1.1.3.01.05 W-236B Pretreatment Facility 1.1.1.3.01.05.01 Project Management 1.1.1.3.01.05.01.02 Engineering Support (M&O Contractor)	2. DATE PREPARED September 23, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.01.05.01.02.02/VIII	5. WBS ELEMENT TITLE Systems Engineering Interface							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1280-0-AB							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.2 Process Waste 4.2.2.1 Pretreat Waste	12. BUDGET AND REPORTING NUMBER(S) <table style="width: 100%; border: none;"> <tr> <td style="text-align: left;">Expense</td> <td style="text-align: left;">Capital</td> <td style="text-align: left;">Line Item</td> </tr> <tr> <td></td> <td></td> <td>39EW31301</td> </tr> </table>		Expense	Capital	Line Item			39EW31301
Expense	Capital	Line Item						
		39EW31301						

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING			
CENRTC			
GPP			
LINE ITEM			377
TOTAL			377

1.1.1.3.01.05.01.02.02

B. TECHNICAL BASES

Goals & objectives:

The objective of this element is to maintain a close interface with TWRS systems engineering to ensure that the project is in consonance with the overall TWRS systems. The objective is also to produce an approved Interface Control Plan (ICP).

Status of Design Documentation:

At the current time, the only completed design documentation is a functions and requirements (F&R) document for pretreat supernatant. This document has been reviewed and approved by WHC and is currently in the review and approval stage by RL. Conceptual Design has been awarded to the Architect & Engineer (A/E) firm of Raytheon/BNFL and is in the very early stages.

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

- Completed and approved Interface Control Plan

C. STATEMENT OF WORK

Required activities:

This element provides for the preparation of the interface control plan. Initially this plan will identify all interfaces with existing site utilities and services, other projects, and other organizations. The plan will describe these interfaces in enough detail so that all parties can agree on the interface. The plan will also describe how these interfaces will be managed, especially in regard to other projects which are in various phases of planning, design or construction. The plan will be issued at various times such as after completion of conceptual design and at the completion of Title I, but it will be finalized during detailed design. The final document will contain a depiction of each interface, identifying each valve, switchgear, motor control center etc. where an interface exists and physically identifying the point where the responsibilities of the W-236B project end and the other entity begins.

Technologies to be assessed:

Technology assessment is covered under WBS 1.1.1.3.01.05.0123/4 cost accounts within 1.1.1.3.01.05/level IV, W-236B Pretreatment Facility (LLW).

Options to be considered:

Options to be considered is covered under WBS 1.1.1.3.01.05.0123/4 cost accounts within 1.1.1.3.01.05/level IV, W-236B Pretreatment Facility (LLW).

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	R. R. Gadd <i>RRGadd</i>	9/22/94
Activity Manager	B. K. Horsager <i>BKHorsager</i>	9-22-94
Cost Account Manager	B. K. Horsager <i>BKHorsager</i>	9-22-94
Project Control Analyst	D. L. Montoya <i>Dante L Montoya</i>	9/22/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	R. R. Gadd <i>RRGadd</i>	9-22-94
Activity Manager	B. K. Horsager <i>BKHorsager</i>	9-22-94
Cost Account Manager	B. K. Horsager <i>BKHorsager</i>	9-22-94
Project Control Analyst	D. L. Montoya <i>Dante L Montoya</i>	9/22/94

FDS Number

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Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.01 Waste Pretreatment 1.1.1.3.01.05 W-236B Pretreatment Facility 1.1.1.3.01.05.01 Project Management 1.1.1.3.01.05.01.02 Engineering Support (M&O Contractor)	2. DATE PREPARED September 23, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.01.05.01.02.03/VIII	5. WBS ELEMENT TITLE Cognizant Systems Engineering							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1280-0-AB							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.2 Process Waste 4.2.2.1 Pretreat Waste	12. BUDGET AND REPORTING NUMBER(S) <table border="0"> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3130010</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3130010		
Expense	Capital	Line Item						
EW3130010								

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	1259	1648	203
CENRTC			
GPP			
LINE ITEM			
TOTAL	1259	1648	203

B. TECHNICAL BASES

Goals & objectives:

The objective of this activity is to have completed conceptual and advanced conceptual for the pretreatment facility which have undergone vigorous design reviews at the 30 %, 60 %, and 90 % phases of the conceptual design and at the completion of the advanced conceptual design. By the end of this process all comments will have been resolved and the documents will have been approved by WHC.

Status of Design Documentation:

At the current time the only completed design documentation is a Functions and Requirements Document (F&R) for pretreat supernatant. This document has been reviewed and approved by WHC and is currently in the review and approval stage by RL. Conceptual Design has been awarded to the Architect & Engineer (A/E) firm of Raytheon/BNFL, and is in the very early stages.

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

- Completed and documented design reviews at the 30 %, 60 % and 90 % stages of conceptual design.
- Completed and documented design reviews for the advanced conceptual design.

C. STATEMENT OF WORK

Required activities:

Design Input -Cognizant engineers will provide input to the project baseline and design media for the systems for which they are responsible. This will include written material which may form parts of the documents and will also include review of the documents before they are approved to ensure accuracy of the system descriptions and performance. Documents for which cognizant engineer input is required include the F&R's, PDC, PSE, etc.

Design Reviews - Design reviews will be conducted at the 30 %, 60 %, and 90 % stages of conceptual design and at the completion of advanced conceptual design. Activities include receiving and distributing the design review packages, selecting the design review participants, scheduling the design reviews, performing the system design reviews, collecting and resolving comments with the reviewers and then with the architect engineer, and finally obtaining approval of the package via signed off RCR's and an approved EDT.

Technologies to be assessed:

Technologies are being assessed to develop engineering design data to provide a basis for process and equipment selection and sizing for the LLW pretreatment facility. The main avenues to be used for developing applied engineering data are laboratory, bench-scale, and pilot-scale testing of selected unit operations and/or processes. Testing will be accomplished using both waste simulants and actual waste depending on the technical or training need of the project.

- Pretreated Supernatant. Two approaches for pretreating supernatant are being investigated; removal of cesium only and removal of cesium plus other radionuclides (strontium, technetium, TRU, etc.). With respect to cesium removal, which is the planning baseline, the following technologies will be tested to provide engineering design data and operation verification.

- Cesium ion-exchange
- Separation of HLW solids from liquids

With respect to other radionuclides, which is the alternative to the baseline, the following technologies are being assessed as required to meet product specification for LLW waste immobilization.

- Removal of technetium from alkaline solutions
- Removing strontium and TRU from alkaline solutions

Other technologies which may require testing to determine engineering design parameters involve recycling and decontaminating chemicals. If trade studies indicate a potential for cost savings, these process will be included in the project scope and will require engineering design information development.

Options to be considered:

Major areas of the program where options have been identified are processing, facility configuration, and processing strategy.

- Processing. With respect to pretreatment of supernatant, examples of processing options being considered are listed below. All options include separation of solids from supernatant and concentration of various liquid streams by evaporation as defined by future engineering trade studies in conjunction with the TWRS material logistics studies. Options for strontium and TRU removal may require destruction or removal of organic complexants from the supernatant as well.

- Cesium removal (planning baseline)
- Cesium and strontium removal
- Cesium and technetium removal
- Cesium, technetium and strontium removal.

With respect to pretreatment of sludge/solids, examples of processing options being considered are listed below. These options are being evaluated by project W-236B to determine the probable composition and flowrates of streams that may be added to tank supernatant. These streams are expected to have a large impact on the throughput of the LLW pretreatment facility. All options to the planning baseline include sludge washing and enhanced sludge washing (caustic leach) as a precursor.

- Sludge washing (planning baseline)
- Enhanced sludge washing (planning baseline)
- Other leaching of sludge

- Facility Configurations. The optional facility configurations being considered are documented in the draft Facility Configuration Evaluation, Phase 1 trade study. The options are listed below.

- Combined LLW pretreatment and LLW vitrification (includes two subcases: modules in a centralized configuration and centralized facility)
- Combined LLW pretreatment and HLW vitrification
- Combined LLW pretreatment, LLW vitrification and HLW vitrification
- Stand alone LLW pretreatment (includes three subcases: modules in a centralized configuration; centralized facility; and, dispersed modules)

- Processing Strategies. Examples of optional processing strategies being considered are listed below.

- Number of LLW feed blends
- Water recycle

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	R. R. Gadd <i>RR Gadd</i>	9/22/94
Activity Manager	B. K. Horsager <i>BK Horsager</i>	9-22-94
Cost Account Manager	B. K. Horsager <i>BK Horsager</i>	9-22-94
Project Control Analyst	D. L. Montoya <i>Dante Lee Montoya</i>	9/22/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	R. R. Gadd <i>RR Gadd</i>	9/22/94
Activity Manager	B. K. Horsager <i>BK Horsager</i>	9-22-94
Cost Account Manager	B. K. Horsager <i>BK Horsager</i>	9-22-94
Project Control Analyst	D. L. Montoya <i>Dante Lee Montoya</i>	9/22/94

FDS Number

Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.01 Waste Pretreatment 1.1.1.3.01.05 W-236B Pretreatment Facility 1.1.1.3.01.05.01 Project Management 1.1.1.3.01.05.01.02 Engineering Support (M&O Contractor)	2. DATE PREPARED September 23, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.01.05.01.02.04/VIII	5. WBS ELEMENT TITLE Cognizant Systems Engineering							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1280-0-AB							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.2 Process Waste 4.2.2.1 Pretreat Waste	12. BUDGET AND REPORTING NUMBER(S) <table border="0"> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td></td> <td></td> <td>39EW31301</td> </tr> </table>		Expense	Capital	Line Item			39EW31301
Expense	Capital	Line Item						
		39EW31301						

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING			
CENRTC			
GPP			
LINE ITEM			2861
TOTAL			2861

B. TECHNICAL BASES

Goals & objectives:

The objective of this cost element is to have completed plant systems which have successfully gone through system testing and are ready to turn over to operations for readiness review by Jan. 1, 2004 for module 1 and by Sept. 1, 2005 for module 2. These systems include all structural/architectural systems, all process systems and all balance of plant (BOP) systems required to perform the pretreat supernatant function. These systems will have undergone rigorous design review at every stage of design and all testing required by the vendor, by the construction/installation contractor and by WHC.

Status of Design Documentation:

At the current time the only completed design documentation is a Functions and Requirements Document (F&R) for pretreat supernatant. This document has been reviewed and approved by WHC and is currently in the review and approval stage by RL. Conceptual Design has been awarded to the Architect & Engineer firm of Ebasco/BNFL and is in the very early stages.

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

- Completed and documented design reviews at the 30%, 60% and 90% stages of Title I design.
- Completed and documented design review for each system at the 30%, 60%, and 90% stages of Title II design.
- Completed structural plant systems with complete and approved structural and seismic design reports ready to turn over to operations.
- Completed architectural plant systems with complete and approved vendor data packages ready to turn over to operations.
- Completed process and BOP systems with documented post turnover test reports ready to turn over to operations.

C. STATEMENT OF WORK

Required activities:

Design Input - Cognizant engineers will provide input to the project baseline and design media for the systems for which they are responsible. This will include written material which may form parts of the documents and will also include review of the documents before they are approved to ensure accuracy of the system descriptions and performance. Documents for which cognizant engineer input is required include the F&R's, PDC, PSE, PSAR, FSAR SDD's, etc.

Design Reviews - Design reviews will normally be conducted at the 30%, 60%, and 90% stage of each design phase (conceptual, Title I, Title II, etc.). Activities include receiving and distributing the design review packages, selecting the design review participants, scheduling the design reviews, performing the system design reviews, collecting and resolving comments with the reviewers and then with the architect engineer, and finally obtaining approval of the package via signed off RCR's and an approved EDT.

System testing and Acceptance - Cognizant engineers will be responsible to ensure that all system and component testing is performed and documented. These tests will include vendor tests at vendor shops

or in the field, system and component tests by the installation contractor and post turnover tests by WHC prior to turning the system over to operations. Cognizant engineers will also be responsible to ensure that each system and component has complete and approved vendor data available on site for use in repair and replacement and to ensure safety class and Q/A requirements have been met.

Technologies to be assessed:

Technologies are being assessed to develop engineering design data to provide a basis for process and equipment selection and sizing for the LLW pretreatment facility. The main avenues to be used for developing applied engineering data are laboratory, bench-scale, and pilot-scale testing of selected unit operations and/or processes. Testing will be accomplished using both waste simulants and actual waste depending on the technical or training need of the project.

- Pretreated Supernatant. Two approaches for pretreating supernatant are being investigated; removal of cesium only and removal of cesium plus other radionuclides (strontium, technetium, TRU, etc.). With respect to cesium removal, which is the planning baseline, the following technologies will be tested to provide engineering design data and operation verification.

- Cesium ion-exchange
- Separation of HLW solids from liquids

With respect to other radionuclides, which is the alternative to the baseline, the following technologies are being assessed as required to meet product specification for LLW waste immobilization.

- Removal of technetium from alkaline solutions
- Removing strontium and TRU from alkaline solutions

Other technologies which may require testing to determine engineering design parameters involve recycling and decontaminating chemicals. If trade studies indicate a potential for cost savings, these process will be included in the project scope and will require engineering design information development.

Options to be considered:

Major areas of the program where options have been identified are processing, facility configuration, and processing strategy.

- Processing. With respect to pretreatment of supernatant, examples of processing options being considered are listed below. All options include separation of solids from supernatant and concentration of various liquid streams by evaporation as defined by future engineering trade studies in conjunction with the TWRS material logistics studies. Options for strontium and TRU removal may require destruction or removal of organic complexants from the supernatant as well.

- Cesium removal (planning baseline)
- Cesium and strontium removal
- Cesium and technetium removal
- Cesium, technetium and strontium removal.

With respect to pretreatment of sludge/solids, examples of processing options being considered are listed below. These options are being evaluated by project W-236B to determine the probable composition and flowrates of streams that may be added to tank supernatant. These

streams are expected to have a large impact on the throughput of the LLW pretreatment facility. All options to the planning baseline include sludge washing and enhanced sludge washing (caustic leach) as a precursor.

- Sludge washing (planning baseline)
 - Enhanced sludge washing (planning baseline)
 - Other leaching of sludge
- Facility Configurations. The optional facility configurations being considered are documented in the draft Facility Configuration Evaluation, Phase 1 trade study. The options are listed below.
 - Combined LLW pretreatment and LLW vitrification (includes two subcases: modules in a centralized configuration and centralized facility)
 - Combined LLW pretreatment and HLW vitrification
 - Combined LLW pretreatment, LLW vitrification and HLW vitrification
 - Stand alone LLW pretreatment (includes three subcases: modules in a centralized configuration; centralized facility; and, dispersed modules)
- Processing Strategies. Examples of optional processing strategies being considered are listed below.
 - Number of LLW feed blends
 - Water recycle

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	R. R. Gadd <i>RRGadd</i>	9/21/94
Activity Manager	B. K. Horsager <i>BKHorsager</i>	9-21-94
Cost Account Manager	B. K. Horsager <i>BKHorsager</i>	9-21-94
Project Control Analyst	D. L. Montoya <i>Dante Lee Montoya</i>	9/22/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	R. R. Gadd <i>RRGadd</i>	9/21/94
Activity Manager	B. K. Horsager <i>BKHorsager</i>	9-21-94
Cost Account Manager	B. K. Horsager <i>BKHorsager</i>	9-21-94
Project Control Analyst	D. L. Montoya <i>Dante Lee Montoya</i>	9/22/94

FDS Number

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Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Waste 1.1.1.3.01 Waste Pretreatment 1.1.1.3.01.05 W-236B Pretreatment Facility 1.1.1.3.01.05.01 Project Management & Integration (M&O Contractor)	2. DATE PREPARED September 23, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.01.05.01.03.01/VIII	5. WBS ELEMENT TITLE Quality Assurance							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1280-0-AB							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.2 Process Waste 4.2.2.1 Pretreat Waste	12. BUDGET AND REPORTING NUMBER(S) <table border="0"> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3130010</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3130010		
Expense	Capital	Line Item						
EW3130010								

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	145	141	175
CENRTC			
GPP			
LINE ITEM			
TOTAL	145	141	175

B. TECHNICAL BASES

Goals & objectives:

To support the design of the Low Level Waste Pretreatment Facility by ensuring that all of the planned and systematic actions necessary to provide adequate confidence that the facility, it's associated systems and components will perform satisfactorily in-service and will meet defined DOE and WHC requirements.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

Prepare and issue a project specific Quality Assurance Program Plan (QAPP) that encompasses all relevant DOE and WHC elements and requirements.

C. STATEMENT OF WORK

Required activities:

- Prepare and maintain the Quality Assurance Program Plan (QAPP),
- provide feedback to project management on the implementation of program,
- provide counsel to management on all quality related issues,
- review all project related programmatic documentation and design media to ensure the
- incorporation of program quality requirements and,
- assist in the qualification of vendors and vendor products for use by the project.

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	R. R. Gadd <i>R.R. Gadd</i>	9/22/94
Activity Manager	J. S. Sparks <i>J.S. Sparks</i>	9-22-94
Cost Account Manager	J. S. Sparks <i>J.S. Sparks</i>	9-22-94
Project Control Analyst	D. L. Montoya <i>Dante Lee Montoya</i>	9/22/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	R. R. Gadd <i>R.R. Gadd</i>	9/22/94
Activity Manager	J. S. Sparks <i>J.S. Sparks</i>	9-22-94
Cost Account Manager	J. S. Sparks <i>J.S. Sparks</i>	9-22-94
Project Control Analyst	D. L. Montoya <i>Dante Lee Montoya</i>	9/22/94

FDS Number

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Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.01 Waste Pretreatment 1.1.1.3.01.05 W-236B Pretreatment Facility 1.1.1.3.01.05.02 Applied Technology 1.1.1.3.01.05.02.01 Equipment (M&O Contractor)	2. DATE PREPARED September 23, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.01.05.02.01.01/Level VIII	5. WBS ELEMENT TITLE Equipment Testing							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1280-00-AB							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.2 Process Waste 4.2.2.1 Pretreat Waste	12. BUDGET AND REPORTING NUMBER(S) <table border="0" style="width: 100%;"> <tr> <td style="text-align: left;">Expense</td> <td style="text-align: center;">Capital</td> <td style="text-align: right;">Line Item</td> </tr> <tr> <td style="text-align: left;">EW3130010</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3130010		
Expense	Capital	Line Item						
EW3130010								

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	10084	12342	10952
CENRTC			
GPP			
LINE ITEM			
TOTAL	10084	12342	10952

B. TECHNICAL BASES

The primary goal of low level waste (LLW) pretreatment is the removal of cesium, technetium, strontium, and transuranics (TRU) from the tank waste supernatant, the liquid from the solids\liquid separations and the liquids produced from the HLW pretreatment process. The equipment needed for LLW pretreatment must be tested and evaluated to ensure proper performance and execution of task. The equipment requirements are influenced by the design and feed specifications for the LLW vitrification facility. The testing and evaluation will provide the necessary data to make recommendations to be incorporated in the design of the LLW pretreatment facility.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS): N/A

- Validation of waste simulant characteristics for solid/liquid separations testing.
- Recommendation of preferred gross filtration equipment, including sizing, solids loading precoat requirements, and operating characteristics.
- Recommendation of preferred polishing filtration equipment, including sizing, solids loading precoat requirements, and operating characteristics.
- Test requirements for hot pilot-scale testing of separations processes.
- Design and construction of hot testing units for radionuclide separations and for solid/liquid separations.
- Validation of LLW pretreatment processes with pilot-scale demonstration operations with actual tank wastes.
- Evaluation of process equipment with respect to fluid leakage and its effect on removal efficiency.

- Validation of the performance of the TRU monitor based on testing with actual wastes.
- Design and construction of full-scale mockup units for operator training and for readiness review documentation preparation.

C. STATEMENT OF WORK

Required activities:

- **Equipment Testing Evaluation and Oversight.** The equipment necessary to perform the pretreatment of supernatant requires testing to ensure that all needs of the supernatant pretreatment are met. This activity will also be involved with the development of equipment test plans and analysis of test data. Tank waste material for testing purposes will be identified and obtained. This activity will also provide F&Rs for project required test facilities and design review support for test facilities.
- **Gross Solids\Liquid Separations.** The solids\liquid separations equipment must be tested and recommended to ensure the removal of gross entrained particulates. The equipment to be tested are settling, centrifuge, incline pipe, and hydro-pulse filter. The test data will be evaluated and recommendations based on the test data will be presented. The characterization data relating to the solids characteristics will also be evaluated and validated.
- **Supernatant Colloid Evaluation and Polishing Filtration.** The solids\liquid separations equipment must be tested for the removal of fine colloidal particles and evaluate the characterization of colloidal particles to determine radionuclide distributions in colloids, liquids, and remaining solids.
- **Ion Exchange (IX) Column Equipment Testing.** Perform equipment testing of cesium ion exchange to determine resin characteristics in bed with respect to repeated cycling. Test various components of process (ie; valves) to determine leakage characteristics of equipment.
- **Instrumentation and Process Control Testing.** Testing of process system to verify process control system operations during all phases of operation including startup and abnormal conditions. Process control equipment (ie; TRU monitor) must be tested to determine instrument sensitivity and reproducibility under process conditions.
- **Operations Support Testing and Training.** Full-scale systems must be provided for development of operating procedures, development of maintenance procedures, and training of operations staff.

Engineering activities to implement the recommendation of T3A-94-151 Milestone will be initiated after RL concurrence with the recommendation. Low-cost critical path permitting activities will be initiated in October 1994. Permitting activities will assume the use of WESF as the facility to be used for pilot-scale testing.

Technologies to be assessed:

Technologies to be assessed in this activity are listed below.

- Solid/liquid separations and polishing filtration
 - In-tank settling
 - Centrifuge
 - Inclined pipe

- Hydropulse filter
- Cross-flow filters
- Effect of flocculants and filter precoats

- Cesium ion exchange
 - CS-100 resin based process (conceptual design reference)
 - Resorcinol-formaldehyde resin (Savannah River Technology Center developed)
 - Crystalline-silico-titanate (CST) resin (Sandia National Laboratory and UOP developed)
 - Super Lig resins (IBC/3M Company developed, Efficient Separations Processes Integrated Program {ESPIP}{EM-50} sponsored)
 - Other developed resins available at selection time

- Technetium separations
 - Process(es) as developed by the Technology Development Program Office for the Pretreatment Program (ADS 1220)

- Strontium separations
 - Process(es) as developed by the Technology Development Program Office for the Pretreatment Program (ADS 1220)

- Transuranics (TRU) separations
 - Process(es) as developed by the Technology Development Program Office for the Pretreatment Program (ADS 1220)

Options to be considered:

The selection of an cesium ion exchange resin has not been completed at this time. The reference resin is CS-100 but the resins resorcinol-formaldehyde, CST, and super lig 625 are all under evaluation to help determine the best resin to use on Hanford waste.

Selection of processes and resins, if applicable, has not been made for technetium, strontium, and TRU separations at this time.

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	R. R. Gadd <i>R.R. Gadd</i>	9-23-94
Activity Manager	S. A. Barker <i>S.A. Barker</i>	9-23-94
Cost Account Manager	S. A. Barker <i>S.A. Barker</i>	9-23-94
Project Control Analyst	D. L. Montoya <i>Dante Lee Montoya</i>	9/23/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	R. R. Gadd <i>R.R. Gadd</i>	9-23-94
Activity Manager	S. A. Barker <i>S.A. Barker</i>	9-23-94
Cost Account Manager	S. A. Barker <i>S.A. Barker</i>	9-23-94
Project Control Analyst	D. L. Montoya <i>Dante Lee Montoya</i>	9/23/94

FDS Number

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Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.01 Waste Pretreatment 1.1.1.3.01.05 W-236B Pretreatment Facility 1.1.1.3.01.05.02 Applied Technology 1.1.1.3.01.05.02.01 Equipment (M&O Contractor)	2. DATE PREPARED September 23, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.01.05.02.01.02\VIII	5. WBS ELEMENT TITLE Sludge Sampler Truck (CENRTC)							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1280-0-AB							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.2 Process Waste 4.2.2.1 Pretreat Waste	12. BUDGET AND REPORTING NUMBER(S) <table border="0" style="width: 100%;"> <tr> <td style="text-align: left;">Expense</td> <td style="text-align: center;">Capital</td> <td style="text-align: right;">Line Item</td> </tr> <tr> <td></td> <td style="text-align: center;">35EW31301</td> <td></td> </tr> </table>		Expense	Capital	Line Item		35EW31301	
Expense	Capital	Line Item						
	35EW31301							

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING			
CENRTC	3810	360	
GPP			
LINE ITEM			
TOTAL	3810	360	

B. TECHNICAL BASES

Goals & objectives:

The primary goal of this cost account is to purchase a sludge sampler truck for use in the operation of 25 liter sludge sampler. The need exists for larger samples of actual waste to support bench-scale and pilot plant testing. Currently, there is no existing vehicle to fulfill this need. The sampling device is being prepared by the retrieval organization.

Also, this task will also purchase sample casks and liners for transporting the sampled waste material across the Hanford site for delivery to the testing facilities. The cask design is being prepared by WHC Transportation during FY1994.

Status of Design Documentation:

Sampler truck design is essentially complete based on previous characterization sampling trucks and also based on previous operations at the Savannah River Site.

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

25 liter sludge sampler truck, casks and cask liners are delivered on site.

C. STATEMENT OF WORK

Required activities:

Sludge Sampler Truck (CENRTC). Purchase a 25 liter sludge sampler truck with CENRTC funds.

Transportation Casks and Liners (CENRTC). Purchase 2 sample casks and liners based on recommendation of WHC Transportation.

Technologies to be assessed: N/A

Options to be considered:

Trade study between an additional sample line to WESF or continued use of the truck will be performed.

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	R. R. Gadd <i>RRGadd</i>	9-23-94
Activity Manager	S. A. Barker <i>SA Barker</i>	9-23-94
Cost Account Manager	S. A. Barker <i>SA Barker</i>	9-23-94
Project Control Analyst	D. L. Montoya <i>Dante L. Montoya</i>	9/23/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	R. R. Gadd <i>RRGadd</i>	9-23-94
Activity Manager	S. A. Barker <i>SA Barker</i>	9-23-94
Cost Account Manager	S. A. Barker <i>SA Barker</i>	9-23-94
Project Control Analyst	D. L. Montoya <i>Dante L. Montoya</i>	9/24/94

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Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.01 Waste Pretreatment 1.1.1.3.01.05 W-236B Pretreatment Facility 1.1.1.3.01.05.02 Applied Technology 1.1.1.3.01.05.02.01 Equipment (M&O Contractor)	2. DATE PREPARED September 23, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.01.05.02.01.03\VIII	5. WBS ELEMENT TITLE TRU Monitor (CENRTC)							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1280-0-AB							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.2 Process Waste 4.2.2.1 Pretreat Waste	12. BUDGET AND REPORTING NUMBER(S) <table border="0" style="width: 100%;"> <tr> <td style="text-align: left;">Expense</td> <td style="text-align: center;">Capital</td> <td style="text-align: right;">Line Item</td> </tr> <tr> <td></td> <td style="text-align: center;">35EW313001</td> <td></td> </tr> </table>		Expense	Capital	Line Item		35EW313001	
Expense	Capital	Line Item						
	35EW313001							

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING			
CENRTC	531		
GPP			
LINE ITEM			
TOTAL	531		

B. TECHNICAL BASES

Goals & objectives:

During the pretreatment of tank liquids, the level of transuranics (TRU) must be monitored to determine the levels of TRU in the material being fed to the LLW Vitrification facility. The TRU monitor is a device to measure concentration levels of TRU in a process stream. The TRU monitor will ultimately be used as an on-line process control instrument to verify levels of TRU going to the LLW vitrification facility. This device will allow close coupling of the LLW pretreatment facility with the LLW vitrification facility. In addition, the confidence that non-TRU LLW glass will be made is much greater that can be achieved with random sampling or batch tank sampling. The advantages of using this device to measure TRU content include:

- rapid turn-around of analyses;
- large number of sample points per million gallons of product at less cost. (Over 3,000 data points per 1,000,000 gallons of liquid vs 10 samples per 1,000,000 tank);
- can be integrated into process control for rapid segregation of off-specification material; and
- Less operator exposure (Samples only need to be taken to calibrate instrument periodically).

This WBS activity will provide for the design and fabrication of a TRU monitor for testing in conjunction with in-tank washing tests being performed. The unit will be utilized in the LLW pretreatment facility when testing is completed.

Status of Design Documentation:

Design activities were undertaken previously by pretreatment to support the TRUEX pilot plant. Those designs would have to be re-evaluated and the fabrication completed.

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

A full-scale operational TRU monitor, ready for field installation and testing.

C. STATEMENT OF WORK

Required activities:

- **TRU Monitor (CENRTC).** Design and procure TRU monitor for hot testing in conjunction with in-tank washing tests.

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	R. R. Gadd <i>RR Gadd</i>	9-23-94
Activity Manager	S. A. Barker <i>SA Barker</i>	9-23-94
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Project Control Analyst	D. L. Montoya <i>Dante L. Montoya</i>	9/23/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	R. R. Gadd <i>RR Gadd</i>	9-23-94
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Project Control Analyst	D. L. Montoya <i>Dante L. Montoya</i>	9/23/94

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Tank Waste Remediation System Work Breakdown Structure
Dictionary.

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4. WBS ELEMENT CODE/LEVEL 1.1.1.3.01.05.02.01.04\VIII	5. WBS ELEMENT TITLE Laboratory Automation and Analysis (CENRTC)							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1280-0-AB							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.2 Process Waste 4.2.2.1 Pretreat Waste	12. BUDGET AND REPORTING NUMBER(S) <table border="0" style="width: 100%;"> <tr> <td style="text-align: left;">Expense</td> <td style="text-align: left;">Capital</td> <td style="text-align: left;">Line Item</td> </tr> <tr> <td></td> <td>35EW31301</td> <td></td> </tr> </table>		Expense	Capital	Line Item		35EW31301	
Expense	Capital	Line Item						
	35EW31301							

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING			
CENRTC	637		
GPP			
LINE ITEM			
TOTAL	637		

B. TECHNICAL BASES

Goals & objectives:

The goal of this cost account is to provide instrumentation and monitors for the automation of laboratory equipment supporting project testing. Automating the laboratory equipment provides three functions:

- 1) it lowers the technicians and scientists exposure to "hot" material testing,
- 2) allows for 24 hour testing without the need for all resources to be involved, and
- 3) lowers the cost of the testing as less resources are utilized.

Status of Design Documentation:

Commercially available process control system will be utilized.

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

A letter from PNL to WHC documenting the installation and readiness for use of the automation equipment.

C. STATEMENT OF WORK

Required activities:

Laboratory Automation and Analysis Equipment Specifications and Procurement

Technologies to be assessed: N/AOptions to be considered:

Commercially available control equipment.

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	R. R. Gadd <i>RR Gadd</i>	9-23-94
Activity Manager	S. A. Barker <i>SA Barker</i>	9-23-94
Cost Account Manager	S. A. Barker <i>SA Barker</i>	9-23-94
Project Control Analyst	D. L. Montoya <i>Dante L. Montoya</i>	9/23/94

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Project Control Analyst	D. L. Montoya <i>Dante Lee Montoya</i>	9/23/94

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Tank Waste Remediation System Work Breakdown Structure
Dictionary.

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4. WBS ELEMENT CODE/LEVEL 1.1.1.3.01.05.02.02.01/VIII	5. WBS ELEMENT TITLE Applied Process Testing							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1280-0-AB							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.2 Process Waste 4.2.2.1 Pretreat Waste	12. BUDGET AND REPORTING NUMBER(S) <table border="0" style="width: 100%;"> <tr> <td style="width: 33%;">Expense</td> <td style="width: 33%;">Capital</td> <td style="width: 33%;">Line Item</td> </tr> <tr> <td>EW3130010</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3130010		
Expense	Capital	Line Item						
EW3130010								

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	2765	5901	7750
CENRTC			
GPP			
LINE ITEM			
TOTAL	2765	5901	7750

B. TECHNICAL BASES

Goals & objectives:

The primary goal of low level waste (LLW) pretreatment is the removal of cesium, technetium, strontium, and transuranics (TRU) from the tank waste supernatant, the liquid from the solids/liquid separations and the liquids produced from the HLW pretreatment process. The processes needed for LLW pretreatment must be tested to determine the design specifications and to validate proper operation of the processes selected. The process testing requirements are influenced by the feed specifications for the LLW vitrification facility. The testing and evaluation of the processes will provide the necessary data to make recommendations concerning process selection, resin selection, process operating conditions, and process operating efficiency to support project design activities.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

- Select resin for cesium separations process;
- Cesium separations process performance with selected resin and configuration;
- Provide technical data to support selection of technetium separation process;
- Provide technical data to support selection of strontium separation process;
- Provide technical data to support selection of TRU separation process;

C. STATEMENT OF WORK

Required activities:

Support process testing of candidate processes to develop criteria for selection of preferred processes, including resin selection if applicable. In addition, this task will interface with other DOE funded technology development activities to help support refinement of their testing programs to provide appropriate data for inclusion into process and/or IX resin selection. Upon selection of process and/or IX resins perform testing to

develop all architect-engineer identified design data. In addition, this WBS activity will support process validation.

Technologies to be assessed:

- Cesium separation by ion exchange
- Strontium separation
- TRU separation
- Technecium separation
- Complexant Destruction

Options to be considered:

- Several cesium ion exchange resins will be tested over the conceptual design period. The resins identified include CS-100 (reference), resorcinol-formaldehyde (R-F) resin, and the engineered form of the crystalline-silico-titanate (CST) resin.
- Initial testing of processes to separate technetium, strontium, and TRU radionuclides is being provided by ADS 1220. Once the processes are selected, this WBS activity will develop the needed design information.

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	R. R. Gadd <i>RR Gadd</i>	9-23-94
Activity Manager	S. A. Barker <i>SA Barker</i>	9-23-94
Cost Account Manager	S. A. Barker <i>SA Barker</i>	9-23-94
Project Control Analyst	D. L. Montoya <i>Dante L. Montoya</i>	9/23/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	R. R. Gadd <i>RR Gadd</i>	9-23-94
Activity Manager	S. A. Barker <i>SA Barker</i>	9-23-94
Cost Account Manager	S. A. Barker <i>SA Barker</i>	9-23-94
Project Control Analyst	D. L. Montoya <i>Dante L. Montoya</i>	9/23/94

FDS Number

Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.01 Waste Pretreatment 1.1.1.3.01.05 W-236B Pretreatment Facility 1.1.1.3.01.05.02 Applied Technology 1.1.1.3.01.05.022 Process (M&O Contractor)	2. DATE PREPARED September 9, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.01.05.02.02.02\VIII	5. WBS ELEMENT TITLE Laboratory Automation and Analysis							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1280-0-AB							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.2 Process Waste 4.2.2.1 Pretreat Waste	12. BUDGET AND REPORTING NUMBER(S) <table border="0" style="width: 100%;"> <tr> <td style="width: 33%;">Expense</td> <td style="width: 33%;">Capital</td> <td style="width: 33%;">Line Item</td> </tr> <tr> <td></td> <td>35EW31301</td> <td></td> </tr> </table>		Expense	Capital	Line Item		35EW31301	
Expense	Capital	Line Item						
	35EW31301							

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING			
CENRTC	\$300		
GPP			
LINE ITEM			
TOTAL	\$300		

B. TECHNICAL BASES

Goals & objectives:

The goal of this cost account is to provide instrumentation and monitors for the automation of laboratory equipment supporting project process testing. Automating the laboratory equipment provides three functions: 1) it lowers the technicians and scientists exposure to "hot" material testing, 2) allows for 24 hour testing without the need for all resources to be involved, and 3) lowers the cost of the testing as less resources are utilized.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS): N/A

C. STATEMENT OF WORK

Required activities: N/A

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	R. R. Gadd	
Activity Manager	S. A. Barker	
Cost Account Manager	S. A. Barker	
Project Control Analyst	D. L. Montoya	

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	R. R. Gadd	
Activity Manager	S. A. Barker	
Cost Account Manager	S. A. Barker	
Project Control Analyst	D. L. Montoya	

<p>FDS Number</p> <p>_____</p>

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Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.01 Waste Pretreatment 1.1.1.3.01.05 W-236B Pretreatment Facility 1.1.1.3.01.05.03 Design Engineering (M&O Contractor)	2. DATE PREPARED September 23, 1994	3. IDENTIFICATION NUMBER DE-AC06-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.01.05.03.01.01/VIII	5. WBS ELEMENT TITLE Design Engineering - Conceptual Design (Expense)	
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1280-0-AB	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.2 Process Waste 4.2.2.1 Pretreat Waste	12. BUDGET AND REPORTING NUMBER(S) Expense Capital Line Item EW3130010	

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	13858	10563	
CENRTC			
GPP			
LINE ITEM			
TOTAL	13858	10563	

B. TECHNICAL BASES

Goals & objectives:

The objective of this cost element is to provide the conceptual and advanced conceptual design required for the Initial Pretreatment Module project to implement the Pretreat Supernate function (4.2.2.1.2) of the Tank Waste Remediation System (TWRS) systems engineering assessment. The project will provide the necessary pretreatment of the low level waste (LLW) supernate to permit successful immobilization of the LLW as glass (vitrification). The vitrification of the LLW will be performed by another project, Low Level Waste Disposal (1.1.1.3.02).

Status of Design Documentation:

The Functions & Requirements (F&Rs) document for Initial Pretreatment Module has been prepared, reviewed, and approved by WHC. It is currently in the review and approval cycle at DOE-RL. A Statement of Work (SOW) has also been prepared and, with the F&Rs, forms the basis for the cost proposal to perform the identified scope of work. The Architect & Engineer (A/E) has been selected to perform this design work, with options to perform the Title I, Title II, and Title III engineering work, as negotiated during future stages of the project.

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

- Completion of the 30% Conceptual Design Review package consisting of drawings, specifications, and other design documentation as defined in the negotiated work scope.
- Completion of the 60% Conceptual Design Review package consisting of drawings, specifications, and other design documentation as defined in the negotiated work scope.
- Completion of the 90% Conceptual Design Review package consisting of drawings, specifications, and other design documentation required to define the technical content of the conceptual design as defined in the negotiated work scope.
- Completion of the 100% Conceptual Design Review package, including the documented cost estimate, and a plan for incorporation of appropriate comments received during the 90% Conceptual Design Review.
- Completion of the Advanced Conceptual Design package to supplement the Conceptual Design Review Package, including incorporation of comments from the Conceptual and Advanced Conceptual Design efforts, and a revised cost estimate to reflect the changes made during the Advanced Conceptual Design work.

C. STATEMENT OF WORK

Required activities:

The A/E is to perform all activities necessary to complete Initial Pretreatment Module (IPM) Conceptual Design. Conceptual design will be used as the basis for requesting approval to proceed with Preliminary (Title I) Design, and Advanced Conceptual Design will incorporate design modifications identified during the Preliminary Design phase. This design work shall include preparation of the Conceptual Design Plan, documentation of design calculations, preparation of necessary design specifications and drawings, preparation of specified design review packages, and supporting activities, including administrative and financial controls, necessary to accomplish the project scope within the budget and schedule constraints of the project. The detailed Statement of Work and the negotiated workscope will define the specific list of deliverables to be

provided under this cost element.

Technologies to be assessed:

The technologies to be assessed are addressed by another element of this project. The F&Rs will delineate the functional requirements which the A/E must meet in development of the Conceptual Design. Trade studies to support development of the Conceptual Design will be identified in the Conceptual Design Plan and negotiated scope of work. Implementation of technologies beyond those identified in the negotiated scope of work will be implemented only to the extent that they are approved and provide improved performance within the budget and schedule constraints of the project.

Options to be considered:

This work will lead to options to be further developed during the Advanced Conceptual Design as defined during the preparation of the Conceptual Design Report and completion of the Conceptual Design effort. The Advanced Conceptual Design work scope will be approved by DOE-RL through the Change Control process, and will provide additional project definition and clarification prior to the initiation of Title I Design. Title I, Title II, and Title III design/support will be performed at the option of DOE-RL pending DOE-HQ concurrence.

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	R. R. Gadd <i>R.R. Gadd</i>	9/22/94
Activity Manager	L. D. Swenson <i>L.D. Swenson</i>	09/22/94
Cost Account Manager	L. D. Swenson <i>L.D. Swenson</i>	09/22/94
Project Control Analyst	D. L. Montoya <i>Dante L. Montoya</i>	9/22/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	R. R. Gadd <i>R.R. Gadd</i>	9/22/94
Activity Manager	L. D. Swenson <i>L.D. Swenson</i>	09/22/94
Cost Account Manager	L. D. Swenson <i>L.D. Swenson</i>	09/22/94
Project Control Analyst	D. L. Montoya <i>Dante L. Montoya</i>	9/22/94

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WHC-SP-1101

Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.01 Waste Pretreatment 1.1.1.3.01.05 W-236B Pretreatment Facility 1.1.1.3.01.05.03 Design Engineering 1.1.1.3.01.05.03.02 Title I (M&O Contractor)	2. DATE PREPARED September 23, 1994	3. IDENTIFICATION NUMBER DE-AC06-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.01.05.03.02.01/VIII	5. WBS ELEMENT TITLE Design Engineering - Title I							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1280-0-AB							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.2 Process Waste 4.2.2.1 Pretreat Waste	12. BUDGET AND REPORTING NUMBER(S) <table> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td></td> <td></td> <td>39EW31301</td> </tr> </table>		Expense	Capital	Line Item			39EW31301
Expense	Capital	Line Item						
		39EW31301						

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING			
CENRTC			
GPP			
LINE ITEM			16882
TOTAL			16882

1.1.1.3.01.05.03.02.01

A7-159

B. TECHNICAL BASES

Goals & objectives:

The objective of this cost element is to provide the Title I engineering required for the Initial Pretreatment Project to implement the Pretreat Supernate function (4.2.2.1.2) of the Tank Waste Remediation System (TWRS) systems engineering assessment. The project will provide the necessary pretreatment of the low level waste (LLW) supernate to permit successful immobilization of the LLW as glass (vitrification). The vitrification of the LLW will be performed by another project.

Status of Design Documentation:

The Functions & Requirements (F&Rs) document for Initial Pretreatment Module has been prepared, reviewed, and approved by WHC. It will be modified and updated as the Conceptual and Advanced Conceptual Designs progress. The Conceptual Design Report, supplemented by the Advanced Conceptual Design, will form the technical basis for the Title I Design activities. Those documents, along with a Statement of Work to be prepared and issued for the Title I work, will form the basis for the cost proposal to perform the capital-funded scope of work. The Architect & Engineer (A/E) has been selected to perform the Title I, Title II, and Title III design/support work at the option of DOE-RL with DOE-HQ concurrence, as documented using the project change control procedures.

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

- * Completion of the 30% Title I Design Review package consisting of drawings, specifications, and other design documentation as defined in the negotiated work scope.
- * Completion of the 60% Title I Design Review package consisting of drawings, specifications, and other design documentation as defined in the negotiated work scope.
- * Completion of the 90% Title I Design Review package consisting of drawings, specifications, and other design documentation necessary to define the technical portion of the Title I design as defined in the negotiated work scope.
- * Completion of the 100% Title I Design Review package consisting of drawings, specifications, and other design documentation, including the cost estimate, necessary to define the complete scope of the Title I Design as specified in the negotiated work scope.

C. STATEMENT OF WORK

Required activities:

The A/E is to perform all activities necessary to complete the Title I Engineering Design of the Initial Pretreatment Module project, as directed by WHC in the exercise of the contract options. This design work shall include preparation of a schedule and work plan for the negotiated scope of work, preparation of the Title I Design package (including the documented cost estimate, documentation of design calculations, preparation of necessary design specifications and drawings, and preparation of specified design review packages) and supporting activities (including administrative and financial controls) necessary to accomplish the project scope within the budget and schedule constraints of the project. The detailed Statement of Work and the negotiated workscope will define the specific list of deliverables to be provided under this cost element.

Technologies to be assessed:

The technologies to be assessed are addressed by another element of this project. The F&Rs will delineate the functional requirements which the A/E must meet in development of the Conceptual Design. Trade studies to be completed during the Title I Design will be identified in the negotiated

scope of work. Implementation of technologies beyond those identified in the negotiated scope of work will be pursued only to the extent that they are approved and provide improved performance within the budget and schedule constraints of the project.

Options to be considered:

Title I, Title II, and Title III engineering will be continued at the discretion of DOE-RL, as funding and continued project justification are available. (Title II and Title III activities will be included in separate work breakdown structure dictionary sheets when they are applicable.)

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	R. R. Gadd <i>R.R. Gadd</i>	9/22/94
Activity Manager	L. D. Swenson <i>L.D. Swenson</i>	09/22/94
Cost Account Manager	L. D. Swenson <i>L.D. Swenson</i>	09/22/94
Project Control Analyst	D. L. Montoya <i>Dante L. Montoya</i>	9/22/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	R. R. Gadd <i>R.R. Gadd</i>	9/22/94
Activity Manager	L. D. Swenson <i>L.D. Swenson</i>	09/22/94
Cost Account Manager	L. D. Swenson <i>L.D. Swenson</i>	09/22/94
Project Control Analyst	D. L. Montoya <i>Dante L. Montoya</i>	9/22/94

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Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.01 Waste Pretreatment 1.1.1.3.01.05 W-236B Pretreatment Facility 1.1.1.3.01.05.06 Regulatory Compliance & Safety/(M&O Contractor)	2. DATE PREPARED September 23, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.01.05.06.01.01/VIII	5. WBS ELEMENT TITLE Regulatory Permits							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1280-0-AB							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.2 Process Waste 4.2.2.1 Pretreat Waste	12. BUDGET AND REPORTING NUMBER(S) <table style="width: 100%; border: none;"> <tr> <td style="width: 33%;">Expense</td> <td style="width: 33%;">Capital</td> <td style="width: 33%;">Line Item</td> </tr> <tr> <td>EW3130010</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3130010		
Expense	Capital	Line Item						
EW3130010								

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	277	391	237
CENRTC			
GPP			
LINE ITEM			
TOTAL	277	391	237

B. TECHNICAL BASES

Goals & objectives:

Provide all required regulatory permits (NEPA, RCRA, air, etc.) for the low level waste pretreatment facility and any required hot testing. The permits will be prepared in a quality manner to meet the appropriate schedules.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

- Complete the NEPA Documentation for the ion exchange and filter tests.
- Complete the required air permits (TAP, PSD, NESHAP, and NOC [WAC 246 - 247]) for the ion exchange and filter tests.
- Complete the RCRA permits required for the ion exchange and filter tests.
- Complete RCRA permits (NOI, Part A, and Part B) for the low level waste pretreatment facility.
- Complete the air permits (TAP, PSD, NESHAP, and NOC [WAC 246 - 247]) for module 1 of the low level waste pretreatment facility.
- Complete the air permits (TAP, PSD, NESHAP, and NOC [WAC 246 - 247]) for module 2 of the low level waste pretreatment facility.
- Complete POC checklist for ion exchange and filter tests.
- Complete revision of the IPM Permitting Plan.

C. STATEMENT OF WORK

Required activities:

Prepare all required permits for the low level pretreatment facility and any required hot testing. The permits include air permits (NESHAP, PSD, TAP, NOC [WAC 246 - 246]), RCRA permits (NOI, Part A, and Part B), NEPA documentation, and miscellaneous reviews, permits, and approvals (e.g. preoperation monitoring, cultural resources review, endangered species approval, SEPA checklist, etc.). Revise the IPM Permitting Plan and prepare the POC checklist for the ion exchange and filter tests. Document preparation includes reviews, comment incorporation, approvals, and document revisions as necessary. Track documents during review cycles and respond to questions.

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	R.R. Gadd <i>R.R. Gadd</i>	9/22/94
Activity Manager	D.L. Banning <i>R.R. Gadd</i>	9/22/94
Cost Account Manager	D.L. Banning <i>for</i>	
Project Control Analyst	D.L. Montoya <i>Dante L. Montoya</i>	9/22/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	R.R. Gadd <i>R.R. Gadd</i>	9/22/94
Activity Manager	D.L. Banning <i>R.R. Gadd</i>	9/22/94
Cost Account Manager	D.L. Banning <i>for</i>	
Project Control Analyst	D.L. Montoya <i>Dante L. Montoya</i>	9/22/94

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Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Waste 1.1.1.3.01 Waste Pretreatment 1.1.1.3.01.05 W-236B Pretreatment Facility 1.1.1.3.01.05.06 Regulatory Compliance & Safety/(M&O Contractor)	2. DATE PREPARED September 23, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.01.05.06.02.01/VIII	5. WBS ELEMENT TITLE Preliminary Safety Evaluation							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1280-0-AB							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.2 Process Waste 4.2.2.1 Pretreat Waste	12. BUDGET AND REPORTING NUMBER(S) <table border="0"> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3130010</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3130010		
Expense	Capital	Line Item						
EW3130010								

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	569	576	35
CENRTC			
GPP			
LINE ITEM			
TOTAL	569	576	35

B. TECHNICAL BASES

Goals & objectives:

Support conceptual design of the low level waste pretreatment facility so it will meet all safety requirements.
Prepare a quality Preliminary Safety Evaluation on schedule that will meet all requirements.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

Complete a Safety Management Plan for the low level waste pretreatment project.

Complete a Preliminary Safety Evaluation report to be issued with the Conceptual Design Report.

C. STATEMENT OF WORK

Required activities:

- Prepare a Safety Management Plan for the project.
- Perform preliminary hazards identification and assessments.
- Perform accident analyses.
- Identify the hazards associated with facility operations, assess the potential consequences and evaluate the barriers for the identified hazards.
- Prepare preliminary Safety Evaluation Report.
- Document preparation includes review, comment incorporation, approvals, and document revisions as necessary. Track documents during review cycles and respond to questions.
- Provide design support to the conceptual design effort.

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	R.R. Gadd <i>R.R. Gadd</i>	9/22/94
Activity Manager	D.L. Banning <i>R.R. Gadd</i>	9/22/94
Cost Account Manager	D.L. Banning <i>for</i>	
Project Control Analyst	D.L. Montoya <i>Dante Lee Montoya</i>	9/22/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	R.R. Gadd <i>R.R. Gadd</i>	9/22/94
Activity Manager	D.L. Banning <i>R.R. Gadd</i>	9/22/94
Cost Account Manager	D.L. Banning <i>for</i>	
Project Control Analyst	D.L. Montoya <i>Dante Lee Montoya</i>	9/22/94

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WHC-SP-1101

Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.01 Waste Pretreatment 1.1.1.3.01.05 W-236B Pretreatment Facility 1.1.1.3.01.05.06 Regulatory Compliance & Safety (M&O Contractor)	2. DATE PREPARED September 23, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.01.05.06.02.02/VIII	5. WBS ELEMENT TITLE Safety Analysis Reports							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1280-0-AB							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.2 Process Waste 4.2.2.1 Pretreat Waste	12. BUDGET AND REPORTING NUMBER(S) <table border="0"> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td></td> <td></td> <td>39EW31301</td> </tr> </table>		Expense	Capital	Line Item			39EW31301
Expense	Capital	Line Item						
		39EW31301						

1.1.1.3.01.05.06.02.02

A7-171

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING			
CENRTC			
GPP			
LINE ITEM			850
TOTAL			850

B. TECHNICAL BASES

Goals & objectives:

Support definitive design and construction of the low level waste pretreatment facility (project W-236B) so it will meet all safety requirements. Prepare a quality Preliminary Safety Analysis Report and a Final Safety Analysis Report on schedule that will meet all requirements.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

- Complete a Preliminary Safety Analysis Work Plan.
- Complete a Preliminary Safety Analysis Report for Module 1 of the low level waste pretreatment facility.
- Complete a Preliminary Safety Analysis Report for Module 2 of the low level waste pretreatment facility.
- Complete a Final Safety Analysis Report for the low level waste pretreatment facility.
- Complete a Criticality Safety Evaluation Report.
- Complete a Technical Safety Requirements document.

C. STATEMENT OF WORK

Required activities:

- Evaluate hazards and potential consequences during definitive design and construction.
- Provide input to the design to prevent and mitigate potential accident consequences.
- Conduct risk analyses for the final design.
- Prepare a Safety Analysis Work Plan.
- Prepare Preliminary Safety Analysis Reports for facility modules 1 and 2.

- Prepare the Final Safety Analysis Report for module 1 and revise for module 2.
- Prepare the Criticality Safety Evaluation Report and the Technical Safety Requirements Document.
- Provide design support for definitive design.
- Document preparation includes reviews, comment incorporation, approvals, and document revisions as necessary.
- Track documents during review cycles and respond to questions.

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	R. R. Gadd <i>R R Gadd</i>	9/22/94
Activity Manager	D. L. Banning <i>> R R Gadd</i>	9/22/94
Cost Account Manager	D. L. Banning <i>for</i>	
Project Control Analyst	D. L. Montoya <i>Dante Lee Montoya</i>	9/22/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	R. R. Gadd <i>R R Gadd</i>	9/22/94
Activity Manager	D. L. Banning <i>> R R Gadd</i>	9/22/94
Cost Account Manager	D. L. Banning <i>for</i>	
Project Control Analyst	D. L. Montoya <i>Dante Lee Montoya</i>	9/22/94

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WHC-SP-1101

Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.01 Waste Pretreatment (M&O Contractor)	2. DATE PREPARED September 23, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.01.06/V	5. WBS ELEMENT TITLE High Level Waste Pretreatment	
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1220-0-AF	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER / TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.2.1	12. ADS/TDD BUDGET AND REPORTING NUMBER Expense EW3130010	

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)	FY 1998 \$(000)	FY 1999 \$(000)	FY 2000 \$(000)	FY 2001 \$(000)
OPERATING		851					
CENRTC							
GPP							
LINE ITEM							
TOTAL		851					

1.1.1.3.01.06

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B. TECHNICAL BASES

The product of High-Level Waste (HLW) Pretreatment is a processing facility for pretreating sludges/solids to meet the feed specifications of the HLW vitrification facility. Construction of the HLW pretreatment facility is scheduled for completion in May 2007 and completion of preparations for startup is scheduled for completion in May 2008. The standards for turning the facility over to operations for hot startup (TPA M-50-04) by June 2008 include Key Decision 4, Approval to Commence Operation/Production per DOE Order 4700.1; DOE Standard 3006-93, Planning and Conduct of Operational Readiness Reviews; DOE Order 5480.31, Startup and Restart of Nuclear Facilities; and requirements for receiving operating licenses and permits from regulatory agencies.

Goals and objectives:

The primary goal is to provide a processing capability for pretreating selected sludges/solids to meet the feed specifications of the HLW vitrification facility. The secondary goal is to provide a processing capability for pretreating sludges/solids to reduce the volume of HLW produced. The objective is to provide a facility with the required capability by May 2008.

Major end-item deliverables:

- Design, construction and startup preparations for the HLW pretreatment facility.

Acceptance criteria:

- Key Decision 4, Approval to Commence Operation/Production per DOE Order 4700.1, Project Management System.
- DOE Standard 3006-93, Planning and Conduct of Operational Readiness Reviews.
- DOE Order 5480.31, Startup and Restart of Nuclear Facilities.
- Receipt of appropriate nuclear facility licenses and permits.

C. STATEMENT OF WORK

Required activities over lifetime:

- Prepare Conceptual Design (CDR) for HLW Pretreatment Facility (A-E: Ebasco/BNFL)
- Prepare Advanced Conceptual Design (ACDR) for HLW Pretreatment Facility (A-E: Ebasco/BNFL)
- Prepare Title I Design for HLW Pretreatment Facility (A-E)
- Prepare Title II Design for HLW Pretreatment Facility (A-E)
- Prepare PSE for HLW Pretreatment Facility (WHC)
- Prepare PSAR for HLW Pretreatment Facility (WHC)
- Prepare FSAR for HLW Pretreatment Facility (WHC)
- Prepare Other Permitting for HLW Pretreatment Facility (WHC)
- Construct HLW Pretreatment Facility (Construction Contractor)
- Prepare for HLW Pretreatment Facility Startup (WHC)

Interfaces:

#	From This WBS To	Item Provided
1	Systems Definition (1.1.1.3.01.04)	Input to technical options for organic destruction LLW/HLW
2	High Level Waste (1.1.1.0.03)	Input to Title I HLW Vitrification Facility
	Tech. Integ. & Planning (1.1.1.3.01.03)	Input to HLW Pretreatment Facility operations
	To This WBS From	
	AB	Input to TWRS EIS

Technologies to be assessed:

- Acid leaching of sludges/solids
- Removing organics from sludge
- Chemical reconstitution of sludge
- Chemical recycle of caustic

Options to be considered:

Major areas where possible options have been identified are processing and facility configuration.

- Processing. The processing options for the HLW pretreatment facility are listed below.
 - Acid leaching of selected sludge types to reduce volume of HLW produced
 - Removal of organics in some sludge types to meet HLW feed specifications
 - Chemical reconstitution (acidification and neutralization) of some sludge types to reduce the volume of HLW produced
 - Recycle caustic to reduce the amount of sodium in the feed to the LLW vitrification facility
- Facility Configuration. The optional facility configurations are listed below.
 - Combined LLW pretreatment and HLW pretreatment
 - Combined LLW pretreatment, HLW pretreatment and HLW vitrification
 - Stand alone facility

D. OTHER LEGAL DRIVERS AND ORDER REQUIREMENTS

Refer to DOE/RL-92-60, Rev 1, March 31, 1994, "TWRS Functions and Requirements"

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Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.01 Waste Pretreatment 1.1.1.3.01.06 HLW Pretreatment Facility 1.1.1.3.01.06.01 Project Management 1.1.1.3.01.06.01.01 Management & Integration (M&O Contractor)	2. DATE PREPARED September 23, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.01.06.01.01.01/VIII	5. WBS ELEMENT TITLE HLW Pretreatment Project Management							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1220-0-AC							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.2 Process Waste 4.2.2.1 Pretreat Waste	12. BUDGET AND REPORTING NUMBER(S) <table border="0" style="width: 100%;"> <tr> <td style="text-align: left;">Expense</td> <td style="text-align: center;">Capital</td> <td style="text-align: right;">Line Item</td> </tr> <tr> <td style="text-align: left;">EW3130010</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3130010		
Expense	Capital	Line Item						
EW3130010								

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING		134	
CENRTC			
GPP			
LINE ITEM			
TOTAL		134	

B. TECHNICAL BASES

The primary mission for the High Level Waste (HLW) Pretreatment Management and Integration activity is to provide overall project management guidance, direction, support and interface for the HLW pretreatment project. This activity will support the project in the areas of general management, business management, engineering management, permitting and safety management, architect/engineer (A/E) contract management and applied engineering management. This provides the minimum staffing level necessary to provide continued project direction and operations.

Status of Design Documentation:

Currently, the only completed design documentation is the TWRS Functions and Requirements (F&Rs) document.

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS): N/A

Provide project guidance to manage the program to the established baseline.

C. STATEMENT OF WORK

Required activities:

1. **General Project Management.**
This provides the general project management direction, guidance and support.
2. **Project Business Management.**
This provides the project business and scheduling management direction, guidance and support.

3. **Project A/E Resident Engineering Management.**
This provides the project A/E resident engineering management direction, guidance and support.
4. **Project Engineering Integration Management.**
This provides the project engineering integration management direction, guidance and support.
5. **Project Permitting and Safety Management.**
This provides the project permitting and safety management direction, guidance and support.
6. **Project Applied Engineering.**
This provides the project applied engineering direction, guidance and support.

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	K. A. Gasper <i>KAGasper</i>	9/23/94
Activity Manager	K. A. Gasper <i>KAGasper</i>	9/23/94
Cost Account Manager	K. A. Gasper <i>KAGasper</i>	9/23/94
Project Control Analyst	P. R. Weinman <i>P.R. Weinman</i>	9/23/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	K. A. Gasper <i>KAGasper</i>	9/23/94
Activity Manager	K. A. Gasper <i>KAGasper</i>	9/23/94
Cost Account Manager	K. A. Gasper <i>KAGasper</i>	9/23/94
Project Control Analyst	P. R. Weinman <i>P.R. Weinman</i>	9/23/94

FDS Number

1.1.1.3.01.06.01.01.01

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Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.01 Waste Pretreatment 1.1.1.3.01.06 HLW Pretreatment Facility 1.1.1.3.01.06.03 Design Engineering (M&O Contractor)/A&E Contractor	2. DATE PREPARED September 23, 1994	3. IDENTIFICATION NUMBER DE-AC06-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.01.06.03.01.01/VIII	5. WBS ELEMENT TITLE Design Engineering - Conceptual Design (HLW)							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1220-0-AC							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.2 Process Waste 4.2.2.1 Pretreat Waste	12. BUDGET AND REPORTING NUMBER(S) <table border="0" style="width: 100%;"> <tr> <td style="width: 33%;">Expense</td> <td style="width: 33%;">Capital</td> <td style="width: 33%;">Line Item</td> </tr> <tr> <td>EW3130010</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3130010		
Expense	Capital	Line Item						
EW3130010								

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING		717	
CENRTC			
GPP			
LINE ITEM			
TOTAL		717	

B. TECHNICAL BASES

Goals & objectives:

The objective of this cost element is to provide the conceptual and advanced conceptual design required for the High Level Waste Pretreatment Facility project to implement the Pretreat Sludges/Solids function (4.2.2.1.3) of the Tank Waste Remediation System (TWRS) systems engineering assessment. The project will provide the necessary pretreatment of the high level waste (HLW) to permit successful immobilization of the HLW as glass (vitrification). The vitrification of the HLW will be performed by another project, High Level Waste Disposal (1.1.1.3.03).

Status of Design Documentation:

The only complete design documentation is the TWRS Functions & Requirements (F&Rs) document with functions identified to Level 4. The F&Rs document for HLW Pretreatment will be prepared, reviewed and approved by WHC as part of this project.

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

- * Completion of the 100% Conceptual Design package, including the documented cost estimate, and a plan for incorporation of appropriate comments received during the Conceptual Design Reviews.
- * Completion of the Advanced Conceptual Design package to supplement the Conceptual Design Review Package, including incorporation of comments from the Conceptual and Advanced Conceptual Design efforts, and a revised cost estimate to reflect the changes made during the Advanced Conceptual Design work.

C. STATEMENT OF WORK

Required activities:

The selected Architect & Engineer (A/E) will perform all activities necessary to complete the HLW Pretreatment Facility Conceptual Design. Conceptual design will be used as the basis for requesting

1.1.1.3.01.06.03.01.01

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approval to proceed with Preliminary (Title I) Design, and Advanced Conceptual Design will incorporate design modifications identified during the Preliminary Design phase. This design work shall include preparation of the Conceptual Design Plan, documentation of design calculations, preparation of necessary design specifications and drawings, preparation of specified design review packages, and supporting activities, including administrative and financial controls, necessary to accomplish the project scope within the budget and schedule constraints of the project. The detailed Statement of Work (SOW) and the negotiated workscope will define the specific list of deliverables to be provided under this cost element.

Technologies to be assessed:

The technologies to be assessed are addressed by another element of this project. The F&Rs will delineate the functional requirements which the A/E must meet in development of the Conceptual Design. Trade studies to support development of the Conceptual Design will be identified in the Conceptual Design Plan and negotiated scope of work. Implementation of technologies beyond those identified in the negotiated scope of work will be implemented only to the extent that they are approved and provide improved performance within the budget and schedule constraints of the project.

Options to be considered:

This work will lead to options to be further developed during the Advanced Conceptual Design as defined during the preparation of the Conceptual Design Report and completion of the Conceptual Design effort. The Advanced Conceptual Design work scope will be approved by DOE-RL through the Change Control process, and will provide additional project definition and clarification prior to the initiation of Title I Design. Title I, Title II, and Title III design/support will be performed at the option of DOE-RL pending DOE-HQ concurrence.

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	K.A. Gasper <i>K.A. Gasper</i>	9/23/94
Activity Manager	K.A. Gasper <i>K.A. Gasper</i>	9/23/94
Cost Account Manager	K.A. Gasper <i>K.A. Gasper</i>	9/23/94
Project Control Analyst	P.R. Weinman <i>P.R. Weinman</i>	9/23/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	K.A. Gasper <i>K.A. Gasper</i>	9/23/94
Activity Manager	K.A. Gasper <i>K.A. Gasper</i>	9/23/94
Cost Account Manager	K.A. Gasper <i>K.A. Gasper</i>	9/23/94
Project Control Analyst	P.R. Weinman <i>P.R. Weinman</i>	9/23/94

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Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste (M&O Contractor)	2. DATE PREPARED September 23, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.02/IV	5. WBS ELEMENT TITLE Low-Level Waste							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1230							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-60 REV.1) 4.2.3.1 Immobilize and Dispose LLW	12. BUDGET AND REPORTING NUMBER <table> <tr> <td>Expense</td><td>Capital</td><td>Line Item</td></tr> <tr> <td>EW313001-0</td><td>35EW3130-1</td><td>39EW3130-1</td></tr> </table>		Expense	Capital	Line Item	EW313001-0	35EW3130-1	39EW3130-1
Expense	Capital	Line Item						
EW313001-0	35EW3130-1	39EW3130-1						

13. ELEMENT DESCRIPTION

A. COST CONTENT

The total WBS element cost is \$7,770,682,000.

B. TECHNICAL BASES

Goals and Objectives:

The Low-Level Waste (LLW) program, as defined by the "Hanford Site Tank Waste Remediation System Technical Strategy," dated March 18, 1994, will receive LLW from the TWRS Pretreatment Facility and treat and store/dispose of LLW. The LLW program will treat the waste through vitrification and non-vitrification processes, develop product-handling methods, and store/dispose of the waste in a retrievable form, onsite, in near-surface facilities, and in an environmentally and publicly accepted manner. This program also includes the implementation of disposal site closure and monitoring strategy. Consistent with a system engineering

approach, processing of LLW is planned to be completed by January 2022. This represents approximately a seven-year acceleration to the original Tri-Party Agreement milestone (M-60-00, Complete vitrification of Hanford low-level tank waste).

The LLW program will provide sound engineering and technical basis for the design, construction and operation of vitrification facility, disposal facilities, closure of the disposal facilities, and transition of the vitrification facility for decommissioning at the end of mission.

When sound engineering or a technical basis is not readily available, a technology development activity(s) will be initiated.

Goals and objectives:

1.1.1.3.02.01, Technical Integration and Planning

- Plan and implement the business plans and technical plans to support the LLW program.

1.1.1.3.02.02, Technical Development and Applied Engineering

- Plan and implement melter selection, glass formulation, disposal systems, glass quality, and feed specifications.
- Provide information to the support the Performance Assessment (PA) and compliance activities in support of the storage/disposal action.

1.1.1.3.02.03, Facility Operations

- Provide staff, training and operations of the LLW Vitrification Facility.
- Provide operational input to the design and startup of the facility.

1.1.1.3.02.04, Systems Definition

- Define, plan, and prepare trade studies required for scoping of facilities and processes for LLW treatment and disposal.
- Develop criteria and prepare PA.
- Develop strategy and maintain compliance documentation.

1.1.1.3.02.05, LLW Facility

- Plan and manage the LLW Vitrification Plant Project through hot startup.
- Provide a LLW Vitrification Plant and disposal/storage facility fully operational by the year 2005.

1.1.1.3.02.06, Grout Facilities

- Proceed with deactivation of the Grout Facilities and maintain the facilities in cold standby as specified by the January 25, 1994, Tri-Party Agreement.
 - Maintain capability to restart facilities within a two-year window.
 - Issue Grout Facilities Standby Plan. This plan details the checklist for deactivation, surveillance, and monitoring activities as well as the standby/restart organization.

LLW Programmatic Risks:

- The ability to successfully apply high-capacity, commercial melter technology to the vitrification of radioactive high-sodium waste feed is a major program uncertainty. This has been deemed a medium-risk item.
- The approval of the PA will be heavily dependent upon high quality glass and/or a chemical matrix material to inhibit the release of long-lived soluble species such as Tc, U, Np, and I. This has been deemed a high-risk item.
- The Tri-Party Agreement funding profile may be inadequate to support the construction and operation of the LLW Vitrification Plant (i.e., a \$500M "lightly shielded" facility). This has been deemed a medium-risk item.
- The 2005 hot startup date is a "demand schedule" which forces the scheduling of key activities on a parallel path. This has been deemed a medium-risk item.

Major end-item deliverables:

The completion activity for the LLW program is to complete vitrification of LLW, close the storage/disposal area, and prepare vitrification and disposal facilities for transition to decontamination and decommissioning (D & D).

1.1.1.3.02.01, Technical Integration and Planning

- Business documents (ADS, Multi-Year Work Plan/baseline)
- Justification of Mission Need
- Involvement with development of TWRS Public Involvement Plan
- Approval authority of Technology Development Program Office's (TDPO) Integrated Technology Plan
- Review and concurrence on miscellaneous project plans

1.1.1.3.02.02, Technical Development and Applied Engineering

- Begin LLW melter testing with simulants (M-60-01).
- Define and issue LLW simulant recipe (and basis) for initial melter tests. (M-60-01A)
- Complete melter feasibility and system operability tests, select reference melter (s), and establish reference LLW glass formulation which meets complete system requirements (M-60-02)
- Feed specification envelope to pretreatment

1.1.1.3.02.03, Facility Operations

- Complete vitrification of Hanford low-level tank waste (M-60-00)
- Deliver vitrified LLW for storage and/or disposal.
- Initiate hot operations of the LLW Vitrification Facility (M-60-05)
- Liquid and solid waste effluents
- Process sampling for lab analysis

1.1.1.3.02.04, Systems Definition

- Facility Configuration Options Study (M-60-03-TI)

1.1.1.3.02.05, LLW Facility

- Submit conceptual design and initiate definitive design of the LLW Vitrification Facility. (M-60-03).
- Initiate construction of LLW Vitrification Facility (M-60-04).

1.1.1.3.02.06, Grout Facilities

- Deactivate Grout Facilities and transfer facilities to D & D.

Acceptance criteria:

All LLW will have been disposed of in an environmentally sound manner. This will consist of the treatment and storage/disposal of Hanford's LLW meeting or exceeding the criteria developed and then outlined in programmatic technical documentation.

1.1.1.3.02.02, Technical Development and Applied Engineering decommissioning (D & D).

- Milestone verification will be onsite, witnessed by RL/WHC/Ecology personnel if necessary. (M-60-01)
- Acceptance criteria for this milestone will be Ecology's acceptance of the deliverable, which will define the simulated double-shell tank (DST) waste characterization information. (M-60-01A)
- Final acceptance criteria (production rates, product quality, durability, etc) will be developed upon completion of phase I melter testing. (M-60-02)
- Acceptable feed specification from pretreatment for LLW vitrification.

1.1.1.3.02.03, Facility Operations

- The criteria will be developed upon the completion of the operations plan.
- The chief criteria for start of hot operations are completion of the requirements of: Key Decision 4 - Approval to Commence Operation/Production per DOE Order 4700.1, Project Management System; completion of an operational readiness review per DOE Standard 3006-93, Planning and Conduct of Operational Readiness Reviews; and meeting the facility startup requirements set forth in DOE Order 5480.31, Startup and Restart of Nuclear Facilities. Meeting the requirements of these three documents by the operating contractor will serve as the basis for DOE approval of the operating contractor to start hot operations of the LLW Vitrification Facility.

1.1.1.3.02.05, LLW Facility (Projects)

- A Conceptual Design Report will be submitted by the architect-engineer and approved by WHC. Completion of Key Decision 1, approval to initiate Title I design per DOE Order 4700.1, will be granted by DOE.

- The criterion is completion of "Key Decision 3 - Approval to Commence Construction", per DOE order 4700.1. Approval of the contractor's updated project plan by DOE-RL will signify authorization to initiate construction of the LLW Vitrification Facility. Achievement of this milestone (M-60-03) will be the issuance of a construction contract for site preparation.

C. STATEMENT OF WORK

The LLW program continues to evolve the commercial glass technology that will be utilized in the effective treatment of Hanford's radioactive LLW. The program will design and construct the vitrification facility, utilizing the functions and requirements documents developed by TWRS. Waste form criteria will be developed and analyzed to ensure that the environment will be protected as the result of this storage/disposal action. The facility will be operated on an around the clock basis, with production capacity based on minimizing impact to tank space.

The LLW program consists of performing:

1.1.1.3.02.01, Technical Integration and Planning

- Provide for general program management and support by quality, safety, and environmental oversight
- Provide support for public involvement efforts to maintain public commitment to the Program

1.1.1.3.02.02, Technical Development and Applied Engineering

- Select reference melter (M & O Contractor)
- Select glass formulation (M & O Contractor-Offsite Labs)
- Select matrix/canister for disposal (M & O Contractor-Offsite Labs)
- Select disposal system (M & O Contractor-Offsite Labs)
- Perform process/equipment development and testing (M & O Contractor-Offsite Labs)
- Provide NDT quality verification of disposal system (M & O Contractor)
- Perform pilot-scale testing (M & O Contractor-Offsite Labs)
- Perform waste form quality testing (M & O Contractor-Offsite Labs)

1.1.1.3.02.03, Facility Operations

- Operational technical support (design review and input) during the program.
- Acceptance and operability testing of the systems during the design period.
- Staffing and training of operators and technicians prior to plant commissioning.
- Cold operations testing and request to startup. (M & O Contractor)
- Initiate radioactive operations by 2005. (M & O Contractor)
- Complete LLW vitrification operations by 2028, planning indicates the program will be able to achieve an approximate 7-year acceleration to 2028. (M & O Contractor)
- Prepare the facility for turnover to D & D. (M & O Contractor)

1.1.1.3.02.04, Systems Definition

- Perform Facility Configuration Trade Study (M & O Contractor, Subcontractors)
- Prepare PA (M & O Contractor-offsite labs)
- Site selection (M & O Contractor, Subcontractors)
- Functions & Requirements (M & O Contractor)
- Process flowsheet (M & O Contractor)
- Disposal system studies (M & O Contractor-offsite labs)
- Reviews and facility upgrade support (M & O Contractor)
- Maintain compliance documentation (M & O Contractor)

1.1.1.3.02.05, LLW Facility

- Plan and manage all project activities, including project plans and procedures.
- Procure design, construction, and testing services for a vitrification facility and disposal/storage for one-year capacity of glass product. (M & O Contractor)
- Contractor procure facility components, equipment, and raw materials required to complete the facilities up to the point of hot operations architect/engineer/construction management (AECM)
- Contractor perform facility construction (AECM)
- Review and approve design products (M & O Contractor)
- Prepare and approve all safety analyses. Ensure independent reviews of PSA, PSAR, and FSAR (M & O Contractor)
- Prepare and submit for approval all permit applications. Ensure internal reviews and regulator reviews are accomplished (M & O Contractor)
- Develop QA plans; perform audits and surveillances (M & O Contractor/AECM)
- Establish QA requirements: records, trend analyses, training (AECM)
- Provide as-built documentation required to operate and maintain the facilities (AECM)

1.1.1.3.02.06, Grout Facilities

- Deactivate Grout Facilities (M & O Contractor)
- Surveillance and monitoring of Grout Facilities (M & O Contractor)
- Development of and maintenance of emergency restart plan (M & O Contractor)

Interfaces:

This LLW program is extremely dependant on the receipt of suitable pretreated waste stream. This waste stream must meet criteria outlined by LLW. The waste stream is predicated on retrieval sequence and rates.

#	From This WBS To	Item Provided
1	Waste Pretreatment 1.1.1.3.01	Feed composition
1	Program Management and Administration 1.1.1.1.01	Business documents/reporting
1	External/Solid Waste	Solid waste, facility equipment
2	External/Liquid Waste	Liquid waste facility liquid effluents
3	Characterization 1.1.1.2.04	Sampling
4	External/Environmental Restoration	D&D transfer facilities
5	External/HWVP or new processes	Nonvitrifiable waste
1	External/Environmental Restoration	Grout Facilities for D&D
	To This WBS From	Items Provided
1	Waste Retrieval 1.1.1.2.05	Water recycle needs
2	External/Environmental Restoration	Requirements for closure

3	Waste Pretreatment 1.1.1.3.01	Preliminary and final product specs
4	High-Level Waste 1.1.1.3.03	Characteristics and volume of HLW plant
1	Program Management and Administration 1.1.1.1.01	Business document guidance
1	Program Management and Administration 1.1.1.1.01	Permit approvals
2	External/DOE	DOE-HQ FSAR approval
3	External/DOE	DOE-HQ approved PA
4	Waste Pretreatment 1.1.1.3.01	Pretreated feed
	To this WBS from	Items Provided
5	Characterization 1.1.1.2.04	Process sample data
1	External/DOE	DOE-HQ approval of Key Decision 0
2	Program Management and Administration 1.1.1.1.01 DOE	Approve TWRS EIS and issue ROD
3	External/DOE	DOE-HQ Key Decision 1 through 4

Technologies to be assessed:

1.1.1.3.02.02 Technical Development and Applied Engineering

- Feed preparation, vitrification system, off gas treatment process control alternate waste form, disposal system, matrix/containers, quality verification

1.1.1.3.02.04 Systems Definition

- Disposal system concepts

Options to be considered:

1.1.1.3.02.02, Technical Development and Applied Engineering

- Melter technologies from industry
- Feed specification
- Waste form types
- Packaging
- Technetium disposal
- Off gas scrubbers
- Analytical methods for glass durability control
- Alternative glass form compositions
- Feed systems
- Glass handling systems

1.1.1.3.02.04, Systems Definition

- Degree of retrievability of wastes
- Possible need for chemical or physical barriers

1.1.1.3.02.05, LLW Facility

- Contracting options will be analyzed and optimum selected. This includes design/build turnkey with performance guarantees and privatization (design, build, operate)

D. OTHER LEGAL DRIVERS AND ORDER REQUIREMENTS

The drivers for this program element are defined in Tank Waste Remediation System Functions and Requirements, DOE/RL-92-60, Rev 1, Functions Requirements, Table F4.2.3.1, Item V, and systems Architecture, Table A4.2.3.1, Item VIII, paragraph C.

Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.02 Low-Level Waste (M&O Contractor)	2. DATE PREPARED September 23, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.02.01/V	5. WBS ELEMENT TITLE Technical Integration and Planning							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1230-0-AC							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-60 REV.1) 4.2.3.1 Immobilize and Dispose LLW	12. BUDGET AND REPORTING NUMBER <table style="width: 100%; border: none;"> <tr> <td style="text-align: left;">Expense</td> <td style="text-align: left;">Capital</td> <td style="text-align: left;">Line Item</td> </tr> <tr> <td>EW313001-0</td> <td>35EW3130-1</td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW313001-0	35EW3130-1	
Expense	Capital	Line Item						
EW313001-0	35EW3130-1							

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)	FY 1998 \$(000)	FY 1999 \$(000)	FY 2000 \$(000)	FY 2001 \$(000)
OPERATING	1444	1684	1581				
CENRTC	12	0	0				
GPP	0	0	0				
LINE ITEM	0	0	0				
TOTAL	1456	1684	1581				

B. TECHNICAL BASES

Goals & objectives:

The Low-Level Waste (LLW) Program will receive LLW from the TWRS Pre-treatment Facility treat and store/dispose of Hanford's LLW. The LLW Program will treat the waste through vitrification and non-vitrification processes, develop product handling methods and store/dispose in a retrievable form, on-site in near-surface facilities in an environmentally and publicly accepted manner. The program also includes implementation of disposal site closure and monitoring strategy. Processing of LLW is planned to be completed by January 2022. This essentially represents approximately a seven year acceleration to the current Tri-Party Agreement milestone.

The entire TWRS mission is based upon the Hanford Site TWRS Technical Strategy. This strategy has been signed by Senior WHC and RL management. To Assist in the accomplishment of implementing this strategy, The LLW Technical Integration and Planning activity will:

- Plan and implement the business plans to support the Low-Level Program such as:
 - Strategic plans (Program Specific)
 - Fiscal year work plans
 - Multi-year work plans
 - Activity data sheets
 - Integrated Technology Plan
- Prepare and obtain approval of the LLW Key Decision document titled "Justification of Mission Need"

Programmatic Risk:

- Provide leadership and guidance for the Low-Level Waste Program, this includes, but not limited to: overall LLW Program Management strategy, planning, reporting, interfacing with DOE-RL/WHC organization, guidance of technical organizations and Technology Development Program Office, and risk assessment.

Major end-item deliverables:

- This activity will terminate upon hot operations of the vitrification facility. Work scope and resources are planned in 1.1.1.3.2.3.
- Multi year work plans
- Baseline documents-life cycle planning and costs estimates
- Activity data sheets-programmatic budget submittal
- Justification of Mission Need
- Public Involvement Plan
- These deliverables outline management plans and how the program will manage risk in the various areas of the program. The risk are identified in the areas of technical, management and programmatic.

Acceptance criteria:

WHC review, comment incorporation and RL/HQ approval of the subject baseline documents.

C. STATEMENT OF WORK:

Required activities over lifetime:

- Provide for the overall LLW Program organization, direction, control, planning, and strategy to successfully meet programmatic expectations of our customers. (WHC)
 - Development of the overall LLW strategy which outlines the successful path for the program as well as outlining the technical issues associated with the vitrification of Hanford's Double Shell Tanks radioactive low-level waste fraction.
 - Development of multi year and long range planning documents.
 - Provide for programmatic budget requests to RL/HQ.
 - Review critical programmatic documents, such as: Integrated Technology Plan, Functions and Requirements, etc.
- Provide support to the Systems Engineering activities at the TWRS level. These concepts (functions and requirements) will be driven down within the LLW Program. (WHC)
- Development and maintenance of a public involvement plan, which will: (WHC)

- Maintain public commitment to the Program
- Obtain public discussion with periodic updates on the program, as well as significant issues, and impacts based on technical tradeoffs (facility capabilities, shielding, waste form considerations, etc).

Interfaces:

#	From This WBS To	Item Provided
1	Program Mgmt & Admin/1.1.1.1.01	Business documents/reporting
	To This WBS From	
1	Program Mgmt & Admin/1.1.1.1.01	Business document guidance

Technologies to be assessed: N/AOptions to be considered: N/A**D. OTHER LEGAL DRIVERS AND ORDER REQUIREMENTS:**

The drivers for this program are defined in the Tank Waste Remediation Systems Functions and Requirements, DOE/RL-92-60, Rev 1, Functions Requirements Table F4.2.3.1, Item V, and Systems Architecture, Table A4.2.3.1, Item VIII, paragraph C; Tables A-1, B-1, B-2, B-3, and B-5 where applicable.

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Tank Waste Remediation System Work Breakdown Structure Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.02 Low Level Waste Disposal 1.1.1.3.02.01 Tech Integ and Planning	2. DATE PREPARED August 31, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.02.01.01/VI	5. WBS ELEMENT TITLE Program Management: Business Plans	
6. WBS INDEX LINE NO Not used	7. CURRENT REV NO 0	8. EFFECTIVE REVISION DATE September 23, 1994
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1230-0-AC	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENT DOCUMENT (DOE/RL-92-60 REV.1) N/A		12. BUDGET AND REPORTING NUMBER Expense Capital EW3130010 35EW3130-1

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	433	593	472
CENRTC	0	0	0
GPP	0	0	0
LINE ITEM	0	0	0
TOTAL	433	593	472

ORIGINAL

SEP 16 1994

B. TECHNICAL BASES

Goals & objectives:

The objective of this WBS Element is to produce high quality and creditable business plans which demonstrate a successful path forward to achievement of all milestones (TPA, HQ, RL and Other). These plans will be included in the Multi-year work plan (MYWP) (Program Element Schedule Activity Number LOPM101).

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

Prepare and submit to TWRS Program Office (primary interface point for this WBS element) the following business plans for the Low Level Waste Program (LOPM101).

- MYWP/Baseline which define the life cycle schedule and cost baseline for the program.
- Provide status and updates to the various WHC data bases accurately reporting schedule status on a monthly basis. This data will support the SMS system, critical issues, MPR, etc.

C. STATEMENT OF WORK

Required activities:

(10/01/94-09/30/97)	Provide guidance to CAMs in the preparation of the LLW Program's business documentation (LOPM101).
(10/01/94-09/30/97)	Provide schedule and financial resources to prepare schedules and financial information supporting the CAMs and to produce the best business plans possible which will show programmatic creditability (LOPM101).
(10/01/94-09/30/97)	Provide for the LLW Program integration prior to submittal of the business plans (LOPM101).
(10/01/94-09/30/97)	Perform quality and independent reviews of products to further show the creditability of the products produced by the program office (LOPM101).
(10/01/94-09/30/97)	Resolve comments various reviewers have on the business plans (LOPM101).
(10/01/94-09/30/97)	Submit the documents as required to WHC TWRS Program Office for submittal to RL and other customers as necessary (LOPM101).
(10/01/94-09/30/97)	Maintain baseline control on business documents via change control process (LOPM101).

Technologies to be assessed:

N/A

Options to be considered:

N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	R. J. Murkowski	
Activity Manager	R. F. Wood	9/20/94
Cost Account Manager	R. F. Wood	
Project Control Analyst	T. A. Grillo K. F. Hanlon	9/23/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	R. J. Murkowski	
Activity Manager	R. F. Wood	9/20/94
Cost Account Manager	R. F. Wood	
Project Control Analyst	T. A. Grillo K. F. Hanlon	9/23/94

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.02 Low Level Waste Disposal Program 1.1.1.3.02.01 Technical Integration and Planning	2. DATE PREPARED August 23, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.02.01.02/VI	5. WBS ELEMENT TITLE Program Management: Management Plans/Guidance Documents	
6. WBS INDEX LINE NO. WILL NOT BE USED	7. CURRENT REV NO 0	8. EFFECTIVE REVISION DATE September 23, 1994
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1230-0-AC	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) N/A	12. BUDGET AND REPORTING NUMBER Expense Capital Line Item EW3130010	

13. ELEMENT DESCRIPTION

A. COST CONTENT

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	3	3	3
CENRTC	0	0	0
GPP	0	0	0
LINE ITEM	0	0	0
TOTAL	3	3	3

SEP 16 1994
ORIGINAL

B. TECHNICAL BASES

Goals & objectives:

Develop key strategy documents, which will chart the course for the program in terms of identification and management of risks, issues, public values, stakeholder interaction with the program, identification of public process at key decision points during the life cycle of the program, and other concerns (Program Element Schedule Activity Numbers LOPM101/LOPM102).

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

Prepare/update and submit for external release the document noted above. In addition, this WBS element will provide any additional guidance documents which may be deemed necessary.

C. STATEMENT OF WORK

Required activities:

(10/01/94-09/30/97)	Review the documentation produced in FY 1994 and make any required adjustments. These adjustments can be changes in risks, public values, change in strategic approach to technical assumptions (LOPM102).
(10/01/94-09/30/97)	Obtain approval of documents based upon the WHC MRP requirements (LOPM102).
(10/01/94-09/30/97)	Issue the documents to public reading rooms, HQ, RL, EPA, Ecology and contractor personnel as required (LOPM102).

Milestones:

(03/01/95)	Issue update of LLW Program Technical Strategy

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	R. J. Murkowski	
Activity Manager	R. F. Wood	9/20/94
Cost Account Manager	R. F. Wood	
Project Control Analyst	T. A. Grillo/K. F. Hanlon	9/23/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	R. J. Murkowski	
Activity Manager	R. F. Wood	9/20/94
Cost Account Manager	R. F. Wood	
Project Control Analyst	T. A. Grillo/K. F. Hanlon	9/23/94

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.02 Low Level Waste Disposal Program 1.1.1.3.02.01 Technical Integration and Planning	2. DATE PREPARED September 5, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.02.01.04/VI	5. WBS ELEMENT TITLE Program Management: Systems Engineering	
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO 0	8. EFFECTIVE REVISION DATE September 23, 1994
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1230-0-AC	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1)		12. BUDGET AND REPORTING NUMBER Expense EW3130010

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	29	28	29
CENRTC	0	0	0
GPP	0	0	0
LINE ITEM	0	0	0
TOTAL	29	28	29

SEP 16 1994
ORIGINAL

B. TECHNICAL BASES

Goals & objectives:

Specifically, this activity will ensure that systems engineering at the program level approach will be utilized in the implementation of the LLW Program by supplying program office personnel to interact with System Engineering (ADS 1200) for reasonableness of the Functions, Requirements, and Architecture which are described in the TWRS Functions and Requirements Document (Program Element Schedule Activity Number LOPM104).

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS): N/A

C. STATEMENT OF WORK

Required activities:

(10/01/94-09/30/97) Provide LLW Program guidance/support/interface to the TWRS system engineering group for the updated and issuance of the TWRS Functions and Requirements. This document will updated periodically. By providing this guidance and documentation review, the LLW Program will secure ownership and be aware of the interface within WHC/TWRS and their impact on LLWP(LOPM104).

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	R. J. Murkowski	
Activity Manager	R. F. Wood	9/20/94
Cost Account Manager	R. F. Wood	
Project Control Analyst	T. A. Grillo K. F. Hanlon	9/23/94

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Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	R. J. Murkowski	
Activity Manager	R. F. Wood	9/20/94
Cost Account Manager	R. F. Wood	
Project Control Analyst	T. A. Grillo K. F. Hanlon	9/23/94

FDS Number

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Tank Waste Remediation System Work Breakdown Structure Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.02 Low Level Waste Disposal Program 1.1.1.3.02.01 Technical Integration and Planning	2. DATE PREPARED August 23, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.02.01.05/VI	5. WBS ELEMENT TITLE Program Management: Program Administration	
6. WBS INDEX LINE NO. WILL NOT BE USED	7. CURRENT REV NO 0	8. EFFECTIVE REVISION DATE September 23, 1994
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1230-0-AC	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENT DOCUMENT (DOE/RL- 92-60 REV.1) 4.2.3.1	12. BUDGET AND REPORTING NUMBER(S) Expense Capital EW3130010 Line Item	

13. ELEMENT DESCRIPTION

A. COST CONTENT

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	940	1030	1046
CENRTC	12	0	0
GPP	0	0	0
LINE ITEM	0	0	0
TOTAL	952	1030	1046

SEP 16 1994
ORIGINAL

B. TECHNICAL BASES

Goals & objectives:

Provide administrative support to the LLW program (Program Element Schedule Activity Number LOPM105).

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

This WBS element will be a level of effort task which will encompass the following:

Prepare monthly reporting documentation and submit to TWRS Program Office (primary interface point for this WBS element) the following weekly/monthly reports for the Low Level Waste Program:

TWRS Requirements

- Site Management System
- Critical Issues
- Monthly Performance Review
- Prepare special presentations for financial, schedule, and technical issues for a varied audience.

LLW Program Specific

- Coordinate RL, Ecology, TDPO, and WHC weekly interface meetings. These meetings focus on planning, issues, milestones, etc as required to keep the program on track. These meetings are informal in nature.
- Coordinate monthly HQ, RL, Ecology, TDPO, and WHC performance meetings. These are formal presentations by each area of the program element in the areas of cost and schedule performance, risks, issues, actions required, milestone status, barriers and etc.
- Prepare presentations for staff meetings, internal technical briefings, etc.

C. STATEMENT OF WORK

Required activities:

- (10/01/94-09/30/97) Provide the necessary leadership, management and guidance to support line organizations such that the program elements objectives along with milestones are achieved on time (LOPM105).
- (10/01/94-09/30/97) Update schedule and financial systems to provide valuable management tools to the program management team. Reports will be issued for analysis and management decisions/corrective action (LOPM105).

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	R. J. Murkowski	
Activity Manager	R. F. Wood	9/20/94
Cost Account Manager	R. F. Wood	
Project Control Analyst	T. A. Grillo/K. F. Hanlon	9/23/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	R. J. Murkowski	
Activity Manager	R. F. Wood	9/20/94
Cost Account Manager	R. F. Wood	
Project Control Analyst	T. A. Grillo/K. F. Hanlon	9/23/94

FDS Number

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.02 Low Level Waste Disposal 1.1.1.3.02.01 Tech Integ and Planning	2. DATE PREPARED September 5, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.02.01.06/VI	5. WBS ELEMENT TITLE Program Management: Public Involvement	
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO 0	8. EFFECTIVE REVISION DATE September 23, 1994
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1230-0-AC	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FORM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) N/A		12. BUDGET AND REPORTING NUMBER(S) Expense EW3130010

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	29	30	31
CENRTC	0	0	0
GPP	0	0	0
LINE ITEM	0	0	0
TOTAL	29	30	31

SEP 16 1994
ORIGINAL

B. TECHNICAL BASES

Goals & objectives:

Specifically, this activity will assist in the development of the TWRS public involvement plan, scheduling decision and status meetings with stakeholders and various Indian Nations.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS): N/A

C. STATEMENT OF WORK

Required activities:

- (10/01/94-09/30/97) Review the baseline documentation produced due to public involvement/Decision making and make any required adjustments. These adjustments can be changes in risks, public values, change in strategic approach to technical assumptions (LOPM106).
- (10/01/94-09/30/97) Issue the documents to public reading rooms, HQ, RL, EPA, Ecology and contractor personnel as required (LOPM106).

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	R. J. Murkowski	
Activity Manager	R. F. Wood	9/20/94
Cost Account Manager	R. F. Wood	
Project Control Analyst	T. A. Grillo K.F. Hanlon	9/23/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	R. J. Murkowski	
Activity Manager	R. F. Wood	9/20/94
Cost Account Manager	R. F. Wood	
Project Control Analyst	T. A. Grillo K. F. Hanlon	9/23/94

FDS Number
1D411A

Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.02 Low-Level Waste (M&O Contractor)	2. DATE PREPARED September 23, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.02.02/V	5. WBS ELEMENT TITLE Technology Development and Applied Engineering							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1230-0-AC							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-60 REV.1) 4.2.3.1 Immobilize and Dispose LLW	12. BUDGET AND REPORTING NUMBER <table style="width: 100%; border: none;"> <tr> <td style="text-align: left;">Expense</td> <td style="text-align: left;">Capital</td> <td style="text-align: left;">Line Item</td> </tr> <tr> <td>EW313001-0</td> <td>35EW3130-1</td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW313001-0	35EW3130-1	
Expense	Capital	Line Item						
EW313001-0	35EW3130-1							

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)	FY 1998 \$(000)	FY 1999 \$(000)	FY 2000 \$(000)	FY 2001 \$(000)
OPERATING	25626	23577	11390				
CENRTC	287	300	338				
GPP	0	0	0				
LINE ITEM	0	0	0				
TOTAL	25913	23877	11728				

B. TECHNICAL BASES:

Goals & Objectives:

The Low-Level Waste (LLW) Program will receive LLW from the TWRS Pretreatment Facility treat and store/dispose of Hanford's LLW. The LLW Program will treat the waste through vitrification and non-vitrification processes, develop product handling methods and store/dispose in a retrievable form, on-site in near-surface facilities in an environmentally and publicly accepted manner. The program also includes implementation of disposal site closure and monitoring strategy. Processing of LLW is planned to be completed

The entire TWRS mission is driven based upon the Hanford Site TWRS Technical Strategy. This strategy has been signed by Senior WHC and RL management.

The LLW program element will provide sound engineering and technical basis for the design, construction and operation of vitrification facility, disposal facilities, closure of the disposal facilities, and transition of the vitrification facility for decommissioning at the end of mission.

When sound engineering or a technical basis is not readily available a technology development activity (s) will be initiated.

- Plan and implement technology and applied engineering program that will lead to the following:
 - Melter Selection
Commercial melter vendors will be selected and tested to determine if their melter types can be adapted to the LLW Program. The testing will be a phased testing with the first phase as proof of principle. The second phase will allow for enhancements of melter systems to handle progressively difficult simulants. A primary melter and an alternate will be chosen at the end of testing.
 - Simulant Development and Characteristics
Simulants will be developed for melter testing and supplied to the potential vendors. The first simulant to be developed will be a double-shell simulant as this will most likely be the first feed to a melter. This simulant is based on double-shell tank waste characterization information. Later, simulants for phase II testing will be based on the best information available from tank inventories.
 - Glass Formulation
Glass formulations will be developed to support melter testing and selection in the early phases of the Program. Formulations to support the Program will continue to be developed as characterization information becomes available. There will be a range of formulations developed for variations in waste as tanks are retrieved. The characteristics of the various glasses to be produced can then be used in modeling on the entire disposal package (and site) to determine the effects on the environment. This work will proceed concurrently as the design work on the waste package and disposal site is developed. Durability testing will be carried on for glass formulations. Work in predicting off gas and non-vitrifiable products will support design of the Vitrification Facility. All work will follow closely with melter selection.
 - Ancillary Process Requirements
Development of process needs as identified through melter testing, flowsheet development and engineering studies. These will include feed systems for melter off gas system development and glass product handling. In addition, non-vitrifiable products will be identified, and methods of disposing or recycling these products will be developed.
 - Disposal Matrix/Container Selection
Disposal of glass on the Hanford Site will require meeting DOE Order 5820.2A. This is currently envisioned to require a matrix or container around the glass product as part of the disposal system. The compatibility of a matrix/container will be developed to ensure it will meet the long-term performance requirements.
 - Disposal System Selection

Technology studies are necessary to support disposal system engineering and design. These include developing and documenting a technical basis for disposal systems, data needs for the Performance Assessment (PA) to eliminate conservatism and provide a defensible PA, and modeling to assure the overall disposal system will perform.

- Glass Quality Performance
The need for certifying the quality of glass waste form integrity, and integrity of refractory will be approached from and non-destructive testing avenue. An important lessons learned from Grout was that this is a long-lead item that should be worked up-front.
- Feed Specification
Development of a feed specification will be an interactive process with Pretreatment. Feed specifications will be a combination of pretreatment technologies for removal, retrieval sequence and melter/formulation ability to capture wastes.
- Provide additional information to the support the following:
 - Performance Assessment
During the design and development of the project, the basis of the PA will be used to guide decisions. Scoping PA's will be run to guide decisions as glass quality disposal concepts, citing of disposal system, and matrix/packaging materials. This will allow for determining the best methods and assuring successful passing of the PA.
 - Permitting Activities
These activities include development and application of methods for the quality verification of the glass waste form, and the matrix and disposal system, along with providing data on the integrity of the disposal system.
 - Safety Analysis
Technology activities will focus on development of specific needs for operating within the specified safety envelope. These could include enhancements of formulation, refractory development and buildup of constituents, development of off gas treatment, melter stabilization and product handling techniques.
 - Design, Construction, and Operations of the LLW Facility
Selection of melter technologies, feed systems, formulations, off gas systems, refractories, filtration systems for the design and construction will be supported by Technology Development and Applied Engineering. As operations progress, needs will be identified as changes in formulation or melter system improvements to meet the needs of changing feeds due to retrieval sequence of the tanks.

Programmatic Risks

The ability to successfully apply high capacity commercial melter technology to the vitrification of radioactive high sodium waste feed is a major program uncertainty. This has been deemed a medium risk item.

The performance assessment (PA) will be heavily dependent upon high quality glass and/or a chemical matrix material to inhibit the release of long-lived soluble species such as Tc, U, Np, I. This has been deemed a high risk item.

Major end-item deliverables:

- Begin Low-Level Waste Melter Testing with Simulants
- Define and Issue LLW Simulant Recipe (and basis) for Initial Melter Tests
- Complete Melter Feasibility and System Operability Tests, Select Reference Melter (s), and Establish Reference LLW Glass Formulation Which Meets Complete System Requirements
- Feed Specification envelope to pretreatment
- Waste form qualification
- Process design parameters input to design and operations preparations
- Glass formulation for melter testing
- Glass formulation for LLW
- Disposal system qualification

This activity will terminate upon completion of formulation and/or product verification for the last processing of low level waste.

Acceptance criteria:

- Milestone verification will be on-site witness by RL/WHC/Ecology personnel if necessary.
- Acceptance criteria for this milestone will be Ecology's acceptance of the deliverable that will define the simulated double shell tank (DST) waste characterization information.
- Final acceptance criteria (production rates, product quality, durability, etc) will be developed upon completion of phase I melter testing.
- Acceptable feed specification from pretreatment for LLW vitrification.
- Verification of the processes, products, systems and operating parameters under this element will assure an acceptable product at the required capacity that will need disposal requirements for LLW.

C. STATEMENT OF WORK:

Required activities over lifetime:

- Perform melter testing and evaluation (WHC)
- Select LLW melter candidate (WHC)
- Per feed preparation/process development (PNL-WHC)
- Select reference melter (WHC)
- Select glass formulation (PNL-WHC)
- Select matrix/canister for disposal (PNL-WHC)
- Select disposal system (PNL-WHC)
- Perform process/equipment development and testing (PNL-WHC)
- Provide NDT quality verification of disposal system (WHC)
- Perform pilot scale testing (PNL-WHC-AECM)
- Perform waste form quality testing (PNL-WHC)

Interfaces:

#	From This WBS To	Item Provided
1	Waste Pretreatment 1.1.1.3.01	Feed composition
	To This WBS From	
1	Waste Retrieval 1.1.1.2.05	Water recycle needs
2	ER/Ext	Requirements for closure
3	Waste Pretreatment 1.1.1.3.01	Preliminary and final product specs
4	Waste Pretreatment 1.1.1.3.01	Characteristics & volume of HLW plant

Technologies to be assessed:

Feed preparation, vitrification systems, off-gas treatment process control alternate waste form, disposal system, matrix/containers, product quality verification

Options to be considered:

- Melter technologies from industry
- Feed specification
- Waste form types
- Packaging
- Technetium disposal
- Off-gas scrubbers
- Analytical methods for glass durability control
- Alternative glass form compositions
- Feed systems
- Glass handling systems

D. OTHER LEGAL DRIVERS AND ORDER REQUIREMENTS

The drivers for this program are defined in the Tank Waste Remediation Systems Functions & Requirements, DOE/RL-92-60, Rev 1, Functions Requirements Table F4.2.3.1, Item V, and Systems Architecture, Table A4.2.3.1, Item VIII, paragraph C; Tables A-1, B-1, B-2, B-3, and B-5 where applicable.

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Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program /PNL 1.1.1.3 Process Tank Waste 1.1.1.3.02 Low Level Waste Disposal 1.1.1.3.02.02 Tech Dev & Applied Engrg (M&O Contractor)	2. DATE PREPARED August 31, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930				
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.02.02.01/VI	5. WBS ELEMENT TITLE Melter Selection					
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO 0	8. EFFECTIVE REVISION DATE September 23, 1994				
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1230-0-AC					
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.3.1 Immobilize & Dispose LLW		12. BUDGET AND REPORTING NUMBER(S) <table style="width: 100%;"> <tr> <td style="text-align: center;">Expense</td> <td style="text-align: center;">Capital</td> </tr> <tr> <td style="text-align: center;">EW3130010</td> <td></td> </tr> </table>	Expense	Capital	EW3130010	
Expense	Capital					
EW3130010						

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	14432	11726	1326
CENRTC	0	0	0
GPP	0	0	0
LINE ITEM	0	0	0
TOTAL	14432	11726	1326

ORIGINAL

SEP 26 1994

B. TECHNICAL BASES

Goals & objectives:

Plan and implement a melter selection activity that will select the best available melter technology and alternate technology to immobilize the LLW with a high capacity melter. Select melter subsystems as feed, product handling and off gas that will provide continuous operation of the melter.

Status of Design Documentation:

At this time, no design documentation is developed. The data developed through and during the technology selection will be used for the Functions and Requirements (F&R) (see box 11, DOE/RL-92-60, Rev. 1) documentation, and the conceptual and detail design.

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

The Tri-Party milestone M-60-02, "Select Reference Melter System by June 1996," is the major deliverable for this cost account. Interfaces include interfacing with design to determine best system for melters, configuration of the facility, and requirements of utilities.

C. STATEMENT OF WORK

Required activities:

A reference melter system and alternative melter system will be selected for vitrification of low level waste. The selected melter system will have flexibility to handle a range of tank wastes retrieved from various tank farms as the tank retrieval process proceeds. This flexibility will include variability of temperature, formulations, feeds, offgas handling, and product configuration. Melter technology, maturity, reliability, maintainability, scale-up capacity, ability to be used in a radioactive environment, decontamination ease, expected life of components, stability, and replacement life will be important considerations in the selection.

The testing will be conducted with simulants in two phases to select a melter. The first phase will be a "proof of principle" to determine the viability of the melters, followed by testing with more complex simulants to select a reference system.

Included in the WBS element are analytical laboratory services to test melter feeds, glass quality, and offgas products. This includes samples taken at the vendors' facilities with traceability to the sample testing. All results will be documented, and the data assembled in a usable form with actual testing observations and information.

Consultants from the glass industry will be utilized to advise WHC, review test plans and aid in selection processes in an advisory capacity.

Phase I and Phase II melter testing using simulants to determine reference melter for LLW.

Technologies to be assessed:

Joule heated, combustion and others as plasma arch.

Options to be considered:

Melter options to be considered are Joule heated, combustion, and others (plasma torch, carbon arc, etc.)

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	RJ Murkowski/	
Activity Manager	KC Burgard/	
Cost Account Manager	ET Weber III/	
Project Control Analyst	TA Grillo/KF Hanlon	

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	RJ Murkowski/	
Activity Manager	KC Burgard/	
Cost Account Manager	ET Weber III/	
Project Control Analyst	TA Grillo/KF Hanlon	

FDS Number
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Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program /PNL 1.1.1.3 Process Tank Waste 1.1.1.3.02 Low Level Waste Disposal 1.1.1.3.02.02 Tech Dev & Applied Engrg (M&O Contractor)	2. DATE PREPARED August 31', 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.02.02.02/VI	5. WBS ELEMENT TITLE LLW Simulant Development & Specifications	
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO 0	8. EFFECTIVE REVISION DATE September 23, 1994
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1230-0-AC	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT(DOE/RL-92-60 REV. 1) 4.2.3.1 Immobilize & Dispose LLW		12. BUDGET AND REPORTING NUMBER Expense EW3130010

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	717	1183	172
CENRTC	0	0	0
GPP	0	0	0
LINE ITEM	0	0	0
TOTAL	717	1183	172

SEP 26 1994
ORIGINAL

B. TECHNICAL BASES

Goals & objectives:

Goal is to develop and specify simulant to support testing of LLW melters. The objective is to determine the ability of a melter system to feed the waste and vitrify it in a sustained operation. The simulant will be based on the best available characterization data and specification for waste feed.

Status of Design Documentation:

At this time, no design documentation is available, but will be developed based on information compiled during melter testing.

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

This activity interfaces with melter testing and is necessary to support Tri-Party Agreement milestone M-60-01, Begin LLW melter testing with simulants.

C. STATEMENT OF WORK

Required activities:

Melter testing will be done with waste simulant developed to simulate the characteristics of waste that will be fed to the melter.

Development of three to five simulants for Phase II testing of melters. Simulants will be procured from a chemical supplier, and delivered to the melter vendors. Simulants will have recipes describing the mixing of simulants, agitation, and storage in holding tanks as temperature, time of storage, and concentrations for the simulant vendor and melter vendor.

The development of a feed specification or feed range is an iterative process with the Pretreatment Program. The final specification and range will depend upon the ability of the pretreatment process to remove major constituents from the waste.

Technologies to be assessed:

Simulant formulation, minor components, glass melting temperatures, feed technology.

Options to be considered:

N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	RJ Murkowski/	
Activity Manager	KC Burgard/	
Cost Account Manager	ET Weber III/	
Project Control Analyst	TA Grillo/KF Hanlon	

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	RJ Murkowski/	
Activity Manager	KC Burgard/	
Cost Account Manager	ET Weber III/	
Project Control Analyst	TA Grillo/KF Hanlon	

FDS Number
<u>1D422A</u>

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Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program/PNL 1.1.1.3 Process Tank Waste 1.1.1.3.02 Low Level Waste Disposal 1.1.1.3.02.02 Tech Dev & Applied Engrg (O&M Contractor)	2. DATE PREPARED September 23, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.02.02.03/VI	5. WBS ELEMENT TITLE Integrated Process System	
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO 0	8. EFFECTIVE REVISION DATE September 23, 1994
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1230-0-AC	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.3.1 Immobilize & Dispose LLW		12. BUDGET AND REPORTING NUMBER Expense EW3130010

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	3577	2252	2211
CENRTC	234	0	0
GPP	0	0	0
LINE ITEM	0	0	0
TOTAL	3811	2252	2211

B. TECHNICAL BASES

Goals & objectives:

Provide for development and identification of process systems for vitrification of the low level glass. Objective will include the integration of different components of the vitrification system (the feed system, melter, offgas, product handling, and recycle streams) will have to be selected to ensure that they are compatible and able to meet the requirements. This integration will ensure production of a uniform glass with required durability, which will meet safety and environmental requirements.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

Selection of a melter system to include melter feed, offgas, glass handling. M-60-02

C. STATEMENT OF WORK

Required activities:

Determine the need for process systems, maturity of available systems, and technology needs to adopt existing systems into a radiological environment. Major systems to be investigated are feed systems, offgas systems, product handling systems, and recycle or secondary waste systems. Also included in this cost account are investigation of refractory corrosion and contamination build up and specific component investigation as the migration of technetium. Requirements for independent testing to support the evaluation of vendor melter testing technologies will be performed as they are identified.

Technologies to be assessed:

Feed system, glass handling and offgas.

Options to be considered:

Feed system for liquid feed as high pressure pumps auger or calcining. Product handling as casks, frit or cullet, solid blocks. Offgas for isolation of radionuclides and hazardous waste.

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	R. J. Murkowski	
Activity Manager	K. C. Burgard	
Cost Account Manager	E. T. Weber III	
Project Control Analyst	T. A. Grillo K. F. Hanlon	

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	R. J. Murkowski	
Activity Manager	K. C. Burgard	
Cost Account Manager	E. T. Weber III	
Project Control Analyst	T. A. Grillo K. F. Hanlon	

FDS Number

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Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program/PNL 1.1.1.3 Process Tank Waste 1.1.1.3.02 Low Level Waste Disposal 1.1.1.3.02.02 Tech Dev & Applied Engrg (M&O Contractor)	2. DATE PREPARED August 31, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.02.02.04/VI	5. WBS ELEMENT TITLE Product Quality Verification	
6. WBS INDEX LINE NO Not used	7. CURRENT REV NO 0	8. EFFECTIVE REVISION DATE September 23, 1994
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1230-0-AC	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.3.1 Immobilize & Dispose LLW		12. BUDGET AND REPORTING NUMBER Expense EW3130010

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	479	466	449
CENRTC	0	0	0
GPP	0	0	0
LINE ITEM	0	0	0
TOTAL	479	466	449

SEP 26 1994

ORIGINAL

B. TECHNICAL BASES

Goals & objectives:

Provide for a method for determining the quality of the vitrified product using nondestructive testing (NDT) techniques that are commercially available. Provide NDT monitoring methods for the disposal system that will meet the Part B permit requirements.

Status of Design Documentation: N/A

1.1.1.3.02.02.04

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Nondestructive methods for monitoring waste form integrity and glass quality.

C. STATEMENT OF WORK

Required activities:

Develop an applied engineering approach to utilize existing technologies for product quality verification. The quality of glass in the melter and immediately leaving the melter needs to be determined by NDT techniques to ensure that the final product will meet the long term requirements. The integrity of the disposal system glass, matrix and disposal unit requires a system for continued monitoring. This system can be developed utilizing electrochemical techniques.

This work is necessary to ensure the 30-year monitoring period required by the Resource Conservation Recovery Act (RCRA).

Technologies to be assessed:

Electrochemical monitoring.

Options to be considered:

Monitoring of the melt, quality verification of glass and long-term monitoring of glass in matrix material.

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	R. J. Murkowski	
Activity Manager	K. C. Burgard	
Cost Account Manager	A. A. Kruger	
Project Control Analyst	T. A. Grillo K. F. Hanlon	

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	R. J. Murkowski	
Activity Manager	K. C. Burgard	
Cost Account Manager	A. A. Kruger	
Project Control Analyst	T. A. Grillo K. F. Hanlon	

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Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program/PNL 1.1.1.3 Process Tank Waste 1.1.1.3.02 Low Level Waste Disposal 1.1.1.3.02.02 Tech Dev & Applied Engrg (M&O Contractor)	2. DATE PREPARED September 14, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.02.02.05/VI	5. WBS ELEMENT TITLE Miscellaneous Technology Studies	
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO 0	8. EFFECTIVE REVISION DATE September 23, 1994
9. APPROVED CHANGES Not used	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1230-0-AC	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV.1) 4.2.3.1 Immobilize & Dispose LLW		12. BUDGET AND REPORTING NUMBER Expense EW3130010

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	572	557	541
CENRTC	0	0	0
GPP	0	0	0
LINE ITEM	0	0	0
TOTAL	572	557	541

ORIGINAL

SEP 26 1994

B. TECHNICAL BASES

Goals & objectives:

Evaluate alternative technologies to determine if they could improve or be substituted for the existing technologies. Objective could include unsolicited proposals, EM-50 projects, and/or new technologies as they become available.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

Non identified at this time. Determine if the MAWS and NAL process can be used in the LLW process. Evaluate process recycle systems and determine viability to LLW.

C. STATEMENT OF WORK

Required activities:

Review unsolicited proposals, EM-50 work (MAWS, NAC, etc.), and/or other technologies such as feed systems, offgas systems, or international projects that could provide alternatives for low-level waste disposal.

Technologies to be assessed:

NAC, MAWS, mobile melter, cold glass.

Options to be considered:

Alternatives to handle offgas and solidify possible new glass technologies when they are identified to us.

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	R. J. Murkowski	
Activity Manager	K. C. Burgard	
Cost Account Manager	E. T. Weber III	
Project Control Analyst	T. A. Grillo K. F. Hanlon	

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	R. J. Murkowski	
Activity Manager	K. C. Burgard	
Cost Account Manager	E. T. Weber III	
Project Control Analyst	T. A. Grillo K. F. Hanlon	

FDS Number

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Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program/PNL 1.1.1.3 Process Tank Waste 1.1.1.3.02 Low Level Waste Disposal 1.1.1.3.02.02 Tech Dev & Applied Engrg (M&O Contractor)	2. DATE PREPARED August 31, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.02.02.06/VI	5. WBS ELEMENT TITLE LLW Pilot Scale Systems	
6. WBS INDEX LINE NO. N/A	7. CURRENT REV NO 0	8. EFFECTIVE REVISION DATE September 23, 1994
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1230-0-AC	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV.1) 4.2.3.1 Immobilize & Dispose LLW		12. BUDGET AND REPORTING NUMBER Expense EW3130010

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	108	982	3128
CENRTC	0	0	338
GPP	0	0	0
LINE ITEM	0	0	0
TOTAL	108	982	3466

SEP 26 1994
ORIGINAL

B. TECHNICAL BASES

Goals & objectives:

Goal is to develop a pilot scale melter system (feed, melter, offgas, product handling) to provide information for design and construction, flow sheet data, formulation process data, and glass feed information.

Status of Design Documentation: N/A

Finalize pilot plant needs study, decision on pilot plan, decision on hot pilot plant, prepare pilot melter criteria, prepare pilot melter conceptual design and identify pilot melter needs.

C. STATEMENT OF WORK

Required activities:

- Determine need for pilot plant and possible location of plant.
- Develop requirements and rough-order-of-magnitude (ROM) for pilot facility.
- Design and construct a pilot facility
- Operate pilot facility to aid in design/construction selections and to develop operational data.

This data will help operations once the plant is running and as new tank retrieval campaigns progress. The determination of a hot versus a cold pilot has not been made.

Technologies to be assessed:

Vitrification, feed system, offgas.

Options to be considered:

Hot pilot vs. cold pilot. Scale of pilot plan and complexity of pilot.

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	R. J. Murkowski	
Activity Manager	K. C. Burgard	
Cost Account Manager	E. T. Weber III	
Project Control Analyst	T. A. Grillo K. F. Hanlon	

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	R. J. Murkowski	
Activity Manager	K. C. Burgard	
Cost Account Manager	E. T. Weber III	
Project Control Analyst	T. A. Grillo K. F. Hanlon	

FDS Number

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Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program/PNL 1.1.1.3 Process Tank Waste 1.1.1.3.02 Low Level Waste Disposal 1.1.1.3.02.02 Tech Dev & Applied Engrg (M&O Contractor)	2. DATE PREPARED September 14, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.02.02.07/VI	5. WBS ELEMENT TITLE LLW Packaging and Materials	
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO 0	8. EFFECTIVE REVISION DATE September 23, 1994
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1230-0-AC	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV.1) 4.2.3.1 Immobilize & Dispose LLW		12. BUDGET AND REPORTING NUMBER Expense EW3130010

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	3043	3581	1373
CENRTC	0	0	0
GPP	0	0	0
LINE ITEM	0	0	0
TOTAL	3043	3581	1373

ORIGINAL

SEP 26 1994

B. TECHNICAL BASES

Goals & objectives:

Goal is to develop matrix materials and/or container for the low-level waste glass. Objectives include literature searches, product testing and selection.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

Product package that will be compatible with glass and disposal system.

C. STATEMENT OF WORK

Required activities:

Determine the best matrix material and/or container for long term storage of the low level waste. This includes compatibility testing of possible materials, and configurations to select the best method for the disposal system. The long term integrity of the material needs to be tested as well as the effects on glass durability. This will include literature searches, product testing, and selection with strong interfaces with the PA.

The materials will have to meet the requirements of the Low-Level Waste Performance Assessment (PA) and be compatible with the glass and disposal systems, while providing for retrievability.

Technologies to be assessed:

Casks, grout, ceramics, polymers.

Options to be considered:

Casks, vaults, vertical caisson storage.

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	R. J. Murkowski	
Activity Manager	K. C. Burgard	
Cost Account Manager	E. T. Weber III	
Project Control Analyst	T. A. Grillo K. F. Hanlon	

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	R. J. Murkowski	
Activity Manager	K. C. Burgard	
Cost Account Manager	E. T. Weber III	
Project Control Analyst	T. A. Grillo K. F. Hanlon	

FDS Number

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Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program/PNL 1.1.1.3 Process Tank Waste 1.1.1.3.02 Low Level Waste Disposal 1.1.1.3.02.02 Tech Dev & Applied Engrg (M&O Contractor)	2. DATE PREPARED August 31, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.02.02.08/VI	5. WBS ELEMENT TITLE Non-Vitrifiable Waste	
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO 0	8. EFFECTIVE REVISION DATE September 23, 1994
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1230-0-AC	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV.1) 4.2.3.1 Immobilize & Dispose LLW		12. BUDGET AND REPORTING NUMBER Expense EW3130010

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	764	493	0
CENRTC	0	0	0
GPP	0	0	0
LINE ITEM	0	0	0
TOTAL	764	493	0

SEP 23 1994
 ORIGINAL

B. TECHNICAL BASES

Goals & objectives:

Goal is to develop a means of disposal of nonvitrifiable waste. Objectives include review of process flowsheets, literature searches, etc.

Status of Design Documentation:

Items will be identified through testing or research. At this time no official documentation exists.

1.1.1.3.02.02.08

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Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

Identifiable of nonvitrifiable wastes, and a waste form to dispose of the items.

Throughout the technology development and during the engineering development, certain items, elements or chemical compounds may be identified that will not be vitrified. These could be large items such as melters or piping, or something as technetium or iodine that will not stay in the melt. A means of disposal will be necessary.

C. STATEMENT OF WORK

Required activities:

Identify nonvitrifiable products from the vitrification process. Review process flowsheets to determine if nonvitrifiable products can be captured in high-level waste or recycled through pretreatment. Determine the best disposal form for nonvitrifiable products, and develop a disposal system.

Technologies to be assessed:

Grout, ceramics, and polymer waste forms, off-gas scrubber systems for products.

Options to be considered:

Recycled to LLW, HLW or pretreatment handling of waste forms, new configurations or co-disposal.

This could be solid waste stabilization or a secondary waste form.

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	RJ Murkowski/	
Activity Manager	KC Burgard/	
Cost Account Manager	AA Kruger	
Project Control Analyst	TA Grillo/KF Hanlon	

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	RJ Murkowski/	
Activity Manager	KC Burgard/	
Cost Account Manager	AA Kruger	
Project Control Analyst	TA Grillo/KF Hanlon	

FDS Number

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Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program/PNL 1.1.1.3 Process Tank Waste 1.1.1.3.02 Low Level Waste Disposal 1.1.1.3.02.02 Tech Dev & Applied Engrg (M&O Contractor/PNL)	2. DATE PREPARED September 14, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.02.02.11/VI	5. WBS ELEMENT TITLE Oversight & Planning							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8.EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1230-0-AC							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.3.1.2 Dispose LLW 4.2.3.1.3 Close LLW	12. BUDGET AND REPORTING NUMBER(S) <table style="width: 100%; border: none;"> <tr> <td style="text-align: left;">Expense</td> <td style="text-align: left;">Capital</td> <td style="text-align: left;">Line Item</td> </tr> <tr> <td>EW3130010</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3130010		
Expense	Capital	Line Item						
EW3130010								

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	142	206	265
CENRTC	0	0	0
GPP	0	0	0
LINE ITEM	0	0	0
TOTAL	142	206	265

SEP 26 1994

ORIGINAL

B. TECHNICAL BASES

Goals & objectives:

Goal is to provide support to Program Office to oversee ongoing work. Objectives include meeting attendance meetings, interface with other Programs such as Pretreatment or High-Level Waste and plan work.

Status of Design Documentation:

Limited documentation in HLW and Pretreatment. None exists in LLW.

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

Fiscal year planning, melter planning, recommendations of technologies.

C. STATEMENT OF WORK

Required activities:

Detail planning and backup for areas such as melter testing, glass formulations, process systems, simulant, disposal systems melter, technology development and applied engineering.

Technologies to be assessed:

Melter, simulant, glass formulation, process systems, nonvitrifiable waste forms, quality verification, disposal systems.

Options to be considered:

Melter types such as electronic, combustion, feed systems, disposal systems, feed variations, durability testing. Consider work being performed in-house, by PNL or going to off-site contractors or national labs.

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	R. J. Murkowski	
Activity Manager	K. C. Burgard	
Cost Account Manager	E. T. Weber III	
Project Control Analyst	T. A. Grillo K. F. Hanlon	

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	R. J. Murkowski	
Activity Manager	K. C. Burgard	
Cost Account Manager	E. T. Weber III	
Project Control Analyst	T. A. Grillo K. F. Hanlon	

FDS Number

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.02 Low-Level Waste (O&M Contractor)	2. DATE PREPARED August 31, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.02.03/V	5. WBS ELEMENT TITLE Facility Operations	
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1230-0-AC	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT(DOE/RL-92-60 REV. 1) 4.2.3.1	12. BUDGET AND REPORTING NUMBER Expense Capital Line Item EW313001-0 35EW3130-1	

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated dollars)

ORIGINAL
SEP 16 1994

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)	FY 1998 \$(000)	FY 1999 \$(000)	FY 2000 \$(000)	FY 2001 \$(000)
OPERATING	322	144	135				
CENRTC	0	0	0				
GPP	0	0	0				
LINE ITEM	0	0	0				
TOTAL	322	144	135				

B. TECHNICAL BASES:

Goals & objectives:

The Low-Level Waste (LLW) Program will receive LLW from the TWRS Pretreatment Facility treat and store/dispose of Hanford's LLW. The LLW Program will treat the waste through vitrification and non-vitrification processes, develop product handling methods and store/dispose in a retrievable form, onsite in near-surface facilities in an environmentally and publicly accepted manner. The Program also includes the implementation of disposal site closure and monitoring strategy. Process of LLW is planned to be completed by January 2022. This essentially represents approximately a seven year acceleration to the current Tri-Party Agreement milestone.

WHC-SP-1101

The LLW Program element will provide sound engineering and technical basis for the design, construction and operation of vitrification facility, disposal facilities, closure of the disposal facilities, and transition of the vitrification facility for decommissioning at the end of the mission.

This cost element will provide for the staffing, training, operations, and maintenance of the LLW Vitrification Facility. This element will also provide operational input to the design and startup of the facility. In addition to the actual plant operations, activities in the long term include preparation of the processing and disposal facilities for turnover to Decontamination & Decommissioning (D&D) organization for final disposition.

Programmatic Risk:

- The ability to successfully apply high capacity commercial melter technology to the vitrification of radioactive high sodium waste feed is a major program uncertainty. This has been deemed a medium risk item.
- The performance assessment (PA) will be heavily dependent upon high quality glass and/or a chemical matrix material to inhibit the release of long-lived soluble species such as Tc, U, Np, I. This has been deemed a high risk item.
- The Tri-Party Agreement funding profile may be inadequate to support the construction and operation of the LLWVP (ie: a \$500M "lightly shielded" facility). This has been deemed a medium risk item.
- The 2005 hot startup date is a "demand schedule" which forces the development of key activities on a parallel path. This has been deemed a medium risk item.

Major end-item deliverables:

- This cost element will deliver vitrified LLW for storage and/or disposal.
- This activity will terminate upon completion of closure activities and the decision made to transition the facilities to Decontamination & Decommissioning (D&D) for final action.

Acceptance criteria:

- Acceptance by achieving and maintaining DOE Order and Regulatory Compliance, successful disposal of all LLW in a vitrified waste form which meets Program Technical Baseline, and transition of LLW Vitrification and disposal facilities to D&D.

C. STATEMENT OF WORK:

Required activities over lifetime:

- Operational technical support (design review and input) to the project during the design period
- Acceptance and operability testing of equipment and systems during/after construction
- Staffing, training, and certification of operators and technicians prior to plant commissioning (qualification and training records of operators and technicians will be maintained in compliance with applicable DOE Orders).
- Cold operations preparation and testing, Operational Readiness Reviews (ORRs), prior to request for authorization to startup.
- Key Decision "4" requested to initiate hot operations by June 2005 (M-60-05)
- During operational phase, scheduled outages for maintenance and facility and equipment modifications, upgrades and/or replacement are included.

- Complete LLW vitrification operations by 2028 (TWRS interface goals 2021)
- Construction and operation of disposal facilities.
- Closure and preparation of operations and disposal facilities for turnover to D&D
- Final closure activities such as RCRA covers, barriers, safety documentation, etc., are contained in the "Compliance" portion of the Systems Definition planning. Closure estimates contained in this WBS are the manpower and disposal casks (assumed for purposes of estimate to be disposal method).
- Cost growth experienced in the 2022-2023 timeframe due to ongoing parallel efforts in support of final processing and disposal of low level waste, as well as startup of cleanout and closure activities on vitrification and disposal facilities in preparation for final transfer to D&D. Estimates will be updated as additional information becomes available.

Interfaces :

Interfaces are to be determined through the facility options study and process flowsheet development.

#	From This WBS To	Item Provided
1	Ext	Solid waste, facility equipment
2	Ext	Liquid waste facility liquid effluents
3	Characterization 1.1.1.2.04	Sampling
4	Ext	D&D transfer facilities
5	Ext	Nonvitrifiable waste
	To This WBS From	
1	Program Management & Administration 1.1.1.1.01	Permit approvals
2	Ext	DOE-HQ FSAR approval
3	Ext	DOE-HQ approved PA
4	Waste Pretreatment 1.1.1.3.01	Pretreated feed
5	Characterization 1.1.1.2.04	Process sample data

Technologies to be assessed: N/A

Options to be considered: N/A

D. OTHER LEGAL DRIVERS AND ORDER REQUIREMENTS

The drivers for this program are defined in Tank Waste Remediation System Functions and Requirements, DOE/RL-92-60, Rev 1, Functions & Requirements Table F4.2.3.1, Item V, and Systems Architecture, Table A4.2.3.1, Item VIII, paragraph C; Tables A-1, B-1, B-2, B-3, and B-5 where applicable.

**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.02 Low-Level Waste Program 1.1.1.3.02.03 Facility Operations	2. DATE PREPARED September 6, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.02.03.01/VI	5. WBS ELEMENT TITLE Project Definition Support	
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO 0	8. EFFECTIVE REVISION DATE September 23, 1994
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1230-AC	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER /TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOED/RL-92-60 REV. 1) 4.2.3.1		12. BUDGET AND REPORTING NUMBER Expense Capital EW313001-0 35EW3130-1

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	322	0	0
CENRTC	0	0	0
GPP	0	0	0
LINE ITEM	0	0	0
TOTAL	322	0	0

ORIGINAL

SEP 16 1994

B. TECHNICAL BASES

Goals & objectives:

The goal is to provide the LLW Projects and LLW Program with operations technical input during baseline development, conceptual design and advanced conceptual design for project scope and functions definition. Objectives include operability, maintenance and training requirements definition, manpower assessments, engineering design and report review and operability/maintainability evaluations.

Status of Design Documentation:

Preconceptual design information is being prepared by engineering activities. Preliminary engineering studies have defined preliminary facility concepts and functions.

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

None. This activity will provide WHC internal communications input to the Engineering and Project departments for requirements definition and engineering design/report reviews.

C. STATEMENT OF WORK

Required activities:

This work scope includes definition of operational and maintenance functional requirements for project consideration and use with the A/E design. This activity includes the following:

- Operating space evaluation
- Maintenance concept definition
- Training requirements definition
- Facility labeling and numbering systems definition
- Manpower requirements
- Personnel protection definition
- Systems Engineering functional requirements definition
- Review of engineering design for O&M impacts
- Review of engineering studies for O&M impacts

Technologies to be assessed:

This activity will assess engineering concepts and design for the baseline program. Alternatives will be reviewed as they are proposed to modify the baseline.

Options to be considered:

Options will be defined by Engineering and/or the A/E.

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	R. J. Murkowski	
Activity Manager	J. A. Voogd <i>J. A. Voogd</i>	9/23/94
Cost Account Manager	C. S. Haller	
Project Control Analyst	T. A. Grillo <i>T. A. Grillo</i> K. F. Hanlon	9/23/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager	R. J. Murkowski	
Program Element Manager	J. A. Voogd <i>J. A. Voogd</i>	9/23/94
Activity Manager	C. S. Haller	
Project Business Representative	T. A. Grillo <i>T. A. Grillo</i> K. F. Hanlon	9/23/94

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.02 Low-Level Waste Program 1.1.1.3.02.03 Facility Operations	2. DATE PREPARED September 5, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.02.03.02/VI	5. WBS ELEMENT TITLE Preparation for LLW Operations	
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO 0	8. EFFECTIVE REVISION DATE September 23, 1994
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1230-AC	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER /TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOED/RL-92- 60 REV. 1) 4.2.3.1		12. BUDGET AND REPORTING NUMBER Expense Capital EW313001-0 35EW3130-1

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	0	144	135
CENRTC	0	0	0
GPP	0	0	0
LINE ITEM	0	0	0
TOTAL	0	144	135

SEP 16 1994
ORIGINAL

B. TECHNICAL BASES

Goals & objectives:

Goal is to provide staffing, plant administrative procedures, training, and test planning efforts for the LLW Vitrification Plant leading to startup of the LLW Vitrification Facility. Objectives include provide staffing for plant operation forces including: management, operators, plant engineering, production-planners, maintenance, training, quality assurance, safety and administration. In addition, plant administration techniques, training programs, preparations leading to cold chemical testing and hot startup will be provided.

Status of Design Documentation:

Preconceptual design information is being prepared by engineering activities. Preliminary engineering studies have defined preliminary facility concepts and functions.

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

None in FY 1995-1997 time frame. This activity will provide WHC draft documentation for startup and ORR planning.

C. STATEMENT OF WORK

Required activities:

The required activities in the current planning time frame include the following:

- Plant operations management staffing
- Plant engineering staff
- Production management planning
- Preliminary planning for ORR and startup

Future activities include the following:

- Plant, engineering maintenance, training, safety and QA staffing
- O&M training
- Procedure preparation
- Cold testing preparation
- Hot operations preparation

Technologies to be assessed:

This activity will assess engineering concepts and design for the baseline program.

Options to be considered:

Options will be defined by Engineering and/or the A/E.

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	R. J. Murkowski	
Activity Manager	J. A. Voogd <i>J.A. Voogd</i>	4-23-94
Cost Account Manager		
Project Control Analyst	T. A. Grillo <i>T.A. Grillo</i> K. F. Hanlon	9-23-94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	R. J. Murkowski	
Activity Manager	J. A. Voogd <i>J.A. Voogd</i>	9-23-94
Cost Account Manager		
Project Control Analyst	T. A. Grillo <i>T.A. Grillo</i> K. F. Hanlon	9-23-94

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Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.02 Low-Level Waste (M&O Contractor)	2. DATE PREPARED August 31, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.02.04/V	5. WBS ELEMENT TITLE Systems Definition							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1230-0-AC							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.3.1	12. BUDGET AND REPORTING NUMBER <table style="width: 100%; border: none;"> <tr> <td style="text-align: left;">Expense</td> <td style="text-align: left;">Capital</td> <td style="text-align: left;">Line Item</td> </tr> <tr> <td>EW313001-0</td> <td>35EW3130-1</td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW313001-0	35EW3130-1	
Expense	Capital	Line Item						
EW313001-0	35EW3130-1							

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)	FY 1998 \$(000)	FY 1999 \$(000)	FY 2000 \$(000)	FY 2001 \$(000)
OPERATING	9728	9484	7198				
CENRTC	27	0	0				
GPP	0	0	0				
LINE ITEM	0	0	0				
TOTAL	9755	9484	7198				

B. TECHNICAL BASES:

Goals & objectives:

The Low-Level Waste (LLW) Program will receive LLW from the TWRS Pretreatment Facility treat and store/dispose of Hanford's LLW. The LLW Program will treat the waste through vitrification and non-vitrification processes, develop product handling methods and store/dispose in a retrievable form, on-site in near-surface facilities in an environmentally and publicly accepted manner. The program also includes

1.1.1.3.02.04

A8-83

ORIGINAL
SEP 26 1994

The entire TWRS mission is based upon the Hanford Site TWRS Technical Strategy. This strategy has been signed by Senior WHC and RL management.

The LLW program element will provide sound engineering and technical basis for the design, construction and operation of vitrification facility, disposal facilities, closure of the disposal facilities, and transition of the vitrification facility for decommissioning at the end of mission.

When sound engineering or a technical basis is not readily available a technology development activity (s) will be initiated.

1. Define, plan and prepare trade studies required for scoping of facilities and processes for LLW treatment and disposal.
 - Facility Configuration Options Trade Study
 - Site selection and environmental baseline
 - Process flowsheet development
 - Miscellaneous engineering studies
 - Functions and Requirements (F&R)
 - Disposal facilities concepts
 - Reviews and technical basis documentation
 - Upgrade support during operations
2. Develop criteria and prepare Performance Assessment (PA).
 - Prepare interim PA
 - Generate data needed for PA models
 - Prepare preliminary and final PA
 - Provide ongoing PA maintenance
3. Develop strategy and maintain compliance documentation.
 - Support technical inputs to TWRS-EIS
 - Permitting
 - Safety Analysis Report
 - Closure (RCRA)

Programmatic Risks:

The performance (PA) will be heavily dependent of advisable high quality glass and/or a chemical matrix material to inhibit the release of long-lived soluble species such as Tc, U, Np, I. This has been deemed a high risk item.

Major end-item deliverables:

- Facility Configuration Options Study (M-60-03-TT)
- Trade studies supporting conceptual design
- Low-level waste site selection and baseline
- Interim Performance Assessment (PA)
- Final PA
- LLW F&R
- Disposal facilities concepts study
- Closure plans

This activity will terminate upon completion of processing and closure activities, as well as documentation completed prior to decision to transition to Decontamination & Decommissioning (D&D) for final action.

Acceptance criteria:

Acceptance criteria includes approval by RL and/or DOE-HQ of documents requiring approval (i.e. F&R, PA) and the degrees of usefulness of work to support decision processes and provide information to support project design efforts.

C. STATEMENT OF WORK:

Required activities over lifetime:

- Perform Facility Configuration Trade Study (WHC/Fluor/BNFL-Ebasco)
- Trade studies (WHC/Fluor)
- Prepare PA (WHC/PNL)
- Site selection (WHC/Fluor)
- F&R (WHC)
- Disposal system studies (WHC/LATA)
- Reviews and facility upgrade support (WHC)
- Maintain compliance documentation (WHC)

Interfaces:

#	From This WBS To	Item Provided
1	Program Management & Administration 1.1.1.1.01	NEPA support documentation
	To This WBS From	
1	External to TWRS	Design for Hanford Permanent Isolation Barriers
2	External to TWRS	Site dose commitment to LLW disposal
3	Program Management & Administration 1.1.1.1.01	Site allocation for LLW effluent releases

Technologies to be assessed:

- Disposal system concepts

Options to be considered:

- Degree of retrievability of wastes
- Possible need for chemical or physical barriers

D. OTHER LEGAL DRIVERS AND ORDER REQUIREMENTS

The drivers for this program are defined in the Tank Waste Remediation Systems Functions and Requirements, DOE/RL-92-60, Rev 1, Functions Requirements Table F4.2.3.1, Item V, and Systems Architecture, Table A4.2.3.1, Item VIII, paragraph C; Tables A-1, B-1, B-2, B-3, and B-5 where applicable.

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Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.02 Low Level Waste 1.1.1.3.02.04 System Definition 1.1.1.3.02.04.01 Define Func.& Requirements	2. DATE PREPARED August 22, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930				
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.02.04.01./VI	5. WBS ELEMENT TITLE Define Functions And Requirements					
6. WBS INDEX LINE NO. WILL NOT BE USED	7. CURRENT REV NO 0	8. EFFECTIVE REVISION DATE August 31, 1994				
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1230-0-AC					
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV.1) 4.2.3.1	12. BUDGET AND REPORTING NUMBER <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">Expense</td> <td style="width: 50%;">Capital</td> </tr> <tr> <td>EW313001-0</td> <td>35EW3130-1</td> </tr> </table>		Expense	Capital	EW313001-0	35EW3130-1
Expense	Capital					
EW313001-0	35EW3130-1					

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated dollars)*

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	3277	379	56
CENRTC	0	0	0
GPP	0	0	0
LINE ITEM	0	0	0
TOTAL	3277	379	56

SEP 26 1994
ORIGINAL

* Information will be provided in the September issue.

B. TECHNICAL BASES

Goals & objectives:

Define functions and requirements which allow for the design, construction, and operation of facilities for the treatment, immobilization, and disposal of LLW.

Status of Design Documentation:

Preliminary identification of functions and requirements for various alternatives are provided in Tank Waste Technical Options Report (WHC-EP-0616), the Facility Configuration Study (WHC-SD-WM-ES-295 Rev 0), and the TWRS Functions and Requirements (DOE/RL-92-60, Rev 1).

Major end-item deliverables:

- LLW Functions And Requirements Document
- LLW Feed Acceptance Criteria Document
- LLW Product Criteria Document
- Trade Study Document: Process Control Strategy
- Disposal System Configuration Decision Analysis Document
- Updated Facility Configuration Trade Study Report
- Trade Study Document: Product Configuration
- Solid Waste Handling Study
- Connector Development Trade Study
- ILLW Disposal Facility Engineering Study Report

C. STATEMENT OF WORK

Required activities:

1. Develop Functions And Requirements (1.1.1.3.02.04.01.01)

This activity pulls together into one document the functions and requirements that are established from the development of LLW acceptance criteria for feed to the vitrification facility, ILLW product criteria for the disposal facility, and from facility configuration decisions and analysis. Documents to be produced, including those which support the end-item deliverables, include:

- Preliminary LLW Functions And Requirements Document
- LLW Functions And Requirements Document.

2. Define LLW Feed Waste Acceptance Criteria (1.1.1.3.02.04.01.02)

This activity established the acceptance criteria for LLW feed to the vitrification facility. Decisions on radionuclide DF's from the facility configuration decision analysis, and results from glass formulation developments and the ILLW performance assessment will impact the low level WAC. This low-level WAC will provide some of the criteria necessary for establishing tank waste retrieval sequencing and blending requirements. Documents to be produced, including those which support the end-item deliverables, include:

- Preliminary LLW Acceptance Criteria Document.
- LLW Acceptance Criteria Document.

3. Define ILLW Product Criteria (1.1.1.3.02.04.01.03)

This activity established the criteria for placement of ILLW into the disposal facility. The strategy for establishing ILLW product criteria involves the development and system analysis of information relating to the glass formulation, glass shape, product configuration, and performance assessment. Information relating to establishment of a preferred glass formulation is developed through laboratory analysis and testing of various glass formulations with a variety of different waste loadings. This information also

affects the results of ILLW performance assessments (1.1.1.3.02.04.02). Completion of the ILLW performance assessment requires the experimental measurement of parameters affecting glass corrosion and leaching, waste transport rates through glass, and the development of computer models to simulate the overall glass leaching and transport phenomena. Results from the performance assessment (1.1.1.3.02.04.02) will feed back to decisions on the glass formulation and overall product configuration.

Results and decisions from activities directed towards establishing LLW glass formulation, evaluations of ILLW disposal performance (Prepare LLW Performance Assessment (1.1.1.3.02.04.02) & Disposal Systems and trade study on ILLW product configuration (Casks/Vaults and Sulfur/Drainable Cullet, glass shape, etc.), Preliminary Disposal Options Study and Process Control will be incorporated into the product criteria. Documents to be produced, including those which support the end-item deliverables, include:

- Preliminary LLW Product Criteria document
- LLW Product Criteria document
- Trade Study Document: Product Configuration
- Disposal System Configuration Decision Analysis document

4. Define Process And Disposal System Requirements & Concept (1.1.1.3.02.04.01.04)

This activity will establish the functions and requirements for both the LLW processing and ILLW disposal facilities. Information will be developed through various trade studies and decisions will be made through a systems and decision analysis. The decision analysis will focus on information developed in the following studies:

- Facility Configuration Study
- Phase II Trade Study: Disposal Options Configuration Study
- Phase II Trade Study: LLW Process Control

5. Documents to be produced, including those which support the end-item deliverables, include:

- Facility Configuration Trade Study Report
- Trade Study Document: Process Control Strategy
- Preliminary LLW Disposal Options Study
- Facility Configuration Decision Analysis Document
- LLW Vitrification Facility Engineering Study Report
- ILLW Disposal Facility Engineering Study Report

6. Determine NRC classification of SST LLW fraction (1.1.1.3.02.04.01.05).

This activity will obtain concurrence that, like the DST waste, the LLW fraction from the pretreated SST waste is "incidental waste," not HLW and not subject to NRC regulation.

Technologies to be assessed:

The technologies and alternatives to be addressed are identified in the TWRS Program Plan and the TWRS Functions and Requirements (DOE/RL-92-60, Rev 1).

Options to be considered:

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	RJ Murkowski	
Activity Manager	GF Williamson	
Cost Account Manager	R. C. Hoyt	
Project Control Analyst	TA Grillo/KF Hanlon	

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	RJ Murkowski	
Activity Manager	GF Williamson	
Cost Account Manager	R. C. Hoyt	
Program Control Analyst	TA Grillo/KF Hanlon	

FDS Number
<u>1D444A</u>

Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.02 Low Level Waste 1.1.1.3.02.04 Systems Definition 1.1.1.3.02.04.02 Prepare LLW PA	2. DATE PREPARED August 31, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.02.04.02/VI	5. WBS ELEMENT TITLE Prepare low-level waste performance assessment	
6. WBS INDEX LINE NO Not used	7. CURRENT REV NO 0	8. EFFECTIVE REVISION DATE September 23, 1994
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV.1)		12. BUDGET AND REPORTING NUMBER

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	4130	7570	5938
CENRTC	27	0	0
GPP	0	0	0
LINE ITEM	0	0	0
TOTAL	4157	7570	5938

ORIGINAL

SEP 26 1994

B. TECHNICAL BASES

Goals & objectives:

To obtain DOE-HQ approval on final performance assessment document governing disposal of low-level glass wastes in Hanford disposal facility.

1. Write interim performance assessment (with extensive review) which will justify authorization of Hanford Low-Level Waste Glass Project
2. Write preliminary performance assessment which is found "technically adequate" by the Peer Review Panel which will allow construction to start on low-level waste disposal facility.

1.1.1.3.02.04.02

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Status of Design Documentation:

1. Performance Objectives for Interim Performance Assessment (Draft) at LLW Program Office
2. Scenarios for Interim Performance Assessment (Draft) at LLW Program Office
3. Statements of Work for FY 1995 to FY 2000 (Draft) at Program Office
4. Impacts of Design Options on Disposal Facility Performance (draft) will be at Program Office by August 10, 1994.

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

1. Write Interim Performance Assessment - December 31, 1996. This will support the construction start for the LLW Vitrification Facility.
2. Write Preliminary Performance Assessment - June 30, 1998. This will support the construction start of the LLW Disposal Facilities.

C. STATEMENT OF WORK

Required activities:

- 04.02.01 Experimental Data for Performance Assessments
 - a. Determine performance objectives for interim performance assessment (1/31/95) and for preliminary performance assessment (6/30/96)
 - b. Determine scenarios for interim performance assessment (1/31/95) and for preliminary performance assessment (6/30/96)
 - c. Select and verify tools for interim performance assessment (6/30/95) and for preliminary performance assessment (including certification) (12/31/97)
 - d. Develop inventory estimates for the interim performance assessment (9/30/95) and for preliminary performance assessment (9/30/97)
 - e. Develop disposal facility related data for interim performance assessment (10/31/95) and for preliminary performance assessment (12/31/97).
 - f. Develop glass release rates for the interim performance assessment (9/30/95) and for preliminary performance assessment (9/30/97)
 - g. Develop recharge rate, hydraulic data, chemical data, and dosimetry data for interim performance assessment (9/30/95)
 - h. Develop hydraulic data for preliminary performance assessment (9/30/97)
 - i. Develop recharge rate data for preliminary performance assessment (12/30/97)
 - j. Develop chemical transport data for preliminary performance assessment (7/31/97)
 - k. Develop ground water data for preliminary performance assessment (9/30/97)
 - l. Develop dosimetry data for preliminary performance assessment (9/30/97)
 - m. Develop integrated testing data for preliminary performance assessment (9/30/97)
- 04.02.02 Baseline Characterization for TWRS Complex (in future will contain integrated drilling tasks from 04.02.01.12)
 - a. Write site baseline sampling and analysis plan (9/30/95)
 - b. Perform surface sampling (6/30/96)
 - c. Document surface sampling laboratory results (12/31/96)
 - d. Perform subsurface sampling using boreholes (9/30/96)
 - e. Document subsurface sampling laboratory results (9/30/97)
 - f. Document Baseline characterization (9/30/98)
- 04.02.03 Provide guidance to Program Office
 - a. Provide guidance as required
 - b. Manage performance assessment activities

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- 04.02.04 Interim Performance Assessment
 - a. Calculate responses and document (12/31/96)
 - b. Define contingencies if results are unacceptable (9/30/97)
 - c. Complete internal and external review (9/30/97)
- 04.02.05 Preliminary Performance Assessment
 - a. Calculate responses and document (6/30/98)
 - b. PRP review (12/31/98)
- 04.02.06 Final Performance Assessment (activity starts in FY 98)
- 04.02.07 Maintain Performance Assessment (activity starts in FY 2000)

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	R. J. Murkowski	
Activity Manager	G. F. Williamson	
Cost Account Manager	J. A. Rawlins	
Project Control Analyst	T. A. Grillo K. F. Hanlon	

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Manager	R. J. Murkowski	
Activity Manager	G. F. Williamson	
Cost Account Manager	J. A. Rawlins	
Project Business Representative	T. A. Grillo K. F. Hanlon	

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT	2. DATE PREPARED September 6, 1994	3. IDENTIFICATION NUMBER
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.02.04.03/VI	5. WBS ELEMENT TITLE Define LLW Technical Baseline	
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1)	12. BUDGET AND REPORTING NUMBER(S) Expense Capital Line Item	

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	1015	710	731
CENRTC	0	0	0
GPP	0	0	0
LINE ITEM	0	0	0
TOTAL	1015	710	731

SEP 16 1994

ORIGINAL

B. TECHNICAL BASES

Goals & objectives:

Define the technical baseline which allow for the design, construction and operation of facilities for the treatment, immobilization and disposal of LLW.

Status of Design Documentation:

Preliminary identification of technical documents include the Tank Waste Technical Options Report (WHC-EP-0616), Description of the TWRS Process Flowsheet (WHC-SD-WM-TI-613), and Tank Waste Pretreatment Dynamic Simulation Model (WHC-SD-WM-DR-012).

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

- LLW Technical Baseline Document
- Process Flow & Queuing Study

C. STATEMENT OF WORK

Required activities:

- Develop LLW Process Flowsheet (by Pretreatment)
- Develop Tank Waste Retrieval Sequencing/Blending Plan (by Pretreatment)
- Identify LLW (Flowsheet) Development Needs (by Pretreatment)
- Establish LLW Technical Baseline (1.1.1.3.02.04.03.01)

Develop and issue preliminary LLW Technical Baseline document. The document will give the TWRS strategy description, baseline and planning assumptions, flowsheet summary, references and R & D requirements, as well as technical issues as they are addressed and taken from workshops. This document will be one of the three or four major baseline documents for the LLW Program. The scope and content of the document will change as issues and technical needs change. This will be a central document for summaries of technical status, needs and issues. This will be a main input to Conceptual Design, help with Safety Analysis work, and input to Definitive Design. The following will be summarized in the Baseline document:

- LLW Process Flowsheet (by Pretreatment)
 - Tank Waste Retrieval Sequencing/Blending Plan (by Pretreatment)
 - LLW (Flowsheet) Development Needs (by Pretreatment)
 - Process Flow & Queuing Study (1.1.1.3.02.04.03.03)
 - TWRS Program Plan
 - Facility Configuration decisions
 - Preliminary Function & Requirements
 - LLW Feed Acceptance Criteria
 - LLW Product Criteria
 - Workshop identified technology needs
- Process Flow & Queuing Study (1.1.1.3.02.04.03.03)

Identify the critical LLW-TWRS interface parameters and tank farm requirements. Evaluate the logistical impacts of the existing LLW process flowsheet on the TWRS flowsheet. Identify the critical internal LLW interfaces and LLW process constraints, including sensitivity to waste oxide loading. Evaluate the effects of the LLW process in relation to the TWRS flowsheet. The evaluation is to include, start date delays, determination of lag storage tank capacity.

Determine pretreatment and liquid effluent critical interfaces. Determine sample turnaround time required for each of three melter options. Determine transfer (pumping) rates for each melter option. Perform TOE and

capacity parameter study. Provide evaluation of two alternate feed technologies, evaporation and denitrification. Provide evaluation of two alternate product technologies, cullet in sulfur slurry and glass in canisters.

The following will be used to aid in the Queuing Study:

- LLW Process Flowsheet
- Tank Waste Retrieval Sequencing/Blending Plan
- Identify LLW (Flowsheet) Development Needs
- TWRS Program Plan
- Facility Configuration decisions
- Preliminary Function & Requirements
- Melter evaluations

Technologies to be assessed:

The technologies and alternatives to be addressed are identified in the TWRS Program Plan and are as noted above.

Options to be considered:

The options in the studies are noted above.

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	R. J. Murkowski	
Activity Manager	G. F. Williamson	
Cost Account Manager	R. C. Hoyt	
Project Control Analyst	T. A. Grillo K. F. Hanlon	

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	R. J. Murkowski	
Activity Manager	G. F. Williamson	
Cost Account Manager	R. C. Hoyt	
Project Control Analyst	T. A. Grillo K. F. Hanlon	

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1.3.02.04	2. DATE PREPARED September 5, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.02.04.05/VI	5. WBS ELEMENT TITLE Maintain LLW Technical Basis Documentation	
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO 0	8. EFFECTIVE REVISION DATE September 23, 1994
9. APPROVED CHANGES	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER /TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1)		12. BUDGET AND REPORTING NUMBER Expense

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	197	237	285
CENRTC	0	0	0
GPP	0	0	0
LINE ITEM	0	0	0
TOTAL	197	237	285

SEP 16 1994

ORIGINAL

B. TECHNICAL BASES

Goals & objectives:

Develop and implement a system to handle and control LLW project documentation.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

- Issue LLW Project media handling master plan. (1.1.1.3.02.04.05.01/VII)
- Develop LLW Project media handling system. (1.1.1.3.02.04.05.02/VII)
- Implement LLW Project media handling and control system. (1.1.1.3.02.04.05.03/VII)

C. STATEMENT OF WORK

Required activities:

Issue LLW Project Media Handling Master Plan - This deliverable requires defining the identification method which will be used to trace media and data transmitted between WHC, PNL, and other government and private entities involved in the development of the LLW Project. The plan will further define the verification method which will be used by IRM to verify congruence between the electronic and hard copy media which is transmitted between organizations involved in the LLW Project. Configuration management aspects of the various media will be identified and properly related to IRM requirements. A project index master list will be generated to allow accurate cataloging of media for retrievability. WHC will determine internally acceptable software and drawing format which the A/E firm will be expected to use for drawing media development. The drawing utilization plan will be identified at least on a preliminary level to allow IRM to handle design drawing media properly as it is received from the A/E.

Develop LLW Project media handling system - This deliverable requires development and issuance of an IRM Execution Plan which implements the specific requirements identified in the LLW Project Media Handling Master Plan. Any hardware required to physically and electronically handle project media will be procured if not already available within the existing IRM structure. The IRM staff responsible for the LLW Project media handling will be identified and trained as necessary. The LLW Project media handling system will then be implemented.

Implement LLW Project Media Handling and Control System - This deliverable requires implementing the LLW Project media handling master plan as identified in the IRM Execution Plan. Once implemented, the system will be maintained by IRM personnel. Project participants from WHC Projects and Operations will periodically audit the system to verify that media handling needs are being met and that the system continues to be a useful tool.

Technologies to be assessed:

N/A

Options to be considered:

N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	R. J. Murkowski	
Activity Manager	G. F. Williamson	
Cost Account Manager	G. F. Williamson	
Project Control Analyst	T. A. Grillo K. F. Hanlon	

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	R. J. Murkowski	
Activity Manager	G. F. Williamson	
Cost Account Manager	G. F. Williamson	
Project Control Analyst	T. A. Grillo K. F. Hanlon	

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.02 Low Level Waste 1.1.1.3.02.04 System Definition 1.1.1.3.02.04.06 Eng. Rev.& Prog. Support	2. DATE PREPARED September 5, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.02.04.06/VI	5. WBS ELEMENT TITLE Engineering Reviews and Program Support	
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1230-0-AC	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER /TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.3.1		12. BUDGET AND REPORTING NUMBER Expense

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	149	108	111
CENRTC	0	0	0
GPP	0	0	0
LINE ITEM	0	0	0
TOTAL	149	108	111

SEP 16 1994
ORIGINAL

B. TECHNICAL BASES

Goals & objectives:

This activity will provide the resources necessary for technical support to the Program Office. This includes technical planning, development of decision logic, integration of Program activities with the TWRS Systems Engineering work, and the development of fiscal year and multi-year work plans.

Status of Design Documentation:

This activity builds from the direction and guidance which has already been laid out in the TWRS Program Plan, the current TWRS LLW Fiscal Year Work Plan, TWRS LLW Technical/Cost/Schedule Baseline, and the TWRS Functions and Requirements (DOE/RL-92-60, Rev. 1).

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

- Decision logic diagrams integrating LLW Program activities and illustrating the technical strategy for achieving the LLW Program objectives
- Completed WBS dictionary sheets, schedule activity planning forms, and estimating work sheets
- Information requests from Program Office

C. STATEMENT OF WORK

Required activities:

Develop LLW Decision Logic (1.1.1.3.02.04.06.01)

This activity involves the identification of decisions which must be made in order for the LLW Program Office to progress towards completion of LLW Program goals and objectives. Information and data will be identified which must be available in order to make the necessary decisions. Activities will be identified which must be completed in order to develop the necessary data and information required for decision analysis. These activities will then be incorporated into a decision logic diagram, integrating LLW Program activities.

- Provide Technical Support to Program Office (1.1.1.3.02.04.06.02)

This activity will provide a level of effort, as necessary, to support the Program Office in the development of information requests, WBS dictionary sheets, schedule activity planning forms, and estimating work sheets based upon the LLW Program decision logic.

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	R. J. Murkowski	
Activity Manager	G. F. Williamson	
Cost Account Manager	R.C. Hoyt	
Project Control Analyst	T. A. Grillo K. F. Hanlon	

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	R. J. Murkowski	
Activity Manager	G. F. Williamson	
Cost Account Manager	R. C. Hoyt	
Project Control Analyst	T. A. Grillo K. F. Hanlon	

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Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste	2. DATE PREPARED August 31, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.02.04.07/VI	5. WBS ELEMENT TITLE Compliance	
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO 0	8. EFFECTIVE REVISION DATE September 23, 1994
9. APPROVED CHANGES N/A	10. ADS ID / ADS SUFFIX / SUBACTIVITY NUMBER 1230-0-AC	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOED/RL-92-60 REV.1) 4.2.3.1		12. BUDGET AND REPORTING NUMBER

13. ELEMENT DESCRIPTION

A. COST CONTENT (escalated dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	960	481	76
CENRTC	0	0	0
GPP	0	0	0
LINE ITEM	0	0	0
TOTAL	960	481	76

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ORIGINAL

B. TECHNICAL BASES

Goals & objectives:

Safety and environmental support for LLW vitrification. Safety goals involve methodology development for process design, acceptance criteria specification, trade study support, and specification of process or site related analysis input assumptions. Environmental goals include support to LLW vitrification project and program in the development of data to support environmental permitting activities for LLW vitrification plant.

Status of Design Documentation: N/A

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Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

Safety Facility Accident Analysis - Supports TPA milestone # M-60-03: Submit Conceptual Design & Initiate Definitive Design

Environmental Supports preparation of LLW vitrification plant part-A permit application

C. STATEMENT OF WORK

Required activities:

- Safety:
 - o LLW Melter Options Safety Study
 - o Separations/LLW/HLW Vitrification Facility Interactions Safety Assessment
 - o Radiological Source Terms Development (Accidental Release, Criticality, Shielding)
 - o Safety Analysis Inputs, Methods and Criteria
 - o WHC Review and Support of Designer Safety Analysis Efforts
- Environmental:
 - o Prepare air emissions report(s)
 - o Perform preliminary Best Available Radionuclide Control Technology (BARCT) analysis
 - o Perform preliminary Best Available Control Technology (BACT) and Best Available Control Technology for Toxics (T-BACT) analyses
 - o Develop data required to support preparation of LLW vitrification plant part A permit application
 - o Evaluate melter permitting requirements
 - o Further evaluate regulatory implications of constructing TWRS structures adjacent to or over past contaminated sites.

Technologies to be assessed:

Design concepts will be assessed based on current safety and environmental practices. alternate

Options to be considered:

To be defined by process design and A/E

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	R. J. Murkowski	
Activity Manager	G. F. Williamson	
Cost Account Manager	D. E. Mitchell	
Project Control Analyst	T. A. Grillo K. F. Hanlon	

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	R. J. Murkowski	
Activity Manager	G. F. Williamson	
Cost Account Manager	D. E. Mitchell	
Project Control Analyst	T. A. Grillo K. F. Hanlon	

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Tank Waste Remediation System
Work Breakdown Structure Dictionary

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.02 Low-Level Waste (O&M Contractor)	2. DATE PREPARED August 31, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.02.05/V	5. WBS ELEMENT TITLE Low-Level Waste Vitrification Facility	
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1230-0-AC	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOED/RL-92-60 REV. 1) 4.2.3.1.1 4.2.3.1.2	12. BUDGET AND REPORTING NUMBER Expense Capital Line Item EW313001-0 35EW3130-1 39EW3130-1	

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated dollars)

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	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)	FY 1998 \$(000)	FY 1999 \$(000)	FY 2000 \$(000)	FY 2001 \$(000)
OPERATING	13074	20090	6726				
CENRTC	0	0	0				
GPP	0	0	0				
LINE ITEM	0	0	16697				
TOTAL	13074	20090	23423				

B. TECHNICAL BASES:

Goals and objectives:

The Low-Level Waste (LLW) program will receive LLW from the TWRS Pretreatment Facility and treat and store/dispose of Hanford's LLW. The LLW program will treat the waste through vitrification and non-

1.1.1.3.02.05

A8-111

Agreement milestone.

The entire TWRS mission is driven based upon the Hanford Site TWRS Technical Strategy. This strategy has been signed by senior WHC and RL management.

The LLW program will provide sound engineering and technical basis for the design, construction, and operation of vitrification facility, disposal facilities, closure of the disposal facilities, and transition of the vitrification facility for decommissioning at the end of mission.

When sound engineering or a technical basis is not readily available a technology development activity(s) will be initiated.

- Plan and manage the Low-Level Waste Vitrification Plant Project through hot startup.
- Provide a low-level waste vitrification plant and disposal/storage facility fully operational by the year 2005.

Programmatic Risk:

- The Tri-Party Agreement funding profile may be inadequate to support the construction and operation of the LLWVP (ie: a \$500M "lightly shielded" facility. This has been deemed a medium risk item.
- The ability to successfully apply high capacity commercial melter technology to the vitrification of radioactive high sodium waste feed is a major program uncertainty. This has been deemed a medium risk item.
- The 2005 hot startup date is a "demand schedule" which forces the development of key activities on a parallel path. This has been deemed a medium risk item.

Major end-item deliverables:

- Submit conceptual design and initiate definitive design of the LLW vitrification facility
- Initiate Construction of LLW Vitrification Facility
- Conceptual design completed
- Title I design completed
- Title II design completed
- Complete initial phase (4 to 6) of disposal/storage facilities
- PSAR and FSAR reviewed and approved
- Permit applications (RCRA, CAA, Water) to the EPA, State, and local agencies
- Supplemental NEPA analyses to update the TWRS EIS

This activity will terminate upon completion of construction of the LLW Vitrification facility and the contingent of storage/disposal facilities in December 2003, complete acceptance testing of systems facilities, and complete facility turnover to 1.1.1.3.2.3 for initiation of hot operations. initial and

Acceptance criteria:

- A CDR will be submitted by the architect-engineer and approved by WHC. Completion of Key Decision 1, approval to initiate Title I design per DOE Order 4700.1, will be granted by DOE.
- The criterion for start of construction is completion of "Key Decision 3 - Approval to Commence Construction", per DOE order 4700.1. Approval of the contractor's updated project plan by DOE-RL will signify authorization to initiate construction of the LLW pretreatment facility. Achieve of the milestone, construction contract for site preparation shall have been awarded.
- Design verification, compliance with Project Functions and Requirements and project-specific design criteria
- Acceptance testing of completed construction
- Completion of startup testing
- Completion of cold operations readiness reviews
- Completion of cold operations acceptance testing
- Completed facility will be accepted by 1.1.1.3.02.03

C. STATEMENT OF WORK:

Required activities over lifetime:

- Plan and manage all project activities. Includes project plans and procedures (WHC)
- Procure design, construction, and testing services for a vitrification facility and disposal/storage for one-year capacity of glass product (WHC)
- Contractor procure facility components, equipment, and raw materials required to complete the facilities up to the point of hot operations architect/engineer/construction management (AECM)
- Contractor perform facility construction (AECM)
- Review and approve design products (WHC)
- Prepare and approve all safety analyses. Ensure independent reviews of PSA, PSAR, and FSAR (WHC)
- Prepare and approve all permit applications. Ensure internal reviews and regulator reviews are accomplished (WHC)
- Provide project reporting system including written reports and status presentations (WHC/AECM)
- Prepare and maintain project schedules (WHC/AECM)
- Ensure preparation and maintenance of project estimates--TEC and TPC (WHC/AECM)
- Support DOE in yearly budget validations and key decision process (WHC/AECM)
- Develop QA plans; perform audits and surveillances (WHC/AECM)
- Establish QA requirements: records, trend analyses, training (AECM)
- Establish project-wide training program (WHC)
- Support public involvement activities initiatives established by the Program Office (WHC)
- Provide day-to-day direction of the contracted "design agent" (WHC)
- Provide day-to-day direction of the construction manager (WHC)
- Provide as-built documentation required to operate and maintain the facilities (AECM)
- Provide for independent Title III inspection of construction/procurement for the government (AECM)
- Perform construction acceptance testing (WHC/AECM)
- Prepare operational and maintenance procedures (WHC/AECM)
- Prepare operator training (WHC/AECM)
- Perform startup testing (WHC)
- Perform cold operations testing (WHC)
- Depending on contracting decision, WHC on AECM perform initial "hot operations" to meet

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- performance specification requirements
- Provide facilities/systems up to the point of interface with other TWRS facilities. This includes feed stream, water, steam, electricity, sewer, roads, railroads, effluents, analytical labs, solid waste (WHC)

Interfaces:

#	From This WBS To	Item Provided
	N/A	N/A
	To This WBS From	Item Provided
1	External/DOE	DOE-HQ approval of Key Decision 0
2	Program Management and Administration 1.1.1.1.01 DOE	Approve TWRS EIS and Issue ROD
3	External/DOE	DOE-HQ Key Decision 1, 2, 3, 4, 5

Technologies to be assessed:

Not under this current WBS. Designer will determine if additional technology development is required. This additional development will most likely be performed by contractor.

Options to be considered:

Contracting options will be analyzed and optimum selection made. This includes design/build turnkey with performance guarantees and privatization (design, build, operate)

D. OTHER LEGAL DRIVERS AND ORDER REQUIREMENTS

The drivers for this program are defined in the Tank Waste Remediation Functions & Requirements, DOE/RL-92-60, Rev 1, Functions Requirements Table F4.2.3.1, Item V, and Systems Architecture, Table A4.2.3.1, Item VIII, paragraph C; Tables A-1, B-1, B-2, B-3, and B-5 where applicable.

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Tank Waste Remediation System Work Breakdown Structure Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Wastes 1.1.1.3.02 Low-Level Waste 1.1.1.3.02.05 Low-Level Waste Facility	2. DATE PREPARED August 23, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.02.05.01/VI	5. WBS ELEMENT TITLE Project Management	
6. WBS INDEX LINE NO. WILL NOT BE USED	7. CURRENT REV NO 0	8. EFFECTIVE REVISION DATE September 23, 1994
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1230-0-AC	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.3.1.1 4.2.3.1.2	12. BUDGET AND REPORTING NUMBER Expense Capital Line Item	

13. ELEMENT DESCRIPTION

A. COST CONTENT (escalated dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	2046	2022	402
CENRTC	--	--	--
GPP	--	--	--
LINE ITEM	--	--	2015
TOTAL	2046	2022	2417

B. TECHNICAL BASES

Goals & objectives:

Plan and manage the Low-Level Waste Vitrification Plant Project through hot startup.

Status of Design Documentation:

N/A

1.1.1.3.02.05.01

A8-115

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

• Prepare and issue project quality assurance plan	7/95
• Obtain Key Decisions 1/2	9/96
• Obtain Key Decision 3	9/97

Risk, Impacts, Mitigation:

The planning is based on a stand-alone LLWVP that is designed and constructed in the conventional manner. There is a possibility that the LLWVP may be combined with the pretreatment facility. In addition, the acquisition strategy may be changed to include competitive conceptual design with the option for privatization. Interim TPA milestones may be affected if any of these changes occur. The major TPA milestone of hot startup of the LLWVP in June 2005 will be accomplished with any of the alternatives under consideration.

C. STATEMENT OF WORK

Required activities:

- Plan and manage all project activities. Includes project plans and procedures
- Provide project reporting system, including written reports and status presentations
- Prepare and maintain project schedules
- Ensure preparation and maintenance of project estimates--TEC and TPC
- Support DOE in yearly budget validations and key decision process
- Develop QA plans; perform audits and surveillances
- Establish QA requirements: records, trend analyses, training
- Establish project-wide training program
- Support public involvement activities initiatives established by the Program Office.

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	R. J. Murkowski	
Activity Manager	P. Felise	
Cost Account Manager	P. Felise	
Project Control Analyst	T. A. Grillo/K. F. Hanlon	

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	R. J. Murkowski	
Activity Manager	P. Felise	
Cost Account Manager	P. Felise	
Project Control Analyst	T. A. Grillo/K. F. Hanlon	

FDS Number

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Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Wastes 1.1.1.3.02 Low-Level Waste 1.1.1.3.02.05 Low-Level Waste Facility 1.1.1.3.02.05.01 Project Management 1.1.1.3.02.05.01.01 Project Management and Integration	2. DATE PREPARED 09/14/94	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.02.05.01.01.01/VIII	5. WBS ELEMENT TITLE Management - Expense	
6. WBS INDEX LINE NO. WILL NOT BE USED	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE 10/01/94
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1230-0-AC	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER 4.2.3.1.1, 4.2.3.1.2	12. BUDGET AND REPORTING NUMBER(S)	

13. ELEMENT DESCRIPTION

A. COST CONTENT

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	957	994	75
CENRTC	--	--	--
GPP	--	--	--
LINE ITEM	--	--	--
TOTAL	957	994	75

B. TECHNICAL BASES

Goals & objectives: Plan and manage the Low-Level Waste Vitrification Plant Project through hot startup.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

- Obtain Key Decisions 1/2

9/96

Risk, Impacts, Mitigation:

The planning is based on a stand-alone LLWVP that is designed and constructed in the conventional manner. There is a possibility that the LLWVP may be combined with the pretreatment facility. In addition, the acquisition strategy may be changed

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to include the option for privatization. Interim TPA milestones may be affected if this change occurs. The major TPA milestone of hot startup of the LLWVP in June 2005 will be accomplished with any of the alternatives under consideration.

C. STATEMENT OF WORK

Required activities:

- Plan and manage all project activities
- Provide project reporting system, including written reports and status presentations
- Prepare and maintain project schedules
- Ensure preparation and maintenance of project estimates--TEC and TPC
- Support DOE in yearly budget validations and key decision process
- Support public involvement activities initiatives established by the Program Office
- Select Architect-Engineer/Construction Manager for the LLWVP Project
- Management travel
- Secretarial support
- Preparation and attendance at management meetings/presentations

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	P. Felise <i>Paul Felise</i>	9/20/94
Activity Manager	D. H. Nyman <i>D. H. Nyman</i>	9/25/94
Cost Account Manager	D. H. Nyman <i>D. H. Nyman</i>	9/25/94
Project Control Analyst	P. L. DeShaw <i>P. L. DeShaw</i>	9/30/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	P. Felise <i>Paul Felise</i>	9/20/94
Activity Manager	D. H. Nyman <i>D. H. Nyman</i>	9/25/94
Cost Account Manager	D. H. Nyman <i>D. H. Nyman</i>	9/25/94
Project Control Analyst	P. L. DeShaw <i>P. L. DeShaw</i>	9/20/94

FDS Number

Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Wastes 1.1.1.3.02 Low-Level Waste 1.1.1.3.02.05 Low-Level Waste Facility 1.1.1.3.02.05.01 Project Management 1.1.1.3.02.05.01.01 Project Management and Integration	2. DATE PREPARED 09/14/94	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.02.05.01.01.02/VIII	5. WBS ELEMENT TITLE Management - Capital	
6. WBS INDEX LINE NO. WILL NOT BE USED	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE 10/01/94
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1230-0-AC	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER 4.2.3.1.1, 4.2.3.1.2	12. BUDGET AND REPORTING NUMBER(S)	

13. ELEMENT DESCRIPTION

A. COST CONTENT

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	--	--	--
CENRTC	--	--	--
GPP	--	--	--
LINE ITEM	--	--	933
TOTAL	--	--	933

B. TECHNICAL BASES

Goals & objectives: Plan and manage the Low-Level Waste Vitrification Plant Project through hot startup.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

- Obtain Key Decision 3

9/97

Risk, Impacts, Mitigation:

The planning is based on a stand-alone LLWVP that is designed and constructed in the conventional manner. There is a possibility that the LLWVP may be combined with the pretreatment facility. In addition, the acquisition strategy may be changed

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to include the option for privatization. Interim TPA milestones may be affected if this change occurs. The major TPA milestone of hot startup of the LLWVP in June 2005 will be accomplished with any of the alternatives under consideration.

C. STATEMENT OF WORK

Required activities:

- Plan and manage all project activities
- Provide project reporting system, including written reports and status presentations
- Prepare and maintain project schedules
- Ensure preparation and maintenance of project estimates--TEC and TPC
- Support DOE in yearly budget validations and key decision process
- Support public involvement activities initiatives established by the Program Office
- Management travel
- Secretarial support
- Preparation and attendance at management meetings/presentations

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	P. Felise <i>Paul Felise</i>	9/20/94
Activity Manager	D. H. Nyman <i>D. H. Nyman</i>	9/20/94
Cost Account Manager	D. H. Nyman <i>D. H. Nyman</i>	9/20/94
Project Control Analyst	P. L. DeShaw <i>P. L. DeShaw</i>	9/20/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	P. Felise <i>Paul Felise</i>	9/20/94
Activity Manager	D. H. Nyman <i>D. H. Nyman</i>	9/20/94
Cost Account Manager	D. H. Nyman <i>D. H. Nyman</i>	9/20/94
Project Control Analyst	P. L. DeShaw <i>P. L. DeShaw</i>	9/20/94

FDS Number

Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Wastes 1.1.1.3.02 Low-Level Waste 1.1.1.3.02.05 Low-Level Waste Facility 1.1.1.3.02.05.01 Project Management 1.1.1.3.02.05.01.01 Project Management and Integration	2. DATE PREPARED 09/14/94	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.02.05.01.01.03/VIII	5. WBS ELEMENT TITLE Engineering Administration - Expense	
6. WBS INDEX LINE NO. WILL NOT BE USED	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE 10/01/94
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1230-0-AC	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER 4.2.3.1.1, 4.2.3.1.2	12. BUDGET AND REPORTING NUMBER(S)	

13. ELEMENT DESCRIPTION

A. COST CONTENT

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	740	759	39
CENRTC	--	--	--
GPP	--	--	--
LINE ITEM	--	--	--
TOTAL	740	759	39

SEP 26 1994
 ORIGINAL

B. TECHNICAL BASES

Goals & objectives: Prepare and maintain documentation and procedures for the Low-Level Waste Vitrification Plant Project.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

• Complete Architect-Engineer/Construction Manager Statement of Work for Conceptual Design	3/95
• Complete Functional and Operational Requirements	3/95
• Complete Systems Engineering Management Plan	3/95
• Complete Project Risk Management Plan	9/96
• Complete Project Test and Evaluation Plan	9/96
• Complete Project Plan	9/96
• Complete Architect-Engineer/Construction Manager Statement of Work for Preliminary Design	9/96

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Risk, Impacts, Mitigation:

The planning is based on a stand-alone LLWVP that is designed and constructed in the conventional manner. There is a possibility that the LLWVP may be combined with the pretreatment facility. In addition, the acquisition strategy may be changed to include the option for privatization. Interim TPA milestones may be affected if this change occurs. The major TPA milestone of hot startup of the LLWVP in June 2005 will be accomplished with any of the alternatives under consideration.

C. STATEMENT OF WORK

Required activities:

- Prepare and maintain Architect-Engineer/Construction Manager Statement of Work
- Prepare and maintain Functional and Operational Requirements
- Prepare and maintain Systems Engineering Management Plan
- Prepare and maintain Project Risk Management Plan
- Prepare and maintain Project Test and Evaluation Plan
- Prepare and maintain Project Plan
- Monitor and review architect-engineer billings
- Prepare Training and Qualification Plan

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	P. Felise <i>Paul Felise</i>	9/20/94
Activity Manager	D. H. Nyman <i>D. H. Nyman</i>	9/20/94
Cost Account Manager	D. H. Nyman <i>D. H. Nyman</i>	9/20/94
Project Control Analyst	P. L. DeShaw <i>P. L. DeShaw</i>	9/20/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	P. Felise <i>Paul Felise</i>	9/20/94
Activity Manager	D. H. Nyman <i>D. H. Nyman</i>	9/20/94
Cost Account Manager	D. H. Nyman <i>D. H. Nyman</i>	9/20/94
Project Control Analyst	P. L. DeShaw <i>P. L. DeShaw</i>	9/20/94

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Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Wastes 1.1.1.3.02 Low-Level Waste 1.1.1.3.02.05 Low-Level Waste Facility 1.1.1.3.02.05.01 Project Management 1.1.1.3.02.05.01.01 Project Management and Integration	2. DATE PREPARED 09/14/94	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.02.05.01.01.04/VIII	5. WBS ELEMENT TITLE Engineering Administration - Capital	
6. WBS INDEX LINE NO. WILL NOT BE USED	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE 10/01/94
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1230-0-AC	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER 4.2.3.1.1, 4.2.3.1.2	12. BUDGET AND REPORTING NUMBER(S)	

13. ELEMENT DESCRIPTION

A. COST CONTENT

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	--	--	--
CENRTC	--	--	--
GPP	--	--	--
LINE ITEM	--	--	372
TOTAL	--	--	372

B. TECHNICAL BASES

Goals & objectives: Maintain documentation and procedures for the Low-Level Waste Vitrification Plant Project.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

- Complete Architect-Engineer/Construction Manager Statement of Work for Detailed Design

7/98

A8-125

Risk, Impacts, Mitigation:

The planning is based on a stand-alone LLWVP that is designed and constructed in the conventional manner. There is a possibility that the LLWVP may be combined with the pretreatment facility. In addition, the acquisition strategy may be changed to include the option for privatization. Interim TPA milestones may be affected if this change occurs. The major TPA milestone of hot startup of the LLWVP in June 2005 will be accomplished with any of the alternatives under consideration.

C. STATEMENT OF WORK

Required activities:

- Prepare and maintain the Architect-Engineer/Construction Manager Statement of Work
- Maintain the Functional and Operational Requirements
- Maintain the Systems Engineering Management Plan
- Maintain Project Risk Management Plan
- Maintain Project Test and Evaluation Plan
- Maintain Project Plan
- Monitor and review architect-engineer billings

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	P. Felise <i>Paul Felise</i>	9/20/94
Activity Manager	D. H. Nyman <i>D. H. Nyman</i>	9/20/94
Cost Account Manager	D. H. Nyman <i>D. H. Nyman</i>	9/20/94
Project Control Analyst	P. L. DeShaw <i>P. L. DeShaw</i>	9/20/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	P. Felise <i>Paul Felise</i>	9/20/94
Activity Manager	D. H. Nyman <i>D. H. Nyman</i>	9/20/94
Cost Account Manager	D. H. Nyman <i>D. H. Nyman</i>	9/20/94
Project Control Analyst	P. L. DeShaw <i>P. L. DeShaw</i>	9/20/94

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Wastes 1.1.1.3.02 Low-Level Waste 1.1.1.3.02.05 Low-Level Waste Facility 1.1.1.3.02.05.01 Project Management 1.1.1.3.02.05.01.02 Business Management	2. DATE PREPARED 09/14/94	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.02.05.01.02.01/VIII	5. WBS ELEMENT TITLE Project Administration - Expense	
6. WBS INDEX LINE NO. WILL NOT BE USED	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE 10/01/94
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1230-0-AC	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER 4.2.3.1.1, 4.2.3.1.2	12. BUDGET AND REPORTING NUMBER(S)	

13. ELEMENT DESCRIPTION

A. COST CONTENT

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	440	696	79
CENRTC	--	--	--
GPP	--	--	--
LINE ITEM	--	--	--
TOTAL	440	696	79

SEP 26 1994
ORIGINAL

B. TECHNICAL BASES

Goals & objectives: Provide support to the LLWVP Project by performing project control activities.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

- Variance analysis reports (monthly)
- SMS reports (monthly)
- MRM presentations (monthly)
- Mid-year review reports (April)
- Fiscal year work plans (September)

A8-127

Risk, Impacts, Mitigation:

This activity is essential to the operation of the LLWVP Project and delay of this activity would hamper the ability to properly control and report on the project. This would be unacceptable to the customer.

C. STATEMENT OF WORK

Required activities:

- Perform scheduling tasks as it pertains to business management reporting
- Maintain milestone control log and milestone description sheets
- Support development of TEC and TPC estimates
- Perform BA/BO funding and schedule "what-if" scenarios as requested by DOE and integrating organizations
- Maintain the master budgets/funds log; perform contingency management and analysis; and perform funds management
- Support the annual project budget validation
- Prepare fiscal year requests for project authorization modifications
- Provide cost and schedule input to the integrated LLWVP/WM Program Plan
- Support WHC and DOE program management on all other financial and schedule requests relative to the project
- Coordinate with participating contractors on the development of the MCS
- Support preparation of the annual work plan
- Support preparation of weekly, monthly, quarterly, and other status reports and briefings as required
- Provide integrated statusing and reporting for the LLWVP Project per requirements
- Administer project change control system; implement approved changes into the affected baseline documents
- Provide for document control and correspondence services
- Miscellaneous clerical activities as required

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	P. Felise <i>Paul Felise</i>	9/20/94
Activity Manager	D. H. Nyman <i>D. H. Nyman</i>	9/20/94
Cost Account Manager	D. Marshall <i>D. Marshall</i>	9/20/94
Project Control Analyst	P. L. DeShaw <i>P. L. DeShaw</i>	9/20/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	P. Felise <i>Paul Felise</i>	9/20/94
Activity Manager	D. H. Nyman <i>D. H. Nyman</i>	9/20/94
Cost Account Manager	D. Marshall <i>D. Marshall</i>	9/20/94
Project Control Analyst	P. L. DeShaw <i>P. L. DeShaw</i>	9/20/94

FDS Number

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Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Wastes 1.1.1.3.02 Low-Level Waste 1.1.1.3.02.05 Low-Level Waste Facility 1.1.1.3.02.05.01 Project Management 1.1.1.3.02.05.01.02 Business Management	2. DATE PREPARED 09/14/94	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.02.05.01.02.02/VIII	5. WBS ELEMENT TITLE Project Administration - Capital	
6. WBS INDEX LINE NO. WILL NOT BE USED	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE 10/01/94
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1230-0-AC	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER 4.2.3.1.1, 4.2.3.1.2	12. BUDGET AND REPORTING NUMBER(S)	

13. ELEMENT DESCRIPTION

COST CONTENT

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	--	--	--
CENRTC	--	--	--
GPP	--	--	--
LINE ITEM	--	--	774
TOTAL	--	--	774

B. TECHNICAL BASES

Goals & objectives: Provide support to the LLWVP Project by performing project control activities.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

- Variance analysis reports (monthly)
- SMS reports (monthly)
- MRM presentations (monthly)
- Mid-year review reports (April)
- Fiscal year work plans (September)

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Risk, Impacts, Mitigation:

This activity is essential to the operation of the LLWVP Project and delay of this activity would hamper the ability to properly control and report on the project. This would be unacceptable to the customer.

C. STATEMENT OF WORK

Required activities:

- Perform scheduling tasks as it pertains to business management reporting
- Maintain milestone control log and milestone description sheets
- Support development of TEC and TPC estimates
- Perform BA/BO funding and schedule "what-if" scenarios as requested by DOE and integrating organizations
- Maintain the master budgets/funds log; perform contingency management and analysis; and perform funds management
- Support the annual project budget validation
- Prepare fiscal year requests for project authorization modifications
- Provide cost and schedule input to the integrated LLWVP/WM Program Plan
- Support WHC and DOE program management on all other financial and schedule requests relative to the project
- Coordinate with participating contractors on the development of the MCS
- Support preparation of the annual work plan
- Support preparation of weekly, monthly, quarterly, and other status reports and briefings as required
- Provide integrated statusing and reporting for the LLWVP Project per requirements
- Administer project change control system; implement approved changes into the affected baseline documents
- Provide for document control and correspondence services
- Miscellaneous clerical activities as required

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	P. Felise <i>Paul Felise</i>	9/20/94
Activity Manager	D. H. Nyman <i>D. H. Nyman</i>	9/20/94
Cost Account Manager	D. Marshall <i>D. Marshall</i>	9/20/94
Project Control Analyst	P. L. DeShaw <i>P. L. DeShaw</i>	9/20/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	P. Felise <i>Paul Felise</i>	9/20/94
Activity Manager	D. H. Nyman <i>D. H. Nyman</i>	9/20/94
Cost Account Manager	D. Marshall <i>D. Marshall</i>	9/20/94
Project Control Analyst	P. L. DeShaw <i>P. L. DeShaw</i>	9/20/94

FDS Number

Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Wastes 1.1.1.3.02 Low-Level Waste 1.1.1.3.02.05 Low-Level Waste Facility 1.1.1.3.02.05.01 Project Management 1.1.1.3.02.05.01.02 Business Management	2. DATE PREPARED 09/14/94	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.02.05.01.02.03/VIII	5. WBS ELEMENT TITLE Resource Management - Expense	
6. WBS INDEX LINE NO. WILL NOT BE USED	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE 10/01/94
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1230-0-AC	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER 4.2.3.1.1, 4.2.3.1.2	12. BUDGET AND REPORTING NUMBER(S)	

13. ELEMENT DESCRIPTION

A. COST CONTENT

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	142	168	184
CENRTC	--	--	--
GPP	--	--	--
LINE ITEM	--	--	--
TOTAL	142	168	184

B. TECHNICAL BASES

Goals & objectives: Provide resources for the normal operation of the LLWVP Project to include the following: general modifications to the building, office supplies and equipment, training, and other miscellaneous expenses.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS): N/A

Risk, Impacts, Mitigation:

Delay in activity would significantly affect the project as it would not provide the necessary resources for the day-to-day operations.

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C. STATEMENT OF WORK

Required activities:

- Office building modifications to allow for moving and rearrangement
- Office supplies and equipment
- Training for the LLWVP Project personnel
- Other miscellaneous expenses

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	P. Felise <i>Paul Felise</i>	9/20/94
Activity Manager	D. H. Nyman <i>D. H. Nyman</i>	9/20/94
Cost Account Manager	D. Marshall <i>Dennis Marshall</i>	9/20/94
Project Control Analyst	P. L. DeShaw <i>P. L. DeShaw</i>	9/20/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	P. Felise <i>Paul Felise</i>	9/20/94
Activity Manager	D. H. Nyman <i>D. H. Nyman</i>	9/20/94
Cost Account Manager	D. Marshall <i>Dennis Marshall</i>	9/20/94
Project Control Analyst	P. L. DeShaw <i>P. L. DeShaw</i>	9/20/94

FDS Number

Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Wastes 1.1.1.3.02 Low-Level Waste 1.1.1.3.02.05 Low-Level Waste Facility 1.1.1.3.02.05.01 Project Management 1.1.1.3.02.05.01.02 Business Management	2. DATE PREPARED 09/14/94	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.02.05.01.02.04/VIII	5. WBS ELEMENT TITLE Automated Data Processing Equipment - Expense	
6. WBS INDEX LINE NO. WILL NOT BE USED	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE 10/01/94
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1230-0-AC	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER 4.2.3.1.1, 4.2.3.1.2	12. BUDGET AND REPORTING NUMBER(S)	

3. ELEMENT DESCRIPTION

A. COST CONTENT

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	144	76	99
CENRTC	--	--	--
GPP	--	--	--
LINE ITEM	--	--	--
TOTAL	144	76	99

B. TECHNICAL BASES

Goals & objectives: Provide resources for the acquisition, maintenance, and upgrades of ADP equipment for the LLWVP Project.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS): N/A

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Risk, Impacts, Mitigation:

Delays or cancellation of this activity would result in corresponding delays or failure to maintain ADP equipment and the inability to obtain new equipment and upgrades.

C. STATEMENT OF WORK

Required activities:

- Maintain local area network and assure connection to general usage network
- Computer maintenance including service contracts
- Acquisitions of hardware and software
- Project software and hardware management

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	P. Felise <i>Paul Felise</i>	9/20/94
Activity Manager	D. H. Nyman <i>D. H. Nyman</i>	9/20/94
Cost Account Manager	D. Marshall <i>Derrick Marshall</i>	9/20/94
Project Control Analyst	P. L. DeShaw <i>P. L. DeShaw</i>	9/20/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	P. Felise <i>Paul Felise</i>	9/20/94
Activity Manager	D. H. Nyman <i>D. H. Nyman</i>	9/20/94
Cost Account Manager	D. Marshall <i>Derrick Marshall</i>	9/20/94
Project Control Analyst	P. L. DeShaw <i>P. L. DeShaw</i>	9/20/94

FDS Number

A8-134

Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Wastes 1.1.1.3.02 Low-Level Waste 1.1.1.3.02.05 Low-Level Waste Facility 1.1.1.3.02.05.01 Project Management 1.1.1.3.02.05.01.03 Quality Assurance	2. DATE PREPARED 09/14/94	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.02.05.01.03.01/VIII	5. WBS ELEMENT TITLE Quality Assurance - Expense	
6. WBS INDEX LINE NO. WILL NOT BE USED	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE 10/01/94
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1230-0-AC	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER 4.2.3.1.1, 4.2.3.1.2	12. BUDGET AND REPORTING NUMBER(S)	

13. ELEMENT DESCRIPTION

A. COST CONTENT

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	214	411	542
CENRTC	--	--	--
GPP	--	--	--
LINE ITEM	--	--	--
TOTAL	214	411	542

B. TECHNICAL BASES

Goals & objectives: Establish and maintain a project quality assurance program. Provide cost effective and improvement-oriented oversight of project activities

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

● Prepare and issue a project quality assurance plan	3/95
● Revise and issue the Project Quality Assurance Plan	3/96
● Revise and issue the Project Quality Assurance Plan	3/97

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Risk, Impacts, Mitigation:

None

C. STATEMENT OF WORK

Required activities:

- Develop, issue, and revise WHC Project Quality Assurance Plan
- Review and approve participant quality assurance plans
- Establish project quality assurance requirements
- Plan and oversee appropriate project activities including development, review, and acceptance of Project Plan and project procedures
- Develop, schedule, maintain, and status project oversight activities including audits and surveillances, including participants
- Report status of project quality assurance program through reports and presentations
- Prepare and update project quality assurance cost/estimate
- Establish and coordinate quality assurance interfaces
- Provide necessary quality assurance training
- Establish integrated trend analysis program
- Review Title III inspection program and implementing procedures

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	P. Felise <i>P. Felise</i>	9/20/94
Activity Manager	D. H. Nyman <i>D. H. Nyman</i>	9/20/94
Cost Account Manager	A. Y. Dingle <i>A. Y. Dingle</i>	9-20-94
Project Control Analyst	P. L. DeShaw <i>P. L. DeShaw</i>	9/20/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	P. Felise <i>P. Felise</i>	9/20/94
Activity Manager	D. H. Nyman <i>D. H. Nyman</i>	9/20/94
Cost Account Manager	A. Y. Dingle <i>A. Y. Dingle</i>	9-20-94
Project Control Analyst	P. L. DeShaw <i>P. L. DeShaw</i>	9/20/94

FDS Number

A8-136

Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Wastes 1.1.1.3.02 Low-Level Waste 1.1.1.3.02.05 Low-Level Waste Facility	2. DATE PREPARED August 23, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.02.05.02/VI	5. WBS ELEMENT TITLE Safety Analysis Report/Permitting	
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO 0	8. EFFECTIVE REVISION DATE September 23, 1994
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1230-0-AC	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER /TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV.1) 4.2.3.1.1 4.2.3.1.2		12. BUDGET AND REPORTING NUMBER(S)

13. ELEMENT DESCRIPTION

A. COST CONTENT

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	386	634	346
CENRTC	--	--	--
GPP	--	--	--
LINE ITEM	--	--	300
TOTAL	386	634	646

B. TECHNICAL BASES

Goals & objectives:

Provide safety/health and permitting documentation addressing safety-significant and environmental aspects of the LLWVP operation based upon project design media and operational plans.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

- Initial safety management plan 9/95
- Annual permitting plan 9/95
- Criticality safety evaluation report 6/97
- Preliminary Safety Analysis Report 9/97

Risk, Impacts, Mitigation: N/A

C. STATEMENT OF WORK

Required activities:

- Prepare and approve all safety analyses. Ensure independent reviews.
- Prepare and approve all permit applications. Ensure internal reviews and regulator reviews are accomplished.

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	R. J. Murkowski	
Activity Manager	P. Felise	
Cost Account Manager	P. Felise	
Project Control Analyst	T. A. Grillo K. F. Hanlon	

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	R. J. Murkowski	
Activity Manager	P. Felise	
Cost Account Manager	P. Felise	
Project Control Analyst	T. A. Grillo K. F. Hanlon	

FDS Number

1D455A

Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Wastes 1.1.1.3.02 Low-Level Waste 1.1.1.3.02.05 Low-Level Waste Facility 1.1.1.3.02.05.02 Safety Analysis Report/Permitting 1.1.1.3.02.05.02.01 Safety/Health	2. DATE PREPARED 09/14/94	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.02.05.02.01.01/VIII	5. WBS ELEMENT TITLE Safety Documentation Planning & Coordination - Expense	
6. WBS INDEX LINE NO. WILL NOT BE USED	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE 10/01/94
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1230-0-AC	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER 4.2.3.1.1, 4.2.3.1.2	12. BUDGET AND REPORTING NUMBER(S)	

13. ELEMENT DESCRIPTION

A. COST CONTENT

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	66	79	82
CENRTC	--	--	--
GPP	--	--	--
LINE ITEM	--	--	--
TOTAL	66	79	82

B. TECHNICAL BASES

Goals & objectives: Develop and implement an overall safety management and compliance strategy, provide an interface for technical safety issues, integrate the latest safety requirements and analysis methods into the design process, and function as the interface with safety programs at other sites and facilities for lessons learned and consistency.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

- Safety Management Plan

Risk, Impacts, Mitigation:

N/A

C. STATEMENT OF WORK

Required activities:

- Prepare and issue Safety Management Plan and annual revisions
- Maintain cognizance of safety requirements and latest analysis methods
- Participate in technical safety exchange programs with other sites and committees

Technologies to be assessed:

N/A

Options to be considered:

N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	P. Felise <i>Paul Felise</i>	9/20/94
Activity Manager	D. G. Baide <i>DG Baide</i>	9/20/94
Cost Account Manager	D. G. Baide <i>DG Baide</i>	9/20/94
Project Control Analyst	P. L. DeShaw <i>P. L. DeShaw</i>	9/20/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	P. Felise <i>Paul Felise</i>	9/20/94
Activity Manager	D. G. Baide <i>DG Baide</i>	9/20/94
Cost Account Manager	D. G. Baide <i>DG Baide</i>	9/20/94
Project Control Analyst	P. L. DeShaw <i>P. L. DeShaw</i>	9/20/94

FDS Number

A8-140

Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Wastes 1.1.1.3.02 Low-Level Waste 1.1.1.3.02.05 Low-Level Waste Facility 1.1.1.3.02.05.02 Safety Analysis Report/Permitting 1.1.1.3.02.05.02.01 Safety/Health	2. DATE PREPARED 09/14/94	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.02.05.02.01.03/VIII	5. WBS ELEMENT TITLE Project Safety Documentation - Expense	
6. WBS INDEX LINE NO. WILL NOT BE USED	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE 10/01/94
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1230-0-AC	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER 4.2.3.1.1, 4.2.3.1.2	12. BUDGET AND REPORTING NUMBER(S)	

13. ELEMENT DESCRIPTION

A. COST CONTENT

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	228	1,130	1,435
CENRTC	--	--	--
GPP	--	--	--
LINE ITEM	--	--	--
TOTAL	228	1,130	1,435

B. TECHNICAL BASES

Goals & objectives: Develop pre-authorization safety basis documentation and support the independent review and approval cycle, evaluate and address safety significant issues, perform identified special studies, supporting analyses, and risk assessments, and integrate the pre-authorization safety basis into the design process.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

- Preliminary Safety Evaluation
- Preliminary Safety Analysis Report

2/96

9/97

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Risk, Impacts, Mitigation:

- Preliminary Safety Evaluation is required for the Conceptual Design Report
- Preliminary Safety Analysis Report is required to start construction (Key Decision 3)

C. STATEMENT OF WORK

Required activities:

- Prepare and issue Preliminary Safety Analysis Report and annual revisions
- Participate in the design review process
- Provide guidance to the design agent in the preparation of safety related design analyses

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	P. Felise <i>Paul Felise</i>	9/20/94
Activity Manager	D. G. Baide <i>DG Baide</i>	9/20/94
Cost Account Manager	D. G. Baide <i>DG Baide</i>	9/20/94
Project Control Analyst	P. L. DeShaw <i>P. L. DeShaw</i>	9/20/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	P. Felise <i>Paul Felise</i>	9/20/94
Activity Manager	D. G. Baide <i>DG Baide</i>	9/20/94
Cost Account Manager	D. G. Baide <i>DG Baide</i>	9/20/94
Project Control Analyst	P. L. DeShaw <i>P. L. DeShaw</i>	9/20/94

FDS Number

A8-142

Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Wastes 1.1.1.3.02 Low-Level Waste 1.1.1.3.02.05 Low-Level Waste Facility 1.1.1.3.02.05.02 Safety Analysis Report/Permitting 1.1.1.3.02.05.02.02 Permitting	2. DATE PREPARED 09/14/94	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.02.05.02.02.01/VIII	5. WBS ELEMENT TITLE Permit Documentation Planning and Coordination - Expense	
6. WBS INDEX LINE NO. WILL NOT BE USED	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE 10/01/94
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1230-0-AC	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER 4.2.3.1.1, 4.2.3.1.2	12. BUDGET AND REPORTING NUMBER(S)	

13. ELEMENT DESCRIPTION

A. COST CONTENT

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	13	23	24
CENRTC	--	--	--
GPP	--	--	--
LINE ITEM	--	--	--
TOTAL	13	23	24

B. TECHNICAL BASES

Goals & objectives: Develop and implement an overall permitting compliance strategy, provide an interface for environmental issues, integrate environmental requirements into the design process, and function as the interface with regulators on permitting issues.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

- Permitting Plan

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Risk, Impacts, Mitigation: N/A

C. STATEMENT OF WORK

Required activities:

- Prepare and issue Permitting Plan and annual revisions
- Maintain cognizance of environmental requirements and upcoming rule making
- Participate in overall Hanford permitting activities representing construction projects

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	P. Felise <i>Paul Felise</i>	9/20/94
Activity Manager	D. G. Baide <i>DG Baide</i>	9/20/94
Cost Account Manager	D. G. Baide <i>DG Baide</i>	9/20/94
Project Control Analyst	P. L. DeShaw <i>P.L. DeShaw</i>	9/20/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	P. Felise <i>Paul Felise</i>	9/20/94
Activity Manager	D. G. Baide <i>DG Baide</i>	9/20/94
Cost Account Manager	D. G. Baide <i>DG Baide</i>	9/20/94
Project Control Analyst	P. L. DeShaw <i>P.L. DeShaw</i>	9/20/94

FDS Number

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Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Wastes 1.1.1.3.02 Low-Level Waste 1.1.1.3.02.05 Low-Level Waste Facility 1.1.1.3.02.05.02 Safety Analysis Report/Permitting 1.1.1.3.02.05.02.02 Permitting	2. DATE PREPARED 09/14/94	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.02.05.02.02.02/VIII	5. WBS ELEMENT TITLE Site Baseline Characterization and Environmental Studies - Expense	
6. WBS INDEX LINE NO. WILL NOT BE USED	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE 10/01/94
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1230-0-AC	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER 4.2.3.1.1, 4.2.3.1.2	12. BUDGET AND REPORTING NUMBER(S)	

13. ELEMENT DESCRIPTION

A. COST CONTENT

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	--	--	87
CENRTC	--	--	--
GPP	--	--	--
LINE ITEM	--	--	--
TOTAL	--	--	87

B. TECHNICAL BASES

Goals & objectives: Develop the required environmental baseline and site characterization necessary to allow the construction, operation, and final closure of the LLWVP facility.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

- › Soil Baseline Summary Report

9/97

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Risk, Impacts, Mitigation:

- Site characterization baseline is required information supporting the RCRA Part B Permit

C. STATEMENT OF WORK

Required activities:

- Prepare and issue Soil Baseline Summary Report

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	P. Felise <i>Paul Felise</i>	9/20/94
Activity Manager	D. G. Baide <i>D. G. Baide</i>	9/20/94
Cost Account Manager	D. G. Baide <i>D. G. Baide</i>	9/20/94
Project Control Analyst	P. L. DeShaw <i>P. L. DeShaw</i>	9/20/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	P. Felise <i>Paul Felise</i>	9/20/94
Activity Manager	D. G. Baide <i>D. G. Baide</i>	9/20/94
Cost Account Manager	D. G. Baide <i>D. G. Baide</i>	9/20/94
Project Control Analyst	P. L. DeShaw <i>P. L. DeShaw</i>	9/20/94

FDS Number

A8-146

Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Wastes 1.1.1.3.02 Low-Level Waste 1.1.1.3.02.05 Low-Level Waste Facility 1.1.1.3.02.05.02 Safety Analysis Report/Permitting 1.1.1.3.02.05.02.02 Permitting	2. DATE PREPARED 09/14/94	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.02.05.02.02.03/VIII	5. WBS ELEMENT TITLE NEPA Permitting - Expense	
6. WBS INDEX LINE NO. WILL NOT BE USED	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE 10/01/94
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1230-0-AC	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER 4.2.3.1.1, 4.2.3.1.2	12. BUDGET AND REPORTING NUMBER(S)	

13. ELEMENT DESCRIPTION

A. COST CONTENT

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	26	46	24
CENRTC	--	--	--
GPP	--	--	--
LINE ITEM	--	--	--
TOTAL	26	46	24

B. TECHNICAL BASES

Goals & objectives: Develop additional NEPA documentation, not adequately addressed by the TWRS EIS, necessary to cover those issues of environmental significance resulting from detailed design activities.

Status of Design Documentation: - N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

- Supplement Analysis

TBD

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Risk, Impacts, Mitigation: N/A

C. STATEMENT OF WORK

Required activities:

- Prepare and issue NEPA Supplement Analyses

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	P. Felise <i>Paul Felise</i>	9/20/94
Activity Manager	D. G. Baide <i>DG Baide</i>	9/20/94
Cost Account Manager	D. G. Baide <i>DG Baide</i>	9/20/94
Project Control Analyst	P. L. DeShaw <i>P. L. DeShaw</i>	9/20/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	P. Felise <i>Paul Felise</i>	9/20/94
Activity Manager	D. G. Baide <i>DG Baide</i>	9/20/94
Cost Account Manager	D. G. Baide <i>DG Baide</i>	9/20/94
Project Control Analyst	P. L. DeShaw <i>P. L. DeShaw</i>	9/20/94

FDS Number

A8-148

Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Wastes 1.1.1.3.02 Low-Level Waste 1.1.1.3.02.05 Low-Level Waste Facility 1.1.1.3.02.05.02 Safety Analysis Report/Permitting 1.1.1.3.02.05.02.02 Permitting	2. DATE PREPARED 09/14/94	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.02.05.02.02.04/VIII	5. WBS ELEMENT TITLE RCRA Permitting - Expense	
6. WBS INDEX LINE NO. WILL NOT BE USED	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE 10/01/94
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1230-0-AC	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER 4.2.3.1.1, 4.2.3.1.2	12. BUDGET AND REPORTING NUMBER(S)	

13. ELEMENT DESCRIPTION

A. COST CONTENT

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	19	46	87
CENRTC	--	--	--
GPP	--	--	--
LINE ITEM	--	--	--
TOTAL	19	46	87

B. TECHNICAL BASES

Goals & objectives: Develop and implement an overall program for dealing with RCRA regulated wastes, provide an interface for RCRA related issues, integrate RCRA requirements into the design process, and obtain a RCRA Part B operating permit.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

1 RCRA Part B Permit

05/05

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Risk, Impacts, Mitigation:

- RCRA Part B Permit is required for radioactive operations (Key Decision 4)

C. STATEMENT OF WORK

Required activities:

- Prepare and submit RCRA Part B Permit application and support review/comment resolution process
- Conduct meetings with regulators and support RCRA issue during interim status period
- Maintain cognizance of RCRA regulations
- Participate in the design review process
- Provide guidance to the design agent on RCRA related design issues

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	P. Felise <i>Paul Felise</i>	9/20/94
Activity Manager	D. G. Baide <i>DG Baide</i>	9/20/94
Cost Account Manager	D. G. Baide <i>DG Baide</i>	9/20/94
Project Control Analyst	P. L. DeShaw <i>Ph DeShaw</i>	9/20/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	P. Felise <i>Paul Felise</i>	9/20/94
Activity Manager	D. G. Baide <i>DG Baide</i>	9/20/94
Cost Account Manager	D. G. Baide <i>DG Baide</i>	9/20/94
Project Control Analyst	P. L. DeShaw <i>Ph DeShaw</i>	9/20/94

FDS Number

A8-150

Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Wastes 1.1.1.3.02 Low-Level Waste 1.1.1.3.02.05 Low-Level Waste Facility 1.1.1.3.02.05.02 Safety Analysis Report/Permitting 1.1.1.3.02.05.02.02 Permitting	2. DATE PREPARED 09/14/94	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.02.05.02.02.05/VIII	5. WBS ELEMENT TITLE Air & Water Permitting - Expense	
6. WBS INDEX LINE NO. WILL NOT BE USED	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE 10/01/94
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1230-0-AC	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER 4.2.3.1.1, 4.2.3.1.2	12. BUDGET AND REPORTING NUMBER(S)	

13. ELEMENT DESCRIPTION

.. COST CONTENT

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	39	165	205
CENRTC	--	--	--
GPP	--	--	--
LINE ITEM	--	--	--
TOTAL	39	165	205

B. TECHNICAL BASES

Goals & objectives: Develop and implement an overall program for dealing with air emissions and waste water discharges, provide an interface for air and water related issues, integrate air and water regulatory requirements into the design process, and obtain approvals and permits for air emissions and waste water discharges.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

• Notice Of Construction - Radioactive Air Emissions	11/97
• Notice Of Construction - Nonradioactive Air Emissions	11/97
• TEDF Wastewater Discharge Permit Update	09/99

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Risk, Impacts, Mitigation:

- Notice Of Construction approvals are required to begin construction of the emissions unit
- Wastewater permits and updates are required before any waste discharge

C. STATEMENT OF WORK

Required activities:

- Prepare and submit Notice(s) Of Construction and support review/comment resolution process
- Prepare and submit process and domestic wastewater discharge permit applications and support review/comment resolution process
- Conduct meetings with regulators
- Maintain cognizance of air and water regulations
- Participate in the design review process
- Provide guidance to the design agent on air and water permitting related design issues

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	P. Felise <i>Paul Felise</i>	9/20/94
Activity Manager	D. G. Baide <i>DG Baide</i>	9/20/94
Cost Account Manager	D. G. Baide <i>DG Baide</i>	9/20/94
Project Control Analyst	P. L. DeShaw <i>P. L. DeShaw</i>	9/20/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	P. Felise <i>Paul Felise</i>	9/20/94
Activity Manager	D. G. Baide <i>DG Baide</i>	9/20/94
Cost Account Manager	D. G. Baide <i>DG Baide</i>	9/20/94
Project Control Analyst	P. L. DeShaw <i>P. L. DeShaw</i>	9/20/94

FDS Number

A8-152

Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Wastes 1.1.1.3.02 Low-Level Waste 1.1.1.3.02.05 Low-Level Waste Facility	2. DATE PREPARED September 7, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.02.05.03/VI	5. WBS ELEMENT TITLE Design Engineering	
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1230-0-AC	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.3.1.1 4.2.3.1.2	12. BUDGET AND REPORTING NUMBER(S) Expense Capital Line Item	

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	11662	13970	3493
CENRTC	--	--	--
GPP	--	--	--
LINE ITEM	--	--	3288
TOTAL	11662	13970	6781

B. TECHNICAL BASES

Goals & objectives:

Prepare a conceptual design to comply with the requirements specified in the Functional and Operational Requirements (F&OR) and the Design Requirements Document (DRD) that will be provided by WHC. Develop a conceptual design report, including project design

1.1.1.3.02.05.03

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criteria. Prepare preliminary design that complies with the F&OR and the DRD and based on the Conceptual Design Report.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

• Start conceptual design	3/95
• Submit reference conceptual design report	2/96
• Submit conceptual design report (reference and advanced) TPA Milestone M-60-03	11/96
• Start preliminary design, TPA Milestone M-60-03	11/96
• Complete preliminary design sufficient to begin detailed design	10/97
• Complete preliminary design	9/98

Risk, Impacts, Mitigation:

The planning is based on a stand-alone LLWVP that is designed by an A-E selected on the basis of qualifications to perform the work. This A-E will also perform as construction manager (AE/CM). There is a possibility that the LLWVP may be combined with the pretreatment facility. In addition, the acquisition strategy may be changed to include competitive conceptual design with the option for privatization. Interim TPA milestones may be affected, if any of these changes occur. The major TPA milestone of hot startup of the LLWVP in June 2005 will be accomplished with any of the alternatives under consideration.

C. STATEMENT OF WORK

Required activities:

- Prepare various plant layouts to select best concept for completion of conceptual design (AE/CM).
- Complete the conceptual design and reference conceptual design report (AE/CM).
- Perform advanced conceptual design and complete conceptual design report (reference and advanced) (AE/CM).
- Prepare preliminary design in compliance with the F&OR and the project design criteria (AE/CM).
- Provide day-to-day direction of the contracted design agent (WHC).
- Review and approve design products (WHC).
- Prepare and maintain project schedules (WHC and AE/CM).
- Ensure preparation and maintenance of project estimates--TEC and TPC (WHC and AE/CM).
- Support DOE in yearly budget validations and key decision process (WHC and AE/CM).
- Develop plans; perform audits and surveillances (WHC and AE/CM).
- Provide as-built documentation required to operate and maintain the facilities (AE/CM).
- Prepare operational and maintenance procedures (WHC and AE/CM).

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	R. J. Murkowski	
Activity Manager	P. Felise	
Cost Account Manager	P. Felise	
Project Control Analyst	T. A. Grillo K. F. Hanlon	

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	R. J. Murkowski	
Activity Manager	P. Felise	
Cost Account Manager	J. D. Phillips	
Project Control Analyst	T. A. Grillo K. F. Hanlon	

FDS Number

1D455A

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Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Wastes 1.1.1.3.02 Low-Level Waste 1.1.1.3.02.05 Low-Level Waste Facility 1.1.1.3.02.05.03 Design Engineering 1.1.1.3.02.05.03.01 Conceptual	2. DATE PREPARED 09/19/94	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.02.05.03.01.01/VIII	5. WBS ELEMENT TITLE Design Liaison - Expense	
6. WBS INDEX LINE NO. WILL NOT BE USED	7. CURRENT REV NO. 0	8. EFFECTIVE REV DATE 10/01/94
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NO. 1230-0-AC	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER 4.2.3.1.1, 4.2.3.1.2	12. BUDGET AND REPORTING NUMBER(S)	

13. ELEMENT DESCRIPTION

A. COST CONTENT

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	1095	2599	219
CENRTC	--	--	--
GPP	--	--	--
LINE ITEM	--	--	--
TOTAL	1095	2599	219

B. TECHNICAL BASES

Goals & objectives: Provide necessary technical direction to the AE/CM during the conceptual design process including activities that affect the operability of the plant and include TWRS process engineering and TWRS engineering development expertise into the design. Also, provide permitting and regulatory compliance overview and guidance to the effort of the AE/CM. Provide additional TWRS engineering input to special design reviews on an "as-needed" basis. Review and comment/approve the design as the AE/CM effort progresses.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

- WHC reviews and approves AE/CM conceptual design work plan 04/95
- WHC submits Conceptual Design Report to RL for review 02/01/96
- WHC reviews and approves Reference Conceptual Design Report 02/28/96
- WHC reviews and approves AE/CM advanced conceptual design work plan 03/96
- WHC submits Advanced Conceptual Design Report to RL for review 10/01/96
- WHC reviews and approves Advanced Conceptual Design Report 10/31/96
- WHC reviews and approves multiple conceptual layouts, general arrangement drawings, construction cost estimates/schedule per dates established in AE/CM work plan
- WHC conducts periodic formal design reviews and issue follow up action report per dates established in AE/CM work plan
- Additional milestones will be established when the AE/CM submits the Conceptual Design Work Plan and the Advanced Conceptual Design Work Plan

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Risk, Impacts, Mitigation: The planning is based on a stand-alone LLWVP that is designed by an A-E selected on the basis of qualifications to perform the work (Brooks Act). This A-E will also perform as construction manager (AE/CM). There is a possibility that the LLWVP may be combined with the pretreatment facility. In addition, the acquisition strategy may be changed to include a privatization option. Interim TPA milestones may be affected if this change occurs. The major TPA milestone of hot startup of the LLWVP in June 2005 will be accomplished with any of the alternatives under consideration.

C. STATEMENT OF WORK

Required activities:

- Review and approve the AE/CM's work plans
- Review/concur with the Design Requirements Document and revisions
- Direct the technical scope of the AE/CM work via formal written communications
- Provide necessary specific technical direction and guidance to the AE/CM for activities that affect the operability of the plant
- Provide TWRS process engineering expertise and TWRS engineering development expertise input to the design
- Maintain daily contact with the AE/CM to guide/monitor activities
- Maintain Hanford Site technology activities interface
- Maintain all other Hanford Site interfaces with AE/CM
- Coordinate preparation of multiple facility layouts for alternate melter technologies
- Support development of process heat and material balance including bases for input
- Review and approve all AE/CM design products including Conceptual Design Report
- Arrange and conduct periodic formal design review meetings with additional review staff as necessary
- Obtain from the AE/CM the design information necessary for WHC-prepared permitting and regulatory compliance documents
- Make adequate provisions for RL review and comment on major deliverables

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	P. Felise <i>Paul Felise</i>	9/20/94
Activity Manager	J. D. Phillips <i>John D. Phillips</i>	9/20/94
Cost Account Manager	J. D. Phillips <i>John D. Phillips</i>	9/20/94
Project Control Analyst	P. L. DeShaw <i>P. L. DeShaw</i>	9/20/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	P. Felise <i>Paul Felise</i>	9/20/94
Activity Manager	J. D. Phillips <i>John D. Phillips</i>	9/20/94
Cost Account Manager	J. D. Phillips <i>John D. Phillips</i>	9/20/94
Project Control Analyst	P. L. DeShaw <i>P. L. DeShaw</i>	9/20/94

FDS Number

Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Wastes 1.1.1.3.02 Low-Level Waste 1.1.1.3.02.05 Low-Level Waste Facility 1.1.1.3.02.05.03 Design Engineering 1.1.1.3.02.05.03.01 Conceptual	2. DATE PREPARED 09/19/94	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.02.05.03.01.02/VIII	5. WBS ELEMENT TITLE Conceptual Design (Architect-Engineer) - Expense	
6. WBS INDEX LINE NO. WILL NOT BE USED	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE 10/01/94
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1230-0-AC	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER 4.2.3.1.1, 4.2.3.1.2	12. BUDGET AND REPORTING NUMBER(S)	

13. ELEMENT DESCRIPTION

A. COST CONTENT

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	8952	12898	3216
CENRTC	--	--	--
GPP	--	--	--
LINE ITEM	--	--	--
TOTAL	8952	12898	3216

B. TECHNICAL BASES

Goals & objectives: Prepare a conceptual design in accordance with the Statement of Work and in compliance with requirements specified in the Functional and Operational Requirements and the Design Requirements Document that will be provided by WHC. Develop a conceptual design report (CDR) including project design criteria. Conceptual design and CDR to be in compliance with DOE Order 4700.1.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

- Start conceptual design 3/95
- Submit conceptual design work plan 3/95
- Submit reference CDR 2/96
- Submit advanced conceptual design work plan 2/96
- Submit CDR (reference and advanced), TPA Milestone M-60-03 10/31/96
- Additional milestones will be established when the AE/CM submits conceptual and advanced conceptual design work plans

A8-159

Risk, Impacts, Mitigation:

The planning is based on a stand-alone LLWVP that is designed by an A-E selected on the basis of qualifications to perform the work (Brooks Act). This A-E will also perform as construction manager (AE/CM). There is a possibility that the LLWVP may be combined with the pretreatment facility. In addition, the acquisition strategy may be changed to include a privatization option. Interim TPA milestones may be affected if this change occurs. The major TPA milestone of hot startup of the LLWVP in June 2005 will be accomplished with any of the alternatives under consideration.

C. STATEMENT OF WORK

Required activities:

- Prepare a conceptual design work plan and schedule
- Prepare various plant layouts based on different melter technologies in order to select best concept for completion of conceptual design
- Complete the conceptual design and reference CDR in accordance with DOE Order 4700.1
- Perform advanced conceptual design and complete CDR (reference and advanced)
- Prepare a construction cost estimate and construction schedule
- Prepare and maintain project schedules (WHC and AE/CM)
- Provide monthly presentations of project status/problems and path forward (AE/CM)
- Ensure preparation and maintenance of project estimates--TEC and TPC (WHC and AE/CM)
- Support DOE in yearly budget validations and key decision process (WHC and AE/CM)
- Develop quality assurance plans; perform audits and surveillances (WHC and AE/CM)
- Develop LLWVP maintenance philosophy and operations guidelines
- Develop facility containment/confinement approaches
- Develop safety classification and evaluations of facilities, structures, and equipment
- Provide design information to WHC permitting and regulatory compliance as needed for their efforts

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	P. Felise <i>Paul Felise</i>	9/20/94
Activity Manager	J. D. Phillips <i>John D. Phillips</i>	9/20/94
Cost Account Manager	J. D. Phillips <i>John D. Phillips</i>	9/20/94
Project Control Analyst	P. L. DeShaw <i>P. L. DeShaw</i>	9/20/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	P. Felise <i>Paul Felise</i>	9/20/94
Activity Manager	J. D. Phillips <i>John D. Phillips</i>	9/20/94
Cost Account Manager	J. D. Phillips <i>John D. Phillips</i>	9/20/94
Project Control Analyst	P. L. DeShaw <i>P. L. DeShaw</i>	9/20/94

FDS Number

A8-160

Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Wastes 1.1.1.3.02 Low-Level Waste 1.1.1.3.02.05 Low-Level Waste Facility 1.1.1.3.02.05.03 Design Engineering 1.1.1.3.02.05.03.02 Preliminary	2. DATE PREPARED 09/19/94	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.02.05.03.02.01/VIII	5. WBS ELEMENT TITLE Design Support - Expense	
6. WBS INDEX LINE NO. WILL NOT BE USED	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE 10/01/94
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1230-0-AC	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER 4.2.3.1.1, 4.2.3.1.2	12. BUDGET AND REPORTING NUMBER(S)	

13. ELEMENT DESCRIPTION

A. COST CONTENT

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	--	--	329
CENRTC	--	--	--
GPP	--	--	--
LINE ITEM	--	--	--
TOTAL	--	--	329

B. TECHNICAL BASES

Goals & objectives: Provide WHC permitting and regulatory compliance (P&RC) overview and guidance of the AE/CM efforts.
Provide additional TWRS engineering input to special design reviews on an "as-needed" basis.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

- WHC P&RC deliverables (if any) to be better defined upon submittal of AE/CM work plan TBD
- TWRS Engineering deliverables (if any) to be better defined upon submittal of AE/CM work plan TBD

Risk, Impacts, Mitigation:

The planning is based on a stand-alone LLWVP that is designed by an A-E selected on the basis of qualifications to perform the work (Brooks Act). This A-E will also perform as construction manager (AE/CM). There is a possibility that the LLWVP may be combined with the pretreatment facility. In addition, the acquisition strategy may be changed to include a privatization option. Interim TPA milestones may be affected if this change occurs. The major TPA milestone of hot startup of the LLWVP in June 2005 will be accomplished with any of the alternatives under consideration.

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C. STATEMENT OF WORK

Required activities:

- Review/concur with Design Requirements Document and revisions
- Maintain daily contact with the AE/CM to guide/monitor activities in the area of permitting and regulatory compliance
- Maintain all other Hanford Site permitting and regulatory compliance interfaces with AE/CM
- Obtain from the AE/CM the design information necessary for WHC-prepared permitting and regulatory compliance documents.
- Provide special TWRS engineering review or input to the design on an "as-needed" basis. Examples may include special reviews for site utility tie-ins or additional staffing for periodic (30-60-90%) formal design reviews.

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	P. Felise <i>Paul Felise</i>	9/20/94
Activity Manager	J. D. Phillips <i>John D. Phillips</i>	9/20/94
Cost Account Manager	J. D. Phillips <i>John D. Phillips</i>	9/20/94
Project Control Analyst	P. L. DeShaw <i>P. L. DeShaw</i>	9/20/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	P. Felise <i>Paul Felise</i>	9/20/94
Activity Manager	J. D. Phillips <i>John D. Phillips</i>	9/20/94
Cost Account Manager	J. D. Phillips <i>John D. Phillips</i>	9/20/94
Project Control Analyst	P. L. DeShaw <i>P. L. DeShaw</i>	9/20/94

FDS Number

A8-162

Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Wastes 1.1.1.3.02 Low-Level Waste 1.1.1.3.02.05 Low-Level Waste Facility 1.1.1.3.02.05.03 Design Engineering 1.1.1.3.02.05.03.02 Preliminary	2. DATE PREPARED 09/19/94	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.02.05.03.02.02/VIII	5. WBS ELEMENT TITLE Design Liaison - Capital	
6. WBS INDEX LINE NO. WILL NOT BE USED	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE 10/01/94
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1230-0-AC	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER 4.2.3.1.1, 4.2.3.1.2	12. BUDGET AND REPORTING NUMBER(S)	

13. ELEMENT DESCRIPTION

A. COST CONTENT

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	--	--	--
CENRTC	--	--	--
GPP	--	--	--
LINE ITEM	--	--	2008
TOTAL	--	--	2008

B. TECHNICAL BASES

Goals & objectives: Provide necessary technical direction to the AE/CM during the preliminary design process including activities that affect the operability of the plant and including TWRS process engineering and TWRS engineering development expertise into the design review and comment/approve the design as the AE/CM effort progresses.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

- WHC reviews and approves AE/CM preliminary design work plan 10/96
- WHC approves preliminary design as being sufficient to begin detailed design (Title II) 9/26/97
- WHC conducts periodic formal design reviews and issues follow-up action report per dates established in AE/CM work plan
- Additional WHC FY 1997 milestones will be established upon receipt of the AE/CM preliminary design work plan

A8-163

Risk, Impacts, Mitigation:

The planning is based on a stand-alone LLWVP that is designed by an A-E selected on the basis of qualifications to perform the work (Brooks Act). This A-E will also perform as construction manager (AE/CM). There is a possibility that the LLWVP may be combined with the pretreatment facility. In addition, the acquisition strategy may be changed to include a privatization option. Interim TPA milestones may be affected if this change occurs. The major TPA milestone of hot startup of the LLWVP in June 2005 will be accomplished with any of the alternatives under consideration.

C. STATEMENT OF WORK

Required activities:

- Review and approve the AE/CM's work plans
- Review/concur with the Design Requirements Document and revisions
- Direct the technical scope of the AE/CM work via formal written communications
- Provide necessary specific technical direction and guidance to the AE/CM for activities that affect the operability of the plant
- Provide TWRS process engineering expertise and TWRS engineering development expertise input to the design
- Maintain daily contact with the AE/CM to guide/monitor activities
- Maintain Hanford Site technology activities interface
- Maintain all other Hanford Site interfaces with AE/CM
- Support development of process heat and material balance, including bases for input
- Review and approve all AE/CM design products including process flow diagrams, general arrangement drawings, P&IDs, and one-line diagrams
- Arrange and conduct periodic formal design review meetings with additional review staff as necessary
- Make adequate provisions for RL review and comments on major deliverables

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	P. Felise <i>Paul Felise</i>	9/20/94
Activity Manager	J. D. Phillips <i>John D. Phillips</i>	9/20/94
Cost Account Manager	J. D. Phillips <i>John D. Phillips</i>	9/20/94
Project Control Analyst	P. L. DeShaw <i>P. L. DeShaw</i>	9/20/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	P. Felise <i>Paul Felise</i>	9/20/94
Activity Manager	J. D. Phillips <i>John D. Phillips</i>	9/20/94
Cost Account Manager	J. D. Phillips <i>John D. Phillips</i>	9/20/94
Project Control Analyst	P. L. DeShaw <i>P. L. DeShaw</i>	9/20/94

A8-164

Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Wastes 1.1.1.3.02 Low-Level Waste 1.1.1.3.02.05 Low-Level Waste Facility 1.1.1.3.02.05.03 Design Engineering 1.1.1.3.02.05.03.02 Preliminary	2. DATE PREPARED 09/19/94	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.02.05.03.02.03/VIII	5. WBS ELEMENT TITLE Preliminary Design (Architect-Engineer) - Capital	
6. WBS INDEX LINE NO. WILL NOT BE USED	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE 10/01/94
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1230-0-AC	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER 4.2.3.1.1, 4.2.3.1.2	12. BUDGET AND REPORTING NUMBER(S)	

13. ELEMENT DESCRIPTION

A. COST CONTENT

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	--	--	--
CENRTC	--	--	--
GPP	--	--	--
LINE ITEM	--	--	12610
TOTAL	--	--	12610

B. TECHNICAL BASES

Goals & objectives: Prepare preliminary design in accordance with the Statement of Work and in compliance with the Functional and Operational Requirements and the Design Requirements Document that will be provided by WHC. The preliminary design will be based on the Conceptual Design Report, and in compliance with DOE Order 4700.1.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

- Submit preliminary design work plan 9/96
- Start preliminary design, TPA Milestone M-60-03 10/28/96
- Complete preliminary design sufficient to begin detailed design 9/97
- Complete preliminary design 9/30/98
- Additional FY 1997 milestones will be established upon receipt of AE/CM preliminary design work plan

8A - 165

Risk, Impacts, Mitigation:

The planning is based on a stand-alone LLWVP that is designed by an A-E selected on the basis of qualifications to perform the work (Brooks Act). This A-E will also perform as construction manager (AE/CM). There is a possibility that the LLWVP may be combined with the pretreatment facility. In addition, the acquisition strategy may be changed to include a privatization option. Interim TPA milestones may be affected if this change occurs. The major TPA milestone of hot startup of the LLWVP in June 2005 will be accomplished with any of the alternatives under consideration.

C. STATEMENT OF WORK

Required activities:

- Prepare a preliminary design work plan and schedule
- Prepare preliminary design in compliance with the Functional and Operational Requirements and the project design criteria (AE/CM) and DOE Order 4700.1
- Prepare and maintain project schedules (WHC and AE/CM)
- Provide monthly presentations of project status/problems and path forward (AE/CM)
- Ensure preparation and maintenance of project estimates--TEC and TPC (WHC and AE/CM)
- Support DOE in yearly budget validations and key decision process (WHC and AE/CM)
- Develop quality assurance plans; perform audits and surveillances (WHC and AE/CM)
- Provide design information to WHC permitting and regulatory compliance as needed for their efforts

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	P. Felise <i>Paul Felise</i>	9/20/94
Activity Manager	J. D. Phillips <i>John D. Phillips</i>	9/20/94
Cost Account Manager	J. D. Phillips <i>John D. Phillips</i>	9/20/94
Project Control Analyst	P. L. DeShaw <i>P. L. DeShaw</i>	9/20/94

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	P. Felise <i>Paul Felise</i>	9/20/94
Activity Manager	J. D. Phillips <i>John D. Phillips</i>	9/20/94
Cost Account Manager	J. D. Phillips <i>John D. Phillips</i>	9/20/94
Project Control Analyst	P. L. DeShaw <i>P. L. DeShaw</i>	9/20/94

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.02 Low-Level Waste (M&O Contractor)	2. DATE PREPARED August 31, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.02.06/V	5. WBS ELEMENT TITLE Grout Facilities	
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1230-0-AC	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.3.1	12. BUDGET AND REPORTING NUMBER(S) Expense Capital Line Item EW313001-0 35EW3130-1	

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)	FY 1998 \$(000)	FY 1999 \$(000)	FY 2000 \$(000)	FY 2001 \$(000)
OPERATING	1623	262	146				
CENRTC	0	0	0				
GPP	0	0	0				
LINE ITEM	0	0	0				
TOTAL	1623	262	146				

B. TECHNICAL BASES:

Goals & objectives:

M&O contractor is to provide the expertise to develop a comprehensive and detailed level of planning to ensure that the facility is transitioned to a safe standby condition in a controlled and orderly manner with minimal impact to plant personnel. The plan (and its implementation) must support a safe restart of the facility within two years in the event its operation is necessary to provide tank space for safety reasons prior to construction of additional double-shell tanks.

- Proceed with the deactivation of the Grout Facilities
 - Issue Grout Facilities Standby Plan. This plan details the checklist for deactivation. The Plan

1.1.1.3.02.06

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also provides some information on surveillance and monitoring activities as well as the standby/restart organization.

- Maintain the Facilities in a standby condition as specified by the January 25, 1994 Tri-Party Agreement.
- Provide the capability to restart the Facilities within a two year window as specified by DOE-RL letter no. 93-DSB-044, L. Erickson to President, Westinghouse Hanford Company, dated 21 December 1993.
 - Pursue the removal and replacement of the failed mixer in Tank 241-AP-102.
 - Resolve the hydrogen issue for the Final Safety Analysis Report (FSAR).

Programmatic Risk:

There is no programmatic risk associated with this cost account.

Major end-item deliverables:

- Terminate Grout Facilities and the decision made to transition to D&D.
- Deactivate facilities in accordance with Grout Facilities Standby Plan.
- Store documentation in a retrievable manner.
- Maintain the Facilities in a safe shutdown condition.
- Finalize approval (internal WHC or external) on critical technical documents.

This activity will terminate upon completion of closure activities as outlined in the Grout Facilities Standby Plan (WHC-SD-WM-SSP-005) and transition to Decontamination & Decommissioning (D&D) for final action.

Acceptance criteria:

- Acceptance criteria includes approval by RL of the standby plan and the successful completion of checklist detailed in the standby plan.
- A maintenance plan is approved (internal) and maintained
- Surveillances are current, complete and documented
- A restart plan is approved (internal) and maintained

C. STATEMENT OF WORK:

Required activities over lifetime:

- Deactivation of Grout Facilities
- Surveillance and monitoring of facilities
- Development and maintenance of emergency restart plan

Interfaces:

#	From This WBS To	Item Provided
1	Ext/ER	Grout Facilities for D&D
	To This WBS From	
	N/A	

Technologies to be assessed: N/AOptions to be considered: N/A**D. OTHER LEGAL DRIVERS AND ORDER REQUIREMENTS:**

The drivers for this cost account are defined in the Federal Facility Agreement and Consent Order (Tri-Party Agreement), signed January 25, 1994 and the Grout Treatment Facility Standby Plan, WHC-SD-WM-SSP-005, January 1994.

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Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.02 Low Level Waste 1.1.1.3.02.06 Grout Facilities	2. DATE PREPARED August 23, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.02.06.02/VI	5. WBS ELEMENT TITLE Grout Facilities Two Year Restart Comp. Activ.(FY 95 WK)							
6. WBS INDEX LINE NO. WILL NOT BE USED	7. CURRENT REV NO 0	8. EFFECTIVE REVISION DATE August 31, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1230-0-AA							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.3.1	12. BUDGET AND REPORTING NUMBER <table style="width: 100%; border: none;"> <tr> <td style="text-align: left;">Expense</td> <td style="text-align: left;">Capital</td> <td style="text-align: left;">Line Item</td> </tr> <tr> <td>EW313001-0</td> <td>35EW3130-1</td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW313001-0	35EW3130-1	
Expense	Capital	Line Item						
EW313001-0	35EW3130-1							

13. ELEMENT DESCRIPTION**A. COST CONTENT (Escalated Dollars)**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	1172	0	0
CENRTC	0	0	0
GPP	0	0	0
LINE ITEM	0	0	0
TOTAL	1172	0	0

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B. TECHNICAL BASESGoals & objectives:

Continue cold standby operations. Bring the facilities into compliance with DOE's 2 year restart criteria.

Status of Design Documentation:

Definitive design supporting the removal of a failed mixer in Tank AP-102 was initiated in August, 1994.

1.1.1.3.02.06.02

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Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

Remove the failed AP-102 mixer. Publish the Grout Performance Assessment and close issues associated with the Grout Final Safety Analysis Report. Revise Restart Plan.

C. STATEMENT OF WORK

Required activities:

10/01/94 - 09/30/95	Regulatory compliance activities
10/01/94 - 09/30/95	DOE order compliance activities
10/01/94 - 09/30/95	Two year restart compliance activities
10/01/94 - 09/30/95	Equipment transfer activities
10/01/94 - 09/30/95	Administrative Support

Milestones:

03/31/95	Remove failed mixer from AP-102
12/31/94	Publish Grout Performance Assessment
09/30/95	Close FSAR issues
09/30/95	Update the Grout Restart Plan

Technologies to be assessed:

Mechanisms supporting the removal of long-length items from waste tanks.

Options to be considered:

None.

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	RJ Murkowski	
Activity Manager	RD Claghorn	
Cost Account Manager		
Project Control Analyst	TA Grillo/KF Hanlon	

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	RJ Murkowski	
Activity Manager	RD Claghorn	
Cost Account Manager		
Project Control Analyst	TA Grillo/KF Hanlon	

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Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.02 Low Level Waste 1.1.1.3.02.06 Grout Facilities	2. DATE PREPARED September 7, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.02.06.03/VI	5. WBS ELEMENT TITLE Maintain Grout Facilities in Cold Standby (FY 96, 97)	
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1230-0-AC	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.3.1	12. BUDGET AND REPORTING NUMBER(S) Expense Capital Line Item EW313001-0 35EW3130-1	

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	0	156	146
CENRTC	0	0	0
GPP	0	0	0
LINE ITEM	0	0	0
TOTAL	0	156	146

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Update Restart Plan.

C. STATEMENT OF WORK

Required activities:

10/01/95 - 09/30/96	Regulatory compliance activities
10/01/95 - 09/30/96	DOE order compliance activities
10/01/95 - 09/30/96	Two year restart compliance activities
10/01/95 - 09/30/96	Equipment transfer activities
10/01/95 - 09/30/96	Administrative Support

Milestones:

09/30/96 Update the Grout Restart Plan

Technologies to be assessed:

None.

Options to be considered:

None.

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	RJ Murkowski	
Activity Manager	RD Claghorn	
Cost Account Manager		
Project Control Analyst	TA Grillo/KF Hanlon	

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	RJ Murkowski	
Activity Manager	RD Claghorn	
Cost Account Manager		
Project Control Analyst	TA Grillo/KF Hanlon	

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Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.02 Low Level Waste 1.1.1.3.02.06 Grout Facilities	2. DATE PREPARED September 14, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.02.06.05/VI	5. WBS ELEMENT TITLE Fabricate Container for Failed AP-102 Mixer	
6. WBS INDEX LINE NO. WILL NOT BE USED	7. CURRENT REV NO 0	8. EFFECTIVE REVISION DATE September 23, 1994
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1230-0	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.3.1	12. BUDGET AND REPORTING NUMBER Expense Capital Line Item EW313001-0 35EW3130-1	

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	451	106	0
CENRTC	0	0	0
GPP	0	0	0
LINE ITEM	0	0	0
TOTAL	451	106	0

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Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

Remove the failed AP-102 mixer. Publish the Grout Performance Assessment and close issues associated with the Grout Final Safety Analysis Report. Revise Restart Plan.

C. STATEMENT OF WORK

Required activities:

10/01/94 - 03/31/95	Container procurement documentation
10/01/94 - 03/31/95	Fabricate container

Milestones:

11/30/94	Prepare documentation for procurement
01/30/95	Deliver the container for beneficial use

Technologies to be assessed:

Container fabrication for long-length items from waste tanks.

Options to be considered: None.

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	R. J. Murkowski	
Activity Manager	R. D. Claghorn	
Cost Account Manager		
Project Control Analyst	T. A. Grillo/K. F. Hanlon	

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	R. J. Murkowski	
Activity Manager	R. D. Claghorn	
Cost Account Manager		
Project Control Analyst	T. A. Grillo/K. F. Hanlon	

FDS Number
1D466A

Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste (M&O Contractor)	2. DATE PREPARED September 15, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.03/IV	5. WBS ELEMENT TITLE High-Level Waste	
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1240-0	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.2.2 Immobilize HLW/TRU Waste 4.2.2.3 Prepare Cs/Sr Capsules for Disposal 4.2.2.4 Interim Store IHLW 4.2.2.5 Interim Store and Transport ITRU Waste	12. BUDGET AND REPORTING NUMBER Expense Capital Line Items EW3130010	

13. ELEMENT DESCRIPTION

A. COST CONTENT

Total cost of High-Level Waste is \$12,639,481,000.

B. TECHNICAL BASES

Goals and objectives:

The products of this element are expected to be the completion of immobilization of all Hanford high-level waste/transuranic (HLW/TRU) waste and preparation of cesium/strontium capsules into forms acceptable to the geologic repository (DOE-RW), interim storage of the waste products (until their acceptance by and transfer to the repository) and HLW facilities that have been prepared and transferred to the decontamination and decommissioning (D & D) program. Supporting products to be completed under this element include HLW input into the TWRS technical integration and planning effort, a complete definition of the HLW system (including a comprehensive analysis of alternatives including privatization), completed HLW vitrification and interim storage facilities, HLW technology

development and applied engineering, safe facility operations, and an orderly closeout of the Hanford Waste Vitrification Project (HWVP).

The three primary risks associated with this scope are listed below. Actions being taken to reduce these risks include comprehensive integration and analysis of interfaces with other TWRS program elements, a series of trade studies and DOE-RW negotiations leading to complete system definition, and a rigorous technology development program to identify and develop the most viable vitrification technologies.

1. Inadequate integration with other TWRS program elements that might lead to the inability to adequately characterize tank waste, pretreat HLW to HLW feed specifications, transfer feed at the required rate, or adequately disposition system generated waste.
2. Inability to adequately define the required inputs, functions, and outputs of the HLW system. This includes, but is not limited to, the definition of the HLW feed characteristics, volume of HLW to be processed, repository requirements for acceptable waste products, plant system generated waste treatment requirements, and length of the interim storage period.
3. Inability to develop the required technology for a high-capacity vitrification system. The primary risk involves the selection, development, and testing of the plant melter system within program cost and schedule constraints. Nearly a factor of two reduction in the near-term budget from a "robust" program has resulted in a melter system development and testing program that has little flexibility to respond to "unknowns" or budget cuts. Impacts to Tri-Party Agreement milestones will result from such developments.

Major end-item deliverables:

- The final deliverable is the disposal of immobilized HLW glass containers by shipment to the repository by fiscal year 2040.
- HLW Program Strategic Plan and Multi-Year Work Plan, integrated with the TWRS Program Implementation Plan (Act # HL01001)
- Major Milestones:
 - M-51-01, Provide to Ecology and EPA an evaluation of alternative concepts for treatment and disposal of high level Hanford tank wastes (Act # HL04025)
 - M-51-02, Complete melter tests and select reference melter (Act # HL02006)
 - M-51-03, Initiate hot operations of the HLW vitrification facility (Act # HL03018)
 - M-51-00, Complete vitrification of Hanford high level tank waste (Act # HL03018)
- Vitrified HLW ready for transfer to the repository (Act # HL03018)
- A HLW facility prepared for D & D (Act # HL03021A and HL03042)

Acceptance Criteria:

- All Hanford HLW/TRU waste is immobilized and transferred to the repository in accordance with the DOE-RW Waste Acceptance System Requirements Document.
- All Hanford HLW facilities meet TBD requirements for transfer to the D & D program.

C. STATEMENT OF WORK

This program element is configured to address the TWRS requirements to process and dispose of the HLW fraction of both the double-shell and single-shell tank wastes. The scope includes all activities necessary to design, build, permit, and operate a HLW vitrification facility and supporting facilities. Included in this program element is the orderly closeout of the HWVP Project; administration and integration associated with program element activities; technology and engineering to support development of a high-capacity HLW vitrification facility; design, construction, and operation of that facility; and vitrified waste product storage. The projected volume of waste to be vitrified under the revised TWRS strategy will require a vitrification plant with a capacity of 10 to 20 tons/day of vitrified waste product. The High-Level Waste Program will develop and demonstrate melter and process systems that provide high-capacity vitrification of HLW. Sufficient testing will be done to select the plant melter and primary process systems and control features during conceptual design. Additional testing will continue during preliminary and final design to verify the selected process systems. The plant will be operated for 19 years to vitrify all the HLW fraction of the SST and DST waste. The plant design will include capabilities to overpack and package cesium and strontium capsules for disposal in a repository. It will also include capabilities to prepare for disposal used melters and other contaminated replaceable plant equipment.

Required activities over lifetime:

1.1.1.3.03.01, Technical Integration and Planning

- Provide overall High-Level Waste program management, strategy, and planning.
- Develop baseline schedules and budgets.
- Develop and maintain cost account plans.
- Pre-project documentation and support.

1.1.1.3.03.02, Technology Development and Applied Engineering

- Plan and implement a set of technology and engineering development activities that will lead to melter selection, ancillary process requirement definition, glass formulation, waste form and container selection, process/product model development and determination of feed processibility.
- Provide information to support design safety analysis, permitting activities, construction and operation of the HLW facility.

1.1.1.3.03.03, Facility Operations

- Provide input to design, procedures development, readiness reviews and trained staff so the HLW facilities will be operated in a safe, efficient, and environmentally sound manner.
- Convert all HLW into an acceptable waste product and store it until shipped to the repository.
- Prepare the HLW facility for D & D.

1.1.1.3.03.04, System Definition

- Provide the engineering trade studies needed to resolve planning assumptions; evaluate the potential for privatization; define HLW feed and products; define the HLW functions, requirements, and architecture; and define immobilized HLW concepts and criteria.

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1.1.1.3.03.05, HLW Facility

- Design, construct, and prepare for operations a HLW vitrification and interim storage facility(ies) capable of producing and temporarily storing a qualified waste form.

1.1.1.3.03.06, HWVP Project Closeout

- Provide an orderly closeout of HWVP project activity.

Interfaces:

#	From This WBS To	Item Provided
1	Repository (DOE-RW)	Immobilized HLW suitable for transfer to the repository
2	All TWRS Program Elements	Coordinated HLW schedules and interface requirements with other program elements
3	D & D Program	HLW facilities prepared for D & D
4	Characterization 1.1.1.2.04	Characterization and core sample requirements
5	Pretreatment 1.1.1.3.01	HLW feed specifications
6	TWRS Systems Engineering	Trade studies and related input on HLW functions, requirements, architecture, and interfaces
	To This WBS From	Item Provided
1	All TWRS Program Elements	All TWRS Program Elements schedules and their interface requirements
2	Repository (DOE-RW)	Waste acceptance criteria, transport, and permanent disposal space for immobilized HLW containers
3	TWRS	Approve TWRS EIS, integrated site selection study, and site flow sheet
4	Pretreatment 1.1.1.3.01	Pretreated, blended feed for operations
5	Characterization 1.1.1.2 .04	Characterization data and core samples for process development testing
6	TWRS Systems Engineering	Current TWRS Functions and Requirements Document

Technologies to be assessed:

Technologies to be assessed include feed preparation, vitrification systems, off-gas treatment systems, process/product control, alternative glass forms and types, alternative packaging technologies, immobilized HLW interim storage concepts, and remote maintenance concepts.

Options to be considered:

- Privatization or commercialization of HLW immobilization
- Alternative feed preparation processes/chemistries
- High temperature melter, stirred melter, and/or other potential melter candidates as determined by a melter candidate assessment activity
- Alternative melter off-gas treatment systems
- Alternative analytical methods, instrumentation, and control philosophies and models
- Alternative glass forms/compositions and container configurations
- Alternative operations, maintenance, and interim storage concepts
- Alternative facility type and degree of integration
- Alternative capsule disposal concepts

D. OTHER LEGAL DRIVERS AND ORDER REQUIREMENTS

Refer to DOE/RL-92-60, Rev 1, 31 March 1994, TWRS Functions and Requirements

- Functions and Requirements Constraints: Tables F4.2.2.2, F4.2.2.3, F4.2.2.4, and F4.2.2.5, Items V, Paragraphs B.
- System Architecture Constraints: Tables A4.2.2.2, A4.2.2.3, A4.2.2.4, and A4.2.2.5, Items VIII, Paragraphs C.

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.03 High Level Waste (M&O Contractor)	2. DATE PREPARED September 15, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.03.01/V	5. WBS ELEMENT TITLE Technical Integration and Planning	
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1240-0-AA	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER / TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.2.2 Immobilize HLW/TRU Waste 4.2.2.3 Prepare Cs/Sr Capsules for Disposal 4.2.2.4 Interim Store IHLW 4.2.2.5 Interim Store and Transport ITRU Waste	12. BUDGET AND REPORTING NUMBER Expense Capital Line Item EW3130010	

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)	FY 1998 \$(000)	FY 1999 \$(000)	FY 2000 \$(000)	FY 2001 \$(000)
OPERATING	1,476	1,243	1,123				
CENRTC							
GPP							
LINE ITEM							
TOTAL	1,476	1,243	1,123				

B. TECHNICAL BASES

Goals & objectives:

Provide management, planning and integration leading to:

- an integrated High Level Waste (HLW) Program plan and planning input and coordination with the TWRS program and other program elements
- HLW program management plan
- Baseline schedules and budgets for HLW
- Current cost account plans
- An integrated HLW strategy
- Pre-project documentation support

The primary risk associated with this effort is inadequate integration with other TWRS program elements which might lead to inability to adequately characterize tank wastes, pretreat HLW to HLW feed specifications, transfer feed at the required rate, or adequately dispose of system-generated waste. To reduce this risk, a comprehensive analysis and integration of all TWRS interfaces will be undertaken.

Major end-item deliverables:

- HLW Program Strategic Plan
- HLW input to annual Multi-Year Program Plan
- HLW input to TWRS MYWP and Program Implementation Plan, including logics and resource loaded schedules.
- Annual HLW ADSs
- Key Decision "O" Documentation

Acceptance criteria:

- All Hanford HLW is immobilized in canisters and transferred to the repository program.
- All Hanford HLW Program facilities are transferred to the D&D Program
- All Hanford HLW activities are completed and coordinated with all related TWRS activities

C. STATEMENT OF WORK

Required activities over lifetime:

- Perform technical integration and planning / (Mandatory of Contractor)

Interfaces:

#	From This WBS To	Item Provided
1	1.1.1.3.03.02 1.1.1.3.03.03 1.1.1.3.03.04 1.1.1.3.03.05 1.1.1.3.03.06	Integration with and program management of all elements within HLW Program
2	All TWRS Program Elements	HLW schedules and interface requirements to other elements
3	TWRS Systems Engineering	HLW schedules and interface requirements to other elements and programs
	To This WBS From	
1	All TWRS Program Elements	All TWRS Program Elements schedules and their interface requirements
2	TWRS Systems Engineering	All TWRS Program Element and other programs interface requirements

Technologies to be assessed: N/AOptions to be considered:

- Privatization or commercialization of HLW immobilization

D. OTHER LEGAL DRIVERS AND ORDER REQUIREMENTSRefer to DOE/RL-92-60, Rev 1, 31 March 1994, TWRS Functions and Requirements

- Functions and Requirements Constraints: Tables F4.2.2.2, F4.2.2.3, F4.2.2.4, and F4.2.2.5, Items V, Paragraphs B.
- System Architecture Constraints: Tables A4.2.2.2, A4.2.2.3, A4.2.2.4, and A4.2.2.5, Items VIII, Paragraphs C.

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.03 High Level Waste 1.1.1.3.03.01 Technical Integration and Planning/M&O Contractor	2. DATE PREPARED September 23, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.03.01.01/VI	5. WBS ELEMENT TITLE Program Planning, Integration and Management							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1240-0-0							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.2.2 4.2.2.4 4.2.2.3 4.2.2.5	12. BUDGET AND REPORTING NUMBER(S) <table> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3130010</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3130010		
Expense	Capital	Line Item						
EW3130010								

13. ELEMENT DESCRIPTION**A. COST CONTENT (Escalated dollars)**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	180	112	141
CENRTC			
GPP			
LINE ITEM			
TOTAL	180	112	141

B. TECHNICAL BASES

Goals & objectives:

Provide program management, planning and integration:

- Planning input/coordination with the TWRS Program
- Baseline schedules and budget for HLW
- Integrated HLW strategy
- Mission Analysis

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

High-Level Waste Program Strategy
Input to Multi-Year Work Plan
Activity Data Sheets and annual updates
Justification of Mission Need
Program Logics and resource loaded schedules
Work Breakdown Structure

C. STATEMENT OF WORK

Required activities:

Provide input to:
High-Level Waste Strategy
ADS Input
Multi-Year Program Plan
Develop interface with various program offices
Conduct Mission Analysis

Technologies to be assessed: N/A

Options to be considered:

Privatization or commercialization of HLW immobilization.

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager		
Activity Manager		
Cost Account Manager		
Project Control Analyst		

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	<i>R. Powell</i>	<i>9/23/94</i>
Activity Manager	<i>P. S. Schum</i>	<i>9/23/94</i>
Cost Account Manager	<i>P. S. Schum</i>	<i>9/23/94</i>
Project Control Analyst	<i>John L. Crowe</i>	<i>9/25/94</i>

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Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.03 High Level Waste 1.1.1.3.03.01 Technical Integration and Planning/M&O Contractor	2. DATE PREPARED September 23, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.03.01.02/VI	5. WBS ELEMENT TITLE Program Business Management							
6. WBS INDEX LINE NO. Not used.	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1240-0-0-AA							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.2.2 4.2.2.4 4.2.2.3 4.2.2.5	12. BUDGET AND REPORTING NUMBER(S) <table> <tr> <td>Expense</td> <td>Capital</td> <td>Line Items</td> </tr> <tr> <td>EW3130010</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Items	EW3130010		
Expense	Capital	Line Items						
EW3130010								

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	781	916	939
CENRTC			
GPP			
LINE ITEM			
TOTAL	781	916	939

B. TECHNICAL BASES

Goals & objectives:

Provide program business management:

- Fiscal Year Work Plan tracking
- Current Fiscal Year cost account tracking
- Baseline Change Control
- Monthly Performance Reporting
- Yearly Update of Multi-Year Work Plan

Provide Program Office Support

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

- Multi-Year Work Plan
- Site Management System Reports
- Monthly Review Meetings

C. STATEMENT OF WORK

Required activities:

- Multi Year work planning
- Fiscal year work tracking

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager		
Activity Manager		
Cost Account Manager		
Project Control Analyst		

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	<i>P. J. Powell</i>	9/23/94
Activity Manager	<i>P. J. Schauer</i>	9/23/94
Cost Account Manager	<i>P. J. Schauer</i>	9/23/94
Project Control Analyst	<i>Shen L. Crowe</i>	9/25/94

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.03 High Level Waste 1.1.1.3.03.01 Technical Integration and Planning/M&O Contractor	2. DATE PREPARED September 23, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.03.01.03/VI	5. WBS ELEMENT TITLE Pre-project Documentation and Support							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1240-00-AA							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.2.2 4.2.2.4 4.2.2.3 4.2.2.5	12. BUDGET AND REPORTING NUMBER(S) <table border="0"> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3130010</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3130010		
Expense	Capital	Line Item						
EW3130010								

13. ELEMENT DESCRIPTION**A. COST CONTENT (Escalated Dollars)**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	515	215	43
CENRTC			
GPP			
LINE ITEM			
TOTAL	515	215	43

B. TECHNICAL BASES

Goals & objectives:

Provide pre-project documentation & support to HLW:

- Preliminary Project Planning
- KD-0 Preparation
- Preparation of Permitting Strategy Plan
- Preparation of Preliminary Project Plan
- Support to preparation of TWRS EIS
- Preliminary Operations Support Plan

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

- KD-0 (start conceptual design) Approval
- Project Acquisition Strategy

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager		
Activity Manager		
Cost Account Manager		
Project Control Analyst		

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	<i>R. Powell</i>	<i>9/23/94</i>
Activity Manager	<i>P. J. Schauer</i>	<i>9/23/94</i>
Cost Account Manager	<i>P. J. Schauer</i>	<i>9/23/94</i>
Project Control Analyst	<i>Sherr L. Crowe</i>	<i>9/25/94</i>

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.03 High Level Waste (M&O Contractor)	2. DATE PREPARED September 15, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.03.02/V	5. WBS ELEMENT TITLE Technology Development & Applied Engineering							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1240-0-AB							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.2.2 Immobilize HLW and TRU Waste 4.2.2.3 Prepare Cs/Sr Capsules for Disposal 4.2.2.4 Interim Store IHLW 4.2.2.5 Interim Store and Transport ITRU Waste	12. BUDGET AND REPORTING NUMBER <table> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3130010</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3130010		
Expense	Capital	Line Item						
EW3130010								

13. ELEMENT DESCRIPTION**A. COST CONTENT (Escalated dollars)**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)	FY 1998 \$(000)	FY 1999 \$(000)	FY 2000 \$(000)	FY 2001 \$(000)
OPERATING	11,193	14,876	14,165				
CENRTC	1,823	2,617	1,680				
GPP							
LINE ITEM							
TOTAL	13,016	17,493	15,845				

B. TECHNICAL BASES

Goals & objectives:

- Plan and implement technology and engineering development program that will lead to:
 - melter selection and development
 - ancillary process requirement definition
 - glass formulation
 - disposal container selection
 - determination of feed processibility
 - process/product model development
- Provide information to support:
 - safety analysis
 - permitting activities
 - waste form qualification
 - design, construction, and operation of the HLW facility

A primary risk associated with this scope is inability to develop the required technology for a high-capacity vitrification system. This involves the selection, development, and testing of the plant melter system within program cost and schedule constraints.

Associated Systems Engineering functions:

This item performs the function and requirements elements "Immobilize HLW and TRU Waste" (4.2.2.2), "Prepare Cs/Sr Capsules for Disposal (4.2.2.3), "Interim Store IHLW" (4.2.2.4), and "Interim Store and Transport ITRU Waste" (4.2.2.5). This item is supported by the functions and requirements elements "Store Waste" (4.2.1.1), "Characterize Waste" (4.2.1.2), "Retrieve Waste" (4.2.1.3), "Pretreat Waste" (4.2.2.1), and "Manage System Generated Waste and Excess Facilities" (4.2.3).

Major end-item deliverables:

Major milestones:

- M-51-02 Complete Melter Tests and Select Reference Melter
- Select reference melter
- Process design parameters input to design and operations preparation
- Waste form qualification
- Melter system testing data
- Radioactive feed test data
- Feed specification for Pretreatment
- Glass formulation for melter testing and operations
- Operations process control models and parameters
- Feed processibility assessment
- Glass formulation basis for design

Acceptance criteria:

- Verification that the processes, products, systems and operating parameters developed under this element will produce an acceptable product at the required capacity.

C. STATEMENT OF WORK

Required activities over lifetime

- Perform melter testing and evaluation/(Lab contractor - M & O Contractor) HL02005
- Select melter candidates/(Lab contractor - M & O Contractor) HL02004
- Perform feed preparation and process development/(Lab Contractor - M & O Contractor) HL0212A HL0212B
- Select reference melter and processes/(Lab Contractor - M & O Contractor) HL02006
- Perform initial reference system radioactive testing/(Lab Contractor - M & O Contractor - Sub Contractor) HL02009
- Perform process and equipment development and testing/(Lab Contractor - M & O Contractor) HL02007
- Perform process/plant systems testing/(Lab Contractor - M & O Contractor) HL02008
- Perform process/plant systems operations support and qualification testing/(Lab Contractor - M&O Contractor) HL0208A
- Perform radioactive testing for operations and qualification support/(Lab Contractor - M & O Contractor) HL02010
- Perform canister or cask product qualification/(Lab Contractor - M & O Contractor) HL0215B
- Assess feed processability/(Lab Contractor - M & O Contractor) HL02017
- Formulate glass for reference melter tests and operations/(Lab Contractor - M & O Contractor) HL02012, HL02016

WHC-SP-1101

Interfaces:

#	From This WBS to	Item Provided
1	Pretreatment 1.1.1.3.01	Updated Feed Specification and bench test feed requirements
2	Pretreatment 1.1.1.3.01	Feed Concentration Requirements
3	1.1.1.3.03.03	Feed processibility/spec for Ops
4	1.1.1.3.03.05	Preferred melter option report
5	1.1.1.3.03.05	Final melter evaluation report
6	1.1.1.3.03.05	Process and equipment concepts and parameters for design
7	1.1.1.3.03.03	Process and plant parameters for ops
8	1.1.1.3.03.05	Process and plant test results for plant qualification
9	1.1.1.3.03.05	Glass formulation for definitive design
10	1.1.1.3.03.05	Container qualification data
11	1.1.1.3.03.03	Glass formulation and qualification envelope for ops
#	To This WBS From	Item Provided
1	Characterization 1.1.1.2	Characterization data when published
2	Pretreatment 1.1.1.3.01	Pretreated feed for how bench scale testing (100's of liters)
3	Pretreatment 1.1.1.3.01	Estimates of pretreated feed characteristics
4	Characterization 1.1.1.2	Quantities of core sample material for PT and HLW process development testing
5	1.1.1.3.03.04	Glass compositions for melter evaluation
6	1.1.1.3.03.04	Container qualification requirements
7	1.1.1.3.03.05	Development/testing requirements

Technologies to be assessed:

- Feed preparation, melter systems, off-gas treatment systems, process control, and alternate glass forms and types

Options to be considered:

- Alternative feed preparation processes/chemistries
- High Temperature Melter, Stirred Melter, and other potential melter candidates
- Alternative melter off-gas scrubbers
- Alternative analytical methods, instrumentation, and control models
- Alternative glass forms/compositions and container configurations

D. OTHER LEGAL DRIVERS AND ORDER REQUIREMENTS

Refer to DOE/RL-92-60, Rev 1, 31 March 1994, TWRS Functions and Requirements

- Functions and Requirements Constraints: Tables F4.2.2.2, F4.2.2.3, F4.2.2.4, and F4.2.2.5, Items V, Paragraphs B.
- System Architecture Constraints: Tables A4.2.2.2, A4.2.2.3, A4.2.2.4, and A4.2.2.5, Items VIII, Paragraphs C.

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.03 High Level Waste 1.1.1.3.03.02 Technology Development & Applied Engineering (M&O Contractor)	2. DATE PREPARED September 23, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.03.02.01/VI	5. WBS ELEMENT TITLE Vitrification Technology Development Management							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1240-0-AB							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.2.2 4.2.2.4 4.2.2.3 4.2.2.5	12. BUDGET AND REPORTING NUMBER(S) <table> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3130010</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3130010		
Expense	Capital	Line Item						
EW3130010								

13. ELEMENT DESCRIPTION**A. COST CONTENT (Escalated dollars)**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)	FY 1998 \$(000)	FY 1999 \$(000)	FY 2000 \$(000)	FY 2001 \$(000)
OPERATING	1031	1085	883				
CENRTC							
GPP							
LINE ITEM							
TOTAL	1031	1085	883				

B. TECHNICAL BASES

Goals & objectives:

Manage PNL vitrification technology development work by providing planning, integration and coordination of work scope; control, accountability and timely reporting; Quality Assurance and program support.

Status of Design Documentation: N/A

Major end-item deliverables:

Technology Development Work Plan

C. STATEMENT OF WORK

Required activities:

Support ITP development
Conduct work planning
Provide quality assurance
Provide management, coordination and support functions

Technologies to be assessed: N/A

Options to be considered: N/A

B. TECHNICAL BASES

Goals & objectives:

Manage PNL vitrification technology development work by providing planning, integration and coordination of work scope; control, accountability and timely reporting; Quality Assurance and program support.

Status of Design Documentation: N/A

Major end-item deliverables:

Technology Development Work Plan

C. STATEMENT OF WORK

Required activities:

Support ITP development
 Conduct work planning
 Provide quality assurance
 Provide management, coordination and support functions

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager		
Activity Manager		
Cost Account Manager		
Project Control Analyst		

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	<i>R. Powell</i>	9/23/94
Activity Manager	<i>J. S. Schumacher</i>	9/23/94
Cost Account Manager	<i>J. S. Schumacher</i>	9/23/94

Project Control Analyst	<i>Shen L. Crowe</i>	<i>9/25/94</i>
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FDS Number _____

**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.03 High Level Waste 1.1.1.3.03.02 Technology Development and Applied Engineering (M&O Contractor)	2. DATE PREPARED September 23, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.03.02.02/VI	5. WBS ELEMENT TITLE HLW Process/Product Development							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1240-0-AB							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-(92-60 REV 1) 4.2.2.2 Immobilize HLW/TRU Waste 4.2.2.3	12. BUDGET AND REPORTING NUMBER(S) <table> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3130010</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3130010		
Expense	Capital	Line Item						
EW3130010								

13. ELEMENT DESCRIPTION**A. COST CONTENT (Escalated Dollars)**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	3655	3301	3324
CENRTC	103	117	180
GPP			
LINE ITEM			
TOTAL	3758*	3418	3404

* Includes FY94 Expense carryover of \$280K in contract obligations

B. TECHNICAL BASES

Goals & objectives:

- Plan, manage and implement technology development activities that will provide:
 - feed preparation chemistry and rheology definition data, process development and evaluation (HL02012a, HL02012b)
 - feed simulants for melter system testing and evaluation (HL02012a, HL02012b)
 - HLW glass composition formulations for melter evaluation and system definition (HL04011, HL02012, HL02016)
 - Radioactive process/product lab testing (HLO2012A)
 - Process/Product model development (HL02007, HL02008)

Status of Design Documentation:

The HLW Program is in the engineering trade study phase. Preliminary functions and requirements are documented in DOE/RL-92-60, Rev. 1, 31 March 1994. Conceptual design is scheduled to begin March 1997.

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

- Feed simulant compositions for development testing
- Data to support HLW melter feed rheology definition
- Recommendation on alternate reductants and flowsheet parameters for feed preparation
- Glass compositions for melter testing
- Glass formulation basis for conceptual and advanced conceptual design

C. STATEMENT OF WORK

Required activities:

- Glass composition formulation development (HL04011, HL02012, HL02016)
 - Updated report on glass compositions for melter testing
 - Glass formulation basis for conceptual design
 - Glass formulation basis for advanced conceptual design
- Feed chemistry and rheology development and evaluation (HL02012a, HL02012b)
 - Simulant development summary reports - 06/95, 06/97
 - Rheology summary reports - 12/95, 09/97
 - Alternate reductant summary report - 09/95
- Radioactive process/product lab testing (HLO2012A)
- Process/product model development (HL02007, HL02008)

Technologies to be assessed:

- HLW glass formulation development and melter feed chemistry and rheology evaluation.

Options to be considered:

- Alternative melter systems
- Alternative melter feed preparation flowsheets
- Alternative glass formulations

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager		
Activity Manager		
Cost Account Manager		
Project Control Analyst		

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	<i>R. Powell</i>	9/23/94
Activity Manager	<i>P. J. Schae</i>	9/23/94
Cost Account Manager	<i>J. S. Sam</i>	9/23/94
Project Control Analyst	<i>Shirley L. Crowe</i>	9/25/94

FDS Number

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.03 High Level Waste 1.1.1.3.03.02 Technology Development & Applied Engineering (M&O Contractor)	2. DATE PREPARED September 23, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.03.02.03/VI	5. WBS ELEMENT TITLE HLW Equipment/Process Development and Testing							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1240-0-AB							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-(92-60 REV 1) 4.2.2.2 Immobilize HLW/TRU Waste 4.2.2.4 Interim Store IHLW	12. BUDGET AND REPORTING NUMBER(S) <table border="0"> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3130010</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3130010		
Expense	Capital	Line Item						
EW3130010								

13. ELEMENT DESCRIPTION**A. COST CONTENT (Escalated Dollars)**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	3487	8451	7574
CENRTC	1720	2500	1500
GPP			
LINE ITEM			
TOTAL	5207*	10951	9074

* Includes FY94 Expense carryover of \$1026 and CENRTC carryover of \$970 in contract obligations

B. TECHNICAL BASES

Goals & objectives:

- Plan, manage and implement technology development activities that will provide:
 - HLW melter feed preparation equipment/system testing data for equipment/process selection (HL02007)
 - HLW melter system test data for melter system selection (HL02004, HL02005, HL02006, HL02007)
 - large vitrified product container testing strategy (HL02015b)
 - HLW and effluent treatment survey in conjunction with LLW (HL02007)

Status of Design Documentation:

The HLW Program vitrification facility is in the engineering trade study phase. Preliminary functions and requirements are documented in DOE/RL-92-60, Rev. 1, 31 March 1994. Conceptual design is scheduled to begin March 1997.

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

- Pilot-scale test data to support melter system selection for conceptual design.
- Verified canister waste form product.
- Test data to support final melter system selection for definitive design (TPA Milestone M-51-02)

C. STATEMENT OF WORK

Required activities:

- Laboratory testing of process equipment and pilot-scale feed preparation system testing (HL02007)
 - Initial report on feed preparation equipment and process options
 - Recommendation on process and equipment concepts for conceptual design
- Melter system evaluation based on small-scale (1/10th scale) testing (HL02004, HL02005, HL02006, HL02007)
 - Report on high-temperature melter evaluation testing
 - Report on stirred melter evaluation testing
 - Report on cold-wall induction melter evaluation testing
 - Interim recommendation on preferred melter option
- Large container development and testing (HL02015b)
 - Development and testing strategy
- Waste and effluent treatment survey in conjunction with LLW (HL02007)

- Initial reference system radioactive testing (HL02009)

Technologies to be assessed:

- HLW melter feed preparation equipment/processes
- HLW melter and off-gas systems
- Large HLW container evaluation

Options to be considered:

- Alternative feed processes and equipment
- Alternative melter systems
- Alternative canister designs and sizes

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager		
Activity Manager		
Cost Account Manager		
Project Control Analyst		

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager		
Activity Manager		
Cost Account Manager		
Project Control Analyst		

FDS Number _____

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.03 High Level Waste 1.1.1.03.02 Technology Development and Applied Engineering/M&O Contractor	2. DATE PREPARED September 23, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.03.02.04/VI	5. WBS ELEMENT TITLE Technology Development Requirements and Oversight							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1240-0-AB							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.2.2 Immobilize HLW and TRU Waste 4.2.2.3 Prepare Cs/Sr Capsules for Disposal 4.2.2.4 Interim Store IHLW 4.2.2.5 Interim Store and Transport ITRU Waste	12. BUDGET AND REPORTING NUMBER(S) <table border="0"> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3130010</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3130010		
Expense	Capital	Line Item						
EW3130010								

13. ELEMENT DESCRIPTION**A. COST CONTENT (Escalated Dollars)**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	443	569	581
CENRTC			
GPP			
LINE ITEM			
TOTAL	443	569	581

B. TECHNICAL BASES

Goals & objectives:

- Provide management, coordination and integration of all activities performed within Technology Development and Applied Engineering (1.1.1.3.02).
- Provide management of program interfaces and development of technology requirements with the R&D contractor.

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

- Annual technology development requirements for the R&D contractor.
- Review of R&D Contractor HLW Technology Development Work Plan.

C. STATEMENT OF WORK

Required activities:

- Manage technical interface with R&D contractor.
- Manage interfaces in Technical Development and Applied Engineering activities.

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager		
Activity Manager		
Cost Account Manager		
Project Control Analyst		

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	<i>R. Powell</i>	<i>9/23/94</i>
Activity Manager	<i>P. J. Schauer</i>	<i>9/23/94</i>
Cost Account Manager	<i>Tom W. Crawford</i>	<i>9-23-94</i>
Project Control Analyst	<i>Sherr L. Crowe</i>	<i>9/25/94</i>

FDS Number

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.03 High Level Waste 1.1.1.3.03.02 Technology Development & Applied Engineering (M&O Contractor)	2. DATE PREPARED September 23, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.03.02.05/VI	5. WBS ELEMENT TITLE Process/Equipment Evaluation							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1240-0-AB							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.2.2 Immobilize HLW and TRU Waste 4.2.2.3	12. BUDGET AND REPORTING NUMBER(S) <table> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3130010</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3130010		
Expense	Capital	Line Item						
EW3130010								

13. ELEMENT DESCRIPTION**A. COST CONTENT (Escalated Dollars)**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	2328	795	715
CENRTC			
GPP			
LINE ITEM			
TOTAL	2328	795	715

B. TECHNICAL BASES

Goals & objectives:

- Select a reference melter system for conceptual design of the HLW vitrification plant. (HL02006)
- Provide technical interface with the R&D contractor on activities related to evaluation of candidate melter systems. (HL02005, HL02007)

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

- Documentation of HLW Candidate Melter Selection Process - 11/94
- HLW Melter Development Plan and Updates
- High-Temperature Melter Test Report
- Reference Melter Selection Plan
- Melter Candidate Assessment Report
- A reference HLW vitrification plant melter system for conceptual design.

C. STATEMENT OF WORK

Required activities:

- Candidate melter systems selection. (HL02004)
- Melter testing oversight (HL02005)
- Melter support systems evaluation oversight (HL02007)
- Reference melter selection (HL02006)

Technologies to be assessed:

- Melter technologies applicable to HLW vitrification.
- HLW melter support systems and equipment (feed preparation, off-gas, effluents, etc.)

Options to be considered:

- Alternative melter systems
- Alternative process equipment/systems

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager		
Activity Manager		
Cost Account Manager		
Project Control Analyst		

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager		
Activity Manager		
Cost Account Manager		
Project Control Analyst		

FDS Number

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.03 High Level Waste 1.1.1.03.02 Technology Development & Applied Engineering	2. DATE PREPARED September 23, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.03.02.06/VI	5. WBS ELEMENT TITLE Feed/Process Evaluation							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1240-0-AB							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.2.2 Immobilize HLW and TRU Waste 4.2.2.3 Prepare Cs/Sr Capsules for Disposal 4.2.2.4 Interim Store IHLW 4.2.2.5	12. BUDGET AND REPORTING NUMBER(S) <table> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3130010</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3130010		
Expense	Capital	Line Item						
EW3130010								

13. ELEMENT DESCRIPTION**A. COST CONTENT (Escalated Dollars)**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	249	675	643
CENRTC			
GPP			
LINE ITEM			
TOTAL	249	675	643

B. TECHNICAL BASES

Goals & objectives:

- Prepare a HLW feed processing operational Assessment based on updated HLW feed specifications, glass formulation development data, feed chemistry/rheology data, melter performance data and plant flowsheet. (HLO2017)
- Evaluate process support data on chemical processes, including feed processing, liquid waste processing, and offgas treatment. Provide data needs and coordinate acquisition of data. (HLO212A)
- Provide technical interface with the R&D contractor on activities related to feed preparation chemistry/rheology, waste simulant, and glass formulation development.(HLO212A)

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

- Annual feed processability assessment report.
- Glass formulation strategy
- Process based data compilations for chemical process systems including feed processing, liquid waste treatment, and offgas treatment. Identify data needs and arrange for acquisition of needed data
- Process data compilation
- Criticality control approach

C. STATEMENT OF WORK

Required activities:

- Glass formulation evaluation (HLO4015)
- Process feed and chemistry evaluation (HLO212A)
- Feed Processing Operational Assessment (HLO4015)

Technologies to be assessed:

- HLW glass formulations.
- HLW feed/process options.
- Criticality control options

Options to be considered:

- High temperature and low temperature glasses.
- Alternative chemical processes for feed preparation, offgas treatment and liquid waste treatment

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager		
Activity Manager		
Cost Account Manager		
Project Control Analyst		

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	<i>R. Powell</i>	<i>9/23/94</i>
Activity Manager	<i>P. J. Schauer</i>	<i>9/23/94</i>
Cost Account Manager	<i>Tom W. Crawford</i>	<i>9-23-94</i>
Project Control Analyst	<i>Sherr L. Crowe</i>	<i>9-25-94</i>

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.03 High Level Waste 1.1.1.3.03.02 Technology Development & Applied Engineering (M&O Contractor)	2. DATE PREPARED September 23, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.03.02.07/VI	5. WBS ELEMENT TITLE Plant/Process Engineering Design Support							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1240-0-AB							
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Expense	Capital	Line Item						
EW3130010								

13. ELEMENT DESCRIPTION**A. COST CONTENT (Escalated Dollars)**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING			445
CENRTC			
GPP			
LINE ITEM			
TOTAL			445

B. TECHNICAL BASES

Goals & objectives:

- Provide engineering support to conceptual design in the areas of:
 - Process equipment and development support (HL02017a)
 - Process technology (HL02017a)
 - Process design (HL02017a)

Status of Design Documentation: N/A

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

- Input to functions and requirements for conceptual design.
- Engineering trade studies supporting process, equipment, and plant design options.

C. STATEMENT OF WORK

Required activities:

- Design systems engineering support. (HL02017a)
- Process technology support. (HL02017a)
 - Input to TWRS Process Flowsheet - 09/97
- Process Design Support. (HL02017a)
- Interface with Pretreatment

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager		
Activity Manager		
Cost Account Manager		
Project Control Analyst		

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	<i>R. P. Powell</i>	9/23/94
Activity Manager	<i>P. J. Schaefer</i>	9/23/94
Cost Account Manager	<i>Tom W. Crawford</i>	9-23-94
Project Control Analyst	<i>Sherrill Lowe</i>	9-25-94

FDS Number

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1. TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.03 High Level Waste (M&O Contractor)	2. DATE PREPARED September 15, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.03.03/V	5. WBS ELEMENT TITLE Facility Operations							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1240-0-AC							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.2.2 Immobilize HLW and TRU Waste 4.2.2.3 Prepare Cs/Sr Capsules for Disposal 4.2.2.4 Interim Store IHLW 4.2.2.5 Interim Store and Transport ITRU Waste	12. BUDGET AND REPORTING NUMBER <table> <tr> <td>Expense</td> <td>Capital</td> <td>Line Items</td> </tr> <tr> <td>EW3130010</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Items	EW3130010		
Expense	Capital	Line Items						
EW3130010								

13. ELEMENT DESCRIPTION**A. COST CONTENT (Escalated Dollars)**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)	FY 1998 \$(000)	FY 1999 \$(000)	FY 2000 \$(000)	FY 2001 \$(000)
OPERATING			419				
CENRTC							
GPP							
LINE ITEM							
TOTAL			419				

B. TECHNICAL BASES

Goals & objectives:

- Provide design input so that a safe, operable, and maintainable HLW facility is designed and built
- Ensure that both facility and staff are trained and ready for safe and environmentally sound radioactive operations
- Operate, maintain, modify vitrification and interim storage facilities, and procure/disposition materials as needed to produce a qualified waste product
- Convert all HLW/TRU into an acceptable waste product and store it until shipped to the repository

Major end-item deliverables:

- Major milestones:
 - M-51-03 Initiate Hot Operation of the HLW Vitrification Facility
 - M-51-00 Complete Vitrification of Hanford High Level Tank Waste
- Containers of vitrified HLW meeting repository specifications
- Operations preparation and readiness review plans
- Trained operations staff
- A facility prepared for decontamination and decommissioning

Acceptance criteria:

- All HLW has been converted into an immobilized waste form and transferred to the repository
- The facility has been fully prepared for decontamination and decommissioning

C. STATEMENT OF WORK

Required activities over lifetime:

- Develop operations and maintenance concepts to support project definition/(M & O Contractor) HL03018A
- Provide operations support to the HLW project through design input and reviews, test planning and operability and maintainability assessments/(M & O Contractor) HL03019A
- Develop procedures and train staff in preparation for operations/(M & O Contractor) HL03019
- Perform readiness reviews/(M & O Contractor) HL03020
- Perform cold operations in support of plant qualification and startup/(M & O Contractor)
- Produce a qualified waste product during radioactive operations of the vitrification plant/(M & O Contractor) HL03018
- Operate the interim storage facility/(M & O Contractor) HL03021A
- Prepare the waste containers for shipment to the repository/(M & O Contractor) HL05044
- Prepare the HLW facility for decontamination and decommissioning/(M & O Contractor) HL03042
- Perform HLW facility decontamination and decommissioning (M & O Contractor)

Interfaces:

#	From This WBS To	Item Provided
1	1.1.1.3.03.05	Ops support to project design
2	1.1.1.3.03.05	Facility operability and maintainability assessments
3	1.1.1.3.03.04	Operations/Maintenance concepts
4	1.1.1.3.03.05	Waste Form Qualification support
5	Repository DOE-RL	Containers filled with immobilized HLW and Supporting Documentation
	To This WBS From	
1	Characterization 1.1.1.2	Characterization data
2	Pretreatment 1.1.1.3.01	Projected feed characteristics for HLW plant operations
3	Pretreatment 1.1.1.3.01	Pretreated, blended HLW feed for operations
4	1.1.1.3.03.02	Process/plant parameters for operations
5	1.1.1.3.03.02	Glass formulations and qualification envelope for operations
6	1.1.1.3.03.02	Feed processibility/specification for operations
7	1.1.1.3.03.05	Completed vitrification and interim storage facility
8	Repository DOE-RL	Transportation and permanent disposal space for IHLW containers

Technologies to be assessed: N/AOptions to be considered:

- Alternative operations and maintenance concepts
- Alternative storage concepts

D. OTHER LEGAL DRIVERS AND ORDER REQUIREMENTSRefer to DOE/RL-92-60, Rev 1, 31 March 1994, TWRS Functions and Requirements

- Functions and Requirements Constraints: Tables F4.2.2.2, F4.2.2.3, F4.2.2.4, and F4.2.2.5, Items V, Paragraphs B.
- System Architecture Constraints: Tables A4.2.2.2, A4.2.2.3, A4.2.2.4, and A4.2.2.5, Items VIII, Paragraphs C.

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.03 High Level Waste 1.1.1.3.03.03 Facility Operations	2. DATE PREPARED September 23, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.03.03.01/VI	5. WBS ELEMENT TITLE Operations Support HLW Project Definition							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1240-0-AC							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER / TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.2.2 Immobilize HLW and TRU Waste 4.2.2.3 Prepare Cs/Sr Capsules for Disposal 4.2.2.4 Interim Store IHLW 4.2.2.5	12. BUDGET AND REPORTING NUMBER(S) <table border="0"> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3130010</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3130010		
Expense	Capital	Line Item						
EW3130010								

13. ELEMENT DESCRIPTION**A. COST CONTENT (Escalated Dollars)**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING			419
CENRTC			
GPP			
LINE ITEM			
TOTAL			419

B. TECHNICAL BASES

Goals & objectives:

- Provide ongoing operability and maintainability input, planning and documentation review support to the HLW Program and HLW Project during the phases of baseline development, conceptual design and advanced conceptual design. (HL03018A)
- Provide a planning basis for the follow-on HLW Operations preparation activities

Status of Design Documentation:

This facility is in the engineering trade study phase. No operations documentation yet exists. Preliminary functions and requirements for the HLW facility are documented in DOE/RL-92-60, Rev 1, 31 March 1994.

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

- HLW Operations and Maintenance Concept
- Operations Project Support Plan
- Initial Operations Preparation Plan

C. STATEMENT OF WORK

Required activities:

- A related activity that must be completed prior to this element is preliminary operations planning (1.1.1.3.03.01.3)
- Update the initial Operations and Maintenance concept
- Update the Operations Project Support Plan
- Prepare an initial Operations Preparation Plan
- Provide O and M review and input to HLW Project Documentation and design efforts.

Technologies to be assessed: N/A

Options to be considered:

- Alternative Operations and Maintenance concepts

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager		
Activity Manager		
Cost Account Manager		
Project Control Analyst		

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	<i>R. Powell</i>	9/23/94
Activity Manager	<i>P. S. Schum</i>	9/23/94
Cost Account Manager	TBD	
Project Control Analyst	<i>Sherry A. Howe</i>	9/25/94

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.03 High Level Waste (M&O Contractor)	2. DATE PREPARED September 15, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.03.04/V	5. WBS ELEMENT TITLE System Definition							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1240-0-AD							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER / TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.2.2 Immobilize HLW and TRU Waste 4.2.2.3 Prepare Cs/Sr Capsules for Disposal 4.2.2.4 Interim Store IHLW 4.2.2.5 Interim Store and Transport ITRU Waste	12. BUDGET AND REPORTING NUMBER <table> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3130010</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3130010		
Expense	Capital	Line Item						
EW3130010								

13. ELEMENT DESCRIPTION**A. COST CONTENT (Escalated Dollars)**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)	FY 1998 \$(000)	FY 1999 \$(000)	FY 2000 \$(000)	FY 2001 \$(000)
OPERATING	4,578	3,702	3,221				
CENRTC							
GPP							
LINE ITEM							
TOTAL	4,578	3,702	3,221				

B. TECHNICAL BASES

Goals & objectives:

- Provide the pre-conceptual engineering studies needed to:
 - Define the Immobilized HLW functions, requirements, and architecture
 - Define IHLW concepts and criteria prior to conceptual design
 - Define the requirements for HLW interim storage
- Evaluate the potential for privatizing the HLW immobilization function

Major end-item deliverables:

- Major milestones:
 - M-51-01 Provide report to Ecology and EPA on evaluation of alternative concepts for treatment and disposal of Hanford HLW. HL02004A
 - M-51-01-T1 Provide EPA and Ecology with results of evaluation and a decision to proceed/not proceed with the ECA proposal for vitrification. HL04023A
- Feed Specification strategy HL04014
- Feed processability assessment report HL04014
- Characterization data requirements HL04014
- Process and facility functions and requirements for design HL04022, HL04023
- HLW feed specification HL04015
- Waste form and canister qualification requirements HL04024
- Process and facility concept and criteria basis for design HL04024, HL04025
- Government technology transfer package HL04025
- Functional and operational requirements HL04025
- Product definition and criteria HL04022

Acceptance criteria:

A suitable technical basis exists for the initiation of conceptual design

C. STATEMENT OF WORK

Required activities over lifetime

- Perform initial trade studies/(M & O Contractor and A/E Contractor)
- Perform initial waste glass formulation/(M & O Contractor and Lab Contractor)
- Perform initial and design HLW feed specification/processability assessment/(M & O Contractor)
- Develop HLW process and facility scope and requirements/(M & O Contractor)
- Develop HLW process and facility concepts and criteria/(M & O Contractor and A/E Contractor)

Interfaces:

#	From This WBS To	Item Provided
1	Pretreatment 1.1.1.3.01	Initial HLW feed specification
2	Low Level Waste 1.1.1.3.02	Characteristics and volumes of HLW plant generated LLW streams
3	Characterization 1.1.1.2	Characterization data requirements for HLW process development
4	Pretreatment 1.1.1.3.01	Decision on sludge washing
5	1.1.1.3.03.02	Glass compositions for melter evaluation
6	1.1.1.3.03.05	Glass formulation basis for conceptual design
7	1.1.1.3.03.05	Feed processability/spec for design
8	1.1.1.3.03.05	Process and facility functions and requirements for design
9	1.1.1.3.03.05	Process and facility concepts and criteria for design
10	1.1.1.3.03.02	Container qualification requirements
	To This WBS From	
1	1.1.1.3.03.03	Operations/maintenance concept
2	TWRS	TWRS integrated site selection study
3	Pretreatment 1.1.1.3.01	Initial estimates of pretreated feed characteristics
4	Pretreatment 1.1.1.3.01	Updated pretreated feed characteristics
5	Pretreatment 1.1.1.3.01	Corrosion effects of washed sludge
6	Characterization 1.1.1.2	Characterization data
7	Characterization 1.1.1.2	Quantities of core sample material for PT and HLW process development testing
8	TWRS	TWRS site flow sheet
9	Repository	Waste acceptance criteria

Technologies to be assessed:

- Off-gas treatment systems, process control, alternate waste glass forms and types, IHLW interim storage concepts, and remote maintenance

Options to be considered:

- Canister type and size
- Facility type
- Alternative remote maintenance features
- Facility integration
- Type and form of waste glass
- Privatization
- Cs/Sr capsule disposal concepts
- Alternative feed prep and off-gas and effluent treatment systems
- Alternative analytical facility configurations
- Alternative interim storage concepts

D. OTHER LEGAL DRIVERS AND ORDER REQUIREMENTS

Refer to DOE/RL-92-60, Rev 1, 31 March 1994, TWRS Functions and Requirements

- Functions and Requirements Constraints: Tables F4.2.2.2, F4.2.2.3, F4.2.2.4, and F4.2.2.5, Items V, Paragraphs B.
- System Architecture Constraints: Tables A4.2.2.2, A4.2.2.3, A4.2.2.4, and A4.2.2.5, Items VIII, Paragraphs C.

**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.03 High Level Waste 1.1.1.3.03.04 System Definition	2. DATE PREPARED September 23, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.03.04.01\VI	5. WBS ELEMENT TITLE Define Initial Design Feed Specifications							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1240-0-AE							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER / TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.2.2 Immobilize HLW and TRU Waste 4.2.2.3 Prepare Cs/Sr Capsules for Disposal	12. BUDGET AND REPORTING NUMBER(S) <table border="0"> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3130010</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3130010		
Expense	Capital	Line Item						
EW3130010								

13. ELEMENT DESCRIPTION**A. COST CONTENT (Escalated Dollars)**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	187	220	142
CENRTC			
GPP			
LINE ITEM			
TOTAL	187	220	142

B. TECHNICAL BASES

Goals & objectives:

- Develop and document of the design basis feeds to be used for system definition and conceptual design of the HLW vitrification facility.
- Establish preliminary optimization of the waste feed streams with respect to the HLW product composition.

Status of Design Documentation:

A preliminary description of the HLW vitrification facility design basis feed is included in the Facility Configuration Study (WHC-SD-WM-ES-295, Rev 0) which provides a starting point for developing future modifications.

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

- Documentation of evaluations optimizing the feed streams pre-treatment with respect to the HLW product composition.
- Documentation of feed compositions used for as a basis for conceptual design activities

C. STATEMENT OF WORK

Required activities:

Related activities that must be completed prior to completion of the final design basis feed description include:

- Preliminary design basis feed description defining nominal feed, shielding basis feed, and safety/regulatory basis feed. The feed basis description will include the scenario used to formulate the design basis and flowsheet calculations translating the impact of operating with the feed to key regions of the facility.
- Documented decisions on the disposition of TRU tank waste and Cs/Sr capsules.
- Revised design basis feed description incorporating the results of the preliminary HLW/Pretreatment interface optimization and product criteria decisions concerning the need for separate TRU tank waste processing and the viability of overpacked capsules as a product form. The design basis feed description revision will also be supplemented to include definition of a criticality safety basis and an operational variability design basis.
- Final design basis feed description incorporating modifications resulting from the final interface optimization evaluations.

Related activities that must be completed prior to completion of the optimization of feed streams provided to the HLW vitrification process:

- Chemical component glass loading data.
- Pretreatment performance and implementation cost data.
- Preliminary HLW/pretreatment Interface Optimization Document summarizing the initial economic evaluation of trade-off between additional cost for removing more chemical

components from the HLW feed in pretreatment and cost reductions achieved by reduced glass production.

- Final HLW/pretreatment Interface Optimization Document summarizing additional economic evaluations of the trade-off between pre-treatment chemical separations and glass production reductions. The need for this additional optimization will be dependent on the preliminary optimization results.

Technologies to be assessed:

The design basis feed development will be based on vitrification technology.

Options to be considered:

The primary feed design basis will be constructed around the baseline program strategy which assumes all tank waste will be processed for disposal in the HLW geologic repository, with cesium and strontium capsules overpacked for disposal. Options to the baseline strategy which impact the feed design basis are dependent on decisions which will be developed by the Product Definition activities (1.1.1.3.03.04.02) concerning the disposition of capsules and possible separate treatment of TRU tank waste. These decisions may create options for the feed design basis which would incorporate capsule material into the nominal design feed basis or require segregated processing of TRU tank waste through the HLW vitrification facility.

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager		
Activity Manager		
Cost Account Manager		
Project Control Analyst		

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	<i>[Signature]</i>	9/23/94
Activity Manager	<i>[Signature]</i>	9/23/94
Cost Account Manager	<i>[Signature]</i>	9-23-94
Project Control Analyst	<i>[Signature]</i>	9-25-94

FDS Number

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.03 High Level Waste 1.1.1.3.03.04 System Definition	2. DATE PREPARED September 23, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.03.04.02/VI	5. WBS ELEMENT TITLE Define Initial Design Products							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1240-0-AE							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER / TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.2.2 Immobilize HLW and TRU Waste 4.2.2.3 Prepare Cs/Sr Capsules for Disposal 4.2.2.4 Interim Store IHLW 4.2.2.5 Interim Store and Transport ITRU Waste	12. BUDGET AND REPORTING NUMBER(S) <table> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3130010</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3130010		
Expense	Capital	Line Item						
EW3130010								

13. ELEMENT DESCRIPTION**A. COST CONTENT (Escalated Dollars)**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	726	717	61
CENRTC			
GPP			
LINE ITEM			
TOTAL	726	717	61

B. TECHNICAL BASES

Goals & objectives:

- Develop and document of the product criteria and description used for system definition and initiation of conceptual design for the HLW vitrification facility.
- Develop data required to facilitate a decision on the disposition of cesium and strontium capsules as the basis for system definition and initiation of conceptual design.
- Develop background data required to facilitate a decision on the disposition of TRU tank waste as the basis for system definition and initiation of conceptual design.

Status of Design Documentation:

Preliminary product criteria are summarized in DOE/RL-92-60 Rev 1, "Tank Waste Remediation System Functions and Requirements" which require expansion for application in the system definition activities. Planning assumptions are incorporated in the draft High Level Waste Program Strategy and WHC-EP-0786 (Draft) "Tank Waste Remediation System Program Decisions and Risk Assessment" which project the results of decisions for disposition of the capsules and TRU tank waste. The planning disposition architecture is based on overpacking capsules for repository disposal and combining TRU tank waste processing with the remainder of tank waste for disposal in the HLW repository (no segregated TRU tank waste processing).

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

- Final HLW Product Description Document describing the HLW vitrification facility product(s) and product package(s) to be used for system definition and conceptual design activities.
- Documentation of the capsule disposition decision and decision basis.
- Documentation of the TRU tank waste disposition decision and decision basis.

C. STATEMENT OF WORK

Required activities:

Required activities that must be completed prior to completion of the HLW Product Description Document include:

- Preparation of a Preliminary Product Criteria and Description Document
- Preparation of Trade Studies comparing:
 - Canister Size Variations
 - Monolith versus non-monolith glass product forms
 - Alternative onsite Storage Configurations
 - Alternative glass types
- Facilitate a documented decision analysis process and DOE decision review of the results from each trade study.
- Revise the Product Criteria and Description Document based on the outcome of trade study decisions.

- Prepare a HLW Product Description Document incorporating the results of decisions on the disposition of capsules and TRU tank waste.

Prepare decision basis documentation, facilitate a documented decision analysis process, and DOE decision review to support validation, or modification, of the planning assumption for disposition of capsules.

Prepare decision basis documentation, facilitate a documented decision analysis process, and DOE decision review to support validation, or modification, of the planning assumption for disposition of TRU tank waste.

Technologies to be assessed:

Product criteria and descriptions for tank waste will be based on vitrification technology. Capsule disposition will consider either overpacking or vitrification technologies.

Options to be considered:

HLW Product Alternatives evaluated by trade studies include, but are not limited to:

- Canister Size Variations - standard HLW canister, elongated standard HLW canister, Multi-Purpose Canister (MPC) as defined by the HLW Repository, and modified canister to optimize utilization of the MPC as an overpack.
- Product Form - Monolith glass pour, or physical forms which may facilitate product sampling for purposes of quality control.
- Product Package - Individual canisters vs canisters overpacked in a MPC.
- Onsite Storage Configurations - Below grade storage facility versus shielded canisters on an above grade pad.
- Glass Types - Borosilicate glass and non-borosilicate glass.

The capsules disposition alternatives include, but are not limited to:

- Overpack Cs and Sr salts for repository disposal.
- Incorporate into the HLW vitrification facility feed.
- Vitrify the capsules.

The TRU tank waste disposition alternative include, but are not limited to:

- Process TRU tank waste together with other tank waste for disposal in the HLW repository.
- Segregate processing of the TRU tank waste in the vitrification facility to allow disposal in either the HLW or TRU waste repository.
- Process TRU tank waste in a separate facility.

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager		
Activity Manager		
Cost Account Manager		
Project Control Analyst		

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	<i>R. Powell</i>	9/23/94
Activity Manager	<i>P. J. Schaefer</i>	9/23/94
Cost Account Manager	<i>Tom W. Craft</i>	9-23-94
Project Control Analyst	<i>Sherril Crowe</i>	9/25/94

FDS Number

WHC-SP-1101

Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.03 High Level Waste 1.1.1.3.03.04 System Definition	2. DATE PREPARED September 23, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.03.04.03/VI	5. WBS ELEMENT TITLE Define Initial Process System Requirements and Concepts	
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1240-0-AE	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER / TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV.1) 4.2.2.2 Immobilize HLW and TRU Waste 4.2.2.3 Prepare Cs/Sr Capsules for Disposal 4.2.2.4 Interim Store IHLW 4.2.2.5 Interim Store and Transport ITRU Waste	12. BUDGET AND REPORTING NUMBER(S) Expense Capital Line Item EW3130010	

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	3665	2765	3018
CENRTC			
GPP			
LINE ITEM			
TOTAL	3665	2765	3018

B. TECHNICAL BASES

Goals & objectives:

Provide adequate requirements and supporting technical data for the HLW Program to initiate conceptual design. This includes a reference process flowsheet, a preferred HLW facility configuration, and a Functions and Requirements (F&R) document which together describe the needs of the HLW Program.

Status of Design Documentation:

- An initial reference TWRS Process Flowsheet was issued in June 1994, (WHC-SD-WM-TI-613 Rev. 0).
- An initial TWRS Facility Configuration Study was issued in June 1994, (WHC-SD-WM-ES-295 Rev. 0).
- A functional analysis has been started by TWRS Systems Engineering and initial requirements have been defined in the Facility Configuration Study cited above.

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

- DOE-approved F&R document
- WHC-approved reference flowsheet document
- WHC-approved Facility Configuration Study for HLW vitrification plant
- Individual trade study reports
- Design input data package for conceptual design

C. STATEMENT OF WORK

Required activities:

- Develop and update reference HLW process flowsheets as feed design basis, product criteria, and technology baselines are revised.
- Develop HLW facility concepts and perform decision analysis to determine optimum facility configuration. The results of the analysis will provide input to the Functions and Requirements document.
- Develop and update the HLW Functions and Requirements document prior to start of conceptual design. This effort requires input from all of the Systems Definition element, most of the Technology Development and Applied Engineering element, and some of the HLW Facility element.
- Provide a technology transfer function to provide data required for conceptual design.

Technologies to be assessed: N/A

Options to be considered:

- Various blends of tank wastes
- Various combinations of pretreatment processes
- Various facility configurations

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager		
Activity Manager		
Cost Account Manager		
Project Control Analyst		

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager		
Activity Manager		
Cost Account Manager		
Project Control Analyst		

FDS Number _____

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.03 High Level Waste (M&O Contractor)	2. DATE PREPARED September 15, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.03.05/V	5. WBS ELEMENT TITLE HLW Facility							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1240-0-AE							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.2.2 Immobilize HLW and TRU Waste 4.2.2.3 Prepare Cs/Sr Capsules for Disposal 4.2.2.4 Interim Store IHLW 4.2.2.5 Interim Store and Transport ITRU Waste	12. ADS/TDD BUDGET AND REPORTING NUMBER <table> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3130010</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3130010		
Expense	Capital	Line Item						
EW3130010								

13. ELEMENT DESCRIPTION**A. COST CONTENT (Escalated Dollars)**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)	FY 1998 \$(000)	FY 1999 \$(000)	FY 2000 \$(000)	FY 2001 \$(000)
OPERATING	88	1,528	8,803				
CENRTC							
GPP							
LINE ITEM							
TOTAL	88	1,528	8,803				

B. TECHNICAL BASES

Goals & objectives:

- Design, construct, and prepare for operations a HLW vitrification and interim storage facility(s) capable of producing and storing a qualified waste form product

Major end-item deliverables:

- Major Milestones:
 - M-51-00-T1 Submit conceptual design of the HLW vitrification facility HL05033B
 - M-51-00-T2 Initiate definitive design of the HLW vitrification facility HL05038A
 - M-51-00-T3 Initiate construction of the HLW vitrification facility HL05041A
 - M-51-00-T4 Complete construction of the HLW vitrification facility HL05041B
- Air/water permits
- RCRA permits
- NEPA documentation
- Criticality/Safety reports
- Waste Form and Canister Description Document
- Waste Compliance Plan
- Waste Qualification Report
- Conceptual Design report
- Key Decision documentation
- Project Management Plan
- Project Design Criteria
- Design reviews
- Quality Assurance Plan
- Completed vitrification/storage facility

Acceptance criteria:

- Completion of Plant turnover to Operations
- Approval of the Waste Qualification Report

C. STATEMENT OF WORK

Required activities over lifetime:

- Provide project permitting and environmental documentation/(M & O Contractor - A/E Contractor) HL05027
- Provide safety/health documentation/(M & O Contractor - A/E Contractor HL05028
- Provide waste form qualification documentation/(M & O Contractor - Lab Contractor) HL05030, HL05031, HL05032
- Provide conceptual design, definitive design, procurement, construction, and acceptance of a HLW vitrification/storage facility/(M & O Contractor - Subcontractor - A/E Contractor) HL05033, HL05035, HL05038, HL05039, HL05040, HL05040A, HL05041
- Provide overall management of the HLW Vitrification/storage project/(M & O Contractor) HL05033A
- Perform acceptance testing of the facility/(M & O Contractor)

Interfaces:

#	From This WBS To	Item Provided
1	1.1.1.3.03.03	Completed vitrification facility
2	1.1.1.3.03.02	Development/testing requirements
#	To This WBS From	Item Provided
1	1.1.1.3.03.02	Preferred melter option report
2	1.1.1.3.03.02	Final Melter evaluation report
3	1.1.1.3.03.02	Process/Equipment concepts for conceptual design
4	1.1.1.3.03.02	Process/plant test results for plant qualification
5	1.1.1.3.03.02	Glass formulation for definitive design
6	1.1.1.3.03.02	Container qualification data
7	1.1.1.3.03.03	Ops support to project design
8	1.1.1.3.03.03	Facility operability and maintainability assessments
9	1.1.1.3.03.03	Waste form qualification support
10	1.1.1.3.03.04	Glass formulation for conceptual design
11	1.1.1.3.03.04	Feed processibility/spec for design
12	1.1.1.3.03.04	Process and facility functions and requirements for design
13	1.1.1.3.03.04	Process and facility concepts and criteria for design
14	Pretreatment 1.1.1.3.01	Final pretreated feed characteristics for design
15	Pretreatment 1.1.1.3.01	Characteristics and volume of LLW plant generated HLW streams
16	Pretreatment 1.1.1.3.01	Pretreat decision on sludge washing
17	TWRS	Approved TWRS EIS

Technologies to be assessed:

- Feed preparation, vitrification systems, off-gas treatment systems, process control, alternate waste forms, IHLW interim storage concepts, and remote maintenance

Options to be considered:

- Facility type
- Alternative remote maintenance features
- Facility integration
- Alternative process systems and equipment
- Alternative analytical facility configurations
- Alternative facility acquisition strategies

D. OTHER LEGAL DRIVERS AND ORDER REQUIREMENTS

Refer to DOE/RL-92-60, Rev 1, 31 March 1994, TWRS Functions and Requirements

- Functions and Requirements Constraints: Tables F4.2.2.2, F4.2.2.3, F4.2.2.4, and F4.2.2.5, Items V, Paragraphs B.
- System Architecture Constraints: Tables A4.2.2.2, A4.2.2.3, A4.2.2.4, and A4.2.2.5, Items VIII, Paragraphs C.

**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.03 High Level Waste 1.1.1.3.03.05 HLW Facility	2. DATE PREPARED September 23, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.03.05.01/VI	5. WBS ELEMENT TITLE HLW Project Management							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1240-0-AE							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER /TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.2.2 Immobilize HLW and TRU Waste 4.2.2.3 Prepare Cs/Sr Capsules for Disposal 4.2.2.4 Interim Store IHLW 4.2.2.5	12. BUDGET AND REPORTING NUMBER(S) <table> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3130010</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3130010		
Expense	Capital	Line Item						
EW3130010								

13. ELEMENT DESCRIPTION**A. COST CONTENT (Escalated Dollars)**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING		1058	1116
CENRTC			
GPP			
LINE ITEM			
TOTAL		1058	1116

B. TECHNICAL BASES

Goals & objectives:

- Provide project management functions for the HLW project (HL05033A)

Status of Design Documentation:

This facility is in the engineering trade study phase. No approved project documentation yet exists. Preliminary functions and requirements for the HLW facility are documented in DOE/RL-92-60, Rev 1, 31 March 1994.

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

- Project Data Sheet
- Budget Validation
- Project Plan/Charter
- Project management plan
- Key Decision Documentation
- Initial Independent cost estimate
- Project Execution Plan
- Configuration Management Plan
- Baseline change control system
- Project acquisition strategy
- Quality Assurance Plan

C. STATEMENT OF WORK

Required activities:

This activity must be preceded by the activities included under Pre-project Documentation and Support (1.1.1.3.03.01.03).

- Perform project management administration and integration functions
 - Prepare project planning documents
 - Prepare project Key Decision documentation
 - Perform project systems engineering management
 - Perform configuration management
- Perform Project Business Management
 - Perform project baseline planning scheduling, reporting and change control
 - Develop project acquisition strategy and prepare contracting documents
 - Provide project office support
- Develop and sustain project quality assurance program

Technologies to be assessed: N/A

Options to be considered:

- Alternative project execution strategies
- Alternative project acquisition strategies

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager		
Activity Manager		
Cost Account Manager		
Project Control Analyst		

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	<i>R. Powell</i>	9/23/94
Activity Manager	TBD	
Cost Account Manager	TBD	
Project Control Analyst	<i>Sheri & Lowe</i>	9/24/94

FDS Number

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Tank Waste Remediation System Work Breakdown Structure
Dictionary.

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.03 High Level Waste 1.1.1.3.03.05 HLW Facility	2. DATE PREPARED September 23, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.03.05.02/VI	5. WBS ELEMENT TITLE Safety Analysis/Permitting	
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1240-0-AE	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.2.2 Immobilize HLW and TRU Waste 4.2.2.3 Prepare Cs/Sr Capsules for Disposal 4.2.2.4 Interim Store IHLW 4.2.2.5	12. BUDGET AND REPORTING NUMBER(S) Expense Capital Line Items EW3130010	

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING			514
CENRTC			
GPP			
LINE ITEM			
TOTAL			514

B. TECHNICAL BASES

Goals & objectives:

- Provide Safety/health analysis, assessments, and documentation needed to resolve safety and health issues and comply with applicable DOE orders and public law.
- Provide permitting and environmental analysis, assessments, and documentation needed to support HLW facility design, construction and operation, resolve technical issues and comply with applicable DOE orders and public law.

Status of Design Documentation:

This facility is in the engineering trade study phase. No approved safety/health/permitting documentation yet exists. A draft TWRS-EIS is in preparation and will provide the required NEPA coverage for the facility when approved. Preliminary functions and requirements for the HLW facility are documented in DOE/RL-92-60, Rev 1, 31 March 1994.

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

- Safety documentation strategy and plan
- Annual Safety Management plans
- Criticality Safety Evaluation Report
- Preliminary Safety Analysis Report
- Design Safety Evaluation Report
- Final Safety Analysis Report
- Permitting Strategy/Plan
- Permit compliance plan
- Environmental Requirements checklist
- Initial Air Permits
- NEPA supplemental documentation
- Water Permits
- RCRA Permits (A and B)
- BACT and T-BACT analysis
- BARCT analysis

C. STATEMENT OF WORK

Required activities:

- Project Safety/Health (HL05028)
 - Prepare initial safety documentation strategy and plan
 - Prepare preliminary safety evaluation
 - Develop initial safety management plan
- Project Permitting (HL05027)
 - Develop initial permitting strategy/plan
 - Develop permit compliance plan
 - Support NEPA documentation
 - Develop environmental requirements checklist

Technologies to be assessed: N/A

Options to be considered: N/A

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager		
Activity Manager		
Cost Account Manager		
Project Control Analyst		

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	<i>R. Powell</i>	9/23/94
Activity Manager	TBD	
Cost Account Manager	TBD	
Project Control Analyst	<i>Shen L. Crowe</i>	9/25/94

FDS Number _____

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.03 High Level Waste 1.1.1.3.03.05 HLW Facility	2. DATE PREPARED September 23, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.03.05.03/VI	5. WBS ELEMENT TITLE Waste Form Qualification							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1240-0-AE							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.2.2 Immobilize HLW and TRU Waste 4.2.2.3 Prepare Cs/Sr Capsules for Disposal 4.2.2.4 Interim Store IHLW 4.2.2.5	12. BUDGET AND REPORTING NUMBER(S) <table border="0"> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3130010</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3130010		
Expense	Capital	Line Item						
EW3130010								

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING	88	468	791
CENRTC			
GPP			
LINE ITEM			
TOTAL	88	468	791

B. TECHNICAL BASES

Goals & objectives:

- Develop and document of a waste form(s) that is (are) acceptable to the geologic repository and suitable for interim storage.
- Document that the materials and processes used during vitrification can consistently produce a product that meets qualification requirements (Waste Form Qualification Report).

Status of Design Documentation:

Preliminary requirements for a product that meets repository criteria are specified in the EM-WAPS (Waste Acceptance Product Specification). It is anticipated that the WAPS can and will be modified to allow a Hanford HLW waste form that will result in reduced disposal costs.

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

- Draft Waste Form and Canister Description Document
- Waste Acceptance Product concept screening decision
- Waste Acceptance Strategy and Program Plan
- Initial Waste Form and Canister Description Document
- Draft EM-WAPS (Waste Acceptance Product Specification)
- Waste Compliance Plan
- Waste Form Qualification Report (Prior to M-51-03, Initiate Hot Operations of the HLW vitrification facility)
- Waste Form Qualification Report-Hot Operations Supplement

C. STATEMENT OF WORK

Required activities:

Related activities that the must be completed prior to completion of Waste Form Description Documentation include:

- Perform initial feed processability assessment (HL04011)
 - Define initial design feed specifications (1.1.1.3.03.04.01)
 - Perform initial feed/process development (product/process control modeling) (HL02012B)
- Prepare Waste Form and Canister Description documentation (HL05030)
 - Resolve Waste Acceptance criteria with DOE-RW
 - Publish draft Waste Form and Canister Description Document
 - Prepare a draft EM-WAPS (Waste Acceptance Product Specification)
- Prepare Waste Form Qualification requirements and plans (HL05031)
 - Develop waste acceptance strategy and program plan
 - Develop Waste Compliance Plan

- Prepare Waste Form Qualification Report (HL05032)
 - Publish WQR (requires completion of initial Reference System Radioactive Testing (HL02009) and Canister/cask Product Qualification (HL2015B))
 - Publish WQR hot operations supplement (requires one year of HLW Radioactive Operations (HL02018))

Technologies to be assessed: N/A

Options to be considered:

- Alternative waste glass forms and types
- Alternative canister types and sizes
- Alternative product/process control methodologies

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager		
Activity Manager		
Cost Account Manager		
Project Control Analyst		

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	<i>R. Powell</i>	9/23/94
Activity Manager	TBD	
Cost Account Manager	<i>R. Powell for Tom W Crawford</i>	9/23/94
Project Control Analyst	<i>Shawn L. Crowe</i>	9/25/94

FDS Number

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.03 High Level Waste 1.1.1.3.03.05 HLW Facility	2. DATE PREPARED September 23, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.03.05.04/VI	5. WBS ELEMENT TITLE Conceptual Design/Advanced Conceptual Design							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1240-0-AE							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER / TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1) 4.2.2.2 Immobilize HLW and TRU Waste 4.2.2.3 Prepare Cs/Sr Capsules for Disposal 4.2.2.4 Interim Store IHLW 4.2.2.5	12. BUDGET AND REPORTING NUMBER(S) <table> <tr> <td>Expense</td> <td>Capital</td> <td>Line Items</td> </tr> <tr> <td>EW3130010</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Items	EW3130010		
Expense	Capital	Line Items						
EW3130010								

13. ELEMENT DESCRIPTION**A. COST CONTENT (Escalated Dollars)**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING			6382
CENRTC			
GPP			
LINE ITEM			
TOTAL			6382

B. TECHNICAL BASES

Goals & objectives:

- Provide design, engineering trade studies and technical support needed to create a conceptual design and supporting documents for a HLW vitrification and interim storage facility capable of producing and storing a qualified waste form product. (HLO5033 and HLO5035)

Status of Design Documentation:

This facility is in the engineering trade study phase. Preliminary functions and requirements for the HLW facility(ies) are documented in DOE/RL-92-60, Rev 1, 31 March 1994. Conceptual design is scheduled to begin March 1997.

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

- M-51-03-T1 Submit conceptual design of the HLW vitrification facility (HLO5033B)
- Conceptual Design Guides
- Conceptual Design Report
- Conceptual cost estimates
- Design review packages
- Safety analysis and permitting data input and review
- Design Data Needs Report

C. STATEMENT OF WORK

Required activities:

- Related activities that must be completed before this activity can start are Define Design Feed Specs (1.1.1.3.03.04.01), Define Design Products (1.1.1.3.03.04.02), and Define Process System Requirements and Concepts (1.1.1.3.03.04.03). A related activity that must be completed before this activity can finish is Select Reference Melter (HLO2006).
- Prepare HLW Conceptual Design (HLO5033) leading to Milestone M-51-03-T1 Submit conceptual design of the HLW vitrification facility (HLO5033B).
- Prepare HLW Advanced Conceptual Design (HLO5035)

Technologies to be assessed: N/A

Options to be considered:

- Alternative process systems and equipment
- Canister handling concepts
- Facility type/degree of integration
- Capsule preparation facility concepts
- Alternative analytical facility configurations
- Alternative interim storage facility concepts

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager		
Activity Manager		
Cost Account Manager		
Project Control Analyst		

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	<i>R. Powell</i>	<i>9/23/94</i>
Activity Manager	<i>TBD</i>	
Cost Account Manager	<i>TBD</i>	
Project Control Analyst	<i>Sherr L. Lowe</i>	<i>9/25/94</i>

FDS Number _____

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**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.03 High Level Waste (M&O Contractor)	2. DATE PREPARED September 15, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.03.06/V	5. WBS ELEMENT TITLE HWVP Project Closeout							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1240-0-XX							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1)	12. BUDGET AND REPORTING NUMBER <table> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td>EW3130010</td> <td></td> <td></td> </tr> </table>		Expense	Capital	Line Item	EW3130010		
Expense	Capital	Line Item						
EW3130010								

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)	FY 1998 \$(000)	FY 1999 \$(000)	FY 2000 \$(000)	FY 2001 \$(000)
OPERATING							
CENRTC							
GPP							
LINE ITEM	6,201						
TOTAL	6,201	0	0		-		

B. TECHNICAL BASES

Goals & objectives:

- Provide an orderly closeout of HWVP project Activity

Major end-item deliverables:

- Completion of the TWRS Office building
- Documentation of terminated activities associated with the project management, design, permitting, startup/operations, safety/health, and technology development functions of the HWVP project
- Completion of the mechanical site utilities subcontract
- Termination of the canister storage building and batch plant subcontracts
- Tri-Party Agreement milestone # HWVP M-03

Acceptance criteria:

- Acceptance of the TWRS office building
- Termination of all HWVP project activities

C. STATEMENT OF WORK

Required activities over lifetime:

- Complete the TWRS office building and mechanical site utilities subcontracts/(M & O Contractor)
- Terminate other HWVP subcontracts/(M & O Contractor)
- Complete Documentation and storage of HWVP project files/(M & O Contractor)
- Transition staff to other TWRS activities/(M & O Contractor)

Interfaces: N/A

Technologies to be assessed: N/A

Options to be considered: N/A

D. OTHER LEGAL DRIVERS AND ORDER REQUIREMENTS

- Revised Tri-Party Agreement, January 25, 1994, Milestone # HWVP M-03

**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.03 High Level Waste 1.1.1.3.03.06 HWVP Closeout	2. DATE PREPARED August 31, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.03.06.01.01.01/VIII	5. WBS ELEMENT TITLE Project Management							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1240-1-XX							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER / TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1)	12. BUDGET AND REPORTING NUMBER(S) <table> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td></td> <td></td> <td>39EW31500</td> </tr> </table>		Expense	Capital	Line Item			39EW31500
Expense	Capital	Line Item						
		39EW31500						

13. ELEMENT DESCRIPTION**A. COST CONTENT (Escalated Dollars)**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING			
CENRTC			
GPP			
LINE ITEM	717.9		
TOTAL	717.9*		

* FY94 Line Item Carryover

B. TECHNICAL BASESGoals & objectives:

Provide management and oversight for the orderly suspension of HWVP project activities.

Status of Design Documentation: N/A

1.1.1.3.03.06.01.01.01

A9-103

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):
Not applicable.

C. STATEMENT OF WORK

Required activities:

- Management and clerical support for closeout activities as required

Technologies to be assessed:

Not applicable.

Options to be considered:

Not applicable.

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	RW Powell	
Project Manager	RA Smith	
Cost Account Manager	RA Smith	
Project Control Analyst	CR Ritter	

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	RW Powell <i>RW Powell</i>	9/23/94
Project Manager	RA Smith <i>RA Smith</i>	9/23/94
Cost Account Manager	RA Smith <i>RA Smith</i>	9/23/94
Project Control Analyst	CR Ritter <i>CR Ritter</i>	9/23/94

FDS Number

3V1101

**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.03 High Level Waste 1.1.1.3.03.06 HWVP Closeout	2. DATE PREPARED August 31, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.03.06.01.01.04/VIII	5. WBS ELEMENT TITLE Construction Management							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1240-1-XX							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1)	12. BUDGET AND REPORTING NUMBER(S) <table> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td></td> <td></td> <td>39EW31500</td> </tr> </table>		Expense	Capital	Line Item			39EW31500
Expense	Capital	Line Item						
		39EW31500						

13. ELEMENT DESCRIPTION**A. COST CONTENT (Escalated Dollars)**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING			
CENRTC			
GPP			
LINE ITEM	20.8		
TOTAL	20.8*		

* FY94 Line Item Carryover

B. TECHNICAL BASESGoals & objectives:

Provide interface with direction for UCAT closeout activities including turnover of equipment and site of WHC.

Status of Design Documentation: N/A

1.1.1.3.03.06.01.01.04

A9-105

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):
Not applicable.

C. STATEMENT OF WORK

Required activities:

- Coordinate transfer of equipment and materials and turnover of the site from UCAT to WHC.

Technologies to be assessed:

Not applicable.

Options to be considered:

Not applicable.

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	RW Powell	
Project Manager	RA Smith	
Cost Account Manager	RA Smith	
Project Control Analyst	CR Ritter	

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	RW Powell <i>RW Powell</i>	9/23/94
Project Manager	RA Smith <i>RA Smith</i>	9/23/94
Cost Account Manager	RA Smith <i>RA Smith</i>	9/23/94
Project Control Analyst	CR Ritter <i>CR Ritter</i>	9/23/94

FDS Number

3V1104

**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.03 High Level Waste 1.1.1.3.03.06 HWVP Closeout	2. DATE PREPARED August 31, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.03.06.01.02.01/VIII	5. WBS ELEMENT TITLE Project Integration							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1240-1-XX							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1)	12. BUDGET AND REPORTING NUMBER(S) <table> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td></td> <td></td> <td>39EW31500</td> </tr> </table>		Expense	Capital	Line Item			39EW31500
Expense	Capital	Line Item						
		39EW31500						

13. ELEMENT DESCRIPTION**A. COST CONTENT (Escalated Dollars)**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING			
CENRTC			
GPP			
LINE ITEM	109.9		
TOTAL	109.9 *		

* FY94 Line Item Carryover

B. TECHNICAL BASESGoals & objectives:

Provide project control

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):
Not applicable.

C. STATEMENT OF WORK

Required activities:

- Monthly and Quarterly Reports including:
Site Management System
Project Tracking System
Project Managers Monthly and Quarterly Report
- Change Control as required
- Scheduling support as required
- Liaison support to design and construction contractors
- Transition staff to other TWRS activities

Technologies to be assessed:

Not applicable.

Options to be considered:

Not applicable.

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	RW Powell	
Project Manager	RA Smith	
Cost Account Manager	D Marshall	
Project Control Analyst	CR Ritter	

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	RW Powell <i>RW Powell</i>	9/23/94
Project Manager	RA Smith <i>RA Smith</i>	9/23/94
Cost Account Manager	D Marshall <i>D Marshall</i>	9/23/94
Project Control Analyst	CR Ritter <i>CR Ritter</i>	9/23/94

FDS Number

3V1201

Tank Waste Remediation System Work Breakdown Structure Dictionary.

1. PROGRAM TITLE/PARTICIPANT	2. DATE PREPARED	3. IDENTIFICATION NUMBER
1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.03 High Level Waste 1.1.1.3.03.06 HWVP Closeout	August 31, 1994	DE-ACO6-87RL10930
4. WBS ELEMENT CODE/LEVEL	5. WBS ELEMENT TITLE	
1.1.1.3.03.06.01.03.01/VIII	Systems Engineering Management	
6. WBS INDEX LINE NO.	7. CURRENT REV NO.	8. EFFECTIVE REVISION DATE
Not used	0	September 23, 1994
9. APPROVED CHANGES	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER	
N/A	1240-1-XX	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1)	12. BUDGET AND REPORTING NUMBER(S)	
	Expense Capital	Line Item 39EW31500

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING			
CENRTC			
GPP			
LINE ITEM	220.6		
TOTAL	220.6 *		

*** FY94 Line Item Carryover**

B. TECHNICAL BASES

Goals & objectives:

Provide review and comment on as-built and design media, coordinate resolution of comments on final drawings and test results, interface with and provide direction for Fluor/Ucat records transfer, archiving of as-built and design media, and provide warrantee engineering support to assure that maintenance is done on equipment as specified in warrantee and that equipment failures are repaired by vendor under terms of warrantee.

Status of Design Documentation:

Title II Design media being archived.

1.1.1.3.03.06.01.03.01

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):
Not applicable.

C. STATEMENT OF WORK

Required activities:

- Review/comment on as-built drawings
- Input of drawing, vendor information, design calculations, etc. into the WHC document system.
- Warrantee engineering support

Technologies to be assessed:

Not applicable.

Options to be considered:

Not applicable.

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	RW Powell	
Project Manager	RA Smith	
Cost Account Manager	RA Smith	
Project Control Analyst	CR Ritter	

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	RW Powell <i>R. Powell</i>	9/23/94
Project Manager	RA Smith <i>RA Smith</i>	9/23/94
Cost Account Manager	RA Smith <i>RA Smith</i>	9/23/94
Project Control Analyst	CR Ritter <i>C. R. Ritter</i>	9/23/94

FDS Number

3V1301

**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.03 High Level Waste 1.1.1.3.03.06 HWVP Closeout	2. DATE PREPARED August 31, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.03.06.03.01.04/VIII	5. WBS ELEMENT TITLE Field Engineering and Inspection							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1240-1-XX							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1)	12. BUDGET AND REPORTING NUMBER(S) <table> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td></td> <td></td> <td>39EW31500</td> </tr> </table>		Expense	Capital	Line Item			39EW31500
Expense	Capital	Line Item						
		39EW31500						

13. ELEMENT DESCRIPTION**A. COST CONTENT (Escalated Dollars)**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING			
CENRTC			
GPP			
LINE ITEM	989.8		
TOTAL	989.8 *		

* FY94 Line Item Carryover

B. TECHNICAL BASESGoals & objectives:

Complete as-building of Design media, transfer/ship office equipment used during Design to WHC, provide testing support for fire water system, and transfer project record documents to WHC for archiving.

Status of Design Documentation:

Title II Design media being archived.

1.1.1.3.03.06.03.01.04

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

C. STATEMENT OF WORK

Required activities:

- Complete as-building of design media
- Transfer/ship office equipment to WHC
- Provide testing support
- Transfer project record documents to WHC

Technologies to be assessed:

N/A

Options to be considered:

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	RW Powell	
Project Manager	RA Smith	
Cost Account Manager	RA Smith	
Project Control Analyst	CR Ritter	

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	RW Powell <i>RW Powell</i>	9/23/94
Project Manager	RA Smith <i>RA Smith</i>	9/23/94
Cost Account Manager	RA Smith <i>RA Smith</i>	9/23/94
Project Control Analyst	CR Ritter <i>C. R. Ritter</i>	9/23/94

FDS Number

3V3E01

**Tank Waste Remediation System Work Breakdown Structure
Dictionary.**

1. PROGRAM TITLE/PARTICIPANT 1.1.1 TWRS Program 1.1.1.3 Process Tank Waste 1.1.1.3.03 High Level Waste 1.1.1.3.03.06 HWVP Closeout	2. DATE PREPARED August 31, 1994	3. IDENTIFICATION NUMBER DE-ACO6-87RL10930						
4. WBS ELEMENT CODE/LEVEL 1.1.1.3.03.06.03.02.01/VIII	5. WBS ELEMENT TITLE Construction							
6. WBS INDEX LINE NO. Not used	7. CURRENT REV NO. 0	8. EFFECTIVE REVISION DATE September 23, 1994						
9. APPROVED CHANGES N/A	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER 1240-1-XX							
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV. 1)	12. BUDGET AND REPORTING NUMBER(S) <table> <tr> <td>Expense</td> <td>Capital</td> <td>Line Item</td> </tr> <tr> <td></td> <td></td> <td>39EW31500</td> </tr> </table>		Expense	Capital	Line Item			39EW31500
Expense	Capital	Line Item						
		39EW31500						

13. ELEMENT DESCRIPTION**A. COST CONTENT (Escalated Dollars)**

	FY 1995 \$(000)	FY 1996 \$(000)	FY 1997 \$(000)
OPERATING			
CENRTC			
GPP			
LINE ITEM	4,140.9		
TOTAL	4,140.9*		

* FY94 Line Item Carryover

B. TECHNICAL BASESGoals & objectives:

Complete as-built drawings and submit to WHC, turnover of documentation and records to WHC for archiving, turnover of office equipment and site, resolution of subcontractor claims and settlement of claims, close out contracts, and demobilize.

Status of Design Documentation: N/A

1.1.1.3.03.06.03.02.01

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

C. STATEMENT OF WORK

Required activities:

- Complete final negotiation of claims
- Prepare/submit as-built drawings to WHC
- Closeout of contract
- Relocation

Technologies to be assessed:

N/A

Options to be considered:

D. AUTHORIZATION

INITIAL PLANNING		
Title	Authority to Institute Planning (Name/Signature)	Date
Program Element Manager	RW Powell	
Project Manager	RA Smith	
Cost Account Manager	RA Smith	
Project Control Analyst	CR Ritter	

COST ACCOUNT AUTHORIZATION		
Title	Cost Account Plan Acceptance (Name/Signature)	Date
Program Element Manager	RW Powell <i>RW Powell</i>	9/24/94
Project Manager	RA Smith <i>RA Smith</i>	9/23/94
Cost Account Manager	RA Smith <i>RA Smith</i>	9/23/94
Project Control Analyst	CR Ritter <i>C.R. Ritter</i>	9/23/94

FDS Number

3V3F01

APPENDIX B
RESPONSIBILITY ASSIGNMENT MATRIX

TWRS RESPONSIBILITY ASSIGNMENT MATRIX

<u>CWBS NUMBER</u>	<u>TITLE</u>	<u>WHC RESPONSIBILITY</u>	<u>DOE-RL RESPONSIBILITY</u>
1.1	TWRS		
1.1.1	TWRS PROGRAM		J.D. WAGONER
1.1.1.1	MANAGE PROGRAM	A.L. TREGO	T.R. SHERIDAN
1.1.1.1.01	PROGRAM MANAGEMENT & ADMINISTRATION	W.T. ALUNKAL	E.W. HIGGINS
1.1.1.1.01.01	FORMULATION	R.D. WOJTASEK	W. F. EDWARDS
1.1.1.1.01.02	EXECUTION	K.N. JORDAN	
1.1.1.1.01.03	EVALUATION		
1.1.1.1.01.04	PROGRAM MANAGEMENT SYSTEMS		
1.1.1.2	MANAGE TANK WASTE		
1.1.1.2.01	TANK FARM OPERATIONS & MAINTENANCE		A.B. SIDPARA
1.1.1.2.01.01	TECHNICAL INTEGRATION & PLANNING		
1.1.1.2.01.02	TANK FARM COMPLIANCE & CORRECTIVE ACTIONS	D.M. LUCOFF	
1.1.1.2.01.03	INDUSTRIAL HYGIENE		
1.1.1.2.01.03	TANK FARM 200 EAST STORAGE FACILITY		
1.1.1.2.01.04	TANK FARM 200 WEST STORAGE FACILITY		
1.1.1.2.01.05	TANK FARM SST STABILIZATION		
1.1.1.2.01.06	VADOSE ZONE CHARACTERIZATION		
1.1.1.2.01.06	TANK FARM EVAPORATOR/AW&AP TANK FARM OPERATIONS		
1.1.1.2.01.07	TANK FARM RETIRED FACILITIES		
1.1.1.2.02	WASTE TANK SAFETY	M. A. PAYNE	R.E. GERTON
1.1.1.2.02.01	WASTE TANK TECHNICAL INTEGRATION & PLANNING		
1.1.1.2.02.02	WASTE TANK HYDROGEN MITIGATION		
1.1.1.2.02.03	WASTE TANK FERROCYNANIDE SAFETY PROGRAM		
1.1.1.2.02.04	WASTE TANK FLAMMABLE GAS SAFETY PROGRAM		
1.1.1.2.02.05	WASTE TANK ORGANIC SAFETY PROGRAM		
1.1.1.2.02.06	WASTE TANK HIGH-HEAT SAFETY PROGRAM		
1.1.1.2.02.07	MISCELLANEOUS UNDERGROUND STORAGE TANKS		
1.1.1.2.02.08	WASTE TANK VAPOR RESOLUTION		
1.1.1.2.02.09	WASTE TANK NUCLEAR CRITICALITY		
1.1.1.2.02.10	OTHER WASTE TANK SAFETY ISSUES		
1.1.1.2.02.11	WASTE TANK HYDROXIDE CONTROL		
1.1.1.2.03	TANK FARM UPGRADES	J.D. THOMSON	R. L. LONG JR.
1.1.1.2.03.01	TECHNICAL INTEGRATION & PLANNING		
1.1.1.2.03.02	CONFIGURATION MANAGEMENT		
1.1.1.2.03.03	LIFE MANAGEMENT		
1.1.1.2.03.04	W236A MULTI-FUNCTION WASTE TANK FACILITY		
1.1.1.2.03.06	INSTRUMENTATION & CONTROL / ELECTRICAL UPGRADES		
1.1.1.2.03.07	W314 TANK FARM RESTORATION/SAFE OPERATIONS		
1.1.1.2.03.09	MECHANICAL UPGRADES		
1.1.1.2.03.10	W030 VENTILATION UPGRADES		
1.1.1.2.03.16	FACILITY UPGRADES		
1.1.1.2.03.17	W188 RADIOLOGICAL SUPPORT FACILITY		

TWRS RESPONSIBILITY ASSIGNMENT MATRIX (CONTINUED)

<u>CWBS NUMBER</u>	<u>TITLE</u>	<u>WHC RESPONSIBILITY</u>	<u>DOE-RL RESPONSIBILITY</u>
1.1.1.2.04	CHARACTERIZATION		
1.1.1.2.04.01	TECHNICAL INTEGRATION & PLANNING		
1.1.1.2.04.02	TECHNOLOGY DEVELOPMENT & APPLIED ENGINEERING		
1.1.1.2.04.03	FIELD SAMPLING & MEASURE.		
1.1.1.2.04.04	ANALYTICAL INTEGRATION		
1.1.1.2.04.05	DATA EVALUATION & REPORTING		
1.1.1.2.05	WASTE RETRIEVAL		
1.1.1.2.05.01	TECHNICAL INTEGRATION & PLANNING		
1.1.1.2.05.03	FACILITY OPERATIONS		
1.1.1.2.05.04	SYSTEM DEFINITION		
1.1.1.2.05.05	W151 101AZ RETRIEVAL		
1.1.1.2.05.06	W211 INITIAL RETRIEVAL. SYSTEM		
1.1.1.2.05.07	FINAL DOUBLE SHELL TANK RETRIEVAL SYS.		
1.1.1.2.05.08	W315 PILOT SCALE RETRIEVAL		
1.1.1.2.05.09	W320 100-C SLUICING		
1.1.1.2.05.10	SST TRAINING & TEST FACILITY		
1.1.1.2.05.11	W340 LONG REACH ARM		
1.1.1.2.05.12	SINGLE SHELL TANK CLOSURE DEMONSTRATION		
1.1.1.2.05.13	SINGLE SHELL TANK CLOSURE		
1.1.1.2.05.14	MISCELLANEOUS UNDERGROUND STORAGE TANK RETRIEVAL SYSTEMS		
1.1.1.3	PROCESS TANK WASTE		
1.1.1.3.01	WASTE PRETREATMENT		
1.1.1.3.01.01	TECHNICAL INTEGRATION & PLANNING		
1.1.1.3.01.02	TECHNOLOGY DEVELOPMENT & APPLIED ENGINEERING		
1.1.1.3.01.03	FACILITY OPERATIONS		
1.1.1.3.01.04	SYSTEM DEFINITION		
1.1.1.3.01.05	W236B PRETREATMENT FACILITY- INITIAL PRETREATMENT MODULE		
1.1.1.3.01.06	HIGH LEVEL WASTE PRETREATMENT		
1.1.1.3.02	LOW LEVEL WASTE		
1.1.1.3.02.01	TECHNICAL INTEGRATION & PLANNING		
1.1.1.3.02.02	TECHNOLOGY DEVELOPMENT & APPLIED ENGINEERING		
1.1.1.3.02.03	FACILITY OPERATIONS		
1.1.1.3.02.04	SYSTEM DEFINITION		
1.1.1.3.02.05	LOW LEVEL WASTE FACILITY		
1.1.1.3.02.06	GROUT FACILITIES		
1.1.1.3.03	HIGH LEVEL WASTE		
1.1.1.3.03.01	TECHNICAL INTEGRATION & PLANNING		
1.1.1.3.03.02	TECHNOLOGY DEVELOPMENT & APPLIED ENGINEERING		
1.1.1.3.03.03	FACILITY OPERATIONS		
1.1.1.3.03.04	SYSTEM DEFINITION		
1.1.1.3.03.05	HIGH LEVEL WASTE FACILITY		
1.1.1.3.03.06	HANFORD WASTE VITRIFICATION PLANT PROJECT CLOSEOUT		

APPENDIX C
PROGRAM ELEMENT SCHEDULES

[illegible]

Activity ID	Activity Description	Early Start	Early Finish	FY94	FY95	FY96	FY97
XLLBLP03	LL TO BL: LLW FISCAL YEAR 98 ADS	06MAR96	05MAR96	J	A	S	O
XLLBLP04	LL TO BL: LLW FY99 ADS SUBMITTAL	06MAR97	05MAR97	J	A	S	O
XLLBLS01	LL TO BL: LLW MYWP INPUT FOR TWRS	19MAY95	18MAY95	J	A	S	O
XLLBLS02	LL TO BL: LLW ADS NARRATIVE-LT010301	18MAY95	17MAY95	J	A	S	O
1.1.1.01.01.02 Systems Engineering							
AAA500	PERFORM RISK MANAGEMENT	01OCT97	30SEP97	J	A	S	O
AAA600	ESTABLISH PROGRAM LEVEL TECH BASELINE PH	01OCT97	30SEP97	J	A	S	O
AAA700	DEVELOP AND MAINTAIN TWRS MODEL	01OCT97	30SEP97	J	A	S	O
AAA800	PERFORM STRATEGIC ANALYSIS	01OCT97	30SEP97	J	A	S	O
ADH100	MANAGE TWRS TESTING & EVALUATION	01OCT97	30SEP97	J	A	S	O
ADL100	IMPLEMENT SYSTEM ENGINEERING	01OCT97	30SEP97	J	A	S	O
ADL200	PERFORM TWRS SYSTEM ENGINEERING	01OCT97	30SEP97	J	A	S	O
ADL300	PROVIDE SYSTEM ENGINEERING TOOLS	01OCT97	30SEP97	J	A	S	O
SEW9511	PREPARE FUNCTIONAL REQUIREMENTS	03OCT94*	29SEP95	J	A	S	O
SEW9512	ESTABLISH TECHNICAL REQUIREMENTS	03OCT94*	31JAN95	J	A	S	O
SEW9512D	ISSUE TECH REQ SPECS FOR DOE APRVL		31MAR95	J	A	S	O
SEW9513	PREPARE DESIGN REQUIREMENT'S BASELINE - 95	03OCT94*	29SEP95	J	A	S	O
SEW9513A	ISS W-236 MULTI-TANK WASTE FACIL DESIGN REQ		30JUN95	J	A	S	O
SEW9513B	ISS W-58 CROSS-SITE TRANSFER LINE DESIGN		02AUG95	J	A	S	O
SEW9513C	ISSUE W-211 INITIAL RETRIEVAL DESIGN REQ DOC		31AUG95	J	A	S	O
SEW9521	PROVIDE SE POLICY & PROCEDURES - 95	03OCT94*	29SEP95	J	A	S	O
SEW9521A	DNFSB 3.7.G - COMPLETE REVISED SEMP		29SEP95	J	A	S	O
SEW9521B	DNFSB 3.7.F - REVISED IMPL PROCEDURES		29SEP95	J	A	S	O
SEW9522	PROVIDE SE TRAINING - 95	03OCT94	29SEP95	J	A	S	O
SEW9523W	PROVIDE SYS ENGR INFO SYSTEMS - 95	03OCT94	29SEP95	J	A	S	O
SEW9523X	PROVIDE SYS ENGR RMACS - 95	03OCT94	29SEP95	J	A	S	O
SEW9523Y	PROVIDE SYS ENGR IDMMMS - 95	03OCT94	29SEP95	J	A	S	O
SEW9523Z	PROVIDE SYS ENGR DECISION ANALYSIS - 95	03OCT94	29SEP95	J	A	S	O
SEW9525	PROVIDE DECISION MANAGEMENT - 95	03OCT94*	29SEP95	J	A	S	O
SEW9526	PROVIDE RISK MANAGEMENT - 95	03OCT94*	29SEP95	J	A	S	O
SEW9526A	ISSUE RISK ASSESSMENT REPORT		30JUN95	J	A	S	O
SEW9527	SE PUBLIC INVOLVEMENT - 95	03OCT94*	29SEP95	J	A	S	O
SEW9528	PROVIDE SE INTERFACE MGMT - 95	03OCT94*	29SEP95	J	A	S	O
SEW9529	PROVIDE SE INFORMATION MGMT - 95	03OCT94	29SEP95	J	A	S	O
SEW952A	PROVIDE PROGRAM MODELS - 95	03OCT94	29SEP95	J	A	S	O
SEW952AA	CMPLT TOP LVL ANIMATION OF UPDATE BSD		01DEC94	J	A	S	O
SEW952B	ESTABLISH PROJECT STRATEGY - 95	03OCT94*	29SEP95	J	A	S	O

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Activity ID	Activity Description	Early Start	Early Finish	FY94	FY95	FY96	FY97
BMW9770	PROGRAM ADMIN PLANNING	01OCT96	30SEP97	J	A	S	O
BMW9775	PROG ADMIN: TRAINING, SUPPORT, SUPPLIES,	01OCT96	30SEP97	J	A	S	O
BMWBS100	BUSINESS SYSTEMS UPGRADES - LOE	01OCT93	30SEP94	J	A	S	O
BMWFA005	FUNDS MANAGEMENT - LOE	01OCT93	30SEP94	J	A	S	O
BMWHR010	HUMAN RESOURCES/ADMIN/COMMUNICATIONS -	01OCT93	30SEP94	J	A	S	O
1.1.1.01.02.02 Technology Development Program Office - Pacific N							
ABE100		01OCT97	30SEP97	J	A	S	O
ABE200		01OCT97	30SEP97	J	A	S	O
DMW590	DOE MGMT (HQ/RL)/GSSC	01OCT93	30SEP94	J	A	S	O
PT952010	TDPO PROGRAM MANAGEMENT	03OCT94	29SEP95	J	A	S	O
PT952020	FY95 TDPO PLANNING	03OCT94*	31MAR95	J	A	S	O
PT952021	CONTINUE FY95 TDPO PLANNING	03APR95	29SEP95	J	A	S	O
PT952030	FY95 TECHNOLOGY MANAGEMENT	03OCT94	31AUG95	J	A	S	O
PT952031	CONTINUE FY95 TECHNOLOGY MANAGEMENT	01SEP95	29SEP95	J	A	S	O
PT952040	TDPO SUPPORT	03OCT94	29SEP95	J	A	S	O
PT952050	SYSTEMS INTEGRATION SUPPORT	03OCT94	29SEP95	J	A	S	O
PT952060	FY95 PROGRAM SUPPORT	03OCT94*	01MAY95	J	A	S	O
PT952061	CONTINUE FY95 PROGRAM SUPPORT	02MAY95*	31AUG95	J	A	S	O
PT952062	CONTINUE FY95 PROGRAM SUPPORT	01SEP95*	29SEP95	J	A	S	O
PT952070	ADVANCED TANK WASTE TECHNOLOGY	03OCT94	29SEP95	J	A	S	O
PT952080	PROCESS SCIENCE & ENGINEERING SEMINARS	03OCT94	29SEP95	J	A	S	O
PT952090	PEER REVIEWS	03OCT94	29SEP95	J	A	S	O
PT952100	TWRS TECH PRIMER, GRAPHICS, INFORMATION	03OCT94	29SEP95	J	A	S	O
PT952110	TWRS TECHNOLOGY QUALITY MANAGEMENT	03OCT94	29SEP95	J	A	S	O
PT95M01	FY95 UPDATE OF ITP		31MAR95	J	A	S	O
PT95M02	SUBMITTAL OF FY96 WORK PLAN		31AUG95	J	A	S	O
PT95M05	COORDINATE PREP OF FY96 WORK PLANS		29SEP95	J	A	S	O
PT962010	TDPO PROGRAM MANAGEMENT	02OCT95	30SEP96	J	A	S	O
PT962020	FY96 TDPO PLANNING	02OCT95	29MAR96	J	A	S	O
PT962021	CONTINUE FY95 TDPO PLANNING	01APR96	27SEP96	J	A	S	O
PT962030	FY96 TECHNOLOGY MANAGEMENT	02OCT95	29AUG96	J	A	S	O
PT962031	CONTINUE FY96 TECHNOLOGY MANAGEMENT	30AUG96	27SEP96	J	A	S	O
PT962040	TDPO SUPPORT	02OCT95	30SEP96	J	A	S	O
PT962050	SYSTEMS INTEGRATION SUPPORT	02OCT95	30SEP96	J	A	S	O
PT962060	FY96 PROGRAM SUPPORT	02OCT95	29APR96	J	A	S	O
PT962061	CONTINUE FY96 PROGRAM SUPPORT	30APR96	29AUG96	J	A	S	O
PT962062	CONTINUE FY96 PROGRAM SUPPORT	30AUG96	27SEP96	J	A	S	O

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Activity ID	Activity Description	Early Start	Early Finish	FY94	FY95	FY96	FY97
PTD4301	CONTINUE TDPO IMPLEMENTATION	12SEP94	30SEP94	J	A	S	O
PTD4400	TDPO SUPPORT	01OCT93	30SEP94	A			
PTD6010	TDA-94-150 ISSUE PNL TWRS PROJ CONT SYS		30SEP94*				
PTD6030	TDA-94-152 ISSUE FY95 TECH DEV WORK PLAN TO		09SEP94*				
1.1.1.01.02.03 Project Business Management/Site Integration							
ABD100		01OCT97	30SEP97				
ABD120	PERFORM TWRS SITE INTEGRATION PH1	01OCT97	30SEP97				
PJ9505	CNTRL PROJ SUPPT TO TWRS - MGMT-95	03OCT94	29SEP95				
PJ9510	CNTRL PROJ SUPPT TO TWRS - TECH SYS-95	03OCT94	29SEP95				
PJ9515	CNTRL PROJ SUPPT TO TWRS - BASELINE-95	03OCT94	29SEP95				
PJ9520	CNTRL PROJ SUPPT TO TWRS - ADMIN-95	03OCT94	29SEP95				
PJ9525	TK WASTE MGT/SUPPT TO TWRS MGMT FY95	03OCT94*	29SEP95				
PJ9530	TK WASTE MGT/SUPPT TO TWRS INT FY95	03OCT94	29SEP95				
PJ9535	TWRS SITE INTEGRATION - WHC-95	03OCT94*	29SEP95				
PJ9540	TWRS SITE INTEGRATION - FLUOR	03OCT94*	28FEB95				
PJ95M01	FINAL TWRS MASTER SITE PLAN COMPLETED		30JUN95				
PJ95M02	UPDATE OF TWRS MASTER SITE PLAN		29SEP95				
PJ9605	CNTRL PROJ SUPPT TO TWRS - MGMT-96	02OCT95	30SEP96				
PJ9610	CNTRL PROJ SUPPT TO TWRS - TECH SYS-95	02OCT95	30SEP96				
PJ9615	CNTRL PROJ SUPPT TO TWRS - BASELINE-96	02OCT95	30SEP96				
PJ9620	CNTRL PROJ SUPPT TO TWRS - ADMIN-96	02OCT95	30SEP96				
PJ9625	TK WASTE MGT/SUPPT TO TWRS MGMT FY95	02OCT95	30SEP96				
PJ9630	TK WASTE MGT/SUPPT TO TWRS INT FY95	02OCT95	30SEP96				
PJ9635	TWRS SITE INTEGRATION - WHC-96	02OCT95	30SEP96				
PJ9645	TWRS SITE INTEGRATION - ICF KH-96	02OCT95	30SEP96				
PJ96M01	COMPLETE '96 UPDATE OF TWRS MASTER SITE		30SEP96				
PJ9705	CNTRL PROJ SUPPT TO TWRS - MGMT-97	01OCT96	30SEP97				
PJ9710	CNTRL PROJ SUPPT TO TWRS - TECH SYS-97	01OCT96	30SEP97				
PJ9715	CNTRL PROJ SUPPT TO TWRS - BASELINE-97	01OCT96	30SEP97				
PJ9720	CNTRL PROJ SUPPT TO TWRS - ADMIN-97	01OCT96	30SEP97				
PJ9725	TK WASTE MGT/SUPPT TO TWRS MGMT FY95	01OCT96	30SEP97				
PJ9730	TK WASTE MGT/SUPPT TO TWRS INT FY95	01OCT96	30SEP97				
PJ9735	TWRS SITE INTEGRATION - WHC-97	01OCT96	30SEP97				
PJ9745	TWRS SITE INTEGRATION - ICF KH-97	01OCT96	30SEP97				
PJ97M01	COMPLETE '97 UPDATE OF TWRS MASTER SITE		30SEP97				
PJW0001	TWRS PROJECTS MANAGEMENT	01OCT93	30SEP94				
PJW0005	PROJECT ADMINISTRATION & TECHNICAL	01OCT93	30SEP94				

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Activity ID	Activity Description	Early Start	Early Finish	FY94	FY95	FY96	FY97
XABHLP001	PM TO HL: ROD TO HLW PRELIM DESIGN	30SEP96	27SEP96	J	A	S	O
XABLOP000	PM TO LL: ROD TO LW TITLE I/II/III	30SEP96	27SEP96				
XABLOP001	PM TO LL: ROD TO LLW TITLE I/II/III	30SEP96	27SEP96				
XABDP000	PM TO WP: ROD TO TITLE I - HLW PRETREAT	30SEP96	27SEP96				
XABR0P000	PM TO WR: ROD TO D/C SST WR SYSTEM	30SEP96	27SEP96				
XABS0P001	PM TO OM: ROD TO FINAL SAFE OPS - EAST IF	30SEP96	27SEP96				
XCHPMS01	CH TO PM: HLW/LLW CHARACTERIZATION DATA	26SEP96	25SEP96				
XPXABS004	WP TO PM: APPLIED TECH EVAL TO TWRS EIS	02OCT95	29SEP95				
1.1.1.01.02.05 Permits							
ABGT00		01OCT97	30SEP97				
RC950501	PREPARE ENVIRONMENTAL COMPLIANCE	03OCT94	31MAR95				
RC9505011	CONTINUE ENVIRONMENTAL COMPLIANCE	03APR95	29SEP95				
RC9505015	DEVELOP INPUT TO LDR ANNUAL REPORT	03OCT94	31MAR95				
RC950502	TWRS WIDE DELISTING	03OCT94	29SEP95				
RC95M01	M-26-01E LDR ANNUAL REPORT		31MAR95				
RC95M02	TWRS MONTHLY PERMIT STATUS REPORT		29SEP95				
RC960501	PROVIDE MODIFICATION TO TWRS PERMITS	02OCT95	30SEP96				
RC96M01	COMPLETE PLAN FOR MAPPING TWRS WASTE		30SEP96				
RC970501	CONTINUE MODIFICATION TO TWRS PERMITS	01OCT96	30SEP97				
XABS0P001	PM TO OM: RCRA PERMIT TO FNL SAFE FACIL OP	01OCT96	30SEP96				
1.1.1.01.02.07 Communications and Administration							
ADF110	CONDUCT EMPLOYEE CONCERNS/SUGGESTIONS	01OCT97	30SEP97				
ADM100	PERFORM TWRS COMMUNICATIONS & BLDG	01OCT97	30SEP97				
CBW9505	COMMUNICATION, DISPLAYS, PRESENTATIONS	03OCT94	29SEP95				
CBW9510	ORGANIZATIONAL DEVELOPMENT	03OCT94	29SEP95				
CBW9515	EMPLOYEE INVOLVEMENT PROGRAMS	03OCT94	29SEP95				
CBW9605	FY96 COMMUNICATION, DISPLAYS,	02OCT95	30SEP96				
CBW9610	FY96 ORGANIZATIONAL DEVELOPMENT	02OCT95	30SEP96				
CBW9615	FY96 EMPLOYEE INVOLVEMENT PROGRAMS	02OCT95	30SEP96				
CBW9705	FY97 COMMUNICATION, DISPLAYS,	01OCT96	30SEP97				
CBW9710	FY97 ORGANIZATIONAL DEVELOPMENT	01OCT96	30SEP97				
CBW9715	FY97 EMPLOYEE INVOLVEMENT PROGRAMS	01OCT96	30SEP97				
1.1.1.01.02.08 Quality Assurance							
ADAT00		03OCT97	02OCT97				
QA950300	SUPPORT DOE-RL TWRS MANAGEMENT SYS.	03OCT94	29SEP95				
QA950310	REVISE DOE-RL TWRS TOTAL QUALITY MGMT	03OCT94	29DEC94				
QA950320	REVIEW DOE-RL TWRS PMSD ANNEXES	30DEC94	28FEB95				

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Activity ID	Activity Description	Early Start	Early Finish	FY94	FY95	FY96	FY97
SCW244	COMPILE/ANALYZE PERFORMANCE DATA	01OCT93	30SEP94	J	A	S	O
SCW246	GENERATE ANALYSIS REPORTS	01OCT93	30SEP94	J	A	S	O
SCW248	CORR ACTION PROG PERFORMANCE	01OCT93	30SEP94	J	A	S	O
1.1.1.01.02.10 Reengineering							
ADF100	CONDUCT TWRS REENGINEERING &	01OCT97	30SEP97				X
REW9510	SELECT FY95 INITIATIVES AND TOOLS	03OCT94	30DEC94				
REW9520	WORK PROCESS EVALUATION	03JAN95	30JUN95				
REW9530	MONITOR IMPLEMENTATION; PREP ECCEL DOCS.	05JUL95	29SEP95				
REW9540	IMPLEMENT VIRTUAL OFFICE PILOT	03OCT94	30DEC94				
REW9510	SELECT FY96 INITIATIVES AND TOOLS	02OCT95	29DEC95				
REW9520	WORK PROCESS EVALUATION	02JAN96	28JUN96				
REW9530	MONITOR IMPLEMENTATION; PREP ECCEL DOCS.	01JUL96	30SEP96				
REW9540	IMPLEMENT SPECIAL INITIATIVE	02OCT95	29DEC95				
REW9710	SELECT FY97 INITIATIVES AND TOOLS	01OCT96	31DEC96				
REW9720	WORK PROCESS EVALUATION	02JAN97	30JUN97				
REW9730	MONITOR IMPLEMENTATION; PREP ECCEL DOCS.	01JUL97	30SEP97				
REW9740	IMPLEMENT SPECIAL INITIATIVE	01OCT96	31DEC96				
TQWT025	PROFILE II IMPLEMENTATION	01OCT93	06JUL94				
TQWT075	IMPLEMENT SIX WESTIP PROGRAM CYCLES	01OCT93	30SEP94				
TQWT100	TOTAL QUALITY/REENGINEERING INITIATIVES	01OCT93	30SEP94				
1.1.1.01.02.11 Qualification and Training							
QTW9505	DEV POSITION QUAL STD FOR MGR/TECH SPPT	03OCT94*	27JAN95				
QTW9510	3.5.A CMPL POSITION QUAL STD FOR MGR TRN		27JAN95				
QTW9515	DEV QUAL TRN PLANS FOR MGR/TECH SPPT TRN	30JAN95	27MAR95				
QTW9520	3.5.B CMPL QUAL TRN PLANS FOR MGR TRN		27MAR95				
QTW9525	DEV PLAN TO QUALIFY OR REPLACE PERSONNEL	28OCT94*	25MAY95				
QTW9530	CONDUCT QUALIFICATION ASSESSMENT		17MAR95				
QTW9535	DEV PROCESS TO ID/DEV & ASSIGN QUAL	03OCT94*	27JAN95				
QTW9540	3.5.C CMPL WHC TWRS STAFF ANAL/SELECT		27JAN95				
QTW9545	STAFFING ANALYSIS	01DEC94*	31MAR95				
QTW9550	COMPLETE QUALIFICATION ASSESSMENT	15FEB95*	17MAR95				
QTW9545	STAFFING ANALYSIS	01DEC95*	01APR96				
QTW9745	STAFFING ANALYSIS	02DEC96*	01APR97				
1.1.1.01.02.12 Information Resources Management							
ADE115	CONTINUE DEVELOPMENT/IMPLEMENTATION	01OCT97	30SEP97				X
TRW9502	CONTINUE TWRS INFO SYS DEFINITION ENGR	03OCT94*	30NOV94				
TRW9510	COMPLETE TWRS INFO SYS DEFINITION ENGR		30NOV94				

Activity ID	Activity Description	Early Start	Early Finish	FY94	FY95	FY96	FY97
IRW9520	DEVELOP TWRS DATA MGMT PLAN (M-35-03)	03OCT94*	31MAR95	J	A	S	O
IRW9529	M-35-03 ISSUE TWRS DATA MGMT PLAN TO DOE		31MAR95				
IRW9530	DEVELOP TWRS INFO MGMT CENTER	03OCT94*	29SEP95				
IRW9538	OPERATIONAL INFORMATION MANAGNT SYSTEMS		29SEP95				
IRW9540	INTEGRATE TWINS as TWRS SYS DELIVERY	03OCT94*	29SEP95				
IRW9550	PROVIDE STANDARD ARCHIVING SYSTEM FOR	03OCT94*	29SEP95				
IRW9560	INTEGRATE TWRS ISSUE/ACTION TRACKING	03OCT94*	29SEP95				
IRW9605	IMPLEMENT TWRS INFO MGMT CENTER	02OCT95	30SEP96				
IRW9705	MANAGE TWRS INFO MGMT CENTER	01OCT96	30SEP97				
1.1.1.01.02.13 Acquisition Management							
ACW9505	PREPARE WHC TWRS PROCUREMENT PLAN	03OCT94*	30DEC94				
ACW9510	PREPARE WHC TWRS PMSD IMPLEMENTING	03OCT94*	31MAR95				
ACW9515	PREPARE WHC TWRS PROCUREMENT	03OCT94*	29SEP95				
ACW9605	MANAGE WHC TWRS ACQUISITIONS - FY96	02OCT95	30SEP96				
ACW9705	MANAGE WHC TWRS ACQUISITIONS - FY97	01OCT96	30SEP97				
ADG100	CONDUCT TWRS ACQUISITION MANAGEMENT	01OCT97	30SEP97				
TQWP050	PROCUREMENT, PROPERTY, AND MATERIAL MGT	01OCT93	30SEP94				
1.1.1.01.03 Evaluation							
1.1.1.01.03.01 Program Analyses							
ACA200	PERFORM TWRS PERFORMANCE ANALYSIS	31JAN97	30JAN97				
PAW9505	PREPARE PROGRAM ANALYSIS PROCEDURES	03OCT94*	31JAN95				
PAW9605	MANAGE PROGRAM ANALYSIS PROCEDURES -	01FEB95	31JAN96				
PAW9705	MANAGE PROGRAM ANALYSIS PROCEDURES -	01FEB96	30JAN97				
1.1.1.01.03.02 Program Data							
ACA100	PERFORM TWRS PERFORMANCE ANALYSIS	01OCT97	30SEP97				
PDW9505	MANAGE DIRECT FUNDS & REPORTS - FY95	03OCT94	29SEP95				
PDW9510	MANAGE INDIRECT FUNDS & REPORTS - FY95	03OCT94*	29SEP95				
PDW9605	MANAGE DIRECT FUNDS & REPORTS - FY96	02OCT95	30SEP96				
PDW9610	MANAGE INDIRECT FUNDS & REPORTS - FY96	02OCT95	30SEP96				
PDW9705	MANAGE DIRECT FUNDS & REPORTS - FY97	01OCT96	30SEP97				
PDW9710	MANAGE INDIRECT FUNDS & REPORTS - FY97	01OCT96	30SEP97				
1.1.1.01.03.03 Customer Support (GSSC)							
ADK100		01OCT97	30SEP97				
ADK120		01OCT97	30SEP97				
ADK130		01OCT97	30SEP97				
DM950301	GSSC SUPPORT TO RL TWRS	03OCT94	29SEP95				
DM950302	CLERICAL SUPPORT	03OCT94	29SEP95				

[illegible]

Activity ID	Activity Description	Early Start	Early Finish	FY94	FY95	FY96	FY97
1 Tank Waste Remediation System Mission							
1.1 TWRS Program							
1.1.2 Manage Tank Waste							
1.1.2.01 Tank Farm Operations and Maintenance							
1.1.2.01.01 Technical Integration and Planning							
SO04000	Perform TF Program Element & Baseline Management	01OCT97*	30SEP28				
SO04005	Perform Nuclear Safety Oversight	01OCT97*	30SEP28				
SO04010	Perform Tank Farm Program Assessments	01OCT97*	30SEP28				
SO04015	Perform Planning & Administration Support	01OCT97*	30SEP28				
SO04020	Perform Issues/Corrective Action Management	01OCT97*	30SEP28				
SO04029	Continue Tank Farm Training Program	01OCT97*	30SEP28				
SO04030	Provide QA/QC Support to Tank Farms	01OCT97*	30SEP28				
SO04035	Perform Tank Farm Security Operations	01OCT97*	30SEP28				
SO04037	Complete Tank Farm Security Upgrades	01OCT97*	30SEP99				
SO04040	Maintain Tank Farm Operational & Admin Procedure	01OCT97*	30SEP28				
SO04045	Perform CASS/TMACS/SACS Data Base Management	01OCT97*	30SEP28				
1.1.2.01.01.01 Program Element and Baseline Management							
94D430A	Program Management	01OCT93	30SEP94				
94D430B	Plan/Budget/Tech Support & Special Projects	01OCT93*	30SEP94				
94D430E	Nuc Safety Oversight Support for TFO & M	01OCT93*	30SEP94				
94D430G	Conduct of Operations	01OCT93*	30SEP94				
D4101	Program Office Management	03OCT94	29SEP95				
D41016	Program Office Management	02OCT95	30SEP96				
D41017	Program Office Management	01OCT96	30SEP97				
D4102	Activity Admin/Budget Analyst Sppt to Program	03OCT94	29SEP95				
D41026	Activity Admin/Budget Analyst Sppt to Program	02OCT95	30SEP96				
D41027	Activity Admin/Budget Analyst Sppt to Program	01OCT96	30SEP97				
D4103	Scheduler Support for Program Office	03OCT94	29SEP95				
D41036	Scheduler Support for Program Office	02OCT95	30SEP96				
D41037	Scheduler Support for Program Office	01OCT96	30SEP97				
D4104	Integrated Schedule Program Support	03OCT94	29SEP95				
D41046	Integrated Schedule Program Support	02OCT95	30SEP96				
D41047	Integrated Schedule Program Support	01OCT96	30SEP97				

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Project Start Project Finish Data Date Plot Date		01OCT93 30SEP97 01OCT93 17SEP94		Early Bar Progress Bar		0316		TWRS TANK FARM OPERATIONS & MAINT. 9/20/94 DRAFT SCHEDULE		Sheet 1 of 63 WESTINGHOUSE HANFORD COMPANY Revision Date Checked Approved	
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Activity ID	Activity Description	Early Start	Early Finish	FY94	FY95	FY96	FY97
N1D430AM	Complete TF O&M FY95 Fiscal Year Workplan Input		30AUG94*	J	A	S	O
N1D430C	Tank Farms Integrated Schedule Recovery	01NOV93*	30SEP94	J	A	S	O
1.1.2.01.01.02 Tank Farm Program Assessments							
D420A	Electrical Maintenance	03OCT94	29SEP95				
D420A6	Electrical Maintenance	02OCT95	30SEP96				
D420A7	Electrical Maintenance	01OCT96	30SEP97				
D420B	BPA Electrical Usage	03OCT94	29SEP95				
D420B6	BPA Electrical Usage	02OCT95	30SEP96				
D420B7	BPA Electrical Usage	01OCT96	29SEP97				
D420C	Contaminated Laundry/Masks	03OCT94	29SEP95				
D420C6	Contaminated Laundry/Masks	02OCT95	30SEP96				
D420C7	Contaminated Laundry/Masks	01OCT96	30SEP97				
D420D	Steam Usage - Heating Steam & Process Steam	03OCT94	29SEP95				
D420D6	Steam Usage - Heating Steam & Process Steam	02OCT95	30SEP96				
D420D7	Steam Usage - Heating Steam & Process Steam	01OCT96	30SEP97				
D420E	Water Usage	03OCT94	29SEP95				
D420E6	Water Usage	02OCT95	30SEP96				
D420E7	Water Usage	01OCT96	30SEP97				
D420F	Dry Waste Disposal	03OCT94	29SEP95				
D420F6	Dry Waste Disposal	02OCT95	30SEP96				
D420F7	Dry Waste Disposal	01OCT96	30SEP97				
D420G	Fire System Maintenance	03OCT94	29SEP95				
D420G6	Fire System Maintenance	02OCT95	30SEP96				
D420G7	Fire System Maintenance	01OCT96	30SEP97				
D420H	Fleet-Light Duty/Heavy Equipment Maintenance	03OCT94	29SEP95				
D420H6	Fleet-Light Duty/Heavy Equipment Maintenance	02OCT95	30SEP96				
D420H7	Fleet-Light Duty/Heavy Equipment Maintenance	01OCT96	30SEP97				
N1D420A	Electrical Assessments	01OCT93*	30SEP94				
N1D420B	Laundry & Mask Assessments	01OCT93*	30SEP94				
N1D420C	Steam & Water Assessments	01OCT93*	30SEP94				
N1D420D	Support Services Assessments	01OCT93*	30SEP94				
N1D420E	Waste Burial Assessments	01OCT93*	30SEP94				
1.1.2.01.01.03 Planning and Administration							
94D41	MGMT. ADMIN & OPERATIONS SUMMARY	15NOV93*	14NOV94				
94D410A	ENHANCED TICKLER SYSTEM	01OCT93	30SEP94				
94D410B	OCCURRENCE REPORTING	01OCT93	30SEP94				
94D410B10	MANAGE OCC. REPT. & PROC. SYS. FOR WASTE	01OCT93	30SEP94				

Activity ID	Activity Description	Early Start	Early Finish	FY94	FY95	FY96	FY97
94D410B20	DEVELOP & MAINTAIN OCCURRENCE REP'ING.	01OCT93	30SEP94	J	A	S	O
94D410B30	DEV. & MAINTAIN WASTE TANK LESSONS	01OCT93	30SEP94	J	A	S	O
94D410N	TECHNICAL DATA SERVICE CENTER	01OCT93	30SEP94	J	A	S	O
94D410N13	CONTINUE OPERATION	07JUN94	21SEP94	J	A	S	O
94D410N15	GENERATE 12 STATUS REPORTS QUARTERLY	27JUN94	23SEP94	J	A	S	O
94D410N17	GENERATE MONTHLY STATUS REPORT	27JUN94	29JUL94	J	A	S	O
94D410N17	GENERATE MONTHLY STATUS REPORT	01AUG94	26AUG94	J	A	S	O
94D410N17	GENERATE MONTHLY STATUS REPORT	29AUG94	30SEP94	J	A	S	O
94D410N18	MAINTAIN CONTROLLED COPIES OF WHC	01OCT93	30SEP94	J	A	S	O
94D410N18	MAINTAIN CONTROLLED COPIES OF POP'S. (LOE)	01OCT93	30SEP94	J	A	S	O
94D410N18	CONFIGURATION MANAGEMENT SUPPORT	01OCT93	30SEP94	J	A	S	O
94D410N18	COMPUTERIZED PROD/CONT/DIST OF TWRS	01OCT93	30SEP94	J	A	S	O
94D410N19	IMPLEMENT NEW CONTROL DISTRIBUTION	15JUN94	30SEP94	J	A	S	O
94D410N19	CONTROL/DISTRIBUTION OF TWRS CONTROLLED	01OCT93	30SEP94	J	A	S	O
94D410R	TWRS SUPPORT SERVICES ADMINISTRATION	01OCT93	30SEP94	J	A	S	O
94D410R12	PROV. MGMT, EXEMPT, SAL. NON EX SUPP FOR	01OCT93	30SEP94	J	A	S	O
94D410T	MGMT. SURVEILL. PROGS. & PERFORMANCE	15NOV93	14NOV94	J	A	S	O
94D410T102	PROD. MONTHLY MGMT. FACIL/SURV. REPORTS	01FEB94	30SEP94	J	A	S	O
94D410T150	MAINTAIN PERF. IND. BULL. BRDS & DAILY OPS	15NOV93	14NOV94	J	A	S	O
94D410T164	PRODUCE MONTHLY TWRS PERF. INDICATOR	08JUN94	14JUL94	J	A	S	O
94D410T166	PRODUCE MONTHLY TWRS PERF. INDICATOR	15JUL94	10AUG94	J	A	S	O
94D410T168	PRODUCE MONTHLY TWRS PERF. INDICATOR	11AUG94	13SEP94	J	A	S	O
94D410T170	PRODUCE MONTHLY TWRS PERF. INDICATOR	14SEP94	11OCT94	J	A	S	O
94D410T172	PRODUCE MONTHLY TWRS PERF. INDICATOR	12OCT94	14NOV94	J	A	S	O
94D410T180	PRODUCE TWRS DAILY REPORT	01OCT93	30SEP94	J	A	S	O
MBC3A0A	TIE TO COMPLIANCE PROGRAMS (1N1C3A)	03OCT94	03OCT94	J	A	S	O
MBC3A0F	TIE TO OPS AND MAINTENANCE (1N1C3A)	15NOV94	15NOV94	J	A	S	O
MBD431987	TIE TO MULTI YEAR PLAN SOD4015	01OCT97	01OCT97	J	A	S	O
MBD490R	TIE FROM 1N1D49 (PREVIOUS OSR	30SEP94	30SEP94	J	A	S	O
NTD430A	CAP MANAGEMENT	03OCT94	29SEP95	J	A	S	O
NTD430A01	CAP MANAGEMENT	03OCT94	29SEP95	J	A	S	O
NTD430A6	CAP MANAGEMENT	02OCT95	30SEP96	J	A	S	O
NTD430A7	CAP MANAGEMENT	01OCT96	30SEP97	J	A	S	O
NTD430B	MGMT. SYSTEMS FUNCTIONAL AREA MGMT. &	03OCT94	29SEP95	J	A	S	O
NTD430B01	MANAGEMENT SYSTEMS MANAGEMENT &	03OCT94	29SEP95	J	A	S	O
NTD430B6	WGMT. SYSTEMS FUNCTIONAL AREA MGMT. &	02OCT95	30SEP96	J	A	S	O

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Activity ID	Activity Description	Early Start	Early Finish
N1D430F	USQ TRACKING	03OCT94*	29SEP95
N1D430F01	PERFORM USQ TRACKING & ISSUE QUARTERLY	03OCT94*	30DEC94
N1D430F02	PERFORM USQ TRACKING & ISSUE QUARTERLY	03JAN95	31MAR95
N1D430F03	PERFORM USQ TRACKING & ISSUE QUARTERLY	03APR95	30JUN95
N1D430F04	PERFORM USQ TRACKING & ISSUE QUARTERLY	05JUL95	29SEP95
N1D430F6	USQ TRACKING	02OCT95	30SEP96
N1D430F7	USQ TRACKING	01OCT96	30SEP97
N1D430G	OSR TRACKING	03OCT94*	29SEP95
N1D430G01	PERFORM OSR SURV. TRACKING & ISSUE 6	03OCT94*	30DEC94
N1D430G02	PERFORM OSR SURV. TRACKING & ISSUE 6	03JAN95	31MAR95
N1D430G03	PERFORM OSR SURV. TRACKING & ISSUE 6	03APR95	30JUN95
N1D430G04	PERFORM OSR SURV. TRACKING & ISSUE 6	05JUL95	29SEP95
N1D430G6	OSR TRACKING	02OCT95	30SEP96
N1D430G7	OSR TRACKING	01OCT96	30SEP97
N1D430H	EQUIPMENT STATUS TRACKING	03OCT94*	29SEP95
N1D430H01	PERFORM EQUIP. STATUS TRACK. & ISSUE 3 MOS.	03OCT94	30DEC94
N1D430H02	PERFORM EQUIP. STATUS TRACK. & ISSUE 3 MOS.	03JAN95	31MAR95
N1D430H03	PERFORM EQUIP. STATUS TRACK. & ISSUE 3 MOS.	03APR95	30JUN95
N1D430H04	PERFORM EQUIP. STATUS TRACK. & ISSUE 3 MOS.	05JUL95	29SEP95
N1D430H6	EQUIPMENT STATUS TRACKING	02OCT95	30SEP96
N1D430H7	EQUIPMENT STATUS TRACKING	01OCT96	30SEP97
N1D430J	REVISE STRUCTURE OF WHC-IP-0842 MANUAL	03OCT94*	29SEP95
N1D430J01	DEVELOP 0842 RESTRUCTURING PLAN	03OCT94	28OCT94
N1D430J02	RESTRUCTURE/RE-ISSUE WHC-IP-0842 MANUAL	31OCT94	27JAN95
N1D430J02	RE-STRUCTURE/RE-ISSUE WHC-IP-0842 MANUAL		27JAN95
N1D430J6	REVISE STRUCTURE OF WHC-IP-0842 MANUAL	02OCT95	30SEP96
N1D430J7	REVISE STRUCTURE OF WHC-IP-0842 MANUAL	01OCT96	30SEP97
N1D430K	0842 PROCEDURES	03OCT94*	29SEP95
N1D430K01	REVISE AND/OR ISSUE 12 PROCEDURES	03OCT94	30DEC94
N1D430K02	REVISE AND/OR ISSUE 13 PROCEDURES	03JAN95	31MAR95
N1D430K03	REVISE AND/OR ISSUE 13 PROCEDURES	03APR95	30JUN95
N1D430K04	REVISE AND/OR ISSUE 13 PROCEDURES	05JUL95	29SEP95
N1D430K04	IMPLEMENTATION OF 51 PROCEDURES		29SEP95
N1D430K6	ISSUE 52 PROCEDURES	02OCT95	30SEP96
N1D430K7	ISSUE 52 PROCEDURES	01OCT96	30SEP97
N1D430L	PROCESS 180 PROCEDURE REVISIONS FOR SITE	03OCT94*	29SEP95

Activity ID	Activity Description	Early Start	Early Finish	FY94	FY95	FY96	FY97
N1D430L01	PROCESS 40 SITE MANUAL PROCEDURE	03OCT94	30DEC94	J	A	S	O
N1D430L02	PROCESS 50 MPR'S	03JAN95	31MAR95				
N1D430L03	PROCESS 50 MPR'S	03APR95	30JUN95				
N1D430L04	PROCESS 40 MPR'S	05JUL95	29SEP95				
N1D430L04	PROCESS 180 PROCEDURES FOR SITE MANUALS		29SEP95				
N1D430L6	PROCESS 180 PROCEDURE REVISIONS FOR SITE	02OCT95	30SEP96				
N1D430L7	PROCESS 180 PROCEDURE REVISIONS FOR SITE	01OCT96	30SEP97				
N1D430M	EMERGENCY PREPARADNESS	03OCT94*	29SEP95				
N1D430M01	CONDUCT 6 TABLE TOP DRILLS	03OCT94*	31MAR95				
N1D430M02	CONDUCT 6 TABLE TOP DRILLS	03APR95*	29SEP95				
N1D430M03	ISSUE 242-A EVAP. EMERGENCY RESPONSE	03OCT94*	03MAR95				
N1D430M03	ISSUE 242-A EVAPORATOR EMERGENCY		03MAR95				
N1D430M04	REVIEW AND UPDATE TF BUILDING EMERGENCY	03APR95	04AUG95				
N1D430M04	REVIEW AND UPDATE TANK FARM BUILDING		04AUG95				
N1D430M05	ISSUE TANK FARMS EMERGENCY RESPONSE	03OCT94	27JAN95				
N1D430M06	REVIEW/REVISE 3 EMERGENCY RESPONSE	30JAN95	26MAY95				
N1D430M07	COMPLETE PHASE 2 SIRD'S ASSESSMENT FOR E	30JAN95	28APR95				
N1D430M08	REVIEW/REVISE OPERATIONS SUPPORT CTR.	01MAY95	28JUL95				
N1D430M09	UPDATE TWRS EMERGENCY PREPARADNESS	30MAY95	29SEP95				
N1D430M10	UPDATE TWRS EMERGENCY PREPARADNESS		29SEP95				
N1D430M6	EMERGENCY PREPARADNESS	02OCT95	30SEP96				
N1D430M7	EMERGENCY PREPARADNESS	01OCT96	30SEP97				
ZBD480A	TIE TO OPERATING PROCEDURES (1N1D48)	03OCT94	03OCT94				
1.1.2.01.01.04 Tank Farm Training							
93TD440A	OPERATIONS TECHNICAL TRAINING	01OCT93	30SEP94				
93TD440AK	INITIATE CLASS RM/OJT TRAINING ON NEW QUAL		30SEP94				
93TD440C	MANAGER AND SUPERVISOR PROGRAM	01OCT93	30SEP94				
93TD440CK	COMPLETE TRAINING OF NEW SUPERVISOR		30SEP94				
94D440B	TANK FARM OPERATOR INITIAL TRAINING	01OCT93*	30SEP94				
94D440B10	LIQUID LEVEL MONITORING CLASS #3	01AUG94*	26AUG94				
94D440B14	CASS/TMACS CLASS #10	24JUN94	28JUL94				
94D440B15	CASS/TMACS CLASS #11	29JUL94	25AUG94				
94D440B15	CASS/TMACS CLASS #12	26AUG94	29SEP94				
94D440B16	CORE SAMPLING CLASS	27JUN94*	23JUL94				
94D440D	CONDUCT TF SUPERVISOR/MANAGER TRAINING	01OCT93*	30SEP94				
94D440D10	OFFER SUPERVISOR/MANAGER CLASS #2	01AUG94*	25AUG94				
94D440E	MAINTAIN EXISTING MANUALS IN TECH. ACC.	01OCT93*	30SEP94				

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Activity ID	Activity Description	Early Start	Early Finish	FY94	FY95	FY96	FY97
D440D02F0	DEVELOP 14 ELECTRICAL CLASS/LAB	06FEB95	29SEP95	J	A	S	O
D440D02F0	DEVELOP STUDENT MATERIALS	06FEB95	29SEP95	J	A	S	O
D440D02F0	DEVELOP INSTRUCTIONAL AIDS	06FEB95	29SEP95	J	A	S	O
D440D02G0	PRESENT ELECTRICAL CLASS	03OCT94*	29SEP95	J	A	S	O
D440D02G0	PREPARE FOR 6 ELECTRICAL CLASSES	03OCT94*	29SEP95	J	A	S	O
D440D02G0	DELIVER 6 ELECTRICAL CLASS/LAB	03OCT94*	29SEP95	J	A	S	O
D440D02G0	REMEDIATION ACTIVITY FOR 6 ELECTRICAL	03OCT94*	29SEP95	J	A	S	O
D440D02G9	PRESENT ELECTRICAL CLASSES	02OCT95*	30SEP96	J	A	S	O
D440D02G9	PRESENT ELECTRICAL CLASSES	01OCT96*	30SEP97	J	A	S	O
D440D02H0	MAINTAIN ELECTRICAL TRAINING MANUAL	03OCT94*	29SEP95	J	A	S	O
D440D02H0	MODIFY CLASS FROM FEEDBACK	03OCT94*	29SEP95	J	A	S	O
D440D02H0	MAINTAIN ELECTRICAL TASK LIST	03OCT94*	29SEP95	J	A	S	O
D440D02H0	MAINTAIN ELECTRICAL OJT PACKAGES	03OCT94*	29SEP95	J	A	S	O
D440D02H0	MAINTAIN ELECTRICAL L.P. AND S.H.	03OCT94*	29SEP95	J	A	S	O
D440D02H0	MAINTAIN EVALUATION MATERIALS	03OCT94*	29SEP95	J	A	S	O
D440D02H9	MAINTAIN ELECTRICAL TRAINING MATERIAL	02OCT95*	30SEP96	J	A	S	O
D440D02H9	MAINTAIN ELECTRICAL TRAINING MATERIAL	01OCT96*	30SEP97	J	A	S	O
D440D03A0	DEVELOP MILLWRIGHT CORE TTM	03OCT94*	03JAN95	J	A	S	O
D440D03B0	IMPLEMENT MW CORE	03OCT94*	29SEP95	J	A	S	O
D440D03B0	DEVELOP OF MILLWRIGHT CORE TRAINING	03OCT94*	02DEC94	J	A	S	O
D440D03B0	DEVELOP MILLWRIGHT CORE TRAINING	05DEC94	03JAN95	J	A	S	O
D440D03B0	ADMIN. MW CORE TRAINING	04JAN95	29SEP95	J	A	S	O
D440D03B9	IMPLEMENT MILLWRIGHT CORE TRAINING	02OCT95*	30SEP96	J	A	S	O
D440D03B9	IMPLEMENT MILLWRIGHT CORE TRAINING	01OCT96*	30SEP97	J	A	S	O
D440D03C0	MW ASSESSMENT PACKAGE	03OCT94*	03JAN95	J	A	S	O
D440D03C0	DEVELOP MILLWRIGHT QUESTIONNAIRE	30NOV94	03JAN95	J	A	S	O
D440D03C0	DEVELOP OF ALL MILLWRIGHT JPM'S	03OCT94*	29NOV94	J	A	S	O
D440D03D0	SUPPORT DEVELOPMENT OF MILLWRIGHT QTPS	01FEB95*	14JUL95	J	A	S	O
D440D03E	TWRS WT MAINT MILLWRIGHT INIT TRNG PROG		29SEP95	J	A	S	O
D440D03E0	DELIVERY OF MILLWRIGHT OJT PACKAGES	03OCT94*	29SEP95	J	A	S	O
D440D03E0	DEVELOP 14 MILLWRIGHT OJT PACKAGES	03OCT94*	29SEP95	J	A	S	O
D440D03E0	GRAPHICS/DTP FOR OJT GUIDES	03OCT94*	29SEP95	J	A	S	O
D440D03F0	DELIVERY OF MILLWRIGHT CLASS MATERIAL	03OCT94*	29SEP95	J	A	S	O
D440D03F0	DESIGN 11 MILLWRIGHT CLASSROOM/LAB	03OCT94*	29SEP95	J	A	S	O
D440D03F0	DEVELOP 11 MILLWRIGHT CLASSROOM/LAB	03OCT94*	29SEP95	J	A	S	O
D440D03F0	DEVELOP STUDENT MATERIALS	03OCT94*	29SEP95	J	A	S	O

Activity ID	Activity Description	Early Start	Early Finish
D440D03F0	DEVELOP INSTRUCTIONAL AIDS	03OCT94*	29SEP95
D440D03G0	DELIVER MILLWRIGHT CLASSES	03OCT94*	29SEP95
D440D03G0	PREPARE FOR 4 CLASSES	03OCT94*	29SEP95
D440D03G0	DELIVER 4 MILLWRIGHT CLASSES (64	03OCT94*	29SEP95
D440D03G0	REMEDATION ACTIVITY FOR 4 MILLWRIGHT	03OCT94*	29SEP95
D440D03G9	PRESENT MILLWRIGHT CLASS	02OCT95*	30SEP96
D440D03G9	PRESENT MILLWRIGHT CLASS	01OCT96*	30SEP97
D440D03H0	MAINTAIN MW TRAINING MATERIAL	03OCT94*	29SEP95
D440D03H0	MODIFY CLASSES FROM EVALUATION DATA	03OCT94*	29SEP95
D440D03H0	MAINTAIN MILLWRIGHT TASK LIST	03OCT94*	29SEP95
D440D03H0	MAINTAIN OJT PACKAGES	03OCT94*	29SEP95
D440D03H0	MAINTAIN MW LESSON PLANS & STUDENT	03OCT94*	29SEP95
D440D03H0	MAINTAIN EVALUATION MATERIALS	03OCT94*	29SEP95
D440D03H9	MAINTAIN MILLWRIGHT TRAINING MATERIAL	02OCT95*	30SEP96
D440D03H9	MAINTAIN MILLWRIGHT TRAINING MATERIAL	01OCT96*	30SEP97
D440D04A0	DEVELOP PIPEFITTER CORE TASK TO TRAINING	03OCT94*	03JAN95
D440D04B0	IMPLEMENT PIPEFITTER CORE TRAINING	03OCT94*	29SEP95
D440D04B0	DEVELOP PIPEFITTER CORE TRAINING	03OCT94*	02DEC94
D440D04B0	DEVELOP PIPEFITTER CORE TRAINING	05DEC94	03JAN95
D440D04B0	ADMIN PF CORE TRAINING	04JAN95	29SEP95
D440D04B9	IMPLEMENT PIPEFITTER CORE TRAINING	02OCT95*	30SEP96
D440D04B9	IMPLEMENT PIPEFITTER CORE TRAINING	01OCT96*	30SEP97
D440D04C0	PF ASSESSMENT PACKAGE	03OCT94*	31MAR95
D440D04C0	DEVELOP PF QUESTIONNAIRE	02FEB95	31MAR95
D440D04C0	ANALYZE ALL PF TASKS	03OCT94*	30NOV94
D440D04C0	DEVELOP ALL PF JPM'S	01DEC94	01FEB95
D440D04D0	SUPPORT DEVELOPMENT OF PF QTPS	03APR95*	14JUL95
D440D04E	TWRS WT PIPEFITTER INIT TRNG PROG		29SEP95
D440D04E0	PIPEFITTERS OJT PACKAGES	03NOV94*	29SEP95
D440D04E0	DEVELOP 44 PF OJT TRAINING PACKAGES	30NOV94*	29SEP95
D440D04E0	GRAPHICS/DTP SUPPORT FOR OJT GUIDES	30NOV94*	29SEP95
D440D04F0	PIPEFITTER CLASS MATERIAL	03JAN95*	29SEP95
D440D04F0	DESIGN	30NOV94*	30DEC94
D440D04F0	DEVELOP 44 CLASSROOM/LAB SESSIONS	03JAN95	29SEP95
D440D04F0	DEVELOP STUDENT MATERIALS	03JAN95	29SEP95
D440D04F0	DEVELOP INSTRUCTIONAL AIDS	03JAN95	29SEP95

Activity ID	Activity Description	Early Start	Early Finish
D440D04G0	DELIVER PF CLASSES	28FEB95*	29SEP95
D440D04G0	PREPARE FOR 6 LESSONS	28FEB95*	29SEP95
D440D04G0	DELIVER 6 PF CLASSES (96 INSTRUCTOR HOURS)	28FEB95*	29SEP95
D440D04G0	REMEDIACTION ACTIVITY FOR 6 PF CLASSES	28FEB95*	29SEP95
D440D04H0	DELIVER PIPEFITTER TRAINING MATERIAL	03OCT94*	29SEP95
D440D04H0	MODIFY CLASS FROM EVALUATION DATA	03OCT94*	29SEP95
D440D04H0	MAINTAIN PF TASK LIST	03OCT94*	29SEP95
D440D04H0	MAINTAIN OJT PACKAGES	03OCT94*	29SEP95
D440D04H0	MAINTAIN PF LESSON PLANS & STUDENT	03OCT94*	29SEP95
D440D04H0	MAINTAIN EVALUATION MATERIALS	03OCT94*	29SEP95
D440D05A0	REVISE PROGRAM DESCRIPTION	15JUN95*	29SEP95
D440D05A0	DETERMINE JOB REQUIREMENTS FOR PAINTERS	15JUN95*	15AUG95
D440D05A0	DETERMINE JOB REQUIREMENTS FOR	15JUN95*	15AUG95
D440D05A0	DETERMINE JOB REQUIREMENTS FOR WELDERS	15JUN95*	15AUG95
D440D05A0	REVISE PROGRAM DESCRIPTION	16AUG95	30AUG95
D440D05A0	ASSESS INCUMBENT PAINTERS, INSULATORS,	01AUG95*	01SEP95
D440D05A0	DEVELOP QTPS FOR PAINTERS, INSULATORS,	05SEP95	29SEP95
D440D06A0	DEVELOP L.P. AND S.H. FOR WTM ADMIN.	03OCT94*	03JAN95
D440D06B0	DELIVER ADMINISTRATIVE CLASSES	03JAN95*	29SEP95
D440D06B0	PREPARE FOR 4 WTM ADMIN. CLASSES	03JAN95*	29SEP95
D440D06B0	DELIVER 4 WTM ADMIN CLASSES	03JAN95*	29SEP95
D440D06C0	DEVELOP SYSTEM OVERVIEW L.P. AND S.H.	03OCT94*	03JAN95
D440D06D0	DELIVER WRM TRAINING SYSTEM CLASS	03JAN95*	29SEP95
D440D06D0	PREPARE FOR SYSTEMS CLASS	03JAN95*	29SEP95
D440D06D0	DELIVER 8 SYSTEMS CLASSES	03JAN95*	29SEP95
D440D06D0	REMEDIACTION ACTIVITY FOR SYSTEMS CLASSES	03JAN95*	29SEP95
D440D06D9	PRESENT WTM TRAINING SYSTEM CLASS	02OCT95*	30SEP96
D440D06D9	PRESENT WTM TRAINING SYSTEM CLASS	01OCT96*	30SEP97
D440D07A0	EVALUATE LEVEL 1 & 2 WTM CLASSES	03OCT94*	29SEP95
D440D07A0	PERFORM 12 LEVEL 1 & 2 EVALUATIONS (I&C)	03OCT94*	29SEP95
D440D07A0	PERFORM 6 LEVEL 1 & 2 EVALUATIONS	03OCT94*	29SEP95
D440D07A0	PERFORM 4 LEVEL 1 & 2 EVALUATIONS	03OCT94*	29SEP95
D440D07A0	PERFORM 6 LEVEL 1 & 2 EVALUATIONS	03OCT94*	29SEP95
D440D07B0	FOUR LEVEL 3 EVALUATIONS	15JUN95*	29SEP95
D440D07B0	PERFORM 1 LEVEL 3 EVALUATION FOR I&C	15JUN95*	29SEP95
D440D07B0	PERFORM 1 LEVEL 3 EVALUATION FOR ELEC.	15JUN95*	29SEP95

Activity ID	Activity Description	Early Start	Early Finish	FY94	FY95	FY96	FY97
D440D07B0	PERFORM 1 LEVEL 3 EVALUATION FOR MW	15JUN95*	29SEP95	J	A	S	O
D440D07B0	PERFORM 1 LEVEL 3 EVALUATION FOR PF	15JUN95*	29SEP95	J	A	S	O
D440D07B9	FOUR LEVEL 3 EVALUATIONS	02OCT95*	30SEP96				
D440D07B9	FOUR LEVEL 3 EVALUATIONS	01OCT96*	30SEP97				
D440D08A0	WRITE STATEMENT OF WORK FOR 6 VENDOR	03OCT94*	29SEP95				
D440D08A9	SPONSOR VENDOR TRAINING	02OCT95*	30SEP96				
D440D08A9	SPONSOR VENDOR TRAINING	01OCT96*	30SEP97				
D440E01A0	REVISE WTM TRAINING DESCRIPTION	15JUN95*	30AUG95				
D440E01A0	DESIGN CONTINUING TRAINING PROGRAM FOR	15JUN95*	01AUG95				
D440E01A0	PERFORM REVISION TO TRAINING PLAN	02AUG95	30AUG95				
D440F	SUPPORT STAFF INITIAL TRAINING	03OCT94*	29SEP95				
D440F01A	TECHNICAL SUPPORT TRAINING	03JAN95*	03APR95				
D440F01B	WT TECH. SUPPORT SPECIFIC CLASS MATERIAL	03JAN95*	29SEP95				
D440F01C	WT TECH. SUPPORT SPECIFIC COURSES	03OCT94*	29SEP95				
D440F01C9	PROVIDE TECHNICAL SUPPORT CLASSES	02OCT95*	30SEP96				
D440F01C9	PROVIDE TECHNICAL SUPPORT CLASSES	01OCT96*	30SEP97				
D440F01D	MAINTAIN WT TECH SUPPORT TRAINING	03OCT94*	29SEP95				
D440F01D9	MAINTAIN TECHNICAL SUPPORT CLASSES	02OCT95*	30SEP96				
D440F01D9	MAINTAIN TECHNICAL SUPPORT CLASSES	01OCT96*	30SEP97				
D440F01E	IDENTIFY EXISTING TRAINING MATERIAL	03OCT94*	03APR95				
D440F02A	WT HPT TRAINING PROGRAM DESCRIPTION	01JUN95*	29SEP95				
D440F03A	WT TECHNICAL INSTRUCTOR TRAINING	01MAY95*	14JUL95				
D440F04A	WT MANAGER TRAINING PROGRAM DESCRIPTION	03JAN95*	31MAR95				
D440F04B	DEVELOP WT MANAGER SPECIFIC CLASS	03APR95*	29SEP95				
D440F04C	PRESENT WT MANAGER SPECIFIC COURSES	03APR95*	29SEP95				
D440F04C9	PRESENT MANAGER CLASSES	03OCT95*	01OCT96				
D440F04C9	PRESENT MANAGER CLASSES	02OCT96*	01OCT97				
D440F04D	MAINTAIN WASTE TANK MGR. SPECIFIC TRNG	03OCT94*	02OCT95				
D440F04E	ID EXISTING MANAGER TRAINING	03JAN95*	31MAR95				
D440F05A	WASTE TANK PIC SPECIFIC TRAINING MATERIAL	03OCT94*	29SEP95				
D440F05A9	PRESENT PIC COURSES	02OCT95*	30SEP96				
D440F05A9	PRESENT PIC COURSES	01OCT96*	30SEP97				
D440F05B	MAINTAIN WASTE TANK PIC SPECIFIC TRNG.	03OCT94*	29SEP95				
D440F05B9	MAINTAIN PIC COURSES	02OCT95*	30SEP96				
D440F05B9	MAINTAIN PIC COURSES	01OCT96*	30SEP97				
D440F06A	STANDARDS/REQUIREMENTS IDENTIFICATION	03OCT94*	03JAN95				

Activity ID	Activity Description	Early Start	Early Finish	FY94	FY95	FY96	FY97
D440F06A9	PERFORM PHASE 2 ASSESSMENTS	02OCT95*	30SEP96	J	A	S	O
D440F06A9	PERFORM PHASE 2 ASSESSMENTS	01OCT96*	30SEP97				
D440F07A	PRESENT 30 COURSES	03OCT94*	29SEP95				
D440F07A9	PRESENT 30 HAZARDOUS WASTE COURSES	02OCT95*	30SEP96				
D440F07A9	PRESENT 30 HAZARDOUS WASTE COURSES	01OCT96*	30SEP97				
D440F07B	MAINTAIN COURSES	03OCT94*	29SEP95				
D440F08A	EMERGENCY PREPARADNESS TRAINING	03OCT94*	29SEP95				
D440F08A9	EMERGENCY PREPARADNESS TRAINING	02OCT95*	30SEP96				
D440F08A9	EMERGENCY PREPARADNESS TRAINING	01OCT96*	30SEP97				
D440F08B	FACILITY ORIENTATION	03OCT94*	29SEP95				
D440F08B9	PROVIDE TWRS FACILITY ORIENTATION	02OCT95*	30SEP96				
D440F08B9	PROVIDE TWRS FACILITY ORIENTATION	01OCT96*	30SEP97				
D440G	SUPPORT STAFF CONTINUING TRAINING	03OCT94*	29SEP95				
D440G01A	ID SUPPORT STAFF CONTINUING TRAINING	03OCT94*	31AUG95				
D440G01B	PROVIDE WT TECH SUPPORT STAFF CONTINUING	01SEP95*	29SEP95				
D440G01B9	TECHNICAL SUPPORT CONTINUING TRAINING	03OCT95*	01OCT96				
D440G01B9	TECHNICAL SUPPORT CONTINUING TRAINING	02OCT96*	01OCT97				
D440G01C	PROVIDE WT PIC CONTINUING TRAINING	03OCT94*	29SEP95				
D440G01C9	PROVIDE PIC CONTINUING TRAINING	02OCT95*	30SEP96				
D440G01C9	PROVIDE PIC CONTINUING TRAINING	01OCT96*	30SEP97				
D440G01D	PROVIDE WT USQE CONTINUING TRAINING	03OCT94*	29SEP95				
D440G01D9	PROVIDE USQ CONTINUING TRAINING	02OCT95*	30SEP96				
D440G01D9	PROVIDE USQ CONTINUING TRAINING	01OCT96*	30SEP97				
D440G01E	PROVIDE WT TECH INSTRUCTOR CONTINUING	03OCT94*	29SEP95				
D440G01E9	WT INST. CONTINUING TRAINING	02OCT95*	30SEP96				
D440G01E9	WT INST. CONTINUING TRAINING	01OCT96*	30SEP97				
D440G01F	PROVIDE WT DANGEROUS HAS. WASTE	03OCT94*	02OCT95				
D440G01F9	HAZARDOUS WASTE CONTINUING TRAINING	03OCT95*	01OCT96				
D440G01F9	HAZARDOUS WASTE CONTINUING TRAINING	02OCT96*	01OCT97				
N1D44	TRAINING	03OCT94*	29SEP95				
N1D440A	TRAINING ADMINISTRATION	03OCT94*	29SEP95				
N1D440A1	MANAGEMENT	03OCT94*	29SEP95				
N1D440A2	RECORDS AND SCHEDULING	03OCT94*	29SEP95				
N1D440A3	DIRECT TRAINING PROGRAMS MANAGEMENT	03OCT94*	29SEP95				
N1D440A4	PROCEDURES	03OCT94*	05JUL95				
N1D440A5	ASSESSMENTS	03OCT94*	29SEP95				

Activity ID	Activity Description	Early Start	Early Finish	FY94	FY95	FY96	FY97
N1D440A51	S/RID PHASE 2 ASSESSMENT	03OCT94*	30DEC94	J	A	S	O
N1D440A52	TRAINING AND QUALIFICATION S/RID REVISION						
N1D440A6	TRAINING ADMINISTRATION	02OCT95*	30SEP96				
N1D440A7	TRAINING ADMINISTRATION	01OCT96*	30SEP97				
N1D440B	OPERATORS INITIAL TRAINING	03OCT94*	29SEP95				
N1D440B01	NPO INIT & CONT. TRNG IN COMPLIANCE		29SEP95				
N1D440B1	NPO CERTIFICATION	03OCT94*	29SEP95				
N1D440B10	ROUTINES CERTIFICATION	03OCT94*	29SEP95				
N1D440B10	ROUTINES ANALYZE/DESIGN/MAINT. AND	21NOV94*	21JUL95				
N1D440B10	ROUTINES IMPLEMENT	03OCT94*	22SEP95				
N1D440B10	FIELD CREW CERTIFICATION	21OCT94*	18AUG95				
N1D440B10	FIELD CREW ANALYZE/DESIGN/MAINT. AND	12DEC94*	21JUL95				
N1D440B10	FIELD CREW IMPLEMENT	10OCT94*	18AUG95				
N1D440B10	SALTWELL CERTIFICATION	03OCT94*	30AUG95				
N1D440B11	SALTWELL ANALYZE/DESIGN/MAINT. AND	06MAR95*	18AUG95				
N1D440B11	SALTWELL IMPLEMENT	19OCT94*	30AUG95				
N1D440B11	242-A CERTIFICATION	03OCT94*	29SEP95				
N1D440B11	242-A ANALYZE/DESIGN/MAINT. AND UPGRADE	07NOV94*	29SEP95				
N1D440B11	242-A IMPLEMENT (PREP/DELIVERY/EVALUATE)	03OCT94*	15SEP95				
N1D440B11	CASS/IMACS CERTIFICATION	03OCT94*	29SEP95				
N1D440B11	CASS/IMACS ANALYZE/DESIGN/MAINT. AND	07NOV94*	28JUL95				
N1D440B11	CASS/IMACS IMPLEMENT	23JAN95*	19MAY95				
N1D440B12	204-AR CERTIFICATION	03OCT94*	30JUN95				
N1D440B12	204-AR ANALYZE/DESIGN/MAINT. AND UPGRADE	03OCT94*	17MAR95				
N1D440B12	204-AR IMPLEMENT (PREP/DELIVERY/EVALUATE)	23JAN95*	26JUN95				
N1D440B12	AGING WASTE CERTIFICATION	03OCT94*	29SEP95				
N1D440B12	AGING WASTE ANALYZE/DESIGN/MAINT. AND	31OCT94*	17MAY95				
N1D440B12	AGING WASTE IMPLEMENT	30JAN95*	29SEP95				
N1D440B12	DRYWELL CERTIFICATION	03OCT94*	29SEP95				
N1D440B13	DRYWELL ANALYZE/DESIGN/MAINT. AND	07NOV94*	26MAY95				
N1D440B13	DRYWELL (PREP/DELIVERY/EVALUATE)	17OCT94*	07APR95				
N1D440B13	WASTE SAMPLING CERTIFICATION	03OCT94*	25AUG95				
N1D440B13	WASTE SAMPLING ANALYZE/DESIGN/MAINT. AND	03OCT94*	19MAY95				
N1D440B13	WASTE SAMPLING (PREP/DELIVERY/EVALUATE)	07NOV94*	25AUG95				
N1D440B13	WASTE TRUCK/SAMPLE TRUCK CERTIFICATION	03OCT94*	18AUG95				
N1D440B13	WST TRK/SMPLE TRK ANALYZE/DESIGN/MAINT. AND	03OCT94*	09JUN95				

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Activity ID	Activity Description	Early Start	Early Finish
N1D440C10	ROUTINES ANALYSIS/DESIGN/DEVELOP	07/NOV94*	27/JAN95
N1D440C10	ROUTINES (PREP/DELIVERY/EVALUATION)	16/JAN95*	28/APR95
N1D440C10	FIELD CREW CERTIFICATION	03/OCT94*	30/JUN95
N1D440C10	FIELD CREW ANALYSIS/DESIGN/DEVELOP	12/DEC94*	17/MAR95
N1D440C10	FIELD CREW (PREP/DELIVERY/EVALUATION)	20/MAR95*	16/JUN95
N1D440C10	SALTWELL CERTIFICATION	05/DEC94*	28/JUL95
N1D440C11	SALTWELL ANALYSIS/DESIGN/DEVELOP	06/MAR95*	21/APR95
N1D440C11	SALTWELL (PREP/DELIVERY/EVALUATION)	24/APR95*	14/JUL95
N1D440C11	242-A CERTIFICATION	05/DEC94*	01/SEP95
N1D440C11	242-A ANALYSIS/DESIGN/DEVELOP	08/FEB95*	28/APR95
N1D440C11	242-A (PREP/DELIVERY/EVALUATION)	01/MAY95*	18/AUG95
N1D440C11	CASS/TMACS CERTIFICATION	31/OCT94*	29/SEP95
N1D440C11	CASS/TMACS ANALYSIS/DESIGN/DEVELOP	05/JUN95*	21/JUL95
N1D440C11	CASS/TMACS (PREP/DELIVERY/EVALUATION)	24/JUL95*	29/SEP95
N1D440C12	204-AR CERTIFICATION	31/OCT94*	30/JUN95
N1D440C12	204-AR ANALYSIS/DESIGN/DEVELOP	12/DEC94*	17/MAR95
N1D440C12	204-AR (PREP/DELIVERY/EVALUATION)	20/MAR95*	09/JUN95
N1D440C12	AGING WASTE CERTIFICATION	31/OCT94*	30/JUN95
N1D440C12	AGING WASTE ANALYSIS/DESIGN/DEVELOP	08/FEB95*	17/MAR95
N1D440C12	AGING WASTE (PREP/DELIVERY/EVALUATION)	20/MAR95*	09/JUN95
N1D440C12	DRYWELL CERTIFICATION	31/OCT94*	01/SEP95
N1D440C13	DRYWELL ANALYSIS/DESIGN/DEVELOP	19/DEC94*	19/MAY95
N1D440C13	DRYWELL (PREP/DELIVERY/EVALUATION)	05/JUN95*	01/SEP95
N1D440C13	WASTE SAMPLING CERTIFICATION	03/OCT94*	30/JUN95
N1D440C13	WASTE SAMPLING ANALYSIS/DESIGN/DEVELOP	08/DEC94*	17/MAR95
N1D440C13	WASTE SAMPLING (PREP/DELIVERY/EVALUATION)	20/MAR95*	09/JUN95
N1D440C13	WASTE TRUCK/SAMPLE TRUCK CERTIFICATION	05/DEC94*	29/SEP95
N1D440C13	WASTE TRUCK SAMPLING	21/FEB95*	21/JUL95
N1D440C14	WASTE TRUCK SAMPLING	24/JUL95*	29/SEP95
N1D440C14	SURV. & INSPECT. CERTIFICATION	03/OCT94*	30/JUN95
N1D440C14	SURV. & INSPECT SAMPLING	17/OCT94*	10/MAR95
N1D440C14	SURV. & INSPECT (PREP/DELIVERY/EVALUATION)	13/MAR95*	02/JUN95
N1D440C14	CONTAINER DOC. CERTIFICATION	03/OCT94*	30/JUN95
N1D440C14	CONTAINER DOC. SAMPLING	14/NOV94*	10/MAR95
N1D440C14	CONTAINER DOC. (PREP/DELIVERY/EVALUATION)	13/MAR95*	02/JUN95
N1D440C16	OPERATIONS ENG. CERTIFICATION	05/DEC94*	01/SEP95

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Activity ID	Activity Description	Early Start	Early Finish	FY94	FY95	FY96	FY97
D450A703	Readiness Review Support	01OCT96	30SEP97	J	A	I	S
D450A704	TWRS QA Training Level III Support	01OCT96	30SEP97	J	A	I	S
D450A705	Overhead Support	01OCT96	30SEP97	J	A	I	S
D450A706	QA Procurement Support	01OCT96	30SEP97	J	A	I	S
D450A707	Hoisting & Rigging QA Support	01OCT96	30SEP97	J	A	I	S
N1D450A	QUALITY ASSURANCE SUPPORT	01OCT93	30SEP94	J	A	I	S
1.1.2.01.06 Configuration Management							
N1D460A00	CONFIGURATION MANAGEMENT FY95	03OCT94	29SEP95	J	A	I	S
N1D460A00	CONFIGURATION MANAGEMENT FY96	02OCT95	30SEP96	J	A	I	S
N1D460A00	CONFIGURATION MANAGEMENT FY97	01OCT96	29SEP97	J	A	I	S
1.1.2.01.07 Tank Farm Security							
94D4701	VA SUPPORT	01OCT93	29JUL94	J	A	I	S
94D470125	(PHASE VI) RESP TO COMM & UPDATE TF VA FIN.	16MAY94	29JUL94	J	A	I	S
94D470126	COMPLETE PHASE VI OF VULNERABILITY		29JUL94	J	A	I	S
94D470500	SUPPORT TANK FARMS SECURITY OPERATIONS	01OCT93	30SEP94	J	A	I	S
94D470600	TANK FARMS SECURITY SUPPORT (LOE)	01OCT93	30SEP94	J	A	I	S
94D470700	SECURITY TRANSITION PROGRAM OFFICE (STPO)	01OCT93	30SEP94	J	A	I	S
MBD471997	TIE TO MYPP NUMBER S004035	01OCT97	01OCT97	J	A	I	S
N1D47	TANK FARMS SECURITY	03OCT94	26JEP97	J	A	I	S
N1D470A	SAFEGUARDS AND SECURITY	03OCT94	29SEP95	J	A	I	S
N1D470A01	COMPLETE UPGRADE ASSESSMENTS	03OCT94	28OCT94	J	A	I	S
N1D470A02	PREPARE SCHEDULE	31OCT94	02DEC94	J	A	I	S
N1D470A03	REVISE CAP	05DEC94	30DEC94	J	A	I	S
N1D470A04	COMPLETE S&S UPGRADES REQUIRED BY RA	03JAN95	30JUN95	J	A	I	S
N1D470A05	UPDATE RISK ASSESSMENT	05JUL95	29SEP95	J	A	I	S
N1D470A06	REVISE & ISSUE TANK FARM SECURITY PLAN	03JAN95	31MAR95	J	A	I	S
N1D470A09	UPDATE RISK ASSESSMENT		29SEP95	J	A	I	S
N1D470A10	REVISE AND ISSUE TANK FARM SECURITY PLAN		31MAR95	J	A	I	S
N1D470A6	SAFEGUARDS AND SECURITY	02OCT95	30SEP96	J	A	I	S
N1D470A7	SAFEGUARDS AND SECURITY	01OCT96	29SEP97	J	A	I	S
N1D470B	SMART CARD SYSTEM	02OCT95	30SEP96	J	A	I	S
N1D470B01	DEVELOP SITE SMART CARD PROGRAM PLAN	02OCT95	30OCT95	J	A	I	S
N1D470B02	DEVELOP SCHEDULE FOR TF SMART CARDS	01NOV95	30NOV95	J	A	I	S
N1D470B03	IMPLEMENT INITIAL SMART CARD ACCESS	01DEC95	30SEP96	J	A	I	S
N1D470B6	SMART CARD SYSTEM	01OCT96	30SEP97	J	A	I	S
N1D470B7	SMART CARD SYSTEM	01OCT97	30SEP98	J	A	I	S
N1D470C	S/RIDS	03OCT95	30SEP96	J	A	I	S

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Activity ID	Activity Description	Early Start	Early Finish
SO03042	Ongoing DST Integrity Assessment Program	01OCT19*	31MAR14*
SO03044	Update 242a/DST Part B Permits as Required	01OCT19*	31MAR14*
SO03045	Perform TF Environ Analysis & Compliance Assmnts	01OCT19*	31DEC28
SO03055	Disposal of Identified Failed Field Equipment	01OCT19*	29SEP00
SO03060	Char, Package & Dispose of New Rad/Haz Waste	01OCT19*	30SEP28
SO03067	Maintain Criticality Safety Bases	01OCT19*	30SEP28
SO03075	Maintain DST Emergency Pumping Capability	01OCT19*	31MAR14*
SO03078	Perform DST Emergency Pumping (If Required)	01OCT19*	31MAR14*
SO03085	Maintain Codes & Standards 90-2 Program	01OCT19*	30SEP28
SO03090	Implement SST Internm OSRs	01OCT19*	27SEP00
SO03093	Implement AWF Interim/Final OSRs	01OCT19*	30SEP98
SO03095	Implement DST Interim/Final OSRs	01OCT19*	30SEP99
SO03105	Issue DST SAR Annual Updates	01OCT19*	30SEP28
SO03117	Maintain/Update 242a Evap FSAR	01OCT19*	31DEC08
SO03119	Issue Other Tank Farm SARs	01OCT19*	30APR07
SO03120	Perform Vadose Zone Characterization & Surveillance	01OCT19*	30SEP28
1.1.2.01.02.01 DST Integrity Assessment			
C310A	Assessment Plans	03OCT19*	29SEP95
C310A6	Assessment Plans	02OCT195	30SEP96
C310A7	Assessment Plans	01OCT196	30SEP97
C310AM1	DST System Integ Assess Engineering Task Plan		31MAY95*
C310B	Assessments and Reporting	03OCT19*	29SEP95
C310B6	Assessments and Reporting	02OCT195	30SEP96
C310B7	Assessments and Reporting	01OCT196	30SEP97
C310C	UT Inspection - Pre-Inspection	03OCT194	29SEP95
C310C6	UT Inspection - Pre-Inspection	02OCT195	30SEP96
C310C7	UT Inspection - Pre-Inspection	01OCT196	30SEP97
C310CM2	DST Integ Assessmnts - UT Equipmt Performance 1st		28APR95*
C310D	UT Inspections	01JUN95*	29SEP95
C310D6	UT Inspections	02OCT195	30SEP96
C310D7	UT Inspections	01OCT196	30SEP97
C310DM1	DST Integ Assessmnts - DST UT Inspection		29SEP95*
N1C310A	DST Integrity Support	01OCT193*	30SEP94
N1C310B	Procure UT Testing Devices & Services	01OCT193*	30SEP94
N1C310E	Perform Initial DST UT Inspections	03JAN94*	30SEP94
N1C310M	Corrective Action Request (CAR) 91-002	01OCT193*	30SEP94
N1C310M01	Identify Facilities Needing Upgrades	01OCT193*	30SEP94

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Activity ID	Activity Description	Early Start	Early Finish	FY94	FY95	FY96	FY97
N1C330Z	Special Tank Farm Permits	03JAN94*	30SEP94	J	A	S	O
1.1.2.01.02.04	Unusable Equipment Disposal Program						
C340A	Ship 3000 cu. ft. per Month of Solid Waste	03OCT94	29SEP95				
C340A01	Engineering Sppt - Procedures, LLWSRDS, SDARS	03OCT94	29SEP95				
C340A02	Operations Sppt - Prepare Waste, Pkg, Lbl, Simple	03OCT94	29SEP95				
C340A02M0	Prep 9000 cu ft of waste for shipment 1st quar.		30DEC94*				
C340A02M0	Prep 9000 cu ft of waste for shipment 2nd quar.		31MAR95*				
C340A02M0	Prep 9000 cu ft of waste for shipment 3rd quar.		30JUN95*				
C340A02M0	Prep 9000 cu ft of waste for shipment 4th quar.		29SEP95*				
C340A03	Ops Support - Collect Waste, Oper Staging Areas	03OCT94	29SEP95				
C340A04	Pkgng Sppt - Develop Pkgs, Provide Tech Sppt	03OCT94	29SEP95				
C340A05	Haz Mail Sppt - Inspections, Issue ORRSRS	03OCT94	29SEP95				
C340A06	Procure Solid Waste Containers	03OCT94	29SEP95				
C340A07	Procedure Devel Sppt - Prep & Revision	03OCT94	29SEP95				
C340A08	RCRA Facility Compl Sppt - Oversight, Reports	03OCT94	29SEP95				
C340A09	Analyze Solid Waste for Rad Constit - 222S Labs	03OCT94	29SEP95				
C340A10	CAP Management	03OCT94	29SEP95				
C340A11	Self Assessment	03OCT94	29SEP95				
C340A12	CSSO & TS&A Administrative Support	03OCT94	29SEP95				
C340A6	Ship 1000 cu.ft. per Month of Solid Waste	02OCT95	30SEP96				
C340A7	Ship 1500 cu.ft. per Month of Solid Waste	01OCT96	30SEP97				
C340AM01	Prepare 3000 cu ft of Solid Waste per month		31OCT94*				
C340AM02	Prepare 3000 cu ft of Solid Waste per month		30NOV94*				
C340AM03	Prepare 3000 cu ft of Solid Waste per month		30DEC94*				
C340AM05	Prepare 3000 cu ft of Solid Waste per month		31JAN95*				
C340AM06	Prepare 3000 cu ft of Solid Waste per month		28FEB95*				
C340AM07	Prepare 3000 cu ft of Solid Waste per month		31MAR95*				
C340AM09	Prepare 3000 cu ft of Solid Waste per month		28APR95*				
C340AM10	Prepare 3000 cu ft of Solid Waste per month		31MAY95*				
C340AM11	Ship 3000 cu ft of Solid Waste per month		30JUN95*				
C340AM13	Prepare 3000 cu ft of Solid Waste per month		31JUL95*				
C340AM14	Prepare 3000 cu ft of Solid Waste per month		31AUG95*				
C340AM15	Prepare 3000 cu ft of Solid Waste per month		29SEP95*				
C340B	Compact 2500 cu. ft. of Waste Per Quarter	03OCT94	29SEP95				
C340B01	Compact Low Level Waste - Offsite Compaction	03OCT94	29SEP95				
C340B02	Engineering Sppt - Prep/Coord Offsite Shipments	03OCT94	29SEP95				
C340B03	Ops Sppt - Prepare Waste for Offsite Shipments	03OCT94	29SEP95				

Activity ID	Activity Description	Early Start	Early Finish	FY94	FY95	FY96	FY97
C340B6	Compact 2500 cu.ft. of Waste Per Quarter	02OCT95	30SEP96	J	A	S	O
C340B7	Compact 2500 cu.ft. of Waste Per Quarter	01OCT96	30SEP97				
C340C	209E Building Maintenance	03OCT94*	29SEP95				
C340C01	Perform Maintenance on the 209E Bldg, as necess.	03OCT94	29SEP95				
C340C02	Develop PMs for the 209 Building	03OCT94	30MAR95				
C340C03	Provide Cognizant Engineering Sppt to 209E Bldg	03OCT94	29SEP95				
C340C6	209E Building Maintenance	02OCT95	30SEP96				
C340C7	209E Building Maintenance	01OCT96	30SEP97				
C340D01	Solid Waste Shipping Assessment	03OCT94*	29SEP95				
C340D6	Solid Waste Shipping Assessment	02OCT95	30SEP96				
C340D7	Solid Waste Shipping Assessment	01OCT96	30SEP97				
C340E01	Backlog Waste File Disposition	03OCT94*	28FEB95				
C340E02	Overpack Soil Drum According to Waiver	03OCT94	30NOV94				
C340E03	Remove Items from 40 LLW Boxes	03OCT94	30NOV94				
N1C340A	Backlog Waste Characterization	01OCT93*	01SEP94				
N1C340A04	Complete Characterizat of All Backlog Waste		01SEP94*				
N1C340AM3	Submit Designation Report on TF Backlog Waste		15AUG94*				
N1C340AM6	Comp Hazardous Sampl Char of Backlog Waste-10%		29JUL94*				
N1C340B	Backlog Waste Field Activities	01NOV93*	30SEP94				
N1C340C	Backlog Waste Shipping Support	01OCT93*	30SEP94				
1.1.2.01.02.05 Radioactive/Hazardous Solid Waste Management							
C350A	Solid Waste Characterization	03OCT94*	29SEP95				
C350A00	CAP Management	03OCT94*	29SEP95				
C350A01	Engng Sppt - Reviews, Prog Plan, DQOs	03OCT94*	29SEP95				
C350A02	Perf Lab Analy Offsite of 3 Rad/Haz Samples/mo	03OCT94*	29SEP95				
C350A03	Perf Analysis Onsite of 20 Rad Samples per month	03OCT94*	29SEP95				
C350A04	Perf Dose-Rate-to-Curie Convers of Contain Data	03OCT94*	29SEP95				
C350A05	Prov Equip, Ops & Analyt Svcs to Assay Container	03OCT94*	29SEP95				
C350A06	Prov Statist Svcs of TF Waste Cont Char Programs	03OCT94*	29SEP95				
C350A08	Self-Assessments/SRIDs	03OCT94*	29SEP95				
C350A6	Solid Waste Characterization	02OCT95*	30SEP96				
C350A600	CAP Management	02OCT95*	30SEP96				
C350A601	Engng Sppt - Reviews, Prog Plan, DQOs	02OCT95*	30SEP96				
C350A602	Perf Lab Analy Offsite of 3 Rad/Haz Samples/mo	02OCT95*	30SEP96				
C350A603	Perf Analysis Onsite of 20 Rad Samples per month	02OCT95*	30SEP96				
C350A604	Perf Dose-Rate-to-Curie Convers of Contain Data	02OCT95*	30SEP96				
C350A605	Prov Equip, Ops & Analyt Svcs to Assay Container	02OCT95*	30SEP96				

Activity ID	Activity Description	Early Start	Early Finish	FY94	FY95	FY96	FY97
C350A606	Prov Statist Svs of TF Waste Cont Char Programs	02OCT95	30SEP96	J	A	S	O
C350A608	Self-Assessments/SRIDs	02OCT95	30SEP96	J	A	S	O
C350A7	Solid Waste Characterization	01OCT96	30SEP97	J	A	S	O
C350A700	CAP Management	01OCT96	30SEP97	J	A	S	O
C350A701	Engng Sppt - Reviews, Prog Plan, DQOs	01OCT96	30SEP97	J	A	S	O
C350A702	Perf Lab Analy Offsite of 3 Rad/Haz Samples/mo	01OCT96	30SEP97	J	A	S	O
C350A703	Perf Analysis Onsite of 20 Rad Samples per month	01OCT96	30SEP97	J	A	S	O
C350A704	Perf Dose-Rate-to-Curie Convers of Contain Data	01OCT96	30SEP97	J	A	S	O
C350A705	Prov Equip, Ops & Analyt Svcs to Assay Container	01OCT96	30SEP97	J	A	S	O
C350A708	Self-Assessments/SRIDs	01OCT96	30SEP97	J	A	S	O
C350B	Solid Waste Delisting	03OCT94	29SEP95	J	A	S	O
C350B01	Provide Sci Sppt for Delisting, Iss HAZ Prtg Pln	03OCT94	29SEP95	J	A	S	O
C350B03	Prov MSLs for Acquis of Rad/Haz Samples-Offsite	03OCT94	29SEP95	J	A	S	O
C350B6	Solid Waste Delisting	02OCT95	30SEP96	J	A	S	O
C350B601	Provide Sci Sppt for Delisting, Iss HAZ Prtg Pln	02OCT95	30SEP96	J	A	S	O
C350B603	Prov MSLs for Acquis of Rad/Haz Samples-Offsite	02OCT95	30SEP96	J	A	S	O
C350B703	Prov MSLs for Acquis of Rad/Haz Samples-Offsite	01OCT96	30SEP97	J	A	S	O
C350C	Special Solid Waste Disposal Projects	03OCT94	29SEP95	J	A	S	O
C350C01	Provide Services to Ops for Non-Routine Waste	03OCT94	29SEP95	J	A	S	O
C350C02	Purchase Special Use/Reusable Waste Containers	03OCT94	29SEP95	J	A	S	O
C350C6	Special Solid Waste Disposal Projects	02OCT95	30SEP96	J	A	S	O
C350C601	Provide Services to Ops for Non-Routine Waste	02OCT95	30SEP96	J	A	S	O
C350C602	Purchase Special Use/Reusable Waste Containers	02OCT95	30SEP96	J	A	S	O
C350C7	Special Solid Waste Disposal Projects	01OCT96	30SEP97	J	A	S	O
C350C701	Provide Services to Ops for Non-Routine Waste	01OCT96	30SEP97	J	A	S	O
C350C702	Purchase Special Use/Reusable Waste Containers	01OCT96	30SEP97	J	A	S	O
C350D	Solid Waste Planning/Forecasting	03OCT94	29SEP95	J	A	S	O
C350D01	Prov Engr/Planning Svcs to Ops for Solid Wst Remv	03OCT94	29SEP95	J	A	S	O
C350D6	Solid Waste Planning/Forecasting	02OCT95	30SEP96	J	A	S	O
C350D601	Prov Engr/Planning Svcs to Ops for Solid Wst Remv	02OCT95	30SEP96	J	A	S	O
C350D7	Solid Waste Planning/Forecasting	01OCT96	30SEP97	J	A	S	O
C350D701	Prov Engr/Planning Svcs to Ops for Solid Wst Remv	01OCT96	30SEP97	J	A	S	O
NTC350B	SHPMT OF NEWLY GEN RADIOHAZ WASTE TO	01OCT93	30SEP94	J	A	S	O
NTC350D	209E SAFETY ASSESSMENTS	01OCT93	30SEP94	J	A	S	O
NTC350F	WASTE PREPLANNING SUPPORT	01OCT93	30SEP94	J	A	S	O
1.1.2.01.02.06	Criticality Engineering			J	A	S	O
194C360A	MAINTAIN CRITICALITY SAFETY BASES	01OCT93	30SEP94	J	A	S	O

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Activity ID	Activity Description	Early Start	Early Finish	FY94	FY95	FY96	FY97
94D490A34	DEVELOP PHASE 3 COMPLIANCE	23JUN94*	08JUL94	J	A	S	O
94D490A36	DOE/RL APPROVAL	11JUL94*	15JUL94	J	A	S	O
94D490A38	INITIATE IMPLEMENTATION OF PHASE 1 - 3 CIP'S.		15JUL94	J	A	S	O
94D490A35	REVISE PROCEDURES FOR DSTIOSR	01OCT93	30S .P94	J	A	S	O
94D490B	IOSR IMP. REVIEW OF SAFETY DOCUMENTATION	01OCT93*	30SEP94	J	A	S	O
94D490B08	PLANT ENGINEERING DOME LOADING	25APR94*	29JUL94	J	A	S	O
94D490B09	PLANT ENGINEERING TANK AND TRANSFER	11JUL94*	30SEP94	J	A	S	O
94D490B13	PLANT ENGINEERING CONCRETE TANK	20JUN94*	22JUL94	J	A	S	O
94D490C	VERIFY & MAINTAIN COMPLIANCE TO SAFETY	01OCT93*	30SEP94	J	A	S	O
94D490E1	POST FLAG TRAINING AND PROCEDURES	16JUN94	30SEP94	J	A	S	O
94D490F	USQ TRACKING	01OCT93*	30SEP94	J	A	S	O
94D490F1	MAINTAIN ACCURATE FILE SYSTEM/DISTRIBUTION	01OCT93*	30SEP94	J	A	S	O
94D490F2	TRANSFER ORIGS. TO RHA & DEV. & IMP. DBASE	01OCT93*	30SEP94	J	A	S	O
94D490G	INTERIM SAFETY BASES QUARTERLY REVIEW (4)	01OCT93*	30SEP94	J	A	S	O
94D490M2	LCO 3.1 CORRECTIVE MAINTENANCE	16JUN94*	30SEP94	J	A	S	O
94D490R	EQUIPMENT STATUS TRACKING	01OCT93*	30SEP94	J	A	S	O
94D490R9	EQUIPMENT STATUS TRACKING SYSTEM	21MAR94*	30SEP94	J	A	S	O
94D490T	OSR TRACKING SYSTEM ADMINISTRATION	01OCT93*	30SEP94	J	A	S	O
94D490T1	MAINTAIN FIELD MANUALS AND DATABASE	01OCT93*	30SEP94	J	A	S	O
94D490T2	ISSUE STATUS REPORTS	01OCT93*	30SEP94	J	A	S	O
94D490V	TEMPORARY LABELING SYSTEM ADMINISTRATION	01OCT93*	30SEP94	J	A	S	O
94D490V1	GENERATE QUARTERLY REPORT/MAINTAIN FILES	01OCT93*	30SEP94	J	A	S	O
94D490W1	CORRECT CBR'S	01OCT93*	30SEP94	J	A	S	O
MBC381995	TIE TO MYPP NUMBER SO03090	27SEP96	27SEP96				
MBD430F	TIE TO USQ TRACKING (1N1D43)	03OCT94	03OCT94				
MBD430G	TIE TO OSR TRACKING (1N1D43)	03OCT94	03OCT94				
MBD430H	TIE TO EQUIPMENT STATUS TRACKING (1N1D43)	03OCT94	03OCT94				
NTC38	OSR IMPLEMENTATION SUMMARY	03OCT94*	29SEP95				
NTC380A	PROGRAM MANAGEMENT	03OCT94*	29SEP95				
NTC380B	PHASE 2 SUMMARY LINE	03OCT94*	30MAR95				
NTC380B07	LETTER TO DOE/RL PHASE 2 W/WAIVERS		30MAR95				
NTC380C	PHASE 3 SUMMARY LINE	30NOV94*	30MAR95				
NTC380C08	COMPLETE PHASE 2 AND 3 WORKSCOPE		30MAR95				
NTC380D	PHASE 2 & 3 WAIVERS SUMMARY	02OCT95*	27SEP96				
NTC380D01	AIR LIFT	02OCT95*	29DEC95				
NTC380D02	AY EXHAUSTERS	02OCT95*	30OCT95				

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Activity ID	Activity Description	Early Start	Early Finish	FY94	FY95	FY96	FY97
N1C380L02	UPDATE AWF ISEL	05JUL95	31AUG95	J	A	S	O
N1C380L03	UPDATE SST ISEL	01SEP95	29SEP95				
N1C380L04	UPDDATE 3 INTERIM SAFETY EQUIPMENTS LISTS		29SEP95				
N1C380M	PRC SUPPORT SUMMARY	03OCT94	29SEP95				
N1C380N	CFR IMPLEMENTATION PLANS SUMMARY	03OCT94	29SEP95				
N1C380N01	10CFR 820	03OCT94	31OCT94				
N1C380N02	10CFR 830	01NOV94	28JUL95				
N1C380N03	10CFR 835	01AUG95	29SEP95				
N1C380N04	STAFF SUPPORT FOR IMP. OF 10CFR 820 & 830		29SEP95				
N1C380P	S/IDS	03OCT94	29SEP95				
N1C380P1	PERFORM ANNUAL S/IDS NUCLEAR SAFETY		29SEP95				
1.1.2.01.02.09 Safety Documentation							
C390A	SST-Tech Facility Description	03OCT94	30JUN95				
C390A01	Revise AWF/DST/SST IOSRs w/DOE-RL Comments		30MAY95				
C390A6	IOSRs Revisions/Updates	02OCT95	30SEP96				
C390A7	IOSRs Revisions/Updates	01OCT96	30SEP97				
C390B	ASA Follow-On Tasks	03OCT94	30AUG95				
C390B01	Prov Ltr After Agmt w/RL re: All Follow-On Work		15NOV94				
C390B02	Comp ASA Follow-On Tasks/Revise Top Rpts/Chap 3		30AUG95				
C390C	ASA Comments and Issue Resolution	03OCT94	31JUL95				
C390D	ISB ASA Updates/Revisions	03OCT94	29SEP95				
C390D01	Update ISB to Incorporate Rev IOSRs		29SEP95				
C390E	Safety Document Updates - ISB Volume 2	01DEC94	31JUL95				
C390E02	ISB Vol 2: Incorporate Comments & Op Summ from the ASA		30AUG95				
C390E6	Safety Document Updates	02OCT95	30SEP96				
C390E7	Safety Document Updates	01OCT96	30SEP97				
C390F	AWF/DST Chapter Writing	03OCT94	29SEP95				
C390F01	Draft SAR Submitted to Functional Review		30AUG95				
C390F6	AWF/DST Chapter Writing	02OCT95	30SEP96				
C390F7	AWF/DST Chapter Writing	01OCT96	30SEP97				
C390G	SST Graded SAR Work	03OCT94	29SEP95				
C390G01	Prov Delimit of Approach of SST/Chap 2,3,4,5		29SEP95				
C390G6	SST Graded SAR Work	02OCT95	30SEP96				
C390G7	SST Graded SAR Work	01OCT96	30SEP97				
C390H	SAR Program Planning	03OCT94	29SEP95				
C390H13	Provide Annual Program Plan to DOE-RL		29SEP95				
C390H6	SAR Program Planning	02OCT95	30SEP96				

Activity ID	Activity Description	Early Start	Early Finish	FY94	FY95	FY96	FY97
C390H7	SAR Program Planning	01OCT96	30SEP97	J	A	S	O
N1D46P1	SAR Upgrade Program Admin (Program Plan)	01OCT93	30SEP94	J	A	S	O
N1D46P1M1	Issue TFSAD Program Plan		30SEP94	J	A	S	O
N1D46T1	DST/AWF Project Management	01OCT93	30SEP94	J	A	S	O
N1D46T6	Support to Other Programs	01JUL94	30SEP94	J	A	S	O
N1D46T8	Support Sequence Analysis	01OCT93	29JUL94	J	A	S	O
N1D46T9	DST/ASA Documentation	02MAY94	29JUL94	J	A	S	O
N1D46T9M1	DST Upgraded Safety Envelope Documentation		29JUL94	J	A	S	O
N1D46TC	DST/AWF ASA Follow-on Activities	01JUL94	30SEP94	J	A	S	O
N1D46TD	Safety Envelope Configuration Management	01OCT93	30SEP94	J	A	S	O
N1D46TDM	SST Safety Envelope Configuration Mgmt (ISB)		30SEP94	J	A	S	O
N1D46TE	DST Technical Bases Compl Reviews for HF Study	01JUL94	30SEP94	J	A	S	O
N1D46TF	DST Technical Bases for Program Chapters Dev	01JUL94	30SEP94	J	A	S	O
N1D46TN	AWF Fire Hazard Analysis	01JUL94	30SEP94	J	A	S	O
N1D46TQ	DST FSAR Chapter Writing - Facility Desc Chptrs	02MAY94	30SEP94	J	A	S	O
N1D46TR	DST FSAR Chapter Writing - Safety Analysis Chptrs	01JUN94	30SEP94	J	A	S	O
N1D46TS	DST FSAR Chap Writing - Codes/Stand/OTdr Assess	01JUN94	30SEP94	J	A	S	O
N1D46W1	SST - Project Management	01OCT93	30SEP94	J	A	S	O
N1D46W3	AWF/DST/SST Haz Mat'l Char & Source Terms	01OCT93	30SEP94	J	A	S	O
N1D46W8	AWF/DST/SST Sequence Analysis - Topical Reports	01OCT93	29JUL94	J	A	S	O
N1D46W9	SST Documentation Prep/Consistency Review	01FEB94	29JUL94	J	A	S	O
N1D46W9M	SST-Upgraded Safety Envelope Documentation		29JUL94	J	A	S	O
N1D46WB	Facility Desc Ops & As-Built Conditions (SST)	01JUN94	30SEP94	J	A	S	O
N1D46WC	Facility Designs Codes & Standards SST Tech Bas	01APR94	30SEP94	J	A	S	O
N1D46WD	SST Technical Bases Fire Hazards Analysis	01JUL94	30SEP94	J	A	S	O
N1D46WZ	SST-ASA Follow-On Activities	01JUL94	30SEP94	J	A	S	O
1.1.2.01.02.10	SIRIDS Program						
94D4B0A	CA/IM MANAGEMENT AND ADMINISTRATION	01OCT93	30SEP94	J	A	S	O
94D4B0B	DATABASE ADMINISTRATION	01OCT93	30SEP94	J	A	S	O
94D4B0C	CORRECTIVE ACTION ISSUE MANAGEMENT	01OCT93	30SEP94	J	A	S	O
94D4B0C14	PREPARE & TRANSMIT QUARTERLY LETTER	01JUL94	30SEP94	J	A	S	O
94D4B0C16	CORRECTIVE ACTION ISSUE MGMT. STATUS		30SEP94	J	A	S	O
MBC3A1997	TIE TO MYPP NUMBER SO04015	01OCT97	01OCT97	J	A	S	O
N1C3A0A	COMPLIANCE PROGRAMS	03OCT94	29SEP95	J	A	S	O
N1C3A0A01	MANAGE COMPLIANCE PROGRAMS AND ALARA	03OCT94	29SEP95	J	A	S	O
N1C3A0A02	INTEGRATED COMPLIANCE MANAGEMENT	09OCT95	07OCT96	J	A	S	O
N1C3A0A03	COMPLIANCE MANAGEMENT MODULE COMPLETE		07OCT96	J	A	S	O

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Activity ID	Activity Description	Early Start	Early Finish	FY94	FY95	FY96	FY97
NTC3A0G01	DEVELOP RAD PRACTICES MANUAL	03OCT95*	01APR96	J	A	S	O
NTC3A0G6	ALARA PLANNING	02OCT95*	30SEP96				
NTC3A0G7	ALARA PLANNING	01OCT96	30SEP97				
1.1.2.01.02.11							
MBC3B1997	TIE TO MYPP ACTIVITY NUMBER UNKNOWN	01OCT97	01OCT97				
NTC3B0A	PROGRAM MANAGEMENT	03OCT94*	29SEP95				
NTC3B0A1	PROGRAM MANAGEMENT	03OCT94*	29SEP95				
NTC3B0A6	PROGRAM MANAGEMENT SUMMARY 1996	02OCT95	30SEP96				
NTC3B0A7	PROGRAM MANAGEMENT SUMMARY 1997	01OCT96	30SEP97				
NTC3B0B	TANK FARM SOURCE MONITORING SWEEPS	03OCT94*	29SEP95				
NTC3B0B1	PERFORM AND DOCUMENT SWEEPS	03OCT94*	30DEC94				
NTC3B0B2	PROVIDE COPY OF DOCUMENTATION TO TWRS	03JAN95*	31MAR95				
NTC3B0B3	ISSUE QUARTERLY SUMMARY REPORT	03OCT94*	30DEC94				
NTC3B0B4	ISSUE QUARTERLY SUMMARY REPORT	03JAN95*	31MAR95				
NTC3B0B5	ISSUE QUARTERLY SUMMARY REPORT	03APR95*	30JUN95				
NTC3B0B6	ISSUE QUARTERLY SUMMARY REPORT	05JUL95*	29SEP95				
NTC3B0B8	TANK FARM MONITORING SWEEPS 1996	02OCT95	30SEP96				
NTC3B0B9	TANK FARM MONITORING SWEEPS 1997	01OCT96	30SEP97				
NTC3B0F	BASELINE HAZARD ASSESSMENT	03OCT94*	30MAR95				
NTC3B0F1	DEVELOP MASTER SCHEDULE	03OCT94*	21OCT94				
NTC3B0F2	ESTABLISH TEAMS	24OCT94*	31OCT94				
NTC3B0F3	CONDUCT FIELD ASSESSMENTS & COLLECT	01NOV94*	02MAR95				
NTC3B0F4	UPDATE HEALTH AND SAFETY PLAN (HASP)	03MAR95*	15MAR95				
NTC3B0F5	ISSUE UPDATED HASP	16MAR95*	30MAR95				
NTC3B0F51	HEALTH AND SAFETY BASELINE HAZARD		30MAR95				
NTC3B0F6	BASELINE HAZARD ASSESSMENT	02OCT95*	30SEP96				
NTC3B0F7	BASELINE HAZARD ASSESSMENT	01OCT96	30SEP97				
NTC3B0J	FIRE PROTECTION ASSESSMENTS	03OCT94*	29SEP95				
NTC3B0J01	PERFORM SCHEDULED FIRE ASSESSMENTS	03OCT94*	30DEC94				
NTC3B0J02	DOCUMENT ASSESSMENT	03JAN95*	31MAR95				
NTC3B0J03	ISSUE REPORT ASSESSMENT	03APR95*	30JUN95				
NTC3B0J04	SUBMIT FINDINGS TO QUEST	05JUL95*	29SEP95				
NTC3B0J05	REPORT ASSESSMENT STATUS ON QUARTERLY	03OCT94*	30DEC94				
NTC3B0J06	REPORT ASSESSMENT STATUS ON QUARTERLY	03JAN95*	31MAR95				
NTC3B0J07	REPORT ASSESSMENT STATUS ON QUARTERLY	03APR95*	30JUN95				
NTC3B0J08	REPORT ASSESSMENT STATUS ON QUARTERLY	05JUL95*	29SEP95				
NTC3B0J09	HEALTH AND SAFETY FIRE PROTECTION		29SEP95				

Activity ID	Activity Description	Early Start	Early Finish	FY94	FY95	FY96	FY97
N1C3B0J10	FIRE PROTECTION ASSESSMENTS	02OCT95	30SEP96	J	A	S	O
N1C3B0J11	FIRE PROTECTION ASSESSMENTS	01OCT96	30SEP97				
N1C3B0P	HERF SAMPLING AND ANALYSIS	03OCT94	29SEP95				
N1C3B0P1	ESTABLISH, PERFORM, ANALYZE, DOCUM. & REPT.	03OCT94	29SEP95				
N1C3B0P6	HERF SAMPLING AND ANALYSIS	02OCT95	30SEP96				
N1C3B0P7	HERF SAMPLING AND ANALYSIS	01OCT96	30SEP97				
1.1.2.01.02.12							
C3C0A	Radiological Control & Safety	03OCT94	29SEP95				
C3C0A01	Functional Area Management & Administration	03OCT94	29SEP95				
C3C0A02	Regulatory Compliance & Assessment	03OCT94	29SEP95				
C3C0A02A	Complete RADCON Manual Compliance Review		30OCT94				
C3C0A02B	Compliance Documentation of 10CFR835		29SEP95				
C3C0A02C	SIRIDS Radiation Protection Self-Assessment		29SEP95				
C3C0A03	Training Administration	03OCT94	29SEP95				
C3C0A04	HPT Core Task Training	03OCT94	29SEP95				
C3C0A05	Project Support	03OCT94	29SEP95				
C3C0A06	Operations Support	03OCT94	29SEP95				
C3C0A07	Radiological Controls	03OCT94	29SEP95				
C3C0A6	Radiological Control & Safety	02OCT95	30SEP96				
C3C0A7	Radiological Control & Safety	01OCT96	30SEP97				
C3C0B	Program Support	03OCT94	29SEP95				
C3C0B6	Program Support	02OCT95	30SEP96				
C3C0B7	Program Support	01OCT96	30SEP97				
1.1.2.01.03 Tank Farm East Storage Facilities							
SO06130	Perform Interim Safe Facility Operations - East TF	01OCT97	30SEP00				
SO06145	Perform Interim Safe Routine Surveillance - East TF	01OCT97	30SEP00				
SO06160	Perform Interim Safe Ops - East Corrective Maint	01OCT97	30SEP00				
SO06175	Perform Interim Safe Ops - East Preventative Maint	01OCT97	30SEP00				
SO06185	Perform 200 East Plant/Systems Engineering	01OCT97	30NOV28				
SO06190	Perform 200E Industrial Hygiene Monitoring & Analysis	01OCT97	30NOV28				
SO06193	Perform New 200 East Tank Farm Preparations	01OCT97	29DEC98				
XSPSOS010	TU to OM: Consol Alarm Panel to Fnl Safe Ops -E TF	01OCT97	30SEP97				
XSPSOS010	TU to OM: Ctrl Room Upgrds to Fnl Safe Ops -E TF	01OCT97	30SEP97				
XSPSOS011	TU to OM: Contam Eqpt Disp to Fnl Safe Ops -E TF	01OCT97	30SEP97				
XSPSOS011	TU to OM: Start Ops (W-028) to Fnl Safe Ops -E TF	01OCT97	30SEP97				
XSSSOS013	TS to OM: Mit Pump AWW-101 to Fnl Safe Ops -E TF	01OCT97	30SEP97				
XSSSOS014	TS to OM: FeCN Sfty Issue to Fnl Safe Ops -E TF	01OCT97	30SEP97				

Activity ID	Activity Description	Early Start	Early Finish	FY94	FY95	FY96	FY97
XSSOS014	TS to OM: Mit C-103 Issue to Fnl Safe Ops -E 1F	01OCT97*	30SEP97	J	A	S	O
1.1.2.01.03.01	200 East Preventive Maintenance						
94F610A	EAST TANK FARM PMS	01OCT93*	30SEP94				
94F610B	EAST TANK FARM PM PRODUCTION CONTROL	01OCT93*	30SEP94				
94F610C	TANK FARM PM UPGRADES	01OCT93*	30SEP94				
N1F610A	EAST TANK FARM PREVENTATIVE MAINTENANCE	03OCT94*	29SEP95				
N1F610A10	COMPLETE ANNUAL PREVENTATIVE		29SEP95				
N1F616A	EAST TANK FARM PREVENTATIVE MAINTENANCE	02OCT95*	30SEP96				
N1F616A10	COMPLETE ANNUAL PREVENTATIVE		30SEP96				
N1F617A	EAST TANK FARM PREVENTATIVE MAINTENANCE	01OCT96*	30SEP97				
N1F617A10	COMPLETE ANNUAL PREVENTATIVE		30SEP97				
1.1.2.01.03.02	200 East Corrective Maintenance						
94F620A	EAST TANK FARM CM'S	01OCT93*	30SEP94				
94F620B	EAST TANK FARM CM PRODUCTION CONTROL	01OCT93*	30SEP94				
94F620C	MAINTENANCE ENVIRONMENTAL CONTROL &	01OCT93*	30SEP94				
94F620D	MAINTENANCE MANGEMENT	01OCT93*	30SEP94				
N1F620A	EAST TANK FARM'S CORRECTIVE MAINTENANCE	03OCT94*	29SEP95				
N1F620A10	REPAIR MALFUNCTIONING EXHAUSTERS	03OCT94*	30MAY95				
N1F620A15	REPAIR MALFUNCTIONING EXHAUSTERS		30MAY95*				
N1F620A20	REPAIR ACTIVE CASS ALARM DEFICIENCIES	03OCT94*	16JAN95				
N1F620A25	REPAIR ACTIVE CASS ALARM DEFICIENCIES		16JAN95*				
N1F620A30	REPAIR MATERIAL DEFICIENCIES IN 204-AR/AN/AP	03OCT94*	29MAR95				
N1F620A35	REPAIR MATERIAL DEFICIENCIES IN 204-AR/AN/AP		29MAR95*				
N1F620A40	WORK PACKAGE CLOSEOUT CYCLE TIME	03OCT94*	29SEP95				
N1F620A45	MAINTAIN WORK PACKAGE CLOSEOUT CYCLE		29SEP95				
N1F620A50	OPERATIONS ESSENTIAL EQUIPMENT UP TIME >	03OCT94*	29SEP95				
N1F620A55	MAINTAIN OPS ESSENTIAL EQPMT UP TIME > 90%		29SEP95				
N1F620A60	PM DELINQUENCIES LESS THAN 8%	03OCT94*	29SEP95				
N1F620A65	MAINTAIN PM DELINQUENCIES LESS THAN 8%		29SEP95				
N1F620B	MAINTENANCE & PRODUCTION CONTROL	03OCT94*	29SEP95				
N1F620B10	BACKLOG REDUCTION	03OCT94*	29SEP95				
N1F620B15	ACHIEVE BACKLOG REDUCTION REQUIREMENTS		29SEP95				
N1F620B20	WORK PACKAGE SUSPENSIONS	03OCT94*	29SEP95				
N1F620B25	MAINTAIN WP SUSPENSIONS RATE		29SEP95				
N1F620B30	REPETITIVE WORK PACKAGES 200 EAST	03OCT94*	29SEP95				
N1F620B35	DEVELOP REPETITIVE WORK PACKAGES		29SEP95				
N1F620C	MAINTENANCE IMPLEMENTATION PLAN	03OCT94*	31MAR95				

Activity ID	Activity Description	Early Start	Early Finish	FY94	FY95	FY96	FY97
N1F620C10	MAINTENANCE IMPLEMENTATION PLAN		31MAR95	J	A	S	O
N1F626A	EAST TANK FARMS CORRECTIVE MAINTENANCE	02OCT95*	30SEP96				
N1F626B	MAINTENANCE & PRODUCTION CONTROL	02OCT95*	30SEP96				
N1F626C	MAINTENANCE IMPLEMENTATION PLAN	02OCT95*	29MAR96				
N1F627A	EAST TANK FARMS CORRECTIVE MAINTENANCE	01OCT96*	30SEP97				
N1F627B	MAINTENANCE & PRODUCTION CONTROL	01OCT96*	30SEP97				
N1F627C	MAINTENANCE IMPLEMENTATION PLAN	01OCT96*	31MAR97				
1.1.2.01.03.03 200 East Facility Operations							
94F63AA	200E FACILITY OPERATIONS	01OCT93*	30SEP94				
94F63AA06	LOE EXECUTION OF WASTE RECEIPTS	01OCT93*	30SEP94				
94F63AA10	IMPLEMENT SST INTRUSION INVESTIGATION PLAN	03JAN94*	30SEP94				
94F63AA11	PLAN PREP APPROVED WORK PKG'S FIC	01JUL94*	15SEP94				
94F63AA11	INSTALL 9 FIC'S - EAST RESOURCES	05AUG94*	15SEP94				
94F63AA11	INSTALL 9 LIQUID LEVEL INDICATORS - EAST	01OCT93*	30SEP94				
94F63AB	200E ALARA/RADIOLOGICAL CONTROL	02MAY97*	30SEP94				
94F63AC	LOW INSTALLATION - EAST	01OCT93*	30SEP94				
94F63AD	200E HEALTH PHYSICS SUPT	01OCT93*	30SEP94				
94F63AF	200E HERBICIDE SPRAYING	01OCT93*	30SEP94				
94F63AG	200E CRANE & RIGGING SUPPORT	01OCT93*	30SEP94				
94F63AH	200E CUSTODIAL SERVICES	01OCT93*	30SEP94				
N1F6300	PROJECT MANAGEMENT	03OCT94*	29SEP95				
N1F630A	GENERAL ADMINISTRATION	03OCT94*	29SEP95				
N1F630B	SITE SERVICES	03OCT94*	29SEP95				
N1F630C	CONDUCT 45 INTERNAL WASTE TRANSFERS	03OCT94*	29SEP95				
N1F630C10	COMPLETE 45 INTERNAL WASTE TRANSFERS		29SEP95				
N1F630D	13 EXTERNAL WASTE TRANSFERS	03OCT94*	29SEP95				
N1F630D10	COMPLETE 13 EXTERNAL WASTE TRANSFERS		29SEP95				
N1F630E	RESTORE CROSS-SITE TRANSFER CAPABILITY	03OCT94*	31MAR95				
N1F630E10	RESTORE CROSS-SITE TRANSFER CAPABILITY IN		31MAR95				
N1F630F	FIELD ACTIVITIES	03OCT94*	29SEP95				
N1F630G	204-AR OPERATIONS	03OCT94*	29SEP95				
N1F630H	TECHNICAL SERVICES	03OCT94*	29SEP95				
N1F630I	CONDUCT OF OPERATIONS	03OCT94*	29SEP95				
N1F630J	HEALTH PHYSICS	03OCT94*	29SEP95				
N1F630K	HERBACIDE SPRAYING	03OCT94*	29SEP95				
N1F630K20	COMPLETE HERBACIDE SPRAYING		29SEP95				
N1F630L	CUSTODIAL SERVICES	03OCT94*	29SEP95				

Activity ID	Activity Description	Early Start	Early Finish	FY94	FY95	FY96	FY97
N1F630M	EQUIPMENT REMOVAL	01DEC94*	30JUN95	J	A	S	O
N1F630N	INDUSTRIAL HYGIENE & SAFETY	03OCT94*	29SEP95	J	A	S	O
N1F630NT0	COMPLETE TH&S REVIEW/APPROVAL		29SEP95	J	A	S	O
N1F6360	PROJECT MANAGEMENT	02OCT95*	30SEP96	J	A	S	O
N1F636A	GENERAL ADMINISTRATION	02OCT95*	30SEP96	J	A	S	O
N1F636B	SITE SERVICES	02OCT95*	30SEP96	J	A	S	O
N1F636C	CONDUCT INTERNAL WASTE TRANSFERS	02OCT95*	30SEP96	J	A	S	O
N1F636D	EXTERNAL WASTE TRANSFERS	02OCT95*	30SEP96	J	A	S	O
N1F636E	CROSS-SITE TRANSFER CAPABILITY	02OCT95*	29MAR96	J	A	S	O
N1F636F	FIELD ACTIVITIES	02OCT95*	30SEP96	J	A	S	O
N1F636G	204-AR OPERATIONS	02OCT95*	30SEP96	J	A	S	O
N1F636H	TECHNICAL SERVICES	02OCT95*	30SEP96	J	A	S	O
N1F636I	CONDUCT OF OPERATIONS	02OCT95*	30SEP96	J	A	S	O
N1F636J	HEALTH PHYSICS	02OCT95*	30SEP96	J	A	S	O
N1F636K	HERBACIDE SPRAYING	02OCT95*	30SEP96	J	A	S	O
N1F636L	CUSTODIAL SERVICES	02OCT95*	30SEP96	J	A	S	O
N1F636M	EQUIPMENT REMOVAL	01DEC95*	01JUL96	J	A	S	O
N1F636N	INDUSTRIAL HYGIENE & SAFETY	02OCT95*	30SEP96	J	A	S	O
N1F6370	PROJECT MANAGEMENT	01OCT96*	30SEP97	J	A	S	O
N1F637A	GENERAL ADMINISTRATION	01OCT96*	30SEP97	J	A	S	O
N1F637B	SITE SERVICES	01OCT96*	30SEP97	J	A	S	O
N1F637C	CONDUCT 45 INTERNAL WASTE TRANSFERS	01OCT96*	30SEP97	J	A	S	O
N1F637D	13 EXTERNAL WASTE TRANSFERS	01OCT96*	30SEP97	J	A	S	O
N1F637E	CROSS-SITE TRANSFER CAPABILITY	01OCT96*	31MAR97	J	A	S	O
N1F637F	FIELD ACTIVITIES	01OCT96*	30SEP97	J	A	S	O
N1F637G	204-AR OPERATIONS	01OCT96*	30SEP97	J	A	S	O
N1F637H	TECHNICAL SERVICES	01OCT96*	30SEP97	J	A	S	O
N1F637I	CONDUCT OF OPERATIONS	01OCT96*	30SEP97	J	A	S	O
N1F637J	HEALTH PHYSICS	01OCT96*	30SEP97	J	A	S	O
N1F637K	HERBACIDE SPRAYING	01OCT96*	30SEP97	J	A	S	O
N1F637L	CUSTODIAL SERVICES	01OCT96*	30SEP97	J	A	S	O
N1F637M	EQUIPMENT REMOVAL	02DEC96*	01JUL97	J	A	S	O
N1F637N	INDUSTRIAL HYGIENE & SAFETY	01OCT96*	30SEP97	J	A	S	O
1.1.2.01.03.04	200 East Routine Surveillance						
94F640A	200E ROUTINE SURVEILLANCE	01OCT93*	31SEP94	J	A	S	O
94F640A02	200E ROUTINE SURVEILLANCES COMPLETE		30SEP94	J	A	S	O
94F640A04	MAT'L FOLLOW THRU W/S.G. TRUCK PURCHASE	01OCT93*	01SEP94	J	A	S	O

Activity ID	Activity Description	Early Start	Early Finish	FY94	FY95	FY96	FY97
94F640A06	RECEIVE SPECTRAL GAMMA TRUCKS	01OCT93*	01SEP94				
94F640B	200E LOW/DRYWELL READINGS	01OCT93*	30SEP94				
94F640B01	COMPLETE LOW/DRYWELL/LATERAL READINGS		30SEP94				
94F640B02	PREP/PLAN/APPV/SCHED WPs TO SUPT SST	01OCT93*	30AUG94				
94F640B04	OBTAIN 16 SST IN-TANK PHOTOS	01APR94*	30AUG94				
94F640B06	OBTAIN 16 SST IN-TANK PHOTOS		30AUG94*				
94F640C	200E HPT SURVEILLANCE SUPPORT	01OCT93*	30SEP94				
N1F640A	ROUTINE SURVEILLANCE	03OCT94*	29SEP95				
N1F640A20	COMPLETE ROUTINE SURVEILLANCE		29SEP95				
N1F640B	SURVEILLANCE DATA ANALYSIS	03OCT94*	29SEP95				
N1F640C	SURVEILLANCE OPERATING PARAMETERS	03OCT94*	29SEP95				
N1F640C10	COMPLETE OPERATING PARAMETERS		29SEP95				
N1F640D	TANK EVAPORATION ANALYSIS	03OCT94*	29SEP95				
N1F640D10	COMPLETE TANK EVAPORATION ANALYSIS		29SEP95				
N1F640E	LOW/DRYWELL READING	03OCT94*	29SEP95				
N1F640E10	COMPLETE LOW/DRYWELL SURVEILLANCE		29SEP95				
N1F640F	IN TANK PHOTOS/PIT INVENTORIES	03OCT94*	29SEP95				
N1F640F20	COMPLETE IN TANK PHOTOS/PIT INVENTORIES		29SEP95				
N1F640G	HEALTH PHYSICS	03OCT94*	29SEP95				
N1F640G20	COMPLETE HEALTH PHYSICS REQUIREMENTS		29SEP95				
N1F646A	ROUTINE SURVEILLANCE	02OCT95*	30SEP96				
N1F646A20	COMPLETE ROUTINE SURVEILLANCE		30SEP96				
N1F646B	SURVEILLANCE DATA ANALYSIS	02OCT95*	30SEP96				
N1F646C	SURVEILLANCE OPERATING PARAMETERS	02OCT95*	30SEP96				
N1F646C10	COMPLETE OPERATING PARAMETERS		30SEP96				
N1F646D	TANK EVAPORATION ANALYSIS	02OCT95*	30SEP96				
N1F646D10	COMPLETE TANK EVAPORATION ANALYSIS		30SEP96				
N1F646E	LOW/DRYWELL READING	02OCT95*	30SEP96				
N1F646E10	COMPLETE LOW/DRYWELL SURVEILLANCE		30SEP96				
N1F646F	IN TANK PHOTOS/PIT INVENTORIES	02OCT95*	30SEP96				
N1F646F20	COMPLETE IN TANK PHOTOS/PIT INVENTORIES		30SEP96				
N1F646G	HEALTH PHYSICS	02OCT95*	30SEP96				
N1F646G20	COMPLETE HEALTH PHYSICS REQUIREMENTS		30SEP96				
N1F647A	ROUTINE SURVEILLANCE	01OCT96*	30SEP97				
N1F647A20	COMPLETE ROUTINE SURVEILLANCE		30SEP97				
N1F647B	SURVEILLANCE DATA ANALYSIS	01OCT96*	30SEP97				

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Activity ID	Activity Description	Early Start	Early Finish	FY94	FY95	FY96	FY97
NTG/60R58	ISSUE PROCESS TESTS	03OCT94	27SEP95	J	A	S	O
NTG/60R60	DEVELOP/REVIEW/REVISE ECNS	02OCT95	27SEP96				
NTG/60R60	DEVELOP/REVIEW/REVISE POPS/MAINT	02OCT95	27SEP96				
NTG/60R61	REVIEW OSRS/OSDs	02OCT95	27SEP96				
NTG/60R61	PREPARE & VERIFY INST. DOCUMENTATION	02OCT95	27SEP96				
NTG/60R61	PROVIDE FIELD SUPPT FOR	02OCT95	27SEP96				
NTG/60R62	IN TANK PHOTO EFFORT SUPPORT	03OCT94	29SEP95				
NTG/60R62	RESPOND TO TECHNICAL REQUESTS	02OCT95	27SEP96				
NTG/60R62	DEVELOP/REVIEW/REVISE PROCESS MEMOS	02OCT95	27SEP96				
NTG/60R63	SUPPORT TRANSFERS	02OCT95	27SEP96				
NTG/60R63	RESPOND TO	02OCT95	27SEP96				
NTG/60R63	EVAL SYSTEMS FOR REVISED CODES &	02OCT95	27SEP96				
NTG/60R64	STATUS & ORDER SPARE PARTS	02OCT95	27SEP96				
NTG/60R64	SCREEN/EVALUATE USQs	02OCT95	27SEP96				
NTG/60R65	PERFORM SYSTEM WALKDOWNS	02OCT95	27SEP96				
NTG/60R65	STATUS WORK PKGS/OPERATIONS CONCERNS	02OCT95	27SEP96				
NTG/60R65	ISSUE PROCESS TESTS	02OCT95	27SEP96				
NTG/60R66	IN TANK PHOTO EFFORT SUPPORT	02OCT95	27SEP96				
NTG/60W0	MANAGE WSE EFFORTS	03OCT94	29SEP95				
NTG/60W0	DEV/MAINTAIN BUDGET/SCHEDULE 1ST HALF FY	03OCT94	31MAR95				
NTG/60W0	SCHEDULE AND BUDGETS AT REQUIRED DATES		31MAR95				
NTG/60W0	DEV/MAINTAIN BUDGET/SCHEDULE 2ND HALF FY	03APR95	29SEP95				
NTG/60W1	SCHEDULE AND BUDGETS AT REQUIRED DATES		29SEP95				
NTG/60W6	MANAGE WSE EFFORTS	02OCT95	30SEP96				
NTG/60W6	DEV/MAINTAIN BUDGET/SCHEDULE 1ST HALF FY	02OCT95	01APR96				
NTG/60W6	DEV/MAINTAIN BUDGET/SCHEDULE 2ND HALF FY	02APR96	30SEP96				
NTG/60Z60	DEVELOP PART B IMPLEMENTATION PLAN	02OCT95	28DEC95				
NTG/6AC70	200 WEST SYSTEM PROCESS ENGINEERING	01OCT96	30SEP97				
NTG/6AF02	EMERGENT WORK	03OCT94	29DEC94				
NTG/6AF60	EMERGENT WORK	02OCT95	28DEC95				
1.1.2.01.04.07	New 200 West Tank Farm						
1.1.2.01.04.08	West Tank Farm Improvements						
1.1.2.01.05	Tank Farm SST Stabilization/Single-Shell Tank Pro						
SO05275	Perform Remaining SST Interim Stabilization	01OCT97	30SEP00				
SO05306	Int Slab of 2 FG WLT in 241-A/AX Tank Farms	01OCT97	31DEC99				
SO05315	Int Slab of 4 FeCN WL Tanks in 241-BX/BY	01OCT97	30SEP98				
SO05327	Int Slab of 7 FG WL Tanks in 241-S/SX Farm	01OCT97	30%OV99				

Activity ID	Activity Description	Early Start	Early Finish	FY94	FY95	FY96	FY97
SO05333	Inter Stabil 2 Org WL Tanks in 241-S/SX Farm	01OCT97*	31MAR99	J	A	S	O
SO05338	Int Stabil 2 NWL Tanks in 241-T Tank Farms	01OCT97*	30AUG98	J	A	S	O
SO05355	Perform SST Intrusion Prevention	01OCT97*	31AUG00	J	A	S	O
SO05362	Maintain SST Emergency Pumping Capabilities	01OCT97*	30SEP98	J	A	S	O
SO05375	Provide SST Emergency Pumping Contingency	01OCT97*	30APR99	J	A	S	O
SO05378	Obtain/Operate Light Duty Utility Arm	01OCT97*	30SET 18	J	A	S	O
SO05380	Provide SST Program Support	01OCT97*	30SEP01	J	A	S	O
1.1.2.01.05.01 SST Interim Stabilization							
94E510A	BY & C FARM INTERIM STABILIZE PREPARATIONS	01OCT93*	30SEP94	Y			
94E510A006	C-FARM EQUIPMENT REPAIR/REPLACE	01OCT93*	23SEP94	Y			
94E510A008	C-102 EQUIPMENT REPAIR/REPLACE	01OCT93*	22SEP94	Y			
94E510A010	C-107 EQUIPMENT REPAIR/REPLACE	01OCT93*	22SEP94	Y			
94E510A012	C-110 EQUIPMENT REPAIR/REPLACE	01OCT93*	22SEP94	Y			
94E510A014	C-102/107/110 READINESS REVIEW	26SEP94	29SEP94	Y			
94E510A016	CR VAULT EQUIPMENT REPAIR/REPLACE	20OCT93*	20SEP94	Y			
94E510A018	CR VAULT READINESS REVIEW	21SEP94	30SEP94	Y			
94E510A024	BY-102/109 & C-102/107/110 PUMPING	31MAY94	29SEP94	Y			
94E510A026	JET PUMP TANK BY-102	31MAY94*	31AUG94	Y			
94E510A028	JET PUMP TANK BY-109	31MAY94*	28 SEP94	Y			
94E510A038	INITIATE INTERIM STABILIZATION	30SEP94		Y			
94E510B	U-FARM INTERIM STABILIZE FIELD PREPARATIONS	01OCT93*	30SEP94	Y			
94E510B002	PREP & ISSUE U-FARM SCHEDULES FOR REPAIRS	01OCT93*	31AUG94	Y			
94E510B004	PREP RESOURCE LOADED SCHEDULE U-FARM IS		31AUG94	Y			
94E510B006	U-FARM INTERIM STABILIZE PREPARATIONS	1-SEP94*	30SEP94	Y			
94E510B008	PARTIAL U-FARM INTERIM STABILIZATION		30SEP94	Y			
94E510D	S-FARM INTERIM STABILIZE FIELD PREPARATIONS	01OCT93*	30SEP94	Y			
94E510D00	S-FARM INTERIM STABILIZATION FIELD PREP	01FEB94	30SEP94	Y			
94E510D00	PARTIAL S-FARM INTERIM STABILIZATION		30SEP94	Y			
94E510E	STABILIZATION PREPARATION	01OCT93*	30SEP94	Y			
94E510E004	DEVELOP 244-BX/244-TX DCRT FACILITY MANUALS	01OCT93*	30SEP94	Y			
94E510E006	PRODC 220F-55 SST HISTORICAL RECORDS	01OCT93*	30SEP94	Y			
94E510E008	CONDUCT STUDY BEST METHOD PREP SSTs FOR	01OCT93*	30SEP94	Y			
94E510G	USQ EVALUATIONS	01OCT93*	30AUG94	Y			
94E510G00	CP SST SFY EVAL IS OF NON-STABILIZED		30AUG94	Y			
94E510H	C-105 DECLARED INTERIM STABILIZED	01OCT93*	30SEP94	Y			
94E510H00	C-105 PROCESS TEST	01OCT93	30SEP94	Y			
N1E510A00	BY-102/109 & C-102/107/110 PUMPING	03OCT94*	30DEC94	Y			

Activity ID	Activity Description	Early Start	Early Finish
NTE510A00	JET PUMP TANK BY-109	03OCT94*	21NOV94
NTE510A00	JET PUMP TANK C-102	03OCT94*	30DEC94
NTE510A00	JET PUMP TANK C-107	03OCT94*	30DEC94
NTE510A01	JET PUMP TANK C-110	03OCT94*	11NOV94
NTE510A01	T2A-95-316 COMP RMVL OF PUMPABLE LIQ FROM		30NOV94*
NTE510A01	M-41-01-12 COMP IS BY-102,109 & C-102,107,110		30DEC94
NTE510A01	BY & C POST PUMPING ACTIVITIES	03OCT94*	31JAN95
NTE510B00	U FARM PROJECT PREPARATION	03OCT94*	06APR95
NTE510B01	U FARM TRANSFER LINES-ROUTES	03OCT94	26JUN95
NTE510B01	U FARM PUMP CTRL&INST. SKIDS	03OCT94	22JUN95
NTE510B02	U FARM JET PUMP INSTALLATION	06JAN95*	18MAY95
NTE510B02	U FARM INFRASTRUCTURE REPAIR	03OCT94*	08MAY95
NTE510B03	U FARM PROCEDURE/TRAINING	11NOV94*	09FEB95
NTE510B03	U FARM MANAGEMENT REVIEW	05JAN95*	26JUL95
NTE510B03	M-41-13 START IS OF 3 ORG. WLT IN U-FARM	31JUL95*	
NTE510B04	U FARM PUMPING (U-102,106,107,111) (F-Y95)	31JUL95	29SEP95
NTE510B04	M-41-13-101 COMPL IS OF 3 ORG. WLT IN U-FARM		31DEC96
NTE510B04	M-41-08 START IS ON 1 N-WLT IN U-FARM	31JUL95*	
NTE510B04	U FARM PUMPING (U-102)	31JUL95	29MAR96
NTE510B04	M-41-08-11 COMPL IS ON 1 N-WLT IN U-FARM		29MAR96
NTE510B04	U FARM POST PUMPING (U-102,106,107,111)	12DEC95*	30SEP96
NTE510B05	U FARM PROJECT PREP (U-103,105,108,109)	05JUL95*	29SEP95
NTE510B05	U FARM TRANSFER LINES (U-103,105,108,109)	06JUL95*	29SEP95
NTE510B06	U FARM PMP CTRL&INST. SKIDS (U-103,05,08,09)	06JUL95*	29SEP95
NTE510B06	U FARM JET PUMP INSTALLATION	13DEC95*	26APR96
NTE510B07	U FARM INFRASTRUCTURE REPAIR (U-103,05,08,09)	06JUL95*	29SEP95
NTE510B07	U FARM PROCEDURE/TRAINING	23OCT95*	19JAN96
NTE510B08	U FARM MANAGEMENT REVIEW	12DEC95*	17JUL96
NTE510B08	M-41-11 START IS ON 4 FG TANKS U-FARM	30APR96*	
NTE510B08	U FARM PUMPING (U-103,105,108,109) (F-Y96)	05JUL96*	30SEP96
NTE510B08	M-41-11-11 COMPL IS ON 4 FG TANKS U-FARM		30MAY97
NTE510B09	U FARM POST PUMPING (U-103,105,108,109)	21JUN96*	30SEP96
NTE510B64	U FARM PUMPING (U-102,106,107,111) (F-Y96)	02OCT95*	30SEP96
NTE510B65	U FARM PROJECT PREP (U-103,105,108,109)	02OCT95*	15MAR96
NTE510B65	U FARM TRANSFER LINES (U-103,105,108,109)	02OCT95*	30APR96
NTE510B66	U FARM PMP CTRL&INST. SKIDS (U-103,05,08 &09)	02OCT95*	30APR97

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Activity ID	Activity Description	Early Start	Early Finish	FY94	FY95	FY96	FY97
94E530C00	CNDCT SST EMRGNCY PREP SMPLNG REQ FOR	01OCT93	30SEP94	J	A	S	O
94E530C00	CNDCT SUFFICIENT TRANSFER LINE PRESUR TEST	01OCT93	30SEP94	J	A	S	O
94E530D	RESTORE 244-U DCRT	01OCT93	30SEP94	J	A	S	O
94E530D00	RESTORE 244-U TO OPERATION	01OCT93	30SEP94	J	A	S	O
94E530D00	RESTORE 244-U DCRT TO OPERATING						
94E530F	OVERGROUND TRANSFER DESIGN/FAB	01OCT93	30SEP94	J	A	S	O
94E530F008	FABRICATION	02MAY94	30SEP94	J	A	S	O
94E530F012	CMPLT DESIGN/PROC. OF ALTERNATE TRANSFER						
94E530G	ISSUE RFP FOR HLLW CASK	01OCT93	30SEP94	J	A	S	O
94E530G00	PROCRE HLLW TRANSPORT CASK	01MAR94	30SEP94	J	A	S	O
94E530H	DEVELOP PLAN TO RESOLVE CORROSION	01OCT93	30SEP94	J	A	S	O
94E530H00	IMPLEMENTATION PLAN RESOLVE HEAT TRACE	01JUL94	30SEP94	J	A	S	O
94E530H00	DVLP/IMPLMNT PLAN RSLV HEAT TRACE CONDUIT						
94E530K	HLLW TRANSPORT CASK (CAPITAL EQUIP \$)	15FEB94	30SEP94	J	A	S	O
94E530K02	HLLW SAR TRANSLATION	15FEB94	31AUG94	J	A	S	O
94E530K06	HLLW DESIGN, DRAWING PREP	01SEP94	30SEP94	J	A	S	O
N1E530A00	EM PMP PROCEDURE WRITING (INCL. WORK PKG	03OCT94	31MAR95	J	A	S	O
N1E530A00	M-41-02-13 DETAILED PROC. FOR EM PPG. TO						
N1E530A00	M-41-02 EMERGENCY LEAK RESPONSE						
N1E530B00	SST INHIBITOR ADDITIONS FY95	03OCT94	29SEP95	J	A	S	O
N1E530B60	SST INHIBITOR ADDITIONS FY96	02OCT95	30SEP96	J	A	S	O
N1E530B70	SST INHIBITOR ADDITIONS FY97	01OCT96	29SEP97	J	A	S	O
N1E530C00	MAINTN EMERG PPG EQUIP ACCORDING TO PM	03OCT94	29SEP95	J	A	S	O
N1E530C60	MAINTN EMERG PPG EQUIP ACCORDING TO PM	02OCT95	30SEP96	J	A	S	O
N1E530C70	MAINTN EMERG PPG EQUIP ACCORDING TO PM	01OCT96	29SEP97	J	A	S	O
N1E530D00	COMPL. FOLLOW-UP ON 244-U DBL CON. REC. TK	03OCT94	31MAR95	J	A	S	O
N1E530D00	M-41-02-14 RESTORE 244-U DCRT TO COMP OP						
N1E530G00	DEVELOP LOADING FACILITY FOR HLLW CASK	03OCT94	29SEP95	J	A	S	O
N1E530G00	PROVIDE SAR & PROCURMT SPT FOR DEL. HLLW	03OCT94	29SEP95	J	A	S	O
N1E530G60	DEVELOP LOADING FACILITY FOR HLLW CASK	02OCT95	29MAR96	J	A	S	O
N1E530G60	PROVIDE SAR & PROCURMT SPT FOR DEL. HLLW	02OCT95	29MAR96	J	A	S	O
N1E530K01	HLLW MAT'L PROCUREMENT	03OCT94	29SEP95	J	A	S	O
N1E530K01	SHIP HLLW TO FOB POINT	02OCT95	26OCT95	J	A	S	O
N1E530K02	HLLW ON SITE ACCEPTANCE	27OCT95	02JAN96	J	A	S	O
N1E530K02	M-41-03B HLLW AVAILABLE ON SITE		02JAN96	J	A	S	O
1.1.2.01.05.04	SST Stabilization Program Support						
94E540A	S&I PROGRAM MANAGEMENT AND SUPPORT	01OCT93	30SEP94	J	A	S	O

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Activity ID	Activity Description	Early Start	Early Finish	FY94	FY95	FY96	FY97
94E560H	LIGHT DUTY UTILITY ARM	01FEB94*	30SEP94	J	A	S	O
94E560H1	PROV. QA SUPPORT TO THE LDUA SYSTEM	01FEB94*	30SEP94	J	A	S	O
94E560H13	PROVIDE QA LTR REP. FOR ACT. SUPPORTING	01FEB94*	30SEP94	J	A	S	O
94E560H2	PROV. TWRS I/F & TECH SUPP. TO DEV/HOT DEP.	01FEB94*	30SEP94	J	A	S	O
94E560H27	GENERATE KEH TKN FRMS ASSESSMENT FINAL	01FEB94*	30SEP94	J	A	S	O
94E560H28	KEH TF ASSMNT. FIN. REPORT COMP. FOR LDUA	01FEB94*	30SEP94	J	A	S	O
94E560H29	GENERATE LDUA ORR STRATEGY REPORT	01FEB94*	30SEP94	J	A	S	O
94E560H30	LDUA ORR STRATEGY REPORT COMPLETE			J	A	S	O
94E560H4	PROV. SAFETY ANALYSIS SUPP TO THE LDUA	01FEB94*	30SEP94	J	A	S	O
94E560H46	CONTINUE SAFETY ANALYSIS DOCUMENTATION	01JUL94	30SEP94	J	A	S	O
N1E560	LIGHT DUTY UTILITY ARM	03OCT94*	30SEP97	J	A	S	O
N1E560A	LDUA FY 95 SUMMARY	03OCT94*	29SEP95	J	A	S	O
N1E560A01	CONTINUATION OF REQ'D. DOC'S. FOR HOT TEST	03OCT94*	30MAR95	J	A	S	O
N1E560A01	LIGHT DUTY UTILITY ARM ENVIRONMENTAL		30MAR95	J	A	S	O
N1E560A02	LDUA MANAGEMENT SUPPORT	03OCT94*	29SEP95	J	A	S	O
N1E560A03	LDUA FY 96 SUMMARY	02OCT95*	30SEP96	J	A	S	O
N1E560A04	LDUA MANAGEMENT SUPPORT	03OCT95*	30SEP96	J	A	S	O
N1E560A05	LDUA 97 FY SUMMARY	01OCT96*	30SEP97	J	A	S	O
N1E560A06	LDUA MANAGEMENT SUPPORT	01OCT96*	30SEP97	J	A	S	O
N1E560B	SUPPORT LDUA DESIGN ACTIVITY SUMMARY LINE	03OCT94*	21JUN95	J	A	S	O
N1E560B01	REVIEW SPAR 80% DETAIL DESIGN PACKAGE	03OCT94*	30NOV94	J	A	S	O
N1E560B02	SUPPORT MEMBER OF DESIGN TEAM	03OCT94*	21JUN95	J	A	S	O
N1E560B03	PROVIDE INPUT TO H20 DECON DESIGN	03OCT94*	30JAN95	J	A	S	O
N1E560B04	H20 DECON FABRICATION	31JAN95	13FEB95	J	A	S	O
N1E560B04	H20 DECON SYSTEM PROCUREMENT (CAPITOL	31JAN95	13FEB95	J	A	S	O
N1E560B05	H20 DECON TEST	02OCT95*	13OCT95	J	A	S	O
N1E560B06	DEVELOP SPECIAL GOING GAUGES (CAPITAL	03OCT94*	30JUN95	J	A	S	O
N1E560B06	DEVELOP SPECIAL END EFFECTORS (DOE	03OCT94*	30JUN95	J	A	S	O
N1E560B1	RECEIVE 2ND LDUA ARM		02OCT95	J	A	S	O
N1E560C	TRAINING SUMMARY LINE	02OCT95*	27SEP96	J	A	S	O
N1E560C01	COMPLETE TRAINING PLAN	02OCT95*	28MAR96	J	A	S	O
N1E560C02	PREPARE TRAINING PACKAGE (PROCEDURE &	29MAR96*	26SEP96	J	A	S	O
N1E560C03	PREPARE OPERATION AND MAINTENANCE	29MAR96	26SEP96	J	A	S	O
N1E560C05	TRAINING SUMMARY LINE	30SEP96*	27DEC96	J	A	S	O
N1E560C06	COMPLETE TRAINING OF OPERATIONS	27SEP96*	26SEP96	J	A	S	O
N1E560C07	TRAINING	30DEC96*	23JAN97	J	A	S	O

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Activity ID	Activity Description	Early Start	Early Finish	FY94	FY95	FY96	FY97
N1A120B	PREVENTATIVE MAINTENANCE AP/AW	03OCT94*	29SEP95	JAN95			JAN97
N1A126A	PREVENTATIVE MAINTENANCE 242-A	02OCT95*	30SEP95				
N1A126B	PREVENTATIVE MAINTENANCE AP/AW	02OCT95*	30SEP96				
N1A127A	PREVENTATIVE MAINTENANCE 242-A	01OCT96*	30SEP97				
N1A127B	PREVENTATIVE MAINTENANCE AP/AW	01OCT96*	30SEP97				
1.1.2.01.06.03 242A/AP and AW Tank Farms Base Operations							
94A130A	242-A EVAPORATOR CORRECTIVE MAINTENANCE	01OCT93*	30SEP94				
94A130B	COMPLETE 94-2 PMS	01OCT93*	30SEP94				
94A130C	242-A/241-AW/241-AP CM SUPPORT	01OCT93*	30SEP94				
N1A130A	242A CAMPAIGN CIMS	03OCT94*	30DEC94				
N1A130B	242A 95-1 OUTAGE CIMS	03JAN95*	23JUN95				
N1A130C	242A 95-1 CAMPAIGN CIMS	27JUN95*	29SEP95				
N1A130D	AP/AW TANK FARMS CIMS	03OCT94*	29SEP95				
N1A136A	242A 96-1 CORRECTIVE MAINTENANCE	02OCT95*	02JAN96				
N1A136B	242A 96-2 CORRECTIVE MAINTENANCE	05JAN96*	24JUN96				
N1A136C	242A 96-3 CIMS	05JUL96*	30SEP96				
N1A136D	AP/AW TANK FARMS CIMS	02OCT95*	30SEP96				
N1A137A	242A 97-1 CORRECTIVE MAINTENANCE	01OCT96*	30DEC96				
N1A137B	242A 97-2 CORRECTIVE MAINTENANCE	03JAN97*	23JUN97				
N1A137C	242A 97-3 CIMS	07JUL97*	30SEP97				
N1A137D	AP/AW TANK FARMS CIMS	01OCT96*	30SEP97				
1.1.2.01.06.04 242A/AP and AW Tank Farms Routine Surveillance a							
94A140A	242-A EVAP/AW/AP BASE OPERATIONS	01OCT93*	30SEP94				
94A140A12	SUPPORT ALL POST START PUNCHLIST ITEMS	29JUL94*	29SEP94				
94A140B	242-A EVAP RESTART PROGRAM/OUTAGE	01APR94*	30SEP94				
94A140D	242-A/AW/AP HPT BASE SUPPORT	01OCT93*	30SEP94				
94A140F	PROCESS CRANE OPERATOR SUPPORT	01OCT93*	30SEP94				
94A140H	242-A SAMPLE TRUCK DRIVER	01OCT93*	30SEP94				
94A140J	PROCURE HEPA FILTERS AND PLENUMS	03JAN94*	30SEP94				
N1A140A	CAMPAIGN 94-2 TANKS 101, 107, 108 AP	03OCT94*	29DEC94				
N1A140B	OUTAGE FOR CAMPAIGN 95-1	30DEC94	30JUN95				
N1A140C	CAMPAIGN 95-1 TANKS 101, 103, 106 AP	01JUL95*	29SEP95				
N1A140D	OUTAGE FOR CAMPAIGN 96-1	02OCT95	05JAN96				
N1A140E6	CAMPAIGN 96-1 AP FARM TANKS TBD	08JAN96	02APR96				
N1A140F	BASE SUPPORT FOR FY 1995	03OCT94*	29SEP95				
N1A140G6	OPERATE 242-A EVAP & AW/AP FARMS - OPS 2	02OCT95*	30SEP96				
N1A140G7	OPERATE 242-A EVAP & AW/AP FARMS - OPS 2	01OCT96*	30SEP97				

Activity ID	Activity Description	Early Start	Early Finish	FY94	FY95	FY96	FY97
N1A140G8	MILESTONE-1997 ACCUMULATOR-S001390	01OCT97	30SEP97	J	A	I	S
1.1.2.01.06.05 242-A Outage/Restart Planning							
94A150A	242-A/AW/AP ROUTINE SURVEILLANCE	01OCT93*	30SEP94				
94A150A02	4 SHIFT COVERAGE 242-A/AW/AP ROUTINE	01OCT93*	30SEP94				
94A150A03	IMPLEMENT 5TH SHIFT	30SEP94*					
94A150A04	5 SHIFT COVERAGE 242-A/AW/AP ROUTINE	01SEP94*	30SEP94				
94A150A16	242-A OPERATOR CERTIFICATION OJT	15APR94*	30SEP94				
94A150A18	242-A CERTIFICATION OF NEW OPERATORS		30SEP94				
94A150A22	OTP BASIN #44	02MAY94*	28JUL94				
94A150A30	RUN PLAN 94-2	15JUN94*	15SEP94				
94A150A34	TRANSFER PROCEDURE FOR 101707/108-AP	01AUG94*	31AUG94				
94A150A38	REVISE WAPP/QAPP	17JAN94*	31AUG94				
94A150A40	PRESTART TRAINING	06JUN94*	31AUG94				
94A150A42	PW/CBRS/OSR/CM TO SUPPORT 94-2	23FEB94*	30SEP94				
94A150A44	START 242-A EVAP CAMP. 94-2		30SEP94				
94A150B	PROCURE 242-A PUMPS, FAN MOTOR, COMPRESSOR &	03JAN94*	30SEP94				
94A150D	242-A ROUTINE SURV HPT SUPPORT	01OCT93*	30SEP94				
N1A150A	242-A/AW/AP ROUTINE SURVEILLANCES	03OCT94*	29SEP95				
N1A150A2	T.F. EVAP/AW & AP T.F. OPERATION &		29SEP95				
N1A150A6	R42-A & AW/AP ROUTINE SURVEILLANCE	02OCT95*	30SEP96				
N1A150A7	242-A & AW/AP ROUTINE SURVEILLANCE	01OCT96*	30SEP97				
N1A150A8	MILESTONE-1997 ACCUMULATOR-S001410	01OCT97	30SEP97				
N1A150F	242-A CERT. TRN/N/CERTIFY OPERATORS	03OCT94*	29SEP95				
1.1.2.01.06.06 242A/AP and AW Tank Farms Engineering and Analysis							
1.1.2.01.06.07							
94A170A	242-A/AW/AP ENGR CAP MGMT & SUPPORT	01OCT93*	30SEP94				
94A170B	SYSTEM/PROCESS ENG FOR 242-A/AW/AP	01OCT93*	30SEP94				
94A170B02	PREPARE 6 SYS DESIGN DESCRIPTIONS (SDD)	02OCT95*	30SEP96				
94A170B03	ISSUE 6 SYS DESIGN DESCRIPTIONS (SDD) FOR		30SEP96				
94A170B04	PREPARE SYS STATUS REPORT (SSR) PLAN	02MAY95*	30SEP96				
94A170B06	PREPARE ONE PROTOTYPE SSR	01JUL96*	30SEP96				
94A170B10	PREPARE 242-A ONE-LINE DRAWING	01JUL96*	30SEP94				
94A170B16	PREPARE PROCESS CONTROL PLAN 94-2	01JUL94*	30SEP94				
94A170B17	ISSUE PROCESS CONTROL PLAN 94-2		30SEP94				
94A170B20	PREPARE POST RUN DOCUMENT 94-1	01JUL94*	30SEP94				
94A170B21	ISSUE POST RUN DOCUMENT 94-1		30SEP94				
94A170B28	COGNIZANT ENG SUPPORT FOR CM/PM	01OCT93*	30SEP94				

Activity ID	Activity Description	Early Start	Early Finish	FY94	FY95	FY96	FY97
94A170B30	COGNIZANT ENG SUPPORT FOR OPERATIONS	01OCT93*	30SEP94	J	A	S	O
94A170C	SHIFT ENGINEERING SUPPORT	01OCT93*	30SEP94	J	A	S	O
94A170D	242-A/AVW/AP ENGR SUPPORT FOR SURVEILLANCE	01OCT93*	30SEP94	J	A	S	O
94A170D02	COORDINATE DEVELOPMENT OF ELECT SURVEIL	01OCT93*	30SEP94	J	A	S	O
94A170D04	IMPLEMENT ELECT SURVEIL MODULES WITHIN 2	01OCT93*	30SEP94	J	A	S	O
94A170D12	PERFORM MONTHLY SURVEILLANCE OF ALL	01OCT93*	30SEP94	J	A	S	O
94A170D13	PERFORM MONTHLY SURVEILLANCE OF ALL	01OCT93*	30SEP94	J	A	S	O
94A170D22	PERFORM EVAPORATION ANALYSIS OF	01DEC95*	19MAR96				
94A170E	LAB SUPPORT FOR 242-A/AVW/AP	01OCT93*	30SEP94	J	A	S	O
94A170E10	PERFORM RCRA ANALYSIS FOR CAMP 94-2 FEED	01OCT93*	29JUL94	J	A	S	O
94A170E12	PERF RCRA ANALYSIS FOR CAMPAIGN 94-2 FEED	29JUL94	29JUL94	J	A	S	O
94A170E14	PERFORM RCRA ANALYSIS FOR TANK 104-AW	16MAY94*	15SEP94	J	A	S	O
94A170E18	PERFORM NON-RCRA ANALYSIS FOR TREATMENT	01OCT93*	30SEP94	J	A	S	O
N1A170A	242-A EVAP ENGINEERING CAP MANAGEMENT	03OCT94*	29SEP95				
N1A170B	CAMPAIGN 94-2 ENGINEERING	03OCT94*	29DEC94				
N1A170B02	COMPLETE CAMPAIGN 94-2 SUPPORT		29DEC94				
N1A170C	OUTAGE 94-2 ENGINEERING	30DEC94*	30JUN95				
N1A170C02	ISSUE CAMPAIGN 95-1 PROCESS CONTROL PLAN		30JUN95				
N1A170C04	COMPLETE PRE-CAMPAIGN 95-1 OUTAGE		30JUN95				
N1A170D	CAMPAIGN 95-1 ENGINEERING	05JUL95*	29SEP95				
N1A170D02	COMPLETE CAMPAIGN 95-1 SUPPORT		29SEP95				
N1A170E6	OUTAGE 96-1 ENGINEERING	02OCT95	05JAN96				
N1A170E60	COMPLETE PRE-CAMPAIGN 96-1 OUTAGE		05JAN96				
N1A170E60	ISSUE 95-2 PROCESS CONTROL PLAN - 50%		05JAN96				
N1A170E60	SUPPORT 96-1 CAMPAIGN	08JAN96*	02APR96				
N1A170E60	SUPPORT 96-2 OUTAGE	03APR96	30SEP96				
N1A170F	242-A COGNIZANT ENGINEERING SUPPORT	03OCT94*	29SEP95				
N1A170F02	TECHNICAL INPUT TO VENT & BALANCE		29SEP95				
N1A170G02	PREP LERF OPERATIONAL TEST REPORT	03OCT94*	31MAR95				
N1A170G04	PREPARE SETPOINT MATRIX DOCUMENT	03APR95	30JUN95				
N1A170G06	PREPARE AFFIDAVITS FOR READINESS REVIEW	05JUL95	15AUG95				
N1A170G08	READINESS REVIEW BOARD APPROVAL OF	16AUG95	29SEP95				
N1A170G10	RESOLVE 4 REMAINING POST-START ENGR		29SEP95				
N1A170H02	VALIDATE EQUIPMENT STATUS TRACKING	01NOV94*	03JAN95				
N1A170H04	EQUIPMENT STATUS TRACKING SYSTEM		03JAN95				
N1A170J04	PREPARE CAMPAIGN 94-2 POST RUN DOCUMENT	30DEC94	31JUL95				

Activity ID	Activity Description	Early Start	Early Finish	FY94	FY95	FY96	FY97
N1A170J06	ISSUE CAMPAIGN 94-2 POST RUN DOCUMENT		31JUL95	J	A	S	O
N1A170N02	REVIEW NON-OSR/OSD CBRS	03OCT94*	28FEB95				
N1A170N04	NON-OSR/OSD CBRS REVIEW COMPLETE		28FEB95				
N1A170P02	242-A FSAR UPDATE	03OCT94*	22DEC94				
N1A170P04	242-A FSAR UPDATE AVAIL TO DOE		22DEC94				
N1A170P06	242-A FSAR REVIEW SUPPORT	27DEC94	01JUN95				
N1A170R02	CAMPAIGN 94-2 RCRA & PROCESS CONTROL	03OCT94*	30JUN95				
N1A170R06	CAMPAIGN 95-1 RCRA & PROCESS CONTROL	05JUL95	14JAN96				
N1A170S60	242-A/AVW/AP PLANT SYSTEMS ENGINEERING	02OCT93*	30SEP96				
N1A170S70	242-A/AVW/AP PLANT SYSTEMS ENGINEERING	07OCT96	30SEP97				
N1A170S70	SO01405	01OCT97	30SEP97				
XCHOMIA0	VALIDATE FEED TANK DATA FOR CAMPAIGN 96-1	22AUG94*					
1.1.2.01.07 Tank Farm Retired Facilities and Turnover Support							
SO08430	Perform Retired Tank Farm Facils Surveillance	01OCT97*	31DEC28				
SO08435	Perform Retired Tank Farm Facilities Maintenance	01OCT97*	31DEC28				
SO08440	Perform Retired Tank Farm Facilities Engineering	01OCT97*	31DEC28				
SO08445	Preparation of TF Facil for Turn-Over to ER	01OCT97*	31DEC28				
1.1.2.01.07.01 Retired Facilities Surveillance							
N1H810A70	PERFORM RETIRED TANK FARM FACILS	02OCT96*	30SEP97				
1.1.2.01.07.02 Retired Facilities Maintenance							
N1H820A70	PERFORM RETIRED TANK FARM FACILS	02OCT96*	30SEP97				
1.1.2.01.07.03 Retired Facilities Plant Engineering							
N1H830A70	PERFORM RETIRED TANK FARM FACILS	02OCT96*	30SEP97				
1.1.2.01.07.04 Preparation for Turnover to D&D Operations							
N1H840A70	PREP OF RETIRED TANK FARM FACILS	02OCT96*	30SEP97				
1.1.2.01.08 Undefined WBS							
D4101A	Submit FY96 TF O&M Multi-Year Work Plan Update		29SEP95				
D4101B	Submit Env Rest & WM 5 Yr Plan ADS for ADS 1100		31MAY95*				
D4104A	Product/Distrib Draft of FY96 TWRS Integ Sched		15SEP95*				

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Activity ID	Activity Description	Early Start	Early Finish	FY94	FY95	FY96	FY97
1 Tank Waste Remediation System							
1.1 Tank Waste Remediation System Program							
1.1.2 Manage Tank Waste							
1.1.2.02 Waste Tank Safety							
1.1.2.02.01 Waste Tank Technical Integration and Planning							
SS0A101	Perf Waste Tank Safety Program Management	01OCT97	29SEP01				
SS0A120	Waste Tank Safety Quality Assurance	01OCT97	29SEP01				
1.1.2.02.01.01 Integration and Planning							
NZA110A00	WASTE TANK SAFETY PROGRAM PLANNING	01OCT93	30SEP94				
NZA110A02	BASELINE PLANNING FY95	03OCT94	29SEP95				
NZA110A04	ISSUE FINAL WTS PROGRAMMATIC RISK ASSMT	03OCT94	29SEP95				
NZA110A06	ISSUE FINAL WTS PROGRAMMATIC RISK ASSMT		29SEP95				
NZA110A08	BASELINE PLANNING FY96	02OCT95	30SEP96				
NZA110A12	BASELINE PLANNING FY97	01OCT96	30SEP97				
NZA110B02	WTS PROGRAM MANAGEMENT	01OCT93	30SEP94				
NZA110B04	MANAGEMENT & INTEGRATION FY95	03OCT94	29SEP95				
NZA110B08	MANAGEMENT & INTEGRATION FY96	02OCT95	30SEP96				
NZA110B12	MANAGEMENT & INTEGRATION FY97	01OCT96	30SEP97				
NZA110C02	CORRECTIVE ACTION MANAGEMENT	01OCT93	30SEP94				
NZA110D04	ISSU WTS PROGRAMMATIC RISK ASSESSMENT	01OCT93	30SEP94				
NZA110D06	MS-400 ISSU WTS PROGRAMMATIC RISK ASSESS		30SEP94				
NZA110E00	SYSTEMS ENGR & RISK MANAGEMENT	01OCT93	30SEP94				
NZA110F00	PROVIDE GOVERNMENT SUPPORT	01OCT93	30SEP94				
NZA110G00	SAFETY INITIATIVES MANAGEMENT CONTROL	01OCT93	31AUG94				
NZA110H00	WTSP PROGRAM RESERVE	01SEP94*	30SEP94				
NZA110K02	WASTE MGMT EXTERNAL ADVISORY COMMITTEE	01OCT93	30SEP94				
NZA110K04	ADVISORY SUPPORT FY95	03OCT94	29SEP95				
NZA110K06	ADVISORY SUPPORT FY96	02OCT95	30SEP96				
NZA110K08	ADVISORY SUPPORT FY97	01OCT96	30SEP97				
NZA110L02	FY94 ENVIRONMENTAL INTERFACE REVIEW	01OCT93	30SEP94				
YSS0A101	PERFORM WTS PROGRAM MANAGEMENT		30SEP97				
YSS0A103	ISSU WTS PROG RISK ASSESS REMAINING SIS RL		29SEP95				
1.1.2.02.01.02 Waste Tank Safety Quality Assurance							

Project Start 01OCT92		Early Bar		Sheet 1 of 21		WESTINGHOUSE HANFORD COMPANY	
Project Finish 30SEP95		Progress Bar		Date		Checked	
Data Date 01OCT93				Revision		Approved	
Plot Date 17SEP94							
(c) Primavera Systems, Inc.							

TWRS
WASTE TANK SAFETY
9/20/94 DRAFT SCHEDULE

Activity ID	Activity Description	Early Start	Early Finish	FY94	FY95	FY96	FY97
N2A120A00	PROVIDE QA SUPPORT FOR WTSP	01OCT93	30SEP94	J	A	S	O
N2A120A04	WASTE TANK SAFETY QA FY95	03OCT94	29SEP95				
N2A120A06	WASTE TANK SAFETY QA FY96	02OCT95	30SEP96				
N2A120A08	WASTE TANK SAFETY QA FY97	01OCT96	30SEP97				
YSS0A120	WASTE TANK SAFETY QUALITY ASSURANCE		30SEP97				
1.1.2.02.02 Waste Tank Hydrogen Mitigation							
SS0B350	Install Mitigation Pumps in AN Farm	01OCT97	29SEP00				
1.1.2.02.01 Mitigation Program/Project Management							
N2B210A00	PROGRAM MANAGEMENT - HYDROGEN	01OCT93	30SEP94				
N2B210A04	PROGRAM MANAGEMENT FY95	03OCT94	29SEP95				
N2B210A06	PROGRAM MANAGEMENT FY96	02OCT95	30SEP96				
N2B210A08	PROGRAM MANAGEMENT FY97	01OCT96	30SEP97				
N2B210B00	101-SY MIXER PUMP TESTING & OPS FY94	01OCT93	30SEP94				
N2B210B04	PROJECT MANAGEMENT FY95	03OCT94	29SEP95				
N2B210B06	PROJECT MANAGEMENT FY96	02OCT95	30SEP96				
N2B210B08	PROJECT MANAGEMENT FY97	01OCT96	30SEP97				
N2B210C00	PROJECT ENGINEERING SUPPORT FY94	01OCT93	30SEP94				
N2B210D02	PNL MODELING/TEST PLANS/TEST REPORTS	05JAN94	29SEP94				
N2B210D04	PNL HYDROGEN MITIGATION PROJ MGMT	03OCT94	29SEP95				
N2B210D06	PNL TANK SPECIFIC MITIGATION	03OCT94	29SEP95				
N2B210D08	PNL COMPUTATIONAL MODELING BASELINE	03OCT94	29SEP95				
N2B210D09	PNL ISSU TEST PLAN DILUTION TESTING 103-SY	03OCT94	29SEP95				
N2B210D10	ISSU TEST PLAN DILUTION TESTING 103-SY TO RL	02OCT95	15JAN96				
N2B210D11	DATA MANAGEMENT BASELINE	03OCT94	29SEP95				
N2B210D12	DATA ANALYSIS BASELINE	03OCT94	29SEP95				
N2B210D13	ISSU TEST PLAN DILUTION TESTING 103-SY TO RL		15JAN96				
N2B210D14	PNL INSTRUMENTATION DEVELOPMENT	03OCT94	29SEP95				
N2B210D15	LTR REPT VOID/VIDSCOMETER CHARACTER	03OCT94	28APR95				
N2B210D16	LTR REPT VOID/VIDSCOMETER CHARACTER		28APR95				
N2B210D17	PNL DILUTION STUDIES	02OCT95	25MAR96				
N2B210D18	PNL DILUTION STUDIES	01OCT96	30SEP97				
N2B210D19	PNL ENGINEERING SERVICES FY96	02OCT95	30SEP96				
N2B210D20	PNL ENGINEERING SERVICES FY97	01OCT95	30SEP97				
N2B210E00	SAFETY ANALYSIS UPDATE SY-101 (LANL)	03OCT94	29SEP95				
N2B210E02	LANL BUILD DACS 2A SYS FOR SY FARM	03OCT94	29SEP95				
N2B210E04	LANL INSTALL DACS 2A SYS FOR SY FARM	02OCT95	01FEB96				
N2B210E06	LANL SAFETY ANALYSIS 103-SY/IN-TANK DILUTION	03OCT94	01SEP95				

Activity ID	Activity Description	Early Start	Early Finish	FY94	FY95	FY96	FY97
N2B2T0E07	WHC/WA STATE/B.I.A./DOE REVIEW/APV SA/JEA	05SEP95	23SEP95	J	A	S	O
N2B2T0E08	ISSU SA ON 103-SY/IN-TANK DILUTION		29SEP95				
N2B2T0E10	LANL TECHNICAL SUPPORT 103-SY	01OCT96	23SEP97				
N2B2T0E12	LANL GAS MONITORING SUPPORT	03OCT94	29SEP95				
N2B2T0E14	IN-TANK DILUTION SUPPORT (LANL)	03OCT94	29SEP95				
N2B2T0E16	IN-TANK DILUTION SUPPORT (LANL)	02OCT95	27SEP96				
N2B2T0E21	ISSUE TANK 101-AW SA (LANL)	02OCT95	30SEP96				
N2B2T0E22	ISSUE TANK 101-AW SA (LANL)		27DEC96				
N2B2T0E23	LANL BUILD DACS 2C SYSTEM AN FARM	01OCT95	30SEP97				
N2B2T0E24	LANL DACS 2A SYS FOR SY FARM MAINTENANCE	02OCT95	30SEP96				
N2B2T0E25	LANL 101-SY TECHNICAL SUPPORT	02OCT95	30SEP96				
N2B2T0E26	LANL BUILD DACS 2B SYSTEM 101-AW	02OCT95	30SEP96				
N2B2T0E27	GAS MONITORING SUPPORT (LANL)	02OCT95	30SEP96				
N2B2T0E28	LANL INSTALL DACS 2B SYSTEM 101-AW	01OCT96	07OCT96				
N2B2T0E29	ISSUE TANK 105-AN SA (LANL)	01OCT96	15JUL97				
N2B2T0E30	LANL TECHNICAL SUPPORT 101-AW	30DEC96	29DEC97				
N2B2T0E31	LANL DACS 2C FOR AN FARM MAINTENANCE	01OCT96	30SEP97				
N2B2T0E32	LANL TECHNICAL SUPPORT 104-AN	01OCT96	30SEP97				
N2B2T0E33	ISSUE TANK 105-AN SA (LANL)		15JUL97				
N2B2T0E34	LANL DACS 2A SYS FOR SY FARM MAINTENANCE	01OCT96	30SEP97				
N2B2T0E35	TECHNICAL SUPPORT 105-AN (LANL)	02OCT95	15AUG96				
N2B2T0E36	LANL DACS 2B SYS FOR SY FARM MAINTENANCE	08OCT96	30SEP97				
N2B2T0E38	LANL 101-SY TECHNICAL SUPPORT	01OCT96	30SEP97				
N2B2T0E39	GAS MONITORING SUPPORT (LANL)	01OCT96	30SEP97				
XSSR0P012	TS TO WR:SY-1901 MIT PUMPT TO INITIAL DST WR		29SEP94				
1.1.2.02.02 101-SY Mitigation							
N2B220A00	101-SY SON PROB MIT TECH MECHANICAL	01OCT93	30SEP94				
N2B220A02	ISSU REPT/RECOMD ALTERNATE MIT TESTING		30SEP94				
N2B220A04	PNL/LANL 101-SY SONIC PROBE MITIG SUPP	01OCT93	30SEP94				
N2B220E00	DACS MAINTENANCE & OPERATION FY95	03OCT94	29SEP95				
N2B220F00	GAS MONITORING MAINT & OPERATION FY95	03OCT94	29SEP95				
N2B220F04	GAS MONITORING MAINT & OPERATION FY96	02OCT95	30SEP96				
N2B220F08	GAS MONITORING MAINT & OPERATION FY97	01OCT96	30SEP97				
N2B220G10	INSTRUMENTATION TRANSPORT CONTAINER	23NOV94	25APR95				
N2B220G16	VISCOMETER 101-SY SUPPORT	01DEC94	29SEP95				
N2B220G18	VOIDMETER 101-SY SUPPORT	03OCT94	29SEP95				
N2B220G22	INSTALL CAMERA 101-SY	23JUL94	01DEC94				

Activity ID	Activity Description	Early Start	Early Finish	FY94	FY95	FY96	FY97
N2B220G24	DOC INSTALL OF 2-CAMERA SYS 101-SY	19SEP94	22DEC94	J	A	S	O
N2B220G26	DOC INSTALL OF 2-CAMERA SYSTEM TANK 101-SY		22DEC94				
N2B220H00	MIXER PUMP OPERATIONS FY95	03OCT94	02OCT95				
N2B220H04	INSTALL VOID FRACTION METER	27MAY94	29SEP94				
N2B220H06	INSTL VISCOMETER/VOID METER IN SY-101		30SEP94				
N2B220K00	TEST PUMP REMOVAL PREP	03OCT94	22NOV94				
XSS00P014	TS TO OM: SY-101 MIT PUMP TO FNL SAFE OPS W		22DEC94				
YSS00B300	DESIGN/TEST/INSTALL SY-101 MIT PUMP		28APR95				
YSS00B322	ISSU REPT/RECOMD ALTERNATE MIT TESTING		30SEP94				
1.1.2.02.02.03 103-SY Mitigation							
N2B230A02	PREP SE PLAN & FAB CONTAINER FY94	12APR94	30SEP94				
N2B230A05	AS BUILT PIT PUMP & RISER 103-SY	03OCT94	30NOV94				
N2B230A06	SITE ELECTRICAL/COVER BLOCK DESIGN	31OCT94	27FEB95				
N2B230A08	PREP PROC SPEC/RFP/REVIEW BIDS	03OCT94	10FEB95				
N2B230A10	REV/APV CVR BLK/PUMP ASSY DESIGN	28FEB95	13MAR95				
N2B230A12	ENGINEERING DESIGN SUPPORT	03OCT94	29SEP95				
N2B230A20	ENGINEERING DESIGN SUPPORT	02OCT95	30SEP96				
N2B230B00	AWARD BID FOR PUMP MANUFACTURE SY-103	13FEB95	27FEB95				
N2B230B02	FAB & POUR CVR BLKS/FAB LOAD FRAME	14MAR95	29SEP95				
N2B230B04	ASSEMBLE FAB PUMP 103-SY	02OCT95	29DEC95				
N2B230C00	WORK PLAN/WORK PKG 103-SY	02OCT95	04JAN96				
N2B230C02	PUMP INSTALLATION SUPPORT	03OCT94	29SEP95				
N2B230C04	TRAINING/READINESS REVIEW	05JAN96	29MAY96				
N2B230C08	INSTALL/ATP PUMP 103-SY	31MAY96	31JUL96				
N2B230C12	INSTALL PUMP 103-SY		31JUL96				
N2B230D00	DACS 2A SYSTEM MGMT	03OCT94	29SEP95				
N2B230D02	DACS 2A SYSTEM PROC & FAB 103-SY	02OCT95	31FEB96				
N2B230D04	INSTALL SY FARM DACS 2A		31FEB96				
N2B230E00	DACS MAINTENANCE & OPS 103-SY	02FEB97	30SEP96				
N2B230E04	DACS MAINTENANCE & OPS 103-SY	01OCT96	30SEP97				
N2B230F00	GAS CHARACTERIZATION SYSTEM (GCS) 103-SY	03JUN94	29SEP95				
N2B230F04	GAS CHARACTERIZATION SYSTEM (GCS) 103-SY	02OCT95	30SEP96				
N2B230F08	GAS CHARACTERIZATION SYSTEM (GCS) 103-SY	01OCT96	30SEP97				
N2B230F10	INSTALL GCS (GCS) 103-SY		02JAN96				
N2B230G00	VISCOMETER 103-SY SUPPORT	01NOV94	03MAR95				
N2B230G04	VOIDMETER 103-SY SUPPORT	03OCT94	23JUN95				
N2B230G06	COMPL VOID FRACTION & VISCOMETER TESTING		23JUN95				

Activity ID	Activity Description	Early Start	Early Finish	FY94	FY95	FY96	FY97
N2B230G08	VOIDMETER 103-SY TESTING SUPT	24JAN96	22JAN97	J	A	S	O
N2B230G10	VISCOMETER 103-SY TESTING SUPT	24JAN96	22JAN97	J	A	S	O
N2B230J00	REMOVAL/DISPOSAL SYSTEM 103-SY	24FEB96	22JAN97	J	A	S	O
N2B230K00	IN-TANK DILUTION TEST PREP 103-SY	03OCT94	24FEB95	J	A	S	O
N2B230K04	IN-TANK DILUTION SAMPLING 103-SY	03OCT94	29SEP95	J	A	S	O
N2B230K08	IN-TANK DILUTION SAMPLING 103-SY	16JAN96	29APR96	J	A	S	O
XSSR0P013	TS TO WRRMIT PUMP SY-103 TO INIT WR SYSTEM	01OCT96	30SEP97	J	A	S	O
XSS0P014	TS TO OM:MIT PUMP SY-103 TO FNL SAFE OPS W		31JUL96	J	A	S	O
YSS0B340	INSTALL PUMP 103-SY		30SEP97	J	A	S	O
YSS0B341	INSTALL PUMP 103-SY		31JUL96	J	A	S	O
1.1.2.02.02.04 101-AW Mitigation							
N2B240A06	DESIGN PUMP 101-AW	02OCT95	04MAR96	J	A	S	O
N2B240A08	ENGINEERING DESIGN SUPPORT	02OCT95	30SEP96	J	A	S	O
N2B240B00	PNL/LANL SUPPORT IN-SITU VISCOMETER	01OCT93	30SEP94	J	A	S	O
N2B240B06	PROCURE PUMP 101-AW	05MAR96	02AUG96	J	A	S	O
N2B240B08	FAB PUMP 101-AW	05MAR96	30SEP96	J	A	S	O
N2B240B10	FAB PUMP 101-AW	01OCT96	13MAR97	J	A	S	O
N2B240C00	INSTALL PUMP 101-AW	14JAN97	13MAR97	J	A	S	O
N2B240C02	COMPL 101-AW INSTALL READINESS REV	01OCT96	12MAY97	J	A	S	O
N2B240C04	INSTALL PUMP 101-AW		13MAY97	J	A	S	O
N2B240C08	COMPLETE IN TANK TESTING AW-101	30APR97	16JUN97	J	A	S	O
N2B240C10	COMPLETE IN TANK TESTING AW-101	01OCT96	16JUN97	J	A	S	O
N2B240D04	DACS 2B SYSTEM 101-AW	02OCT95	24JAN97	J	A	S	O
N2B240D06	DACS 2B SYSTEM 101-AW	02OCT95	30SEP96	J	A	S	O
N2B240D08	INSTALL AW FARM DACS 2B		24JAN97	J	A	S	O
N2B240E00	PNL R&D SUPP/LANL SA & TECH SUPT	01NOV93	25AUG94	J	A	S	O
N2B240E04	DACS 2B OPERATIONS 101-AW	01OCT96	14FEB97	J	A	S	O
N2B240E08	DACS 2B MAINTENANCE & OPS 101-AW	01OCT96	30SEP97	J	A	S	O
N2B240F00	GAS CHARACTER SYS MATERIAL - 101-AW	03OCT94	29SEP95	J	A	S	O
N2B240F04	FAB & INSTALL GCS 101-AW	02OCT95	30SEP96	J	A	S	O
N2B240F08	FAB & INSTALL GCS 101-AW		30SEP96	J	A	S	O
N2B240G00	DESIGN/PROCURE/INSTALL MULTI PORT RISER	01OCT93	28JUL94	J	A	S	O
N2B240G02	VOIDMETER 101-AW INSTL SUPPORT	03OCT94	30JUN95	J	A	S	O
N2B240G06	VISCOMETER 101-AW INSTL SUPT	02NOV94	29SEP95	J	A	S	O
N2B240G08	VOIDMETER 101-AW INSTL SUPPORT	02OCT95	30SEP96	J	A	S	O
N2B240G10	VISCOMETER 101-AW INSTL SUPT	23MAY96	12JAN97	J	A	S	O
N2B240G12	COMPL INITIAL VOID FRACTION/VISCOMETER		29SEP95	J	A	S	O

Activity ID	Activity Description	Early Start	Early Finish	FY94	FY95	FY96	FY97
N2B240H08	MIXER PUMP OPERATIONS 101-AW	23JAN97	22JAN98	J	A	S	O
N2B240J00	DACS SUPPORT FY94	01OCT93	30SEP94				
N2B240J04	LANL SUPPORT FOR DACS FY94	01OCT93	30SEP94				
N2B240J06	REMOVAL/DISPOSAL SYSTEM 101-AW	01OCT96	30SEP97				
N2B240J08	ENGINEERING & FENCE MODIFICATIONS	07APR97	30SEP97				
N2B240K00	GAS MONITORING SUPPORT	01OCT93	30SEP94				
XSSR0P012	TS TO WR: MIT PUMP AW-101 TO INIT WR		13MAY97				
XSS0P013	TS TO OM: MIT PUMP AW-101 TO FNL SAFE OPS E		13MAY97				
1.1.2.02.02.05 104-AN Mitigation							
1.1.2.02.02.06 103-AN Mitigation							
N2B260A04	REMOVAL PREP	17MAR94	30SEP94				
N2B260A10	DESIGN INSTALLATION SUPT 103-AN	01OCT97	30SEP98				
N2B260B00	DISPOSAL SYSTEM DESIGN	17MAR94	30SEP94				
N2B260C04	INSTALL PUMP 103-AN	02OCT97	30SEP98				
N2B260C10	COMPL PUMP AN-103 READINESS REVIEW	02OCT97	29SEP98				
N2B260G00	VISCOMETER 103-AN SUPPORT	01NOV96	30SEP97				
N2B260G04	VOIDMETER 103-AN SUPPORT	01OCT96	29SEP97				
N2B260H06	MIXER PUMP OPERATIONS	03OCT97	05JAN98				
N2B260J00	REMOVAL/DISPOSAL SYSTEM 103-AN	01JCT96	30SEP97				
N2B260J04	REMOVAL/DISPOSAL SYSTEM 103-AN	02OCT97	01OCT98				
YSS0B303	M-40-13 DSN/FAB SPARE MIXER PUMP SDY-101		30SEP94				
1.1.2.02.02.07 105-AN Mitigation							
N2B270A00	DESIGN PUMP 104-AN	02OCT95	30SEP96				
N2B270A04	DESIGN PUMP 104-AN	01OCT96	30SEP97				
N2B270B00	PROCURE & FAB PUMP 104-AN	02OCT95	30SEP96				
N2B270B06	FAB & ASSEMBLE PUMP 104-AN	29OCT96	28JUL97				
N2B270C00	INSTALL PREPARATION PUMP 104-AN	02OCT95	30SEP96				
N2B270C02	INSTALL PREPARATION PUMP 104-AN	01OCT96	30SEP97				
N2B270C04	COMPL TANK 104-AN PUMP INSTALL RR	24FEB97	29SEP97				
N2B270C06	INSTALL TANK 104-AN MIT PUMP	04AUG97	30SEP97				
N2B270C08	INSTALL TANK 104-AN MIT PUMP		30SEP97				
N2B270D06	DACS 2C SYSTEM MGMT	01OCT96	01AUG97				
N2B270D08	DACS 2C SYSTEM		01AUG97				
N2B270E00	DACS 2C MAINTENANCE & OPS	01OCT96	27AUG97				
N2B270F00	GAS CHARACTERIZATION SYSTEM (GCS)	01OCT96	30SEP97				
N2B270F06	INSTALL TANK AN-104 (GCS)		31MAR97				

Activity ID	Activity Description	Early Start	Early Finish	FY94	FY95	FY96	FY97
N2B270G00	VISCOMETER 104-AN SUPPORT	30OCT95	30SEP96	J	A	S	O
N2B270G04	VOIDMETER 104-AN SUPPORT	02OCT95	30SEP96				
N2B270G06	VISCOMETER 104-AN SUPPORT	30OCT96	26SEP97				
N2B270G08	VOIDMETER 104-AN SUPPORT	01OCT96	30SEP97				
N2B270H00	MIXER PUMP OPERATIONS	02JUL97	30SEP97				
YSS0B351	INSTALL TANK 104-AN MIT PUMP		30SEP97				
1.1.2.02.03 Waste Tank Ferrocyanide Safety Program							
ZSS0D602	TS TO TS M-40-XX TO M-40-00 RESOLVE TNK SFTY		31JAN97				
1.1.2.02.03.01 Evaluate and Define Technology Development							
N2C310A00	FeCN SIMULATED WASTE STUDIES (FAUSKE)	01OCT93	30SEP94				
N2C310A04	FeCN SIMULATED WASTE STUDIES (FAUSKE)	03OCT94	29SEP95				
N2C310B08	THERMAL MODELING/ANALYSIS FeCN TANKS	01OCT93	30SEP94				
N2C310D04	PNL MANAGEMENT FOR FeCN TANKS	01OCT93	30SEP94				
N2C310D05	PNL MANAGEMENT	03OCT94	29SEP95				
N2C310D06	PNL REPORT OF FeCN AGING STUDIES	01OCT93	23SEP94				
N2C310D07	PNL AGING WASTE STUDIES	03OCT94	29SEP95				
N2C310D08	PNL REPT CESIUM UPTAKE CAPACITY STUDY	01OCT93	23SEP94				
N2C310D10	PNL FeCN SPECIAL STUDIES	01OCT93	23SEP94				
N2C310D12	PNL COMPARE SIMULATED WASTE/ACTUAL	01OCT93	23SEP94				
N2C310D13	ISSU REPT ON FeCN AGING STUDIES (PNL)		29SEP95				
N2C310D14	PNL FeCN SPECIATION/TECH TRANSFER	01OCT93	23SEP94				
N2C310D15	PNL CESIUM UPTAKE	03OCT94	27MAR95				
N2C310D16	PNL CESIUM NICKEL FeCN SOLUBILITY	01OCT93	23SEP94				
N2C310D18	PNL SPECIAL STUDIES/CONSULTATION	03OCT94	29SEP95				
N2C310D19	PNL COMPARE REAL WASTE W/SIMULATED	03OCT94	23JUN95				
N2C310D21	INFRARED/ICP SPECIATION TRANSFER (PNL)	03OCT94	27MAR95				
N2C310D22	PNL MICROCONVECTION MODELING	01OCT93	23SEP94				
N2C310D23	TRANS CYNAIDE SPECIATION TECH TO		27MAR95				
N2C310D24	PNL CESIUM NICKEL FeCN SOLUBILITY	03OCT94	27MAR95				
N2C310D28	SLUDGE MOISTURE MODELING	03OCT94	29SEP95				
N2C310D30	ISSU REPT ON MOISTURE RET MODELING FeCN		29SEP95				
N2C310D32	ISSU PNL REPT MICROCONVECTION MODELING	03OCT94	31MAR95				
N2C310E02	CAP MANAGEMENT FY94	01OCT93	30SEP94				
N2C310E04	DNFSB/CAP MANAGEMENT	03OCT94	29SEP95				
N2C310F16	CORE SAMPLING DATA INTERP 4 FeCN TANKS	01OCT93	30SEP94				
N2C310G02	MOSSBAUER SPECTROMETER	03OCT94	31JUN95				
N2C310H00	SURFACE MOISTURE RETENTION IN FeCN TANKS	01OCT93	30SEP94				

Activity ID	Activity Description	Early Start	Early Finish	FY94	FY95	FY96	FY97
N2C330H04	IN-SITU RELATIVE HUMIDITY INSTRUMENTATION	03OCT94	29SEP95	J	A	S	O
N2C330J01	INFRARED SPECIATION METHODS EVALUATION	01OCT93	30SEP94	J	A	S	O
N2C330J04	INFRARED SPECIATION TRANSFER	03OCT94	29SEP95	J	A	S	O
N2C330L00	SCANNING ELECTRON MICROSCOPE INVESTG	03OCT94	29SEP95	J	A	S	O
YSS0C120	EVAL & DEFINE TECH DEV FOR 18 FeCN TANKS		29SEP95				
YSS0C122	IMPL PNL/WHC CYANIDE ANALYS HOT CELL APPL		27MAR95				
YSS0C125	ISSU REPT ON FeCN AGING STUDIES (RL)		29SEP95				
1.1.2.02.03.02 Number Used During Planning Process - Cancelled.							
1.1.2.02.03.03 Ferrocyanide Safety Issue Resolution							
N2C330A04	CAP MANAGEMENT	01JCT93	30SEP94	J	A	S	O
N2C330A06	CAP MANAGEMENT FeCN TANK SAFETY FY95	03OCT94	29SEP95	J	A	S	O
N2C330A07	TRANSMIT 1ST QUARTERLY REPORT FY95	03OCT94	16JAN95	J	A	S	O
N2C330A08	TRANSMIT 2ND QUARTERLY REPORT FY95	27DEC94	13APR95	J	A	S	O
N2C330A09	TRANSMIT 3RD QUARTERLY REPORT FY95	29MAR95	14JUL95	J	A	S	O
N2C330A10	TRANSMIT FY95 QUARTERLY REPORTS		14JUL95	J	A	S	O
N2C330A12	TRANSMIT 4TH QUARTERLY REPORT FY95	26JUN95	19OCT95	J	A	S	O
N2C330A13	TRANSMIT 1ST QUARTERLY REPORT FY96	02OCT95	19JAN96	J	A	S	O
N2C330A14	TRANSMIT 2ND QUARTERLY REPORT FY96	02JAN96	18APR96	J	A	S	O
N2C330A15	TRANSMIT 3RD QUARTERLY REPORT FY96	07APR96	15JUL96	J	A	S	O
N2C330A16	TRANSMIT QUARTERLY REPORTS FY96		15JUL96	J	A	S	O
N2C330A17	TRANSMIT 4TH QUARTER REPORT FY96	01JUL96	18OCT96	J	A	S	O
N2C330A18	TRANSMIT 1ST QUARTER REPORT FY97	01OCT96	17JAN97	J	A	S	O
N2C330A19	TRANSMIT 2ND QUARTER REPORT FY97	30DEC96	17APR97	J	A	S	O
N2C330A20	TRANSMIT 3RD QUARTER REPORT FY97	31MAR97	15JUL97	J	A	S	O
N2C330A21	TRANSMIT QUARTERLY REPORTS FY97		15JUL97	J	A	S	O
N2C330A22	TRANSMIT 4TH QUARTER REPORT FY97	30JUN97	20OCT97	J	A	S	O
N2C330A24	CAP MANAGEMENT FeCN TANK SAFETY FY96	02OCT95	30SEP96	J	A	S	O
N2C330A30	CAP MANAGEMENT FeCN TANK SAFETY FY97	01OCT96	30SEP97	J	A	S	O
N2C330B04	UPDATE SAFETY DOCUMENTATION FY95	03OCT94	29SEP95	J	A	S	O
N2C330B05	UPDATE SAFETY DOCUMENTATION FY96	02OCT95	30SEP96	J	A	S	O
N2C330B08	UPDATE SAFETY DOCUMENTATION FY97	01OCT96	30SEP97	J	A	S	O
N2C330C00	TRANSMIT DOC TO RESOLVE SITC FARM TANKS	03OCT94	29SEP95	J	A	S	O
N2C330C08	DOE REVIEW/COMMENT - WHC DISPOSITION	02OCT95	31JAN96	J	A	S	O
N2C330C10	TRANSMIT DOC TO RESOLVE SITC FARM TANKS		31JAN96	J	A	S	O
N2C330D04	TECH SUPT FOR USQ CLOSURE/SI RESOLUTION	01OCT93	30SEP94	J	A	S	O
N2C330D14	TECHNICAL SUPPORT SI RESOLUTION FY95	03OCT94	29SEP95	J	A	S	O
N2C330D16	TECHNICAL SUPPORT SI RESOLUTION FY96	02OCT95	30SEP96	J	A	S	O

Activity ID	Activity Description	Early Start	Early Finish	FY94	FY95	FY96	FY97
N2C330D18	TECHNICAL SUPPORT SI RESOLUTION FY97	01OCT96	30SEP97	J	A	S	O
N2C330E00	PROV BASIS FOR SAFE OPER FeCN TKS - SUPT SI	01FEB94	30SEP94				
N2C330E06	PREPARE SAFETY SUPT/SI RESOLUTION	02OCT95	30SEP96				
N2C330E08	TRANS DOC RESOLVE FeCN SI ALL TANKS	01OCT96	31MAR97				
N2C330E10	TRANS DOC RESOLVE FeCN SI ALL TANKS		31MAR97				
N2C330F00	CORE SAMPLE/DATA INTERPRETATION	03OCT94	29SEP95				
N2C330F06	TRANS DATA INTERPR REPT THREE FeCN TANKS		29SEP95				
N2C330F20	CORE SAMPLE/DATA INTERPRETATION	02OCT95	30SEP96				
N2C330F24	TRANS DATA INTERP REPT FIVE FeCN TKS		30SEP96				
N2C330F30	CORE SAMPLE/DATA INTERPRETATION	01OCT96	27JUN97				
N2C330F34	TRANS DATA INTERP REPT REMAINING FeCN		27JUN97				
N2C330G00	FAUSKE CONTRACT - SI RESOLUTION FY96	02OCT95	30SEP96				
N2C330G04	FAUSKE CONTRACT - SI RESOLUTION FY97	01OCT96	30SEP97				
XC0SSP003	CH TO TS: SPPT ROTARY SAMPLE TO CHAR FeCN		29SEP95*				
XSS0P014	TS TO OM: FeCN SFTY ISS TO PNL SAFE OPS - E IF		31MAR97				
YSS0C500	RESOLVE FeCN SAFETY ISSUE		30SEP97				
YSS0C501	DATA INTERPRETATION REPTS 5 TANKS (KMS)		30SEP96				
YSS0C503	TRANSMIT DOC TO RESOLVE SIC FARM TANKS		31JAN96				
YSS0C504	TRANS DATA INTERP REPT REMAINING FeCN		27JUN97				
YSS0C505	TRANS DOC RESOLVE FeCN SI ALL TANKS		31MAR97				
1.1.2.02.04 Waste Tank Flammable Gas Safety Program							
SS0D100	Eval & Define Flammable Gas Tanks	01OCT97	30SEP00				
SS0D120	Eval & Define Tech Dev for Flammable Gas Tanks	01OCT97	30SEP00				
SS0D200	Close USQs for Flammable Gas Tanks	01OCT97	30SEP98				
SS0D400	Store & Monitor Flammable Gas Tanks	01OCT97	30SEP99				
1.1.2.02.04.01 Evaluate and Define Technology Development for F							
N2D410A00	WASTE BEHAVIOR MODELING FY95	03OCT94	29SEP95				
N2D410A02	ISSU REPT MODELING OF WASTE PHYS PROP &	03OCT97	31JUL95				
N2D410A04	ISSU REPT MODELING OF WASTE PHYS PROP &		31JUL95				
N2D410A04	SY FARM THERMAL ANALYSIS	01OCT93	15SEP94				
N2D410A06	WASTE BEHAVIOR MODELING FY96	02OCT95	30SEP96				
N2D410A08	WASTE BEHAVIOR MODELING FY97	03OCT96	30SEP97				
N2D410A08	PHYSICAL MODELING	01OCT93	30SEP94				
N2D410A10	LANL SUPPORT GRE (SI)/MODELING	01OCT93	30SEP94				
N2D410A12	WHC MODELING	01OCT93	30SEP94				
N2D410B02	CAP MANAGEMENT FY94	01OCT93	30SEP94				
N2D410B04	PNL CAP MANAGEMENT SUPPORT	01OCT93	30SEP94				

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Activity ID	Activity Description	Early Start	Early Finish	FY94	FY95	FY96	FY97
1.1.2.02.05.01 Technology for Evaluating Organic Tanks							
N2E510A00	PNL PROJECT MANAGEMENT	01 OCT 93	30 SEP 94	J	A	S	O
N2E510A02	PNL PROJECT MANAGEMENT	03 OCT 94	29 SEP 95	J	A	S	O
N2E510A04	PNL PROJECT MANAGEMENT	02 OCT 95	30 SEP 96	J	A	S	O
N2E510A06	PNL PROJECT MANAGEMENT	01 OCT 95	30 SEP 97	J	A	S	O
N2E510B11	ORGANIC WASTE ENERGETICS	01 OCT 93	14 SEP 94	J	A	S	O
N2E510B2	ORGANIC WASTE ENERGETICS	03 OCT 94	29 SEP 95	J	A	S	O
N2E510B4	ORGANIC WASTE ENERGETICS	02 OCT 95	30 SEP 96	J	A	S	O
N2E510B6	ORGANIC WASTE ENERGETICS	01 OCT 95	30 SEP 97	J	A	S	O
N2E510C11	ENERGETICS WITH SIMULANTS - FAUSKE	01 OCT 93	15 JUL 94	J	A	S	O
N2E510C2	WASTE ENERGETICS W/ SIMULANTS - FAI	03 OCT 94	29 SEP 95	J	A	S	O
N2E510C4	WASTE ENERGETICS W/ SIMULANTS - FAI	02 OCT 95	30 SEP 96	J	A	S	O
N2E510C6	WASTE ENERGETICS W/ SIMULANTS - FAI	01 OCT 95	30 SEP 97	J	A	S	O
N2E510D11	ORGANIC ANALYTICAL METHODS DEVELOPMENT	01 OCT 93	30 SEP 94	J	A	S	O
N2E510D2	ORGANIC ANALYTICAL METHODS DEVELOPMENT	03 OCT 94	29 SEP 95	J	A	S	O
N2E510D4	ORGANIC ANALYTICAL METHODS DEVELOPMENT	02 OCT 95	30 SEP 96	J	A	S	O
N2E510D6	ORGANIC ANALYTICAL METHODS DEVELOPMENT	01 OCT 95	30 SEP 97	J	A	S	O
N2E510E11	ORGANIC WASTE AGING STUDY	01 OCT 93	30 SEP 94	J	A	S	O
N2E510E2	ORGANIC WASTE AGING STUDIES	03 OCT 94	29 SEP 95	J	A	S	O
N2E510E4	ORGANIC WASTE AGING STUDIES	02 OCT 95	30 SEP 96	J	A	S	O
N2E510E6	ORGANIC WASTE AGING STUDIES	01 OCT 95	30 SEP 97	J	A	S	O
N2E510F12	ORGANIC CONCENTRATION MECHANISMS	01 OCT 93	30 SEP 94	J	A	S	O
N2E510F2	ORGANIC CONCENTRATION MECHANISMS	03 OCT 94	29 SEP 95	J	A	S	O
N2E510F4	ORGANIC CONCENTRATION MECHANISMS	02 OCT 95	30 SEP 96	J	A	S	O
N2E510F6	ORGANIC CONCENTRATION MECHANISMS	01 OCT 95	30 SEP 97	J	A	S	O
N2E510G12	ORGANIC ANALYTICAL CHEMISTRY SUPPORT	01 OCT 93	30 SEP 94	J	A	S	O
N2E510G2	ORGANIC ANALYTICAL CHEMISTRY SUPPORT	03 OCT 94	29 SEP 95	J	A	S	O
N2E510G4	ORGANIC ANALYTICAL CHEMISTRY SUPPORT	02 OCT 95	30 SEP 96	J	A	S	O
N2E510G6	ORGANIC ANALYTICAL CHEMISTRY SUPPORT	01 OCT 95	30 SEP 97	J	A	S	O
N2E510H2	SST ORGANIC CARBON & MOISTURE STUDY	03 OCT 94	30 DEC 94	J	A	S	O
N2E510H4	SST ORGANIC CARBON & MOISTURE STUDY	02 OCT 95	29 DEC 95	J	A	S	O
N2E510H6	SST ORGANIC CARBON & MOISTURE STUDY	01 OCT 95	27 DEC 96	J	A	S	O
N2E510J2	ANALYSIS OF TANK T-111 CORE SAMPLE	03 OCT 94	29 SEP 95	J	A	S	O
N2E510K2	SPECIAL STUDIES	03 OCT 94	29 SEP 95	J	A	S	O
N2E510K4	SPECIAL STUDIES	02 OCT 95	30 SEP 96	J	A	S	O
N2E510K6	SPECIAL STUDIES	01 OCT 95	30 SEP 97	J	A	S	O
N2E510L12	ORGANICS SOLUBILITY STUDY	01 OCT 93	30 SEP 94	J	A	S	O

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Activity ID	Activity Description	Early Start	Early Finish	FY94	FY95	FY96	FY97
N2E540C6	PRESSURE MONITORING INSTALLATION	01OCT96*	30SEP97	J	A	S	O
N2E540C61	COMP INST OF PRESS MON SYS & MONITOR		30SEP97				
N2E540D2	MOISTURE MONITOR ENG & (LOW) INSTALL	03OCT94*	29SEP95				
N2E540D4	MOIST MONITOR ENG & LOW INSTALLATION	02OCT95*	30SEP96				
N2E540D6	MOISTURE MONITOR & (LOW) INSTALL	01OCT96*	30SEP97				
N2E540E4	MOISTURE MONITOR/CONTROL	02OCT95*	30SEP96				
N2E540E41	INSTALL MOIST MONIT & CONTROL SYS IN AN		30SEP96				
N2E540E6	MOISTURE MONITOR/CONTROL DEMONSTRATION	01OCT96	30SEP97				
N2E540F2	SAFETY EVALUATION/LOA	03OCT94*	29SEP95				
N2E540F4	SAFETY EVALUATION/LOA	02OCT95	30SEP96				
SS0E500	Resolve Item - Organic Tanks w/o Treatment	01OCT97	30SEP99				
XSPSS012	TU to TS INSTL NEW TC'S & CONN TO TMACS/ORG		31MAR95*				
YSS0E500	RESOLVE INTERNAL ORG TANKS W/O TREATMENT		30SEP97				
1.1.2.02.05.05 Resolution of Unreviewed Safety Questions for Or							
N2E550A4	USQ CLOSURE DOCUMENTATION	01APR96*	30SEP96				
N2E550A6	USQ CLOSURE DOCUMENTATION	31MAR97*	30SEP97				
1.1.2.02.05.06 Resolve Safety Issues Organic Tanks							
N2E560A2	MOISTURE MONITORING/CONTROL ENG.	03OCT94*	29SEP95				
N2E560A20	ENG STUDY MOISTURE MONITORING/CONTROL	03OCT94*	31MAR95				
N2E560A21	COMPLENG STUDY MOISTURE		31MAR95				
N2E560A22	STUDY MOIST MONITOR/CONTROL CONCEPTS	03APR95	30JUN95				
N2E560A23	SEL WASTE MOIST MONIT/CONTROL CONCEPTS FOR		30JUN95				
N2E560A4	MOISTURE MONITORING/CONTROL ENG.	02OCT95	30SEP96				
N2E560A42	COMPL RR-MOIST MONIT/CONTRL		30SEP96				
N2E560B4	SAFETY ISSUE CLOSURE DOCUMENTATION	017APR96	30SEP96				
N2E560B6	SAFETY ISSUE CLOSURE DOCUMENTATION	01APR97	30SEP97				
XSSOP01	TS to OM: Res Safe Iss to Final Safe Ops - E TF		30SEP97				
1.1.2.02.06 Waste Tank High-Heat Safety Program							
1.1.2.02.06.01 Evaluate and Define High Heat Tanks							
N2F610A01	COMPL 106-C TEMP TRANSIENT SUMM RPT (KMS)		30NOV94				
N2F610A1	INVESTIGATE C-106 ANOMALIES	03OCT94*	29SEP95				
N2F610A10	PREPARE PROG PLAN FOR PUBLIC RELEASE	03OCT94	30DEC94				
N2F610A11	TRANS PROG PLAN REV APPROV. FOR PUBLIC		30DEC94				
N2F610A12	TRANS ACTN PLAN REV APPROV. FOR PUBLIC REL		31JAN95				
N2F610A12	COMPL RECV ACT REL TO 106-C POST PROC TEST		30SEP94				
N2F610A12	CONTINGENCY PROCESS TEST	11APR94*	30SEP94				
N2F610A12	COMPL PH T TANK 241-C-106 SAP (RLMS) SI-2i		30SEP94				

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Activity ID	Activity Description	Early Start	Early Finish	FY94	FY95	FY96	FY97
N2G710D4	MONITORING EQUIPMENT UPGRADES	02JCT95	30SEP95	J	A	S	O
N2G710D41	INSTL LIQ LEVEL MONIT SYS FOR ONE TANK		30SEP95				
N2G710D6	MONITORING EQUIPMENT UPGRADES	01OCT96	30SEP97				
N2G710D61	INSTL LIQ LEVEL MONIT SYS FOR ALL TANKS		30SEP97				
N2G710E2	IN-TANK VIDEO/PHOTOS	03APR95	29SEP95				
N2G710E21	VERIFY LG EMPTY TANK WIN-TNK		29SEP95				
N2G710E22	VERIFY LIQ LVL WIN-TNK VIDEO(NON-INVASIVE)		29SEP95				
N2G710E4	IN-TANK VIDEO/PHOTOS	02OCT95	30SEP96				
N2G710E41	VERIFY LIQ LVL FOR 5 TNKS WIN-TNK VIDEO		30SEP96				
N2G710E42	VERIFY 5 EMPTY TNKS WIN-TNK VIDEO		30SEP96				
N2G710E6	IN-TANK VIDEO/PHOTOS	01OCT96	30SEP97				
N2G710E61	VERIFY ALL EMPTY TNKS WIN-TNK VIDEO		30SEP97				
N2G710E62	VERIFY LIQ LVLS FOR ALL APPL TNKS WIN-TNK		30SEP97				
N2G710F2	RISER ACCESSIBILITY	03APR95	29SEP95				
N2G710F4	RISER ACCESSIBILITY	02OCT95	30SEP96				
N2G710F6	RISER ACCESSIBILITY	01OCT96	30SEP97				
N2G710G4	MUST SAFETY ISSUE RESOLUTION	02OCT95	30SEP96				
N2G710G6	MUST SAFETY ISSUE RESOLUTION	01OCT96	30SEP97				
SS0G100	Evaluate and Define Misc. Underground Tanks	01OCT97	29SEP00				
YSS0G100	EVAL & DEFINE MISC UNDERGROUND TANKS		30SEP97				
1.1.2.02.08 Waste Tank Vapor Resolution							
1.1.2.02.08.01 Evaluate and Define for Tank Vapor Safety							
N2H810101	CAP MANAGEMENT	01OCT93	30SEP94				
N2H810101	ORNL PROGRAM MANAGEMENT	01OCT93	30SEP94				
N2H810102	PNL PROGRAM MANAGEMENT	01OCT93	30SEP94				
N2H810A05	COMPL PHASE 3 VAP SAMPL/CHAR OF SUSPECT	01OCT93	30SEP94				
N2H810A05	COMPL PH 3 VAP SAMPL/CHAR OF SUSPECT		30SEP94				
N2H810A05	COMPL FLD WK PH3 VAP SAMPL/CHAR-SUSPECT		30SEP94				
N2H810A1	TANK VAPOR PROGRAM MANAGEMENT	03OCT94	29SEP95				
N2H810A2	SAMPLE & CHAR REMAINING SUSPECT TANKS	03OCT94	30MAY95				
N2H810A20	(SI-26)SAMPL & CHAR REMAINING SUSPECT		30MAY95				
N2H810A20	SAMPL & CHAR GROUP B ORGANIC TANKS	31MAY95	29SEP95				
N2H810A21	(M-40-03)COMP VAP HEADSPACE CHAR OF FeCN		29SEP95				
N2H810A22	(M-40-08)COMP VAP HEADSPACE CHAR OF ORG		29SEP95				
N2H810A23	CHAR VAP HEADSPACE OF REMAIN SUSPECT		29SEP95				
N2H810A24	CHAR VAP HEADSPACE OF REMAIN SUSPECT		29SEP95				
N2H810A25	SAMP VAP HEADSPACE OF REMAINING SUSPECT		29SEP95				

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Activity ID	Activity Description	Early Start	Early Finish	FY94	FY95	FY96	FY97
1 Tank Waste Remediation System Mission							
1.1 TWRS Program							
1.1.2 Manage Tank Waste							
1.1.2.03 Tank Farm Upgrades							
1.1.2.03.01 Technical Integration and Planning							
SP03011B	Perform Technical Integration & Planning	30SEP97	29JUN05	J	A	S	O
SP03012	Perform Systems Engineering	30SEP97	29JUN05	J	A	S	O
1.1.2.03.01.01 Technical Integration and Planning							
N3D410A	Program Management	03OCT94	29SEP95				
N3D410B	TWRS Baseline Activities	03OCT94	29SEP95				
N3D410B00	MYWP Update	03OCT94	30NOV94				
N3D410B01	MYPP Update	03OCT94	29DEC94				
N3D410B02	Activity Data Sheets Update	30DEC94	28APR95				
N3D410B03	MYWP Update (FY 1996)	02MAY95	29SEP95				
N3D410B04	Program Validation	03MAR95	30JUN95				
N3D410D	System Engineering	03OCT94	29SEP95				
N3D410D00	Establish Farm By Farm Priority For W-314 Upg		28FEB95*				
N3D410D01	Prepare Technical Strategy For Instr Upg	03OCT94	30DEC94				
N3D410D02	Prepare Technical Strategy For Vent Upg	03JAN95	31MAR95				
N3D410D03	Prepare Technical Strategy For Elect Upg	03APR95	30JUN95				
N3D410D04	Prepare Technical Strategy For Transfer Line Upg	05JUL95	27SEP95				
N3D411A	Program Management	02OCT95	30SEP96				
N3D411B	TWRS Baseline Activities	02OCT95	30SEP96				
N3D411B00	MYWP Update	02OCT95	29NOV95				
N3D411B01	MYPP Update	02OCT95	28DEC95				
N3D411B02	Activity Data Sheets Update	29DEC95	26APR96				
N3D411B03	MYWP Update (FY 1996)	01MAY96	30SEP96				
N3D411B04	Program Validation	01MAR96	28JUN96				
N3D411D	System Engineering	02OCT95	30SEP96				
N3D411D00	Annual Update of Farm-by-Farm Priority For W-314		28FEB96*				
N3D411D01	Prepare Technical Strategy For Life Extension	02OCT95	29DEC95				
N3D411D02	Prepare Technical Strategy For Config Mgt	02JAN96	29MAR96				
N3D412A	Program Management	01OCT96	29SEP97				

Project Start 01OCT93				U316		Sheet 1 of 25		WESTINGHOUSE HANFORD COMPANY	
Project Finish 30JUN05								Issue	
Data Date 01OCT93								Revision	
Plot Date 17SEP94								Checked/ Approved	
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Activity ID	Activity Description	Early Start	Early Finish	FY94	FY95	FY96	FY97
N3D412B	TWRS Baseline Activities	01OCT96	29SEP97	J	A	S	O
N3D412B00	MYWP Update	01OCT96	26NOV96				
N3D412B01	MYPP Update	01OCT96	27DEC96				
N3D412B02	Activity Data Sheets Update	30DEC96	28APR97				
N3D412B03	MYWP Update (FY 1996)	30APR97	29SEP97				
N3D412B04	Program Validation	03MAR97	30JUN97				
N3D412D	System Engineering	01OCT96	29SEP97				
Z3D410A	MANAGEMENT ACTIVITIES	01OCT93*	30SEP94				
Z3D410B	TWRS BASELINE ACTIVITIES	01OCT93*	30SEP94				
Z3D410C	TF UPGRADE PLANNING SUPPORT	01OCT93*	30SEP94				
Z3D410D	TWRS ENGINEERING SUPPORT	01OCT93*	30SEP94				
Z3D410E	PRORATED TWRS ASSESSMENTS	01OCT93*	29SEP94				
Z3D410G	PROGRAM INTEGRATION	01OCT93*	30SEP94				
Z3D410L	PRG MGT: CORRECTIVE ACTION MANAGEMENT	01OCT93*	29SEP94				
1.1.2.03.02 Configuration Management							
SP0302	Perform Upgrade Configuration Management	01OCT97	30SEP99				
SP03021	Prepare Upgraded TF Operating Procedures	01OCT93	30JUN01				
SP03024	Perform Field Verif Essent Drwgs	01OCT93	30SEP96				
1.1.2.03.02.01 Configuration Management							
N3C3101	CM IMPLEMENTATION-DEVELOP ENGINEERING	03OCT94	29SEP98				
N3C310110	CM IMPLEMENTATION-DEVELOP ENGINEERING	03OCT94	22DEC94				
N3C310120	CM IMPLEMENTATION-REVIEW ENGINEERING	27DEC94	24FEB95				
N3C310130	CM IMPLEMENTATION-EIP COMMENT	27FEB95	28APR95				
N3C3102	CM - DEVELOP SYSTEMS BOUNDARY LIST	03OCT94	29SEP95				
N3C310201	CM - DEVELOP SYSTEMS BOUNDARY LIST	03OCT94	24MAR95				
N3C310203	CM - REVIEW SYSTEMS BOUNDARY LIST	27MAR95	23JUN95				
N3C310205	CM - ISSUE SYSTEMS BOUNDARY LIST	26JUN95	29SEP95				
N3C310205	CM - SYSTEMS & BOUNDARY LIST ISSUED		29SEP95				
N3C3103	DB RECONSTITUTION - PLANNING/BUDGET for	01MAY95	29SEP95				
N3C3104	CM - OFFSITE TRAINING	03OCT94	26MAY95				
N3C3105	CM - PLANNING/BUDGET for FY96-98	01MAY95	29SEP95				
N3C3106	CM - PLANNING/BUDGET for FY97-99	29SEP95	27SEP96				
N3C3107	CM & DR DEVELOP GRADING CRITERIA	03OCT94	29SEP95				
N3C310703	CM & DR - DEVELOP GRADING CRITERIA SD	03OCT94	28APR95				
N3C310704	CM & DR - GRADING CRITERIA WESTIP	01DEC94	28FEB95				
N3C310705	CM & DR - REVIEW GRADING CRITERIA SD	01MAY95	28JUL95				
N3C310707	CM & DR - ISSUE GRADING CRITERIA SD	31JUL95	29SEP95				

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Activity ID	Activity Description	Early Start	Early Finish	FY94	FY95	FY96	FY97
N3E510J	Electronic Archivals	03OCT94	29SEP95	J	A	S	O
N3E510J01	Electronic Archivals	03OCT94	31MAR95	J	A	S	O
N3E510J01	DST Qual Life Ext: Electronic Eng Bibliography		31MAR95	J	A	S	O
N3E510J02	Engineering Record Compilation	03APR95	02OCT95	J	A	S	O
N3E510K	Engineering Record Compilation	03OCT95	30AUG96	J	A	S	O
N3E510M	Life management: Annual Report	03OCT94	29SEP95	J	A	S	O
N3E510P	Support Facilities Assessments	03OCT94	30JUN95	J	A	S	O
N3E510P01	Support Facilities Walkdown	03OCT94	28FEB95	J	A	S	O
N3E510P02	Support Facilities Report	01MAR95	30JUN95	J	A	S	O
N3E511P	Support Facilities Assessments	03OCT95	01OCT96	J	A	S	O
N3E512P	Support Facilities Assessments	02OCT96	30SEP97	J	A	S	O
N3E51AA	Conduc Recom Long-Term Crack Growth Studies	03OCT95	01OCT96	J	A	S	O
N3E51AB	Complete Recom Long-Term Crack Growth Studies	02OCT96	30SEP97	J	A	S	O
N3E51BA	Conduct Long-Term Pitting Study	02OCT95	30SEP96	J	A	S	O
N3E51BB	Complete Pitting Studies	01OCT96	29SEP97	J	A	S	O
N3E51CA	Complete 2 Mechanism Reports	01OCT96	30SEP97	J	A	S	O
N3E51CB	Complete Remaining Attack Report	01OCT97	30SEP98	J	A	S	O
N3E51EA	DST Corrosion Control Upgrades	02OCT95	30SEP96	J	A	S	O
N3E51EB	DST Corrosion Control Upgrades	01OCT96	29SEP97	J	A	S	O
N3E51MA	Life management - Program management	02OCT95	30SEP96	J	A	S	O
N3E51MB	Life management - Program management	01OCT96	30SEP97	J	A	S	O
Z3B2R0A	LEX - PROGRAM MANAGEMENT	01OCT93	30SEP94	J	A	S	O
Z3B2R0C	LEX - 1994 ANNUAL REPORT	31MAY94	01AUG94	J	A	S	O
Z3B2R0E	LEX - STRATEGIC WASTE VOLUME PROJECTIONS	27JUN94	30SEP94	J	A	S	O
Z3B2R0F	LEX - EXAMINATION AND TESTING MANAGEMENT	01OCT93	29JUL94	J	A	S	O
Z3B2R0H	LEX - EXAMINATION AND TESTING PLAN	01OCT93	01JUL94	J	A	S	O
Z3B2R0J	LEX - HISTORICAL REPORT DEPOSITION	01OCT93	15JUL94	J	A	S	O
Z3B2R0L	LEX - STRUCTURAL ANALYSIS SUPPORT	01OCT93	29SEP94	J	A	S	O
Z3B2R0M	LEX - SST USEFUL LIFE ESTIMATE	01OCT93	29SEP94	J	A	S	O
Z3B2R0M03	LEX - PREPARE FINAL REPORT	03MAY94	30SEP94	J	A	S	O
Z3B2R0P	LEX: CORROSION MONITORING AND CONTROL	01OCT93	25AUG94	J	A	S	O
1.1.2.03.04 W-236A Multi-Function Waste Tank Facility							
SP0304	Manage MWTF (W-236a)	01OCT93	30SEP94	J	A	S	O
SP0304BG	Perform Construction Of MWTF (East) Ph 2	01OCT93	30SEP94	J	A	S	O
SP0304BH	M-42-02 Complete Construction Of MWTF (E)		30SEP94	J	A	S	O
SP0304X	M-42-00 Provide Additional DST Capacity (MWTF)		30SEP94	J	A	S	O
XSPR0P009	TU to WR: M-42-00 (MWTF) to Ref SY 101-101/103	01OCT94	30SEP94	J	A	S	O

Activity ID	Activity Description	Early Start	Early Finish	FY94	FY95	FY96	FY97
XSPSOP012	TU to OM: Const of MWTF-E to New 200 E MFWTF	01OCT94	30SEP94	J	A	S	O
1.1.2.03.04.01 Multi-Function Waste Tank Facility W-236A							
1.1.2.03.06 Instrumentation and Control/Electrical Upgrades							
SP030611	Perform TF Liquid Level Gauges Installation	01OCT97	30SEP02				
SP030616B	Define TF General Plant Projects	30SEP97	29JUN05				
SP03062	Perform TF Diesel Generator Upgrades	01OCT96	01APR99				
SP03064	Perform TF Control Rm Upgr	28AUG95	25AUG95				
SP03065	Resolve TF Site Elec Assmt (Safety) Issues	30SEP97	29SEP99				
SP03066	Dsg/Const/Inst TMACS in A,AX,U,B103,TX105	18SEP95	15SEP95				
SP03066A	Safety Initiative TMACS in organic tanks	02OCT95	29SEP95				
SP03067	Design/Const/Inst TMACS in Remaining Farms	30SEP97	28SEP01				
SP03068	HDAT Mitigation	01OCT93	30SEP94				
XSPSOPAAA	TU to OM: Alarm Panel Upgr to Fnl Safe Ops	03APR95	31MAR95				
XSPSOPAAA	TU to OM: Consol Alarm Panel to Fnl Safe Ops	05FEB97	04FEB97				
XSPSOPAAA	TU to OM: SI TMACS to Tks to Fnl Safe Ops		30SEP97				
XSPSOP011	TU to OM: HDAT Mitigation to Fnl Safe Ops -E TF	01OCT94	30SEP94				
XSPSSPAAA	TU to TS: TMACS to Inst new TC's in all Org Tks	26SEP97	25SEP97				
1.1.2.03.06.01 Instrument/Electrical Upgrades							
N3T120A01	241-701A MCC Installation	01OCT94	24MAR95				
N3T120A01	241-701A MCC Installation Complete		24MAR95				
N3T120A02	241-701A MCC: ABU Activities	27MAR95	26MAY95				
N3T120A02	241-701A MCC: Turnover to Operations		26MAY95				
N3T120B	271-CR MCC UPGRADE	20JAN97	24SEP97				
N3T120B01	271-CR MCC: Installation	30JAN97	27AUG97				
N3T120B01	271-CR MCC: Installation Complete		27AUG97				
N3T120B02	271-CR MCC: ABU Activities	28AUG97	27SEP97				
N3T120B02	271-CR MCC: Turnover to Operations		24SEP97				
N3T120C	SY Diesel Generator	31JAN96	30SEP96				
N3T120C01	SY GEN: Installation	31JAN96	26AUG96				
N3T120C01	SY DIESEL GEN: Installation Complete		26AUG96				
N3T120C02	SY GEN: Testing and ABU Activities	01JUL96	27SEP96				
N3T120C02	SY DIESEL GEN: Turnover to Operations		30SEP96				
N3T120E	242-S ALARM UPGRADE	03OCT94	24MAR95				
N3T120E01	242-S Alarm Upgrade: Installation	03OCT94	24MAR95				
N3T120E01	242-S Alarm: Installation Complete		24MAR95				
N3T120E02	242-S Alarm: ABU Activities	27MAR95	25JUL95				
N3T120E02	242-S Alarm: Turnover to Operations		25JUL95				

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Activity ID	Activity Description	Early Start	Early Finish	FY94	FY95	FY96	FY97
N3T141B	TMACS: Eng Construction Oversight (4 Farms)	02OCT95	30SEP96	J	A	S	O
N3T141BM	TMACS: - ATP Complete (AP,AY,AZ,IX)		30SEP96				
N3T141C	Test/Repair Of TC Trees Support	02OCT95	30SEP96				
N3T141C01	TC TREES: Eng Eval -- Prepare Draft Report	02OCT95	29JUL96				
N3T141C02	TC TREES: Eng Eval -- Final Report	30JUL96	25SEP96				
N3T141G	HDAT: 4 Farms (B,BX,U,BY)	02OCT95	30SEP96				
N3T141G01	HDAT: System Requirements Specifications	02OCT95	06MAR96				
N3T141G02	HDAT: 90% Design Review	07MAR96	08MAR96				
N3T141G03	HDAT: Testing	10MAY96	22MAY96				
N3T141G04	HDAT: System Training & Turnover For Operation	10MAY96	22MAY96				
N3T141GM	HDAT: Fully Operational		30SEP96				
N3T141H	Level Gauges Upg Support	27OCT95	26AUG96				
N3T141HM	Level Gauges Upg Support: 28 Installed		26AUG96				
N3T141K	Technical Integration	02OCT95	28AUG96				
N3T142A	TF INSTR: Managerial Activities	01OCT96	30SEP97				
N3T142A01	Instr Upg Plan (WHC-SD-WM-WP-132) - Rev #9	01OCT96	25MAR97				
N3T142A02	TF INSTR: Managerial Activities	26MAR97	25SEP97				
N3T142AM	WHC-SD-WM-WP-132 REV #10 Complete		30SEP97				
N3T142B	TMACS: Eng Construction Oversight (1 Farm)	01OCT96	30SEP97				
N3T142BM	TMACS: - ATP Complete (B)		30SEP97				
N3T142C	Test/Repair Of TC Trees Support	01OCT96	30SEP97				
N3T142C01	TC TREES: Eng Eval -- Prepare Draft Report	01OCT96	29JUL97				
N3T142C02	TC TREES: Eng Eval -- Final Report	30JUL97	25SEP97				
N3T142G	Automate Data Collection (A,AX,AN,AP,AY,AZ)	01OCT96	30SEP97				
N3T142G01	HDAT: System Requirements Specifications	01OCT96	06MAR97				
N3T142G02	HDAT: 90% Design Review	07MAR97	10MAR97				
N3T142G03	HDAT: Testing	12MAY97	22MAY97				
N3T142G04	HDAT: System Training & Turnover For Operation	12MAY97	22MAY97				
N3T142GM	HDAT: Fully Operational		30SEP97				
N3T142H	Level Gauges Upg Support	27OCT96	29JUL97				
N3T142HM	Level Gauges Upg Support: 70 Installed		29JUL97				
N3T142K	Technical Integration	12OCT96	28AUG97				
N3T1450B	TMACS: Constr/ATP In A,AX,AW,AP,AY,AZ Farms	04OCT94	15SEP95				
N3T1450B01	TMACS: Construction/ATP In A,AX Farms	04OCT94	28APR95				
N3T1450B04	TMACS: Construction/ATP For AW Farm	01MAY95	15SEP95				
N3T1450B06	TMACS: Design For AP,AY,AX,IX Farms	01MAY95	14SEP95				

Activity ID	Activity Description	Early Start	Early Finish	FY94	FY95	FY96	FY97
N31450D	Install Liquid Level Gauges in 48 Tanks	03OCT94*	29SEP95	J	A	S	O
N31450D01	SST: Liquid Level Gauges - Install Gauges	03OCT94*	30DEC94				
N31450D02	Up Leak Detect Equip For SST's/Liquid Surfaces		30DEC94				
N31450D03	SST: Liquid Level Gauges: Install 16	03JAN95	31MAR95				
N31450D05	SST: Liquid Level Gauges: Install 16	03APR95	29JUN95				
N31450D07	SST: Liquid Level Gauges: Install 16	30JUL95	29SEP95				
N31450D09	SST: Upgrade Level Gauges Equip (Total 48)		29SEP95				
N31460B	TMACS Construction/Installation (FY 96)	02OCT95*	30SEP96				
N31460D	Install Liquid Level Gauges in 28 SSTs (FY 96)	02OCT95	30SEP96				
N31470B	TMACS Construction/Installation (FY 97)	01OCT96	29SEP97				
N31470D	Install Liquid Level Gauges in 48 Tanks	01OCT96	29SEP97				
Z31140A	TF INSTRUMENTATION: MANAGERIAL ACTIVITIES	01OCT93*	29SEP94				
Z31140A02	TF INSTRUMENTATION: MANAGERIAL ACTIVITIES	28MAR94	30SEP94				
Z31140AM	WHC-SD-WM-WP-132 REV #4 COMPLETE		30SEP94				
Z31140B	TMACS: ENGINEERING CONSTRUCTION	01OCT93*	30SEP94				
Z31140BM	TMACS: - ATP COMPLETE		30SEP94				
Z31140C	TEST/REPAIR OF TC TREES SUPPORT	01OCT93*	30SEP94				
Z31140C01	TC TREES: ENG EVAL -- PREPARE DRAFT REPORT	01OCT93*	29JUL94				
Z31140C02	TC TREES: ENG EVAL -- FINAL REPORT	01AUG94	30SEP94				
Z31140G	AUTOMATE DATE COLLECTION "ROUNDS" IN TANK	28DEC93*	29SEP94				
Z31140G02	HADAT: 90% Design Review	14JUL94*	15JUL94				
Z31140G03	HADAT: Testing	19SEP94*	30SEP94				
Z31140G04	HADAT: System Training & Turnover For Operation	19SEP94*	30SEP94				
Z31140GM	HADAT FULLY OPERATIONAL		30SEP94				
Z31140H	SST LEVEL GAUGES UPG SUPPORT	01NOV93*	30SEP94				
Z31140HM	SST LEVEL GAUGES UPG SUPPORT: 15		30SEP94				
Z31440B	TMACS INSTALLATION IN U.S. SX FARMS	01NOV93*	30SEP94				
Z31440B01	TMACS Installation in U.S. SX Farms	01NOV93*	30SEP94				
Z31440C	TMACS Inst in A, AX & AW Farms	30JUN94*	03OCT94				
Z31440D	Install Liquid Level Gauges in 15 SSTs	01NOV93*	30SEP94				
Z31440D09	SST: LIQUID LEVEL GAUGES: INSTALL 2	27JUN94	29JUL94				
Z31440D11	EST: LIQUID LEVEL GAUGES: INSTALL 2	01AUG94	26AUG94				
Z31440D13	SST: LIQUID LEVEL GAUGES: INSTALL 2	29AUG94	30SEP94				
1.1.2.03.06.05	Electrical/ & C GPPs						
1.1.2.03.07	Tank Farm Restoration and Safe Operations MSA, P						
SP03070-1	Upg Inst Sys/Elec Sys/DST Vent/Trs Line MSA W314	30SEP97	29JUN04				
SP0307A	Integrated Instrumentation System Upg (W-314a)	01OCT93	30SEP97				

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02 12 21 100110

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Activity ID	Activity Description	Early Start	Early Finish
N3K5501	241-TX/TY MODULAR COMPRESSOR INSTALL	03OCT94*	24MAR95
N3K95012	241-A-701 COMPRESSOR INSTALL	03OCT94	24MAR95
N3K95012M	241-A-701 COMPRESSOR INSTALL COMPLETE		24MAR95
N3K95013	241-A-701 COMPRESSOR: TEST & TURNOVER	27MAR95	16JUN95
N3K95013M	241-A-701 COMPRESSOR: TURNOVER TO OPS		16JUN95
N3K9502	241-T COMPRESSOR: TURNOVER	01NOV94*	24FEB95
N3K9502M	241-T COMPRESSOR: TURNOVER TO OPS		24FEB95
N3K9503	241-U COMPRESSOR: TURNOVER	01NOV94*	24FEB95
N3K9503M	241-U COMPRESSOR: TURNOVER TO OPS		24FEB95
N3K9504	241-TX/TY MODULAR COMPRESSOR	03OCT94	24JUL95
N3K95041	241-TX/TY MODULAR COMPRESSOR: DESIGN	03OCT94	22DEC94
N3K95041M	241-TX/TY MODULAR COMPRESSOR: DESIGN		22DEC94
N3K95042	241-TX/TY MODULAR COMPRESSOR: INSTALL	03OCT94	24MAR95
N3K95042M	241-TX/TY MODULAR COMPRESSOR: INSTALL		24MAR95
N3K95043	241-TX/TY MODULAR COMPRESSOR: TEST &	27MAR95	28JUL95
N3K95043M	241-TX/TY MODULAR COMPRESSOR: TURNOVER		28JUL95
N3K950502	241-AP CLOSED LOOP COOLING: INSTALL	03OCT94	28APR95
N3K950502	241-AP CLOSED LOOP COOLING: INSTALL		24MAR95
N3K950503	241-AP CLOSED LOOP COOLING: TEST &	27MAR95	23JUN95
N3K950503	241-AP CLOSED LOOP COOLING: TURNOVER TO		23JUN95
N3K9507	BX/BY MODULAR COMPRESSOR: TEST &	01DEC94*	26MAY95
N3K9507M	BX/BY MODULAR COMPRESSOR: TURNOVER TO		26MAY95
N3K950902	242-S LIQUID WASTE MIN: INSTALL COMPLETE	03OCT94*	25JUG95
N3K950902	242-S LIQUID WASTE MIN: INSTALL COMPLETE		23JUN95
N3K950903	242-S LIQUID WASTE MINIMIZATION:	26JAY95	29SEP95
N3K950903	242-S LIQUID WASTE MIN: TURNOVER TO OPS		29SEP95
N3K950B	COST ACCOUNT ADMIN: MECHANICAL UPGRADES	03OCT94*	29SEP95
N3K950C	OUT YEAR PLANNING	03OCT94	29SEP95
N3K950D	COST ACCOUNT ADMIN: MECHANICAL UPGRADES	02OCT95*	30SEP96
N3K950F	COST ACCOUNT ADMIN: MECHANICAL UPGRADES	01OCT96*	30SEP97
N3K9511	200 EW CHANGE TRAILER MODIFICATION	02OCT95	26APR96
N3K9514	S COMPLEX COMPRESSED AIR	01OCT97*	30SEP98
N3K9528	E STEAM LINE UPG: DESIGN	01OCT96*	30SEP97
N3K9530	WEST STEAM LINE UPGRADE: DESIGN	01OCT96*	31MAR95
N3K9599M	REPLACE COMPRESSED AIR SYSTEMS-10 TANK		31MAR95
Z3A110A	ADMINISTRATIVE SUPPORT	01OCT93*	30SEP94

 

Activity ID	Activity Description	Early Start	Early Finish
N3K9601	STUDIES/PLANS/MOCKUPS & CRITERIA	03OCT94	29SEP95
N3K960103	DEV. WASTE GENERATOR CHAR. PLAN	03OCT94	05JUL95
N3K960105	PROCESS PATH DOCUMENT & QTP	03JAN95	31JUL95
N3K960107	PREPARE COLD TEST FACILITY	03APR95	29SEP95
N3K960107	PREPARE COLD TEST FACILITY KEY		29SEP95
N3K960109	SPMC:PERFORM QTP	02OCT95	29DEC95
N3K960109	SPMC:PERFORM QTP COMPLETE KEY		29DEC95
N3K960111	SPMC:GENERAL OPERATING PROCEDURES	02OCT95	29DEC95
N3K960115	SPMC:EVALUATE REGULATORY ALTERNATIVES	01NOV95	30SEP96
N3K960117	SPMC:SAFETY DOCUMENTS FOR TWRs	03OCT94	30JUN95
N3K9603	COMPONENT REMOVAL EQUIPMENT	03OCT94	29SEP95
N3K960301	FINAL DESIGN	03OCT94	30JAN95
N3K960301	FINAL DESIGN COMPLETE		30MAR95
N3K960303	FABRICATION & ATP	31MAR95	29SEP95
N3K960303	COMPLETE FAB OF (2) FRA MODS & RISER KEY		29SEP95
N3K960305	FABRICATION & ATP	02OCT95	29DEC95
N3K960305	FABRICATION COMPLETE KEY		29DEC95
N3K960312	EVAL NEED FOR NEW FRA DESIGN	02OCT95	29JAN96
N3K960313	GENERAL OPERATING PROCEDURES	03JAN95	26MAY95
N3K960315	DEVELOP ASSESSMENT VERIFICATION SYSTEM	03JAN95	29SEP95
N3K960317	DEVELOP ASSESSMENT VERIFICATION SYSTEM	02OCT95	29DEC95
N3K960319	DESIGN CUTUP EQUIPMENT	01OCT96	30SEPT97
N3K960319	CUTUP EQUIPMENT DESIGN COMPLETE KEY		30SEP97
N3K9605	PACKAGING SYSTEM (CONTAINERS)	03OCT94	29SEP95
N3K960501	FINAL DESIGN TRANSPORT/STORAGE	03OCT94	28MAR95
N3K960503	PROCUREMENT/FABRICATION/SHIPMENT	29MAR95	29SEP95
N3K960503	(2) CONTAINERS FOR PKG SYS DELIVERED KEY		29SEP95
N3K960505	PROCUREMENT/FABRICATION/SHIPMENT	02OCT95	29DEC95
N3K960505	REMAINING TRANSPORT/STORAGE CONTAINERS		29DEC95
N3K960511	DEVELOP SARP'S FIRST DRAFT	03OCT94	26MAY95
N3K960513	INCORPORATE COMMENTS FROM FIRST DRAFT	30MAY95	29SEP95
N3K960515	COMPLETE SARP'S	02OCT95	31OCT95
N3K960515	RELEASE SARP'S KEY		31OCT95
N3K9607	TRANSPORT SYSTEM	03OCT94	29SEP95
N3K960701	AWARD TRANSPORT SYSTEM CONTRACT	03OCT94	30DEC94
N3K960703	TRANSPORT SYSTEM FINAL DESIGN	03JAN95	28APR95

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Activity ID	Activity Description	Early Start	Early Finish	FY94	FY95	FY96	FY97
N3K970E	GOCO TECHNOLOGY DEV/EXCHANGE (FY97)	01OCT96	30SEP97				
Z3C400C	HARDWARE DESIGN GUIDE FOR DISPOSAL	01JUN94	29AUG94				
Z3C400D	MANAGERIAL TASKS	01OCT93	29SEP94				
Z3C400E	TRANSFER PUMP DESIGN	01JUN94	30SEP94				
Z3C400E01	PRELIMINARY TRANSFER PUMP DESIGN	01JUN94	26AUG94				
1.1.2.03.09.09 Mechanical Project Definition							
1.1.2.03.09.10 W-230 SST Ventilation Upgrade							
N3K990B	W-230: SST VENTILATION NEEDS ASSESSMENT	01OCT96	31MAR97				
N3K990BM	M-43-03 W-230: SST VENTILATION UPG NEEDS		31MAR97				
1.1.2.03.10 entilation Upgrades W-030							
SP03101	Mgt Of TF Aging Wstle Vent (W030)	01APR97	31MAR97				
SP0310DG	M-43-01A Start Const (W-030)	31OCT94	28OCT94				
SP0310DI	M-43-01C Begin Ops (W-030)	01NOV96	31OCT96				
SP0310DZ	M-43-01 Compl Proj W-030 TF Vent Upgr	30DEC96	27DEC96				
1.1.2.03.10.01 W-030 Ventilation Upgrades							
N3G24B1	W-030 VENT UPG: PROVIDE WHC MICON SPPT	03OCT94	29SEP95				
N3G24B2	W-030 VENT UPG: PROVIDE WHC MICON SPPT	02OCT95	30SEP96				
N3G24B205	W-030 VENT UPG: MICON SOFTWARE	02OCT95	14FEB96				
N3G24B4	W-030 VENT UPG: PREP FSAR DRAFT/SAFETY	03OCT94	29SEP95				
N3G24B401	W-030 VENT UPG: PREP FSAR DRAFT FY95	03OCT94	22NOV94				
N3G24B402	W-030 VENT UPG: RESPND TO SFTY RELATED	23NOV94	29SEP95				
N3G24B6	W-030 VENT UPG: RESPND TO SFTY RELATED	02OCT95	30SEP96				
N3G24B7	W-030 VENT UPG: PREPARE FINAL FSAR FY97	01OCT96	31DEC96				
N3G24B7M	W-030 VENT UPG: FSAR COMPLETE		31DEC96				
N3G24C1	W-030 VENT UPG: ENVIRONMENTAL FY95/IF	03OCT94	29SEP95				
N3G24C2	W-030 VENT UPG: ENVIRONMENTAL FY96	02OCT95	30SEP96				
N3G24C201	W-030 VENT UPG: SOURCE TERM, STACK	02JAN96	12MAR96				
N3G24E1	W-030 VENT UPG: CONSTRUCTION SUPPORT FY95	31OCT94	29SEP95				
N3G24E1M	M-43-01A START CONST FOR W-030	31OCT94					
N3G24E2	W-030 VENT UPG: CONSTRUCTION SUPPORT FY96	02OCT95	30SEP96				
N3G24E3	W-030 VENT UPG: CONSTRUCTION SUPPORT FY97	01OCT96	31OCT96				
N3G24E3M	M-43-01B COMPLETE CONSTRUCTION FOR W-030		31OCT96				
N3G24F4M	M-43-01C BEGIN OPERATION FOR W-030		27DEC96				
N3G24F5M	M-43-01 Complete Project W-030 TK Farm Vent Upgr		27DEC96				
N3G24H1	W-030 VENT UPG: ENGINEERING & INSPECTION	03OCT94	29SEP95				
N3G24H2	W-030 VENT UPG: ENGINEERING & INSPECTION	02OCT95	30SEP96				
N3G24H3	W-030 VENT UPG: ENGINEERING & INSPECTION	01OCT96	31JAN97				

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Activity ID	Activity Description	Early Start	Early Finish	FY94	FY95	FY96	FY97
N3H26PGM	M-43-07 A Start Construction (W-058)	30NOV95		J	A	S	O
N3H26PK	W-058: Construction	01OCT93	03AUG94				
N3H26PL	W-058: Construction	03OCT96	29AUG97				
N3H26PLA	M-43-07B, Complete Construction Of Proj W-058		29AUG97				
N3H26PM	W-058: Project Management	03OCT94	29SEP95				
N3H26PM3	W-058: Design Reviews	28JAN94	30SEP94				
N3H26PM4	W-058: Design Reviews	03OCT94	30AUG95				
N3H26PM5	W-058: Engineering Support Construction	31AUG95	29SEP95				
N3H26PM6	W-058: Engineering Support Construction (FY 96)	02OCT95	27SEP96				
N3H26PM7	W-058: Engineering Support Construction (FY 97)	29OCT96	26SEP97				
N3H26PN	W-058: Project Management (FY 96)	02OCT95	30SEP96				
N3H26PPH	W-058: Long Lead Procurement (FY 1995)	03OCT94	29SEP95				
N3H26PPJ	W-058: Long Lead Procurement (FY 1996)	02OCT95	30SEP96				
N3H26PPK	W-058: Long Lead Procurement (FY 1997)	01OCT96	28MAR97				
N3H26PR	W-058: Project Management (FY 97)	01OCT96	30SEP97				
Z3H260A	W-058: Envir Documentation	01OCT93	29SEP94				
Z3H260A02	W-058 Prepare NOC For Clean Air Permitting	02MAY94	30SEP94				
Z3H260A02	W-058: Issue NOC To DOH		30SEP94				
Z3H260C	W-058: Software Dev	28DEC93	30SEP94				
Z3H260D	W-058: Def Design	28JAN94	30SEP94				
Z3H260D08	W-058 Water & Steam Crossing Approv Concurrence	16JUN94	29SEP94				
Z3H260D08	W-058 Concurrence Obtained for Crossing		29SEP94				
Z3H260F	W-058: Ind Sfty Spt	01NOV93	30SEP94				
1.1.2.03.12 Aging Waste Transfer Line W-028							
1.1.2.03.12.01 W-028 Aging Waste Transfer Line							
N3M81C01	W-028: PSAR	03OCT94	29SEP95				
N3M81C05	W-028: Definitive Design (FY 95)	03OCT94	29SEP95				
N3M81C05A	W-028: Definitive Design (FY 96)	02OCT95	22MAR96				
N3M81C07	W-028: Eng/Inspection (FY 96)	25MAR96	30SEP96				
N3M81C07A	W-028: Eng/Inspection (FY 97)	01OCT96	29SEP97				
N3M81F0	W-028: Construction (FY 96)	25MAR96	30SEP96				
N3M81F0A	W-028: Construction (FY 97)	01OCT96	30SEP97				
N3M81G0	W-028: Startup/Operation Training (FY 97)	02OCT96	30SEP97				
N3M81G0A	W-028: Startup/Operation Training (FY 98)	01OCT97	26FEB98				
N3M81K0	W-028: NOC Reviews	03OCT94	19JUN95				
N3M81L0	W-028: FSAR	02OCT95	30SEP96				

Activity ID	Activity Description	Early Start	Early Finish	FY94	FY95	FY96	FY97
N3M81L1	W-028: FSAR	01OCT96	12AUG97	J	A	S	O
N3M81M01	W-028: Project Management	03OCT94*	29SEP95				
N3M81M02	W-028: Project Management	02OCT95	27SEP96				
N3M81M03	W-028: Project Management	02OCT96	30SEP97				
N3M81N01	W-028: Design Support	03OCT94*	29SEP95				
N3M81P02	W-028: Engineering/Construction Support	02OCT95*	27SEP96				
N3M81P03	W-028: Engineering Construction Support	30SEP96	30SEP97				
Z3M810A	W-028: Proj Mgt	01OCT93*	30SEP94				
Z3M810B	W-028: PSAR/Env	28DEC93*	30SEP94				
Z3M810B03	W-028: NOTICE OF CONSTRUCTION FOR DOH TO	02MAY94*	30SEP94				
Z3M810B04	W-028: NOC to WDOH		30SEP94				
Z3M810C05	W-028: Def dsg	25APR97*	30SEP94				
Z3M810D	W-028: Tech sp/Des rev	01OCT93*	30SEP94				
Z3M810DM	W-028: WATER & STEAM CROSSING APPROVAL		30SEP94				
1.1.2.03.16 Facility Upgrades							
SP031681	GPP Facility Definition	01OCT93	26JUN01				
XSP050AAA	TU To OM: 209E Sept Tk Upg to Fnl Safe Ops	01MAY95	30MAY95				
XSP050AAA	TU To OM: HDAT Mitigation To Fnl Safe Ops	01OCT97	30SEP97				
1.1.2.03.16.01 Facilities Upgrades							
1.1.2.03.16.02 W-322 242-S Substation Upgrade							
N3B220A	Project Management Support	03OCT94*	29SEP95				
N3B220C	W-364, 209E Septic System	01DEC94*	30MAY95				
N3B220C02	W-364, 209E Septic System: Construction	01DEC94*	29MAR95				
N3B220C03	W-364, 209E Septic System: Closeout	30MAR95	30MAY95				
N3B220C04	W-364, 209E Septic Upgrade OAC		30MAY95				
N3B220D	W-402, E Tk Farm Storage	03OCT94*	31AUG95				
N3B220D01	W-402, East Tk Farm Storage: Proj Authorization	03OCT94*	31OCT94				
N3B220D02	W-402, East Tk Farm Storage: Definitive Design	01NOV94	28FEB95				
N3B220D03	W-402, East Tk Farm Storage: Construction	01MAR95	29JUN95				
N3B220D04	W-402, East Tk Farm Storage: Closeout	30JUN95	31AUG95				
N3B220E	W-413, W Tk Farm Storage	03OCT94*	31AUG95				
N3B220E01	W-413, West Tk Farm Storage: Proj Authorization	03OCT94*	31OCT94				
N3B220E02	W-413, West Tk Farm Storage: Definitive Design	01NOV94	28FEB95				
N3B220E03	W-413, West Tk Farm Storage: Construction	01MAR95	29JUN95				
N3B220E04	W-413, West Tk Farm Storage: Closeout	30JUN95	31AUG95				
N3B220H	W-374, LL Contaminated Equipment	17OCT94	29SEP95				
N3B220K	W-416, Tank Farm Repackaging	01FEB95*	29SEP95				

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Activity ID	Activity Description	Early Start	Early Finish	FY94	FY95	FY96	FY97
N3B280C02	W-XXX, FY 95 CWO: conceptual design	03JAN95*	28FEB95	J	A	S	O
N3B280C05	W-XXX, FY 95 CWO: definitive design	03APR95	30JUN95	J	F	M	A
N3B280C08	W-XXX, FY 95 CWO: construction	05JUL95	31AUG95	J	A	S	O
N3B280C10	W-XXX, FY 95 CWO: close out	01SEP95	29SEP95	J	F	M	A
N3B280D	W-414, BX/BY, Lighting Upgrade	01NOV97	29SEP95	J	A	S	O
N3B280D01	W-414, BX/BY Lighting Upgr: conceptual design	01NOV94*	01MAY95	J	A	S	O
N3B280D02	W-414, BX/BY Lighting Upgrade: definitive design	01MAY95	31JUL95	J	A	S	O
N3B280D03	W-414, BX/BY Lighting Upgrade: construction	01AUG95	29SEP95	J	A	S	O
N3B280K	W-416, 1k Farm Repackg: Design/Construct	02OCT95	27SEP95	J	A	S	O
N3B280K05	W-416, 1k Farm Repackaging: definitive design	31OCT95	28DEC95	J	A	S	O
N3B280K07	W-416, 1k Farm Repackaging: construction	29DEC95	30JUL96	J	A	S	O
N3B280K09	W-416, 1k Farm Repackaging: close out	31JUL96	27SEP96	J	A	S	O
N3B280L	W-XXX, Small Projects	01APR96*	28AUG96	J	A	S	O
N3B280M	W-422, Solid Waste Fac, 209E: Des/Const/Close	02OCT95	27SEP96	J	A	S	O
N3B280M04	W-422, Solid Waste Facility, definitive design	01NOV95	29DEC95	J	A	S	O
N3B280M05	W-422, Solid Waste Facility, construction	02JAN96	31JUL96	J	A	S	O
N3B280M08	W-422, Solid Waste Facility, close out	01AUG96	30SEP96	J	A	S	O
N3B280N	W-423, A Farm Lighting Upg	01DEC95*	29FEB96	J	A	S	O
N3B280N06	W-423, A Farm Lighting Upg: definitive design	05JAN96	29FEB96	J	A	S	O
N3B280S	W-424, T Farm Lighting Upg: Des/Const/Close/ut	01FEB96	30SEP96	J	A	S	O
N3B281N	W-423, A Farm Lighting Upg: Def Dsgn	01OCT96*	06JAN97	J	A	S	O
N3B281P	W-422, TX, TY Tank Farm Lighting Upg	01NOV96*	04SEP97	J	A	S	O
N3B281R	W-YYY, E/W Central Control Facility	01NOV96*	02MAY97	J	A	S	O
N3B281S	W-YYZ, Core Sampling Facility	01NOV96*	04SEP97	J	A	S	O
N3B281T	U Tank Farm Lighting Upgrade	01NOV96*	01AUG97	J	A	S	O
N3B281U	W-ZZZ, Small Projects (CWO)	01APR97*	31JUL97	J	A	S	O
1.1.2.03.16.06	W-226, Centralized Maintenance Facility						
1.1.2.03.16.07	Radiation Zone Lighting (GPPs)						
1.1.2.03.17	Radiological Support Facility W-1881						
SP0317B	Radiation Support Facilities (W-188) (LI)	01OCT93	30SEP96				
SP0317BB	Perform Construction (W-188)	23SEP97	26JUN98				
1.1.2.03.17.01	W-188 Radiological Support Facility						
N3J270A	W-188, Radiological Support Facility: Proj Mgt	03OCT94*	26JUN95				
N3J270A01	W-188: PMIP Preparation	02OCT95*	27FEB96				
N3J270A03	W-188: Prepare Validation Book	28FEB96	26APR96				
N3J270C	W-188: Prepare CDR	02JAN96	28MAR96				
N3J270CM	W-188: Release CDR		28MAR96				

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