The Mixed Waste Management Facility

RECEIVED

APR 12 1996

OSTI

Monthly Report
January 1996

Lawrence Livermore National Laboratory
Environmental Programs

DISTRIBUTION OF THIS DOCUMENT IS UNLIMITED

MASTER

DISCLAIMER

This document was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor the University of California nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial products, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or the University of California. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or the University of California, and shall not be used for advertising or product endorsement purposes.

This report has been reproduced
directly from the best available copy.

Available to DOE and DOE contractors from the
Office of Scientific and Technical Information
P.O. Box 62, Oak Ridge, TN 37831
Prices available from (615) 576-8401, FTS 626-8401

Available to the public from the
National Technical Information Service
U.S. Department of Commerce
5285 Port Royal Rd.,
Springfield, VA 22161

The Mixed Waste Management Facility

Monthly Report
January 1996

Ronald D. Streit

February 1996

Lawrence Livermore National Laboratory
University of California • Livermore, California • 94550

Contents

Project Summary.....	iii
Project Financial Summary	v
1.1.1. Quality Assurance.....	1
1.1.2. PSAR.....	2
1.1.3. NEPA/CEQA.....	3
1.1.4. ES&H.....	4
1.1.5. Program Support.....	5
1.1.6. Public Participation.....	6
1.2.1. Conceptual Design.....	7
1.2.2. Plant Start-Up Management.....	8
1.2.3. Activation.....	9
1.3.1. Project Management.....	10
1.3.2. Project Control.....	12
1.3.3. Technical Systems Integration.....	13
1.4.1. Receiving and Shipping.....	14
1.4.2. Solids Feed Preparation—Conventional.....	15
1.4.2. Solids Feed Preparation—Telerobotics Sorting.....	16
1.4.3. Liquids Feed Preparation.....	18
1.5.1. Mediated Electrochemical Oxidation.....	19
1.5.2. Molten Salt Oxidation.....	20
1.5.3. Wet Oxidation.....	25
1.5.4. UV Photolysis.....	26
1.5.5. Experimental Off-Gas.....	27
1.6.1. Process Transport and Storage.....	28
1.6.2. Analytical Laboratory.....	29
1.6.3. Water Treatment.....	31
1.6.4. Final Forms.....	32
1.6.5. Supervisory Instrumentation and Control (SI&C).....	34
Appendix A. Milestone/Marker Log.....	37

Project Summary

Overview

During January the Project focused on three primary activities: address the issues identified by S. Cowan for the continuation of the MWMF, resolve Title 2 design issues with DWTF Phase 2, and finalize outstanding issues from the Preliminary Design Review.

One of the main items requested by DOE/HQ was a cost-benefit analysis of the MWMF vs. a number of alternative options. This was addressed by contracting with SAIC for an independent study while at the same time addressing a number of specific cases relative to how and where non-incineration technologies may be deployed. The studies were very positive resulting in a "net present value" in the range of \$100M to \$300M—clearly showing the benefits of continuing with the deployment of MWMF as a national testbed. In addition, a case-specific study was completed looking specifically at the benefit of deploying telerobotic feed preparation in the MWMF. The results from this study were also very positive.

We have continued to coordinate our activities with the Mixed Waste Focus Area (MWFA) resulting in a meeting at LLNL with Dick Bateman and John McFee (January 16, 1996) to discuss activities within the "non-incineration states" (NISs). Additionally, we are working with the appropriate MWFA Waste Type Managers to coordinate MWMF activities with DOE treatment plans.

In addition, the Project continues to make good progress in resolving issues identified as part of the Preliminary Design reviews. We have resolved many of the interface design issues and have formalized virtually all of the equipment layouts as required for the DWTF Phase 2 Title 2 design. Further, we have resolved a key MSO design issue associated with injector installation and removal. We continue to work with Hazardous Waste Management to coordinate functions on operations of the facility, use of the process diagnostics requirements, and Supervisory I&C elements of the Project.

Cost Status. B/A for Operating is \$1.095M and Capital is \$10.553M. Current B/O funding for FY96 is \$1,095M OP and \$5,456M CE for a total funding of \$6,551M. Costs to date are: Operating \$128K, Variance of \$37K; Capital \$1,576K, Variance of \$1,872K. The project is currently behind scheduled costs due to DOE allowing only a 10% spending rate until the approval of the KD-2 and a \$1M contract that has not been let due to DOE's "hold" on the KD-2 decision. As soon as we receive the KD-2 decision, a revised spending plan will be submitted.

Schedule Status. As reported last month, KD-2 (Milestone D131-2), which was due to be issued in December 1995, has been delayed pending a project review by DOE. All major procurements have also been held up pending this ongoing project review. A revised Project schedule reflecting all changes will be issued when the DOE review is completed.

Significant Issues and Planned Corrective Actions

As stated in previous months, the uncertainty in the budget for FY96 and out years continues to be the major concern. Entering the fifth month of FY96 the Project does not have an approved budget or accepted scope of work. To proceed effectively the Project will need KD-2 to allow for detailed design and long-lead procurements. As a result, the Project has lost a number of key personnel. As this situation continues, it will become increasingly difficult to meet key Project milestones or to make up lost time. Overall, this will result in higher Project costs and delayed implementation of MWMF systems. The MWMF has been given approval to continue to spend at the current running rate focusing on three main items: resolve the outstanding issues identified at a teleconference meeting with S. Cowan and others, continue to resolve facility (DWTF Phase 2) Title 2 design issues, and follow up on details from the Preliminary Design Review. *Project Baseline 2.0* (PB2.0) was scheduled to be completed in January. However, while a final draft has been completed, it will not be issued until the Project status is finalized and an approved work scope is defined.

The issues identified in the Cowan teleconference have been largely addressed, resulting in a detailed report on the cost benefit of the MWMF. This report (in draft stage) was reviewed with Ram Mukumda at LLNL (January 30, 1996), and the results subsequently presented to Cowan. A series of meetings are being scheduled for early to mid-February to finalize outstanding issues with the MWFA and EM-50, ultimately leading to a final decision on the MWMF Project. A final report on the cost benefit is in process.

Summary of Accomplishments

Detailed accomplishments and milestone status are reported in the Task Summaries that follow the Project Financial Summary. Below we highlight the major accomplishments during this reporting period:

- Technical Systems Integration: Completed review of the facility Phase 2 65% design submittal and provided comments to Parsons.
- Receiving and Shipping: Completed the LI&C System Functional Requirements document and the task analysis for the RAS.
- Solids Feed Preparation: Discussions with Schilling Robotic Systems on the possibility of a CRADA on the telerobotic control system resumed. We are currently investigating the benefits possible through a three-way agreement with LLNL, ORNL, and Schilling.
- Liquids Feed Preparation: Completed the LI&C System Functional Requirements document and the task analysis for the LFP.
- Molten Salt Oxidation: Materials development continues with the completion of the 500-hour corrosion test in LLNL's ten-tube furnace. The purpose of the test was to determine the relative aggressiveness of various salts. The corrosion samples are being evaluated metallographically. Current EDU tests continue to investigate the effects of increasing chloride content. Tests to date have been run at concentrations of 5, 15, and 30 mol% NaCl, with the 45 mol% tests in progress. The Primary Unit baseline arrangement has been frozen. The arrangement is structurally integrated with the Process Off-Gas. Combining the ejector shipping container with the

clearance. A fixed price quotation was received and evaluated for the process design portion of the salt separation project. It was decided to accept the proposal and proceed with the work. The layout of the Process Off-Gas System was completed.

- Final Forms: Experiments have been designed to prepare mineral residues in a manner simulating what will happen in an MSO reactor. The phases that form will be determined, and ceramics will be fabricated from the residues. These experiments are scheduled for February.
- Supervisory Instrumentation and Control: Engineering Development Phase 5 testing activities are now in progress. Preparations are under way to determine nominal database transfer rates (and their limitations), PLC driver transfer rates, MMI update rates, round-trip system response, and network loading.

Project Financial Summary

Figures 1 and 2 present graphical plots of planned vs. actual spending for OPEX and CENRTC. Table 1 presents a more detailed financial summary of the MWMF Project for December. There are no significant financial items to report beyond those discussed in the Cost Status paragraph of the Overview section above.

TABLE 1

MWMF Project - Monthly Financial Summary for FY96
January 1996

OPEX (\$K, monthly expenditures)																Undistrib ⁸	10/95 Plan
	CO*	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Subtotal*			
DOE Funds*	0	0	0	1,400	(305)									1,095	NA, for information only		
FY96 Plan 10/95		52	37	39	36	50	36	58	64	75	64	64	64	639		639	
														0			
Actual		41	35	30	21	0	0	0	0	0	0	0	0	128			
Variance		(11)	(1)	(9)										(22)			
Actual Liens**		140	112	112	112									NA			
Mgmt Reserve		0	0	0	0	0								0	0	118	
95/97 Liens holdback***														0	100	100	
FY96 OPEX budget =																855	

OPEX (\$K, cumulative to date)																DOE FY96 new-SA, OPEX	
DOE Funds*	CO*	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep			budget	guidance ⁴
DOE Funds*	0	0	0	1,400	1,095												
FY96 Plan 10/95 ⁵		52	89	128	185	215	251	309	372	447	511	575	639	639			delta
Actual		41	77	107	128												639
Variance		(11)	(13)	(22)	(37)												

CENRTC (\$K, monthly expenditures)																Undistrib ⁸	10/95 Plan
	CO*	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Subtotal*			
DOE Funds*	0	1,500	0	3,956	0									5,456	NA, for information only	8,572	
FY96 Plan 10/95		561	1,677	621	589	745	574	586	706	580	565	648	721	8,572			
Actual		440	448	322	367									1,576			
Variance		(121)	(129)	(299)	(222)									(1,848)			
Actual Liens**		434	379	479	477									NA			
Mgmt Reserve		0	0	0	0	0								0	0	873	
95/97 Liens holdback***														0	400	400	
FY96 CENRTC budget =															9,845		

CENRTC (\$K, cumulative to date)																DOE FY96 new-SA, CENRTC	
DOE Funds*	CO*	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep			budget	guidance ⁴
DOE Funds*	0	1,500	1,500	5,456	5,456												
FY96 Plan 10/95 ⁵		561	2,238	2,859	3,448	4,192	4,767	5,353	6,059	6,639	7,204	7,851	8,572	8,572			delta
Actual		440	888	1,210	1,576												8,572
Variance		(121)	(1,350)	(1,649)	(1,872)												

PROJECT TOTAL (\$K, monthly expenditures)																Undistrib ⁸	10/95 Plan
	CO*	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Subtotal*			
DOE Funds*	0	1,500	1,500	6,856	6,551										16,407	NA, for information only	9,211
FY96 Plan 10/95		613	1,714	660	625	795	611	644	770	655	629	711	785	9,211			
		0	0	0	0	0	0	0	0	0	0	0	0	0			
Actual		481	483	352	388									1,704			
Variance		(132)	(1,231)	(308)	0									(1,671)			
Actual Liens**		574	491	591	589									NA			
Actual Preliens**			1,141	1,025	272									NA			
Mgmt Reserve		0	0	0	0									0			
95/96 Liens holdback***														0	0	989	
														500	500		
FY96 TOTAL budget =																	10,700

TOTAL PROJECT EXPENDITURES (\$K, cumulative to date)																DOE FY96 new-SA, TOTAL	
DOE Funds*	CO*	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep			budget	guidance ⁴
DOE Funds*	0	1,500	1,500	6,856	6,551												
FY96 Plan 10/95 ⁵		613	2,327	2,987	3,612	4,407	5,018	5,661	6,431	7,086	7,715	8,426	9,211	9,211			delta
Actual		481	964	1,316	1,704												9,211
Variance		(132)	(1,363)	(1,671)	(1,908)												

MANPOWER SUMMARY (total project, by month)													
	CO*	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Labor (FTE)		41.1	31.9	27.5	30.4								
Labor (\$K) ●		364	291	243	220								

* FY95 carryover funds were deobligated (source: LLNL Contract Modification)

** Relevant for current month only; sum not meaningful

*** Includes budgeted amounts for management reserve, liens holdback

Ⓢ Undistributed remaining budget

Ⓢ No guidance has been provided

Ⓢ Updated periodically (see note); only Subtotal Relevant

WBS Element: 1.1.1. Quality Assurance

Task Description: Quality Assurance provides quality assurance (QA) support to the MWMF Project. This effort includes development and implementation of the Project's quality assurance program and oversight for conformance to the approved plan and other quality and ES&H requirements. This WBS element covers only a proportional fraction of the OPEX quality assurance effort, with the CENRTC portion contained under WBS 1.3.2, Project Control.

Summary of Monthly Activities:

- We completed QP-5, "Engineering Change Requests/Orders" (Marker 1.3.2-13.1)
- We worked with Project personnel on QA issues and the QA filing system.

FY96 Budget: Spending profile (\$K, OPEX)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
FY96 Plan (10/95)	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.5
Monthly actual	1.6	1.6	0.8	0.2								
FY96 Plan cumulative	2.3	4.6	6.9	9.2	11.5	13.8	16.1	18.4	20.7	23.0	25.3	27.8
Actual cumulative	1.6	3.1	3.9	4.1								
Current lien	0.0	0.0	0.0	0.0								

Significant Procurement Actions This Month:

None

Milestones and Markers:

*See Appendix A: "Milestone/Marker Log" for original dates and reconciliation.

ID No.	Milestone/Marker	Scheduled Date*	Status
None	No activity		

WBS Element: 1.1.2. PSAR

Task Description: The *Preliminary Safety Analysis Report* (PSAR) provides the integration of safety input, design reviews, and safety analysis for Phases I and II of the integrated MWMF/DWTF Project. Safety analysis includes analysis, generation of documentation, and documentation review and approval. The element includes the generation of the PSAR, which must be completed prior to major procurements and follow-on analysis required for the generation of the *Final Safety Analysis Report* (FSAR). The FSAR is required after construction and prior to operation.

Summary of Monthly Activities:

No activities are planned for FY96.

FY96 Budget: Spending profile (\$K, CENTRC)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
FY96 Plan (10/95)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Monthly actual	0.0	0.0	0.0	0.0								
FY96 Plan cumulative	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Actual cumulative	0.0	0.0	0.0	0.0								
Current lien	64.1	64.1	64.1	64.1								

Significant Procurement Actions This Month:

None

Milestones and Markers:

*See Appendix A: "Milestone/Marker Log" for original dates and reconciliation.

ID No.	Milestone/Marker	Scheduled Date*	Status
None	No activity		

WBS Element: 1.1.3. NEPA/CEQA

Task Description: The NEPA portion of this WBS provides for the preparation of the *Environmental Assessment* (EA) and all required follow-up documentation required by DOE to make a determination about impacts. The effort includes preliminary evaluations, preparation of technical information, EA preparation, and comment resolution.

The CEQA and permitting portion of this WBS provide for the preparation of permit applications and associated environmental analysis to support the regulatory agency permitting and CEQA review process. The effort includes preliminary evaluations, and preparation of technical information to support the agency CEQA document and permit evaluation, and comment resolution. This element prepares and coordinates approval of state and local permits and supports public participation activities associated with the permits approvals.

Summary of Monthly Activities:

We continued providing support to DOE regarding comments received on the EA.

FY96 Budget: Spending profile (\$K, CENRTC)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
FY96 Plan (10/95)	4.2	5.1	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2
Monthly actual	0.5	1.0	1.6	(0.3)								
FY96 Plan cumulative	4.2	9.3	13.5	17.7	21.9	26.1	30.3	34.5	38.7	42.9	47.1	51.3
Actual cumulative	0.5	1.5	3.0	2.7								
Current lien	0.0	0.0	0.0	0.0								

Significant Procurement Actions This Month:

None

Milestones and Markers:

*See Appendix A: "Milestone/Marker Log" for original dates and reconciliation.

ID No.	Milestone/Marker	Scheduled Date*	Status
L113-2	Submit air permit to BAAQMD	Apr 96	
C113-2	Authorization to construct issued by BAAQMD	Jul 96	

WBS Element: 1.1.4. ES&H

Task Description: ES&H provides for ongoing Environment, Safety, and Health (ES&H) representation to the MWMF Project by ES&H specialists to ensure that all activities are conducted in a safe and environmentally sound manner and to ensure that ES&H standards have been properly applied.

Summary of Monthly Activities:

We provided ongoing ES&H support to the MWMF Project as described above.

FY96 Budget: Spending profile (\$K, OPEX)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
FY96 Plan (10/95)	13.1	13.1	13.1	13.1	13.1	13.1	13.1	13.2	13.2	13.2	13.2	13.2
Monthly actual	18.3	16.6	11.4	13.1								
FY96 Plan cumulative	13.1	26.2	39.3	52.4	65.5	78.6	91.7	104.9	118.1	131.3	144.5	157.7
Actual cumulative	18.3	34.9	46.3	59.4								
Current lien	0.0	0.0	0.0	0.0								

Significant Procurement Actions This Month:

None

Milestones and Markers:

*See Appendix A: "Milestone/Marker Log" for original dates and reconciliation.

ID No.	Milestone/Marker	Scheduled Date*	Status
None	No activity		

WBS Element: 1.1.5. Program Support

Task Description: Program Support provides top-level planning, control, and support of MWMF Project OPEX-funded activities. Specific activities include management of Project assurances and interface with development activities. This element encompasses support for the Project Office including organization, schedule and budgeting activities, Project plans and reporting, personnel hiring and housing, Project operations control, facility technical support, and OPEX-funded technical support.

Summary of Monthly Activities:

Due to continuing DOE budget concerns and MWMF status, activities in this element were restricted to Project Manager, scientific oversight support, and clerical support as required. We continue to monitor permitting and environmental assessment comments as well as working with DTSC on the classification of MSO. Additional effort was directed at developing an MWMF business plan consistent with DOE strategy for privatization/commercialization of the waste treatment activities within the DOE complex.

FY96 Budget: Spending profile (\$K, OPEX)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
FY96 Plan (10/95)	31.0	15.3	15.3	15.0	26.0	15.0	20.0	15.0	26.0	15.0	15.3	15.3
Monthly actual	17.5	15.0	15.6	3.5								
FY96 Plan cumulative	31.0	46.3	61.5	76.5	102.5	117.5	137.5	152.5	178.5	193.5	208.8	224.0
Actual cumulative	17.5	32.5	48.1	51.7								
Current lien	45.4	45.4	45.4	45.4								

Significant Procurement Actions This Month:

None

Milestones and Markers:

*See Appendix A: "Milestone/Marker Log" for original dates and reconciliation.

ID No.	Milestone/Marker	Scheduled Date*	Status
D115-1	DOE issues <i>Project Plan</i>	Jan 95	Complete
L115-10	Submit FY96 Plan	Oct 95	
L115-11	FY98 Project Validation	Apr 96	
L115-12	Submit FY97 Plan	Oct 96	

WBS Element: 1.1.6. Public Participation

Task Description: Public Participation provides for public input to the planning and execution phases of the MWMF Project. Included are a National Review Panel (NRP), a community newsletter, and preparation and coordination of press releases and community tours.

Summary of Monthly Activities:

- We coordinated and prepared the MWMF presentation and display for the Southwest Defense Cleanup Conference and Exhibition in Salt Lake City.
- We responded to media regarding public inquiries on the Project and drafted a response and informational material.
- Due to the delay in issuing a KD-2 by DOE, Milestones and Markers have been rescheduled. The first NRP meeting is now planned for April 96.

FY96 Budget: Spending profile (\$K, OPEX)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
FY96 Plan (10/95)	6.0	6.0	8.5	6.0	8.5	6.0	6.0	6.0	6.5	6.0	6.0	6.0
Monthly actual	3.8	2.2	2.3	4.2								
FY96 Plan cumulative	6.0	12.0	20.5	26.5	34.0	41.0	47.0	53.0	59.5	65.5	71.5	77.5
Actual cumulative	3.8	6.0	8.3	12.5								
Current lien	28.2	0.0	0.0	0.0								

Significant Procurement Actions This Month:

None

Milestones and Markers:

*See Appendix A: "Milestone/Marker Log" for original dates and reconciliation.

ID No.	Milestone/Marker	Scheduled Date*	Status
L116-3	NRP Meeting	Apr. 96	
L116-3.1	MWMF Letter	May 96	
L116-4	NRP Meeting	Sep 96	
L116-4.1	MWMF Letter	Oct 96	

WBS Element: 1.2.1. Conceptual Design

Task Description: Conceptual Design provides the Project's technical, cost, and schedule baselines that form the basis for KD-1.

Summary of Monthly Activities:
Conceptual Design activity is complete.

FY96 Budget: Spending profile (\$K, OPEX)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
FY96 Plan (10/95)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Monthly actual	0.0	0.0	0.0	0.0								
FY96 Plan cumulative	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Actual cumulative	0.0	0.0	0.0	0.0								
Current lien	2.0	2.0	2.0	2.0								

Significant Procurement Actions This Month:

None

Milestones and Markers:

*See Appendix A: "Milestone/Marker Log" for original dates and reconciliation.

ID No.	Milestone/Marker	Scheduled Date*	Status
None	No activity		

WBS Element: 1.2.2. Plant Start-Up Management

Task Description: Plant Start-Up Management provides (1) operations and maintenance review of system designs; (2) the development of top-level plans for staffing, training, testing, and readiness review; (3) task analysis and preparation, review and revision of site operating plan, maintenance, instrument calibration, and emergency response procedures; (4) recruiting, hiring, clearing, and providing general employee training for the plant staff; and (5) the development of training materials, training the trainers, and special technical and on-the-job training for the plant staff.

Summary of Monthly Activities:

There are no significant activities under this WBS element until April 1996.

FY96 Budget: Spending profile (\$K, OPEX)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
FY96 Plan (10/95)	0.0	0.0	0.0	0.0	0.0	0.0	16.2	27.2	27.2	27.2	27.2	27.2
Monthly actual	0.0	0.0	0.0	0.0								
FY96 Plan cumulative	0.0	0.0	0.0	0.0	0.0	0.0	16.2	43.4	70.6	97.8	125.0	152.2
Actual cumulative	0.0	0.0	0.0	0.0								
Current lien	0.0	0.0	0.0	0.0								

Significant Procurement Actions This Month:

None

Milestones and Markers:

*See Appendix A: "Milestone/Marker Log" for original dates and reconciliation.

ID No.	Milestone/Marker	Scheduled Date*	Status
L122-1	Issue MWMF Start-Up and Activation Plan	Sep 96	

WBS Element: 1.2.3. Activation

Task Description: Activation provides: (1) the preparation, review, revision, and release of all Operational Test Procedures (OTPs); (2) plant systems activation, integration, and performance of OTPs in each of the technology areas including Operational Readiness Reviews (ORRs); (3) technical support for the preparation of Operational Safety Requirements (OSRs) and Facility Safety Requirements (FSRs), as well as the identification and resolution of problems during plant operational testing, start-up, and activation, including finalization of design documentation for equipment and process modifications; (4) maintenance support to perform equipment or process modifications during start-up, testing, and activation; (5) all operational spares and the initial stores inventory; and (6) all manpower and materials required to deliver support services (e.g., utilities, power, etc.) during construction, testing, and activation of the MWMF.

Summary of Monthly Activities:

There are no activities under this WBS element during FY96.

FY96 Budget: Spending profile (\$K, OPEX)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
FY96 Plan (10/95)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Monthly actual	0.0	0.0	0.0	0.0								
FY96 Plan cumulative	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Actual cumulative	0.0	0.0	0.0	0.0								
Current lien	0.0	0.0	0.0	0.0								

Significant Procurement Actions This Month:

None

Milestones and Markers:

*See Appendix A: "Milestone/Marker Log" for original dates and reconciliation.

ID No.	Milestone/Marker	Scheduled Date*	Status
None	No activity		

WBS Element: 1.3.1. Project Management

Task Description: Project Management provides top-level Project planning, direction, and control of the MWMF Project CENRTC-funded systems. Specific activities include Project management and support of Project Office, Project assurance (including quality assurance, safeguards, environmental protection, and safety oversight), management overview of information management and technical activities, and interface with DOE.

Summary of Monthly Activities:

- Project management continued for all elements of the CENRTC-funded activities. The PB2.0 is essentially complete; however, it will have to be modified before it is issued to adjust the schedule and budget resulting from the significant delay in obtaining KD-2 for the Project. We will address these changes once we have approval to proceed into final design.
- The Project continues to make good progress in resolving issues identified as part of the Preliminary Design reviews. We have resolved many of the interface design issues and have formalized virtually all of the equipment layouts as required for the DWTF Phase 2 Title 2 design. Further, we have resolved a key MSO design issue associated with injector installation and removal. We continue to work with Hazardous Waste Management to coordinate functions on operations of the facility, use of the process diagnostics requirements, and Supervisory I&C elements of the Project.
- One of the main items requested by DOE/HQ during the December meeting with S. Cowan (reported last month) was a cost-benefit analysis of the MWMF vs. a number of alternative options. This was addressed by contracting with SAIC for an independent study while at the same time completing an internal cost-benefit study addressing a number of specific cases relative to how and where non-incineration technologies may be deployed. The studies were very positive, resulting in a "net present value" in the range on the order of \$100M—clearly showing the benefits of continuing with the deployment of MWMF as a national testbed. In addition, a case-specific study was completed looking specifically at the benefit of deploying telerobotic feed preparation in the MWMF. The results from this study were also very positive.
- We have continued to coordinate our activities with the MWFA, resulting in a meeting at LLNL with Dick Bateman and John McFee (January 16, 1996) to discuss activities within the "non-incineration states" (NISs). Additionally, we are working with the appropriate MWFA Waste Type Managers to coordinate MWMF activities with DOE treatment plans.
- Entering the fourth month of FY96, the Project does not have an approved budget or accepted scope of work. As a result, the Project has lost a number of key personnel, and we are not bringing on new team members until such issues are resolved. Key Project milestones will have to be reassessed once the funding and plan for the remainder of the Project is approved by DOE. The Project PDR established the basis for PB2.0. We will continue to proceed along this plan—albeit at a reduced funding rate—until further formal guidance is received from DOE.

- The costs for January show a significant increase from previous months. This is due to a number of factors, the principal factor being the redistribution of OFC facility charges. The MWMF budget plan called for all office charges to be charged to this WBS element. Unfortunately, during the first quarter, charges were distributed to individual account numbers throughout the Project. Most OFC charges were rectified in January. However, OFC overcharges of about \$40K were also identified, which have yet to be corrected. On balance, with the costs adjusted for the correct OFC charges, the account will be very close to the FY96 planned cumulative expenditures.

FY96 Budget: Spending profile (\$K, CENRTC)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
FY96 Plan (10/95)	64.0	88.0	72.0	61.3	64.0	61.3	61.3	61.3	64.0	61.0	61.0	88.0
Monthly actual	42.5	51.6	44.8	161.5								
FY96 Plan cumulative	64.0	152.0	224.0	285.3	349.3	410.5	471.8	533.0	597.0	658.0	719.0	807.0
Actual cumulative	42.5	94.1	138.9	300.4								
Current lien	24.5	21.6	19.2	12.3								

Significant Procurement Actions This Month:

No new procurement; however, additional costs are expected on the existing SAIC contract to cover the additional scope of work for the independent cost-benefit study.

Milestones and Markers:

*See Appendix A: "Milestone/Marker Log" for original dates and reconciliation.

ID No.	Milestone/Marker	Scheduled Date*	Status
L131-1	Preliminary Design Review complete	Nov 95	Complete
D131-2	DOE issues KD-2	Nov 95	Late
L131-5	Issue Project Baseline Rev. 2.0	Jan 96	On Hold [†]
L131-6	Final Design Review complete	Oct 96	

[†]See Project Summary above.

WBS Element: 1.3.2. Project Control

Task Description: Project Control provides for the Project integration, configuration management, cost and schedule control, quality assurance (see WBS 1.1.1), and administration of the CENRTC-funded systems. It develops and maintains the management systems used to monitor progress against the established baselines and to ensure configuration control (drawings, documents, etc.).

Summary of Monthly Activities:

- While awaiting the outcome of the Continuing Resolution and a final budget, we continued to closely monitor costs during January.
- The Rebaseline 2.0 document, which was due to be completed during January (Marker L132-11.1), was assembled in draft form. However, we will not publish and issue it until a decision is made by DOE on the future status of the Project.
- The Engineering Change Control Procedure (Marker L132-13.1) was completed.
- Other activities and accomplishments during January included the following:
 - Issued the DOE PTS monthly report.
 - Issued the *December Monthly Report*.
 - Continued investigating several liens for possible removal from Project accounts.

FY96 Budget: Spending profile (\$K, CENRTC)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
FY96 Plan (10/95)	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	38.0
Monthly actual	13.7	9.1	18.4	8.1								
FY96 Plan cumulative	40.0	80.0	120.0	160.0	200.0	240.0	280.0	320.0	360.0	400.0	440.0	478.0
Actual cumulative	13.7	22.9	41.3	49.4								
Current lien	0.0	0.0	119.2	136.5								

Significant Procurement Actions This Month:

None

Milestones and Markers:

*See Appendix A: "Milestone/Marker Log" for original dates and reconciliation.

ID No.	Milestone/Marker	Scheduled Date*	Status
L132-8.1	Complete support of Project PDR	Nov 95	Complete
L132-10.1	Complete <i>FY96 Budget Plan</i>	Oct 95	Complete
L132-11.1	Complete Cost/Schedule Baseline Rev. 2.0	Jan 96	On Hold
L132-12.1	Complete support of Project Final Design Review	Sep 96	
L132-13.1	Engineering Change Control Procedure	Jan 96	Complete
L132-13.2	Nonconformance Reporting Procedure	Apr 96	
L132-13.3	Complete QA Surveillance/Verification	Aug 96	

WBS Element: 1.3.3. Technical Systems Integration

Task Description: Technical Systems Integration provides the oversight and performance studies intended to verify or document system integration performance, system analysis, special process diagnostics, and planning and analysis of the process aspects of integrated tests. It covers technical issues that affect all primary and support processes. It also includes the responsibility for assuring that the systems interfaces are addressed in the integrated design, including interfaces with LLNL Hazardous Waste Management and facility engineering. The element coordinates the System Design Requirements, the MWMF floor plan, and the Integrated Operating Plan.

- **Summary of Monthly Activities:**

- We met with Parsons personnel and discussed design issues providing guidance for the facility Title 2 work.
- We completed the review of the Phase 2 Title 2 65% design submittal and provided comments to the AE.
- We provided a presentation for the MWMF requirements and presented same in the DWTF Management Briefing.
- We provided information on cost/benefit analysis of the MWMF in response to a DOE request. Formal documentation is expected to be completed next month.
- We have continued to answer questions and give clarification to Parsons to assist in their design effort.

FY96 Budget: Spending profile (\$K, CENRTC)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
FY96 Plan (10/95)	35.0	28.0	28.0	32.0	26.4	29.0	30.0	23.4	23.4	27.4	23.4	23.4
Monthly actual	20.9	14.1	10.3	4.3								
FY96 Plan cumulative	35.0	63.0	91.0	123.0	149.4	178.4	208.4	231.8	255.2	282.6	306.0	329.4
Actual cumulative	20.9	35.0	45.3	49.6								
Current lien	0.9	0.0	0.9	0.9								

Significant Procurement Actions This Month:

None

Milestones and Markers:

*See Appendix A: "Milestone/Marker Log" for original dates and reconciliation.

ID No.	Milestone/Marker	Scheduled Date*	Status
L133-10.5	Facility Title I Design Review (80%)	Oct 95	Complete
L133-10.6	LLNL review of Facility Title I Design	Nov 95	Complete
L133-6	Revised SDR completed for Title II Design	Nov 95	Complete
L133-7.1	Facility Title II Design Review (80%)	Feb 96	
L133-7	LLNL review of Facility Title II Design complete	Mar 96	

WBS Element: 1.4.1. Receiving and Shipping

Task Description: The principal objective of the Receiving and Shipping (RAS) system is to provide for the receiving, logging, identification and characterization of all incoming waste containers, and to determine the acceptability for processing the waste. RAS provides the management, system analysis and support, design (Title I, II, III) engineering, procurement, installation of RAS equipment, Title III inspection, and acceptance test procedures (ATP). RAS includes both receiving and shipping equipment and systems integration.

Summary of Monthly Activities:

- Design work in this area has been deferred due to higher priorities.
- We completed the LI&C System Functional Requirements Document and the task analysis for the RAS.

FY96 Budget: Spending profile (\$K, CENRTC)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
FY96 Plan (10/95)	1.5	1.5	1.5	1.5	2.4	4.9	2.4	4.9	2.4	2.2	2.2	2.2
Monthly actual	3.6	1.9	1.8	1.7								
FY96 Plan cumulative	1.5	3.0	4.5	6.0	8.4	13.3	15.7	20.6	22.9	25.1	27.3	29.5
Actual cumulative	3.6	5.5	7.3	9.1								
Current lien	0.0	0.0	0.0	0.0								

Significant Procurement Actions This month:

None

Milestones and Markers:

*See Appendix A: "Milestone/Marker Log" for original dates and reconciliation.

ID No.	Milestone/Marker	Scheduled Date*	Status
L141-1.3	RAS LI&C System Functional Requirements document complete	Sep 95	Complete
L141-2.1	RAS LI&C System Design Description drafted	Jun 96	
L141-2.2	RAS System Design Description drafted	Sep 96	
L141-2	RAS 90% Final Design Review complete	Oct 96	

WBS Element: 1.4.2. Solids Feed Preparation—Conventional

Task Description: The principal objective of the Conventional Feed Preparation (CFP) system is to provide for the receipt, preparation for processing, and the decontamination of homogeneous and heterogeneous solids received from storage and other processes in the facility. This includes processing the incoming combustible solids waste/surrogate stream into a form required by the treatment processes. The decontamination system provides necessary equipment to ensure materials/containers can be safely transferred out of the facility. CFP provides the management, system analysis and support, design (Title I, II, III) engineering, procurement, installation of CFP equipment, Title III inspection, and acceptance test procedures (ATP). CFP includes both solids feed preparation equipment and systems integration.

Summary of Monthly Activities:

- Design work in this area has been deferred due to higher priorities.
- We continued design activities in preparation for the LI&C System Functional Requirements Document; a draft has been started.

FY96 Budget: Spending profile (\$K, CENRTC)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
FY96 Plan (10/95)	17.3	20.3	31.3	30.3	33.8	31.8	32.8	31.8	31.8	30.5	30.5	31.5
Monthly actual	3.9	1.1	2.9	0.8								
FY96 Plan cumulative	17.3	37.6	68.9	99.2	133.0	164.8	197.6	229.4	261.2	291.7	322.2	353.7
Actual cumulative	3.9	5.0	7.9	8.7								
Current lien	0.0	0.0	0.0	0.0								

Significant Procurement Actions This month:

None

Milestones and Markers:

*See Appendix A: "Milestone/Marker Log" for original dates and reconciliation.

ID No.	Milestone/Marker	Scheduled Date*	Status
L142-1.8	CFP LI&C System Functional Requirements Document complete	Oct 95	Late
L142-3.1	CFP System Design Description drafted	Sep 96	
L142-3.2	CFP LI&C System Design Description drafted	Oct 96	
L142-3	CFP 90% Final Design Review complete	Oct 96	

WBS Element: 1.4.2. Solids Feed Preparation—Telerobotics Sorting

Task Description: The principal objective of the Telerobotics Sorting (TRS) system within Solids Feed Prep is to provide remote container and waste handling equipment necessary to demonstrate remote preparation of feed for treatment processes in the MWMF and to evaluate the technology for use at sites across the DOE complex. TRS interfaces with SFP container receiving and conventional size reduction and segregation equipment and replaces manual (hands-on) sorting and container handling operations in the potentially contaminated process room. TRS primary functions include drum movement; waste characterization; segregation of the incoming waste stream into bulk streams containing predominantly organic solids, heterogeneous solids, homogeneous inorganic solids and metals, and liquids not previously identified; and repackaging of reject materials. TRS provides the management, system analysis and support, design (Title I, II, III) engineering, procurement, installation of Solids Feed Preparation TRS equipment, Title III inspection, and acceptance test procedures (ATP). TRS includes both solids feed preparation equipment and systems integration.

Summary of Monthly Activities:

- Items impacting the facility design remained a top priority in January, including increased definition of the crane to allow a phased installation and updates of the utility requirements for process equipment.
- Discussions with Schilling Robotic Systems on the possibility of a CRADA on the telerobot control system, resumed following their research into commercially available technology. Their reviews found disadvantages with other alternatives, and they have decided to develop their future products using the same environment we have chosen— providing a very good basis for collaboration. We are currently investigating the benefits possible through a three-way CRADA with LLNL, ORNL and Schilling. Each party's interests and skills complement the other's, warranting a look at a three-party effort. The goal is to transfer the technology to Schilling prior to Title III, avoiding DOE lab development of the final system for MWMF.
- Revised P&ID to reflect more detail on telerobotic system instrumentation.
- Completed the ControlShell components for the collision avoidance compute engine—one of the key development pieces needed for increasing system robustness. The second piece, force control, is currently being implemented.
- Continued development of Cybernet hand control interface. Currently awaiting arrival of CPU boards needed to run the software. Existing hardware was borrowed and has insufficient memory to run the code.
- In response to a DOE-HQ request, performed a return-on-investment analysis for telerobotic deployment in MWMF and in a full-scale treatment facility.

FY96 Budget: Spending profile (\$K, CENRTC)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
FY96 Plan (10/95)	59.0	63.0	102.0	75.0	62.0	51.0	48.0	57.0	42.0	40.0	38.0	62.0
Monthly actual	33.0	108.6	46.3	48.5								
FY96 Plan cumulative	59.0	122.0	224.0	299.0	361.0	412.0	460.0	517.0	559.0	599.0	637.0	699.0
Actual cumulative*	33.0	141.6	187.9	236.4								
Current lien	0.0	0.0	0.0	126.6								

*Note: Accumulated costs for work performed under the SAIC Contract will be redistributed to the proper user accounts.

Significant Procurement Actions This Month:

None

Milestones and Markers:

*See Appendix A: "Milestone/Marker Log" for original dates and reconciliation.

ID No.	Milestone/Marker	Scheduled Date*	Status
L1422-2.1	Linear rail facility interface design complete	Dec 95	Complete
L1422-2.2	Prototype sorting application operational	Mar 96	
L1422-2.3	Operator console prototype complete	Apr 96	
L1422-2.4	Telerobot control interface design and performance specification complete	Aug 96	
L1425-2	Crane final design (specification) complete	Aug 96	
L1422-2	Telereobotics Sorting 90% Final Design Review complete	Sep 96	

WBS Element: 1.4.3. Liquids Feed Preparation

Task Description: The principal objective of the Liquids Feed Preparation (LFP) system is to provide for the receipt, characterization, preparation for processing, and handling of homogeneous and heterogeneous liquids and solids/liquids mixtures received from storage and other processes in the facility. This includes segregating the incoming waste stream into aqueous with Trimsol, chlorinated organic liquids, oils, solvents, and scintillation cocktails. LFP provides the management, system analysis and support, design (Title I, II, III) engineering, procurement, installation of LFP equipment, Title III inspection, and acceptance test procedures (ATP). LFP includes both liquids feed preparation equipment and systems integration.

Summary of Monthly Activities:

- Design work in this area has been deferred due to higher priorities.
- We completed the LI&C System Functional Requirements Document and the task analysis for the LFP.

FY96 Budget: Spending profile (\$K, CENRTC)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
FY96 Plan (10/95)	17.5	17.5	17.6	17.6	20.8	20.8	20.8	20.8	20.8	20.8	20.8	20.8
Monthly actual	10.6	15.5	16.4	3.8								
FY96 Plan cumulative	17.5	35.0	52.6	70.2	91.0	111.8	132.6	153.4	174.2	195.0	215.8	236.6
Actual cumulative	10.6	26.1	42.5	46.2								
Current lien	0.0	0.0	0.0	0.0								

Significant Procurement Actions This Month:

None

Milestones and Markers:

*See Appendix A: "Milestone/Marker Log" for original dates and reconciliation.

ID No.	Milestone/Marker	Scheduled Date*	Status
L143-1.6	LFP LI&C System Functional Requirements Document complete	Oct 95	Complete
L143-2.1	LFP System Design Description drafted	Sep 96	
L143-2.2	LFP LI&C System Design Description drafted	Sep 96	
L143-2	LFP 90% Final Design Review complete	Oct 96	

WBS Element: 1.5.1. Mediated Electrochemical Oxidation

Task Description: The principal objective of Mediated Electrochemical Oxidation (MEO) System is to receive appropriately characterized mixed waste streams and completely convert the organic portions to CO₂ and water, to recycle acid and silver, and to remove ash containing the radioactive constituents. The MEO element provides the management, system analysis and support, design (Title I, II, III) engineering, procurement and installation of the MEO equipment, Title III inspection, and acceptance test procedures (ATP) covering both equipment and system integration activities.

Summary of Monthly Activities:

This task has been closed out per DOE Guidance. No FY96 activities.

FY96 Budget: Spending profile (\$K, CENRTC)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
FY96 Plan (10/95)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Monthly actual	3.4	-0.1	0.0	0.0								
FY96 Plan cumulative	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Actual cumulative	3.4	3.3	3.3	3.3								
Current lien	0.9	0.9	0.9	0.9								

Significant Procurement Actions This Month:

None

Milestones and Markers:

*See Appendix A: "Milestone/Marker Log" for original dates and reconciliation.

ID No.	Milestone/Marker	Scheduled Date*	Status
None	No activity		

WBS Element: 1.5.2. Molten Salt Oxidation

Task Description: The principal objectives of Molten Salt Oxidation (MSO) are to receive appropriately characterized mixed waste streams and completely convert the organic portions to CO₂ and water, to remove ash containing the radioactive constituents, and to recycle/process the spent salt. The MSO Project element provides the management, system analysis and support, design (Title I, II, III) engineering, procurement and installation of the MSO equipment, Title III inspection, and acceptance test procedures (ATP) covering both equipment and system integration activities.

Summary of Monthly Activities:

- **Materials Development**

Coatings

- Coated corrosion samples having topcoats of oxide (alumina, stabilized zirconia) or MCrAlY on Inconel 600, with and without interlayers, are being prepared by flame spray or CVD processes at four coating firms (BIRL, CTC, EST, Ultramet). Most of these are scheduled to arrive in February.

Corrosion testing

- The 500-h corrosion test in LLNL's ten-tube furnace to determine the relative aggressiveness of various salts was completed. The corrosion samples are being evaluated metallographically.

Creep of Inconel 600

- Two metallurgical considerations of creep were identified in support of vessel design efforts: (1) the vessel thickness in creep expressions must decrease with time to account for hot corrosion loss of material by oxidation or internal attack, and (2) one must extrapolate existing creep data to 950°C from lower-temperature data published by Inco. Our extrapolation procedure here was shared with metallurgists at Inco who judged it to be acceptable for engineering calculations.

Materials CRADA with Thermal Technology Inc.

- A strawman plan was created to launch this arrangement.

- **Engineering Demonstration Unit (EDU)**

- Current tests continue to investigate the effects of increasing chloride content. Tests to date have been run at concentrations of 5, 15, and 30 mol% NaCl, with the 45 mol% tests in progress. Satisfactory off-gas results are seen at temperatures of 850°C and above at superficial velocities of 1 ft/s for both acetone and mineral oil/toluene. At lower temperatures and/or higher feed rates, significantly higher quantities of CO are produced (> 0.1%) and hydrocarbons on the order of 10 ppm and higher begin to be seen in the off-gas.
- During February, tests as described above at 45 and 55 mol% NaCl will be conducted. Additionally, the Lead Engineer has requested that this test plan be

expanded to include some testing at 70 and 90 mol% NaCl. This will also be completed in February.

- The HCl toxic gas sensor has been installed and is operational. Added PLC logic and SCADA software to acquire, display and log the sensor signal.
- **Primary Unit**
 - The baseline primary arrangement has been frozen. This arrangement is structurally integrated with the Process Off-Gas. A novel approach combines the ejector shipping container with the maintenance enclosure. The result is a smaller and lower enclosure and better crane clearance.
- **Salt Recycle**
 - We received a fixed-price quotation from the vendor for the process design portion of the salt separation project. The quoted price was \$330K and a 22-week schedule. We evaluated this proposal, including the extent of the work proposed, the man-hours estimated to perform the work, the equipment and supply cost estimates, and the rates at which the man-hours and materials were quoted. We found the quotation reasonable, and determined to proceed with the work.
 - The MWMF program was unable to release a \$330K procurement at this time, and program management requested alternatives. After discussions with procurement and with the vendor, a two-step procurement was suggested and approved by MWMF Project management. A subcontract was written as follows to proceed with the first two tasks for \$40K over the next six weeks.
- **Salt Separation Process Modeling**
 - Dissolution/precipitation of nickel and zinc in spent salts were simulated in the modeling software EQ 3/6 with COM database. The results are as follows:

Metal	Starting	Equilibrium conc. in solutions
Ni	310 ppm	0.005 ppm
Zn	6200 ppm	0.015 ppm

Based on the modeling, most of Ni and Zn will precipitate out and residual ions in brine solution would be extremely low. This generally agrees with our lab results except that reaction of zinc ions with OH^- may be very slow kinetically and resulted in higher Zn concentrations in solutions. Sulfiding and coagulation agents will be very helpful for the zinc removal process.

- **Salt Separation Experimental**

- *Heavy Metal Removal Experiments*

Removal of two heavy metals (nickel and zinc) from salt solutions were the main focus in the lab experiments in January. Sources of nickel and zinc in spent salts from waste feeds and/or MSO vessel are expected to be about 0.1% mole and 2% mole, respectively. Acceptable levels of nickel and zinc for Final Forms are 100 ppm and 105 ppm (dry basis) without polymer encapsulation. Laboratory work was used to determine whether sulfiding agents are required to drop concentrations of nickel and zinc in salt solutions. The experimental results for nickel were:

Ni in spent salts	Ni in salt solutions		Dry basis
	Start*	Final**	
	Wet basis	Wet basis	
0.1% mole	310 ppm	4 ppm	<35 ppm

* Ni levels were measured right after solutions were prepared.

** Ni levels were measured after 24 hrs.

The Ni concentration dropped to below 35 ppm overnight. Therefore sulfiding is not required for nickel.

The experimental results for zinc were:

Zn in spent salts	Zn in salt solutions		Dry basis
	Start*	Final**	
	Wet basis	Wet basis	
2% mole	6200 ppm	140 ppm	>500 ppm

* Ni levels were measured right after solutions were prepared.

** Ni levels were measured after 24 hrs.

As shown in the table, Zn concentration dropped to 140 ppm overnight which is too high for Final Forms. Therefore sulfiding is required. Sulfiding of Zn is currently under way in the laboratory.

- *Analysis of Spent Salts*

There was a concern whether sodium carbonate would decompose into sodium oxide at high temperatures (~900°C) if CO₂ bubbling is not adequate. In laboratory experiments we analyzed two spent salts to determine the degree of decomposition. We found that the spent salt from EDU did not decompose at all in the reactor—which is good news. Sodium carbonate salt which was melted in a furnace with cover gas decomposed very significantly (about 30%).

- **Process Off-Gas**

- The layout of the Process Off-Gas System has been completed.
- We visited On-Demand, the vendor for the catalytic converter, on January 25. A unit similar in design to the one quoted for us was being tested during our visit. This enabled us to see a unit in operation and ask specific questions about the design, maintenance, and performance of the unit.
- We met with Joe McIntyre to discuss the sample port size, orientation, and location(s). At least two ports 90 degrees apart on a plane perpendicular to the longitudinal axis of the duct will be installed at the sample point. Each port, where possible, will be a nominal three-inch-diameter pipe with external tapered pipe threads. The sample points are at the inlet and outlet of the HEPA filter and at the exhaust of the catalytic converter.
- We reviewed Parsons' drawings and specified locations for the utility drops.

- **Local I&C**

- We wrote a task list and functional requirements document for the design of the vessel and salt drain heater power controller. This work is being done through a CRADA with Thermal Technology Inc.
- The electrical power requirements for all of MSO were revised to reflect the current design; these are being tracked in a detailed spread sheet.
- Parsons' design for facility power was reviewed and checked for consistency with current MSO needs. Comments were provided on all discrepancies.

FY96 Budget: Spending profile (\$K, CENRTC)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
FY96 Plan (10/95)	215.0	1315.0	215	215	215	215	215	330	227	215	215	215
Monthly actual	201.6	160.4	112.3	80.5								
FY96 Plan cumulative	215.0	1530.0	1745.0	1960.0	2175.0	2390.0	2605.0	2935.0	3162.0	3377.0	3592.0	3807.0
Actual cumulative	201.6	362.0	474.3	554.7								
Current lien	198.6	156	151.3	179.4								

Significant Procurement Actions This Month:

None

Milestones and Markers:

*See Appendix A: "Milestone/Marker Log" for original dates and reconciliation.

ID No.	Milestone/Marker	Scheduled Date*	Status
L152-3.5	LI&C Functional Requirements Document complete	Oct 95	Complete
L152-3.6	LI&C System Preliminary Design complete	Oct 95	Complete
L152-3	MSO System MWMF PDR	Oct 95	Complete
L152-5.1	Select Industrial Participation method for Salt Recycle	Nov 95	Complete
L152-5.2	MSO Peer Review	Jul 96	
L152-5	MSO 90% Final Design Review complete	Sep 96	

WBS Element: 1.5.3. Wet Oxidation

Task Description: The principal objective of Wet Oxidation (WOX) is to demonstrate treatment of organic mixed wastes using a wet oxidation process to convert the organic portions to CO₂, water, and inorganic ions, leaving ash, salts, metals, and radionuclides in a residual solution/slurry. The WOX Project element provides the management, system analysis and support, design (Title I, II, III) engineering, procurement and installation of the WOX equipment, Title III inspection, and acceptance test procedures (ATP) covering both equipment and system integration activities.

Summary of Monthly Activities:

This task has been closed out per DOE guidance. No FY96 activities.

FY96 Budget: Spending profile (\$K, CENRTC)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
FY96 Plan (10/95)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Monthly actual	0.4	0.0	0.0	(0.1)								
FY96 Plan cumulative	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Actual cumulative	0.4	0.4	0.4	0.4								
Current lien	0.0	0.0	0.0	0.0								

Significant Procurement Actions This Month:

None

Milestones and Markers:

*See Appendix A: "Milestone/Marker Log" for original dates and reconciliation.

ID No.	Milestone/Marker	Scheduled Date*	Status
None	No activity		

WBS Element: 1.5.4. UV Photolysis

Task Description: The principal objective of UV Photolysis (UVP) is to demonstrate ultraviolet-driven treatment of the hazardous and toxic organic constituents in the condensate from the Wet Oxidation process (WBS 1.5.3) to produce a sewerable water stream. The UVP Project element provides the management, system analysis and support, design (Title I, II, III) engineering, procurement and installation of the UVP equipment, Title III inspection, and acceptance test procedures (ATP) covering both equipment and system integration activities.

Summary of Monthly Activities:

This task has been closed out per DOE guidance. No FY96 activities.

FY96 Budget: Spending profile (\$K, CENRTC)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
FY96 Plan (10/95)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Monthly actual	0.0	0.0	0.0	0.0								
FY96 Plan cumulative	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Actual cumulative	0.0	0.0	0.0	0.0								
Current lien	0.0	0.0	0.0	0.0								

Significant Procurement Actions This Month:

None

Milestones and Markers:

*See Appendix A: "Milestone/Marker Log" for original dates and reconciliation.

ID No.	Milestone/Marker	Scheduled Date*	Status
None	No activity	None	

WBS Element: 1.5.5. Experimental Off-Gas

Task Description: The principal objective of the Experimental Off-Gas Treatment (XOGT) is to demonstrate advanced, more effective off-gas treatment technologies that minimize secondary waste. These are improved Selective Catalytic Reduction (SCR) of NO_x to nitrogen in gaseous phase, acidic urea DeNO_x scrubbing, and advanced metal filters. The second objective is to demonstrate feasibility and effectiveness of off-gas treatment at or near the source of the gas where the treatment can be tailored to that specific source. The XOGT Project element provides the management, system analysis and support, design (Title I, II, III) engineering, procurement and installation of XOGT equipment, Title III inspection, and acceptance test procedures (ATP) covering both equipment and system integration activities. The XOGT will be backed by the facility off-gas system.

Summary of Monthly Activities:

No activity to report.

FY96 Budget: Spending profile (\$K, CENRTC)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
FY96 Plan (10/95)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Monthly actual	0.0	0.0	0.0	0.0								
FY96 Plan cumulative	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Actual cumulative	0.0	0.0	0.0	0.0								
Current lien	0.0	0.0	0.0	0.0								

Significant Procurement Actions This Month:

None

Milestones and Markers:

*See Appendix A: "Milestone/Marker Log" for original dates and reconciliation.

ID No.	Milestone/Marker	Scheduled Date*	Status
None	No activity		

WBS Element: 1.6.1. Process Transport and Storage

Task Description: The principal objective of the Process Transport and Storage (PTS) system is to collect, transfer, deposit, store and handle containers, discrete items, dry and wet bulk materials, slurries, and liquids. PTS provides management, system analysis and support, design (Title I, II, and III) engineering, procurement and installation of Process Support Systems equipment, Title III inspection, and acceptance test procedures (ATP). PTS includes both process transport and storage equipment and systems integration.

Summary of Monthly Activities:

- Reviewed facility 65% Title II design.
- Deferred additional design definition due to higher-priority work on other WBS elements.

FY96 Budget: Spending profile (\$K, CENRTC)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
FY96 Plan (10/95)	0.5	0.5	5.5	9.5	11.1	14.1	12.1	9.1	3.1	2.1	2.1	2.1
Monthly actual	1.4	1.2	1.4	1.6								
FY96 Plan cumulative	0.5	1.0	6.5	16.0	27.1	41.2	53.3	62.4	65.5	67.6	69.7	71.8
Actual cumulative	1.4	2.6	4.0	5.6								
Current lien	0.0	0.0	0.0	0.0								

Significant Procurement Actions This Month:

None

Milestones and Markers:

*See Appendix A: "Milestone/Marker Log" for original dates and reconciliation.

ID No.	Milestone/Marker	Scheduled Date*	Status
L161-2.1	Final design of transport interface complete	Mar 96	
L161-2.2	Final design of batch makeup station complete	May 96	
L1615-2.3	LI&C prototype user interface approved	May 96	
L1615-2.4	LI&C System Design description complete	Jul 96	
L161-2	PTS 90% Final Design Review complete	Sep 96	

WBS Element: 1.6.2. Process Diagnostic Services

Task Description: The principal objective of the Process Diagnostic Services (PDS) is to provide chemical analysis support for process control and characterization, material control, and regulatory requirements. PDS provides the management, system analysis and support, design (Title I, II, III) engineering, procurement and installation of PDS equipment, Title III inspection, and acceptance test procedures (ATP). PDS includes PDS Equipment, Local Process I&C, and Process Off-Gas.

Summary of Monthly Activities:

- Development of on- and at-line methods for measurements of interest to MSO has been initiated. Measurements of primary interest and priority include chloride and carbonate (ratio and amount present), amount of ash present, and bicarbonate concentration. On- or at-line methods for measurement of these species will be developed. Additional measurements of interest but not required on- or at-line are total metals, anions (fluoride, chloride, bromide), and radionuclides.
- A briefing was given to Keith Gilbert and John Bowers of HWM detailing PDS floorplan, planned equipment, and database and interface/analysis requirements in support of DWTF.
- The status of CES database (to be used as a basis for MWMF database) has been reviewed. The CES database development is on time, with expected completion in late spring, 1996. Manpower requirements for development of MWMF-specific modules have been discussed and remain within FY96 budget.
- Title II facility design drawings were reviewed. Changes were made to the PDS floorplan to remove particle size analysis equipment, and to locate power outlets and wall-mounted heavy equipment. The particle size analysis instrumentation has been deleted by DWTF as no longer required for process characterization.

FY96 Budget: Spending profile (\$K, CENRTC)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
FY96 Plan (10/95)	9.0	15.0	24.0	25.0	29.0	29.0	30.1	37.0	35.0	40.0	125.0	145.0
Monthly actual	6.2	4.1	2.9	2.3								
FY96 Plan cumulative	9.0	24.0	48.0	73.0	102.0	131.0	161.1	198.1	233.1	273.1	398.1	543.1
Actual cumulative	6.2	10.3	13.2	15.5								
Current lien	0.0	0.0	0.0	0.0								

Significant Procurement Actions This Month:

None

Milestones and Markers:

*See Appendix A: "Milestone/Marker Log" for original dates and reconciliation.

ID No.	Milestone/Marker	Scheduled	
		Date*	Status
L162-7	90% Preliminary Design Review	Oct 95	Complete
L162-8.1	Define MSO on- and at-line measurement methods	Mar 96	
L162-8.2	Define off-gas analysis requirements	May 96	
L162-8.3	Select vendor for off-gas system procurement	July 96	
L162-8.4	Select vendors for tritium and gas proportional counter procurements	Aug 96	
L162-8.5	Complete custom test and sample tracking database design	Sep 96	
L162-8	LAB 90% Final Design Review complete	Sep 96	

WBS Element: 1.6.3. Water Treatment

Task Description: Water Treatment (WTR) is an integral part of treatment train demonstrations, continuing treatment of aqueous by-products as part of demonstration tests to produce solid residuals suitable for Final Forms and fully treated water that meets treatment standards and sewer limits. The WTR element provides the management, system analysis and support, design and engineering (Title I, II, III), procurement and installation of the WTR equipment necessary to demonstrate treatment trains, Title III inspection, and acceptance test procedures (ATP) covering both equipment and system integration activities.

Summary of Monthly Activities:

- Started Review of the Functional Requirements Document for the WTR Local I&C System.
- Finished a cost estimate for organic waste treatment commercially.
- Reviewed standards for P&ID drawings.
- Reviewed layout of WTR equipment and utilities.

FY96 Budget: Spending profile (\$K, CENRTC)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
FY96 Plan (10/95)	9.7	9.6	8.3	8.3	8.3	8.3	15.3	15.3	15.3	10.7	11.1	13.2
Monthly actual	12.7	9.8	6.5	2.4								
FY96 Plan cumulative	9.7	19.3	27.6	35.9	44.2	52.5	67.8	83.0	98.3	109.0	120.1	133.3
Actual cumulative	12.7	22.5	29.0	31.4								
Current lien	0.0	0.0	0.0	0.0								

Significant Procurement Actions This Month:

None

Milestones and Markers:

*See Appendix A: "Milestone/Marker Log" for original dates and reconciliation.

ID No.	Milestone/Marker	Scheduled Date*	Status
L163-3.1	LI&C Functional Requirements Document complete	Oct 95	Complete
L163-3.2	LI&C System Preliminary Design Review	Oct 95	Complete
L163-3	WTR System Preliminary Design Review	Oct 95	Complete
L163-4	Begin Final Design	Nov 95	Late
L163-5.1	WTR Unit Operation Subsystems Final Design complete	Aug 96	
L163-5	WTR 90% Final Design Review complete	Sep 96	

WBS Element: 1.6.4. Final Forms

Task Description: The Final Forms (FFM) task is to immobilize the solid residues from the treatment of the mixed waste input streams by the primary processes, and wastes resulting from secondary support processes that are integral to the primary treatment processes. The waste form types under investigation in FY96 are (1) ceramics for mineral residues, (2) polymer microencapsulation for salt, and (3) sulfur-polymer microencapsulation for volatile inorganic solids.

Summary of Monthly Activities:

- General FFM design activities included work on P&IDs, interface control diagrams, the ceramic recipe-writer block logic, miscellaneous interfacing with DWTF design, and documentation. Further work on the P&IDs is in abeyance owing to other priorities of the project mechanical designers.
- Ceramic final forms work continues, with emphasis on leaching behavior differences (as measured by the California WET and Federal TCLP methods), and on characterization and reduction of residual glass in the ceramic. Residual glass is being analyzed using ion accelerator and transmission electron microscopic methods, two techniques we ordinarily avoid for reasons of cost. The role of sulfur, which is an impurity in the zirconia precursor we otherwise prefer, in stabilizing the glass phase is under investigation. We completed an assessment of the effect of sintering temperature (850–1150°C) on phase formation, density, interconnected porosity, and leach resistance.
- Jointly with MSO, we have designed experiments (scheduled for February) to prepare mineral residues in a manner simulating what will happen in an MSO reactor. The phases that form will be determined, and ceramics will be fabricated from the residues.
- The two tasks remaining from FFM's Preliminary Design are completion of the P&IDs and the ceramic recipe-writer block diagram. As noted above, the former is in abeyance due to other priorities; the latter is almost complete. The ceramic interim status report (Marker L164-4.2) is being written and will be completed in February. Costs for January are substantially less than the Plan for several reasons, including postponed procurements, fluctuations of analytical support requirements, and (temporary) high-priority activities of part-time FFM personnel. The expected costs will, however, be incurred over the next few months. The schedule is not compromised.

FY96 Budget: Spending profile (\$K, CENRTC)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
FY96 Plan (10/95)	54.0	35.0	36.0	35.0	198.0	34.0	35.0	34.0	34.0	34.0	34.0	35.0
Monthly actual	50.7	38.0	26.2	17.4								
FY96 Plan cumulative	54.0	89.0	125.0	160.0	358.0	392.0	427.0	461.0	495.0	529.0	563.0	598.0
Actual cumulative	50.7	88.7	114.9	132.3								
Current lien	0.2	0.2	0.2	0.2								

Significant Procurement Actions This Month:

None

Milestones and Markers:

*See Appendix A: "Milestone/Marker Log" for original dates and reconciliation.

ID No.	Milestone/Marker	Scheduled	
		Date*	Status
L164-3	Report: design of polymer microencapsulation system	Oct 95	Late
L164-4.1	Report: volatile residue components and the design of ceramic waste form system	Oct 95	Complete
L164-4.2	Report: Interim status of ceramic waste form compositions and process parameters	Jan 96	Late
L164-5.1	Rotary calciner design procurement complete	Jun 96	
L164-5	Rotary calciner operational	Sep 96	
L164-6.1	Final Design of sulfur-polymer cement system complete	Aug 96	
L164-6.2	Final Design of ceramic recipe-writer complete	Sep 96	
L164-6.3	Final Design of local process off-gas system complete	Jun 96	
L164-6	FFM 90% Final Design Review complete	Jan 97	

WBS Element: 1.6.5. Supervisory Instrumentation and Control (SI&C)

Task Description: Supervisory Instrumentation and Control (I&C) systems will be provided and integrated to demonstrate, test, and evaluate mixed-waste destruction technologies in a safe, environmentally acceptable, reliable, and cost-effective manner. I&C systems provide the management, system analysis and support, design (Title I, II, III) engineering, procurement and equipment installation, Title III inspection, and acceptance test procedures (ATP) covering equipment and system integration activities for facility database management, safety control, process I&C standards, supervisory control, and ancillary systems and equipment (the instrumentation and equipment database, intercom communication, process and surveillance CCTV, cable and power distribution and grounding, and control room facilities).

Summary of Monthly Activities

- We met with Parsons' engineers on Jan. 9th for continued discussion regarding B695 design issues including power distribution, cableways, communications, and lighting.
- We completed review of the DWTF Phase 2 Title II 65% design package for B695.
- We updated all electrical power requirements.
- The *Memorandum of Understanding for MWMF Container Tracking and Material Accounting Requirements* is progressing slowly. This document provides the baseline requirements for marker L165-2.3. The remaining issue to resolve is about certification information.
- The operating system and open database connectivity (ODBC) software on the database interface computer has been upgraded to Windows NT. Upgrades for compatible software from MinnovEX and ORACLE are expected shortly.
- Engineering Development Phase 5 testing activities are now in progress. Preparations are under way to determine nominal and limitations for database transfer rates, PLC driver transfer rates, MMI update rates, round-trip system response, and network loading. Marker L165-1.13 — *Engineering Development tasks complete and documented* has not been completed.
- The HDS Share hardware/software order was received and subsequently readied for prototype configuration testing.
- Container tracking and material accounting methods are being explored. This work is proceeding in concert with the bar coding system design.
- Requirements for the bar coding system for Container Tracking and Material Accounting applications were refined. A design alternatives study is now in progress.
- We continued human interface design standards activities. A ProcessVision application specifically tailored to testing and providing examples of the MMI standards is in progress.
- We established the MWMF/DWTF color code for electrical power service panels.

FY96 Budget: Spending profile (\$K, CENRTC)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
FY96 Plan (10/95)	33.8	38.8	35.8	34.1	29.8	31.1	39.0	37.2	37.2	37.2	40.2	40.2
Monthly actual	34.8	31.5	30.2	34.0								
FY96 Plan cumulative	33.8	72.6	108.4	142.5	172.2	203.3	242.3	279.5	316.7	353.9	394.1	434.3
Actual cumulative	34.8	66.2	96.4	130.5								
Current lien	21.2	21.2	21.2	20.1								

Significant Procurement Actions This Month:

None

Key Milestones and Markers:

*See Appendix A: "Milestone/Marker Log" for original dates and reconciliation.

ID No.	Milestone/Marker	Scheduled Date*	Status
L165-1.12	SI&C Functional Requirements Document complete	Oct 95	Complete
L165-1.13	Engineering Development tasks complete and documented	Oct 95	Late
L165-2.3	Container Tracking and Material Accounting Requirements document approved	Nov 95	Complete
L165-2.4	Facility Monitoring and Safety Control System task analysis complete/documented	Feb 96	
L165-2.5	Instrumentation and Equipment Database complete	Mar 96	
L165-2.6	Final Design Process I&C Standards complete	Apr 96	
L165-2.7	Control Room and Equipment Room design complete	May 96	
L165-2.8	Supervisory Control System SDD drafted	Jun 96	
L165-2	SI&C 90% Final Design Review complete	Oct 96	

Appendix A

Milestone/Marker Log

MWMF Milestone/Marker Log

For Jan 96 Monthly Report - Sorted by Number

Number	Item	PTS	Orig. Date	Date	Status	Comments
	Rev. Date: 2/28/96; Doc. Resp. Person: M. Hussey					
X	= changes in this revision					
C113-1	RD&D permit issued by DTSC	X		Apr-96		date required by DWTF schedule. Better est. after DTSC review applic.
C113-2	Authorization to construct issued by BAAQMD	X	Oct-94	Jul-96		Schedule change as a result of permitting strategy change.
D112-1	PSAR Approved by DOE	X	Jun-94	Nov-94	deleted	facility categorized Low Hazard; DOE approval not req'd
D113-1	EA determination by DOE	X	Aug-94	Sep-95	complete	EA draft submitted for comments. Final determination and issue of FONSI by DOE Compliance Office now expected in September.
D115-1	DOE issues Project Plan	X		Jan-95		
D121-1	Preliminary approval and funding for Preliminary Design	X	Apr-94	Jun-94	complete	delayed decision by DOE
D121-2	KD 1/2 Approval by DOE	X		Jun-94	complete	received KD-1 only
D131-2	DOE issues KD-2	X	Jun-94	Nov-95	late	Delayed due to reduced DOE funding. Decision expected in Dec-95.
L111-1	Develop and issue Quality Assurance Plan			Oct-93	complete	
L111-2	Develop and issue Document Control Plan			Jan-94	complete	
L111-3	Issue Design Review Procedure			Sep-94	complete	
L112-1	PSAR to DOE for Review	X	Mar-94	Dec-94	complete	delayed to include CDR information and due to DOE decision to merge MWMF & DWTF
L112-1.1	Issue PSAR Contract			Oct-93	complete	
L112-1.2	Preliminary PSAR Review			Feb-94	complete	
L113-1	Environmental Assessment (EA) submitted to DOE	X	Mar-94	Jun-94	complete	delayed to include CDR information, draft submitted
L113-2	Submit air permit to BAAQMD	X	May-94	Apr-96		Schedule change as a result of permitting strategy change.
L113-3	Submit RD&D permit application to DTSC	X	Jul-94	Feb-95	on hold	Draft application complete. Permit application may not be submitted if revised strategy is approved.
L113-4	Submit revised EA to DOE (for MWMF/DWTF merge)	X	Dec-94	Feb-95	complete	Delayed to allow coordination with permitting efforts (L113-3).
L114-1.1	ES&H review of 30% CDR			Dec-93	complete	
L114-1.2	ES&H review of 90% CDR			Mar-94	complete	
L114-1.3	ES&H review of 90% PDR		Sep-94	Jan-95	deleted	changed to reflect level of effort work
L114-2	Complete review of PSAR			Aug-94	complete	
L115-1	Submit Project Management Plan (Final)	X	Jan-95	May-95	complete	Delayed due to unavailability of DOE Project Plan.
L115-1.1	Project Management Plan (Draft)			Oct-93	complete	
L115-2	Select Project Engineers and Project Control Manager			Dec-93	complete	
L115-3	Submit FY94 Plan	X		Jan-94	complete	
L115-4	Initiate PTS and Monthly reporting			Jan-94	complete	
L115-5	Technology Selection and Implementation Plan	X		Feb-94	complete	
L115-6	Develop Design Basis Operations Plan			Mar-94	complete	
L115-7	Submit FY95 Plan	X	Sep-94	Dec-94	complete	delayed due to LLNL accounting changes and higher DOE priorities
L115-8	Technology Selection and Implementation Plan, Part II		Mar-95	Apr-95	complete	Document in TID for publication. Release expected in Apr-95.
L115-9	FY97 Project Validation			Apr-95	complete	
L115-10	Submit FY96 Plan	X		Oct-95	complete	
L115-11	FY98 Project Validation			Apr-96		
L115-12	Submit FY97 Plan	X		Oct-96		
L116-1	First meeting of NRP	X	Feb-95	Jun-95	complete	Delayed while key regulatory issues were resolved and the detail strategy for NEPA and CEQA finalized. Now scheduled for 6/20/95.
L116-1.1	National Review Panel (NRP) formed		Dec-94	Apr-95	complete	Activity delayed while key regulatory issues relative to MSO are resolved and the detail strategy for NEPA and CEQA finalized.

	L116-2	Second meeting of NRP		Aug-95	Aug-95	complete	Date affected by review of EA by DOE and State(Ca.).
	L116-2.1	Issue first public newsletter		Mar-95	Sep-95	complete	Date affected by review of EA by DOE and State(Ca.).
	L116-2.2	Receive comments from NRP			Apr-95	Deleted	Comments and action items will be received as part of NRP meeting minutes.
X	L116-3	NRP Meeting		Jan-96	Apr-96		Rescheduled due to delay in receiving KD-2.
X	L116-3.1	MWMF Letter		Feb-96	May-96		Rescheduled due to delay in receiving KD-2.
X	L116-4	NRP Meeting		Jun-96	Sep-96		Rescheduled due to delay in receiving KD-2.
X	L116-4.1	MWMF Letter		Jul-96	Oct-96		Rescheduled due to delay in receiving KD-2.
	L121-1	30% CDR Review			Dec-93	complete	
	L121-1.1	Initiate Point Design Reviews			Oct-93	complete	
	L121-1.2	Complete Point Design Reviews			Nov-93	complete	
	L121-2	90% CDR Review			Mar-94	complete	
	L121-3	CD Report issued	X		Apr-94	complete	
	L122-1	Issue MWMF Start-Up and Activation Plan		Sep-95	Feb-96		Delayed due to 4/95 budget cut.
	L131-1	Preliminary Design Review Completed	X	Sep-94	Nov-95	complete	Delayed due to reduced DOE funding.
	L131-2	Input to FY95 Plan (see 115-7)	X	Sep-94	Dec-94	complete	delayed due to LLNL accounting changes and higher DOE priorities
	L131-3	Submit MWMF Rebaseline (KD-1)	X		Sep-94	complete	
	L131-4	Submit MWMF Rebaseline (MWMF/DWTF Merge)	X	Mar-95	May-95	complete	Delayed due to FY97 field submittals and other higher priority work.
X	L131-5	Issue Project Baseline Rev. 2.0		Sep-95	Jan-96	on hold	On hold due to delay in receiving KD-2.
	L131-6	Final Design Review Complete	X		Oct-96		
	L132-1	Implement Cost planning/tracking systems (document)		Sep-94	Dec-94	complete	activity stretched-out due to reduced funding guidance
	L132-2	Implement Technical baseline control system		May-94	Nov-94	complete	see 132-7
	L132-3	Implement Schedule control/tracking system			Aug-94	complete	see 132-7
	L132-4	Input to FY95 Plan (see L115-7)		Nov-94	Dec-94	complete	delayed due to LLNL accounting changes and higher DOE priorities
	L132-5	Issue Configuration Control System Document		Jan-95	Mar-95	complete	Delayed to allow discussion and review and due to higher priorities.
	L132-6.1	Input to MWMF Project Management Plan (see L115-1)		Feb-95	Apr-95	complete	Delayed due to higher priority work.
	L132-7	Performance Management System documented		Apr-95	Aug-95	complete	Delayed due to requests for unplanned work from DOE.
	L132-8.1	Complete support of Project PDR		Jun-95	Nov-95	complete	Delayed due to reduced DOE funding.
	L132-9	Complete QA Self Assessment			Aug-95	complete	
	L132-9.1	Records Control Procedure issued			Apr-95	complete	
	L132-9.2	Assessment/Surveillance Procedure issued			Jul-95	complete	
	L132-10.1	Complete FY96 Budget Plan			Oct-95	complete	
X	L132-11.1	Complete Cost/Schedule Baseline Rev. 2.0			Jan-96	on hold	On hold due to delay in receiving KD-2.
	L132-12.1	Complete support of Project Final Design Review			Sep-96		
X	L132-13.1	Engineering Change Control Procedure			Jan-96	complete	
	L132-13.2	Non-conformance Reporting Procedure			Apr-96		
	L132-13.3	Complete QA Surveillance/Verification			Aug-96		
	L133-1.1	Draft System Engineering Management Plan			Sep-94	deleted	information in other documents
	L133-1.2	Issue MWMF development plan			Jul-94	complete	
	L133-1.3	Complete MWMF floor plan			Jul-94	complete	
	L133-1.4	Input to FY95 Plan (see 115-7)			Nov-94	complete	
	L133-2	Issue Integrated Operations Plan			Jan-95	complete	
	L133-3	Issue Title I System Design Requirements		Feb-95	Aug-95	complete	Delayed due to reduced DOE funding.
	L133-4	Issue Metrication Plan			Feb-95	complete	
	L133-5	Input to FY96 Plan (see 115-10)			Oct-95	complete	
	L133-6	Revised SDR completed for Title II Design	X		Nov-95	complete	Completion expected in Dec-95.
	L133-7	LLNL Review of Facility Title II Design Complete	X	Apr-96	Mar-96		To meet bldg. occupancy date Facility Title II Design must be shortened.
	L133-7.1	Facility Title II Design Review (80%)		Jan-96	Feb-96		To meet bldg. occupancy date Facility Title II Design must be shortened.
	L133-10.1	Identify emissions for air permit			Jun-95	complete	New marker
	L133-10.2	Review floorplan layout and personnel egress			Jul-95	complete	New marker
	L133-10.3	Review facility Process Flow Diagrams		Aug-95	Sep-95	complete	Delayed due to higher priority activities.

L133-10.4	Facility preliminary design (20%)		Aug-95	Sep-95	complete	Delayed due to higher priority activities.
L133-10.5	Facility Title I Design Review (80%)		Sep-95	Oct-95	complete	Review of drawings in progress. Completion expected in October.
L133-10.6	LLNL Review of Facility Title I Design			Nov-95	complete	
L141-1	RAS System Preliminary Design Review		Sep-94	Sep-95	complete	Delayed due to reduced DOE funding.
L141-1.1	Complete pilot characterization studies		Jun-94	Dec-94	complete	activity stretched-out due to reduced funding guidance
L141-1.2	Identify equipment and define floor plan		Sep-94	Mar-95	complete	activity stretched-out due to reduced funding guidance
L141-1.3	RAS LI&C System Functional Requirements Document complete		Jun-95	Sep-95	late	Delayed due to higher priority activities.
L141-1.4	RAS LI&C Preliminary Design Review		Jul-95	Sep-95	complete	Delayed due to reduced DOE funding.
L141-2	RAS 90% Final Design Review complete			Oct-96		
L141-2.1	RAS LI&C System Design Description drafted			Jun-96		
L141-2.2	RAS System Design Description drafted	X		Sep-96		
L142-1	SFP System Preliminary Design Review		Jul-95	Sep-95	complete	Delayed due to reduced DOE funding.
L142-1.1	SFP surrogate feeds defined			May-94	complete	
L142-1.2	Identify initial suite of characterization equipment		Jun-94	Jan-95	complete	Delayed due to later than scheduled completion of pilot characterization studies and reduced manpower and funding guidance received after original schedule was established.
L142-1.3	Complete validation of characterization, isolation, and segregation methods		Sep-94	Apr-95	complete	Delayed by late completion of pilot characterization studies, reduced manpower/funding guidance, rebaselining activities, and project delay of procurements of engineering development equipment.
L142-1.4	Complete preliminary operator control station design		Mar-95	Apr-95	complete	Delayed due to project rebaseline activities.
L142-1.5	Process Vision/Robline bilateral communication link demonstrated			Feb-95	complete	
L142-1.6	Process Vision/Robline bilateral message handling demonstrated			Mar-95	complete	
L142-1.7	SFP workcell control architecture designed			May-95	complete	
L142-1.8	SFP LI&C System Functional Requirements Document complete		Jun-95	Oct-95	late	Delayed due to higher priority activities.
L142-1.9	LI&C Preliminary Design Review		Jul-95	Sep-95	complete	Delayed due to reduced DOE funding.
L142-1.10	Locate user interface stations and required functionality		Aug-95	Sep-95	complete	Delayed due to higher priority activities.
L142-1.11	Draft FP control console layout		Aug-95	Sep-95	complete	Delayed due to higher priority activities.
L142-2	Telerobotics Preliminary Design Review			Sep-95	complete	New milestone.
L142-3	SFP 90% Final Design Review complete			Oct-96		
L142-3.1	SFP System Design Description drafted	X		Sep-96		
L142-3.2	SFP LI&C System Design Description drafted			Oct-96		
L1422-2	Telerobotics Sorting 90% Final Design Review complete	X		Sep-96		
L1422-2.1	Linear rail facility interface design complete			Dec-95	complete	
L1422-2.2	Prototype sorting application operational			Mar-96		
L1422-2.3	Operator console prototype complete			Apr-96		
L1422-2.4	Telerobot control interface design and performance specification complete			Aug-96		
L1425-2	Crane final design (specification) complete			Aug-96		
L143-1	LFP System Preliminary Design Review		Jul-95	Sep-95	complete	Delayed due to reduced DOE funding.
L143-1.1	Define surrogate feeds		May-94	Nov-94	complete	date changed to agree with extended project schedule
L143-1.2	LFP general arrangement plan finalized		Jul-94	Dec-94	deleted	
L143-1.3	Complete validation of characterization and segregation methods		Sep-94	Apr-95	deleted	Delayed by technical difficulties which have since been resolved.
L143-1.4	LI&C Functional Requirements Document complete		Jun-95	Sep-95	deleted	Transferred to L143-1.6 (Were redundant)
L143-1.5	LI&C Preliminary Design Review		Jul-95	Sep-95	complete	Delayed due to reduced DOE funding.
X L143-1.6	LFP LI&C System Functional Requirements Document complete			Oct-95	complete	Delayed due to higher priority activities.
L143-2	LFP 90% Final Design Review complete			Oct-96		
L143-2.1	LFP System Design Description drafted	X		Sep-96		
L143-2.2	LFP LI&C System Design Description drafted			Sep-96		
L151-1.1	Complete tests on turbo-aerator for nitrous acid conversion (document issued)		Mar-94	Jan-95	complete	Release of report delayed due to slower than expected review cycle.
L151-1.2	Initiate steady-state flow and chemistry balance tests			Apr-94	complete	

L151-1.3	Initiate instrumentation and control system tests for MEO			Aug-94	complete	
L151-1.4	Summarize silver recovery chemistry results to date (document)		Sep-94	Apr-95	complete	Release of report delayed because PI was involved with higher priority tasks. Task has been assigned to another engineer.
L151-1.5	Fabricate and set-up cellulose Feeder		Sep-94	Dec-94	complete	activity stretched-out due to reduced funding guidance
L151-1.6	Report on NaOH-AgCl recovery (document)		Feb-95	Apr-95	complete	Delayed to allow patent disclosure to be filed. Document is in review cycle with release expected in Apr-95.
L151-1.7	Computer simulation of the combined MEO and Acid Recovery control systems (document)		Feb-95	Mar-95	complete	Delayed due to higher priority tasks.
L151-1.8	Final Report on steady-state flow and chemistry balance tests (document issued)		Apr-95	Sep-95	complete	Document delayed while waiting for chemical analysis results.
L151-1.9	Demonstrate prototype cellulose feeder (document)			Jun-95	deleted	Deleted per Rebaseline 1.2 as cost savings measure.
L151-1.10	P&ID drawings (document)			Sep-95	complete	Incorporated into L151-3.
L151-1.11	Layout drawings of major equipment items (document)			Sep-95	complete	Incorporated into L151-3.
L151-1.12	LI&C Functional Requirements Document complete		Aug-95	Sep-95	complete	Delayed due to higher priority activities.
L151-1.13	LI&C Preliminary Design Review			Sep-95	deleted	Replaced by L151-3.
L151-2	MEO System Preliminary Design Review			Sep-95	deleted	Replaced by L151-3.
L151-2.1	Preliminary Process Flow Diagram for MEO			Jun-94	complete	
L151-2.2	Preliminary equipment layout for MEO			Sep-94	complete	
L151-3	MEO System Design Description (document)			Jul-95	complete	New milestone. Replaces L151-1.13 and L151-2.
L152-1	Complete MSO bench scale rubber destruction tests			Dec-93	complete	
L152-2	Select Industrial Participation method for Primary Unit			Jun-95	complete	
L152-2.1	MSO advertise in the CBD		Apr-94	Jun-94	complete	delayed due to funding limitations per DOE guidance
L152-2.2	Complete Design Specification		May-94	Jan-95	complete	delayed for incorporation of reviewer's comments
L152-2.3	Conduct Industrial Partner meeting		Jul-94	Jan-95	complete	Delayed due to funding limitations per DOE guidance and unavailability of participants due to holidays. Scheduled for January 5th.
L152-3	MSO System MWMF PDR	X	Jun-95	Oct-95	complete	Delayed due to reduced DOE funding.
L152-3.1	Preliminary Process Flow Diagram complete for MSO		Jun-94	Sep-94	complete	
L152-3.2	Initiate MSO Preliminary Design			Jul-94	complete	
L152-3.3	Initiate vessel material study			Oct-94	complete	
L152-3.4	Install development unit			Jun-95	complete	
L152-3.5	LI&C Functional Requirements Document complete		May-95	Oct-95	complete	Delayed due to reduced DOE funding.
L152-3.6	LI&C Preliminary Design Review complete		Jun-95	Oct-95	complete	Delayed due to reduced DOE funding.
L152-4	Start Development Activities			Aug-94	complete	
L152-5	MSO 90% Final Design Review complete	X		Sep-96		
L152-5.1	Select Industrial Participation method for Salt Recycle			Nov-95	complete	
L152-5.2	MSO Peer Review			Jul-96		
L153-1	Award WOX contract			Sep-94	deleted	WBS element deleted per DOE guidance
L153-1.1	Complete and document work to date			Jul-94	complete	
L153-1.2	Issue RFQ for WOX treatment unit w/ completed specification			Jun-94	deleted	WBS element deleted per DOE guidance
L153-2	30% Preliminary Design Review for WOX			Sep-94	deleted	WBS element deleted per DOE guidance
L153-2.1	WOX dispersion system test and design recommendation complete			May-94	deleted	WBS element deleted per DOE guidance
L153-2.2	Preliminary WOX treatability tests complete			Jun-94	deleted	WBS element deleted per DOE guidance
L153-2.3	Preliminary WOX Process Flow Diagram complete			Jun-94	deleted	WBS element deleted per DOE guidance
L153-2.4	Preliminary P&ID for WOX Support System complete			Jul-94	deleted	WBS element deleted per DOE guidance
L154-1	Complete and document UVP work to date			Jul-94	complete	
L154-2	UVP System Preliminary Design Review			Sep-94	deleted	WBS element deleted per DOE guidance
L154-2.1	UVP Process Flow Diagram			Jul-94	deleted	WBS element deleted per DOE guidance
L154-2.2	P&ID for UVP Support System			Jul-94	deleted	WBS element deleted per DOE guidance
L154-2.2	EOG preliminary Equipment Layout			Sep-94	deleted	WBS element deleted per DOE guidance
L154-2.3	UVP Equipment Layout			Aug-94	deleted	WBS element deleted per DOE guidance
L155-1	Summarize Gas Liquid Contactor Tests (document)		Jun-95	Aug-95	complete	Delayed due to testing difficulties. Corrections have been made.

L155-1.1	Fab prototype gas-liquid contactor for acidic urea NOx destruction		Jun-94	Jun-95	complete	Delayed due to DOE stretchout & peer review action item(s). Design/fabrication package currently out for bid.
L155-1.2	Complete XOG tests on urea and SCR DeNOx			Jul-94	deleted	break up into other markers
L155-2	Urea DeNOx: peer review			Aug-94	complete	
L155-2.1	Initiate instrumentation and control system test		Aug-94	Feb-95	deleted	Deleted from scope due to budget reductions. (1/95)
L155-3	XOG System Preliminary Design Review		Sep-94	Jun-95	deleted	Deleted from scope due to budget reductions. (1/95)
L155-3.1	Summarize NOx-urea chemistry to date (document)		Sep-95	Sep-95	complete	Delayed awaiting completion of Milestone L155-1. Work in progress.
L155-3.2	Initiate systematic catalysts testing			Jan-95	deleted	Deleted from scope due to budget reductions. (1/95)
L155-3.3	LI&C Functional Requirements Document complete			May-95	deleted	Deleted from scope due to budget reductions. (1/95)
L155-3.4	LI&C Preliminary Design Review			Jun-95	deleted	Deleted from scope due to budget reductions. (1/95) Title correction.
L161-1	Process Transport & Storage System Preliminary Design Review		Sep-94	Sep-95	complete	Delayed due to reduced DOE funding.
L161-1.1	Select standard transport container designs		Jun-94	Jul-95	complete	Delayed due to reduced DOE funding.
L161-1.2	Floor plan layout complete		Jul-94	Aug-95	complete	Delayed due to reduced DOE funding.
L161-1.3	LI&C Functional Requirements Document complete		Jun-95	Sep-95	late	Delayed due to higher priority activities.
L161-1.4	PTS LI&C System Preliminary Design review		Jul-95	Sep-95	complete	Delayed due to reduced DOE funding.
L161-2	PTS 90% Final Design Review complete	X		Sep-96		
L161-2.1	Final Design of transport interface complete		Feb-96	Mar-96		Forecast delay due to design effort being diverted to higher priorities.
L161-2.2	Final Design of batch make-up station complete			May-96		
L1615-2.3	LI&C prototype user interface approved			May-96		
L1615-2.4	LI&C System Design description complete			Jul-96		
L162-1	Complete preliminary floor plan layout			Jun-94	complete	
L162-1.1	Select ATS standard transport container designs			Jun-94	deleted	WBS content revised to "Analytical Lab"
L162-1.2	Finalize ATS transport handling capacity			Jun-94	deleted	WBS content revised to "Analytical Lab"
L162-1.3	Finalize ATS transport equipment selection			Aug-94	deleted	WBS content revised to "Analytical Lab"
L162-2	Define analysis tests based on process acceptance criteria		Sep-94	Oct-95	partial	Delayed due to reduced DOE funding. First issue expected in October.
L162-3	Define facility off-gas monitoring requirements		Sep-94	Feb-95	complete	Completed for preliminary design.
L162-4	Define MEO on-line analysis requirements		Dec-94	Feb-95	complete	Completed for preliminary design.
L162-5	Define MSO on-line analysis requirements		Jan-95	Mar-95	complete	Waiting for salt analysis to be defined. Completion expected in Mar-95.
L162-6	Define DWTF analysis requirements			Feb-95	complete	Completed for preliminary design.
L162-7	Analytical Lab System Preliminary Design review		Aug-95	Sep-95	complete	Rescheduled to Oct. 12, 1995, due to programmatic conflicts.
L162-7.1	LI&C Functional Requirements Document complete		Jul-95	Aug-95	complete	Delayed while document is in review cycle.
L162-7.2	LI&C Preliminary Design Review		Aug-95	Sep-95	complete	Rescheduled to Oct. 12, 1995, due to programmatic conflicts.
L162-8	LAB 90% Final Design Review complete	X		Sep-96		
L162-8.1	Define MSO on- and at-line measurement methods			Mar-96		
L162-8.2	Define offgas analysis requirements			May-96		
L162-8.3	Select vendor for offgas system procurement			Jul-96		
L162-8.4	Select vendors for tritium and gas proportional counter procurements			Aug-96		
L162-8.5	Complete custom test and sample tracking database design			Sep-96		
L163-1	Water Treatment trade-off study		Jun-94	Sep-94	complete	
L163-1.1	Water Treatment trade-off study revision		Dec-94	Feb-95	complete	Delayed due to previously unplanned decision to have TID edit document. Presently out for signatures. Release expected in Feb 95.
L163-2	Memorandum of Understanding with HWM			Jan-95	complete	
L163-3	WTR System Preliminary Design Review		Jul-95	Oct-95	complete	Delayed due to reduced DOE funding.
L163-3.1	LI&C Functional Requirements Document complete		Jun-95	Oct-95	complete	Delayed due to reduced DOE funding.
L163-3.2	LI&C Preliminary Design Review		Jul-95	Oct-95	complete	Delayed due to reduced DOE funding.
L163-4	Begin Final Design		Jul-95	Nov-95	late	Delayed due to reduced DOE funding. KD-2 delayed until Dec-95.
L163-5	WTR 90% Final Design Review complete	X		Sep-96		
L163-5.1	WTR Unit Operation Subsystems Final Design complete			Aug-96		
L164-1	Evaluations of immobilization technologies complete		May-95	Jun-95	complete	Delayed pending decision on most cost effective technology for the project.

	L164-1.1	Preliminary process flow diagram complete for FF			Jul-94	complete	
	L164-1.2	Preliminary equipment layout complete for FF			Aug-94	complete	
	L164-1.3	Report status of immobilization evaluations		Sep-94	May-95	complete	Delayed until after peer review of polymer microencapsulation. Peer Review activities finalized on 4/24/95. Report expected in May 95.
	L164-2	Final Forms System Preliminary Design Review		Jun-95	Aug-95	complete	Delayed due to reduced DOE funding.
	L164-2.1	Final Forms subsystem design status peer review		Feb-95	May-95	complete	Peer Review activities finalized on 4/24/95. Report to be completed in May 95.
	L164-2.2	LI&C Functional Requirements Document complete		May-95	Sep-95	complete	Document in review cycle.
	L164-2.3	LI&C Preliminary Design Review		Jun-95	Aug-95	complete	Delayed due to reduced DOE funding.
	L164-3	Report: Design of polymer microencapsulation system		Jun-95	Oct-95	late	Delayed due to reduced DOE funding. To be rescheduled.
	L164-4.1	Report: Volatile residue components and the design of ceramic waste form system		Jul-95	Oct-95	complete	Delayed due to higher priority activities.
X	L164-4.2	Report: Interim status of ceramic waste form compositions and process parameters		Aug-95	Jan-96	late	Delayed due to higher priority activities. Completion expected Feb-96.
	L164-5	Rotary calciner operational	X		Sep-96		
	L164-5.1	Rotary calciner design procurement complete			Jun-96		
	L164-6	FFM 90% Final Design Review complete			Jan-97		
	L164-6.1	Final Design of sulfur-polymer cement system complete			Aug-96		
	L164-6.2	Final Design of ceramic recipe-writer complete			Sep-96		
	L164-6.3	Final Design of local process off-gas system complete			Jun-96		
	L165-1	SI&C System Preliminary Design Review		May-95	Jun-95	complete	Delayed due to scheduling conflicts.
	L165-1.1	I/C general arrangement plan complete			Mar-94	complete	
	L165-1.2	Process Control System FEP hardware/software selected			Apr-94	complete	
	L165-1.3	Supervisory Control System hardware/software selected			Apr-94	complete	
	L165-1.4	Handling Systems open architecture controller selected			Jul-94	deleted	to WBS 1.4.2
	L165-1.5	Analytical laboratory LIMS selected			Jul-94	deleted	LIMS may not be used in system design
	L165-1.6	Telerobotics platform selected			Aug-94	deleted	to WBS 1.4.2
	L165-1.7	Teleoperator controller selected			Sep-94	deleted	to WBS 1.4.2
	L165-1.8	Database Management System hardware/software selected			Jul-94	complete	
	L165-1.9	Engineering Development System operational		Dec-94	Jan-95	complete	Delayed because of late delivery of MinnovEX DBMS software driver.
	L165-1.10	Rapid prototype Engineering Development testing complete and report written		Jan-95	Feb-95	complete	Delayed because of late delivery of MinnovEX DBMS software driver. See Jan 95 WMMF Monthly Report.
	L165-1.11	Integrated control system design peer review		Feb-95	Mar-95	complete	Completion expected in early Mar 95. Key participants are unavailable in February.
	L165-1.12	SI&C Functional Requirements Document complete		Apr-95	Oct-95	complete	Delayed due to higher priority work on Local I&C.
	L165-1.13	Engineering Development tasks complete and documented		Jun-95	Oct-95	late	Delayed due to higher priority work on Local I&C.
	L165-1.14	Preliminary Design activities complete, documented		Jun-95	Sep-95	complete	Delayed due to reduced DOE funding.
	L165-2	SI&C 90% Final Design Review complete			Oct-96		
	L165-2.1	Instrumentation and Equipment Database operational		Mar-95	Apr-95	complete	Delayed pending I&C design team review scheduled for 4/7/95.
	L165-2.2	Process I&C Standards established			Sep-95	complete	
X	L165-2.3	Container Tracking and Material Accounting requirements document approved	X		Nov-95	complete	Completion expected in Dec-95.
	L165-2.4	Facility Monitoring and Safety Control System task analysis complete / documented			Feb-96		
	L165-2.5	Instrumentation and Equipment Database complete			Mar-96		
	L165-2.6	Final Design Process I&C Standards complete	X		Apr-96		
	L165-2.7	Control Room and Equipment Room design complete			May-96		
	L165-2.8	Supervisory Control System SDD drafted	X		Jun-96		
	end						