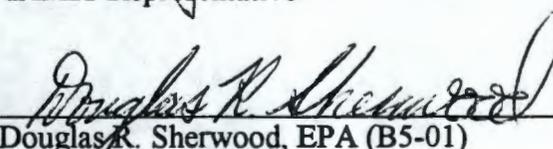
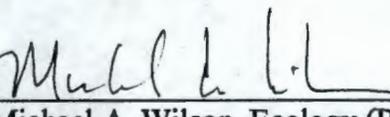


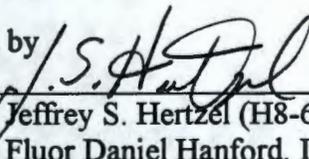
**Meeting Minutes Transmittal/Approval  
Tri-Party Agreement Milestone Review Meeting  
EPA Conference Room  
March 23, 1999**

0073096

Appvl.:  Date: 5/7/99  
Peter M. Knollmeyer, RL (A5-11)  
IAMIT Representative

Appvl.:  Date: 4/27/99  
Douglas R. Sherwood, EPA (B5-01)  
IAMIT Representative

Appvl.:  Date: 4/27/99  
Michael A. Wilson, Ecology (B5-18)  
IAMIT Representative

Prepared by  Date: 4-27-99  
Appvl.: Jeffrey S. Hertz (H8-67)  
Fluor Daniel Hanford, Inc.

**Distribution**

Alexander, S.	Ecology	B5-18	Mishko, A. G.	FDH	H6-06
Augustenborg, J.	RL	S7-41	Morrison, R. D.	FDH	H8-67
Bilson, H. E.	RL	R3-81	Murphy-Fitch, E. J.	FDH	H8-67
Black, D. G.	WMH	H6-20	R. E. Piippo	FDH	A5-15
Blazek, M. L.	ODOE	OR	Rasmussen, J. E.	RL	A5-15
Bowers, E. M.	RL	S7-55	Richards, J.	CTUIR	
Cruz, R. O.	NezPerce		Rodriguez, H. M.	RL	A5-15*
Cusack, L.	Ecology	B5-18*	Ruud, L.	Ecology	B5-18
Einan, D. R.	EPA	B5-01	Sanders, G. H.	RL	A5-15*
Gadbois, L.	EPA	B5-01	Sellers, E. D.	RL	S7-41*
Hertz, J.	FDH	H8-67	Sherwood, A. R.	WMH	H6-06
Holt, R. G.	RL	S7-41	Sherwood, D. R.	EPA	B5-01*
Holland, D.	Ecology	B5-18	Sonnichsen, J. C.	WMH	H6-26
Huston, D.	ODOE	OR	Stone, A.	Ecology	B5-18
Iwatate, D. F.	FDH	A5-15	Wilson, M. A.	Ecology	B5-18*
Jaraysi, M.	Ecology	B5-18	Williams, N. H.	FDH	R3-11
Jarvis, M. F.	RL	A5-15	Yerxa, J. K.	RL	A5-15
Jim, R.	YIN		EDMC		H6-08
Knollmeyer, P.	RL	A5-11*			
Mattlin, E. M.	RL	A5-15			
McDonald, K.	WMH	H6-06			

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**EDMC**

\* W/Attachments

MSREV3.23.99

Tri-Party Agreement Milestone Review  
EPA Conference Room, 712 Swift Boulevard, Richland, Washington  
March 23, 1999

Spent Nuclear Fuel (M-34-00)

The status of the Spent Nuclear Fuel (SNF) Project was discussed. RL and the PHMC discussed the potential issue and subsequent impact to the cask loadout system (CLS). The Project is still on track for the start of fuel removal in November 2000.

Land Disposal Restrictions Annual Report (M-26-01)

The Land Disposal Restrictions Annual Report is on schedule for transmittal by April 30, 1999. Ecology was expressed concern on two items:

1. Whether the M-26 document is a "plan" or a "report" needs to be addressed. "Requirements for Hanford LDR Plan" (aka "white paper") approved in 1990 under M-26-01 was developed before there was any experience in applying/dealing with the LDR. The LDR now needs to be updated to reflect actual experience and knowledge.
2. Should the document be considered as a "primary document," as required by M-26-01.

A meeting will be held between RL and Ecology to revisit the white paper (action: Liz Bowers). A meeting also will be held between RL/Ecology and EPA on whether or not this update should be identified as a primary document (action: Mary Jarvis).

Tritium Treatment Evaluation (M-26-05F)

The IAMIT Milestone Review Form (for milestones without issues or significant activity) was signed by all three parties prior to the meeting.

Mixed Waste Treatment (M-19-00) and Acquisition of Facilities to TSD TRU/TRUM, LLMW and GTC3 (M-91-00)

To date, there has been 346 cubic meters of waste (milestone calls for 246 cubic meters by September 2000) that has been treated (no mixed waste was disposed).

The M-91-4 and M-91-07 workscope (Project W-113 for Post 1970 CH TRU/TRUM Retrieval) will not be completed. A plan on what, when and the dollars required will be completed in June 1999. The Tri-Parties will need to revisit the M-19 milestones and show how they will comply with the M-91 milestones.

Waste Tanks/Corrective Action (Non-TWRS Milestones) (M-32-00)

Two reports were prepared – the Integrity Assessment Report (work defined in the report needs to be done prior to closing out M-32-00) and the Transfer Facility Compliance Plan. Action was given to Ecology, RL and the PHMC to determine what the milestone is, how it will be tracked, and the strategy for achieving completion of this workscope. In addition, resolution needs to be achieved between Ecology and RL on what constitutes completion criteria for M-32-00 milestones. All active operations of the 221-T (T-Plant Canyon) tank system will cease June 30, 1999. Discussions concerning the closure of 221-T are underway between Ecology and RL.

**NOTE: NEXT TRI-PARTY AGREEMENT MILESTONE REVIEW MEETING IS SCHEDULED FOR TUESDAY, APRIL 27, 1999.**

**Milestones to be reviewed: TWRS Program Review – M-40, 41, 43, 44, 45, 46; M-50, 51; and M-60, 61 and 90.**

**Mike Wilson, Chairperson**

**AGENDA**  
**TRI-PARTY AGREEMENT MAJOR MILESTONE MANAGEMENT REVIEW**  
**CHAIRPERSON: P. M. Knollmeyer**

**TUESDAY, February 23, 1999**

**712 Swift Blvd., Suite 5, EPA Conference Room**

<u>TIME</u>	<u>MILESTONE</u>	<u>TITLE</u>	<u>RL DIVISION DIRECTOR</u>	<u>CONT. MGR</u>	<u>PRESENTER</u>
9:00 am	M-13-00	Complete RI/FS Submittals	R. A. Holten	J. L. Walsh	M. C. Hughes
	M-15-00	RI/FS Process Completion	R. A. Holten	J. L. Walsh	M. C. Hughes
	M-16-00	Complete Remedial Actions	R. A. Holten	J. L. Walsh	M. C. Hughes
	M-24-00	RCRA Well Installation	R. A. Holten	J. L. Walsh	M. C. Hughes
	M-93-00	Disposition of Surplus Reactors	R. A. Holten	J. L. Walsh	M. C. Hughes
10:30 am	M-81-00	FFTF	O. A. Farabee	D. B. Klos	O. A. Farabee
	M-82-00	B-Plant Transition	L. D. Romine	L. J. Olguin	D. T. Evans
	M-89-00	324 Bldg. Closure of MW Units	L. D. Romine	L. J. Olguin	D. W. Templeton
	M-92-00	Facilities for Cesium/Strontium, Sodium and Special Case Waste	L. D. Romine	L. J. Olguin	L. D. Romine
	M-83-00	Plutonium Finishing Plant	L. D. Romine	L. J. Olguin	W. D. Seaborg

# **Hanford Spent Nuclear Fuel Project**

## ***Tri-Party Agreement M-34 Milestone Review***



**Larry Gadbois,**  
***U.S. Environmental  
Protection Agency***

**Beth Sellers,**  
***U.S. Department of Energy,  
Richland Operations***

***March 23, 1999***

## ***Significant Accomplishments***

- **Submitted the SNF Project FSAR and CSB Annex**
- **Completed all moist inert TGA runs with irradiated N-fuel**
- **Received Fuel Retrieval System (FRS) table supports and initiated installation**
- **Completed third fuel shipment from 327 Building**
- **Initiated Potable Water System operation**
- **Cold Vacuum Drying Facility progress**
  - *Completed placement of all process equipment procurement contracts*
- **Canister Storage Building progress**
  - *Completed placement of approximately 160 tube assemblies*
  - *Energized MHM and initiated testing*



## ***Upcoming Activities***

- Complete fabrication and delivery of three test MCOs (March 1999)
- Complete MHM Turnover to Startup (March 1999)
- Submittal of 100K SAR annual update (April 1999)
- Complete 327 Building fuel removal (May 1999)
- Submit Debris report to Ecology and EPA (May 1999)
- Begin Facilities Evaluation Board (FEB) Audit (May 1999)
- Complete CSB production tube installation (May 1999)
- Submittal of CVD FSAR (May 1999)
- DOE Approval of CSB FSAR (May 1999)
- Complete KW IWTS construction and installation (June 1999)
- EPA approval of Remedial Action Design Report (June 1999)
- DOE Approve MCO Topical Report (June 1999)
- Complete KW FRS construction and installation (July 1999)
- Complete CVD First 2 bays construction acceptance test (July 1999)
- DOE approval of 100K SAR annual update (July 1999)



Hanford Spent Nuclear Fuel Project

# SNF Project Cost Summary

Fiscal Year	Total SNF Project Forecast	Deactivation Baseline	Total Baseline
FY95	86,900		86,900
FY96	126,931		126,931
FY97	158,306		158,306
FY98	160,866		160,866
FY99	192,055		192,055
FY00	190,955		190,955
FY01	191,337		191,337
FY02	194,404	770	195,174
FY03	149,086	3,595	152,681
FY04	77,850	27,729	105,579
FY05	46,783	39,231	86,014
FY06	10,704	36,253	46,957
FY07		25,935	25,935
Total	1,586,175	133,513	1,719,688



## ***Opportunities to “Beat the Baseline” -- Update***

### **Opportunities**

- **Contract management**
  - Potential claims mitigation\*
  - Contract Incentives\*
    - *In place for CVD equipment*
- **Evaluation of alternative disposal paths and/or process simplification**
  - Sludge\*
    - *Evaluating expanded alternatives*
  - Debris\*
- **Future evaluation of K Basin Deactivation**
  - *Initiating end-point criteria development*
- **Future evaluation of fuel movement operations**

\* *Currently being managed.*



## ***Opportunities to “Beat the Baseline” -- Update (Continued)***

### **Opportunities (Continued)**

- **Process equipment throughput reviews**
  - **CVD Bays\***
    - *Reduced to 3 bays*
  - **Sample/weld stations\***
- **Equipment fabrication efficiencies**
  - **MCOs/baskets\***
    - *MCOs out for bids*
- **KE Basin fuel movement**

*\* Currently being managed.*



## **Opportunities to “Beat the Baseline” Update (Continued)**

### **Risk Mitigation Items (Identified in Analysis)**

- **Drain valves\***
  - *Pipe grouting nearly complete*
- **Oxygen gettering\***
  - *Issue closed*
- **MCO Fabrication\***
  - *RFP out 3/1/99*
- **Post fuel movement rampdown**
- **Vault cooling**
- **IWTS settler tank sludge**
  - *Being resolved*

*\* Currently being managed.*



## ***Opportunities to “Beat the Baseline” Update (Continued)***

### **Risk Mitigation Items (Identified in Analysis) (Continued)**

- **TGA results\***
  - *Issue being closed*
- **Basket fabrication**
- **Number of MCOs**
  - *Initiated 10/1/98*
- **MCO Monitoring\***
  - *BCR approved; design concepts being developed*
- **Safety basis\***
  - *Process to expedite completion in place*
- **Sludge processing space**
  - *Unfavorable evaluation / taking second look*

\* *Currently being managed.*



## ***SNF Project Issues/Concerns***

- **Cask Drop Analysis**
- **FSAR approval**



## ***CLS Issue***

- **Review of the cask drop analysis for the cask loadout system (CLS) identified non-conservative leakage estimates;**
  - *Damage at wall/floor corners can be extensive*
  - *Such damage can result in leak rates beyond acceptable limit*
  - *May impact milestone M34-014a (9/30/99)*



## Key Events

<u>Date</u>	<u>Event</u>
6/97	Cask Drop / Leak Rate Analyses Released Showing Acceptable Leak Rates.
8/97	Soil Permeability USQ Requires Initiation of New Cask/IP Drop Analyses.
1/98	Revise Cask Drop Analyses released.
10/98	CLS SAD Submittal to DOE-RL.
2/99	Independent Review of Revised Drop Analyses Identifies Assumption Deficiencies.



## Options Overview

<i>Option</i>	<i>Schedule Risk</i>	<i>Cost Risk</i>	<i>Confidence in Success</i>	<i>Drop Event Env. Risk</i>	<i>Drop Event Safety Risk</i>
Review analyses for technical correctness and for other energy absorption opportunities. - Opportunities may lead to further analyses	Medium	Medium	Medium	Low	Low
If probability analysis shows that the event is unlikely, stage grout, bentonite following cask drop - Leak mitigation.	Low	Low	High	High	High
Design impact limiter to absorb energy from cask drop – Cask drop mitigation – Design follows analysis finalization – Redesign of other CLS equipment may be required	High	Medium	Low	Low	Low
Redesign IPSS/IP to absorb energy from cask drop (options include water brake, shear pins/plates, hydraulic platform etc.)- Cask drop mitigation – Redesign follows analysis finalization	High	High	High	Low	Low
Review probability of cask drop	Low	Low	Low	Medium	Medium
Review validity of soil permeability data.	Low	Low	Low	High	High



## ***SNF Project Reviews Completed***

- **MCO applicability for Yucca Mountain**
- **Contract incentive review**
- **SNF criticality review of code application**

### ***Upcoming Review***

- **SFD Baseline Assessment**



## ***MCO Disposition Team Charter***

- **The MCO Disposition Team was chartered by EM-60 to review the transportation and disposal aspects of the MCOs as currently designed including the technical analysis on the methods to complete a criticality analysis, a review of options necessary for NRC involvement and an examinations of the procurement strategy for the MCOs. Results of the Team's review were provided to EM-60, EM-70, and EM-1/RW-1**



## ***MCO Disposition Team Findings***

- **The review did not identify any issues that must be resolved in order to proceed with the procurement of the MCO external shell**
- **Several design modifications and more detailed analyses by Hanford have resolved many issues identified in previous reviews**
- **Two issues were identified that needs further investigation to increase the likelihood that the MCO, baskets and fuel are transportable and disposable**
  - ***Use of structural components to preclude criticality***
  - ***Mitigation of thermal aspects due to reactive nature of uranium metal fuel and its corrosion products***



## ***MCO Disposition Team Recommendations***

- **Complete the structural analysis for the basket center tube for deflection or yielding**
  - ***Responsibility: DOE-RL***
- **Review the criticality issues of the baskets including the review of the structural analysis and evaluating the addition of poisons**
  - ***Responsibility: NSNFP***
- **Complete the analysis of the effects of chemical reactivity of the fuel for transportation and disposal**
  - ***Responsibility: NSNFP***



## **MCO Disposition Team Recommendations** **(Continued)**

- **Confirm that the design and fabrication of the MCO and baskets that are performed under ASME, Section III will meet the RW QARD**
  - *Responsibility: NSNFP*
- **Initiate a dialog with the NRC beginning with an Appendix 7 meeting and culminating in a submittal of formal documentation to determine acceptability of administrative controls for fuel loading in the MCO and acceptance of the MCO and cask transportation system**
  - *Responsibility: NSNFP/NTP*



## ***SNF Contract Review***

- **SNF Congressional Hearing commitment to evaluate use of incentives on the SNF Project**
- **HQ's team visited site in February (1 week) and March (1 week)**
- **Focused on:**
  - ⇒ ***SNF subproject contract structure***
    - ***Performance Agreements and relationship to baseline***
    - ***Four subprojects***
    - ***ENCO's structure and workscope***
- **Draft report to be issued in late March; final report by the end of April**



## **SNF Project Criticality Review**

- **EH led Criticality Review Team Hanford Visit 3/9-11/99**
  - *Follow-up to PFP 3/98 Criticality Review*
- **K Basin Sludge Transfer – Criticality Experiments**
  - *Potential program benefit (short and/or long term savings, due to less iron addition required) from thermal iron benchmark experiments*
  - *No impact on site - use of 97-2 funding*
  - *Amount of savings will depend upon timing of experiments*
- **K Basins Criticality Safety Program Review (Jerry McKamy, Tom Hull) - positive impression overall**
  - *Pros – Criticality Safety Engineers (CSE's) Strong, Implementation of PFP Related Program Improvements awaiting Hanford PRO input*
  - *Cons – Conduct of Ops Problems – 5 infractions involving inadvertent fuel/rack movements*



## ***SNF Baseline Mid-Year Review Assessment***

- **RL-SFD to conduct detailed assessment of baseline management process put in place October 4, 1999**
- **Estimated to begin in mid-April and be complete in mid-May**
- **Evaluate:**
  - ***Drivers for baseline change request***
  - ***BOE updates***
    - ***BCR process***
    - ***Training***
    - ***Contingency usage***
    - ***Schedule***



## ***Permitting and Regulatory Issues***

- **None**



## ***Non-TPA Issues with Potential to Impact TPA Milestones***

- **None**







<p style="text-align: center;"><b>LAND DISPOSAL RESTRICTIONS ANNUAL REPORT</b></p> <p style="text-align: center;">M-26-01</p> <p style="text-align: center;">WASTE PROGRAMS DIVISION E. M. Bowers March 23, 1999</p>	<p><u>Milestone Description</u></p> <ul style="list-style-type: none"> <li>• M-26-01 Submit an annual Hanford Site LDR Report in accordance with the LDR Plan to cover the period from April 1 through March 31.</li> <li>• Deliverables Submit the "1999 Hanford Site Land Disposal Restrictions for Mixed Waste" to EPA and Ecology (M-26-01I).</li> <li>• Schedule Report submitted annually by April 30.</li> </ul>
<p><u>RL Program Manager's Assessment of Contractor Performance</u></p> <ul style="list-style-type: none"> <li>• Satisfactory performance, on schedule.</li> </ul> <p><u>Accomplishments/Activities</u></p> <ul style="list-style-type: none"> <li>• Completed draft report. Currently in RL review.</li> </ul> <p><u>Milestone Assessment - schedule and technical</u></p> <ul style="list-style-type: none"> <li>• On schedule.</li> </ul>	<p><u>Planned Actions</u></p> <ul style="list-style-type: none"> <li>• Continue with 1999 report preparation process. Transmit to Ecology and EPA in April 1999.</li> <li>• Work to resolve Ecology concerns on report. See attached sheet.</li> </ul> <p><u>Non-TPA Regulatory Issues. Potential Impacts on TPA</u></p> <ul style="list-style-type: none"> <li>• None.</li> </ul>
<p><u>Budget</u></p> <p>Budget data is not available for FY 1999 because the budget for this report has been combined with several other environmental reports. The report is considered within the expected cost range with no unexpected costs to date. (Annual budget in the past has been around \$100K).</p>	<p><u>Major Changes to 1999 Report</u></p> <ul style="list-style-type: none"> <li>• Includes comparison of 1998 generation projections to actual 1998 generation.</li> <li>• Adds more specific waste minimization information for some streams.</li> <li>• Includes additional waste stream tracking information (WSRd numbers) for CWC streams.</li> <li>• New stream for Cs/Sr capsules stored at WESF.</li> </ul>

The items below will apparently be a part of upcoming enforcement response from Ecology and were discussed as part of the LDR inspection closeout meeting on February 25th. They are provided here for information and discussion.

- 1) Not all mixed wastes stored at Hanford were reported in the 1998 LDR Report. Section 1.a. of the Hanford LDR Plan requires USDOE to accurately identify and describe, by quantity and physical location, the mixed waste stored at Hanford.
- 2) The compliance status of storage methods was not adequately assessed. The FEB was identified as the means to satisfy this LDR Plan requirement for 1998; however, the FEB has not included an assessment of safe storage methods of tank systems holding mixed waste for at least three facilities assessed in the 1997-1997 timeframe (DSTs, B Plant/WESF, 222-S Lab).
- 3) Milestones or schedules were not provided in the 1998 LDR Report for developing and implementing treatment technologies for each LDR waste; specifically, USDOE's submittal regarding SST and DST waste treatment was not adequate.
- 4) Problems continue with accurately meeting LDR testing, tracking, and recordkeeping requirements.
- 5) The schedule provided with the 1998 LDR Report for characterizing waste was not considered by USDOE to be a committed schedule despite being presented by USDOE in a TPA-driven document. Section 3 of the LDR Plan requires the LDR Report to include a comprehensive Waste Characterization Plan, that includes a plan and schedule to characterize all waste stored at Hanford.
- 6) Milestone M-26-01 requires that the annual LDR report be submitted as a primary document, However, neither USDOE nor Ecology is managing it as a primary document per Section 9 of the TPA. Ecology and USDOE need to discuss the steps necessary to ensure the 1999 LDR Report is managed by both parties as a primary document.

**Hanford Federal Facility Agreement and Consent Order  
IAMIT Milestone Review Form  
(For Milestones Without Issues or Significant Activity)**

M-26-05 **Summary**  
F

Date: 3/15/99

**1. Significant Activities Last Three Months**

As requested by Waste Management Federal Services of Hanford, Inc. a task plan for the preparation of a 1999 status report on the evaluation of technologies for the removal and mitigation of tritium in Hanford Site wastewaters was prepared by COGEMA Engineering Corporation. A copy of the task plan is attached. COGEMA Engineering is currently conducting a literature review, consulting with national and international experts on tritium technologies, and preparing a summary update report.

New developments in tritium containment and separation concepts identified to date include: 1) a groundwater pump and recycle operation implemented at Brookhaven National Laboratory in 1997, 2) a ground freezing demonstration at Oak Ridge National Laboratory implemented in 1997, 3) improvements in the combined electrolysis catalytic exchange process, 4) a bithermal - hydrogen exchange process using a wetproof catalyst, and 4) an ion exchange process recently developed and being demonstrated for effective tritium removal from water.

**2. Budget Status (within budget or explain variance)**

Tritium evaluation study is within budget.

**3. Issues**

There are no significant issues associated with the tritium technology evaluation.

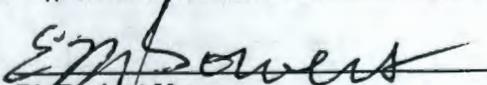
**4. Non-TPA Regulatory Issues with Potential Impact to TPA Milestone**

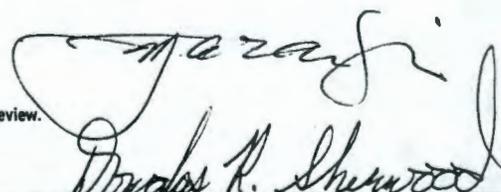
None.

**5. Significant Activities Planned Next Three Months**

A baseline schedule is contained in the attached task description.

Note: Approved form to be submitted to IAMIT members 7 days prior to scheduled Milestone Review.

  
RL Project Manager

  
Ecology/EPA Project Manager

# COGEMA ENGINEERING CORPORATION

## TASK PLAN

### OBJECTIVES:

Conduct a review and prepare a biennial summary update report on the evaluation of tritium removal and mitigation technologies for treatment of Hanford Site wastewaters. This report is required for the Department of Energy (DOE) Hanford site and is in support of the Tri-Party Agreement Milestone M-26-05F (Evaluation of Treatment Technology). The review includes a literature search and collaboration with national and international experts in the field of tritium separation and its removal from wastewaters.

### BACKGROUND:

Tritium has been generated as a by-product in reactor fuel at the Hanford Site by the U. S. defense program nuclear reactor operations from 1944 to 1989. The bulk of this tritium was released to the ground from the fuel separations facilities on the 200 Area plateau in the form of tritiated water in process condensates. Tritium releases to the ground have greatly decreased since the last fuel was processed through the fuel separations plant in 1989. Tritium in these liquid effluents has migrated in the groundwater toward the Columbia River. Tritium decays at a 12.3 year half-life and it is estimated that the tritium inventory from processed fuel has decayed to about  $2.0 \times 10^3$  curies at the present time.

Significant tritium inventories exist in Hanford Site facilities, such as the underground storage tanks and the KE, KW, and N fuel storage basins. Since 1995 a state-approved land disposal site (SALDS) receives condensates from the Hanford Site Effluent Treatment Facility (ETF), which is free of all contaminants except tritium. The tritium comes from processing wastes from single-shell and double-shell underground storage tanks and other miscellaneous wastes. Wastewaters from KE, KW, and N fuel storage basins are expected to be processed through the ETF with their tritium contents being discharged to SALDS.

SALDS is the prescribed location because it has been determined by groundwater sample results evaluation and groundwater flow modeling to allow sufficient decay of the tritium prior to migration to the Columbia River. A minimum 80-year decay time is expected prior to migration to the river.

Tritium separation and isolation technologies to control Hanford Site liquid effluents and groundwaters to meet the Code of Federal Regulations (CFR), 40 CFR 141.14 drinking water maximum contaminant level MCL of 20,000 pCi/L (~2 ppQD) and/or DOE Order 5400.5 as low as reasonably achievable (ALARA) are reviewed on a biennial basis to support evaluations of implementation feasibility. Status of technology reviews have been documented in reports DOE/RL-95-68 and DOE/RL-97-54, Rev. 0.

### PROPOSED DOCUMENT OUTLINE:

TITLE: 1999 EVALUATION OF TRITIUM REMOVAL AND MITIGATION TECHNOLOGIES FOR HANFORD SITE WASTEWATERS

#### ABSTRACT

- 1.0 INTRODUCTION
- 2.0 REMOVAL AND MITIGATION TECHNOLOGIES FOR TRITIUM IN WASTEWATERS
  - 2.1 Group One Removal Technologies
    - 2.1.1 Water Distillation
    - 2.1.2 Hydrogen Isotope Distillation
    - 2.1.3 Water Electrolysis

- 2.1.4 Combined Electrolysis Catalytic Exchange (CECE)
- 2.2 Group Two Removal Technologies
  - 2.2.1 Liquid Phase Catalytic Exchange with Solid Oxide Electrolyte
  - 2.2.2 Liquid Phase Catalytic Exchange with Hot Elly
  - 2.2.3 Membrane Mediated Separation
  - 2.2.4 Laser-Induced Tritium Separation
  - 2.2.5 Polyamide Exchange
  - 2.2.6 Metal Hydride Exchange
- 3.0 SUMMARY
- 4.0 REFERENCES

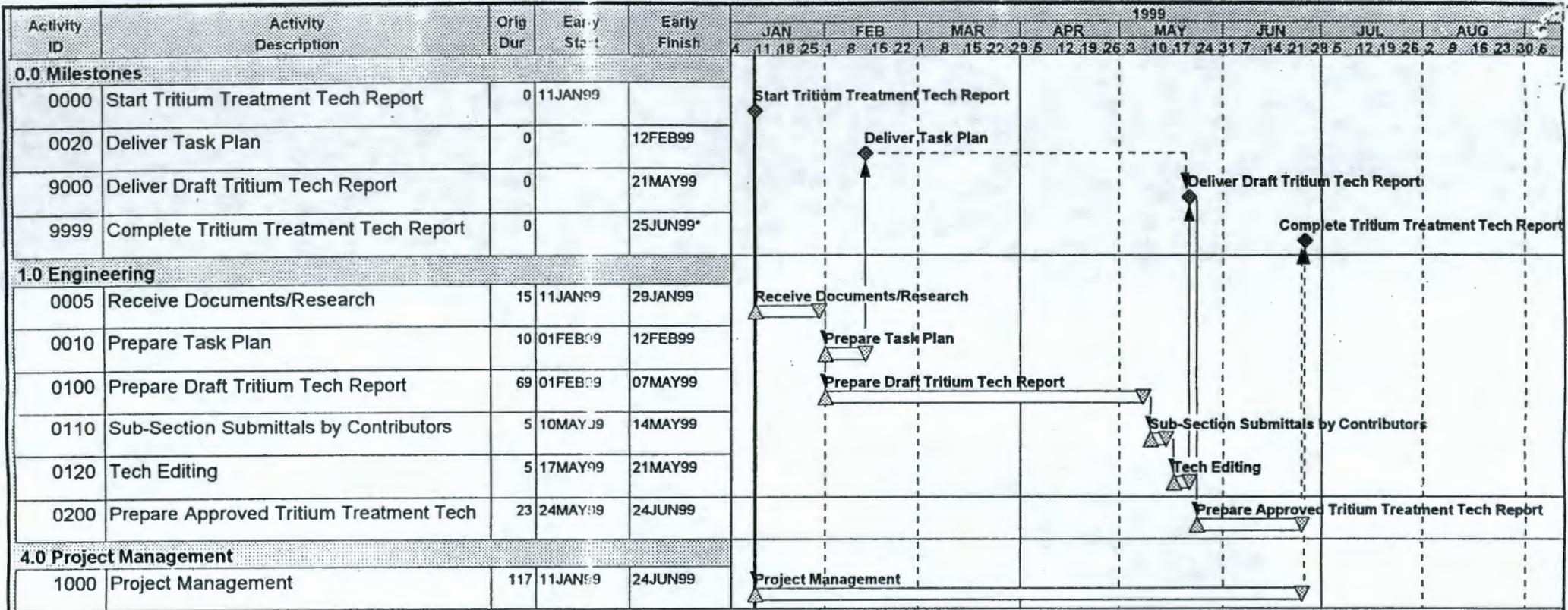
**TASK CRITERIA:**

Identify and describe any new technologies or improvements of previously reported technologies for removal or mitigation of tritium in wastewaters. The baseline report is the *1997 Evaluation of Tritium Removal and Mitigation Technologies for Hanford Site Wastewaters*, DOE/RL-97-54 Rev. 0.

**PRELIMINARY TREATMENT ALTERNATIVES IDENTIFIED FOR INCLUSION:**

The treatment methods listed below are anticipated (based upon literature search information to date) to be updated for the 1999 report based upon additional information that became available in the last two years. Additional processes may be identified as the search continues and as additional contacts are made with national and international experts in technologies for removal of tritium from wastewaters.

- Water Distillation
- Cryogenic Distillation
- Thermal Diffusion
- Combined Electrolysis Catalytic Exchange
- Water Electrolysis
- Laser-Induced Tritium Separation
- Polyamide Exchange



Project Start 11JAN99  
 Project Finish 25JUN99  
 Date Date 11JAN99  
 Run Date 11FEB99

TTR

**COGEMA Engineering**  
**Eval Technology for Tritium Removal**  
**Baseline Schedule**

Sheet 1 of 1

Date	Revision	Checked	Approved

# **M-19-00 & M-91-00**

WASTE PROGRAMS DIVISION

E. M. Bowers

March 1999

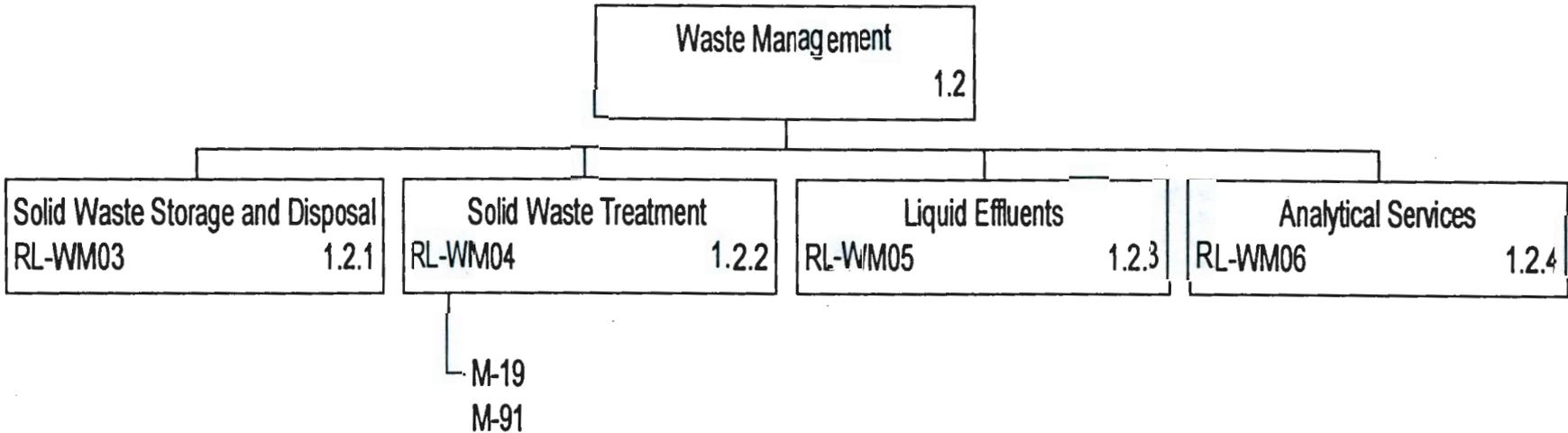
<p align="center"><b>TPA MILESTONE REVIEW</b></p>	<p align="center"><b>WASTE MANAGEMENT FEDERAL SERVICES OF HANFORD, INC. SOLID WASTE TREATMENT</b></p>	<p align="center"><b>MARCH 1999</b></p>
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## MILESTONE DESCRIPTION

<p align="center"><b>TPA MILESTONE</b></p>	<p align="center"><b>DESCRIPTION</b></p>
<p>M-19-00</p>	<p>Complete treatment and/or direct disposal of at least 1,644 cubic meters of Contact Handled Low Level Mixed Waste already in storage as of October 1, 1995, as well as newly generated Hanford Site low level mixed waste.</p> <p>Cumulative treatment and/or direct disposal rates will be at least 246 cubic meters by the end of FY 2000, 822 cubic meters by the end of FY 2001, and 1,644 cubic meters by the end of FY 2002.</p>
<p>M-91-00</p>	<p>Complete the acquisition of new facilities, modification of existing facilities, and/or modification of planned facilities necessary for storage, treatment/processing, and disposal of all Hanford site TRU/TRUM, LLMW, and GTC3.</p>

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# WORK BREAKDOWN STRUCTURE



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### MILESTONE SCHEDULE

WBS (PBS)	BASELINE DATE	FISCAL YEAR 1998													
		OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1.2.2 (RL-WM04) Solid Waste Treatment														<p>* (M-19-01-T03) Complete all NEPA requirements related to commercial contract for LLMW stabilization</p> <p style="text-align: right;">  I (Target)   RL </p>	<p>Milestone completed on September 29, 1998</p>
<b>MILESTONE TYPES:</b>  M TPA MILESTONE  I TPA INTERIM		 DOE-HQ  FO DOE-FO	 FORECAST  RL DOE-RL	<b>FOOTNOTES:</b> * indicates current month activity											

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## MILESTONE SCHEDULE

WBS (ADS)	BASELINE DATE	FISCAL YEAR 1999												
		OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	
1.2.2 (RL-WM04) Solid Waste Treatment	9/30/99												○ I	Milestone completed November 1998
	12/31/98				● I									
	6/30/99												○ I	
		<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;"> <p>(M-91-02) Initiate processing of CH-TRU/TRUM at WRAP I</p> </div> <div style="text-align: center;"> <p>(M-91-10) Submit Hanford Site LLMW and GTC 3 Waste PMP to Ecology</p> </div> <div style="text-align: center;"> <p>→</p> </div> </div>												
<b>MILESTONE TYPES:</b>		○ <sup>M</sup> TPA MILESTONE	▽	◇										<b>FOOTNOTES:</b> * indicates current month activity
		○ <sup>I</sup> TPA INTERIM	△	△										

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## MILESTONE EXCEPTION REPORT

<p align="center"><b>TPA MILESTONE</b></p>	<p align="center"><b>FUTURE MILESTONES IN JEOPARDY</b></p>
<p>M-91-04</p>	<p>“Complete construction of small container Contact Handled (CH) TRU/TRUM retrieval facility(s) and initiate (Project W-113) retrieval of small container TRU/TRUM from 200 Area burial grounds” by September 2000.</p>
<p>M-91-07</p>	<p>“Complete Project W-113 for Post 1970 CH TRU/TRUM retrieval” by September 2004.</p> <p>Baseline capital construction for the TRU Retrieval activities would have required \$834 K in FY 1998 and \$15.9 million in FY 1999 – not currently funded. \$500 K in expense funding is being used in FY 1999 to explore and prepare for simplified retrieval alternatives to Project W-113.</p>

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## M-19 ACCOMPLISHMENTS

<p><b>WBS 1.2.2.3</b></p>	<p align="center"><b><u>M-19-01-T03</u></b> <b><u>LOW LEVEL MIXED WASTE TREATMENT</u></b></p> <p>The letter certifying exemption from the organic/carbonaceous land disposal restriction (based on lack of incineration capacity within 1,000 miles) was submitted to Ecology in December 1998. The exemption will be valid until ATG thermal treatment comes on line in FY 2001.</p> <p>Public Comment period for the ATG RCRA and TSCA permit began March 15 and goes until April 28. A public hearing will be held on April 8, 1999.</p>
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## M-91 ACCOMPLISHMENTS

<p>WBS 1.2.2.3</p>	<p style="text-align: center;"><u>M-91-02</u> <u>INITIATE TRU WASTE PROCESSING AT WRAP</u></p> <p>TRU waste processing has been initiated on the glovebox line at WRAP, more than a month ahead of the milestone due date of December 31, 1998.</p>
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## M-19-00 SCORECARD

<p style="text-align: center;">“Treat and/or directly dispose of at least 246 cubic meters of CH-LLMW by September 2000, 822 cubic meters by September 2001, and 1,644 by September 2002”</p>	<p style="text-align: center;"><u>Quantity in cubic meters</u></p>
<p>M-19 Waste:</p> <ul style="list-style-type: none"> <li>– Macroencapsulation Pilot</li> <li>– Long Length Equipment</li> <li>– Backlog Soils Disposal</li> <li>– B Plant Organic Liquid (TBP)</li> <li>– Mixed Waste from PNNL</li> <li>– Lead Decontamination Project</li> </ul>	<p style="text-align: center;">183 95 54 11 2 1</p>
<p><b>TOTAL M-19 WASTE</b></p>	<p style="text-align: center;"><b>346</b></p>

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## PLANNED ACTIONS

TPA MILESTONE SUPPORTED	DESCRIPTION	SCHEDULED COMPLETION DATE
M-19-00	Dispose of non-PCB Backlog Soils as LLW – up to 225 cubic meters. Limited funding available for disposal of as many of the containers as possible in FY 1999.	9/30/99
M-19-00	Complete the demonstration of mixed waste incineration using the Waste Experimental Reduction Facility (WERF) at the INEEL. 96 drums (16 cubic meters) of mixed low-level waste have been shipped to WERF for incineration. The residues will be returned to Hanford for stabilization and disposal in the Mixed Waste Trench.	9/30/99
M-19-00 & M-19-01	Treat 560 cubic meters of mixed low-level waste using the non-thermal treatment contract with ATG. Treatment is to start in June 1999 per the current milestone schedule contained in the contract with ATG.	9/30/99

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## PLANNED ACTIONS (continued)

<p align="center">TPA MILESTONE SUPPORTED</p>	<p align="center">DESCRIPTION</p>	<p align="center">SCHEDULED COMPLETION DATE</p>
<p align="center">M-91-04</p>	<p>RL is pursuing more cost effective alternatives for TRU container retrieval based upon similar projects at Savannah River and Los Alamos (see Milestone Exception Report).</p>	<p align="center">9/30/00</p>
<p align="center">M-91-10</p>	<p>Continue preparation of the Hanford Site LLMW and GTC3 Project Management Plan.</p>	<p align="center">6/30/99</p>
<p align="center">M-91-03</p>	<p>Begin preparation of the Hanford Site TRU/TRUM Waste Project Management Plan.</p>	<p align="center">6/30/00</p>

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## EXPENSE COST PERFORMANCE

(\$ in Millions)

WBS	FY 1999 TO DATE (February)					AT COMPLETION					COMMENTS
	BUDGETED COST		ACTUAL CST	VARIANCE		BAC	EAC	FYSF	EXPECTED FUNDS FY 99	PROJECTED CARRYOVER WORKSCOPE	
	WORK SCHED	WORK PERF	WORK PERF	SCHED	COST	BCWS					
1.2.2.3 M-19 AND M-91 TREATMENT	0.9	0.3	0.3	0.6	0.0	4.1	6.5	3.4	6.5	3.1	Carryover: \$3.1 M- T for C

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## EXPENSE COST VARIANCE ANALYSIS

<b>WBS</b>	<b>COST VARIANCE \$18K</b>	
1.2.2.3	<p><u>(Description and Cause:)</u></p> <ul style="list-style-type: none"> <li>- The cost variance is within established thresholds.</li> </ul>	<p><u>(Impacts and Corrective Action:)</u></p> <p>No impacts.</p>

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# EXPENSE SCHEDULE VARIANCE ANALYSIS

WBS	SCHEDULE VARIANCE \$(605K)	
1.2.2.3	<p><u>(Description and Cause:)</u></p> <p>The schedule variance is due to a combination of the following:</p> <ul style="list-style-type: none"> <li>• Staging of waste for ATG contract has not yet begun due to delay in the permit.</li> <li>• TRU Retrieval activities have been progressing slowly due to a need to redefine the milestone.</li> <li>• RMW Planning/Implementation has some workscope which will not be accomplished (technical studies, technology development, MW Monthly, etc.)</li> </ul>	<p><u>(Impacts and Corrective Action:)</u></p> <p>Some workscope to be removed by Change Request WM-99-05.</p>

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## M-19 ISSUES

TPA MILESTONE	DATE IDENT	ISSUE	IMPACT	STATUS
M-19-00 & M-19-01	8/98	Issuance of ATG's final draft permit to public review by WDOE and EPA is almost two months behind schedule.	The current implementation schedule for non-thermal treatment of 560 cubic meters using the contract with ATG is extremely tight. Further permitting delays jeopardize the M-19-01 requirement to initiate treatment in FY 1999.	Public comment period began March 15, 1999 and extends through April 28, 1999. A Public Hearing will be Held on April 8, 1999.
M-19-01-T03	3/99	Although milestone was completed with FONSI signed on September 29, 1998, no formal closeout letter was issued.	No impact	A formal closeout letter is being prepared and should be issued by 5/30/99.

**Interim Status Dangerous Waste Tank  
Systems Hanford Federal Facility  
Agreement and Consent Order  
Milestone M-32-00**

**March 23, 1999**

## **Milestone Description**

**"Complete Identified Dangerous Waste Tank Corrective Actions" - September 1999**

**M-32-00 establishes Tri-Party Agreement compliance schedules for correcting known compliance deficiencies in certain Hanford interim status dangerous waste tank systems while allowing the continued operation of those tank systems.**

# Deliverables and Baseline Schedules

- M-32-01      Complete PFP Actions - Dec 94**
- M-32-02      Complete 219-S Actions - June 99\***  
\*Per TPA Change Request M-32-98-01
- M-32-03      Complete T Plant Actions - Sept 99**
- M-32-04      Complete DST Actions - June 94**
- M-32-05      Complete 242-A Evaporator Actions – May 1994**
- M-32-06      Complete 244-AR Actions - prior to restart**
- M-32-07      Complete B Plant Actions - June 96**
- M-32-08      Complete Grout Actions - prior to processing waste**

Interim Status Dangerous Waste Tank Systems  
Milestone M-32-00  
Project Manager's Assessment

Interim Milestone	Description	RCRA Compliance	Customer	Technical	Schedule	Cost
M-32-02	Complete 219-S Action	<input type="checkbox"/>				
M-32-03	Complete T Plant Actions	<input type="checkbox"/>				

Legend:  
 Good Performance  
↓ Worsened Future Outlook

*Mary Field Jarvis*  
M. F. Jarvis  
RL Project Manager (TPA/Solid Waste)

*March 18, 1999*  
Date

# Milestone Assessment

- **Milestones due but not complete (next six months)**

**M-32-02 Complete 219-S Tank Interim Status Actions June 1999**

M-32-02-T03 Complete construction upgrades to 219-S Facility (Project W-178).

(TPA change request approved to reflect schedule impacts of 1998 PCB issues)

**M-32-03 Complete T Plant Tank Actions Sept 1999**

M-32-03-T06 Complete scheduled upgrades to T Plant tank system (Project W-259).

- **Milestones in jeopardy (beyond six months)**

**None**

# **Interim Milestone M-32-02 219-S (222-S Lab)**

## **Significant Accomplishments (last three months)**

- **Project W-178 (tank system upgrades): Installed Cell A liner. Inspected tanks 101 & 102 and reinstalled tanks in Cell A. Processed TPA change request M-32-98-01 changing interim milestone completion date to June 30, 1999.**

## **Significant Planned Activities (next six months)**

- **Project W-178 (tank system upgrades): Reinstall tank services and isolate tank 103. Complete construction.**

## Budget/Cost Status

- **Project W-178 (tank system upgrades):**
  - **Budgeted to date \$5.5M**
  - **Cost to date \$4.4M**
  - **Estimate at completion \$5.5M**

Issues - None

## **Interim Milestone M-32-03**

### **T-Plant (Project W-259/2706-T upgrades)**

#### **Significant Accomplishments (last three months)**

- **Completed Acceptance Test Procedure (ATP) of installed systems. Completed all construction activities.**
- **Completed 211-T Sump demolition and modification work.**
- **Completed project drawing as-built field verifications and transmitted electronic files to the Hanford Document Control System.**
- **Continued preparations for Operational Readiness Assessment, including development of maintenance and operations procedures, personnel training, etc.**

## **Significant Planned Activities (next six months)**

- **Issue Acceptance Test Report.**
- **Complete Operational Test Procedure and issue Operational Test Report.**
- **Complete and validate all operations/maintenance procedures for Operations Readiness Assessment.**
- **Complete Integrity Assessment Report and installation inspection.**
- **Declare facility operational readiness.**

## **Budget/Cost Status**

- **Project W-259 (2706-T upgrades):**
  - **Budgeted to date \$12.8M**
  - **Cost to date \$12.77M**
  - **Estimate at completion \$12.8M**
  -

**Issues – RL believes that completion of secondary containment upgrades to the 2706-T (Project W-259) will complete the scope of work for interim milestone M-32-03. All active operations of the 221-T (T-Plant Canyon) tank system will cease June 30, 1999. Discussions concerning closure of 221-T are underway between Ecology and DOE-RL.**