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A-6001-401 (12/00)

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From: Norris, Kenneth M (Ken)
Sent: Monday, December 22, 2003 4:02 PM
To: Willingham, Christine
Cc: Stroup, Curtis R
Subject: Clearance by E-Mail HNF-19169, Rev 0

Legal Services has cleared for publication/release the Waste Management Low-Level Mixed Waste PMP.

Let me know if you have any questions.

Ken Norris

Page 2 of

Willingham, Christine

From: Spracklen, Michael L
Sent: Tuesday, December 23, 2003 9:15 AM
To: Willingham, Christine
Cc: Scott, Dean D
Subject: HNF-19169 Rev. 0

Chris,

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Fig. 8 photo
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Thanks.

Mike Spracklen
Protection Technology Hanford
376-3738

page 3 of

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Revision 0

M-91 MIXED LOW-LEVEL WASTE PROJECT MANAGEMENT PLAN

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Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management
Project Hanford Management Contractor for the
U.S. Department of Energy under Contract DE-AC06-96RL13200

Fluor Hanford
P.O. Box 1000
Richland, Washington

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HNF-19169
Revision 0

M-91 MIXED LOW-LEVEL WASTE PROJECT MANAGEMENT PLAN

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M-91 MIXED LOW-LEVEL WASTE PROJECT MANAGEMENT PLAN

December 2003

TABLE OF CONTENTS

1.0 Project Goals and Objectives..... 2
2.0 Background..... 2
2.1 Overview of MLLW Management..... 2
2.2 Waste Treatability Groups Information..... 3
2.3 Commercial Disposition..... 6
2.4 Component and Treatability Groups Stability (Contamination Migration)..... 6
2.5 Earlier Evaluations..... 7
2.6 Specific Regulatory Requirements..... 9
3.0 Project Scope..... 12
3.1 Description of Facilities..... 12
3.2 Planned Approach for MLLW Management..... 14
3.3 Work Breakdown Structure (WBS) with Dictionary..... 20
3.4 Treatment, Storage and Disposal Capability/Capacity..... 20
4.0 Project Constraints..... 23
4.1 External Schedule Requirements..... 23
5.0 Schedule and Critical Path Analysis..... 25
5.1 Logic Tied Life Cycle Schedule..... 27
6.0 Key Deliverables/Products..... 27
7.0 Performance Measurement..... 27
7.1 Milestones and Accomplishments..... 27
8.0 Project Control..... 28
8.1 Project Interface Control..... 28
8.2 Reporting and Notification Requirements and Processes..... 28
9.0 Change Management..... 28
10.0 References..... 29

Appendix A - Glossary and Definition of Terms
Appendix B - Treatability Groups Data Tables
Appendix C - Treatability Groups Process Flow Diagrams
Appendix D - WBS Elements Applicable to the Project Management Plan
Appendix E - M-91 Mixed Low-Level Waste Processing Schedule

1.0 PROJECT GOALS AND OBJECTIVES

The Mixed Low-Level Waste (MLLW) Project Management Plan (PMP) has been developed to meet the M-91-03 milestone that requires submission of a plan that addresses Hanford processing of contact-handled (CH) and remote-handled (RH) MLLW. The PMP is required to be in compliance with Agreement Section 11.5, *Waste/Material Stream Project Management Work Plans Prepared Under Agreement Milestone Series M-90-00, M-91-00 and M-92-00* of the Tri-Party Agreement[1] (TPA). Although the M-91-03 milestone requires revision to the MLLW PMP in 2009 and 2013, the status of activities identified in the PMP related to scheduled and completed RH and large/over-size containers of MLLW will provide information for preparing the annual report required by milestone M-91-45.

This PMP and subsequent revisions supercede and completely replace previously prepared M-91-03 and M-91-10 PMPs.

The mission of the Hanford MLLW Project are to compliantly store, treat and dispose of legacy MLLW as well as to effectively manage newly generated MLLW to preclude build up of a back-log of waste awaiting treatment. The M-91 milestones provide a regulatory framework to meet these goals, including:

- Complete thermal treatment of at least 600 m^3 of MLLW by December 31, 2005
- Complete acquisition of facilities/ capabilities and initiate treatment of RH and large/over-size containers of MLLW by June 30, 2008
- Complete treatment of all CH MLLW in storage as of December 31, 2002 (5,066 m^3 in Treatability Groups MLLW-02 through 06, and 08-10) and newly generated and retrieved CH MLLW (in the above Treatability Groups as of June 3, 2009) by December 31, 2009
- Treat all CH MLLW generated after June 30, 2009 in accordance with LDR requirements
- Initiate treatment of 300 m^3 per year of RH and large/over-size container MLLW beginning by June 30, 2008

2.0 BACKGROUND

2.1 Overview of MLLW Management

Mixed waste is defined as radioactive waste that also contains dangerous and/or hazardous constituents (see Appendix A). Based on the May 1987 Byproducts Rule, the radiological constituents of MLLW are governed by the Atomic Energy Act (AEA), and the chemical and hazardous constituents are governed by Resource Conservation and Recovery Act (RCRA) of 1976 (40 CFR 260). WAC 173-303 implements the Hazardous Waste Management Act as amended.

In November of 1986 RCRA regulations were applied such that low-level waste (LLW) that was not already disposed of became subject to RCRA if it contained hazardous waste constituents. Consequently, in July of 1986, the radioactive waste disposal operations undertook the practice of segregating LLW from MLLW. MLLW was placed in RCRA permitted facilities.

In November 1987, the State of Washington Department of Ecology (Ecology) was first authorized by the EPA to regulate MLLW. Subsequently, representatives from DOE-RL and Westinghouse Hanford Company (WHC), EPA Region X and Ecology met to discuss the strategy needed to handle the MLLW that was being generated at the Hanford Site. The resulting strategy, effective January 15, 1988,

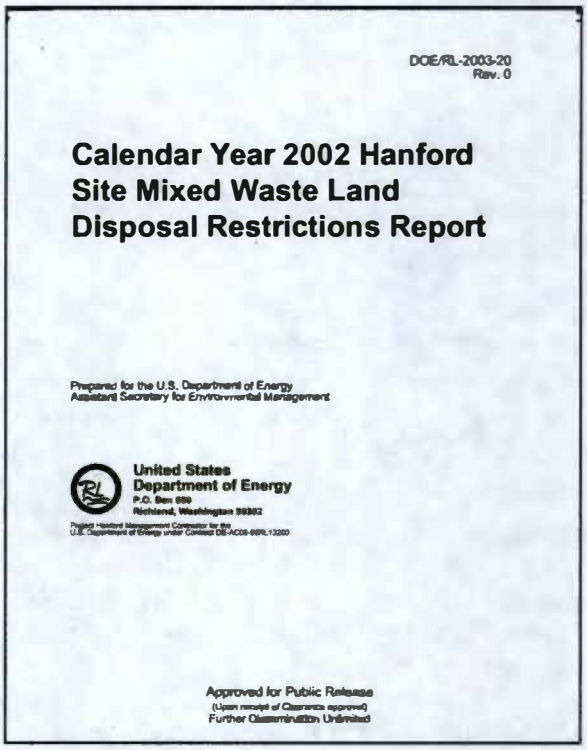
allowed all containerized MLLW generated on-site (except for RH waste and ignitable waste) to be consolidated for temporary aboveground storage on retrievable storage pads. MLLW generated off-site could not be accepted for storage, except on a case-by-case basis with concurrence from EPA and Ecology, until the radioactive mixed waste storage buildings were in place. These new storage buildings were placed in service beginning in 1989.

Land Disposal Restrictions

As part of RCRA, Land Disposal Restrictions (LDR) was promulgated in the late 1980's. Beginning in 1990, TPA milestone M-26-01 required a plan with subsequent yearly reports on the volume of MLLW in storage at the Hanford Site. The latest year's report is the Hanford Site Mixed Waste Land Disposal Restrictions Report [2] (Fig. 1). The data sheets in the report provide total waste volume for both the currently stored inventory and the waste forecasted to be generated during the next five years. The data sheets describe how, where, and what volume of waste is stored and current information about the waste's disposition. There are two types of data sheets in the LDR Report, Treatability Group data sheets and location-specific data sheets. This PMP addresses LDR Treatability Groups MLLW-02 through MLLW-10 as described in Section 2.2.

Waste Acceptance Criteria

The Hanford Site Solid Waste Acceptance Criteria[3] (HSSWAC) document, prepared by Fluor Hanford Incorporated (FH), sets forth the baseline criteria for acceptance of waste at the following Hanford Site treatment, storage, and/or disposal (TSD) units: the Central Waste Complex (CWC), WRAP, T Plant and LLBG. The waste acceptance criteria for each TSD unit have been established to ensure that waste can be managed within the operating requirements of the unit, including environmental regulations, DOE Orders, permits, nuclear safety requirements, waste analysis plans, performance assessments, and other applicable requirements.


DOE/RL-2003-20
Rev. 0

Calendar Year 2002 Hanford Site Mixed Waste Land Disposal Restrictions Report

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

United States
Department of Energy
P.O. Box 550
Richland, Washington 99352

Approved for Public Release
(Upon receipt of Clearance approval)
Further Dissemination Unlimited

Figure 1. Land Disposal Restrictions Report.

2.2 Treatability Groups Information

Mixed Low-Level Waste Treatability Groups

MLLW is currently stored or is forecasted to be generated from activities related to Hanford cleanup. Figure 2 indicates the amount of MLLW currently in storage at CWC, the amount of MLLW expected from retrieval activities, and forecast from other sources. Of the total forecasted Hanford MLLW inventory, approximately five percent (by volume) is RH and large container CH MLLW. These volumes are within the existing and planned MLLW processing capabilities. Additional sources of MLLW at Hanford could result from CERCLA cleanup activities, retrieval operations, and other

cleanup activities; these remediation decisions will determine if additional MLLW processing capability/capacity is required.

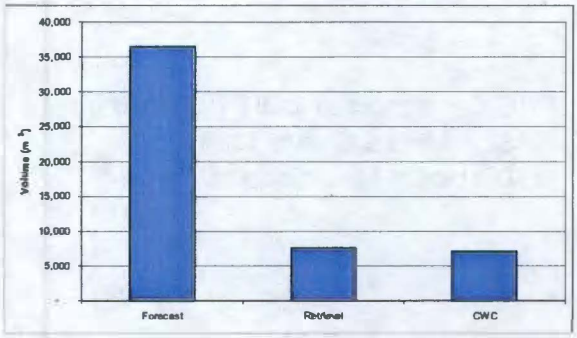


Figure 2. Hanford MLLW Sources.

The MLLW is categorized by the necessary treatment path to ensure that this waste, once treated, will meet LDR requirements for disposal. The Calendar Year 2002 Hanford Site Mixed Waste Land Disposal Restrictions Report includes:

- MLLW-01 "LDR Compliant Waste," Probable Treatment Path – Direct Disposal
- MLLW-02 "Inorganic Non-Debris," Probable Treatment Path – Non-Thermal (Stabilization)
- MLLW-03 "Organic Non-Debris," Probable Treatment Path – Thermal
- MLLW-04a "Organic/Carbonaceous Hazardous Debris," Probable Treatment Path – Non-Thermal (Macro-encapsulation*)
- MLLW-04b "Non-Organic/Non-Carbonaceous Hazardous Debris," Probable Treatment Path – Non-Thermal (Macro-encapsulation)
- MLLW-05 "Elemental Lead," Probable Treatment Path – Non-Thermal (Macro-encapsulation)
- MLLW-06 "Elemental Mercury," Probable Treatment Path – Mercury Amalgamation
- MLLW-07 "RH and Large Container," Probable Treatment Path – M-91
- MLLW-08 "Unique Wastes," Probable Treatment Path – No Path (lack of treatment capability)
- MLLW-09 "Lead Acid & Cadmium Batteries," Probable Treatment Path – Macro-encapsulation once Ecology adopts the new EPA LDR
- MLLW-10 "Reactive Metals," Probable Treatment Path – No Path (lack of treatment capability)

* Organic/Carbonaceous (O/C) LDR inapplicability certification has been in affect since 1999 allowing for the treatment of the O/C debris by methods other than incineration

Much of the MLLW is categorized as requiring non-thermal treatment, such as macro-encapsulation or stabilization (MLLW-02, 04 and 04A). These non-thermal treatment technologies are available both on and off-site. Some of the waste (approximately 840 m^3 - not including potential waste from retrieval operations) requires thermal treatment but very limited technologies are available to address this type of waste, particularly based on the radionuclide activity and dose rates of Hanford's inventory. The remaining volume of MLLW has been identified as "no-path forward waste" or is targeted for M-91 disposition. This consists of large sized containers, RH waste, high mercury subcategory waste, and other technology specific treatments. No-path forward waste is discussed in Section 4.1. MLLW-01, LDR-compliant waste is not addressed in M-91 because it is stored in compliance with WAC-173-303 requirements. MLLW-01 is not within the scope of this PMP.

Mixed Low-Level Waste in Storage

Approximately 21,000 containers representing 6,700 m^3 of MLLW (Fig. 3) are currently stored in the CWC (includes 1,100 m^3 of MLLW-01 LDR Compliant Waste). Waste volumes are as of December 31, 2002 and are from the Calendar Year 2002 Hanford Site Mixed Waste Land Disposal Restrictions Report[2].

Forecasted Waste

Approximately 37,000 m^3 (Fig. 3) of CH and RH MLLW is now forecasted[2,4] through fiscal year (FY) 2035. The current waste forecast does not include off-site MLLW at this time; however, it is anticipated that there will be some off-site MLLW included in future waste forecast updates after the Solid Waste EIS is finalized.

The portion of the MLLW requiring M-91 processing (MLLW-07) consists of both CH and RH fractions. The CH volume consists of large waste items, and waste in boxes (non-drum containers). The RH portion includes all MLLW matrices with dose rates equal to or greater than 200 millirem per hour at contact.

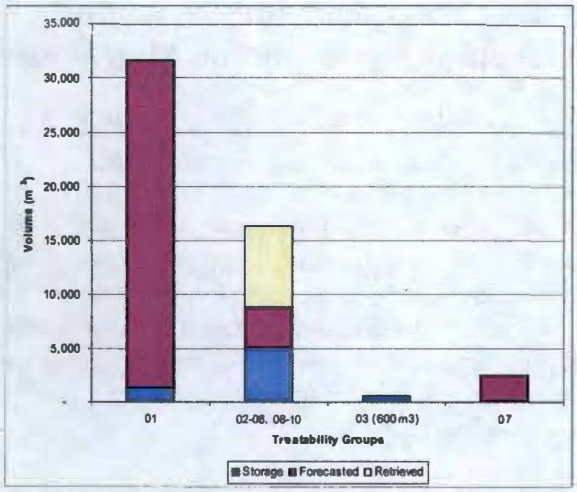


Figure 3. Summary of Hanford MLLW Treatability Groups Storage and Forecasted Volumes.

MLLW from Retrieval

In accordance with milestone M-91-40, retrieval of CH retrievably stored suspect transuranic (TRU) waste in the 200 Area Low Level Burial Grounds was required to begin in burial ground 218-W-4C by November 15, 2003 and be completed in all four burial grounds (i.e., 218-W-4C, 218-E-12B, 218-W-3A and 218-W-4B) by December 31, 2010. The current retrieval process begins with uncovering the waste containers followed by performance of nondestructive assay to separate TRU from non-TRU. Waste that is determined to be TRU will be vented, if necessary, and transported to the Central Waste Complex for additional characterization to support certification requirements for WIPP disposal. It is anticipated that a significant percentage of this retrievably stored suspect TRU waste will assay as low level waste based on the change in definition of TRU waste (currently defined as 100 nanocuries per gram versus the previous 10 nanocuries per gram). In addition, drums were categorized as TRU waste as a conservative measure rather than by assay. Based on this change in definition, it is assumed that about 50% of the retrieved waste will be determined to be non-TRU (approximately 7,500 m^3). This non TRU waste will be managed as suspect MLLW, designated, and transported to a permitted Treatment, Storage or Disposal Facility or to the Environmental Restoration Disposal Facility (ERDF) to be treated and disposed of in accordance with applicable regulatory requirements.

Data Sources

The amounts, characteristics, and locations of the MLLW Treatability Groups were obtained by completing data sorts on the Solid Waste Inventory Tracking System (SWITS) and Solid Waste Integrated Forecast Technical (SWIFT) databases. The SWITS database contains records for the majority of MLLW containers currently stored at Hanford while the SWIFT database contains estimates for MLLW expected to be generated in the future as a result of Hanford cleanup activities.

The SWITS database contains data (e.g., volumes, container information, and radiological, physical, and dangerous waste characteristics) on each container of stored waste. Generator data, waste transfer data or shipping records for the stored waste were used to extract waste information for input to the SWITS database. The SWITS database is a dynamic database and is updated frequently to

reflect waste receipt, processing, and shipment volumes. The data contained in this plan were obtained on December 31, 2002.

The SWIFT database contains estimates of future waste Treatability Groups volumes and characteristics forecasted by waste generating units such as Low-Level Burial Ground waste retrieval. The waste generating units provide basic information that is incorporated into the SWIFT database. The generator specifies the containers in which the waste will be shipped, the projected volume of waste, the physical form of the waste, the Waste Specification Record (WSRd), the dangerous characteristics of the waste, and the radionuclides in the waste. The SWIFT database is updated semi-annually and published in the SWIFT report[4]. The data contained in this plan correspond to revision 12 of the SWIFT Report.

Generating unit input is obtained through formal meetings and informal contact, and is included in SWIFT database updates. The SWIFT data are validated through a quality control process that includes approval by appropriate authorities.

Summaries of MLLW volumes and containers forecasted and retrieved are shown in Tables B-3 and B-4. The tables also show the wastes going to commercial processing and to M-91 (T Plant).

Life cycle forecast and stored volumes (12/31/2002 through 2035), as well as other relevant information, for CH and RH MLLW are presented by generator in Tables B-1 through B-4.

To facilitate Treatability Groups data analysis and summary, the stored and forecast containers were grouped. Any container with a dimension larger than 4 feet by 4 feet by 8 feet was considered a large container.

The waste generators for newly generated MLLW are shown in Tables B-3 and B-4. For details of this forecasted waste for each generator, see the SWIFT report[4]. Tables B-3 and B-4 show all existing and forecasted MLLW volumes by MLLW type, storage facility/generating unit, and by container category. About three percent of the MLLW destined for M-91 (T Plant) is currently in storage at CWC.

RH MLLW waste volumes provided in Tables B-1 and B-4 are also grouped by storage facility, generating unit, and container category.

2.3 Commercial Disposition

Commercial processing will be used on selected Treatability Groups which are discussed in Section 3.2 Planned Approach.

2.4 Component and Treatability Groups (Contamination Migration)

Storage for MLLW is in accordance with regulatory requirements. Currently, MLLW is primarily stored in the CWC in the 200 West Area. The CWC buildings are designed to contain all contaminants that may leak from containers in which they are currently stored as required by Washington State Dangerous Waste Regulations. Any contaminants that might be released from current containment will be collected and repackaged.

Disposal of MLLW in accordance with regulatory requirements has occurred in Trench 34, burial ground 218-W-5 in the 200 West Area. The permitted facility was built to RCRA standards and employs a double liner-leachate collection system as required for near-term containment. Leachate is treated for any contaminants that may be released from the waste. All disposed wastes have been treated to satisfy LDR requirements for hazardous constituents prior to disposal as defined in Washington State Dangerous Waste Regulations. Long-term release of radionuclide contaminants and resulting environmental impacts have been extensively evaluated in a performance assessment analysis[5] as required by

DOE Order 435.1. The conclusions of this analysis are that minimal environmental contamination is expected from radionuclide migration from the facility and that all performance objectives defined in DOE Order 435.1 will be satisfied. Waste acceptance criteria derived from the Performance Assessment analysis ensure continued compliance with DOE Order 435.1.

A second identically designed trench, Trench 31, has been constructed adjacent to Trench 34 and will receive MLLW for disposal. Performance of this trench will be the same as Trench 34.

2.5 Earlier Evaluations

Contact-Handled MLLW Processing Studies

Non-Thermal Treatment

In 1991, the Strategy Assessment for Project W-100, Waste Receiving and Processing (WRAP) Module 2, recommended that the WRAP 2 facility project be divided into smaller functional projects. Based on this study the WRAP 2 Project split into WRAP 2A and WRAP 2B. The primary functions of WRAP 2A were to include processing, packaging, and certification of retrieved and newly generated CH MLLW using nonthermal treatment technologies. A change request to TPA milestone M-19-00 was submitted in October 1991 (M-19-91-1) to charter the separation of WRAP 2 into 2A and 2B. However, this request was later deleted due to commercialization of WRAP 2A waste treatment functions.

The MLLW Stabilization Treatment Program was established to replace the deleted WRAP 2A facility. The program delineated how and where waste would be treated to meet TPA milestone M-19-00 obligations. A TPA milestone change was needed to clarify the new direction for treating waste, so a Change Request was submitted to the regulatory agencies to allow alternative treatment methods or direct disposal options instead of the WRAP 2 Facility.

The MLLW Stabilization Treatment Program was divided into three treatment categories: direct disposal, on-site treatment, and commercial treatment.

The direct disposal category pursued regulatory strategies for direct disposal of some MLLW that was previously identified as requiring treatment.

The on-site treatment category pursued the capability to treat some MLLW at the Hanford Site using the established work force and facilities. The following criteria were used to select waste for on-site treatment:

- Waste that would require further characterization and/or sorting before treatment (e.g. lab packs). Since these wastes must be characterized before treatment, it was recommended to treat the waste at the same time
- Waste that can be treated using treatment methods or technologies that require only minimal capital improvements to initiate actual waste treatment
- Small volume waste Treatability Groups that require specialized treatment

The commercial treatment category provided sufficient feed material for the development of commercial MLLW stabilization treatment services. Commercial stabilization treatment contract provisions were designed to treat virtually all waste Treatability Groups originally planned for the WRAP 2A Facility. In early 1995, it was decided that there was sufficient interest to issue a request for proposal for commercial treatment of the non-thermal MLLW inventory.

During the period of 1996 though 2000, the requirements of TPA milestone M-19-00 was satisfied with the treatment and/or disposal of greater than 1,644 m^3 of MLLW. This was

accomplished two years ahead of the required milestone due date.

Thermal Treatment

A commercial thermal treatment contract was recommended to provide waste treatment by thermal destruction of the hazardous constituents and subsequent immobilization of the radionuclides in a grouted or slag/glass final waste form. Commercial thermal treatment would process wastes regulated by the TSCA and most listed and characteristic hazardous wastes restricted from land disposal under RCRA. In addition to TSCA regulated PCBs, a significant quantity of radioactive mixed waste containing RCRA F-coded, ignitable, and reactive organic constituents was stored or would be generated at the Hanford Site. Thermal destruction is the Best Demonstrated Available (treatment) Technologies (BDAT) for RCRA LDR wastes. The DOE indicated an interest in considering thermal treatment as a primary option for the treatment of radioactive mixed waste because significant volume reduction can be realized using thermal treatment.

A strategy for this activity was initially established that involved consideration and assessment of three treatment options:

- Installation and operation of an on-site thermal treatment facility (Project W-242)
- Treatment at another DOE site
- Contracting for commercial thermal treatment

Each of the above options was investigated to a varying extent and resulted in the issuance of supporting documentation such as waste characterization studies, thermal treatment technology studies, site-specific preliminary engineering designs and cost estimates, and hazard classification analyses.
The option of on-site thermal treatment was investigated in fiscal years 1991 and 1992. An engineering study was performed to identify the preferred technologies for treating Hanford Site radioactive mixed waste. The thermal treatment technology recommended for further evaluation and development was a rotary kiln incinerator. A site-specific thermal treatment facility engineering study was partially completed in FY 1992. The site-specific study included a facility design and equipment layout, as well as capital and operating cost estimates.

The option of sending the waste to other DOE sites for treatment was investigated in detail for the specific case of treatment at Idaho National Engineering and Environmental Laboratory's (INEEL) Waste Experimental Reduction Facility (WERF), which was being refurbished and permitted for restart (SAIC 1992, 1993). The INEEL's WAC for off-site waste treatment was found to be too limited to be of practical consideration. Other sites such as Savannah River Site and Oak Ridge National Laboratory, had thermal treatment facilities, but facility management at these sites indicated that their facilities' projected waste acceptance was at capacity.

The option of commercial thermal treatment provided the most desirable combination of technical feasibility and economic attractiveness. Commercial thermal treatment was initially investigated by surveying the thermal treatment industry's capability and interest in addressing the Hanford Site radioactive mixed waste thermal treatment problem. In FY 1994, it was decided that industry interest and capability was sufficient to issue an RFP to treat the thermally treatable CH MLLW inventory (existing and projected), and a thermal treatment contract was awarded in November 1995. The company awarded the contract proposed a vitrification process to thermally treat the combustible portion of the waste and would produce a glass/slag final waste form for that portion of the waste. The noncombustible portion of the waste would be separated and treated with either microencapsulation (grouting) or macroencapsulation.

The initial results derived from this procurement activity strongly suggested that thermal treatment by a commercial contractor provided acceptable technical risk accompanied by minimum financial risk to the DOE, and that a unit cost-based thermal treatment service would be significantly more cost effective than the construction of an on-site thermal treatment facility (using capital funds).

Studies concluded that the other two options (on-site facility and other DOE site facilities) would continue to be considered as possible alternatives until the uncertainty regarding privatizing thermal treatment can be eliminated. One concern was that a commercial off-site treatment facility might not be capable of thermally treating alpha-contaminated waste. The company that was awarded the thermal treatment contract indicated that the treatment of alpha-contaminated, non-TRU, radioactive mixed waste would be included in the design of their treatment facilities.

Remote-Handled and Large Container Contact-Handled MLLW Processing Studies

Studies assumed that transfer for treatment of all RH MLLW and large size CH MLLW would be by truck or rail in a cask whether it is waste directly from storage or a generator. The receiving function would have the capability to remove the waste container from the transport vehicle. Cask or overpack handling capability would be required.

Size reduction would be performed if needed to make large items more manageable and able to fit into smaller containers. Waste would be sorted to group the waste according to processing requirements. Items requiring thermal treatment would be segregated from those requiring nonthermal stabilization. Stabilization would consist of adding a reagent to the waste to immobilize any hazardous constituents present. The contaminants are not removed or destroyed but the mobility of the contaminants is decreased by adding a stabilizing agent.
The RH MLLW would be packaged into containers for disposal. Waste would meet the acceptance criteria of the disposal site. Waste would either be transferred to storage awaiting disposal or would be transferred directly to disposal.

Initial efforts to identify capabilities for processing waste began in the mid-1980s. Continuing evaluation of waste Treatability Groups, waste acceptance criteria, clean-up schedules, and budget considerations, resulted in development of a new set of TPA milestones, the M-91 series. These evaluations resulted in establishing T Plant as the baseline for RH and large container processing.

2.6 Specific Regulatory Requirements

MLLW Hanford Federal Facility Agreement and Consent Order Milestones (also referred to as the Tri-Party Agreement - TPA)

The TPA contains milestones for treatment of MLLW to ensure that legacy waste is treated to reduce the stored backlog and that newly generated waste is managed such that it does not contribute to the legacy backlog. The revised M-91 milestone series in the proposed change package currently out for public comment includes the following milestones that address the retrieval, designation and treatment of MLLW:

M-91-03 – Revise the Hanford Site TRUM and Mixed Low Level Waste Project Management Plan to comply with TPA Section 11.5 requirements by December 31, 2003, March 31, 2009 and March 31, 2013. Due to the pending litigation described in the M-91 series, this PMP does not address TRUM.

M-91-12 – Complete thermal treatment of an

additional 360 m^3 of CH MLLW by December 31, 2005.*

M-91-12A – Complete thermal treatment of at least 240 m^3 of CH MLLW by December 31, 2004.*

M-91-15 – Complete acquisition of facilities and/or capabilities and initiate treatment of RH and CH MLLW in large boxes and containers by June 30, 2008.

M-91-40 – Retrieve all CH-RSW within burial grounds 218-W-4C, 218-W-4B, 218-W-3A, and 218-E-12B by December 31, 2010.

M-91-41 – Initiate full scale retrieval of RH RSW by January 1, 2011. Retrieval of non-caisson RH RSW shall be completed by December 31, 2014. Retrieval of the 200 Area caisson RH RSW in the 218-W-4B burial ground shall be completed by December 31, 2018.

M-91-42 – Treat specified newly generated CH MLLW and CH MLLW in storage in accordance with the required treatment schedule through December 31, 2009. After June 30, 2009, treat all newly generated MLLW in accordance with the treatment requirements in compliance with WAC 173-303-140 and 40 CFR 268.

M-91-43 – Designate all RH LLW and boxes and large containers of CH MLLW in above ground storage as of June 30, 2003 by December 31, 2008. Begin treatment of CH of RH MLLW and boxes and large containers of CH MLLW at a minimum rate of 300 m^3/yr beginning not later than June 30, 2008.

M-91-45 – Submit a report describing completed and scheduled work relating to RH MLLW and CH MLLW in large boxes and containers by September 30, 2004 and annually thereafter to Ecology.

In addition to the M-91 milestone series, there are a number of M-026-01 milestones that require submission of annual Hanford Land Disposal Restriction Reports in accordance with Agreement Requirements to cover the time period from January 1 of the previous year through December 31 of the reporting year.

Significant Applicable Statutes

MLLW management activities will consider the following requirements as well as any other applicable regulations or DOE requirements.

Clean Air Act (42 USC 7401 et seq.)

The Hanford Site air operating permit has been issued in accordance with Title V the *Clean Air Act Amendments of 1990*, and is implemented through federal and state programs under 40 CFR 70 and WAC 173-401. The permit is intended to provide a compilation of applicable *Clean Air Act* requirements both for radioactive emissions and for non-radioactive emissions at the Hanford Site. Current air permitting documentation is expected to address MLLW management activities. Activities addressed by the PMP will be reviewed against the permitting documentation, as necessary to ensure MLLW management activities are addressed.

Hazardous Materials Transportation Act of 1975 (49 USC 5101 et seq.)

Hazardous material transportation requirements include the preparation of shipping papers to identify and track hazardous materials, packaging and container design, marking, labeling, performance standards, and employee training programs. Specific requirements relating to MLLW management activities and the shipment mode used (i.e., rail, aircraft, vessel, and public highway) will be followed. Off-site shipments of hazardous materials must comply with the implementing regulations at 49 CFR administered by the U.S. Department of Transportation. Based on DOE Orders, on-site movements must also comply unless equivalent documentation is prepared and approved.

* A change package will be submitted for milestones M-91-12 and M-91-12A to reflect the newly proposed treatment schedule included in Appendix E

National Environmental Policy Act (42 USC 4321 et seq.)

The Hanford Site Solid (Radioactive and Hazardous) Waste Environmental Impact Statement (DOE/EIS-0286) is currently under development and will address the treatment, storage, disposal, and transportation of CH and RH MLLW. The Records of Decision(s) [ROD(s)] is expected to be issued in Calendar Year 2004 and will become the documentation for MLLW management activities. Prior to issuance of the ROD(s), existing NEPA documentation will be utilized to cover MLLW management activities. In order to cover all of the necessary activities, existing documentation will be revised or new NEPA documentation will be developed.

Resource Conservation and Recovery Act (RCRA) of 1976 as amended by the Hazardous and Solid Waste Amendments (42 USC 6901 et seq.) of 1984

RCRA addresses the requirements for hazardous wastes, including the treatment, storage, disposal, and transportation, (40 CFR 260-282). Ecology has been delegated authority from EPA to administer RCRA through the State's Hazardous Waste Management Act.

Washington State Hazardous Waste Management Act (RCW 70.105)

The Hazardous Waste Management Act grants Ecology authority to regulate the treatment, storage, disposal, and transportation, of dangerous waste in Washington State. Mixed waste is a subset of dangerous waste. Ecology has promulgated requirements in WAC 173-303, *Dangerous Waste Regulations*. MLLW waste generation activities are subject to generator requirements. MLLW management activities which can not utilize generator provisions must be conducted according to permits under WAC 173-303 in order to operate. Existing permits are expected to address processing activities with the exception of treatment in the trenches at the LLBG. The LLBG Part A Permit application is anticipated to be resubmitted to include treatment in trench provisions following approval of revised NEPA documentation.

Washington Clean Air Act (RCW 70.94) and Associated Regulations

Ecology's Nuclear Waste Program regulates air toxic and criteria pollutant emissions from the Hanford Site. The Department enforces state regulatory controls for air contaminants as allowed under the Washington *Clean Air Act* (RCW 70.94). The Washington State Department of Ecology's implementing requirements (e.g., WAC 173-400, WAC 173-460) specify a review of new source emissions, permitting, applicable controls, reporting, notifications, and provisions of compliance with the general standards for applicable sources of Hanford Site emissions.

The Washington State Department of Health's Division of Radiation Protection regulates radioactive air emissions statewide through delegated authority from EPA and Washington State legislative authority. The Washington State Department of Health implements the federal/state requirements under state regulation WAC 246-247. Prior to beginning any work that would result in creating a new or modified source of radioactive airborne emissions, a notice of construction application must be submitted to the Washington State Department of Health and EPA for review and approval. Ensuring adequate emission controls, emissions monitoring/sampling, and/or annual reporting of air emissions are typical requirements for radioactive air emission sources.

At the local level, the Benton Clean Air Authority was designated authority by EPA to establish a local oversight and compliance program for asbestos renovation and/or demolitions, as regulated by EPA under the National Emission Standards for Hazardous Air Pollutants (40 CFR 61, Subpart M). The Benton

Clean Air Authority enforces/adopts the federal/ state regulations, respectively by reference, as well as imposes additional requirements on sources within the local agency's jurisdiction. Current air permitting documentation is expected to address MLLW management activities. Activities addressed by the PMP will be reviewed against the permitting documentation, as necessary to ensure MLLW management activities are addressed.

3.0 PROJECT SCOPE

3.1 Description of Facilities

On-site MLLW Storage

Central Waste Complex

The CWC, a series of buildings conforming to RCRA requirements, receives and stores radioactive waste in a safe and regulatory compliant manner. The CWC began accepting waste in August 1988.

The storage facilities, located in the Hanford 200-West Area, now include 12 small mixed waste storage buildings (the 2402 series); seven large storage buildings (the 2403 and 2404 series); and building 2420-W, used for cask storage. In addition, there are 27 modules for storing low-flash point mixed waste and 12 modules for storing alkali metals. Also a waste storage pad is part of the CWC.

The CWC provides interim storage for MLLW, TRU waste, and a small amount of LLW, waiting processing or treatment and final disposition. The design storage capacity is approximately 81,000 55-gallon drum equivalents; the operational capacity is about 64,000 drum equivalents.

Figure 4. Receipt of drums at CWC.

All newly generated waste must meet acceptance criteria set by the Hanford Site Solid Waste Acceptance Program. Waste is generally packaged in 55-gallon drums (Fig. 4), unless alternate packages are dictated by size, shape or other form of waste. Each drum is handled individually using a hand truck, fork lift or crane. Drums are placed on pallets with a maximum of four drums banded together; the pallets can then be stacked a maximum of three-high, or 12 drums per stack (Fig. 5). The storage buildings or pads have physical features that provide for segregated storage areas to maintain appropriate separation between groups of incompatible waste and to comply with fire code requirements.

Figure 5. Drum storage in CWC.

MLLW Storage at the T Plant Complex/WRAP

The T Plant Complex and the WRAP facility provides additional storage for MLLW waste packages. Packages are stored waiting processing or shipment to CWC, or ship directly to treatment facilities from WRAP and T Plant.

MLLW Facilities and Processing Capabilities

Two key facilities/capabilities are required for processing Hanford MLLW: commercial facilities and the "M-91 Capability". Processing volumes for commercial facilities and on-site capability are shown in Figure 6.

Hanford will use a combination of on-site and off-site capabilities to process MLLW. Plans are to treat the majority of the MLLW using available commercial services. On-site treatment capability will be utilized when required. Processing of small quantities of waste will be evaluated on a case-by-case basis. The on-site capability will include the "M-91 Capability" for RH MLLW and large container CH MLLW. Hanford will continue to work with the regulators to determine the most cost-effective path forward for treatment and disposal of MLLW while remaining protective of the public, the environment, and workers.

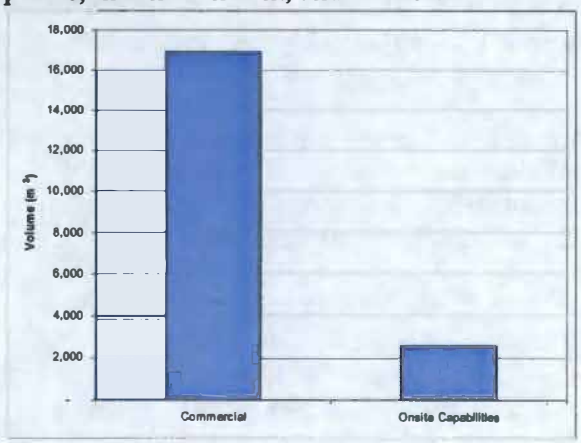


Figure 6. MLLW Processing.

Mixed Low-Level Waste Disposal

Mixed low-level waste is disposed in the Mixed Waste Trenches (LLBG 218-W-5, Trenches 31 and 34 for RCRA waste, the ERDF for CERCLA waste, and Trench 94 (LLBG 218-E-12B) for defueled naval reactor compartments. MLLW could also be disposed at an off-site commercial facility. Trench 94 data are not included in this report. Future waste disposal is planned at the Integrated Disposal Facility (IDF).

Mixed Waste Trenches

The first Mixed Waste Trench (LLBG 218-W-5, Trench 34) was built in 1993, and the second Mixed Waste Trench (LLBG 218-W-5, Trench 31) was built in 1994. Waste storage in Trench 34 began in 1997, and disposal operations began in 1999 after the leachate that is generated from the cell was accepted for treatment at the 200 Area Effluent Treatment Facility (200 ETF). Waste storage in Trench 31 began in 2003 and disposal will initiate when Trench 34 is nearing capacity or if needed for large waste packages. Both Mixed Waste Trenches are RCRA compliant and meet Subtitle-C disposal requirements. They have a double-liner system with leachate collection.

A substantial portion of the Hanford Site's RCRA mixed waste will be disposed in the Mixed Waste Trenches (Fig. 7). Waste for disposal in these units must meet the Hanford Site Solid Waste Acceptance Criteria. Each disposal trench has a free air volume capacity of approximately 24,000 m^3. The actual disposed waste capacity will vary for each trench depending on the size of the disposed waste packages and the number of operational lifts ultimately used in each trench. Currently (December 2003), Trench 34 is approximately 25% full.

Figure 7. Container Disposal in the Mixed Low-Level Waste Trench.

Environmental Restoration Disposal Facility

The ERDF is a RCRA-compliant landfill that is authorized under CERCLA. The landfill is used for disposal of environmental restoration waste being generated from cleanup activities. ERDF is designed to receive, treat and dispose of LLW or MLLW generated through remediation of the Hanford Site. The landfill opened in 1996. The original two cells are filled. Cells 3 and 4 were constructed and are now in use.

Integrated Disposal Facility

The Integrated Disposal Facility (IDF - Figure 8) is a planned facility that consists of a single landfill with two separate, expandable cells. One cell is permitted as a RCRA Subtitle C compliant landfill system with the other cell not permitted. Both landfill cells will include a double liner, a leachate collection and removal system, and a leak detection system. The landfill liner system will comply with RCRA requirements for hazardous waste landfills. The IDF will be designed to allow for future expansion. Each future liner construction project will connect the previously constructed liner and the operations systems and then extend the disposal area. The disposal landfill cover will be designed and located to satisfy the dangerous waste disposal requirements once a decision is made to construct the final cover over the landfill. Current plans are to begin operations in February 2006, prior to the capacity limitation of the mixed waste disposal units.

Figure 8. Conceptual Drawing of the Integrated Disposal Facility.

3.2 Planned Approach for MLLW Management

The planned approach will be designed to treat MLLW in storage first to eliminate the legacy backlog, followed by treatment of MLLW generated from retrieval and other operations to preclude build up of stored waste. This approach will require up-front planning with generators to ensure that waste generation is minimized, where possible, and is consistent with the current Hanford Waste Acceptance Criteria[3] that requires off-site waste generators to treat their waste to Land Disposal Restriction standards prior to acceptance for disposal.

Hanford will use a combination of on-site and off-site capabilities to process MLLW in accordance with the treatment milestones. The current strategy is to treat the majority of the MLLW volume in LDR Treatability Groups MLLW-02 through 06 and MLLW-09 using commercial services. MLLW in LDR Treatability Groups MLLW-08, Unique Waste and MLLW-10, Reactive Waste, currently do not have treatment technologies identified. MLLW in LDR Treatability Group MLLW-03

will be thermally treated using available commercial capacity. A combination of on-site and off-site treatment capabilities will be utilized for the treatment of LDR Treatability Group MLLW-07. Current plans are to acquire size reduction, repackaging and stabilization capabilities to process CH MLLW currently stored or forecasted to be generated in large/over-size containers prior to 2008. These CH processing capabilities will be used to meet the first requirement under milestone M-91-43 to begin treatment by June 30, 2008 of a minimum of 300 m^3 per year of RH and CH large/over-size containers of MLLW (LDR Treatability Group MLLW-07). The need for RH processing capability will be met through development of the "M-91 Capability" in 2012.

Commercial Processing

LDR Treatability Group MLLW-01 (LDR-Compliant Waste) is not within the scope of M-91 because this Treatability Group meets the required LDR treatment standards as specified in 40CFR 268.50(e).

Commercial Stabilization – Treatment Path for LDR Treatability Group MLLW-02

The treatment path for inorganic non-debris MLLW is commercial stabilization and is represented in LDR Treatability Group MLLW-02. This waste consists of both solids and aqueous liquids and would primarily be regulated for toxic metal characteristics, corrosivity and/or inorganic Underlying Hazardous Constituents (UHCs) above LDR treatment standards. The waste may also contain organic non-regulated constituents and/or organic regulated constituents below Universal Treatment Standard (UTS) levels.

The objective of stabilization is to immobilize the hazardous component through chemical and/or physical fixation into low-solubility materials, and by encapsulation to reduce the potential for future releases. Usually, stabilization is accomplished by mixing the waste with Portland cement or pozzolanic materials at a preselected ratio, but stabilization also can include mixing with polymer materials (Fig. 9). This treatment prepares the waste to meet the disposal requirements. Many pretreatment processes may be employed prior to stabilization such as: drying, shredding, screening, and chemical treatments.

Figure 9. Commercial Stabilization of MLLW.

There are several commercial treatment facilities in the United States that can accept the majority of Hanford's waste in this Treatability Group; however, for wastes that cannot be accepted at a commercial treatment unit due to having too high of a radiological inventory (curie content and/or dose rate), these wastes will be managed under the MLLW-07 LDR Treatability Group and treated on-site. On-site treatment of selected MLLW-02 wastes may also be performed.

Commercial Marcoencapsulation Treatment Path for LDR Treatability Groups MLLW-04A, MLLW-04B, and MLLW-05

The primary treatment path for MLLW debris and radioactive lead solids is commercial macroencapsulation. These wastes are represented in LDR Treatability Groups MLLW-04 and MLLW-05. The waste consists of solids and may contain one or more organic and/or inorganic regulated characteristic and listed

waste codes. Since this waste is being treated by one of the debris treatment methods specified in 40CFR268.45, UHC determination is not required and there are no contaminates restrictions for macroencapsulation. Much of the packaged debris waste contains items that are organic based (e.g., paper, plastic, wood, rubber) in excess of 10 percent by volume. Ecology views these waste packages as meeting the definition of Organic/Carbonaceous (O/C) waste and therefore is restricted from land disposal by the State-Only O/C LDR unless the waste is incinerated. Since there is no incineration capability/capacity with in a 1000-miles of Washington State borders, Hanford qualifies for the 1,000-mile inapplicability certification for O/C LDR specified in WAC 173-303-140(4)(d)(iii).

Macroencapsulation consists of applying a surface coating of polymeric organics or using a jacket of inert inorganic materials (e.g., cement) to substantially reduce surface exposure to potential leaching media. Hanford has manly employed the use of Portland cement based grouts to macroencapsulate this waste. The waste is normally sent through one or more size reduction steps (e.g., sorting, cutting/shearing, compaction, and super-compaction) prior to macroencapsulation.

Hanford began treating MLLW debris on-site in 1996 and initiated off-site commercial treatment in 1999. Beginning in 2003, commercial macroencapsulation of radioactive lead solids and "drained" radioactively contaminated lead acid batteries commenced. Hanford has macroencapsulated over 3,000 m^3 of MLLW through FY 2003 (Fig. 10).

There are several commercial treatment facilities in the United States that can accept the majority of Hanford's waste in these Treatability Groups; however, for wastes that cannot be accepted at a commercial treatment unit due to having too high of a radiological inventory (curie content and/or dose rate), these wastes will be managed under the MLLW-07 LDR Treatability Group and treated on-site.

Figure 10. On-site Macroencapsulation of MLLW.

Other debris treatment technologies may be used to process some of the Hanford Site's MLLW debris (e.g., sealing, microencapsulation, extraction methods).

Thermal Treatment of Organics – Treatment Path for LDR Treatability Group MLLW-03

The treatment path for organic non-debris MLLW is commercial thermal treatment (Fig. 11) and is represented in LDR Treatability Group MLLW-03. This waste consists of both solids and aqueous liquids and would primarily be regulated for hazardous organic constituents and/or TSCA PCBs. The waste may also contain inorganic regulated constituents that will require additional treatment after organic destruction.

Destruction of the hazardous organic constituents can be achieved by various treatment methods including (but not all inclusive) incineration, vitrification, steam reforming, thermal desorption, pyrolysis, chemical oxidation, and UV-oxidation. Many pretreatment processes may be employed prior to thermal treatment such as: drying, shredding, screening, and chemical treatments.

There are only a few thermal treatment facilities

in the United States that can accept MLLW, and these facilities are very restrictive on the amount of radiological contamination in the waste that they can accept. Waste in this Treatability Group that cannot be accepted for treatment due to radiological concerns will be managed under the MLLW-07 LDR Treatability Group and treated on-site.

Figure 11. GASVIT Commercial Treatment.

Hanford began treating MLLW off-site by thermal treatment methods in Calendar Year (CY) 1998 with the treatment of Tri-Butyl Phosphate at the Diversified Scientific Services Inc. (DSSI) Unit located in Tennessee.

During CY 2000, O/C MLLW debris was incinerated at WERF at the INEEL site; however, WERF has now been closed and is not expected to operate again.

In CY 2001, Treatability Group MLLW-03 waste was treated at the Allied Technology Group (ATG) facility located in Richland Washington. Treatment was performed by using ATG's gasification-vitrification (GASVIT) unit; however, due to operational problems with the GASVIT unit, ATG filed for Chapter 11 bankruptcy in late CY 2001. ATG did not survive bankruptcy and was taken over by Pacific Eco-Solutions (PEcoS) in CY 2003. The GASVIT unit has not been restarted and it is not known at this time if it will ever be restarted.

During CY 2003, LDR Treatability Group MLLW-03 waste was treated by Perma-Fix located in Tennessee. Treatment was performed by using a combination of their Thermal Desorption and DSSI processes.

All of theses activities are being tracked and counted against TPA milestones M-91-12 and M-91-12A. Waste volumes beyond 600 m^3 will be tracked and counted against TPA milestone M-91-42.

Commercial Amalgamation MLLW-06

Radioactively contaminated elemental mercury waste requires amalgamation as the specified treatment technology under RCRA. The Hanford Site inventory of mercury-bearing waste is relatively small (represented in LDR Treatability Group MLLW-06), as is the case with the inventories at other sites across the DOE Complex. Some of the mercury has already been amalgamated; however, since the amalgamation was done in response to mercury spills from broken equipment (e.g., manometers, thermometers, mercuric switches), no LDR certification is on record to allow disposal at this time.

There are a limited number of commercial treatment units in the United States capable of accepting and treating this waste. None of Hanford's mercury waste has been treated to date; however, it is anticipated that the majority of Hanford's mercury waste can be treated by one or more of these treatment units. However, for those waste packages that cannot be accepted at one of these commercial treatment units due to having too high of a radiological inventory (curie content and/or dose rate), these wastes will be managed under the MLLW-07 LDR Treatability Group and treated on-site.

T Plant Complex for M-91 Capability – Treatment Path for LDR Treatability Group MLLW-07

The commercial stabilization and macroencapsulation treatment may be supplemented or replaced by capability that exists within the T Plant Complex. While the T Plant canyon is being planned for use in treating RH waste, it also has been used to open, inspect, segregate, and repackage mixed waste. The 2706-T Building within the T Plant Complex is a decontamination facility with the capability to open, sample, sort, treat, and repackage CH boxes and drums of MLLW. Some of the waste planned to go to commercial treatment facilities will be inspected in the 2706-T Building before being shipped for treatment.

An engineering study is planned in FY 2005 to determine if the processing capabilities currently in 2706-T can be expanded to include size reduction and repackaging capabilities to support the processing of large boxes and containers of CH MLLW expected to be generated during retrieval operations.

Processing will be needed for the RH waste currently on the Hanford Site and for the RH waste expected to be generated in the future that cannot be treated through commercial capabilities. Examples of needed processing capabilities include sorting and repackaging, NDA/NDE, size reduction, decontamination, solidification/neutralization, and verification/certification/loadout. In the previous evaluation of alternatives, modifying the T Plant Complex is identified as the selected alternative. The modified portion of the T Plant Complex is known on the Hanford Site as the "M-91 Capability," named for the M-91 TPA milestone that requires it. The M-91 Capability also is anticipated to provide for processing of the RH TRU waste and the CH TRU waste that cannot be accepted into the WRAP Facility.

Treatment by Generator Treatment Path for LDR Treatability Group MLLW-07

Long-length contaminated equipment (LLCE) consists of equipment more than 12 feet long that is removed from underground waste tanks. Examples of such equipment are mixer pumps, transfer pumps, air lances, and monitoring equipment. The equipment may contain some residual waste and will require remote handling.

All of the LLCE meets the definition of debris and is being macroencapsulated and disposed into one of Hanford's MLLW Disposal Units (LLBG 218-W5 T31/T34). The macroencapsulation of LLCE began in CY 1996 and was performed at the T Plant facility. Since then, treatment has been done under the Treatment by Generator provisions and shipped directly to the disposal unit. However, it is anticipated that some of the larger LLCE items to be removed from the tanks will be too large to treat directly at the generation site. In these cases, the macroencapsulation treatment is best performed with in the MLLW Disposal Units (i.e., In-Trench Treatment).

In-Trench Treatment – Treatment Path for LDR Treatability Group MLLW-07

After obtaining the permit modification, treatment to meet the LDR requirements will be performed within the MLLW Disposal Units (LLBG 218-W-5 T31/T34) for waste packages containing debris and/or radioactive lead solids with no treatment path forward. The treatment capability consists of the use of immobilization technologies for mixed waste debris as listed under 40 Code of Federal Regulations (CFR) 268.45 Table 1, *Alternative Treatment Standards for Hazardous Debris* and MACRO in 40 CFR 268.42. In addition, the mixed waste containers will meet the 90 percent full container requirements following treatment. Treatment would be limited to those technologies that can be employed in/on containerized mixed waste.

Path Forward for LDR Treatability Group MLLW-08

Alternative treatments will need to be obtained to effectively treat LDR Treatability Group MLLW-08.

LDR Treatability Group MLLW-08 (Unique Waste) is comprised of waste that requires treatment by unique specified treatment technologies (e.g. recovery of metals, recovery by thermal) or for MLLW with dioxins/furans listed waste codes in which there is no known current treatment capability in the United States.

The path forward for this Treatability Group is to obtain treatment variances or determination of equivalent treatments (DETs) which will allow treatment of this waste by existing commercial methods and capabilities.

Path Forward for Treatability Group MLLW-09

Adoption by Ecology of the newly promulgated EPA treatment LDR standards for radioactively contaminated cadmium, mercury, and silver containing batteries will provide a path forward for this Treatability Group. Once the standards are adopted, this waste will be treated via macroencapsulation using commercial facilities.

Path Forward for LDR Treatability Group MLLW-10

The required treatment/processing of MLLW in LDR Treatability Group MLLW-10 will be assessed to determine if the current plan (i.e., disposition of this waste along with sodium from the decommissioning of the Fast Flux Test Facility (FFTF) is still viable and can meet the 2008 need date.

Waste Treatability Groups Process Flow Diagrams

Appendix C depicts the disposition process for the waste Treatability Groups. The waste was grouped with two primary discriminators: where the waste came from and where the waste will be processed. The waste sources are simply defined as existing (inventory) and future (forecasted). The processing locations are defined to be consistent with the TPA milestone M-91.

Secondary discriminators are the various waste packages and the radiation intensity of the waste, either CH or RH. Commercial facilities can only process CH MLLW in drums or small containers. On-site facilities will process MLLW when required. T Plant will process all of the remaining MLLW: RH and large containers of CH. In addition, T Plant will also process MLLW that is "unusual" in that special management may be required.

Waste "Treatability Groups" are included on the Flow Diagrams. These groups are those identified for Hanford in the LDR report. These groups describe how a particular waste will be processed for disposal.

The MLLW process planning will determine, based upon integration of the various constraints, when waste will be processed to assure that all requirements can be met. These planning elements, out of necessity, will be dynamic, in that they are frequently updated to reflect both the progress that has been accomplished as well as any changing requirements.

The Process Flow Diagrams provide the disposition for the MLLW delineated in Figures C-1 through C-3.

Assumptions

- Sufficient commercial treatment capacity is available for LDR Treatability Groups MLLW-02, MLLW-04a, MLLW-04B, MLL05 and MLLW-06
- Treatment/disposition path forward for MLLW-08 and MLLW-10 will be developed no later than June 2008
- Ecology to adopt the newly promulgated treatment LDRs for radioactively contaminated batteries (MLLW-09) in a timely manner
- T Plant will be used to meet the "M-91 Facility" treatment requirement for LDR Treatability Group MLLW-07 (i.e., RH MLLW requiring treatment) while alternative treatment capabilities will be used to meet the requirement for treatment of CH MLLW in large/over-size containers
- Adequate commercial thermal capability and capacity to treat LDR Treatability Group MLLW-03 will be available by no later than 2007
- O/C certification will be maintained through the life-cycle of waste treatment
- Approximately 7,500 m^3 of waste generated from retrieval operations will be MLLW and 80 to 90 percent of this MLLW will be debris waste, and 10 to 20 percent will be non-debris waste that may require thermal treatment
- Regulatory approvals to begin In-Trench Treatment in Trench 31 and Trench 34 will be obtained no later than 2006
- Regulatory approvals to expand the 200 Area Effluent Treatment Facility (ETF) delisting to include all listed waste constituents managed at the Hanford Site
- A change package will be approved by Ecology for milestones M-91-12 and M-91-12A to reflect the newly proposed treatment schedule included in Appendix E

3.3 WBS with Dictionary

Work Breakdown Structure (WBS) dictionary sheets are provided for each of the level 4 WBS elements in the Waste Management Project WBS Hierarchy for Project Baseline Summaries (PBS) RL-0013 and RL-0080. The WBS dictionary sheets identify scope of activities covered under the WBS, planning assumptions applicable for planning the work scope, functions and requirements that define the WBS work-scope, and source documents that drive the requirements. The WBS information is as of June 30, 2003, and changes frequently. Current WBS information is available on request.

The following WBS elements are applicable to the MLLW PMP and found in Appendix D.

WBS	Title
4.02.09	Mixed Waste Disposal Trenches
4.02.02	CWC
4.02.04.01	T Plant
4.02.04.03	M-91 Facility
4.02.10	Mixed Low-Level Waste Treatment
4.02.14	CERCLA Waste Disposal Phase II (ERDF) *Beginning in FY 2013*

3.4 Treatment, Storage and Disposal Capability/Capacity

Bases for Capabilities/Capacities

Annual and total forecast volumes and waste volumes currently in storage on the Hanford Site form the basis for the treatment alternatives and capacities. There is inherent uncertainty associated with any given waste forecast because the assumptions, goals, and mission driving a waste generating program baseline could change, thereby changing the assumptions that drive the forecast volume estimates. Although uncertainties cannot be eliminated entirely, uncertainties are minimized to the extent practicable by validating the SWIFT data

through a QA process that includes conducting peer reviews and interviews with waste generators.

A potential impact of the waste volume forecast uncertainties associated with total volumes and annual generation is that of required/needed through-put for treatment capabilities or facilities. Either under estimation or over estimation could occur.

Should the amount of waste to be treated be overestimated for a given period of time, the impacts on MLLW treatment would be primarily financial. With contracted services, penalties might result from underutilization of the contract or, in severe cases, priority of treatment might be lowered significantly. In the case of staffed facilities, the under utilization could result in an increase in unit cost of treatment.

For the underestimated case of the amount of waste needing treatment in a given time, the impacts could be any of several. Contracted treatment services may or may not be available, may be available at a premium price, or may not be available on a schedule as needed. In the case of staffed facilities, one or more of the facilities might need to be operated up to 24 hours a day as needed to meet milestone requirements rather than the planned one shift operation. This mode of operation would most likely result in decreased unit cost of treatment. In extreme cases of under estimation, sufficient additional capacity might not be available to meet schedule requirements.

Based on current estimates, including waste generated from suspect TRU retrieval operations, CWC can adequately support storage of MLLW and TRU waste (Figure 12).

Based upon current projections of waste volumes, waste characteristics, and available treatment capabilities, the following throughput treatment rates would be needed to meet the milestone values shown in the Schedule, Appendix E.

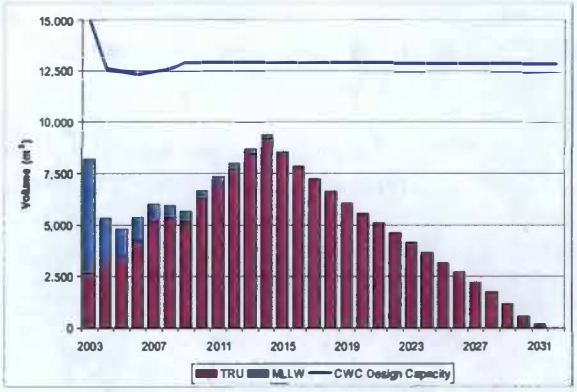


Figure 12. CWC Storage Volumes.

LDR Treatability Groups MLLW-02, MLLW-03, MLLW-04a, MLLW-04b, MLLW-05, MLLW-06, MLLW-08, MLLW-09, AND MLLW-10

The current projected volume for these Waste Treatability Groups is 16,975 m^3. The milestones identified on the Schedule, Appendix E, for this grouping of Treatability Groups shows that 1,630 m^3 must be treated annually.

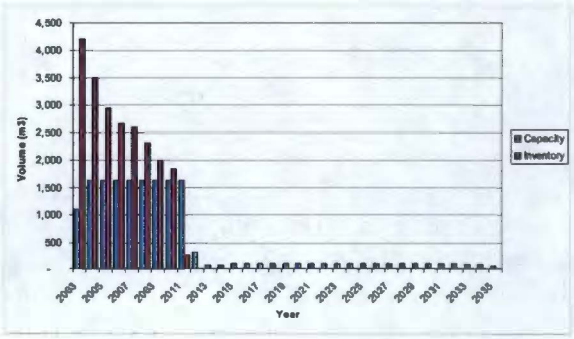


Figure 13. MLLW-02 through MLLW-06, and MLLW-08 through MLLW-10 Available Inventory Versus Process Capacity.

Figure 13 graphically represents the planned work-off for these Treatability Groups. This representation also identifies on an annual basis, the amount of waste from these Treatability Groups that would be available in inventory for treatment. The planned treatment capacities for FY 2004, FY 2005, and FY 2006 are based on the use of commercial MLLW treatment

services. Note that this required capacity is less than 50 percent of that contracted through FY 2006.

Outyear planned treatment capacities include a 20 percent contingency above projected needs. The graphic representation shows adequate capacity exists including the capability of treating additional volumes of these waste Treatability Groups should the need arise.

LDR Treatability Group MLLW-03

The current projected volume for this waste Treatability Group is 3,165 m^3. A total of 600 m^3 of this waste Treatability Group are subject to the M-91-12 and M-91-12A milestones. The remaining is treated as part of the previous Treatability Group.

The schedule (Appendix E)* provides cumulative annual treatment plans:

FY 03 (Actual)	45 m^3
FY 04	75 m^3
FY 05	150 m^3
FY 06	225 m^3
FY 07	300 m^3
FY 08	450 m^3
FY 09	600 m^3

Figure 14 graphically represents the planned work-off of this Treatability Group. This representation also identifies on an annual basis, the amount of waste from this Treatability Group that would be available in inventory for treatment. The thermal treatment capacity shown is based in the near term, through FY 06, the best assessment of capacity available to treat waste of this Treatability Group. Subsequent to FY 07, it is assumed that additional commercial treatment capability will be available to meet the milestone requirements. The continued capacity shown beyond the annual milestone requirements is included to identify that capability exists for treating additional volumes of this waste, should the need arise.

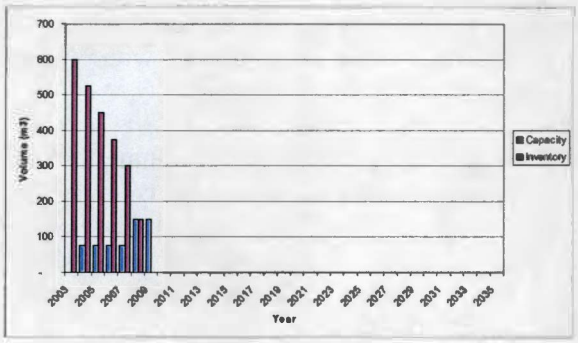


Figure 14. MLLW-03 Available Inventory Versus Process Capacity (M-91-12 and M-91-12A).

LDR Treatability Group MLLW-07

The current forecasted volume for this waste is 2,553 m^3. The schedule (Appendix E) provides annual treatment plans of 300 m^3 beginning in FY 2009.

Figure 15 graphically represents the planned work-off of this waste. This representation also identifies on an annual basis, the amount of waste that would be available in inventory for treatment. The treatment capacity shown actually consists of three treatment pathways:

- Commercial Capability
- In-Trench Treatment
- M-91 Capability

The total annual capacity is based upon completing the treatment of the currently identified waste by 2015 and remaining current, that is, not building up an inventory of this waste.

* A change package will be submitted for milestones M-91-12 and M-91-12A to reflect the newly proposed treatment schedule included in Appendix E

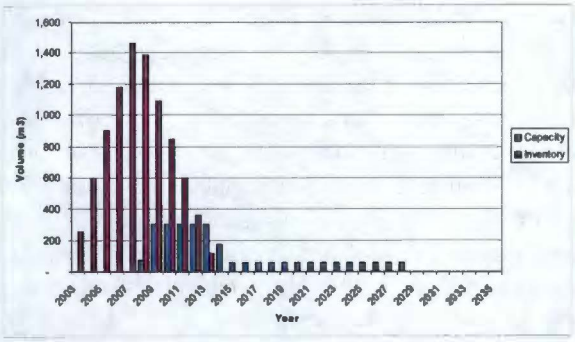


Figure 15. MLLW-07 Available Inventory Versus Process Capacity.

The commercial capability for treatment of this waste, with a commitment for implementation of September 30, 2004, represents an enhanced operation for the current commercial MLLW treatment provider. It appears feasible that this commercial treatment provider might be able to modify the existing treatment capability to receive larger containers of waste than current capability allows. In addition, some waste with higher radiation dose rates than CH might be acceptable. This treatment capability is being actively pursued.

The In-Trench Treatment pathway has a commitment for operational capability by September 30, 2006. During the regulatory process to obtain approval for this treatment, analyses of the waste of this Treatability Group will be undertaken to identify candidate containers for this treatment. Capacity requirements for this treatment pathway will be established.

The M-91 Capability treatment pathway has two "pre-operational" commitments:

- Issue Engineering Study/Functional Design Criteria (FDC) for CH large/oversize MLLW by September 30, 2006
- Issue Engineering Study/FDC for RH MLLW by December 31, 2007

The "Initiate Treatment" commitment for this waste is September 30, 2008.

The M-91 capability/capacity will be determined during the engineering studies and FDC document preparations.

The annual capacity shown, 300 m^3, that continues beyond FY 2015 is included to identify that capability exists for treating additional volumes of this waste, should the need arise.

The additional waste treatment capacities on the graphs beyond the identified milestones are shown to assume capability to meet the requirements of milestone M-91-42, "after June 30, 2009, treat all newly generated MLLW in accordance with the treatment requirements in compliance with WAC-173-303 and 40 CFR 268."

4.0 PROJECT CONSTRAINTS

4.1 External Schedule Requirements

Waste Volumes and Treatment Capacities

Total forecast volumes through 2035 and waste volumes currently in storage at the Hanford site form the basis for the MLLW Processing Capabilities Evaluation discussed in this PMP. The evaluation determined that the current and planned capabilities for MLLW processing are "reasonable" based on the current and future waste generation volumes. However, there is inherent uncertainty associated with waste forecasts due to changes experienced in the waste generator's program baselines.

Regulatory Requirements

Regulatory requirements for permitting and National Environmental Policy Act (NEPA)

documentation will be coordinated to minimize potential impacts to the TPA schedule and achievement of milestones. Environmental impacts from performing M-91-00 activities such as construction or modification of an existing facility have been analyzed in the draft Hanford Site Solid Waste Program Environmental Impact Statement (HSW-EIS). Revisions to the MLLW Trench's RCRA Part A permit will be completed to support treatment of waste in the trench. Revisions to the RCRA Part B and air permits will be completed to support start up of operations by 2012.

Funding Constraints

Funding, work scope, and project assumptions are limited to and consistent with DOE-RL Budget Update Guidance for life cycle planning. This guidance is incorporated into the life cycle baseline when received.

Technology Constraints/Technology Demonstrations

Thermal Desorption

Thermal desorption is a thermal treatment separation process that uses elevated temperature (up to 625° F), reduced pressure, and a carrier gases (steam and inert gases) to remove the volatile or semi-volatile organics from the inorganic portion of the waste. The desorbed organics are collected and treated using either chemical oxidation or combustion to convert them to their final products (primarily CO_2 and H_2O). The solids (mostly inorganics) are treated separately if necessary (e.g., using conventional stabilization techniques to stabilize heavy metals). Major advantages of the process are the limited air emissions and the large variety of waste that it is capable of treating.

Hanford has utilized thermal desorption to treat 73 drums of LDR Treatability Group MLLW-03 waste during FY 2003 at Perma-Fix. This treatment activity was done as a technology demonstration to test the effectiveness of the technology on treating Hanford's waste. The 73 waste packages chosen represented a good cross section of the Treatability Group and included; labpacks, particulates, absorbed liquids and sludges, all with multiple organic contaminants. The treatment was effective; however the treatment capacity is limited and the cost is approximately 10 times that of non-thermal treatment processes. Information gained from the technology demonstration will be used in planning further treatment campaigns.

Characterization Constraints

Characterization of some of the MLLW in storage, as well as suspect MLLW expected to be generated from retrieval and other clean up operations, currently is limited by available technology and facilities. In specific, nondestructive examination (x-ray) and nondestructive assay capability for RH MLLW and/or MLLW in large/over-size containers is not readily available at the present time and will need to be developed to support on-going characterization efforts.

Treatability Groups for Which Treatment Technology Has Not Been Selected

Some of the stored waste and potentially some of the waste forecasted to come from generators and/or retrievably stored waste have attributes for which no treatment is available or there is limited capacity in the United States. These waste Treatability Groups represent relatively small volumes. An assessment will need to be performed to determine the best disposition approach for these wastes. The following LDR Treatability Groups may have waste with this constraint:

- MLLW-08, Special Wastes
- MLLW-09, Radioactive Contaminated Regulated Batteries
- MLLW-10, Reactive Metals

As discussed in Section 3.2, Planned Approach, MLLW in LDR Treatability Group MLLW-08

will require regulatory approval by EPA and Ecology of alternative treatments to effectively treat these wastes. In addition, the path forward for treatment of LDR Treatability Group MLLW-09 will require adoption by Ecology of the newly promulgated EPA treatment LDR standards for radioactively contaminated cadmium, mercury and silver containing batteries. Treatment and disposition of these Treatability Groups will require close coordination with EPA and Ecology to ensure compliance schedules are met.

The required treatment/processing of MLLW in LDR Treatability Group MLLW-10 will need to be assessed to determine if the current plan (i.e., disposition of this waste along with sodium from the decommissioning of the FFTF) is still viable.

5.0 SCHEDULE AND CRITICAL PATH ANALYSIS

The MLLW Processing Schedule, Appendix E, is segmented in 3 Groups, with each Group containing specific waste Treatability Groups:

1. LDR Treatment Groups MLLW-02, MLLW-03 (not including 600 m^3 from Group 2), MLLW-04a, MLLW-04b, MLLW-05, MLLW-06, MLLW-08, MLLW-09, AND MLLW-10
2. LDR Treatment Group MLLW-03 (600 m^3)*
3. LDR Treatment Group MLLW-07

Each Group above has specific treatment requirements and associated activities necessary to accomplish the milestones established for that Group. The following discussion identifies the critical activities and schedule elements for each group.

Group 1

For treatment of the MLLW in Group 1 above, the milestone schedule is prescriptive. The annual cumulative volumes require a continual process operation to achieve the annual treatment quantities.

The treatment of these wastes (see Section 3.2, Planned Approach) falls into two categories - commercially available services and yet-to-be-determined technologies. For the first of these "sub-groups," commercially available services treatment capability requires two critical actions to accomplish the prescribed milestone volumes:

1. Contract(s) with a waste treatment provider with sufficient capacity
2. Adequate waste feed from existing inventory and new waste generation

For the first action, contracts with an existing treatment provider have already been established for waste Treatability Groups MLLW-04a, 4b and 05. The treatment quantities and schedule in the contracts with the treatment provider are sufficient to meet commitments through CY 2005. Establishment of new contracts for the remaining waste is a critical activity; however, the time to place the contracts are not critical path in its self. Instead, the availability of funding that is guaranteed on a multi-year basis is considered a critical path item. Guaranteed multi-year funding would allow for the placement of contracts with guaranteed multi-year minimums. This would assure that a treatment provided would set-aside sufficient treatment capacity earmarked for Hanford waste.

For the second action, assuring adequate waste feed to meet both quantity and schedule requirements is schedule controlling. The critical activity is characterization of existing waste. Of the total quantity of waste required to be treated, about 5,000 m^3 is currently in inventory. A portion of this waste will require further characterization to better assure compliance with transportation and treatment

* A change package will be submitted for milestones M-91-12 and M-91-12A to reflect the newly proposed treatment schedule included in Appendix E

requirements. Cost, schedule and facility limitations for characterizing large quantities of the MLLW would jeopardize meeting the M-91-42 waste volume commitments. To keep this from occurring, the existing waste characterization information will be used to the extent possible to meet transportation, treatment and disposal requirements. This approach will assure that there will be adequate waste feed to treatment facilities.

Within Group 1, the unique and reactive waste treatment technologies are not yet defined. When definition is identified, a critical path analysis will be undertaken and reported. Since no time frame has been established for the treatment technology definition, it is a critical item.

Group 2

For the wastes in Group 2, thermal treatment is the required process. The activities necessary to initiate thermal treatment of this waste group are series events, that is, one following another. For example:

- Identify commercial treatment capability to meet needs for all or part of this Treatability Group
- Analyze the Waste Acceptance Criteria of the treatment supplier for applicability to the Group 2 wastes
- Identify specific waste containers as candidates
- Submit waste profiles and schedule needs to commercial treatment supplier
- Obtain cost and schedule proposal from the supplier
- Issue contract for treatment services

Durations for these types of activities are not available at this time. As soon as schedule definition is available, a critical path analysis will be undertaken and reported. Establishing thermal treatment capability is a critical activity.

Group 3

Three treatment pathways for the waste in this group are identified in Section 3.2, Planned Approach:

1. Treatment by Generator
2. In-Trench Treatment
3. M-91 Capability

The schedule requirements for this waste group identify activities starting by September 30, 2004, with annual milestones through June 30, 2011.

For the September 30, 2004, action "Completion of Limited Commercial Treatment Capability," pathway 1 above, provides for treatment by commercial suppliers of larger waste containers than are included in existing contracts and containers of the higher activity, above contact handled dose rates.

Activities necessary to accomplish this capability include:

- Providing Hanford treatment needs, waste characteristics and schedule (through-put) requirements to commercial suppliers
- Supplier scoping of potential plant modifications
- Obtaining corporate commitment from supplier(s)
- Supplier designing the required modifications
- Supplier modifying regulatory permits, if necessary
- Supplier installing equipment, testing system
- Executing contract with supplier
- Obtain transportation capability
- Obtain permits and/or radiological material license changes to enhance off-site treatment

This treatment pathway is a critical activity.

The second pathway, treatment by generator, is included in the Baseline for the waste Generator of the long length contaminated equipment from underground storage tanks. As this waste will be treated as it is generated, activities for this pathway are not critical items.

The third pathway, In-Trench Treatment, applies previously developed macroencapsulation capability at the disposition location. To implement this treatment pathway, modification of the existing regulatory permit for the Mixed Waste Disposal Facility is required. The milestone for obtaining the regulatory approval is September 30, 2006. As this type of macroencapsulation is a proven operation at Hanford and would require only minimal "development," the critical activity for this treatment pathway is the Permit Modification.
The fourth pathway, M-91 Capability, has an initial milestone for issuing the engineering study/ functional design criteria by September 30, 2005. All other activities associated with this treatment pathway will follow this milestone. Thus, the engineering study/functional design criteria is the critical activity.

5.1 Logic Tied Life Cycle Schedule

The Appendix E provides a schedule of activities associated with the M-91 Processing Capability. The activities are subject to change based upon project progress and application of lessons learned, interface activities outside of the project, budget changes, and contractual items.

Projections of budget and planned processing of MLLW Treatability Groups still show that the project will be completed by FY 2035.

6.0 KEY DELIVERABLES /PRODUCTS

Key products/deliverables that will be developed in support of implementation of the M-91 Change Package include:

- Reports describing completed and scheduled work relating to RH MLLW and CH MLLW in large boxes and containers, including the commitments including status against the commitments in the schedule (Appendix E) annually
- Engineering Study/Functional Design Criteria study for CH MLLW in large boxes and containers (completed by September 30, 2005)
- Engineering Study/Functional Design Criteria study for RH MLLW (completed by December 31, 2007)
- Revised M-91-03 PMP by March 31, 2009 and March 31, 2013

7.0 PERFORMANCE MEASUREMENT

7.1 Milestones and Accomplishments

Performance to meet the milestones established in the M-91 Change Package (M-91-45) and this PMP will be measured using a combination of traditional project management metrics such as cost and schedule performance. In addition, actual volumes of MLLW treated versus the annual milestone requirements will be monitored real-time to ensure that regulatory commitments are met.

8.0 PROJECT CONTROL

System and technical requirements will be made consistent and traceable throughout the WBS as these requirements are developed during the engineering and planning phases of the project. The control system activities will be compatible with related project management activities.

8.1 Project Interface Control

Project interfaces will be controlled by interface control document (ICD), Memorandum of Agreement (MOA) or the Memorandum of Understanding (MOU) process when applicable. The definition of roles, responsibilities and authorities will be negotiated based on the type of interface management documentation to be developed.

Interface among the M-91-03 MLLW activities and other projects, including waste generating programs for inventory tracking and capacity configuration purposes, is essential for a successful project execution. The following is a list of waste activities and projects which will require interface:

- Waste Generating Programs
- Office of River Protection
- WRAP Facility
- TRU Retrieval
- Environmental Impact Statement Project Team
- ERDF

The waste forecasting system and the waste acceptance criteria are operating as interface controls.

8.2 Reporting and Notification Requirements and Processes

Reporting requirements in the TPA are described in TPA Section 4.0, Agreement Management. The primary interface for reporting and notifications are through the DOE Project Managers and to their regulator counterparts or through the Interagency Management and Integration Team (IAMIT). The roles and responsibilities for the Project Manager and IAMIT are contained in TPA Sections 4.1 and 4.2, respectively.

A reporting system will be implemented to provide the status relative to meeting all TPA milestones associated with M-91-03 MLLW. The system will maintain a standardized structure to measure progress against established schedules.

9.0 CHANGE MANAGEMENT

TPA Change Management

Changes to the M-91 PMP will be in accordance with the TPA Action Plan, Chapter 9, Documentation and Records, Section 9.3, Document Revision. Changes or revisions to the PMP may also result in the need to modify TPA milestones. Such changes are subject to the requirements of Section 12.0, Changes to the Agreement, of the Action Plan.

Lifecycle Baseline Change Management

Changes to the life cycle baseline implementing the MLLW PMP will be under change control in accordance with the change management process (HNF-PRO-187477). This guidance defines the requirements and work processes for changing the LifeCycle Baseline Cost,

technical, or schedule that defines and control work scope to be performed in FY 2004-2035.

Modifications to the established life-cycle baseline scope, cost, and schedule will be managed through a baseline change request. Modifications to the established technical baseline contained within the Hanford Site Technical Database (HSTD) will be managed through a HSTD Change Request (HCR) in conjunction with a baseline change request, as necessary.

All baseline change requests for modifications to the Life-Cycle Baseline noted above are to be submitted to the FH Change Control Administrator for entry into the Life-Cycle Baseline Change Log. Baseline change request approvals will be needed based on the following RL-level changes:

- Contract Statement of Work
- Performance Incentives objectives, definitions or completion criteria
- End state definitions
- Contract funding levels
- Annual gold chart metrics
- Impacts to other site contractors
- BCWS changes per PBS per execution year for 15% and $5 million or
- BCWS changes per PBS to total life-cycle cost of more than 2%

If RL review and approval is required, the RL approved baseline change request will be utilized for updates to the Baseline. The HSTD change requests are to be submitted to the HSTD Change Control Administrator for entry into the HSTD Change Control Log.

Administrative changes are minor changes to baseline documents that do not materially alter content (e.g., typographical errors that do not affect units of measure) do not require approval of the Rebaselining Project Manager. These changes will be reflected in baseline displays only after direction by the Rebaselining Project Manager.

10.0 REFERENCES

[1] Hanford Federal Facility Agreement and Consent Order, also known as the Tri-Party Agreement (TPA)

[2] Calendar Year 2002 Hanford Site Mixed Waste Land Disposal Restrictions Report

[3] Hanford Solid Waste Acceptance Criteria, HNF-EP-0063 (latest revision)

[4] Solid Waste Integrated Forecast Technical (SWIFT) Report, HNF-EP-0918 2003.1 (revision 12)

[5] Wood M.I., R. Khaleel, P.D. Rittmann, A.H. Lu, S.H. Finfrock, R.J. Serve, K.J. Cantrell, and T.H. De Lorenzo, 1995, Performance Assessment for the Disposal of Low-Level Waste in the 200 West Area Burial Grounds, WHC-EP-0645, Westinghouse Hanford Company, Richland, Washington

APPENDIX A

GLOSSARY AND DEFINITION OF TERMS

Definitions from the M-91 change package as discussed in this plan are as follows:

- Mixed Low-Level Waste (MLLW)

  MLLW, also referred to as Low-Level Mixed Waste (LLMW), is LLW that is subject to RCRA or 70.105 RCW. MLLW contains both low-level radioactive materials and low-level hazardous chemicals.

- Transuranic (TRU) Waste

  TRU waste is defined as waste that meets the definition in subsection (18) of Section 2 of the Waste Isolation Pilot Plant (WIPP) Land Withdrawal Act, Pub. L. 102-579. TRU waste includes both "mixed transuranic waste" (TRUM) and non-mixed transuranic waste (TRU), and comprises the following categories: CH-TRU, CH-TRUM, RH-TRU, and RH-TRUM.

- Contact-Handled (CH) Waste

  Contact Handled (CH) waste is a waste package with a surface dose rate less than 200 mrem/hr.

- Remote-Handled (RH) Waste

  Remote-handled (RH) waste is a waste package with a surface dose rate equal to or greater than 200 mrem/hr.

- Retrieval of CH-RSW

  This is defined as uncovering CH wastes within DOE's RSW trenches, and removing such CH wastes from the trenches to a permitted and compliant treatment, storage or disposal facility, the Environmental Restoration Disposal Facility (ERDF) or for waste designated in accordance with WAC 173-303-070 through 100 as non-mixed to a storage or disposal facility that DOE determines is appropriate. Storage of any CH HSW that has not been designated as non-mixed pursuant to WAC 173-303-070 through 100 shall include secondary containment pursuant to WAC 173-303-630(7).

- Retrieval of RH-RSW

  This is defined as uncovering RH wastes within DOE's RSW trenches and caissons, and removing such RH wastes from the trenches to a permitted and compliant treatment, storage or disposal facility, the Environmental Restoration Disposal Facility (ERDF) or for waste designated in accordance with WAC 173-303-070 through 100 as non-mixed to a storage or disposal facility that DOE determines is appropriate. Storage of any CH HSW that has not been designated as non-mixed pursuant to WAC 173-303-070 through 100 shall include secondary containment pursuant to WAC 173-303-630(7).

- Waste Designation

  Designation is defined as the process for determining: (1) which containers of LLW are MLLW: and, (2) which containers of TRU waste are mixed TRU (CH-TRUM or RH-TRUM). Designation of waste will be performed pursuant to WAC 173-303-070 through 100. These regulations allow the use of "Acceptable Knowledge," surrogate sampling and other measures for designation to minimize workers' radiation exposure and to reduce costs. Where applicable, DOE intends to use information gathered through

the certification of TRU waste in support of its designation of related LLW Treatability Groups. Where appropriate, DOE will use measures allowed under state and federal regulations to perform accurate and cost effective designations of LLW.

Other acronyms and definitions include:

AEC – Atomic Energy Commission

BDAT – Best Demonstrated Available (treatment) Technology

CERCLA – Comprehensive Environmental Response, Compensation and Liability Act

CFR – Code of Federal Regulations

CWC – Central Waste Complex

DETs – Determination of Equivalent Treatments

DOE – U. S. Department of Energy

DOE-RL – U. S. Department of Energy Richland Operations Office

DSSI – Diversified Scientific Services, Inc.

EA – Environmental Assessment

Ecology – Washington State Department of Ecology

ETF – Effluent Treatment Facility

EIS – Environmental Impact Statement

EM – Environmental Management, DOE

EPA – Environmental Protection Agency

ERDF – Environmental Restoration Disposal Facility

FDC – Functional Design Criteria

FH – Fluor Hanford, Incorporated

FFTF – Fast Flux Test Facility

FY – Fiscal Year

GASVIT – Glassification-Vitrification unit

HAB – Hanford Advisory Board

HCR – HSTD Change Request

HDW-EIS – Hanford Defense Waste Environmental Impact Statement

HFFACO – Hanford Federal Facility Agreement Consent Order – or "The Agreement"

HSGS – Headspace Gas System

HSTD – Hanford Site Technical Baseline

HSW-EIS – Hanford Solid Waste Environmental Impact Statement

HSSWAC – Hanford Site Solid Waste Acceptance Criteria

ICD – Interface Control Document

IDF – Integrated Disposal Facility

IAMIT – Interagency Management and Integration Team

INEEL – Idaho National Engineering and Environmental Laboratory

ISMS – Integrated Environmental, Safety, and Health Management System

LDR – Land Disposal Restriction

LLBG – Low-Level Burial Grounds

LLCE – Long-length contaminated equipment

MOA – Memorandum of Agreement

NOC – Notice of Compliance

MOU – Memorandum of Understanding

NEPA – National Environmental Policy Act

NPDES – National Pollutant Discharge Elimination System

O/C – Organic/Carbonaceous

ORP – Department of Energy Office of River Protection

PBS – Project Baseline Summaries

PEcoS – Pacific Eco-Solutions

PHMC – Project Management Hanford Contract

PMP – Project Management Plan

Pu – Plutonium

PFP – Plutonium Finishing Plant

QA – Quality Assurance

QC – Quality Control

RCRA – Resource Conservation and Recovery Act of 1976

ROD – Record of Decision

RPP – River Protection Project

RSW – Radioactive Solid Waste

SWB – Standard Waste Box (1.80 meters in length, 1.38 meters wide, and 0.94 meters high)

SW-PEIS – Hanford Site (Radioactive and Hazardous Program EIS)

SWITS – Solid Waste Inventory Tracking System

SW EIS ROD – Solid Waste Environmental Impact Statement Record of Decision

SWIFT – Solid Waste Information Forecasting Tool

TRU/TRUM – Transuranic/Transuranic Mixed Waste

TPA – Tri-Party Agreement

TSCA – Toxic Substances Control Act

TSD – Treatment, storage, and/or disposal

UHC – Underlying Hazardous Constituents

UTS – Universal Treatment Standards

WBS – Work Breakdown Structure

WERF – Waste Experimental Reduction Facility

WHC – Westinghouse Hanford Company

WIPP – Waste Isolation Pilot Plant

WMP – Waste Management Project

WM PEIS ROD – Waste Management Programmatic Environmental Impact Statement Record of Decision

WRAP – Waste Receiving and Processing Facility

WSRd – Waste Specification Record

Appendix B:

Treatability Groups Data Tables

(consisting of 4 pages)

Table B-1: MLLW Treatability Groups
Volume in Cubic Meters - Inventory 12/31/02

LOCATION FAC	MLLW-01	MLLW-02	MLLW-03	MLLW-04A	MLLW-04B	MLLW-05	MLLW-06	MLLW-07	MLLW-08	MLLW-09	MLLW-10
200 ETF	6	0.2		27.2							
202-S				10							
222-S Laboratory	208	1.248	5.408	1.644				0.624			
242-A Evaporator				0.26							
CWC	1,122	2,742	811	1,383	140	429	13	80	1	8	18
T Plant Complex	33	3.308	14.168	22.04	4.128	0.208			19.64	0.416	0.208
WRAP	0.2	0.04	8	1.8	0.679						
Total	*1,368.7*	*2,746.8*	*838.6*	*1,446.0*	*144.8*	*429.2*	*13.0*	*80.6*	*20.2*	*8.4*	*18.2*

Table B-2: MLLW Treatability Groups Container Quantities - Inventory 12/31/02

LOCATION FAC	MLLW-01	MLLW-02	MLLW-03	MLLW-04A	MLLW-04B	MLLW-05	MLLW-06	MLLW-07	MLLW-08	MLLW-09	MLLW-10
2402WB	3	1	420	313	7	11					
2402WC		62	15	27			1				1
2402WD		35	317	35	1	4					
2402WE		41	51	36	4	56	4			2	
2402WF	7	27	15	245	4	10		4			
2402WG	1	3	2	25	4	4					
2402WH	11	90	45	77	3	22	2			10	
2402WI		1									
2402WJ		208	111	85	1	10	2	1		15	
2402WL		2	1	8							
2403WA	215	6,341	296	935	15	263	19	2		2	
2403WB	13	21	311	102	10	69	3	8			
2403WC	211	1,994	689	884	39	447	19	5	1	6	
2403WD	2,672	948	117	472	6	207	5	3			
2404WA		30	128	112	7	22	4	3			
2404WB		1	63	51	9	5	1				
2404WC		9	23								
AMW2			5								19
AMW3		1	2								8
AMW4											27
FS01		11	6								
FS02		11	4	2							
FS03		24	11				1				
FS04			8								
FS05			24								
FS06			8						1		1
FS07		5	15	2							
FS08			11								
FS09		2	14								
FS10		10	11								
FS11			2								
FS12		24									
FS13		4	10	2			2				
FS14		12	16	4		2					
FS15		9	8			3					
FS16		8	11	9		1					
FS17		16	7	1							
FS18		20	9	3			1				
FS21		4	17								
FS22		5	14	1							
FS23			11	1					1		
FS24		1	15			1					
FS25				3	1	1					
FS26		13	35								
FS27		8	12								
SA				45	2						
Grand Total	3,133	10,002	2,890	3,480	113	1,138	64	26	3	35	56

* Inventory Container Count is for CWC MLLW only

Table B-3: MLLW Treatability Groups

Volume in Cubic Meters - Forecast 12/31/02

WG_NAME	MLLW-01	MLLW-02	MLLW-03	MLLW-04A	MLLW-04B	MLLW-05	MLLW-06	MLLW-07	MLLW-08	MLLW-09	MLLW-10
100 Area Reactors(2)			3								
222-S Analytical Laboratory	17		97	1,045		33		30			2
242-A Evaporator(2)				11							
2724WB(2)		1	0.1		3						
324(2)		14	15	5		64				0.4	
325 HWTU(2)								41		4	
327(2)		8	6			3	0				
CWC(2)		31					5				
Fast Flux Test Facility											0.3
Hanford Site Operations (Infrastructure)(1)		7									
K-Basin Operations, 100-K(1)			8								
Liquid Effluent Facilities, 300 Area(1)		7	6	27							
Liquid Waste Processing Facilities, 200 Area	1,806	7		214							
LLBG(2)				24							
Pacific Northwest National Laboratory(1)	38		7			3		2			
Plutonium Finishing Plant, 234-5 Z	3	44	62	13	0.3	3	3			3	
RH and Oversized MLLW/TRU(M) Facilities (M-91)(1)		96	169	341							
T Plant Operations, 221-T/2706-T	1	1	8	105	76					0	
Tank Closure(1)	6,464		199								
Tank Farm Facilities(2)		3	89	371	367	11		1,337			
TRU(M) Retrieval(3)			1,500	5,400	600						
Vadose Zone Well Drilling(1)	229										
W-211 DST Retrieval Systems (10 tanks)(1)	1,513										
W-521 Waste Feed Delivery System (8 tanks)(1)	2,347										
Waste Encapsulation & Storage Facility(1)						9		6			
Waste Feed Operations(1)	10,588										
Waste Receiving and Processing Facility, 2336-W(1)			6								
Waste Sampling & Characterization Facility, 6266	-	1	152	1							
Waste Treatment Plant - Operations(1)	7,283							1,057			
Well Maintenance Debris(2)				25							
Total	30,287	219	2,327	7,582	1,046	125	8	2,472	-	7	2

Note: The forecast is compiled from the MLLW to be generated by TRU retrieval activities, the LDR Report forecast, and the SWIFT forecast. The LDR forecast is used for years 2003-2007 and the SWIFT forecast is used for 2008-2035.

(1) Data is from the SWIFT forecast only

(2) Data is from the LDR forecast only

(3) TRU(M) Retrieval is not included in either the SWIFT or LDR forecast

Table B-4: MLLW Treatability Groups

Container Count Forecast* - Inventory 12/31/02

WG_NAME	MLLW-01	MLLW-02	MLLW-03	MLLW-04A	MLLW-04B	MLLW-05	MLLW-06	MLLW-07	MLLW-09	MLLW-10
222-S Analytical Laboratory	60		323	2,128		121		112		
Fast Flux Test Facility										1
Hanford Site Operations (Infrastructure)		28								
K-Basin Operations, 100-K			32							
Liquid Effluent Facilities, 300 Area		27	23	106						
Liquid Waste Processing Facilities, 200 Area	6,793			591						
Pacific Northwest National Laboratory	88		26			11		6		
Plutonium Finishing Plant, 234-5 Z	1	17	24	4	1	1	1		1	
RH and Oversized MLLW/TRU(M) Facilities (M-91)		46	81	163						
T Plant Operations, 221-T/2706-T		5	26	346	295					
Tank Closure	4,046		192							
Vadose Zone Well Drilling	396									
W-211 DST Retrieval Systems (10 tanks)	135									
W-521 Waste Feed Delivery System (8 tanks)	431									
Waste Encapsulation & Storage Facility						34		25		
Waste Feed Operations	8,563									
Waste Receiving and Processing Facility, 2336-W			25							
Waste Sampling & Characterization Facility, 6266			560							
Waste Treatment Plant - Operations	1,984							494		
Grand Total	22,498	122	1,312	3,338	296	167	1	637	1	1

*Only includes SWIFT Report data for 2008 - 2035. Container count information for LDR forecast is not included in this table

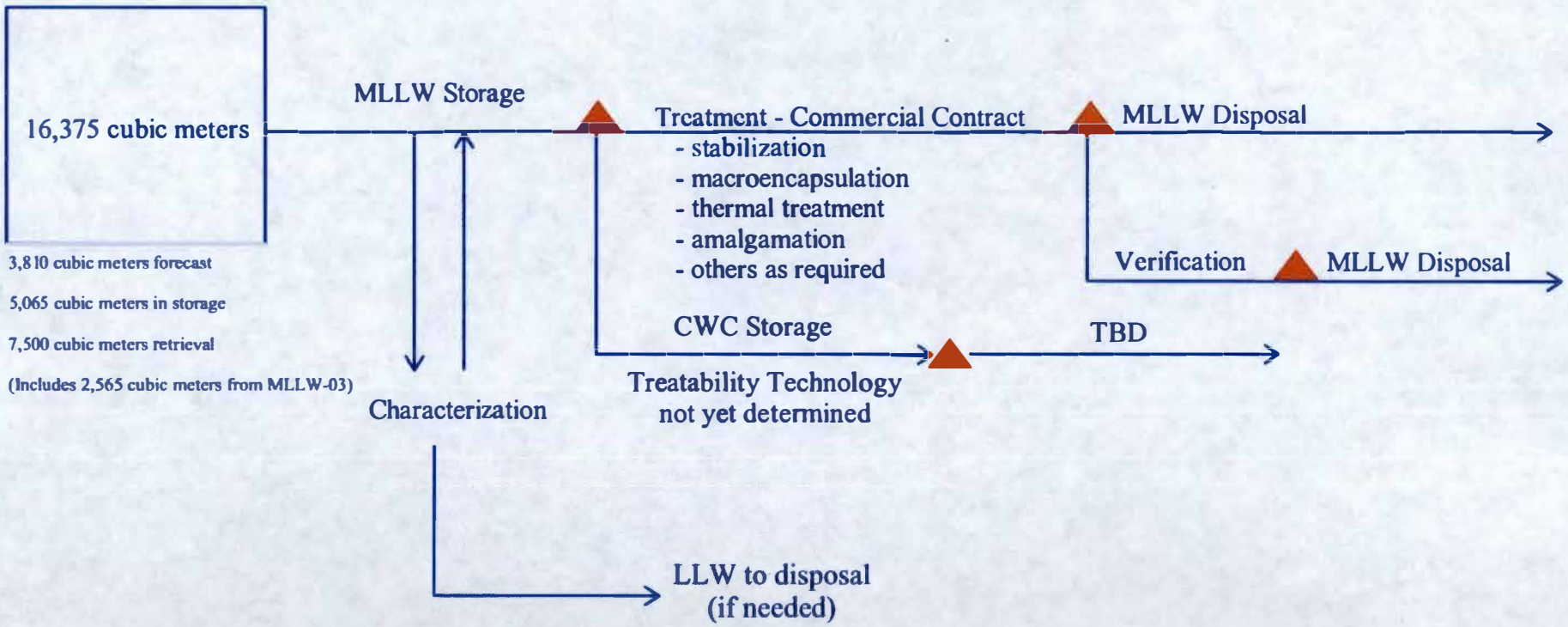
Appendix C:

Treatability Groups Process Flow Diagrams

(consisting of 3 pages)

Figure C-1: Treatability Groups Process Flow Diagrams

Group 1: MLLW-02, MLLW-03, MLLW-04, MLLW-05, MLLW-06, MLLW-08, MLLW-09, MLLW-10



NOTE: Does not include 600 cubic meters of MLLW-03 treated under M-91-12 and M-91-12A milestones

Figure C-2: Treatability Groups Process Flow Diagrams

Group 2: MLLW-03
(600 cubic meters)

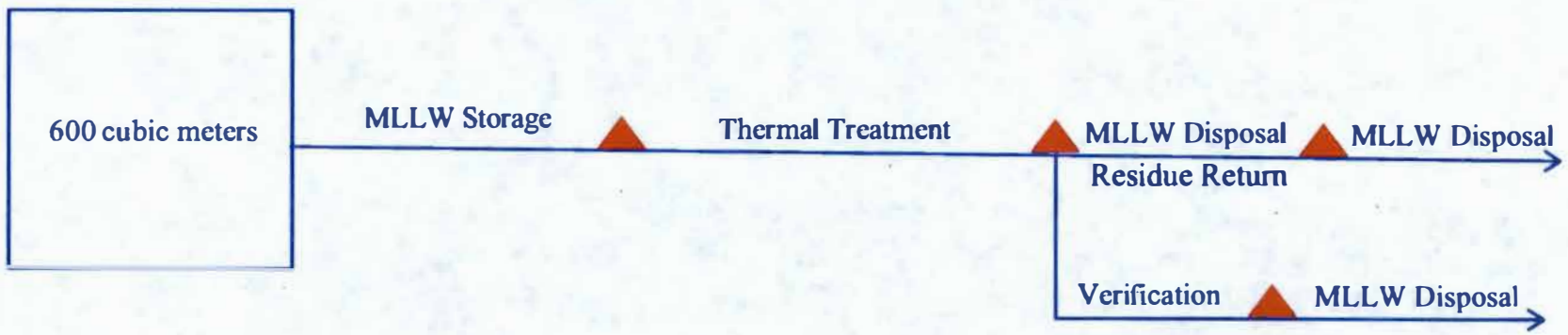
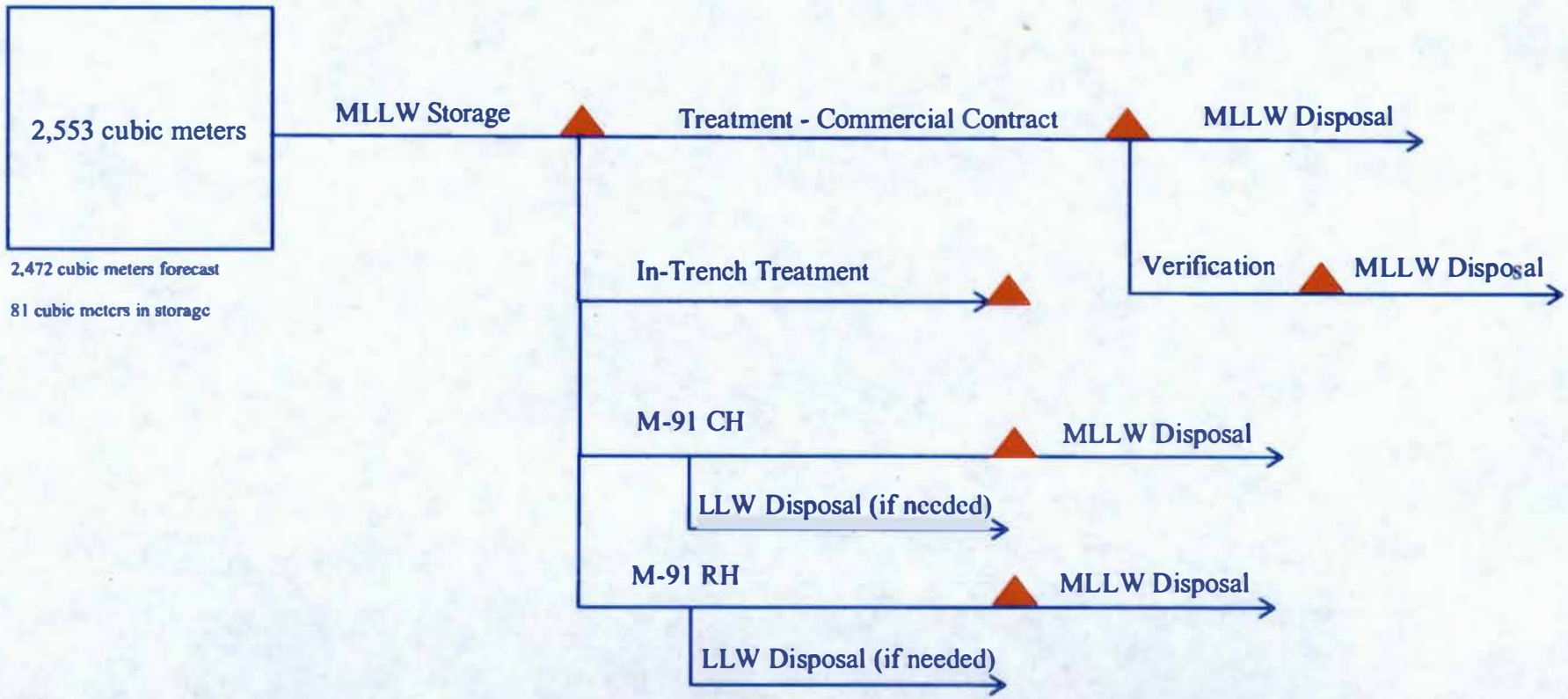


Figure C-3: Treatability Groups Process Flow Diagrams

Group 3: MLLW-07



Appendix D:

WBS Elements Applicable to the Project Management Plan

(June 30, 2003)

(consisting of 10 pages)

FH Reporting Baseline

1.8.2 Mixed Waste Disposal Trenches (MWDT) (4.02.09)

1. Dictionary Title Mixed Waste Disposal Trenches (MWDT)	2. Date 25 June 2003	3. FH Project Waste Management - McKenney, D. E.	
4. Contract WBS No. 4.02.09	5. Dict Rev	6. B & R No.	7. Baseline CR No.
8. RL PBS Name RL-0080 - Operate Waste Disposal Facility			

- **Scope of Work**

  Planned work scope provides activities to maintain safe and compliant conditions within the Mixed Waste Trenches. Provide surveillance and maintenance of structures, systems, components, and processes to ensure operation within the approved safety and compliance requirements envelope, including preventive maintenance and calibrations, repair of failed and malfunctioning equipment, walkdown of safety systems, equipment and facility grounds (operational surveillance), and routine radiological surveys. Management of leachate generated at the MWT and maintenance of the leachate transport tanker is included.

  For FY 2007 and beyond, activities also include design, permitting and construction of MWT closure covers.

Key Assumptions
The Mixed Waste Disposal Trenches will be maintained a ready-to-serve status for the receipt for interim storage and/or disposal of MLLW from generators approved by RL.

Approval to dispose of TSCA regulated waste in the MWT will be evaluated on a case-by-case basis.

Continued MLLW disposal in the MWT will require transport of leachate to 200 ETF for treatment and disposal.

Waste treatment/storage/disposal requests from all generators approved by DOE-RL shall be supported.

MLLW received from non-PHMC generators will be delivered LDR compliant and directly disposed.

The Mixed Low-level Waste Trenches shall be operated and maintained in a safe and

compliant manner in compliance with the Low-Level Burial Grounds Authorization Agreement, 02-ABD-0120.

Drivers

Key documents used for allocating Site requirements to this WBS include:

02-ABD-0120	Approval of the Central Waste Complex (CWC) and Low Level Burial Ground (LLBG) Authorization Agreement Annual Updates
61 FR 41956, August 9, 1996, Doc. 96-20237	Record of Decision for the Disposal of Decommissioned, Defueled Cruiser, Ohio Class, and Los Angeles Class Naval Reactor Plants
65 FR 10061, February 25, 2000, Doc. 00-4439	Record of Decision for the Waste Management Program: Treatment and Disposal of Low-Level Waste and Mixed Low-Level Waste; Amendment of the Record of Decision for the Nevada Test Site
DOE/RL-89-10	Hanford Federal Facility Agreement and Consent Order (Tri-Party Agreement), Revision 5
HNF-EP-0063	Hanford Solid Waste Acceptance Criteria

1.8.5 Central Waste Complex (CWC) (4.02.02)

1. Dictionary Title Central Waste Complex (CWC)	2. Date 26 June 2003	3. FH Project Waste Management - McKenney, D. E.	
4. Contract WBS No. 4.02.02	5. Dict Rev	6. B & R No.	7. Baseline CR No.
8. RL PBS Name RL-0013 - Solid Waste Stabilization and Disposition - 200 Area			

- **Scope of Work**

Central Waste Complex:

Specific activities planned provide for the minimum safe operations and maintenance of the CWC facilities to maintain compliant facility conditions, monitoring and surveillance of existing waste inventories; and for preparation to receive LLW, MLLW and TRU wastes for safe interim storage. Activities include operations, engineering, radiation control, and maintenance of the facility buildings. Permitting, training, procedure development, and environmental compliance activities are included in support of Solid Waste Storage and Disposal Facilities. It also provides replacement of capital equipment not related to construction (CENRTC) in support of the CWC, LLBG (Low-Level Burial Grounds), and MWT (Mixed Waste Trenches) for forklifts, vehicles, and other equipment that exceed their useful life.

Interim Storage and Disposal:

Specific activities planned provide radioactive and hazardous waste services to the waste generators from Solid Waste Services in support of Hanford cleanup activities and DOE complex wide Projects. Activities to dispose of low-level and mixed low-level waste, designate and ship hazardous waste, manage off site Treatment, Storage, and Disposal Facilities (TSDF) contracts, and to store mixed and transuranic wastes are included. Components of Interim Storage and Waste Disposal include placement of waste into storage or disposal, waste approval, waste designation, waste acceptance, waste verification, generator assistance, generator assessments, Solid Waste Inventory Tracking System (SWITS) maintenance, generator training for SWITS, waste billings, waste forecasting and maintenance of the Solid Waste Integrated Forecasting Tool (SWIFT), and rate development. This service only covers normal waste receipt activities and standard waste containers. The cost of special activities will continue to be borne at actual cost by the waste generator. It does include the cost of stabilization for Category III and special Category I low level wastes. The cost of Solid Waste Services provided to waste generators will be recovered through unit rates for each waste type for actual volumes shipped plus the actual cost of special activities. Active commercial contracts for the treatment and disposal of all Hanford Site generated Hazardous wastes shall be maintained.

Key Assumptions
The CWC will maintain a ready-to-serve status for the receipt for interim storage and/or disposal of LLW, MLLW and TRU(M) wastes from on site and off site waste generators.

Waste treatment/storage/disposal requests from all generators approved by DOE-RL shall be supported.

Storage of LLW that does not meet the Hanford Site Solid Waste Acceptance, HNF-EP-0063, for disposal shall be managed within the existing capacity of the Central Waste Complex and shall be treated as capability becomes available.

Drivers
Key documents used for allocating Site requirements to this WBS include:

02-ABD-0120	Approval of the Central Waste Complex (CWC) and Low Level Burial Ground (LLBG) Authorization Agreement Annual Updates
63 FR 3629, January 23, 1998, Doc. 98-1654	Record of Decision for the Waste Management Program: Treatment and Storage of Transuranic Waste
63 FR 41810, August 5, 1998, Doc. 98-20895	Record of Decision for the Waste Management Program: Treatment of Non-wastewater Hazardous Was
65 FR 10061, February 25, 2000, Doc. 00-4439	Record of Decision for the Waste Management Program: Treatment and Disposal of Low-Level Waste and Mixed Low-Level Waste; Amendment of the Record of Decision for the Nevada Test Site
HNF-EP-0063	Hanford Solid Waste Acceptance Criteria

1.8.7 Operate and Maintain the T-Plant Facility (4.02.04.01)

1. Dictionary Title Operate and Maintain the T-Plant Facility	2. Date 5 May 2003	3. FH Project Waste Management - McKenney, D. E.	
4. Contract WBS No. 4.02.04.01	5. Dict Rev	6. B & R No.	7. Baseline CR No.
8. RL PBS Name RL-0013 - Solid Waste Stabilization and Disposition - 200 Area			

Scope of Work

Provide for minimum safe operations at the T Plant Facility. These activities support compliance and safety requirements. Provide surveillance and maintenance of structures, systems, components, and processes to ensure operation within the approved safety and compliance requirements envelope, including preventive maintenance and calibrations, repair of failed and malfunctioning equipment, walkdown of safety systems, equipment and facility grounds (operational surveillance), and routine radiological surveys. Scope includes a range of management assessment activities, ESH&Q support, employee training and certification of operators, emergency planning, and procedure maintenance as required to maintain a safe and compliant facility or process. This activity also provides for high-dose and dual survey (beta-gamma and alpha) treatment services at the T Plant Canyon Facility.

Provide for minimum safe operations at the 2706-T facility. Activities are designed to keep the facility in a safe and compliant status. Maintenance activities will include preventative, corrective, and designated calibration and/or testing services. Training will maintain established qualifications for plant personnel to work in a treatment, storage, and disposal facility. Provide decontamination and waste verification activities, including low-dose alpha and beta-gamma decontamination, and waste verification in the 2706-T facility. Training and certification that is directly related to decontamination/verification will be provided.

Key Assumptions

T-Plant canyon (221-T), and 2706-T minimum safe activities continue at the same level.

2706-T activities continue at the same level.

Drivers

Key documents used for allocating Site requirements to this WBS include:

02-ABD-0139	Approval of the T Plant Authorization Agreement (AA) Annual Update
DOE/WIPP-02-3122 Rev. 0.1	Contact-Handled Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plant

1.8.9 M-91 Facility Activities (4.02.04.03)

1. Dictionary Title M-91 Facility Activities	2. Date 25 June 2003	3. FH Project Waste Management - McKenney, D. E.	
4. Contract WBS No. 4.02.04.03	5. Dict Rev	6. B & R No.	7. Baseline CR No.
8. RL PBS Name RL-0013 - Solid Waste Stabilization and Disposition - 200 Area			

- **Scope of Work**

  Provide for future activities to support projects to modify the T-Plant Canyon Facility to improve the facility's operation, extend its useful life, ensure regulatory compliance, or correct deficiencies.

  Provide for RCRA required treatment of RH MLLW and oversized CH MLLW that will be generated in the future, as well as those currently stored on the Hanford site.

  Provide for treatment activities/processes to prepare RH TRU and TRU containers that can not be processed through WRAP for disposal at WIPP.

  Large containers of contact handled, and all remote handled, TRU waste will be processed and/or packaged, and stored until it is shipped off site for final disposition at WIPP and supports Tri-Party Agreement Milestone M-91.

Key Assumptions
WIPP RH WAC will be issued in FY 2005 to support development of RH TRU facility.

WIPP operates through 2032 for disposal of TRU waste.

Waste treatment/storage/disposal requests from all generators approved by DOE-RL shall be supported.

Drivers
Key documents used for allocating Site requirements to this WBS include:

63 FR 3623, January 23, 1998, Doc. 98-1653	Record of Decision for the Waste Isolation Pilot Plant Disposal Phase
63 FR 3629, January 23, 1998, Doc. 98-1654	Record of Decision for the Waste Management Program: Treatment and Storage of Transuranic Waste
65 FR 10061, February 25, 2000, Doc. 00-4439	Record of Decision for the Waste Management Program: Treatment and Disposal of Low-Level Waste and Mixed Low-Level Waste; Amendment of the Record of Decision for the Nevada Test Site

DOE/RL-89-10	Hanford Federal Facility Agreement and Consent Order (Tri-Party Agreement), Revision 5
DOE/WIPP-02-3122 Rev. 0.1	Contact-Handled Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plant
DOE/WIPP-069	WIPP Waste Acceptance Criteria

1.8.12 MLLW Treatment (4.02.10)

1. Dictionary Title MLLW Treatment	2. Date 24 June 2003	3. FH Project Waste Management - McKenney, D. E.	
4. Contract WBS No. 4.02.10	5. Dict Rev	6. B & R No.	7. Baseline CR No.
8. RL PBS Name RL-0013 - Solid Waste Stabilization and Disposition - 200 Area			

- **Scope of Work**

  Provide for RCRA required treatment and disposal of several categories of newly generated mixed low-level waste (MLLW), as well as those currently stored on the Hanford site. Provide for treatment requirements of contact handled MLLW to meet RCRA land disposal restrictions. Where possible, direct disposal methods for those wastes currently meeting treatment criteria will be pursued at the Low-Level Burial Grounds (LLBG).

Key Assumptions
There will be sufficient commercial treatment capacity available for the standard LDR Report waste streams (i.e., MLLW02, MLLW03, MLLW-04a/b, and MLLW-05).

T-Plant will be available for treatment of mixed waste.

Requirements for mixed waste treatment are supported at a level to ensure that storage capacity is not exceeded.

It is assumed that all MLLW being received from Non-PHMC generators will be delivered LDR compliant and directly disposed.

Drivers
Key documents used for allocating Site requirements to this WBS include:

65 FR 10061, February 25, 2000, Doc. 00-4439	Record of Decision for the Waste Management Program: Treatment and Disposal of Low-Level Waste and Mixed Low-Level Waste; Amendment of the Record of Decision for the Nevada Test Site
DOE/RL-89-10	Hanford Federal Facility Agreement and Consent Order (Tri-Party Agreement), Revision 5
HNF-EP-0063	Hanford Solid Waste Acceptance Criteria

1.8.16 CERCLA Waste Disposal - Phase II (ERDF) (4.02.14)

1. Dictionary Title CERCLA Waste Disposal - Phase II (ERDF)	2. Date 22 June 2003	3. FH Project Waste Management - McKenney, D. E.	
4. Contract WBS No. 4.02.14	5. Dict Rev	6. B & R No.	7. Baseline CR No.
8. RL PBS Name RL-0013 - Solid Waste Stabilization and Disposition - 200 Area			

Scope of Work

CONTRACT STATEMENT OF WORK

Not applicable. Turnover of the Environmental Restoration Disposal Facility to the 200 Area Materials and Waste Management Project will not occur until after FY 2012.

LIFE CYCLE STATEMENT OF WORK

The ERDF is a large-scale, evolving landfill, complete with ancillary facilities, designed to receive and isolate low-level radioactive, hazardous waste, or a combination thereof. The ERDF is designed to provide disposal capacity, as needed, to accommodate projected ER waste volumes.

The ERDF work scope will be transferred to the Waste Management Project after completion of River Corridor Waste Management PBS (RL-RC05) currently managed under a different Contractor. The ERDF work scope will include:

· Management, integration, transportation, and disposal of waste from the CERCLA remedial actions.

· Management, operations, and monitoring of the ERDF.

· Management, integration, and performance of the design and construction of any additional disposal capacity
required to support the CERCLA remedial actions.

· Management of leachate generated at the ERDF and maintenance of the leachate transport tanker.

Key Assumptions

- Current end-state baseline planning assumptions will remain in place until CERCLA/RCRA RODs are issued. An integrated assessment of impacts will be completed before final RODs are issued.
- Current end-state baseline planning assumptions will remain in place until CERCLA/RCRA RODs are issued. An integrated assessment of impacts will be completed before final RODs are issued.

Drivers

Key documents used for allocating Site requirements to this WBS include:

BHI-00139	Environmental Restoration Disposal Facility Waste Acceptance Criteria

Appendix E:

M-91 Mixed Low-Level Waste Processing Activities

(consisting of 1 page)

Appendix E: M-91 Mixed Low-Level Waste Processing Schedule

	Fiscal Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	
Treatment Milestones	**LDR Treatability Groups MLLW-02, MLLW-03, MLLW-04a, MLLW-04b, MLLW-05, MLLW-06, MLLW-08, MLLW-09, and MLLW-10. NOTE: Does not include 600 m³ of MLLW-03 treated under M-91-12 and M-91-12A milestones** *M-91-42 – Treat newly generated CH MLLW and CH MLLW in storage in accordance with the required treatment schedule through 12/31/09. After 6/30/09, treat all newly generated MLLW in accordance with the treatment requirements in compliance with WAC 173-303-140 and 40 CFR 268*	Cumulative waste volume treated by 9/30/04 1,630 m³	Cumulative waste volume treated by 9/30/05 3,260 m³	Cumulative waste volume treated by 9/30/06 4,890 m³	Cumulative waste volume treated by 9/30/07 6,520 m³	Cumulative waste volume treated by 9/30/08 8,150 m³	Treat all waste generated after 6/30/09 in accordance with LDR requirements	Complete treatment of all CH MLLW in storage by 12/31/09				**Group 1**
Treatment Milestones	**LDR Treatability Group MLLW-03** *M-91-12* – Complete thermal treatment of an additional 360 m³ of CH MLLW by 12/31/2005* *M-91-12A* – Complete thermal treatment of at least 240 m³ of CH MLLW by 12/31/2004* Issue RFP for thermal treatment of LDR MLLW-03 by 3/31/04	Cumulative waste volume treated by 9/30/04 75 m³	Cumulative waste volume treated by 9/30/05 150 m³	Cumulative waste volume treated by 9/30/06 225 m³	Cumulative waste volume treated by 9/30/07 300 m³	Cumulative waste volume treated by 9/30/08 450 m³	Cumulative waste volume treated by 9/30/09 600 m³	Complete treatment of all CH MLLW in storage by 12/31/09				**Group 2**
Treatment Milestones	**LDR Treatability Group MLLW-07** *M-91-43 – Designate and begin treatment of 300 m³ per year of RH MLLW and large boxes and containers of CH MLLW no later than 6/30/08 and continue to treat 300 m³ of this waste stream annually*	Obtain limited commercial capability for treatment of CH large containers and RH MLLW by 9/30/04	Issue Engineering Study/Fuctional Design Criteria for CH large/over-size MLLW containers by 9/30/05	Obtain regulatory approvals for initiating in-trench treatment capability by 9/30/06	Issue Engineering Study/Fuctional Design Criteria for RH MLLW containers by 12/31/07	Initiate treatment of LDR MLLW-07 by 6/30/08	Cumulative waste volume treated by 6/30/09 300 m³	Cumulative waste volume treated by 6/30/10 600 m³	Cumulative waste volume treated by 6/30/11 900 m³			**Group 3**
Reporting Milestones	*M-91-03 – Revise the Hanford Site TRUM and Mixed Low Level Waste Project Plan to comply with Agreement Section 11.5 requirements by 12/31/03, 3/31/09 and 3/31/13*						M-91-03 PMP Revision				M-91-03 PMP Revision	
Reporting Milestones	*M-91-45 – Submit a report describing completed and schedule work relating to RH MLLW and CH MLLW in large boxes and containers by 9/30/04 and annually thereafter to Ecology*	M-91-45	M-91-45	M-91-45	M-91-45	M-91-45	M-91-45	M-91-45	M-91-45	M-91-45		
	Fiscal Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	

* A change package will be submitted for milestones M-91-12 and M-91-12A to reflect this newly proposed treatment schedule