[DOE LETTERHEAD]

March 31, 1997

The Honorable John T. Conway
Chairman
Defense Nuclear Facilities Safety Board
625 Indiana Avenue, NW
Suite 700
Washington, D.C. 20004

Dear Mr. Chairman:

Enclosed is the "Low-Level Waste Program Management Plan." This Plan is a deliverable pursuant to the commitment in Task Initiative IV.B.5 identified in the Department's Implementation Plan, Revision 1, for the Defense Nuclear Facilities Safety Board (DNFSB) Recommendation 94-2. The Plan also contains the guidance and criteria for sites to use when considering disposal options that was specified as part of the Task IV.B.4 and committed to be provided in the Low-Level Waste Program Management Plan.

The Low Level Waste Program Management Plan (the Plan) is one of the products of the systems engineering process for low-level waste management. The Plan is based on the System Description Document, which defined the requirements, functions, and interfaces for the Department's low-level waste system, and the Complex-Wide Review, which identified vulnerabilities associated with the management of low-level waste. The document outlines the programmatic strategies, policy initiatives, and assumptions for achieving a complex-wide integrated low-level waste management program. The Plan also identifies the key management interfaces organizational structure, and the division of roles and responsibilities between Headquarters and Field Elements. The Plan describes the near-term and longer-term actions, milestones and responsibilities necessary to achieve the desired future state of the low-level waste program. The Plan also includes commitments from the Department to continually assess the effectiveness of the low-level waste program. In particular building on the 1996 Complex-Wide Review, the Department is committing to periodic complex-wide assessments of data collected primarily from field audits and performance metrics. The periodic assessments of the program will assure continued safe and effective low-level waste management activities and operations, as well as continuous improvement to the program.

This Plan is also intended to be used by the Office of Waste Management in achieving its Ten-Year Plan to complete cleanup at its nuclear sites within the decade. The implementing principles and the goals for low-level waste management in the Low-Level Waste Program Management Plan and the Ten-Year Plan are the same.

The Department has completed the actions identified under this commitment and proposes closure of the commitment.

Sincerely,

Alvin L. Alm

Assistant Secretary for Environmental Management

Enclosure

cc: M. Whitaker, S-3.1

DOE/LLW/PMP-001
Revision: 0

United States Department of Energy
Office of Environmental Management

DOE Low-Level Waste Program Management Plan

March 1997

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DOE Low-Level Waste
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LOW-LEVEL WASTE PROGRAM MANAGEMENT PLAN

TABLE OF CONTENTS

LIST OF ACRONYMS

ALARA	**As Low As Reasonably Achievable**
ARARS	**Applicable or relevant and Appropriate requirements**
CERCLA	**Comprehensive Environmental Response, Compensation, and Liability Act**
COE	**Center of Excellence**
CY	**Calendar Year**
D&D	**Decontamination and Decommissioning**
DAS	**Deputy Assistant Secretary**
DNFSB	**Defense Nuclear Facilities Safety Board**
DOD	**Department of Defense**
DOE	**Department of Energy**
DOE-AL	**Department of Energy-Albuquerque**
DOE-ID	**Department of Energy-Idaho**
DOE-NV	**Department of Energy-Nevada**
DOE-OR	**Department of Energy-Oak Ridge**
DOE-RL	**Department of Energy-Richland**
DOE-SR	**Department of Energy -Savannah River**
DP	**Defense Programs**
EH	**Office of Environment, Safety, and Health**
EH-41	**Office of Environmental Policy and Assistance**
EM	**Office of Environmental Management**
EM-30	**Office of Waste Management**
EM-40	**Office of Environmental Restoration**
EPA	**Environmental Protection Agency**
ER	**Office of Energy Research**
ES&H	**Environment, Safety, and Health**
FY	**Fiscal Year**
GTCC	**Greater-Than-Class C**
HQ	**Headquarters**
IP	**Implementation Plan**
IPABS	**Integrated Planning Accountability and Budget System**
LLW	**Low-Level Radioactive Waste**
MLLW	**Mixed Low-Level Radioactive Waste**
NARM	**Naturally Occurring and Accelerator-Produced Radioactive Material**
NE	**Office of Nuclear Energy**
NEPA	**National Environmental Policy Act**
NRC	**Nuclear Regulatory Commission**
PBS	**Project Baseline Summary**
PMP	**Program Management Plan**

RCRA	**Resource Conservation and Recovery Act**
R&D	**Research and Development**
ROD	**Record of Decision**
SCW	**Special Case Waste**
SLAC	**Stanford Linear Accelerator Center**
TD	**Technology Development**
TSCA	**Toxic Substance Control Act**
TSD	**Treatment, Storage and Disposal**
WAC	**Waste Acceptance Criteria**
WM PEIS	**Waste Management Programmatic Environmental Impact Statement**

1.0 PURPOSE OF THE LLW PROGRAM MANAGEMENT PLAN

The approach to improving the low-level radioactive waste (LLW) management system and developing an integrated program consists of multiple paths and initiatives that converge into a structured program. This LLW Program Management Plan (PMP) identifies LLW program goals, principles to be applied to decision-making, and LLW program priorities. The Plan provides programmatic direction and guidance, and clarification of DOE policies to ensure consistent management of LLW within the DOE complex. The Plan identifies near-term and long-term efforts, as appropriate, that must be completed to move LLW management to a fully integrated program that will be in compliance with LLW policies and requirements, and will allow the Department to demonstrate with confidence that public health and safety, and the environment are protected in accordance with appropriate standards.

In addition this PMP:

- establishes reporting requirements necessary to integrate LLW management, and
- defines roles and responsibilities for LLW Program Management.

In 1994, the Defense Nuclear Facilities Safety Board issued Recommendation 94-2, "Conformance with Safety Standards at Department of Energy (DOE) Low-Level Nuclear Waste and Disposal Sites." The Implementation Plan for Recommendation 94-2 outlined a number of immediate tasks to move LLW disposal facilities toward compliance with the existing DOE Order 5820.2A, *Radioactive Waste Management*.[1] This LLW Program Management Plan references the 94-2 studies and analyses that have been completed and discusses the resulting guidance, criteria, or action plans as elements of the integrated LLW management program. Figure 1 shows the relationship of Recommendation 94-2 tasks to the LLW System. The Plan also identifies milestones and schedules for ongoing studies and analyses. It represents DOE's plan for continued improvements to the LLW management program.

Specifically, the development of this Plan presents an opportunity to realize the benefits of a ***systems engineering management approach*** to the management of LLW. This approach establishes a comprehensive, structured technical basis with clearly defined interfaces for the management of DOE's LLW. The system engineering process includes (1) defining the LLW program ***mission***, (2) conducting a ***functional analysis***; and, (3) identifying the ***system requirements***. Having completed this process an effective and efficient LLW program is emerging. The DOE LLW System Description Document[2] describes the system requirements, functions, and interfaces for the management of the DOE's LLW and establishes the technical basis for this LLW PMP.

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[1]DOE Order 5820.2A, Radioactive Waste Management, September 26, 1988, III.2.c.

[2]DOE Low-Level Waste System Description Document, U.S. Department of Energy, Office of Environmental Management, September 1996.

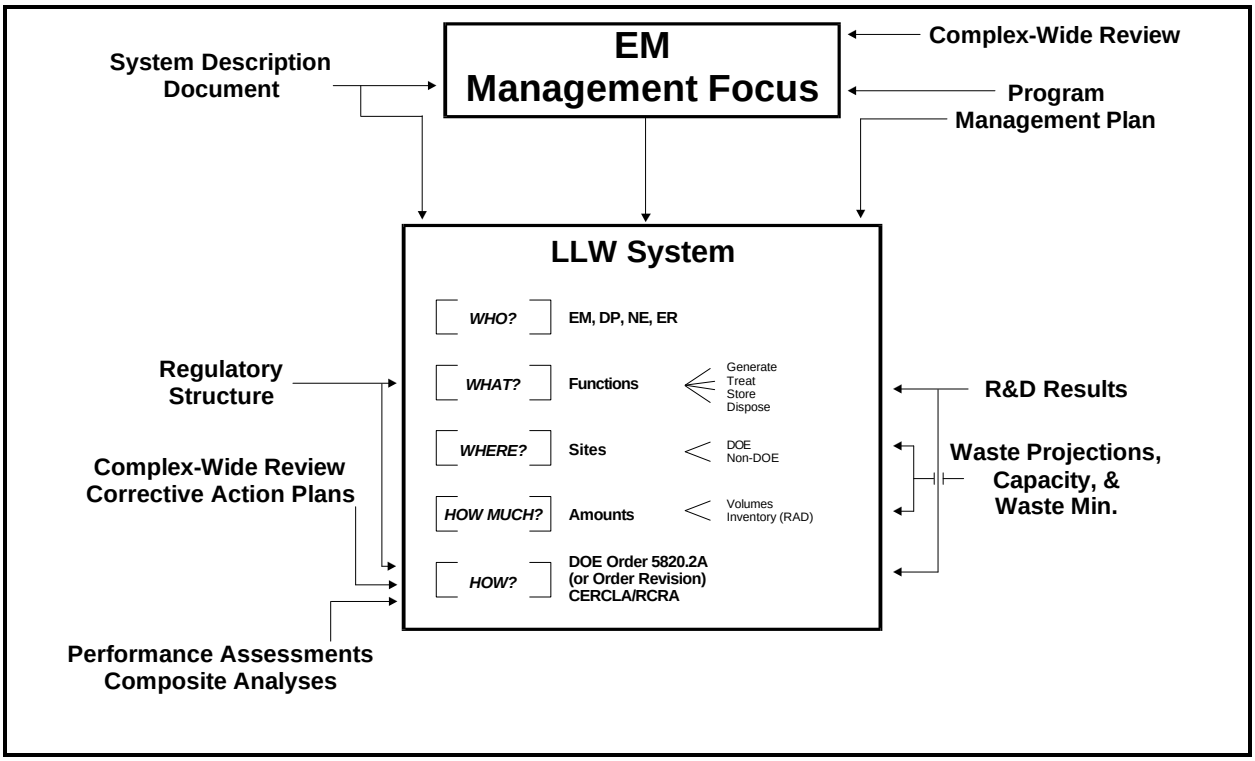

Figure 1 - Relationship of 94-2 Tasks to LLW System

The benefits of utilizing a systems engineering management approach will result in a LLW management program with improved safety and environmental protection and will promote cost effectiveness. Specific benefits are (1) enhanced understanding of the program by all participants, (2) accountability of each participant from clear systems definitions, (3) enhanced program control due to identification of system and program interfaces, (4) increased ability to capitalize on synergistic effects and technical solutions, and (5) the ability to rapidly evaluate and respond to regulatory requirements.

Interface with DOE Programs Continuing to Generate Mission LLW

This LLW PMP was initiated by the Office of Waste Management (EM-30) and developed in consultation with other DOE Program Secretarial Offices (Defense Programs, Energy Research, Nuclear Energy, and Field Management) and DOE Operations Offices and Field elements. LLW will continue to be generated by facilities either under direct management of other offices within the Office of Environmental Management (e.g., Office of Environmental Restoration, EM-40) or within other Program Secretarial Offices. This Plan provides DOE policies, directives, and strategies which will promote the minimization of future-generated LLW and supports the conduct of LLW management operations in a safe, technically sound, economical, and publicly acceptable manner for those Programs which will continue to generate LLW as part of the continuing Departmental missions.

Interface with the Office of Environmental Management Ten-Year Plan

The LLW PMP is the waste type specific plan supporting the Office of Environmental Management (EM) Ten-Year planning process. The goals for LLW management in the EM Ten-Year Plan and this PMP are the same. Meeting the objectives of the Ten-Year Plan (see Section 6.1) is enhanced and very much tied to the goals of DNFSB Recommendation 94-2. DOE is causing focus to be brought to wastes with no disposition paths and a strategy of no storage or minimum storage. This will help bring about closure and mission completion.

The Integrated Planning, Accountability, and Budget System (IPABS) will restructure, streamline, and integrate formerly independent pieces of the EM program management structure. One of the principles of the IPABS is to have DOE-Headquarters (HQ) focus on policy. The elements of this PMP are the essence of the policies for management of LLW.

The foundation of the EM Ten-Year Plan is projects. The projects are to have a defined scope, schedule, and cost supporting a defined end-state. Projectizing will help clearly define connections between the planning, budgeting, and management (execution) elements of the EM management structure, since the projects will be tracked from planning, through budgeting and execution. This PMP will cause improved scope definition for those projects associated with the management of LLW.

2.0 LLW PROGRAM DESCRIPTION

2.1 Mission of the LLW Program

The mission of the Department of Energy (DOE) Low-Level Radioactive Waste (LLW) Management Program is to develop, implement, and coordinate a nationally integrated program for LLW treatment, storage, and disposal that uses a combination of Federal and private facilities to meet the needs of waste generators while fully protecting workers, the public, and the environment. Safety of operations is given highest priority by the Department.

2.2 Scope of the LLW Program

The scope of the LLW program includes the complete life-cycle management of all waste that meets the definition of DOE LLW. LLW includes all radioactive waste not classified as either high-level waste, transuranic waste, spent nuclear fuel or the bulk of the by-product tailings containing uranium or thorium from processed ore. DOE Order 5820.2A, Radioactive Waste Management, permits small volumes of fissionable material to be managed as LLW, if irradiated for research and development only, and not for the production of power or plutonium, and containing small concentrations of transuranic radionuclides (< 100 nCi/g). The DOE Order also allows small volumes

of DOE waste containing 1le(2) by-product material or naturally occurring and accelerator-produced radioactive material (NARM) to be managed as LLW. DOE has also been given the responsibility to dispose of commercially generated greater-than-class-C (GTCC) LLW in a U.S. Nuclear Regulatory Commission (NRC) licensed facility. Sources of LLW include DOE's Defense Programs (DP), the Office of Energy Research (ER), the Office of Nuclear Energy (NE), and the Office of Environmental Management (EM). Any LLW that contains hazardous chemicals covered by the Resource Conservation and Recovery Act (RCRA) or Toxic Substance Control Act (TSCA) requires management as a "mixed" waste. The LLW program interfaces with but does not include programs to manage mixed LLW and GTCC waste.

DOE LLW generation, treatment, storage, and disposal is described in the Waste Management Programmatic Environmental Impact Statement (WM PEIS)[3] (see Section 6.3).

2.3 Background

On September 8, 1994, the DNFSB issued Recommendation 94-2, "Conformance with Safety Standards at Department of Energy (DOE) Low-Level Nuclear Waste and Disposal Sites." The Department accepted Recommendation 94-2 on October 28, 1994. Revision 1 to the 94-2 Implementation Plan (IP) in response to Recommendation 94-2 was submitted to the DNFSB by the Department on May 7, 1996.

In making Recommendation 94-2, the DNFSB concluded that the DOE LLW program had not kept pace with the evolution of commercial practices. The DNFSB also noted that no DOE LLW disposal facility had completed the radiological performance assessments required by DOE Order 5820.2A, Radioactive Waste Management. The DNFSB noted that LLW radiological performance assessments were not required to include all contributing source terms in the evaluations. DNFSB recommended that the Department conduct a complex-wide review to establish the dimensions of the LLW problem, take steps to complete the performance assessments, and in completing the performance assessments, include all of the radioactive source terms. The DNFSB also recommended that the 94-2 Implementation Plan include: issuance of new standards, requirements, and guidance for LLW management; studies to improve modeling capability, studies to enhance waste form and deter intruders and radionuclide migration; studies of volume reduction; a program to improve projections of LLW; and a study of the safety merits and demerits of LLW disposal privatization.

When the DNFSB issued Recommendation 94-2, a number of technical problems associated with management of LLW were apparent, and efforts were initiated to address them. However, no complex-wide appraisal of such programs existed to help determine needed corrective actions to address site-specific and complex-wide deficiencies. In response to DNFSB's recommendation, DOE conducted a comprehensive review of the management of LLW. The Complex-Wide Review of

[3]Draft Waste Management Programmatic Environmental Impact Statement, U.S. Department of Energy, Office of Environmental Management, DOE/EIS-0200-D, August 1995.

DOE's Low-Level Waste Management ES&H Vulnerabilities[4] provided a snapshot of situations and conditions that has helped focus the task of improving DOE's LLW management program. Site-specific assessments were conducted to identify site-specific vulnerabilities. The site-specific vulnerabilities were then evaluated to identify complex-wide vulnerabilities, i.e., vulnerabilities that could be characterized as endemic to the system. This analysis resulted in the identification of a number of structural, institutional, and/or programmatic causes and contributing factors to the vulnerabilities that were determined to be inherent to the LLW management systems. Six complex-wide vulnerabilities were identified as a result of this analysis. DOE's LLW Management Program has prepared corrective action plans for both the site-specific and the complex-wide vulnerabilities. The overall strategy for an integrated DOE LLW Management Program and implementation of corrective actions for identified deficiencies are being addressed through (1) revision of the DOE Radioactive Waste Management Order, (2) tasks identified in the IP for DNFSB Recommendation 94-2, and, (3) preparation of this Program Management Plan.

2.4 Complex-Wide Vulnerabilities

The complex-wide vulnerabilities identified during the Complex-Wide Review are listed below. A summary of the corrective action plans and cross-references to the pertinent section of this Plan are provided:

- **LLW forecasting and capacity planning is inadequate.** DOE has developed guidance for waste forecasting and capacity planning to support effective and integrated planning. The improved capacity planning and waste projection capability will improve program effectiveness, and prevent capacity shortages and unnecessary storage of LLW, thereby decreasing the risk of releases to the environment and exposures to workers and the public (see Section 6.4).

- **Inadequacies in the characterization of LLW complicate treatment, storage, and disposal.** A comprehensive and integrated approach to waste characterization has been developed to provide waste characterization information to the level of detail necessary for the required treatment, storage, and disposal and to account for potential site-to-site and complex-wide linkages. This will be accomplished by (1) analysis of the waste characterization program functions/activities in the LLW System Description Document (see Section 1.0); (2) increased compatibility between data collected at generation and data from subsequent treatment, storage and disposal (see Section 6.4); (3) identifying essential requirements for waste characterization to be included in the Requirements Manual for the Radioactive Waste Management Order revision; and (4) developing

[4]Final Report Complex-Wide Review of DOE's Low-Level Waste Management ES&H Vulnerabilities, U.S. Department of Energy, Office of Environmental Management, DOE/EM-0280, May 1996.

additional implementation guidance for waste characterization to support the DOE Radioactive Waste Management Order revision (see Section 6.14).

- **Storage of LLW for which there is an identified path forward for disposal.** DOE's revised Radioactive Waste Management Order will include specific requirements to dispose of LLW with an identified path forward and will place a time limit on storage (see Section 6.14). The LLW Systems Engineering initiative has identified the LLW management functions/activities that apply to LLW storage (see Section 1.0). The complex-wide LLW Projection Program will provide information on current and planned disposal capacity (see Section 6.4).

- **Storage of LLW under inadequate conditions.** Essential requirements for safe conditions for storage of LLW will be contained in the revised DOE Radioactive Waste Management Order requirements manual (see Section 6.14). Improved capacity planning and waste projections through the LLW Projections Program will reduce unnecessary storage of LLW (see Section 6.4).

- **Some LLW has no technical path forward for disposition.** Requirements for a plan for management of LLW that does not have an identified path forward to disposal will be contained in the revised DOE Radioactive Waste Management Order (See Section 6.14). DOE's Research and Development strategy will identify outstanding LLW R&D technical needs (see Section 6.13).

- **Performance Assessments are generally not approved and technical guidance is inadequate.** Corrective actions to address this complex-wide vulnerability are addressed under the Radiological Task initiative of DOE's 94-2 response effort. Plans and status for addressing this inadequacy are provided in Sections 6.15 and Appendix B of this Plan.

2.5 LLW Program Goals

The principal challenge for the LLW program is to streamline and integrate LLW management practices across the DOE complex. The Department seeks to improve cost-effectiveness, improve safety and environmental protection, maintain consistency, and enhance public confidence with LLW management as successful performance is achieved. Integration across the Department, as well as consistency and comparability across the sites, provide the potential for cost savings and serves as the basis for long-term planning and the identification and resolution of key national issues.

The LLW program goals are:

- ***manage and dispose of newly generated LLW at the same rate it is being generated.***
- ***identify a disposal path for all LLW.***
- ***dispose of all legacy LLW within a decade.***

The goal of the steady state program is a zero backlog of stored LLW awaiting treatment and disposal.

The goals for LLW management contained in this Plan are consistent with the goals of EM's Ten-Year Plan.

2.6 LLW Program Principles

The LLW program will be managed to comply with all applicable DOE Orders, other applicable laws and regulations, treaties, and agreements. The LLW program will be managed to meet the policies, requirements, and guidelines for managing the Department's LLW contained in the current DOE Order 5820.2A, *Radioactive Waste Management.* The DOE Radioactive Waste Management Order is currently being revised. The LLW management program will be managed to comply with the requirements of the revised Order when it is implemented.

Strategic principles that establish the basis for decision-making regarding LLW program activities are:

- Protection of public safety and health, and the environment;
- Protection of LLW facility worker safety;
- Elimination of the most urgent risks;
- Reduce mortgage and support costs to free up funds for further risk reduction;
- Minimization of generation of new LLW;
- Minimization of storage of LLW;
- Effective, efficient, and cost competitive disposal of LLW;
- Stakeholder acceptance and creation of a collaborative relationship between DOE and its regulators and stakeholders;
- Technology development focused on cost and risk reduction; and
- Integration of LLW treatment and disposal across sites.

The strategic principles for LLW management contained in this Plan are consistent with the strategic principles of the Department's Ten-Year Plan.

A discussion of how these strategic principles are applied to the decision-making process is provided in Section 2.5.

2.7 LLW Program Priorities

The priorities of the LLW Program are:

- ***ensure safe storage conditions for LLW requiring storage;***
- ***dispose newly generated waste at the same rate it is generated;***

- ***dispose LLW legacy inventory that has a path forward; and***
- ***seek solutions for disposal of LLW legacy waste that does not have an identified path forward.***

2.8 LLW Program Decision-Making Process

An effective decision-making process identifies the decisions to be made, compiles and analyzes the information needed to develop a full range of alternatives, identifies the criteria to be used, and empowers the right people to make decisions. A systems engineering approach has been implemented by the DOE LLW Management Program to provide a logical, disciplined process that ensures the functions needed to accomplish the LLW mission are identified, and that the programmatic drivers, constraints, assumptions, and performance requirements are identified and satisfied. This is one tool being used along with the Department's experience, stakeholder input, technology exchange, NEPA analyses, and a revised LLW management structure to ensure a sound decision-making process that will continue to improve the LLW program.

In addition, high-level decision-making criteria have been identified for the LLW management program. These criteria are intended to be used to differentiate between alternatives that are equal with respect to meeting the system requirements and constraints. The criteria provide the basis for a measurable, objective, and documented selection process that can be effectively supported and defended. The criteria influencing decision-making for the LLW Management Program are:

- Environment, Safety, and Health - The LLW program will place its highest priority on protecting the health and safety of DOE employees, contractors, and the general public. The decision criteria involving environment, health, and safety are all centered on minimizing radiological and transportation risk to the public, minimizing radiological risk to workers, and minimizing occupational safety risk to workers and keeping radiological releases as low as reasonably achievable. DOE recognizes the primacy of external radiological regulations/standards and accepts that they are providing adequate protection of public safety and health.

- Stakeholder Involvement - The LLW program will be managed to enhance public involvement in key management decisions. The LLW program will be managed to allow the appropriate program's stakeholders, State and Tribal government representatives, and regulatory agencies input to decisions.

- Technical Feasibility - Alternatives are evaluated on the following criteria: (1) existing DOE capability; (2) progress towards waste disposition; and (3) technology can be developed and deployed.

- Cost - The cost decision criteria is focused on minimizing initial cost and life-cycle cost while complying with Waste Acceptance Criteria (WAC) and maximizing operational

flexibility. Additional cost criteria include: credible cost savings, mortgage reduction, and schedule improvement.

- Waste Generation - The waste generation decision criterion is focused on choosing alternatives that minimize the generation of waste.

- Timeliness - This criterion will be used to measure the ability of alternatives to meet schedule commitments.

- Other decision criteria include:

  - impacts on other waste streams;
  - impacts on other DOE activities;
  - requirements changes;
  - site equity; and,
  - ease of implementation.

The process for site-level decisions is site-specific. Elements of the decision process will include the identification of the decision-makers, decision documentation, process schedule, and activities required to complete the decision process. Both the site and the HQ processes will consider the above criteria when making decisions regarding LLW management.

2.9 Quality Assurance

The Office of Waste Management Quality Assurance Plan covering all waste types, meets the requirements specified in Title 10 of the Code of Federal Regulations, Part 830.120, Quality Assurance Requirements (10CFR830.120).

In response to DOE Order 5700.6C, *Quality Assurance,* and 10 CFR 830.120, Quality Assurance Requirements, each site is developing or has developed a Quality Assurance Program Description Document (QAPD) to cover their site operations. These QAPDs are the foundation documents for each site's Quality Assurance Program. The QAPD contents establish the envelope for operation of the quality assurance program. The QAPD applies to organizations, individuals, vendors, and other entities working for the site. 10 CFR 830.120 provides requirements for managing nuclear facilities, while nonnuclear facilities are governed by DOE Order 5700.6C. Quality records are kept as part of the Office of Waste Management Quality Assurance Plan.

3.0 LLW PROGRAM ORGANIZATION AND RESPONSIBILITIES

The organizational elements and the interfaces of the DOE LLW management program are discussed below. Figure 2 shows the organizational relationship of the elements of the LLW program.

3.1 Headquarters

DOE Headquarters (DOE-HQ) develops policy and guidance. The Office of Environment, Safety, and Health (EH) establishes the policy and guidance for protection of workers, the public, and the environment from waste management activities. EM is responsible for formulation of implementing policy and guidance with input from the LLW/MLLW Center of Excellence (Center or COE), field offices, and other HQ components. DOE-HQ staff will continue to be responsible for leading the development of, approving, and issuing policy; providing the Deputy Assistant Secretary for Waste Management with recommendations for DOE Center of Excellence program and site budget allocations; preparing responses to correspondence; serving as an advocate for program decisions made by EM; and interacting with other DOE-HQ offices, federal agencies, and Congressional liaisons. DOE-HQ staff will be responsible for oversight of the DOE LLW/MLLW Center and will rely on the Center for its technical expertise. DOE-HQ will interact directly with the DOE Center-Idaho (Center-ID) on day-to-day business issues. LLW program issues identified by the LLW/MLLW COE will be reviewed by the Office of Waste Management and forwarded to the Deputy Assistant Secretary for Waste Management with recommendations for disposition.

Safety will be an integral part of Office of Environmental Management (EM) work from initial planning through final execution. EM safety focus is on four priority areas: (1) worker involvement, (2) management audits, (3) establishing goals, and (4) establishing metrics. EM's safety management system is being integrated into EM's Ten-Year Plan Management System and ensures that goals are established, resources allocated, performance monitored, and corrective actions taken as required. The Office of Environment, Safety and Health (EH) establishes the policy and guidance for protection of workers, the public, and the environment from waste management activities and provides technical assistance to the Office of Waste Management (EM-30) for developing and implementing requirements and guidance for LLW management through its Office of Environmental Policy and Assistance (EH-41). The Office of Environment, Safety, and Health provides compliance oversight. The Office of Oversight in EH provides independent verification of conformance to established policies and requirements. In particular, it will verify compliance with safety principles identified in the Department's October 21, 1994 letter to the DNFSB articulating the functions the Department deems necessary for an effective safety management program. It will continue to be the responsibility of the Office of Waste Management to prescribe program solutions to safety issues relating to LLW management.

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Figure 2 - LLW Program Organization and Interfaces

It is expected that specific Headquarters roles and responsibilities will be defined in the requirements manual to accompany the revision to DOE's Radioactive Waste Management Order. In the interim, the following responsibilities are in effect consistent with DOE policy:

The Deputy Assistant Secretary for Waste Management and the Deputy Assistant Secretary for Environmental Restoration are responsible, within their respective programs, for:

1. Establishing and maintaining a Complex-Wide Low-Level Waste Management Program. Essential program elements include, but are not limited to, the following:

    a. Strategic planning;
    b. Complex-wide integration of functions and requirements;
    c. Research and development for low-level waste management;
    d. Data collection and management;
    e. Regulatory review; and
    f. Development of requirements, guidance, standards, and procedures.

2. Preparing, issuing, and maintaining this Low-Level Waste Program Management Plan (This responsibility is shared with the LLW/MLLW Center of Excellence).

3. Developing and implementing a process for reviewing and approving performance assessments and composite analyses of LLW disposal facilities submitted by field elements.

4. Issuing a Disposal Authorization Statement following the approval of the performance assessment and composite analysis for a specific facility. The Disposal Authorization Statement constitutes Headquarter's approval of the performance assessment and composite analysis.

5. Ensuring that ongoing and future LLW waste management activities implement waste minimization and pollution prevention programs.

6. Ensuring that defense-in-depth safety principles are incorporated throughout the LLW management program.

7. Establishing and maintaining a system to compile waste generation projection data and other information from radioactive waste management activities across the complex.

8. Providing guidance on conducting evaluations (e.g. assessments, inspections, and reviews) of radioactive waste management facilities and operations to ensure that radioactive waste management activities meet the requirements of the current DOE Radioactive Waste Management Order and DOE policy on LLW management.

3.2 LLW/MLLW Center of Excellence

The DOE LLW/MLLW Center of Excellence (Center) consists of DOE-Idaho (DOE-ID), DOE-Nevada (DOE-NV), and DOE-Albuquerque (DOE-AL) with the Idaho Operations Office being the lead field office. The primary purpose of the Center is to establish and direct a nationally-focused service center for the management of LLW/MLLW. The Center will be a technical resource to the entire DOE complex for LLW/MLLW management.

The LLW/MLLW Center will be organized into the following six primary areas: (1) low-level waste; (2) mixed low-level waste; (3) sealed sources; (4) national systems which will include the National Low-Level Waste Program; (5) greater-than-class-C waste; and (6) data management.

The LLW/MLLW Center will support and implement activities to:

1. Promote protection of public and worker safety and health and the environment in the management of LLW/MLLW.

2. Ensure the LLW/MLLW complex is focused on EM Ten-Year Plan implementation, as applicable.

3. Provide a single efficient LLW/MLLW program management support location and information resource.

4. Minimize generation and storage of LLW and MLLW.

5. Effectively and efficiently dispose of LLW and MLLW.

6. Establish and maintain a working partnership with sites in the cost effective and timely management of LLW and MLLW.

7. Integrate DOE LLW and MLLW activities.

8. Integrate commercial experience with DOE LLW and MLLW programs.

9. Coordinate activities with other DOE Centers to eliminate redundancies and leverage experience.

The LLW/MLLW Center of Excellence will be responsible for:

- Maintaining the LLW Projections data base and annual projections updates.

- Updating the Disposal Capacity Report.

- Updating the LLW System Description Document.
- Revising the LLW Program Management Plan.
- Collecting and evaluating WM LLW routine audit data to identify common or recurring findings and weaknesses.
- Conducting periodic complex-wide assessments (at least as often as every three years).
- Monitoring complex-wide assessment activities and action plans, acting as a point of contact for reporting activities and providing lessons learned and technical advice as needed.
- Reviewing and coordinating guidance developed at HQ on Performance Assessments and Composite Analysis.
- Creating a central library of LLW and MLLW data and information.
- Standardizing WAC technical content and format based on PEIS ROD.

LLW issues identified in performing any of the above responsibilities will be analyzed by the Center of Excellence and recommendations will be developed. The recommendations for disposition will then be forwarded to the Office of Waste Management for review followed by the Deputy Assistant Secretary for Waste Management for decision.

The LLW/MLLW Center-NV is responsible for implementing task initiatives assigned by the LLW/MLLW Center. The Nevada Operations Office has significant operational experience related to LLW handling, LLW acceptance criteria, regulatory requirements, disposal operations, maintenance, and closure. As a strong partner in this program, Nevada will use its expertise to assume the lead for those activities related to disposal operations. LLW/MLLW Center NV staff will be coordinated administratively through the Office of Assistant Manager for Environmental Management but will report operationally to the DOE-ID Center Manager.

DOE-AL's role managing sealed sources will be expanded in the LLW/MLLW Center to include DOE's nationwide radioactive sources management program. DOE-AL has also been instrumental in evaluating waste management TSD program structure through the EM-30 re-engineering effort. DOE-AL will increase its effort, assisting DOE-HQ and the LLW/MLLW Center in coordinating the re-engineering complex-wide. Additionally, DOE-AL's role in the Pollution Prevention Complex-Wide Program and the DOE National Transportation Program will be integrated with the DOE Center's effort in these areas.

3.3 Field

The Field/Operations Offices are accountable for executing LLW operations to protect the health and safety of the public, preserve the environment of the waste management facilities, and ensure that no legacy requiring remedial action remains after operations have been terminated.

The Field/Operations Offices are responsible for providing management and oversight of the contractors providing LLW waste management services. Specific decisions for the management of LLW are made at the field level. Decisions affecting more than one Field or Operations Office, or issues forwarded by the field, will be reviewed by a committee composed of DOE site representatives (currently the Waste Management Steering Committee) and in conjunction with the LLW/MLLW Center of Excellence recommendations will be developed. The recommendations will be forwarded to the Deputy Assistant Secretary for Waste Management for review and disposition.

Line management is directly accountable for the protection of the public, the workers, and the environment. EM and contractor line managers have the authority and are held accountable for integrating safety into all elements of EM program performance. Safety and Health (S&H) performance and the integration of S&H planning into project development is the responsibility of the Project Manager. As a complement to line management, the Department's Office of Environment, Safety and Health (EH) provides safety policy, enforcement, and independent oversight functions.

Safety Mechanisms, as defined in the Department's Safety Management System Policy (DOE P 450.4, October 15, 1996), define how the core safety functions are performed. The mechanisms vary from facility to facility and from activity to activity based on the hazards and the work being performed. Safety mechanisms may include: (1) Departmental expectations expressed through directives (policy, rules, orders, notices, standards, and guidance) and contractor clauses, (2) directives on identifying and analyzing hazards and performing safety analyses, (3) directives which establish processes to be used in setting safety standards, and (4) contractor policies, procedures, and documents established to implement safety management and fulfill commitments made by the Department.

Successful safety management depends on the implementation of the safety goals and policies at the Field element level. Effective management of the EM Ten-Year Plan requires each Field Office to establish safety goals, set demanding targets, and measure progress to ensure continuous improvement in performance. An initial set of four safety indices have been established: (1) lost workday case rate, (2) total recordable case rate, (3) procedural violations/ deficiencies, and (4) corrective action status. All EM managers are expected to actively engage in walkthroughs, in addition to formal audits, at each facility or site for which they are responsible. Worker involvement is also essential in sound safety management because workers understand both the work to be performed and the attendant safety hazards better than anyone else. EM Managers are expected to encourage worker involvement and to track the progress of worker participation to assure that it is substantive and meaningful.

The requirements manual to accompany the revision to DOE's Radioactive Waste Management Order will provide specific roles and responsibilities for Field Element managers; all waste managers of LLW management activities; LLW generators; and storage, treatment, and disposal facility managers.

In the interim, in accordance with DOE Order 5820.2A and DOE LLW management policy, Field Element Managers are responsible for the following:

1. Establish and maintain a Site-Wide Low-Level Waste Management Program to ensure that the requirements of DOE Order 5820.2A, *Radioactive Waste Management* are met.

2. Develop and implement a Low-Level Waste Projections Program to ensure that projected waste generation is consistent with storage, treatment, and disposal capabilities and capacities. Waste projections shall include, as a minimum, generator information, projected waste volume, waste form(s), radionuclide data including key isotopic and curie content, and container types. Projections data shall be provided to Headquarters annually.

3. Implement a waste certification program for each DOE facility generating waste to ensure that treatment, storage, and disposal facility waste acceptance criteria are met.

4. Prepare waste acceptance criteria that ensure the design and operating bases of each treatment, storage, and disposal facility are protected.

5. Prepare and submit a site-specific LLW disposal facility radiological performance assessment that provides a reasonable expectation of compliance with the performance objectives in DOE Order 5820.2A to Headquarters for review and approval.

6. Prepare and submit a composite analysis of all sources of radioactive material which may interact with the disposal facility that provides a reasonable expectation that long-term impacts from the disposal facility and other sources to Headquarters for review and approval.

7. Review and approve closure plans to indicate how each DOE disposal facility will be closed upon termination of operations to ensure that the public and environment will be protected.

8. Review and approve monitoring programs for the collection of sufficient data to evaluate performance of each DOE facility and to detect the migration of contamination.

9. Perform evaluations (e.g., assessments, inspections, and reviews) of LLW facilities and activities to ensure that the requirements of the current DOE Radioactive Waste Management Order and DOE policy on LLW management are met.

4.0 INTERFACES WITH OTHER PROGRAMS

4.1 Environmental Restoration

Pursuant to CERCLA and/or RCRA, the Office of Environmental Restoration (EM-40) generates LLW in performing cleanup work. The Office of Waste Management (EM-30) provides waste management services for some of this LLW. In other instances, Environmental Restoration may dispose the waste onsite as part of the remedial action. Environmental Restoration personnel work closely with the Office of Waste Management and interact with the program managers and DOE field office personnel to ensure programs and projects managed by Environmental Restoration are integrated with Waste Management LLW programs. Also, Environmental Restoration representation on the Waste Management Steering Committee improves coordination in developments that could potentially impact Environmental Restoration projects, and provides another vehicle through which Environmental Restoration senior management may obtain reports on LLW task initiatives and the LLW management program.

In the "Policy for Demonstrating Compliance with DOE Order 5820.2A for Onsite Management and Disposal of Environmental Restoration Low-Level Waste Under the Comprehensive Environmental Response, Compensation, and Liability Act, May 1996" DOE sets forth the policy for integration of the safe management and disposal of LLW generated from environmental restoration activities. Based on a review of the technical requirements of both authorities, the Department determined that the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process can be used to demonstrate compliance with the requirements and procedures of DOE Order 5820.2A for onsite management and disposal of Environmental Restoration LLW. This policy applies to onsite management and disposal of LLW in disposal facilities evaluated, designed, constructed, and operated pursuant to CERCLA. Management and disposal of environmental restoration LLW at offsite DOE facilities shall be conducted under both the substantive and procedural requirements of DOE Order 5820.2A. Disposal of LLW at commercial facilities shall be in accordance with applicable regulatory requirements and meet the DOE guidance/criteria as discussed in Appendix A of this Plan. Implementation requirements and guidance, and roles and responsibilities for field elements and the Office of Environmental Restoration program offices and operations offices to ensure that environmental restoration LLW management and disposal activities are conducted in accordance with the policy are detailed within the policy document.

4.2 Re-engineering of Waste Management

The Department has concluded that the current waste management programmatic structure may not be the most efficient way to motivate performance. Furthermore, excessive programmatic requirements divert resources away from waste disposal. In response, the Department is pursuing improvements in the waste management system through a pilot re-engineering effort. This re-engineering effort is intended to reduce the environmental risk and cost of waste management through

streamlining of program management requirements, and increasing accountability of waste generators, while maintaining an integrated Departmental policy structure capable of addressing disposition of legacy and newly-generated waste.

Two management approaches are being pursued. In the first alternative, Environmental Management would continue to manage all waste at a site. Generator accountability would be increased by charging the generators for management of their waste. In parallel with institution of chargeback systems, initiatives will proceed to reduce the burden of non-essential programmatic requirements.

Under the second alternative, the site's landlord program (usually the largest waste generator) would manage and fund newly generated waste. These programs, typically, do not have a specific programmatic structure for managing waste. Thus the opportunity exists to transition to landlord programs without re-creating an extensive programmatic burden for waste management.

An initial pilot phase to test waste management re-engineering and transition to generator accountability is planned for Fiscal Year 1998. Management of newly generated waste will be transitioned from Environmental Management to Defense Programs at the Kansas City Plant, to Energy Research at Fermi and SLAC, and to Nuclear Energy at Argonne West. At the Savannah River Site, Environmental Management will retain responsibility for waste management but a chargeback system will be instituted. The goal is to complete the transfer of funding responsibility for newly generated waste to the generators by FY 2000.

Transition of waste management from Environmental Management to landlord programs will result in changes in roles and responsibilities that will affect the management of the LLW Program. These changes should be positive and strengthen accountability for waste on the part of waste generators and their Departmental sponsors. A summary of the revised roles and responsibilities that would result from the re-engineering effort include:

- **Environmental Management:** Environmental Management would continue to serve as the central coordinator and interface for LLW. Environmental Management would be responsible for Departmental LLW policy and overall strategy development, general radioactive waste management guidance, and consolidation of Departmental information for LLW.

- **Site Responsibilities:** Departmental waste management policy would be implemented by the cognizant lead program at a site. Cognizant lead programs are generally the site landlord program or Environmental Management depending on the option being implemented at a site. Each cognizant lead program will be managerially and fiscally responsible for storage, treatment, and disposal of newly-generated waste that result from its sponsored activities. The cognizant lead program (DP, NE, ER) will be responsible for ensuring the safety of Waste Management Operations. Consistency of requirement implementation among Departmental programs will be coordinated through an Executive Board that will include upper management representation from the involved programs.

- **Generating Program Responsibilities:** Irrespective of which Departmental program is responsible for waste management at a site, all waste generating programs will be responsible for ensuring waste minimization is included in programmatic reviews of sponsored activities. Each waste-generating program shall plan and budget for the management of all waste generated by its activities for sites where charges to waste generators are in effect.

4.3 Other Federal and State Agencies

The Office of Environmental Management as well as the Office of Environment, Safety and Health maintain an interface with a number of Federal and State Government agencies on LLW issues. Agencies involved include (but are not limited to) the Environmental Protection Agency (EPA), the Nuclear Regulatory Commission (NRC), and the Department of Defense (DOD). The Department works with these agencies on regulatory and policy issues as well as agreements for receipt and dispositioning of waste.

The Low-Level Radioactive Waste Policy Amendments Act of 1985:

Title I, Section 3 of this Act (PL 99-240) is "Responsibilities for Disposal of Low-Level Radioactive Waste". This section makes the Department of Energy responsible for the disposal of LLW which is:

(i) owned or generated by the Department of Energy;
(ii) owned or generated by the United States Navy as a result of the decommissioning of vessels of the United States Navy; or
(iii) owned or generated as a result of any research, development, testing, or production of any atomic weapon;

For items (ii) and (iii), formal written approval is required from the Office of Waste Management prior to initially accepting these waste streams for disposal from outside the Department of Energy. It is generally the policy of the Department that no LLW will be accepted for disposal which is not covered by items (i), (ii) or (iii) above. An exception to this is LLW which is classified for national security purposes (see discussion of Department of Defense below).

Department of Defense

As noted above, in general LLW resulting from DOD activities is a state responsibility under the law. However, certain DOD waste which falls into one of the exception categories (ii or iii) stated above under the Low-Level Radioactive Waste Policy Amendments Act of 1985 can be handled by the Department of Energy. In addition, the Department of Energy accepts for disposal LLW which is

classified for national security reasons. Under the Atomic Energy Act of 1954, as amended, the Department of Energy is responsible for protecting national security, and therefore classified LLW is accepted for disposal. There may be some instances in which agencies other than the DOD have classified waste. Formal written approval from the Office of Waste Management is required prior to initially accepting classified LLW for disposal.

Agreements with Other Agencies

From time to time, the Department may enter into agreements with other Federal and/or State agencies related to LLW management. Such agreements may involve receipt of waste from other agencies or private entities. Agreements are formally documented and approved by DOE Headquarters and the involved agency.

4.4 Other DOE Program Offices

The Office of Environmental Management maintains a close interface with other Departmental Program Offices with respect to LLW management activities. Interfaces occur at both the Headquarters and the Field levels. Several programs including Defense Programs, Nuclear Energy, and Energy Research are major generators of LLW and will continue to generate LLW as part of the continuing DOE missions. Representatives of each of the above provide input to the development of DOE LLW management policy, requirements and guidance.

4.5 Commercial Vendors

DOE currently utilizes some commercially-operated disposal facilities for LLW. DOE policy for use of commercial disposal facilities for LLW is contained in an October, 1996 memorandum which delegated the approval process to the DOE Operations Office Managers and Field Office Managers. The use of a non-DOE disposal facility is evaluated on a case-by-case basis and must meet certain criteria, including appropriate safety, health protection, and economic analyses. A summary of the approval process and the criteria for use of commercial disposal are provided in Appendix A.

5.0 LLW PROGRAM ASSUMPTIONS, UNCERTAINTIES, AND RISKS

A number of critical assumptions form the basis for the continuing development and implementation of the LLW program. There is a degree of uncertainty associated with each assumption which represents risk to the LLW program. Risks include environmental risk and programmatic risks, such as budget allocation reductions and resource constraints.

5.1 Critical Assumptions

Critical assumptions associated with the implementation of the LLW program include:

- A revised set of requirements for the management of LLW will be in place in the revised Radioactive Waste Management Order, DOE O 435.1, as of September 1997.

- Although the Department may be moving toward external regulation of radioactive waste, the LLW program will continue to be self-regulated in the near term.

- DOE will, as presented in the preferred alternative for the Waste Management Programmatic Environmental Impact Statement, streamline or "right size" the LLW treatment and disposal configurations.

- DOE will continue to operate at least some sites generating LLW indefinitely.

- DOE will continue to utilize the current LLW disposal sites, or at least some of them, as well as utilize available commercial disposal.

- DOE will continue to transport LLW from generator sites without disposal to appropriate disposal sites.

- DOE will continue cleanup efforts and will complete the cleanup of most sites within the next decade.

A detailed description of the assumptions used in LLW management are available in the Waste Management PEIS and the LLW System Description Document.

5.2 Environmental Health and Safety Risk Management

The process by which risk is managed in the LLW program is described in several documents. Environmental risk is discussed in detail in the Waste Management PEIS for all aspects of LLW management, as well as how those risks are managed and mitigated. Further, each DOE site has appropriate NEPA documentation for the activities at that site which further discuss the risks and mitigation of risk due to LLW.

The cognizant DOE Field Office is required to prepare a performance assessment (PA) for each LLW disposal facility in order to ensure compliance with the performance objectives required by DOE Order 5820.2A, *Radioactive Waste Management*, or, in the case of LLW facilities operated under CERCLA, to incorporate the substantive requirements of DOE Order 5820.2A into the CERCLA documents and process (see Section 4.1). The PA provides a detailed description of how risks are managed and mitigated in the disposal of LLW.

For all LLW disposal facilities, DOE will also prepare composite analyses that account for other sources of radioactivity that may be left at a DOE site. The composite analyses serve as a long-term management tool. A disposal facility performance assessment and the composite analysis will be the basis for preparation of a disposal authorization statement. The purpose of the disposal authorization statement is to document any limits on design or operations for the facility.

5.3 Programmatic Risks

Budget Allocation-- It is not possible to predict with certainty what future budget impacts will be and how these budget impacts will affect the LLW system. The DOE's top priority is to protect the public and worker health and safety and the environment. In the face of a severe budget reduction, priority will be given to continued funding of those activities ensuring safe management of waste.

Changing Requirements-- The Department's LLW program is evolving as new requirements are being established using a safety and performance basis. This PMP will be revised as necessary to keep current with requirements.

6.0 LLW PROGRAM ACTIVITIES AND STRATEGIES

The goal of a well integrated LLW management program will be achieved through developing and implementing strategies for waste minimization, pollution prevention, characterization, treatment, storage, transportation, and disposal of LLW. The LLW program will be managed to meet the EM Ten-Year Plan objectives and milestones, and the Departmental goals for newly-generated waste. Components of the integrated LLW management program plan are discussed below. These strategies or elements of the integrated LLW management program are dynamic and are evolving through and impacted by regulator and stakeholder input, DOE's re-engineering and redeployment activities, PEIS RODs, DOE Order revision, contractor integration, increased external regulation, and other activities. The Plan provides, to the extent possible, the current status of each LLW management component, and the near-term and long-term activities necessary to establish a comprehensive and integrated LLW program.

6.1 Meeting the EM Ten-Year Plan Objectives and Milestones

The Ten-Year Plan will lay out broad objectives for the entire EM organization. **The EM Vision is that within a decade, the Environmental Management Program will complete cleanup at most sites. At a small number of sites, treatment will continue for the remaining waste streams. This unifying vision will drive budget decisions, sequencing of projects, and the actual actions taken to meet program objectives. The vision will be implemented in collaboration with regulators and stakeholders.**

The objective of the Ten-Year Plan is to accelerate the EM program and remain within flat funding through improved efficiency, waste minimization, privatization, revenues from recycling and reindustrialization. The LLW program goals are consistent with the Ten-Year Plan goals of treatment and disposal of all legacy LLW waste and the treatment and disposal of newly generated LLW at the rate at which it is generated.

Site Ten-Year Plans for DOE field site will provide detailed descriptions of the actions necessary at the site level to enable DOE to achieve the Ten-Year Plan. The Ten-Year Plan Guidance requires the field to address risk, safety and health, and technology development.

The Ten-Year Plans will be used to establish priorities in preparing and planning each year's budget submission. The budget preparation process then determines a detailed prioritization of all of the proposed activities for the budget year, including LLW. The authorization and appropriation bills approved by Congress determine what projects and activities are funded.

In addition, Actions Plans are currently being developed to address issues identified based on stakeholder input to the Ten-Year planning process.

The Ten-Year Plan Tracking System will track issues identified during the Ten- Year Plan development. This will include issues identified for management priority consideration.

6.2 Complex-Wide EM Integration Project

A Complex-Wide EM Integration Project was initiated in July 1996 as a contractor-led effort to identify cost savings and program improvements that could be realized from a system-wide study. Using a systems approach, the Complex-Wide Integration Team, is independently reviewing the capabilities and needs of the EM system, including waste volumes, waste storage, treatment, and disposal facilities, the waste transportation system, and technology requirements. Evaluations of LLW are now under way. Opportunities for integration will be developed in a series of interactive "workouts" involving contractor system engineers and technical experts from across the complex. The Field and Headquarters program managers will then develop action plans starting in March 1997 to further evaluate those opportunities.

Decision criteria or attributes to be used in evaluating the opportunities include:

- Technically Feasible - Is the alternative technically feasible? Does it show progress in achieving the desired end state? Does DOE and/or private sector capabilities exist or can it be developed to achieve the alternatives?

- Barriers - Can the proposed benefits (cost savings, schedule improvements, and risk reduction) be achieved by pursuing these new alternatives?

- Relationships - Consider the link to specific Project Baseline Summaries (PBS's) and whether the alternative has a positive effect on the outcome. (The PBS is a summary level document that describes the scope, budget, schedule, and other performance measures for a project in a site's TYP; the PBS will be the main working document for budget formulation. The PBS will also be used to collect, record, and track project performance information. A description of the PBS elements are contained in the Ten-Year Plan Guidance, Final Version 3.0, issued December, 1996.)

- Cost Savings - Are the cost savings credible? Can the alternative achieve the documented cost savings and schedule improvements?

- Risk - Does the alternative further reduce risk to the public, workers, and the environment?

6.3 Waste Management Programmatic Environmental Impact Statement

DOE is committed to a comprehensive NEPA review process in making decisions on the storage, treatment, and disposal of LLW. DOE is currently working through the NEPA process to make important LLW program management decisions that will shape the future of the LLW program. The Waste Management Programmatic Environmental Impact Statement (WM PEIS) and subsequent Records of Decision (RODs) will provide the framework for LLW program decisions for treatment, storage, and disposal of LLW. Before determinations regarding the long-range aspects of LLW management can be made and a framework for decision-making finalized, the NEPA process must be completed.

The PEIS analyzes a number of different LLW treatment and disposal configurations, including the no action alternative which is the current configuration. The process for determining the configuration, which includes the Disposal Cost Analysis and the National Dialogue discussed in Sections 6.8.1 and 6.8.2, will culminate in the issuance of RODs for LLW under the PEIS.

6.4 LLW Projections Process

One of the deficiencies identified in the evaluation of DOE's LLW management program was the lack of a consistent and reliable data base/information retrieval system to support planning and budget functions. Information regarding the projected volumes, waste types, and radioactivity of LLW is needed to provide an accurate and complete picture for successful completion of many of the component strategies of an integrated LLW management program.

DOE has developed guidance for waste forecasting and capacity planning to support effective and integrated planning. The improved capacity planning and waste projection capability will improve

program effectiveness, and prevent capacity shortages and unnecessary storage of LLW, thereby decreasing the risk of releases to the environment and exposures to workers and the public.

Guidance on making waste projections is provided in the Low-Level Waste Projection Program Guide issued in December 1996.[5] It provides guidance to facilitate the development of consistent and accurate projections of future LLW generation and to ensure that accurate LLW projections are integrated into DOE life-cycle planning activities.

It is expected that the revision to the DOE Radioactive Waste Management Order (DOE O 435.1) will contain a requirement for appropriate Department of Energy field elements to develop and maintain low-level waste projections.

The Requirements Manual associated with Order 435.1 will include requirements based upon key elements in the Low Level Waste Projection Program Guide. Specifically, the following elements are expected to be included in the Requirements Manual:

- Waste management units (or other appropriate DOE Field elements responsible for management of LLW) shall implement a Low-Level Waste Projection Program. Projections will provide annual totals for years 1 through 10 and a total sum for years 11 through 30. The Low-Level Waste Projection Program shall, at a minimum, address the following elements:

  - generator information;
  - projected volume;
  - waste form;
  - radionuclide data including key isotopic and curie content;
  - container types; and
  - treatment, storage, and disposal facility capacity.

- Each waste management unit shall implement data quality objectives to improve the quality of LLW forecasts. A period of three projection cycles may be allowed to fully meet data quality objectives.

- LLW projections shall be updated annually.

- LLW projections shall be integrated into program life-cycle planning efforts.

The LLW Disposal Capacity Report is used to integrate baseline forecasts of LLW that will be generated in the future with data on current and planned disposal capacity. The report includes LLW

[5]Low-Level Waste Projection Program Guide, U. S. Department of Energy, Office of Environmental Management, December 18, 1996.

resulting from treatment of mixed low-level wastes (MLLW). The initial LLW Disposal Capacity Report, issued in July 1996, includes information on volumetric capacity only.[6] An update of this report which includes analysis of the radiological capacity of disposal facilities will be issued September 1997. Subsequent updates of the report will be issued biannually. The LLW/MLLW Center of Excellence is responsible for updates of the Disposal Capacity Report and will make information available to the generating programs about the capacities available (commercial and DOE).

The LLW/MLLW Center of Excellence will collect and integrate generator projection data into updates of the LLW Disposal Capacity Report. The complex-wide forecast is integrated into life-cycle planning considerations for the complex and approval of future DOE projects, including decommissioning and environmental restoration projects.

To determine the accuracy and validity of waste volume projections, the LLW/MLLW Center of Excellence will perform periodic assessments of the projection process. Data from generators on the actual LLW generated for a given assessment period is compared to forecasted generation for the same period. Variances are noted and evaluated to identify areas in the forecast methodology that do not meet accuracy expectations. Headquarters and Field Elements utilize results to compare past projections to actual receipts, and to critique current projections with the purpose of improving techniques and increasing the quality of projections.

6.5 Characterization

A comprehensive and integrated approach to waste characterization has been developed to provide waste characterization information to the level of detail necessary for the required treatment, storage, and disposal and to account for potential site-to-site and complex-wide linkages. This will be accomplished by (1) analysis of the waste characterization program functions/activities in the LLW System Description Document (see Section 1.0), (2) increased compatibility between data collected at generation and subsequent treatment, storage and disposal (see Section 6.4), (3) identifying essential requirements for waste characterization to be included in the Requirements Manual for the Radioactive Waste Management Order revision, and (4) developing additional implementation guidance for waste characterization to support the DOE Radioactive Waste Management Order revision (see Section 6.14).

6.6 Storage

DOE has identified several vulnerabilities regarding the current storage of LLW: (1) the storage of waste for which there is an identified path forward for disposition and (2) storage of waste under

[6]The Current and Planned Low-Level Waste Disposal Capacity Report, U.S. Department of Energy, Office Of Waste Management, Revision 0, July 30, 1996.

inadequate conditions. DOE will include in the revision of the Radioactive Waste Management Order, specific requirements that promote timely disposition of wastes for which there is an identified path forward for disposal in cases where protracted storage increases the potential for unnecessary exposure or release. Essential requirements for safe conditions for storage of LLW will also be included as appropriate in the revised DOE Order Requirements Manual. Improved capacity planning and waste projections through the LLW Projections Program will reduce unnecessary storage of LLW and will ensure that the appropriate storage/disposal capacity for the types of waste generated is available when needed.

Consistent with the EM Ten-Year Plan goals and the Department's goals for newly-generated mission waste, the LLW program's objective is to minimize storage of LLW. DOE's policy is that storage of LLW is a temporary activity. The goals of the LLW program are to manage waste as it is generated and to work off all legacy LLW currently in storage.

6.7 Treatment

As part of the analysis for the Waste Management Programmatic Environmental Impact Statement (WM PEIS) DOE has analyzed two treatment strategies for LLW: minimum treatment, defined as the least amount of treatment required prior to either onsite disposal or transport to another site for disposal; and volume reduction, which reduces the overall disposal volume of LLW using a variety of treatment technologies. Minimum treatment includes solidification of liquids and fines, and packaging. Volume reduction uses several different technologies, including thermal treatment, compaction/supercompaction, size reduction, and evaporation/concentration. Because treatment is based primarily on physical waste characteristics, not all the wastes are eligible for all the treatment technologies.

In current practice, LLW is transported elsewhere for treatment from only a few sites. For all alternatives considered within the WM PEIS, some level of LLW minimum treatment at all sites which have LLW is considered practical. Volume reduction treatment methods will be used where appropriate based on economic and disposal capacity considerations.

The ROD for LLW treatment configuration is currently anticipated to be issued by May 1997.

6.8 Disposal Facility Configuration Decisions

Implementation of an integrated program for the management of LLW will of necessity involve decisions on what waste is to be disposed of where. The Office of Environmental Management is currently reviewing alternatives strategies for disposal of DOE-generated LLW. Proposed alternatives include construction of new disposal facilities at DOE environmental restoration sites, use of offsite and commercial disposal facilities, continued operation of current facilities, and/or consolidation of LLW disposal operations to a fewer number of sites. The configuration will be

designed to make efficient use of resources with the underlying theme of ensuring protection of the public, the environment and workers, and compliance with applicable laws and regulations. The Department will consider all of the options available for the safe disposal of waste including:

- disposal of waste at one or more of the DOE disposal facilities;
- use of commercially-available disposal capacity;
- disposal at a privatized facility for DOE waste; and
- release of the waste from radiological controls and disposal in a facility regulated under environmental regulations such as RCRA.

Decisions on disposal locations for LLW will be consistent with the analysis in the WM PEIS. However, the specific waste disposal decisions will be based on meeting constraining criteria specific to the disposal method or location (e.g., Waste Acceptance Criteria, public acceptance, and cost considerations).

The ROD for LLW disposal is currently anticipated to be issued by September-December 1997.

6.8.1 LLW Disposal Cost Analysis

One of the critical inputs to the disposal configuration decision-making process is comprehensive, valid, and comparable information on the projected annual and life-cycle costs of LLW disposal facilities. This cost data, in combination with technical, stakeholder, risk, and budget information, will be used for cost-benefit analyses of facility closure, continuing operations, and new construction strategies across the entire DOE complex.

The Office of Environmental Management is performing a LLW Disposal Cost Analysis as part of the overall strategy for determining the future LLW disposal configuration. The study will focus on analyzing projected unit costs for LLW disposal at operating and planned facilities for the five-year period FY 1997-2001. The study will identify, evaluate, and quantify the variables impacting the cost for disposal of LLW. This will allow for recommendations of optimum LLW disposal configuration which minimize total disposal costs to DOE and will effect a cost competitive culture at DOE. The analysis complements the WM PEIS by providing greater precision in cost data and is one factor in determining the ROD for disposal configuration.

The LLW Disposal Cost Analysis is expected to be completed by June 1997.

6.8.2 National Dialogue

The Department recognizes the need to develop an effective decision-making process to integrate not only waste storage, treatment, and disposal decisions, but also radioactive materials disposition and cleanup decisions as well. In 1995, DOE began an ongoing "National Dialogue" on radioactive waste and materials disposition through discussions with interested states, site-specific advisory boards, and other forums. The "National Dialogue" is intended to promote openness, increase trust and confidence in DOE decision-making, and complement traditional public outreach efforts conducted under the NEPA process. This effort will allow DOE and stakeholders, especially effected States, to explore decision-making processes that may benefit DOE and host communities. The dialogue will focus on major decisions DOE needs to make over the next few years, principles to be considered in the decision-making process, and stakeholder involvement. DOE will strive to reach traditional and nontraditional stakeholders in an open and inclusive manner to effectively integrate decision-making processes. The LLW program strategies are inherently included in the National Dialogue.

6.8.3 Use of Commercial Disposal Facilities

DOE field and headquarters senior Waste Management (EM-30) and Environmental Restoration (EM-40) personnel, as part of an effort to develop and recommend LLW disposal configurations, are evaluating the use of commercial disposal facilities as part of the overall strategy.[7] Considerations developed from this effort include: (1) a configuration that includes both DOE facilities and commercial facilities may minimize the costs of disposal; (2) including the use of DOE facilities and commercial disposal may provide for a more efficient utilization of DOE resources while leveraging the private sector capabilities; and, (3) commercial sites cannot dispose of all of DOE LLW or MLLW due to limitations in their waste acceptance criteria (WAC) for concentrations of several nuclides. These considerations will be factored into the disposal configuration decision.

One of the tasks delineated by the DNFSB in its Recommendation 94-2 was an evaluation of privately operated facilities for disposal of DOE LLW. The study was conducted using a systems approach to identify safety merits and demerits of using private disposal facilities compared to disposing of LLW at DOE facilities.[8] Seven functional areas were evaluated: siting, design, operations, closure, waste form, performance assessment, and approval and oversight. The study concluded that although there are differences in implementation between the NRC and the DOE for these functional areas, the resulting level of protection provided by the aggregate of these seven functional areas are similar for both systems. The results of the study were fed into the criteria developed for use of a commercial disposal facility for DOE LLW. These criteria are detailed in the October 1996 delegation of

[7]"Recommendation for the Future Configuration of DOE Facilities for the Disposal of MLLW and LLW", Predecisional Draft, September 30, 1996.

[8]Evaluation of the Safety Merits and Demerits of Using Privately Operated Facilities for Disposal of DOE Low-Level Waste, U.S. Department of Energy, September 1996.

authority for exemptions to DOE Order 5820 for use of commercial facilities for disposal of DOE LLW and are provided in Appendix A.

6.8.4 Privatization

Privatization of LLW facilities for treatment, storage, or disposal is a possible strategy as part of an integrated LLW program. A number of field offices have undertaken a range of privatization initiatives and a number of these have demonstrated that large cost savings can be achieved compared to the traditional cost-plus management and operating contractor approach.

EM has defined privatization as a business strategy that includes the following:

- purchase of an end product or service;
- a contractor selected via an open fixed price competition;
- cost-effectiveness;
- contractor-owned/contractor-operated, privately financed facilities; and,
- payment to contractor only upon delivery of the product or service to DOE in accordance with the contract.

In evaluating options for future operation of DOE's LLW facilities, DOE is evaluating the option of privatizing its current treatment, storage and disposal operations and/or privatizing treatment, storage, and disposal services for its future needs. To privatize disposal for future needs, DOE would allow private companies to manage and/or develop the disposal facility and compete for business within the DOE system.

Before making a decision on the use of privatization for treatment, storage and disposal of DOE's LLW, the following activities must be completed:

1. Actual total life cycle costs for LLW disposal facilities and operations must be determined. Disposal costs by waste categories are essential for any decision on this issue. A cost study is currently being conducted by the Office of Waste Management (EM-30) and is scheduled to be completed by June 1997.

2. The LLW disposal configuration must be determined. EM will soon publish its Waste Management Programmatic Environmental Impact Statement and associated Records of Decision (ROD). The ROD for disposal of LLW is currently anticipated to be issued by September-December 1997. By this time, most DOE site Performance Assessments will be complete, as will the additional cost analyses discussed above, and the updated disposal capacity report. These decisions will be made in consultation with regulatory authorities, State and Tribal governments and other interested stakeholders.

3. Changes in regulatory authority may impact DOE's LLW privatization decisions. Requirements of NRC, EPA, DNFSB, or State regulations may effect DOE's LLW privatization decisions. For facilities which are or may be subject to regulation by NRC or the agreement states, the regulatory drivers and requirements of these organizations should be considered in privatizing such disposal facilities and their operations.

6.9 Performance Assessments

In accordance with DOE Order 5820.2A, *Radioactive Waste Management*, and the Department's commitments in the *Defense Nuclear Facilities Safety Board Recommendation 94-2 Implementation Plan*, the Department uses a combination of performance assessments and composite analyses to evaluate the potential long-term impacts of low-level waste disposal facilities. Headquarters will issue a Disposal Authorization Statement upon acceptance of both of these documents for a particular disposal facility. To date, Headquarters has approved or accepted four performance assessments. A performance assessment for the Savannah River Site E-Area Vaults was completed prior to the DNFSB accepting the *Recommendation 94-2 Implementation Plan*. Headquarters completed the review and accepted performance assessments for the Nevada Test Site Area 5 Radioactive Waste Management Site, the Hanford 200 West Burial Grounds, and the Idaho National Engineering and Environmental Laboratory in accordance with the commitments in the *Recommendation 94-2 Implementation Plan*.

The Offices of Waste Management and Environmental Restoration have established a Performance Assessment/Composite Analyses (PA/CA) Review Group composed of DOE staff from Headquarters and the Field. The group's responsibility is to ensure the review of the remaining performance assessments and the composite analyses, and make recommendations to the appropriate Deputy Assistant Secretary regarding issuance of a Disposal Authorization Statement. The Performance Assessment Peer Review Panel, comprising contractor technical staff, will provide technical review as requested by the PA/CA Review Group. At this time, there are three performance assessments under review at Headquarters. These reviews and responses to the sites will be completed by the end of calendar year 1997. The final two performance assessments for existing LLW disposal facilities will be submitted for Headquarters review and acceptance by the end of March 1998. The first composite analyses will be submitted for Headquarters review in September 1997. As the composite analyses are reviewed and found to be acceptable, Headquarters will issue Disposal Authorization Statements. The first Disposal Authorization Statement is expected in April 1998 and the last in the January 2000.

6.10 Waste Acceptance Criteria

DOE Order 5820.2A, *Radioactive Waste Management*, is the basis for each DOE disposal facility's waste acceptance criteria (WAC). The Order identifies technical requirements for WAC. However, the Order does not provide guidance on the content or format for what should be included in a site's

WAC. Consequently, requirements for LLW acceptance and generator certification programs are inconsistent among the DOE disposal sites. Each disposal facility has developed its own WAC, procedures, and policies for waste acceptance. Therefore, waste generators who ship to more than one disposal site must follow a separate procedure to have their waste approved for disposal at each site.

DOE is planning to develop complex-wide standardized waste acceptance criteria (WAC). Certain elements of the DOE site WACs will be standardized; additional site specific considerations will be included as appropriate. Standardization items may include but are not limited to, approval process, general criteria, characterization methods, and waste certification programs. This will enable generators to ship to more than one disposal site without having to develop two very separate programs.

DOE/HQ will require that each DOE site develop a standardized WAC for LLW treatment, storage, and disposal. The LLW/MLLW Center of Excellence will develop the standardization template. DOE/Operations/Field Offices will have the authority to develop and approve all WACs. The LLW/MLLW Center of Excellence will serve as the centralized collection point for WACs and the clearinghouse for information/inquiries by sites disposing of waste. This function will provide staff that is cognizant of the radiological limits for each TSD site and the LLW transfer relationships between sites.

6.11 Release Criteria

DOE Order 5400.5, *Radiation Protection of the Public and Environment*, issued February 8, 1990, established DOE requirements for control and release of property including waste containing residual radioactive material. It describes requirements under which DOE facilities may establish authorized limits for release of waste for offsite disposal. In the past, lack of adequate guidance and a clear process resulted in incidents in which several DOE facilities improperly released and shipped waste containing slight concentrations of residual radioactive material to TSD facilities not licensed by the Nuclear Regulatory Commission (NRC) or Agreement States to handle radioactive materials. In response to these incidents, in 1991, DOE issued a moratorium on the shipment of Resource Conservation and Recovery Act (RCRA) hazardous wastes and Toxic Substances Control Act (TSCA) wastes originating in radiologically controlled areas to such unlicensed facilities. The moratorium was to remain in effect at each DOE facility until the DOE operation demonstrated that it was implementing management programs consistent with the EM-30 "Performance Objective for Certification of Non-Radioactive Hazardous Waste." The performance objective was established to assure that RCRA-hazardous, State-hazardous, and TSCA-regulated wastes shipped from DOE facilities to commercial TSD facilities have no bulk or volume radioactive contamination added as a result of DOE operations and are in compliance with DOE Order 5400.5 criteria for surface contamination, unless the receiving facility is specifically licensed to manage radioactive waste.

DOE is continuing to work with other Federal agencies including the Environmental Protection Agency (EPA) and the Nuclear Regulatory Commission (NRC), and coordinating with states, to establish general radiological control criteria for hazardous waste. Although a schedule for implementing such generally applicable standards has not been determined, DOE will continue to work with other Federal agencies and the states to establish risk-based criteria as soon as possible.

The "Establishment and Coordination of Authorized Limits for Release of Hazardous Waste Containing Residual Radioactive Material", issued January 7, 1997, provides specific guidance to assist DOE waste managers in coordinating with and obtaining agreement of Federal, State, and local regulatory agencies, and operators of TSD facilities, to permit the shipment of hazardous waste containing residual radioactive materials to a commercial TSD not licensed to handle radioactive materials. This guidance describes the DOE approval process, coordination with external regulators and the receiving facility, and documentation requirements, and supplements the EH guidance of November 17, 1995 which discusses the processes to establish and approve authorized limits.

6.12 Pollution Prevention/Waste Minimization

The Secretary of Energy has committed the Department to the following pollution prevention goals for LLW, to be achieved complex-wide by December 31, 1999, using calendar year (CY) 1993 as a baseline:

- Reduce the generation of low-level radioactive waste from routine operations 50 percent.[9]

- Reduce the generation of low-level mixed waste from routine operations 50 percent.[10]

Progress toward achieving the goals will be reported annually to the Secretary in the Annual Report on Waste Generation and Pollution Prevention Progress.

Individual sites are encouraged to develop their own goals that meet or exceed the above complex-wide goals. It is the responsibility of Operations Office managers, and heads of contractor organizations to ensure that appropriate site-specific goals are set. Specific waste reduction goals must be included in the Site Pollution Prevention Plan update to Headquarters (EM-77) by May 31, 1997, per DOE Order 5400.1.

[9]Environmental cleanup/stabilization wastes are excluded from this reduction goal.

[10]Environmental cleanup/stabilization wastes are excluded from this reduction goal.

The Pollution Prevention Program Plan[11] establishes immediate Department-wide priorities, to be implemented by fiscal year (FY) 1998, that will help the sites to focus on the most critical aspects of DOE's pollution prevention program. Additional near-term priorities (FY 97-99) and out-year activities (FY 98-2000) that must be completed to achieve a successful pollution prevention program are also detailed in the Pollution Prevention Program Plan (1996). The Pollution Prevention Program Plan also provides funding guidance to achieve the pollution prevention goals and delineates roles and responsibilities.

As committed in the DNFSB Recommendation 94-2 Implementation Plan, a LLW minimization study was conducted to identify successful waste minimization practices that have been instituted at DOE sites with the intent of extending to more sites those waste minimization practices that can reduce the volumes of waste requiring disposal (Low-Level Radioactive Waste Minimization Evaluation and Strategy, August 1996, DOE/ORO-2043). The strategy developed from this study outlines activities that DOE sites can implement to reduce generation of LLW. Similarly, a Mixed Low-Level Waste Minimization Evaluation and Strategy (November 1996, DOE/ORO-2044) was completed and submitted to the DNFSB in December 1996.

In addition, as part of the Department's re-engineering initiative, generators will be responsible for management of the LLW they generate. The Department believes that this increased accountability will result in LLW minimization.

6.13 LLW Research and Development

To be responsive to the Defense Nuclear Facilities Safety Board's (DNFSB) recommendations (94-2) regarding research and development needs and to improve the technical foundation behind the Department's LLW management program, a strategy has been developed that will identify and prioritize LLW R&D needs and address those needs in a time frame to support the LLW program. The R&D task is designed to improve the LLW management program through a focused and directed effort that identifies, evaluates, and prioritizes specific technical needs and then assesses if those needs are being addressed, either directly or indirectly, within the program. Where outstanding needs exist, a strategy will be developed to prioritize and address those in a timely manner.

This effort will be focused on those items that are most important within the DOE LLW management system (e.g. long-term disposal facility performance, regulatory guidance and application, risks to human health and safety) to ensure that the R&D strategy applies to the most significant problem. Then, identified R&D needs will be assessed against existing or past activities, and the two (needs and activities) will be correlated to identify those needs already addressed by existing technology and those that are not addressed. An R&D program strategy for the coordination of existing or initiation of new projects to address outstanding needs will be developed. Results from related R&D projects

[11]Pollution Prevention Program Plan 1996, U.S. Department of Energy, Office of the Secretary, DOE/S-0118.

will be integrated in the R&D strategy to support final development and implementation of LLW management program improvements. R&D task initiatives will be required to anticipate and react to impending programmatic and policy changes (e.g. changes in regulatory Orders or regulatory authority) as these will probably have a significant impact on the content of the needs evaluation.

Requirements for a plan for management of LLW that does not have an identified path forward to disposal will be contained in the revised DOE Radioactive Waste Management Order.

The EM Ten Year Plan will also incorporate technology development by (1) assessing basic R&D needs and deployment opportunities to meet the 2006 goal, (2) identifying opportunities for basic R&D to address site problems remaining after FY 2006 (where applicable), (3) identifying benefits, including cost savings, risk reduction, or solving problems which are otherwise unsolvable, and (4) integrating current science and technology development activities.

6.14 Implementation of Revised Waste Management Order

DOE is currently in the process of revising DOE Order 5820.2A, Radioactive Waste Management, which will be issued as DOE Order 435.1, with a corresponding manual of requirements and implementation guidance. The order and manual will provide the policies and requirements necessary to improve the management of all types of DOE radioactive waste, including safe generation, treatment, packaging and storage. A major portion of the document will be dedicated to the management of LLW, and will meet requirements of DNFSB 94-2.

Revision activities include: (1) mapping the functions for each type of radioactive waste; (2) identifying hazards associated with the management of the waste ; (3) conducting a requirements analysis; (4) developing requirements that address the identified functions and hazards and the corresponding implementing guidance, and (5) documenting the technical basis for the requirements. The order and manual requirements will address the vulnerabilities associated with the management of LLW identified in the LLW Complex-Wide Review, as well as weaknesses identified through the hazards analysis. These include identification of essential requirements for waste characterization; specific requirements to dispose of LLW with an identified path forward; and essential requirements for safe conditions for storage of LLW. The order and manual will be more performance based than the existing order, and will have a pre-approval process prior to operation and some type of enforcement mechanism.

A draft of the document was issued for external Departmental and DNFSB staff review on February 28, 1997. The document is expected to be published in the Federal Register in June, 1997, and the final Order will be issued in September, 1997.

6.15 Assessing the LLW Program Effectiveness

6.15.1 System Performance Measures

The Low-Level Waste System Description Document (SDD), issued in September 1996, defines the DOE LLW program management system's top-level performance measures and the performance measures for measuring compliance with system requirements (Volume 2, Chapter 2). The top-level performance indicators to be used to measure the LLW program effectiveness and the associated metrics are presented in Table 1. The metrics include both quantity measures and other verifiable events such as: completion of an assignment; implementation of a task; release of a report; or inclusion of specified elements in an analysis. As part of the systems engineering evaluation, the existing DOE LLW requirements were reviewed and assigned to each appropriate performance measure.

These performance indicators and metrics will be used during the periodic LLW program reviews and complex-wide assessments discussed below to evaluate the effectiveness of the LLW program. This process, together with the Ten-Year Plan process of establishing and tracking key management commitments and progress (both corporate and site) will be used to track LLW generators and TSD performance associated with waste volumes, throughput, and schedule and cost performance.

6.15.2 Periodic Assessments

The LLW program is moving to a streamlined process for conducting periodic assessments of program and project performance. Field elements will continue to be responsible for conducting audits of LLW management activities and providing authorization basis prior to facility operation. Frequency of audits will be based on the nature of the activity. Headquarters' role will be to provide guidance on the scope and process for conducting audits and to review the field audit programs and results. Results of the routine WM LLW audits at the sites will be provided to the LLW/MLLW Center of Excellence. The Center's responsibility is to evaluate the data from the audits to identify common or recurring findings or weaknesses. This may give rise to issues that require resolution. Issues identified will be analyzed by the LLW/MLLW Center of Excellence and recommendations will be developed. The recommendations for disposition will then be forwarded to the Deputy Assistant Secretary for Waste Management.

Table 1 - DOE LLW System Performance Measures

Top-Level LLW Performance Measures		
Performance Measure	**Metric**	**Value**
Public Exposure	mrem per person over time	Set by the requirements statements associated with this specific performance measure
Worker Exposure	mrem per person over time	Set by the requirements statements associated with this specific performance measure
Life-Cycle Cost	Cost of the alternative over the DOE LLW system life-cycle beginning when waste is generated and ending when administrative controls are dropped at the disposal site	Selected alternative represents an effective life-cycle cost for the DOE LLW system
Public Acceptance	Approved Record of Decision (ROD)	Selected DOE LLW system T/S/D physical configuration is acceptable to stakeholders
Regulatory Compliance	Permit issued, fines paid, or convictions	Complex-wide DOE LLW system is in compliance with governing Federal and state laws and regulations for the area of concern
Congressional Acceptance	Funds appropriated	Funding support selected alternatives
Departmental Compliance	Number of audit findings	System work is performed to DOE policy, commitments, and orders
Contaminant Level	Radionuclide contaminants per unit volume	Contaminant levels are below the limits set by Federal or state law or regulation for the area of concern
Environmental Compliance	-Acres of sensitive land disturbed -Number of species at risk	Acres disturbed and species at risk are supported and accepted through the NEPA process
Available Capacity for Disposal	Volumetric and radionuclide capacity per time period	Disposal capability is available to dispose of LLW per the generators production plans as agreed to by the generator and WM

From the data collected during field audits and performance metrics, the LLW/MLLW Center of Excellence will conduct a complex-wide assessment of the LLW program at least as often as every three years. The complex-wide assessment will identify site-specific vulnerabilities, complex-wide vulnerabilities and programmatic root causes, as appropriate, and DOE's conclusions and recommendations for development of corrective action plans.

Headquarters currently performs a mid-year and year-end program review with each of the Field/Operations Offices. The LLW/MLLW Center of Excellence will independently review LLW/MLLW performance metrics annually in order to evaluate the progress of the overall LLW/MLLW program. The Center will focus the evaluation on performance trends of the National Program. The Center evaluation , along with the program reviews, will provide input for updating the LLW Program Management Plan. The Program Management Plan will be updated as necessary.

6.15.3 EM Management Commitments

As part of EM's Ten-Year Planning process, each fiscal year a mid-year and end of year review of the plan goals for the program will be performed. Planned and actual volumes of LLW treated and disposed, at both a site level and a total program level, will be evaluated and variances analyzed, as appropriate. Actions Plans will be developed to address areas or issues where LLW management has failed to meet the Ten-Year Plan goals.

In addition, each Operations/Field office must provide management commitments for each fiscal year. These commitments will be very specific and will provide quantitative measures for performance assessment. The commitments will be agreed to and signed by the Operations/Field Office Manager and the Assistant Secretary for Environmental Management. Each Operations/Field Office will agree to accomplish certain key management commitments and to accomplish the work scope as reflected in the site's Ten-Year Plan (i.e., Project, Site, and Operations Baseline Summaries) for the fiscal year. Major milestones and corporate performance measures will be established for high visibility projects. EM Key Corporate Measures (e.g., 5500 cubic meters of LLW disposed by September 1997) and Key Management Commitments (e.g., Complete first cut systems engineering analysis of future transportation needs, National Transportation Program-AL, by June 1997) will be identified. Management commitments and related commitments to non-EM programs will be included.

The process for assessing the LLW program effectiveness also includes: 1) oversight activities by line management and independent organizations, as described in the LLW Program Organization and Responsibilities section of this Plan (Section 3.0); 2) Quality Assurance activities (see Section 2.9); and the variance analysis associated with the Projections Program (see Section 6.4).

6.16 Special Case Waste

There is some LLW defined as Special Case Waste (SCW) for which a final disposition has not been identified. This waste is generally not currently acceptable for near-surface disposal. DOE is developing a consistent management structure for SCW across the DOE complex. Under the revision of the DOE Radioactive Waste Order (Draft DOE O 435.1), there will be a requirement that Field Office Managers document a path forward for all waste, including that for which there is no known disposition. The management strategy for sealed sources and reactor components (Special Performance Assessment Required SCW) is to update current inventories, estimate quantities to be generated from future activities, package for storage and future disposal, identify adequate disposal sites, store until sites become available, and then dispose appropriately. The management strategy for uncharacterized SCW is to characterize the waste and determine if it is actually SCW. The portion that is found to be SCW will then be managed as described above.

7.0 LLW PROGRAM MILESTONES

The following are the major milestones of the LLW Program. Other milestones exist at the site level.

7.1 Configuration Decisions (see Sections 6.7 and 6.8)

- The ROD for the LLW treatment configuration is currently anticipated to be issued by **May, 1997**. The disposal configuration ROD is currently anticipated to be issued by for **September-December, 1997**. Subsequent milestones for transition will be identified in a ROD implementation plan.

- The study to determine total life-cycle costs for disposal facilities and operations will be completed by **June 1997**.

7.2 Periodic Assessment of the LLW Program (see Section 6.15)

- A year-end review of the LLW Management Program will be conducted each fiscal year.

7.3 Performance Assessments, Composite Analyses, and Disposal Authorization Statements (see Section 6.9)

- The DOE milestones for completing performance assessments and composite analyses, and issuing Disposal Authorization Statements are provided in Appendix B.

7.4 **Waste Acceptance Criteria** (see Section 6.10)

- All standardized WACs will be developed and implemented within 18 months after the issuance of this Program Management Plan.

7.5 **Research and Development** (see Section 6.13)

The plan to develop and implement a LLW R&D strategy includes the following milestones:

- A preliminary catalog of DOE and non-DOE LLW Management R&D activities for the initial needs areas was issued in June 1995. This catalog will be updated and revised and recommendations for improvement of R&D and TD reporting and tracking procedures will be made by **March 31, 1997**.

- Identification of potential LLW management technical needs will be completed by **March 31, 1997**.

- A determination of outstanding LLW R&D needs will be completed by **June 30, 1997**.

- Development and recommendation of a strategy for addressing outstanding LLW technical needs will be completed by **September 30, 1997**.

7.6 **Re-engineering Initiatives** (see Section 4.2)

- An initial pilot phase to test waste management re-engineering and transition to generator accountability is planned for **Fiscal Year 1998**. Management of newly-generated waste will be transitioned from Environmental Management to Defense Programs, Energy Research, and Nuclear Energy at four sites. The goal is to complete the transfer of funding responsibility for newly generated waste to the generators by FY 2000.

7.7 **Waste Minimization/Pollution Prevention** (see Section 6.12)

- DOE is committed to reducing the generation of LLW from routine operations 50 percent by **December 31, 1999**, using calendar year 1993 as a baseline.

7.8 **Disposal Capacity Report** (see Section 6.4)

- The Disposal Capacity Report to include evaluation of radiological capacity will be issued by **September 30, 1997**.

APPENDIX A

LLW Commercial Disposal Process

DOE Order 5820.2A states that, "DOE low-level waste shall be disposed of on the site at which it is generated, if practical, or if on-site disposal capability is not available, at another DOE disposal facility." The order contains provisions for exemptions to the requirements provided that appropriate safety, health protection, and economic analyses are prepared by Field organizations and approved by the Office of Waste Management, in consultation with the Office of Environment, Safety, and Health. Prior to October 1996, exemptions to the requirements of Order 5820.2A, allowing for the use of non-DOE facilities for the disposal of DOE LLW, have been granted by Headquarters on a case-by-case basis.

In October 1996, recognizing that the decision on use of non-DOE disposal capability is best made at the Field level, the Assistant Secretary for Environmental Management delegated authority to DOE Operations Managers and Field Office Managers to grant exemptions to the order requirement that LLW be disposed at DOE facilities.[12] The delegation does not allow for the use of State Compact disposal facilities and may not be redelegated. Previous delegation of authority to grant exemptions for small quantities of mixed waste and the blanket exemption for commercial disposal of radioactive waste from environmental restoration activities[13] remain in effect.

The October 1996 delegation memorandum establishes that use of a non-DOE disposal facility shall be evaluated on a case-by-case basis and **must meet the following criteria before approval**:

1. Such facilities must comply with applicable Federal, State, and Local requirements, and have the necessary permits, licenses, and approvals for the specific waste(s) involved, and be determined by DOE, based on a review, to have an adequate history of operational and regulatory performance. The review of operational and regulatory performance must be conducted annually by DOE. A review by one DOE entity can be referenced by another DOE entity to fulfill this requirement;

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[12]Memorandum from A. Alm to Operations Office Managers and Field Office Managers, "Delegation of Authority to Grant Exemptions to Department of Energy Order 5820.2A to Allow for the Use of Commercial Facilities for Disposal of Department of Energy Low-Level Waste," October 24, 1996.

[13]"Commercial Disposal of Department of Energy Radioactive (By-Product and Low-Level) and Mixed Wastes", Thomas P. Grumbly letter to EM-421, October 12, 1993.

2. The Operations or Field Office must document that the use of non-DOE disposal facilities is cost effective and is in the best interest of DOE. As part of the planning process, a range of waste disposal alternatives must be considered and documented, including on-site disposal, an alternative DOE disposal site, and available non-DOE facilities;

3. The DOE waste must be sufficiently characterized and verified to meet the non-DOE facility's waste acceptance criteria;

4. Appropriate National Environmental Policy Act (NEPA) review must be completed. For actions taken under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), it is DOE's policy to incorporate NEPA values into the CERCLA documentation (reference: Secretarial Policy Statement on NEPA, June 1994); and

5. Host States and State Compacts must be consulted before approval of the exemption, and notified prior to shipments being made.

To comply with the consultation requirements of Order 5820.2A, a copy of each exemption request shall be provided to the Office of Environmental Policy and Assistance (EH-41) for their review. They will respond within fifteen working days if there are environmental concerns. If a response is not received within the fifteen working days, approval may be granted. A copy of the exemption request must also be sent to the Office of Waste Management or the Office of Environmental Restoration, as appropriate.

APPENDIX B

RESPONSIBILITIES AND COMMITMENTS

FOR COMPLETION OF ASSESSMENTS AND APPROVALS

Appendix B: Responsibilities and Commitments for Completion of Assessments and Approvals

Site	Disposal Facility	Responsible Field Office	Description	Submit to HQ	HQ Action
Los Alamos National Laboratory	TA-54, Area G	DOE-AL	Perf. Assessment	03/31/97	12/31/97
			Composite Analysis	12/31/97	03/31/98
			Disp. Auth. Stmt.	na	04/30/98
Idaho National Engineering Laboratory	Radioactive Waste Management Complex	DOE-ID	Perf. Assessment	completed	completed
			Composite Analysis	01/31/98	04/30/98
			Disp. Auth. Stmt.	na	05/31/98
Nevada Test Site	Area 5 Radioactive Waste Management Site	DOE-NV	Perf. Assessment	completed	completed
			Composite Analysis	09/30/99	12/31/99
			Disp. Auth. Stmt.	na	01/31/00
Nevada Test Site	Area 3 Radioactive Waste Management Site	DOE-NV	Perf. Assessment	03/31/98	11/30/98
			Composite Analysis	included in PA	
			Disp. Auth. Stmt.	na	02/28/99
Oak Ridge National Laboratory	Solid Waste Storage Area-6 (rev. 1)	DOE-OR	Perf. Assessment	09/30/97	01/21/98
			Composite Analysis	09/30/97	12/31/97
			Disp. Auth. Stmt.	na	06/30/98
Hanford	Environmental Restoration Disposal Facility	DOE-RL	CERCLA Assessment	completed	completed
			Composite Analysis	12/31/97	05/31/98
Hanford	200-W Burial Grounds	DOE-RL	Perf. Assessment	completed	completed
			Composite Analysis	included with ERDF	
			Disp. Auth. Stmt.	na	06/30/98
Hanford	200-E Burial Grounds	DOE-RL	Perf. Assessment	completed	04/30/97
			Composite Analysis	included with ERDF	
			Disp. Auth. Stmt.	na	07/31/98

Appendix B: Responsibilities and Commitments for Completion of Assessments and Approvals

Site	Disposal Facility	Responsible Field Office	Description	Submit to HQ	HQ Action
Savannah River	E-Area Vaults	DOE-SR	Perf. Assessment	completed	completed
			Composite Analysis	09/30/97	12/31/97
			Disp. Auth. Stmt.	na	03/31/98
Savannah River	Saltstone Disposal Facility	DOE-SR	Perf. Assessment	completed	completed
			Composite Analysis	included with E-Area Vault	
			Disp. Auth. Stmt.	na	03/31/98

na - Not applicable. The disposal authorization statement is issued by Headquarters.