IMPLEMENTATION PLAN

DEFENSE NUCLEAR FACILITIES SAFETY BOARD RECOMMENDATION 94-2

Conformance with Safety Standards at Department of Energy Low-Level Nuclear Waste and Disposal Sites

March 31, 1995

Table of Contents

List of Figures

List of Tables

EXECUTIVE SUMMARY

On September 8, 1994, the Defense Nuclear Facilities Safety Board (DNFSB or the Board) 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. This Implementation Plan is submitted in response to Recommendation 94-2.

In making Recommendation 94-2, the Board concluded that the Department of Energy (DOE) low-level waste (LLW) program has not kept pace with the evolution of commercial practices. The Board also noted that no defense nuclear LLW disposal facilities had completed the radiological performance assessments required by DOE Order 5820.2A, Radioactive Waste Management. The Board also noted that LLW radiological performance assessments do not include all applicable source terms in the evaluations.

DNFSB 94-2 recommends 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 term. DNFSB 94-2 also recommends that the Implementation Plan include issuance of new standards, requirements, and guidance for LLW management, studies to improve modeling capability, and waste form and intruder and radionuclide migration deterrence, studies of volume reduction, a program to improve volume projections of LLW, and a study of the safety merits/demerits of privatization.

The Department has evaluated the LLW Management problems using the Board's recommendation and existing knowledge based on earlier work conducted by the Department's Low-Level Waste Management Steering Committee and has made commitments in this Implementation Plan to address the items in the Board's recommendation.

The Implementation Plan is organized into the following major sections:

- Baseline of the Low-Level Waste Management System
- Organization and Management
- Systems Engineering Approach for LLW Management
- Complex-Wide Review
- DOE Regulatory Structure and Process
- Performance Assessments
- Low-Level Waste Projections
- Research and Development

Table ES-1 shows the Departmental Commitment associated with each of the specific Board recommendations in DNFSB 94-2, and the Section of this Implementation Plan which describes the tasks, milestones, and deliverables to achieve the commitment.

Table ES-1: Summary of Recommendations and Departmental Commitments

	Recommendation in DNFSB 94-2	Departmental Commitment	Plan Section
(1)	Conduct a complex-wide review: establish dimensions of LLW problem, identify corrective actions.	Complex-wide review will be conducted on active, planned, & inactive LLW Sites, and LLW treatment and storage facilities; corrective actions will be implemented.	V.
(1a)	Plan should include regularized program for volume projections.	Guidance on volume projections will be issued; a program to routinely evaluate LLW projections will be implemented.	VIII.
(1b)	Plan should include development and issuance of additional LLW require - ments, standards, and guidance.	Immediate steps will be taken to clarify existing requirements; standards will be developed and issued; a LLW rule will be drafted and finalized.	VI.
(1c)	Plan should include planned studies directed towards improving modeling capability, waste form stability, and intrusion and migration deterrence. AND	A research and development program will be initiated to support improved LLW management.	IX.
(1d)	Plan should include studies of enhanced methods to reduce volume of LLW.		
(1e)	Plan should assess the safety merits/demerits of privatization of LLW disposal facilities.	An analysis of safety merits and demerits of the use of a private facility located away from the Department's sites operated for the exclusive disposal of DOE LLW, and the use of a private disposal facility operated at a DOE site by a commercial disposal firm will be conducted.	IV.
(2)	More immediate steps to complete PAs	A schedule is included for completion of current PAs.	VII.
(2a)	PAs are to be based upon the total inventories at the facility.	A phased approach is included for assessing the entire source term without delaying PAs already under review.	VII.
(2b)	PAs with entire source term are to meet 5820.2A dose objectives	The phased approach for assessing the entire source term implements the dose objectives of 5820.2A on the entire source term.	VII.
(3)	Corrective Action Plans are developed for bringing sites into compliance that don't meet 5820.2A dose objectives for the entire source term.	An evaluation will be conducted at active LLW disposal sites; a corrective action plan will be prepared where necessary; corrective actions will be incorporated into PAs during the phased approach of assessing the entire source term.	VII.

A change control process for the Implementation Plan is included. This will allow for changing task initiatives as needed after the complex-wide review is completed, or if other external forces affect the Implementation Plan during the conduct of task activities. A reporting system is also described providing for regular reporting of progress on initiatives to the Board and others.

A glossary, list of acronyms and abbreviations, and a list of references follows the task initiatives.

The commitments summarized above will be completed by Fall of 1996, except for full implementation of an improved volume projections program and finalizing a LLW rulemaking. These will be completed in early 1997 and Fall of 1997, respectively. A very preliminary estimate of the resources required to complete the task initiatives described in this Implementation Plan is approximately $16 million. Of this total, approximately $6 million is incremental funding.

There is the potential for outside influences to have a major impact on the task initiatives and the commitments made in this Implementation Plan. Possible outcomes of two current activities would probably have the greatest impact on the Department's ability to complete the actions in this plan. These would be: (1) A recommendation by the Department's Advisory Committee on External Regulation for external regulation of the DOE LLW management program, and (2) Issuance of 40 CFR 193, the Environmental Protection Agency's generally applicable environmental standard on management and disposal of low-level waste.

I. INTRODUCTION

On September 8, 1994, the Defense Nuclear Facilities Safety Board (DNFSB or the Board) 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. This Implementation Plan is submitted in response to Recommendation 94-2.

The Department recognizes the importance of the issues raised by DNFSB Recommendation 94-2. Many of the issues raised by the Board have previously been identified by the Department of Energy Low-Level Waste Steering Committee, and technical working groups preparing the revision to the Department's Order on radioactive waste management. The Department acknowledges and shares the Board's concerns about the Low-Level Waste Management Program, and provides commitments in this Implementation Plan to address and resolve the problems in the Department's management of LLW.

A. Background

The Department of Energy and its predecessor agencies have been generating and disposing of LLW at its facilities since the dawning of the Manhattan Project in the 1940s. The classified nature of work conducted under the Manhattan Project and succeeding programs led to a variety of site-specific processes and procedures for management and disposal of LLW. The system for managing LLW has evolved over the years into the present day system, which continues to be based primarily on site-specific considerations.

The Atomic Energy Act of 1954, as amended, provides the Department with the authority to manage LLW it generates, and ensure that it is managed in a way that protects the health and safety of the public, workers, and the environment. DOE Order 5820.2A, Radioactive Waste Management, contains the primary requirements governing the safe management of radioactive waste by DOE. Chapter III of the order addresses the management of LLW.

B. Understanding of the Problem

The provisions of Chapter III, Low-Level Waste, of DOE Order 5820.2A, require that a radiological performance assessment (PA) is conducted on LLW disposal facilities to ensure that LLW is managed in a way that is protective of the safety and health of workers and the public, and protects the environment. The results of the PA are to be used as one of the bases for waste acceptance criteria, disposal facility operational conditions, and any other required actions and conditions to ensure that the LLW is managed safely. A successful demonstration of compliance with the dose objectives for public safety in the Order relies almost entirely on the PA process.

The Department's process for development, review, and approval of PAs for the currently active LLW disposal facilities has taken too long. A PA is completed and approved for only one DOE LLW disposal facility. Also, the Order calls for including only LLW disposed after the Order was issued in 1988 in the radiological PA for the disposal facility. This means that LLW disposed prior to the issuance of the Order is not accounted for in determining the conditions required for safe operation of the facility.

The reliance on the PA to determine conditions of operation, combined with the lack of approved PAs and the inclusion of only post-1988 LLW, means that the Department may be currently disposing of LLW without a technically defensible margin of safety, unlike the "defense-in-depth" system used in the commercial regulation of LLW disposal. In that system, minimum technical criteria must be met in several functional areas important to safety in addition to a demonstration through a PA that radiation dose objectives will be met.

C. Objectives of the Implementation Plan

The overall objective of the Implementation Plan is to improve the LLW management system so that performance assessments are approved that demonstrate that DOE LLW disposal facilities meet DOE Order 5820.2A radiological performance objectives; that the PAs include all appropriate LLW as radioactive source terms in the evaluation, and that LLW is disposed with a margin of safety in place to protect workers and the public and the environment in addition to conditions imposed based on the PA. This objective will be accomplished by establishing the technical basis for LLW management, developing and implementing effective policies, requirements, and compliance criteria for managing LLW. Efforts to achieve the objective will be accomplished by an integrated LLW Management Program within the Department's Office of Environmental Management. The program and the initiatives committed to in this plan will be designed and implemented in a manner that builds on activities currently in existence. Examples of this are the use of recent audits to support completion of the complex-wide review; the supplementing of requirements included in the revision of DOE Order 5820.2A as needed to fill gaps in requirements, guidance and standards; the standardization of waste projections activities undertaken to meet other needs; and coordination with programs such as waste minimization and research and development.

The term LLW, as used in this Implementation Plan, includes the radioactive component of mixed low-level waste. The hazardous component of mixed LLW is regulated separately under the provisions of the Resource Conservation and Recovery Act (RCRA).

Guiding principles that frame the basis for decisions to include the actions in the Implementation Plan are:

- Long-term protection of public safety and health, and the environment;
- Protection of LLW facility worker safety;
- Effective and efficient disposal of LLW;
- Minimization of storage of LLW, and;
- Minimization of generation of new LLW.

D. Summary of DNFSB 94-2 Recommendations and Departmental Commitments

The overall objective of the Implementation Plan will be met by the following commitments addressing the Board's recommendations on management of LLW:

1. DNFSB 94-2, paragraph 1, recommends:

A comprehensive complex-wide review be made of the low-level waste issue similar to the review the Department conducted regarding spent nuclear fuel. As with spent fuel, the objective of such review should be the establishment of the dimensions of the low-level waste problem and the identification of corrective actions to address safe disposition of past, present, and future volumes [of low-level waste].

Commitment:

The Department will conduct a complex-wide review of (1) active and planned LLW disposal facilities and inactive LLW disposal facilities and other potentially overlapping radioactive source terms, and LLW treatment and storage facilities by ~~March~~ April 1996, and (2) all remaining inactive LLW disposal facilities by ~~June~~ September 1996. Similar to the Spent Nuclear Fuel Vulnerabilities Study conducted

by the Department, the review will determine the major vulnerabilities of the LLW management system and identify corrective actions to address safe disposition of all LLW. The complex-wide review will be based in part on a systems engineering evaluation which will identify the key technical and programmatic functions of the LLW management program, describe the input and output requirements and constraints for these functions, and establish the criteria for effectively determining system performance. The complex-wide review will be conducted using a "Target-Barrier-Hazard" approach, which will lead to identifying weaknesses that could impact workers, the public, and the environment. Corrective Action Plans will be developed at each site to address the vulnerabilities identified by the complex-wide review.

2. DNFSB 94-2, paragraph 1, subparagraph a, recommends the Implementation Plan should include:

A regularized program for forecasting future burial needs relative to existing capacity, taking into account the projected programs for decontamination and decommissioning of defense nuclear facilities and environmental restoration activities as well as current operational units.

Commitment:

The Department will conduct an evaluation of current waste generation and volume projections of LLW received by LLW disposal facilities, current methodologies used to project LLW volumes, and planned disposal capacity for LLW by October 1995. Following this effort, a LLW projection program will be implemented. The program will issue an implementation guidance document that will describe the recommended methodologies for LLW volume projections and their recommended frequencies. The guidance document will also contain a system for evaluation of the projected volumes of waste requiring disposal to determine the accuracy and validity of waste volume projections. The guidance will be directed specifically at improving projections of LLW from D&D and remedial action projects, but it will also be coordinated with generators creating LLW routinely. The projection program documentation and the guidance will be completed by March 1996. Full implementation of these programs will be achieved by February 1997.

3. DNFSB 94-2, paragraph 1, subparagraph b, recommends the Implementation Plan should include:

The development and issuance of additional requirements, standards or guidance on low-level waste management that address safety aspects of waste form and packaging, burial ground siting and performance assessment, facility design, construction, operation, and closure, and environmental monitoring. Such guidance should reflect consideration of concepts of good practices in low-level waste management as applied in the commercial sector, both nationally and internationally, and results of DOE's technological developments and advisories to the State Compacts pursuant to the Low-Level Radioactive Waste Nuclear (sic) Waste Policy Act of 1982 (sic), as amended.

Commitment:

The Department will take immediate steps to clarify existing requirements in DOE Order 5820.2A to achieve compliance with the radiation dose objectives in the Order. These steps will be to clarify and strengthen the regulatory structure for LLW management by identifying and clarifying the roles and responsibilities for compliance and oversight at LLW disposal facilities, and by directing that all source terms be included in radiological performance assessments for LLW disposal facilities. These immediate steps will be completed by June 1995. The Department will then clarify and

improve the PA review and approval process, including standardizing review criteria and making changes to the Peer Review Panel. These improvements will be made by June 1996. The Department will identify the need for and issue uniform technical standards for LLW management based on best commercial practices both nationally and internationally in, at a minimum, the technical areas of PAs, waste form and packaging, waste characterization, site closure, and site monitoring by June 1996. Additional clarifications on the applicability of the Waste Management Order will be made by October 1996. The Department commits to codifying the essential requirements of LLW management in a low-level waste regulation. The rule will be developed following an evaluation to select requirements from non-DOE LLW management regulations and management systems that are appropriate to incorporate in such a rule for management of DOE LLW. A final regulation will be promulgated by September 1997.

4. DNFSB 94-2, paragraph 1, subparagraphs c and d, recommend the Implementation Plan should include:

Planned studies directed towards (1) improving modeling and predictive capability for assessing migration of radionuclides and (2) enhancing the stability of buried waste forms, deterring intrusion and inhibiting migration of radionuclides; and

Studies of enhanced methods that can be used to reduce the volume of waste to be disposed of, such as compaction and more environmentally acceptable incineration.

Commitment:

The Department will catalog DOE and non-DOE LLW research results and ongoing research activities on improving modeling and predictive capability of migration of radionuclides, enhancing the deterrence of intrusion, enhancing the stability of waste, inhibiting the migration of radionuclides, and volume reduction technologies. This will be accomplished by ~~September~~ July 1995. The Department will identify its needs for improvement in these technical areas by ~~November~~ October 1995. The needs assessment will be correlated with the valid research results and ongoing studies to determine additional research needed for improving LLW management technologies in an integrated program by ~~February 1996~~ December 1995. Results from completed studies will be utilized appropriately in efforts to improve the LLW management program, and coordination with ongoing research will be accomplished through the integrated program. A strategy will be developed and included in a LLW Program Management Plan by ~~April 1996~~ February 1996 for developing the necessary research and development to fill any needs not being met by already completed or ongoing research.

5. DNFSB 94-2, paragraph 1, subparagraph e, recommends the Implementation Plan should include:

Assessment of the safety merits/demerits of privatization of facilities for disposal of DOE low-level wastes.

Commitment:

The Department will evaluate as part of a systems engineering evaluation of the LLW management system the safety merits and demerits of privatizing disposal of DOE LLW. The evaluation will consider the use of a private facility located away from the Department's sites operated for the exclusive disposal of DOE LLW, and the use of a private disposal facility operated at a DOE site by a commercial disposal firm. Other options for privatizing may also be evaluated. This evaluation

will be completed by April 1996 so appropriate results may be included in a LLW Program Management Plan.

6. DNFSB 94-2, paragraph 2, recommends:

More immediate steps be taken to complete the performance assessment process for all active low-level waste burial sites as required by DOE Order 5820.2A. In so doing clarifying instructions should be issued to insure that: (a) performance assessments are based upon the total inventories (past, present, and future) emplaced or planned for the burial site(s); and (b) performance objectives (dose criteria) of DOE Order 5820.2A are achieved for the composite of all low-level waste disposal facilities on the site.

Commitment:

The Department will complete PAs for active and planned LLW disposal facilities with PAs already in review (or to be submitted for review by June 1995) by February 1996, in accordance with the schedule included in this Implementation Plan. The Department will include pre-1988 LLW and other potentially overlapping radioactive source terms, if any, in revised PAs for these facilities during their first PA maintenance cycle. A schedule for completing these revised PAs to include all sources will be committed to by April 1996.

Performance assessments for active and planned LLW disposal facilities that are not already in review by June 1995 will include all sources in their evaluations. The schedule for completing these PAs will be committed to by April 1996.

7. DNFSB 94-2, paragraph 3, recommends:

If non-compliance with reference dose criteria set forth in DOE Order 5820.2A is found, an action plan with schedule be developed for bringing operations into compliance or other acceptable compensating measures be undertaken in the interim pending final closure.

Commitment:

The Department will conduct a preliminary assessment of the radiation dose consequences of the composite contribution of all LLW disposal and other sources for active LLW disposal facilities. These assessments and, where necessary, initial corrective action plans, will be prepared by ~~March~~ April 1996. Similarly, corrective action plans will be required if inclusion of the entire source term in the full performance assessment indicates that performance objectives will be exceeded. Alternatives to be considered in the corrective action plans will include more refined analyses, remediation of source terms, limitations on new LLW disposed in the facility, and termination of disposal operations. A cost-benefit analysis will be conducted to support the decision on appropriate mitigating actions. Although remediation actions at past disposal facilities will be influenced by the composite analysis, final decisions will be made through the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) process. The revised PAs to include all source terms will then include any changes to disposal operations or sources as the corrective action plans are implemented.

These commitments will be implemented through the newly integrated LLW Management Program by either new actions and programs, or by feeding into existing efforts that are already underway within the Department. Interactions with existing efforts will be addressed specifically in the task initiatives sections that follow. Interfaces with other programs will be used more effectively than in the past to ensure the results of task initiatives in response to Recommendation 94-2 are effected.

E. Organization of the Implementation Plan

The Implementation Plan first provides a discussion of the baseline of the LLW Management System, based on work conducted by the Low-Level Waste Management Steering Committee and the report prepared by the Board staff entitled, Low-Level Waste Disposal Policy for Department of Energy Defense Nuclear Facilities. The baseline presentation provides an introduction to the sections that follow, which are the commitments of the Department to improve the management of LLW. The sections describe the tasks and milestones for achieving the commitments, responsibilities for meeting commitments and milestones, and the documentation of the commitments.

II. BASELINE OF THE LOW-LEVEL WASTE MANAGEMENT SYSTEM

The Low-Level Waste Management Steering Committee (LLW SC or Steering Committee) has performed an evaluation of the low-level waste management system over the last three years. The approach used by the Steering Committee began by determining the basic functions of the system and how they interrelate. The basic LLW management system evaluated by the Steering Committee is shown in Figure II.1. As illustrated, the technical functions of LLW management include generation, treatment, storage, disposal, performance assessment, transportation, waste minimization, characterization, and packaging. Mixed LLW and LLW generated from past disposal of LLW are included as inputs to the current LLW management system. The Steering Committee applied a "gap analysis" methodology to the system to determine the first priority actions it would recommend to improve the LLW management system.

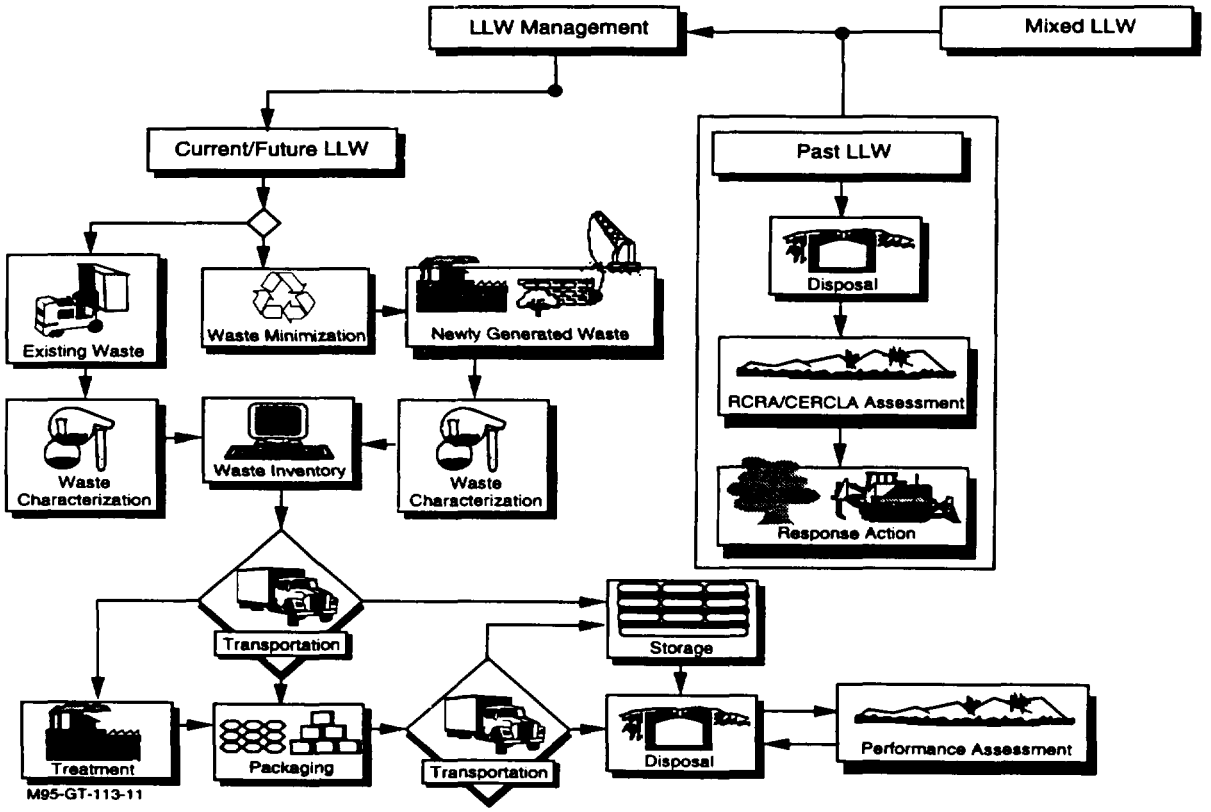


Figure II.1: Low-Level Waste Management System

The methodology involved describing the conditions of the current state of the LLW management system and comparing it to a desired future state. An analysis of the gaps was performed to identify major actions required to progress from the current state to the desired future state. This methodology results in identifying the issues the Department needs to address and technical weaknesses that need to be corrected to achieve the future state. The highest priority actions the Department needs to take first can be identified once all the issues are identified. The methodology used by the Steering Committee to evaluate the LLW management system is illustrated in Figure II.2.

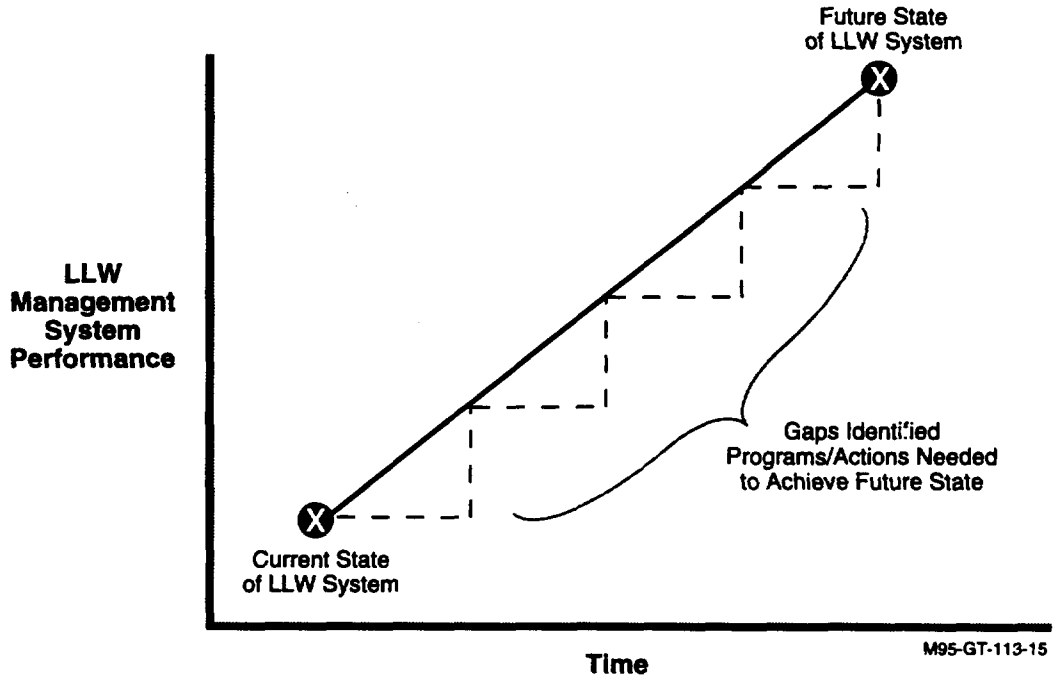


Figure II.2: Evaluation Method Used by LLW Steering Committee

A. Current State of System

The current state of the LLW management system, as evaluated in detail by the Low-Level Waste Management Steering Committee, is documented in the Low-Level Waste Current State System Description (CSSD) (DOE/LLW-202, draft, November 1994).

The CSSD identifies complex-wide and site-specific issues which are indicative of a lack of integration of the LLW management system and its associated problems. Table II-1 summarizes the programmatic and complex-wide issues identified by the ~~DOE Low-Level Waste~~ Steering Committee in the CSSD as the highest priority challenges to improving the LLW management system.

The LLW Management Program and the Steering Committee have begun efforts to address the gaps in the management of LLW to achieve the future state desired.

The Board, in issuing Recommendation 94-2, has pointed to several of the same issues as the Steering Committee, and has brought attention to further issues that were not identified by the Steering Committee. The Department evaluated the Board's recommendation in light of the evaluation already conducted by the Steering Committee, and has identified some root causes of the issues and weaknesses with the management of LLW.

Table II-1: DOE Complex-Wide LLW Issues Identified by the LLW Management Program Steering Committee

Issue Classification	Issue
Waste Generation and Minimization	Motivation to minimize the generation of LLW needs improvement.
	Projections for LLW volumes and characteristics need to be more reliable.
	A lower limit for radioactivity below which waste can be managed as other than LLW is needed.
Waste Data Management	LLW data need to be more complete, consistent, reliable, and retrievable.
Waste Characterization	Requirements for accuracy and precision of radioactive characteristics and identification of physical and chemical characteristics of LLW need to be defined.
Treatment	The decision-making process for LLW treatment alternatives needs to be conducted with more consideration of technical input, and more coordination and communication.
Storage	Storage space needs to be increased because of bottlenecks in the LLW disposal certification process.
	The DOE moratorium on off-site shipments of hazardous waste, WIPP delays, and problematic LLW forms (GTCC and special case) are contributing to storage problems.
Disposal	The process for involving the States in decisions involving LLW disposal operations needs to be better defined and established.
	Approvals of PAs for operating LLW disposal facilities are needed.
	The use of LLW disposal facilities, both commercial and DOE, needs to be expanded and certain restrictions removed.
Institutional	Roles and responsibilities need to be better defined to improve communications, which will result in adequate staffing to perform the LLW management mission at DOE-HQ and the Field levels.
	The decision-making process for responding to technical, policy, and institutional management issues needs to be improved.
Credibility and Public Trust	DOE Waste Management's credibility and public trust needs to be increased. The public participation process and equity discussions relating to DOE technical decisions needs to be well established.
	An independent LLW oversight organizational structure or procedures needs to be established to enhance public credibility and trust.

The Department, despite having Order 5820.2A in place since 1988, cannot successfully demonstrate compliance with the Order at all of the DOE LLW disposal facilities. The root cause of this is a structure for providing policy, requirements, and compliance criteria and for providing oversight of operations to carry out the policies and directives for management of LLW that needs strengthening. The difficulty in strengthening the system lies in the historically decentralized management structure of the Department and in the need for a more coherent and widely understood philosophy of DOE's "self-regulation" principles. Also, the emphasis on weapons production has resulted in secondary consideration being given to management of radioactive waste, and the Department has sometimes given LLW management a lower priority than other waste management activities due to the simultaneous demand for resources and

management attention across a range of competing environmental mandates, each with its own constituency, and the low relative risk posed by low-level waste.

B. Future State of System

The future state of the LLW management system projected by the Low-Level Waste Management Steering Committee during the past three years is reported in the Low-Level Waste Chapter (Chapter 11) of the Waste Type Report (internal Department of Energy draft, dated February 28, 1995).

The vision of the future program as seen by the Steering Committee is:

The vision of the future DOE LLW management program is of a nationally integrated, cost-effective program, based on acceptable risk and sound planning which results in public confidence and support. This management and operations system will isolate and dispose all legacy and D&D waste while also managing and disposing of newly generated wastes at the same rate it is being generated.

The goals of the Low-Level Waste Management Steering Committee for an integrated LLW management system, as described in the Waste Type Report include:

Short-Term Goals:

- Approval decisions made on all existing LLW disposal facility PAs.
- Maintain adequate disposal capacity.
- Eliminate legacy LLW storage (except special-case waste).
- Establish adequate storage capacity for special-case waste.
- Identify LLW management technology needs.
- Implement LLW system consistent with PEIS and FFCAct equity decisions.
- Establish effective DOE internal oversight process.
- Establish LLW minimization implementation plan.
- Implement consistent WAC and certification methodology.
- Establish limit of radioactivity for LLW, below which it need not be managed as LLW.
- Develop integrated Quality Assurance/Quality Control (QA/QC) Program for LLW management functions.
- Establish modular data/information system.

Long-Term Goals:

- Establish consistent regulatory framework for all LLW.
- Integrate LLW management facilities with other waste-type management facilities.
- Require sites to evaluate LLW minimization and/or volume reduction, and implement where feasible.
- Manage and dispose of all LLW as it is generated.

C. Assumptions

In developing the vision and goals of the future state of LLW management, assumptions were made concerning major programmatic issues that the Department could be faced with. These major assumptions are:

- DOE will continue to be self-regulating for LLW, at least for the near-term for onsite activities not involving mixed LLW.
- DOE will continue the policy that LLW generated at Department-owned and operated facilities should be disposed at that facility to the extent practicable.

The Department believes the improvements to the management of LLW needed to respond to the issues identified by the Board and the Board staff in issuing Recommendation 94-2 are consistent with the vision and goals of the LLW Steering Committee for an improved LLW management system, but go a step further by addressing the root causes of the system problems. In fact, the Department envisions that the ultimate result of improvements from responding to the Board will result in achieving an improved future state in a shorter period of time than the future state originally foreseen by the Steering Committee, primarily because the root causes will be addressed. The qualitative effect of Recommendation 94-2 is illustrated in Figure II.3.

The Department, therefore, has developed commitments in this Implementation Plan in response to Recommendation 94-2 that not only respond to issues identified by the Board, but also respond to weaknesses identified by the Department's own analysis, and address the root causes of the system problems. The commitments made detail improvements in the organization and management of the LLW system, implement technical studies to improve the technical basis for LLW management, and develop, issue, and implement new policies, guidance, standards, and eventually a rulemaking to improve the regulatory structure for oversight of LLW management. In completing these commitments, the Department expects to achieve the future state of a fully integrated, technically based, and standardized LLW management system as envisioned by the Board and the LLW Steering Committee.

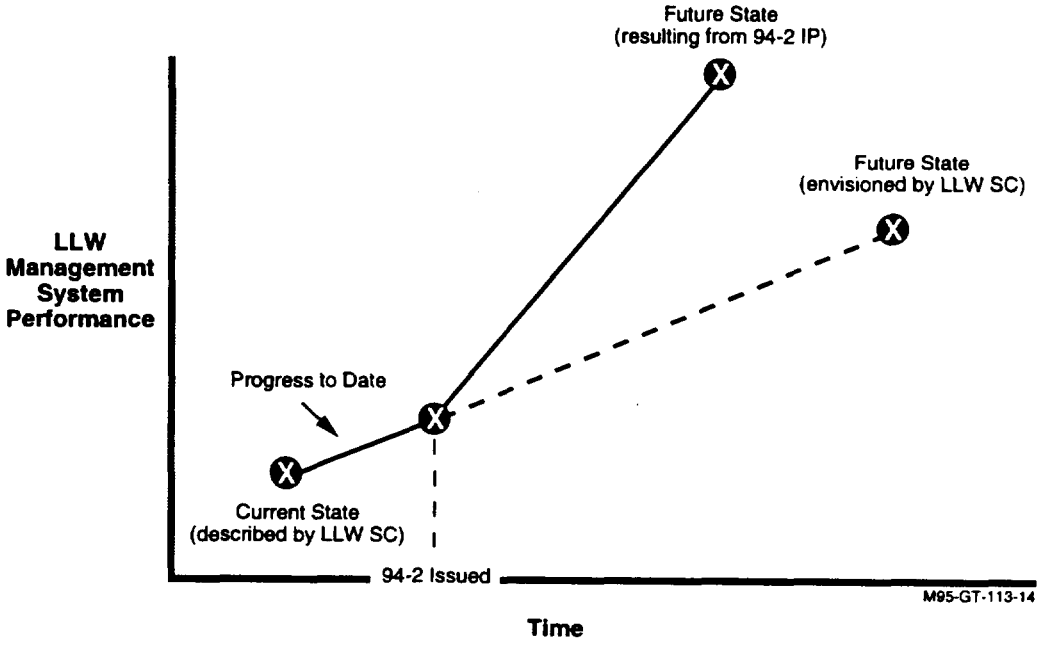


Figure II.3: Result of DNFSB 94-2 on LLW Management Future State

D. Approach

The approach to improving the LLW management system presented in this Implementation Plan takes multiple paths, which converge eventually into an integrated program. First, the Department provides for a restructuring of management of the LLW program at Headquarters, and elevates the priority of LLW management. The new LLW management organization will be responsible for integrating the multiple tasks presented in the Implementation Plan into a structured program.

Utilizing existing knowledge and work already underway, the Implementation Plan provides for immediate tasks to bring LLW disposal facilities into compliance with the existing order and to clarify LLW policies to ensure consistent compliance in the Complex.

At the same time, a systems engineering approach will be applied to provide a technical basis with clearly identified interfaces for the management of the Department's LLW. The initial evaluation will feed the complex-wide review to be conducted on all active, planned, and inactive LLW disposal facilities. The complex-wide review will identify vulnerabilities that require immediate attention at specific facilities, and system vulnerabilities requiring the attention of the LLW management program at the Headquarters level to resolve. Upper-level program documentation describing the program requirements, program strategies, and program plan for LLW management will be prepared based on the systems engineering evaluation. The system vulnerabilities identified by the complex-wide review will be integrated into the program-level documentation as they are prepared.

While the vulnerability assessment is going on, new requirements, standards and guidance to address the critical areas affecting safety identified by the Board will be issued. At the same time, technical studies will be conducted to evaluate further requirements, standards, and guidance needed to improve the regulatory structure and process for LLW management to bring DOE LLW management up to par with commercial and international management practices. The results of the systems engineering approach will assist in identifying areas important to safety requiring the focus of this effort.

An effort will be started to redefine the LLW management system research and development needs, which will culminate in a re-focused research program that takes into account the results of the systems engineering approach, the complex-wide review, and the studies to determine improved standards, requirements, and guidance to improve the technical basis for LLW management.

When the efforts described in the Implementation Plan are completed, a fully integrated LLW program will be operating within the Office of Environmental Management. LLW disposal facilities will be in compliance with existing LLW policies, and the Department will be implementing new policies to bring the Department to higher levels of protection of public health and safety and the environment. A refocused research program will be feeding technical information to the LLW program to address technical deficiencies to ensure the confidence level in demonstrating compliance is assured for the long-term. The program will be operating with a system of self-assessments and independent reevaluations to maintain the level of operating practice and compliance that will be achieved by the Implementation Plan initiatives.

III. ORGANIZATION AND MANAGEMENT

The Department recognizes the importance of improving the management of LLW in the Complex, and makes the following improvements to the organization managing LLW to respond to Recommendation 94-2.

A. Organization and Responsibilities

The Department is committed to improving the low-level waste management system consistent with its acceptance of Recommendation 94-2; to achieving the future state of the program projected by the Low-Level Waste Management Steering Committee, and; to resolving the vulnerabilities identified by the complex-wide review (see Section V). The task group organization shown in Figure III.1 will be established within the Office of Environmental Management to address the needed improvements to the LLW management system.

1. Deputy Assistant Secretary for Waste Management

The Deputy Assistant Secretary for Waste Management (OWM) is assigned the overall responsibility for the efforts described in this Implementation Plan. The Deputy Assistant Secretary will ensure that the funding is committed and the required priority is placed on the task initiatives described. The Deputy Assistant Secretary will continue to report within the line management of the Office of Environmental Management to the Assistant Secretary for Environmental Management.

2. Low-Level Waste Management Task Group

A Low-Level Waste Management Task Group (LLWMTG) will be formed to address the needed improvements in the Department's management of LLW. The LLWMTG will report to the Deputy Assistant Secretary for Waste Management. The mission of the LLWMTG will be to integrate the Department's LLW management system to achieve the program's goals for protecting public safety and health and the environment. The LLWMTG will be responsible for managing the task initiatives described in the Implementation Plan, for reporting the progress and any schedule changes to the Deputy Assistant Secretary, and identifying impacts of schedule changes or any other influences on the commitments in the Implementation Plan. The LLWMTG is responsible for ensuring that results of the complex-wide review (see Section V), or from the other initiatives when they are completed, are integrated into the LLW management program effectively to result in the best possible benefit from the Implementation Plan.

The Low-Level Waste Program Manager will serve as the manager of the Task Group, and will report directly to the Deputy Assistant Secretary. Program managers from the Office of Environmental Management will be assigned to the LLWMTG, and they will report to the Low-Level Waste Program Manager. Each program manager will have a senior technical lead reporting directly to him/her on the five major technical areas being addressed under this Implementation Plan (see Figure III.1).

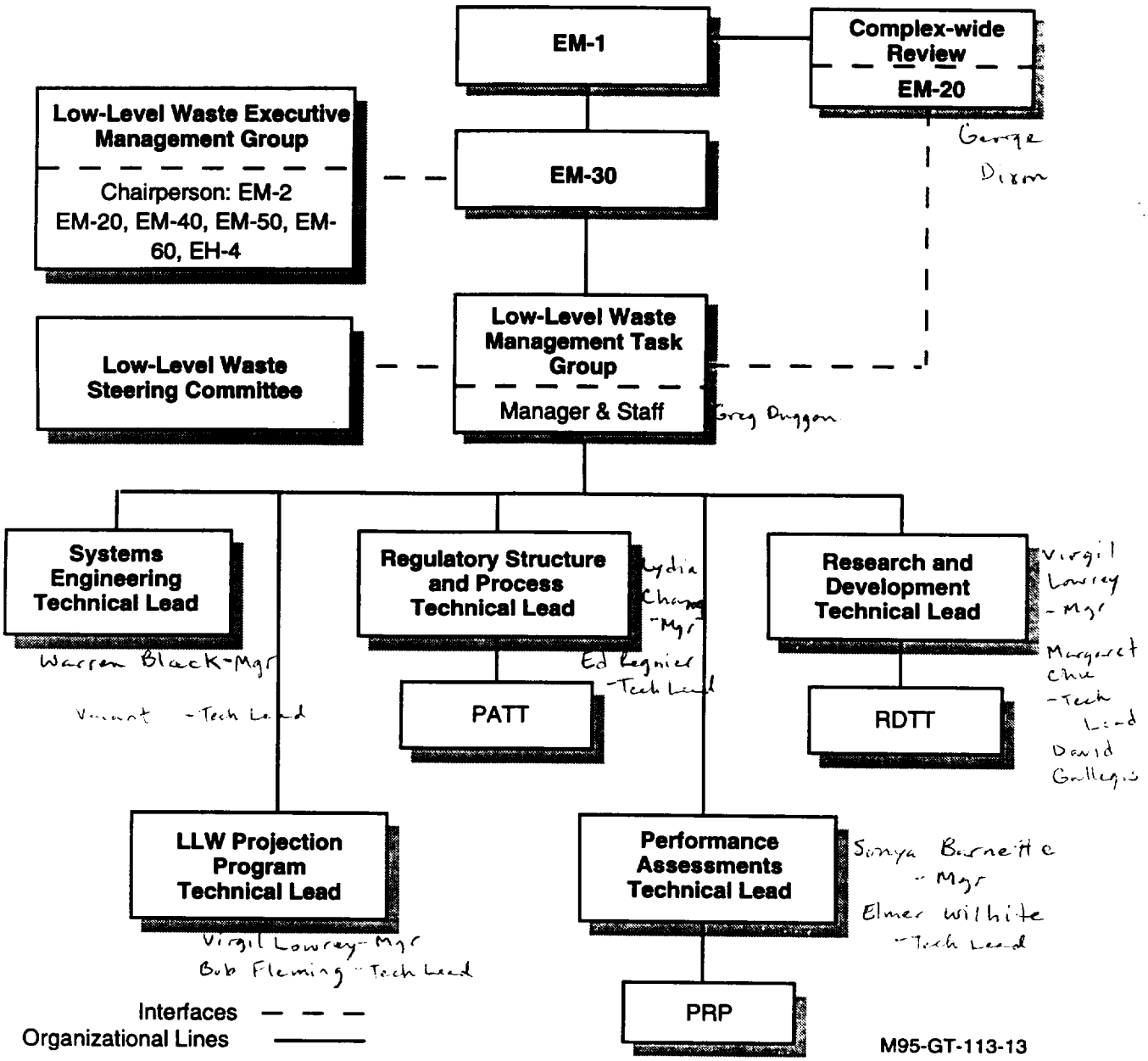


Figure III.1: DOE Organization to Respond to DNFSB 94-2

The LLWMTG will be staffed with Office of Environmental Management personnel with experience in LLW project management or LLW research and development project management. The technical leads supporting the LLWMTG Program Managers will be senior technical DOE Operations Office and contractor personnel with multiple years of experience in the technical area in which they will be assigned.

3. Low-Level Waste Executive Management Group

A Low-Level Waste Executive Management Group will be formed to provide direction to the LLWMTG on major policy issues that are identified as task initiatives in the Implementation Plan are accomplished, or which will be identified later as a result of the complex-wide review or other assessments. The Low-Level Waste Executive Management Group is responsible for ensuring that all programmatic issues that could have some bearing on task initiatives are considered and resolved, and for ensuring that necessary coordination between program offices and programs is identified and carried out. The Low-Level Waste Executive Management Group will be composed of:

- The Principal Deputy Assistant Secretary for Environmental Management, and the following Deputy Assistant Secretaries, or their designees:
- The Deputy Assistant Secretary for Compliance and Program Coordination;
- The Deputy Assistant Secretary for Environmental Restoration;
- The Deputy Assistant Secretary for Technology Development;
- The Deputy Assistant Secretary for Facility Transition and Management; and
- The Deputy Assistant Secretary for Environment.

The Principal Deputy Assistant Secretary for Environmental Management will serve as the Chairperson of the Low-Level Waste Executive Management Group. The Deputy Assistant Secretaries serving on the Executive Management Group will provide program direction when needed to their Offices to accomplish task initiatives in this Implementation Plan in accordance with the schedules and directions as determined by the Executive Management Group. The Offices so directed by the Deputy Assistant Secretaries will report as needed to the LLWMTG on progress on the task initiatives until they are completed.

4. Deputy Assistant Secretary for Compliance and Program Coordination

The Deputy Assistant Secretary for Compliance and Program Coordination is responsible for the complex-wide review described in Section V, and will continue to report directly to the Assistant Secretary. The Department is committed to having the complex-wide review managed independently from the line management of the Office of Waste Management. The technical manager of the complex-wide review assigned within the Office of Compliance and Program Coordination will report to the LLWMTG on progress of the complex-wide review. The Office of Compliance and Program Coordination may also be responsible for a program of self-assessment of and technical assistance to the Low-Level Waste Management Program to maintain quality of the management of the tasks to respond to Recommendation 94-2.

5. LLW Steering Committee (LLW SC)

The LLW SC will continue to provide coordination and integration activities to guide improving the low-level waste management system. The LLW SC will report to the LLWMTG, and will continue to have the same membership and charter. Their efforts will involve technical review and operation office impact review of documents generated by task initiatives and coordination of efforts involved in task initiatives from a field office perspective.

6. Performance Assessment Task Team (PATT)

The PATT will continue to provide a coordination function for program and technical managers of LLW disposal performance assessment (PA) activities conducted at DOE sites by management and operating contractors. The PATT will advise the LLWMTG on policy and guidance required to complete technically defensible and consistent PAs. The current active members and charter will remain in effect for the PATT.

7. Performance Assessment Peer Review Panel (PRP)

The PRP will continue to provide reviews to ensure consistency and technical quality of the PAs prior to submittal to DOE Headquarters. The PRP will report to the LLWMTG on PA review progress and results of PA reviews. The current charter for the PRP will remain in effect for completing reviews of PAs, but changes in procedure will be made to reduce potential conflicts of interest. Also, diversification of the PRP membership roster will be considered to add expertise to the current roster of individuals with site-specific PA experience. Also, a Standard Review Plan (SRP), and other guidance documents, will be prepared to standardize the PRP reviews of PAs. These changes are discussed in Section VI.

8. Research and Development Task Team (RDTT)

A Low-Level Waste Management Research and Development Task Team (RDTT) will be established reporting to the LLWMTG, under the direction of the Research and Development Technical Lead. The RDTT will be responsible for: (1) cataloging past, current, and planned LLW management program R&D activities, (2) coordinating the identification of LLW management program R&D needs, (3) identifying the past, current and planned LLW R&D activities that are or will be addressing identified LLW needs, (4) recommending strategies for addressing LLW R&D needs that remain to be addressed, and (5) reporting on progress of and results from these activities that address LLW management program R&D needs. The RDTT will have members from sites with LLW disposal facilities and the Department's National Laboratories with expertise in LLW management research & development projects. Individuals will be chosen considering the potential for conflicts of interest. The RDTT will identify in its recommended strategies to the LLWMTG, R&D organizations with recognized resources, capabilities, and expertise to meet identified R&D needs. The LLWMTG will negotiate with these organizations for revised or new projects that fulfill LLW management program R&D requirements. The OTD is one organization that is expected to provide, at least in part, the required R&D support.

9. Office of Environment, Safety, and Health

The Office of Environment, Safety and Health (EH) will provide technical assistance to development of requirements and guidance for LLW management through its Office of Environmental Policy and Assistance. EH will provide oversight through the Office of Oversight.

The Office of Oversight in EH will provide independent verification of conformance to established policies and requirements. In particular, it will verify compliance with the 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. The Office of oversight will not directly support or participate in programmatic activities relating to activities at DOE low-level nuclear waste and disposal sites, nor will it prescribe program solutions to safety issues relating to these sites.

Oversight is not a substitute for line management's responsibility to perform reviews and self-assessments of its activities to ensure the effectiveness of its operations. Line management has full responsibility and authority for the safety of its activities. Line management has the responsibility to recognize the safety significance of its activities and must ensure that its organization is well-structured, with clear lines of authority, communication, and well-defined responsibilities; and that its safety policies, requirements, and procedures are established, understood, and practiced by all concerned parties.

B. Management

The Organization described above will operate in accordance with the following management initiatives and functions in order to bring about the improvements in LLW management through an integrated program.

1. Project Management

a. Project Management Plan

A Project Management Plan (P_jMP) will be prepared and implemented by June 30, 1995 by the LLWMTG to manage the task initiatives and commitments described in this Implementation Plan. The P_jMP will contain: detailed schedules and assignments and responsibilities for tasks; the duties, responsibilities, and qualifications for individuals accomplishing initiatives; reporting requirements for individual tasks; other requirements for effective completion, and; a description of progress tracking on tasks.

b. Change Control

A change control process will be developed and instituted by the LLWMTG to effect changes in this Implementation Plan if schedules for deliverables and/or interim milestones are affected by external forces that cannot be predicted at this time.

c. Quality Assurance

The LLWMTG will assure the quality of technical work and products at the program management level. Improvements to the review procedure for PAs will be implemented in which quality records will be identified and record-keeping procedures explained. Qualifications of personnel are (or will be) addressed in charters describing the roles and responsibilities of the PATT, PRP, and the RDTT. The qualifications of personnel to participate in conducting the complex-wide review is addressed in Section V. Training for personnel to participate on the complex-wide review is addressed in Section V, and for serving on the PRP is described in Section VI. The P_jMP will include progress tracking of schedules and milestones to ensure that commitments are being met in response to Recommendation 94-2.

d. Reporting

The LLWMTG will establish a regular report format and provide reports semi-annually to the Board on progress on the commitments described in this Implementation Plan. The report will also be furnished to the Low-Level Waste Executive Management Group to ensure that they are kept abreast of developments at the same time as the Board.

e. National Environmental Policy Act

The initiatives described in this Implementation Plan may result in policies, requirements, technical documents, and program planning documents. These initiatives will improve compliance with DOE directives for existing and planned facilities which are or will be covered under existing or planned National Environmental Policy Act (NEPA) evaluations, as appropriate. The task initiatives will not directly result in new or redesigned facilities.

DOE is already evaluating alternative strategies for improving its management of LLW, and the Department is evaluating the environmental impacts of these alternatives in programmatic, site-wide and project Environmental Impact Statements. The Department intends to coordinate the development of the initiatives described in this plan with these ongoing NEPA analyses and other NEPA analyses, as appropriate.

The implementation of proposed changes in the management of LLW described in the documentation prepared under this Implementation Plan may result in operational changes or in facilities being built or modified. Such decisions however will not be made until the completion of any required analysis under NEPA.

2. Management Interfaces

Besides the organizational changes and arrangements explained above, some existing management interactions and interfaces will be utilized more effectively through the conduct of task initiatives in response to DNFSB 94-2.

a. Interfaces with Operations Office and Laboratories & Management & Operating Contractors

The establishment of the LLWMTG reporting to The Deputy Assistant Secretary for Waste Management will bring higher level management attention to LLW, resulting in more resources to fund and oversee programs and projects involving the management of LLW at the Operations Offices and Sites. The Operations Offices will be directly involved in the core processes and organizational elements in policy-making and program direction setting through the activities responding to Recommendation 94-2. Operations Offices and M&O contractors will be lead technical staff on the LLWMTG, and will provide the majority of the staff which will conduct the complex-wide review, and the other technical studies described. M&O contractors form the staff of the PATT, and PRP, and will staff most of the RDTT. Operations Office program managers form the membership of the LLW Steering Committee.

b. Interface with Office of Compliance and Program Coordination

The integrated LLW program will result in a greater role for the Office of Compliance and Program Coordination. Following the completion of the complex-wide review, which is the responsibility of the Office of Compliance and Program Coordination, a decision will be made to institute a process for self-assessments of and technical assistance to the LLW Management Program to conduct an internal evaluation of progress in meeting the commitments described in this Implementation Plan. The Office of Compliance and Program Coordination may be determined to have this responsibility. As the program initiated by the Office of Environment, Safety, and Health evolves, the Office of Compliance and Program Coordination will play a greater role in ensuring Office of Waste Management program managers are aware of compliance activities. The Office of Compliance and Program Coordination may issue guidance and

other documents to program managers and Operations Offices to ensure that new requirements are understood and complied with.

c. Interface with Office of Environmental Restoration

The interface between the LLWMTG and the Office of Environmental Restoration (OER) will be strengthened as a result of this Implementation Plan. Pursuant to CERCLA and/or RCRA, Environmental Restoration removes LLW in performing cleanup work. Office of Waste Management operations provide waste management services for some of this LLW. In other instances, Environmental Restoration may dispose the waste onsite as part of the CERCLA/ RCRA remedial action. However, RCRA would apply to LLW disposal sites only if mixed LLW is present.

As a result of the task initiatives in this Implementation Plan, Environmental Restoration projects being conducted under CERCLA and/or RCRA may be impacted. Consequently, Environmental Restoration personnel will be assigned to serve on the LLWMTG to interact with program managers and Operations Office personnel to ensure programs and projects managed by Environmental Restoration for the removal of LLW under CERCLA and/or RCRA are integrated with Waste Management LLW programs. Also, Environmental Restoration representation will be increased on the LLW Management Steering Committee to assist in developments that could potentially impact Environmental Restoration projects, and to provide another vehicle through which Environmental Restoration senior management may obtain regular reports on task initiatives and the LLW management program. Environmental Restoration representation will also be heavy on teams conducting Site Assessments under the complex-wide review to ensure that the current situation with CERCLA/RCRA sites is evaluated, and that inactive disposal sites and other source terms being evaluated under the CERCLA and/or RCRA program are fully understood.

d. Office of Technology Development Interface

The LLWMTG will use the existing interfaces to interact with the Office of Technology Development (OTD) and its recently formed Focus Areas. Interactions regarding LLW management program R&D requirements are expected to be greater in both context and frequency than current interactions. Recommended strategies for meeting LLW R&D requirements, whether through OTD or other organizations, will be coordinated with OTD by the RDTT. OTD will provide prompt progress and results reports of its LLW R&D projects for dissemination within the LLW management program.

e. Interface with Office of Facility Transition and Management

The LLWMTG will interface with the Office of Facility Transition and Management (OFTM) in the same capacity as present, but with an emphasis on volume/inventory projections of LLW. The interface will ensure that information on facilities being managed by Facility Transition that will be scheduled for decontamination and decommissioning in the near-term are appropriately considered in development of LLW projection guidance and methodologies.

f. Interface with Nuclear Regulatory Commission and Environmental Protection Agency

The US Nuclear Regulatory Commission (NRC) and the US Environmental Protection Agency (EPA) are the two most important Federal agencies for the Department to interact with concerning the standards and regulations pertaining to management of LLW. Representatives

of NRC and EPA are on the PATT and PRP, and an attempt to expand their roles will be made if additional assistance on coordination or review of PAs becomes necessary. The existing interfaces with NRC and EPA on reviews of documents prepared by the two agencies will be continued under the management of the LLWMTG. This includes proposed environmental standards, rules, and regulatory guidance. The LLWMTG will continue to keep abreast of the standards development affecting the disposal of DOE LLW, and developments in regulations and guidance affecting the commercial disposal of LLW through this interface.

g. Interface with Advisory Committee on External Regulation

The recently chartered Advisory Committee on External Regulation of DOE Nuclear Safety will be making recommendations on whether and how new and existing DOE nuclear facilities and operations might be externally regulated to best protect public safety and health and the environment, eliminate unnecessary oversight, and reduce costs. The Committee will submit its recommendations to the Secretary and simultaneously to the White House, the Office of Management and Budget, and the Council on Environmental Quality. The Secretary has asked for an interim report in six months and final recommendations by the end of 1995. The Committee will also examine whether national security programs may warrant special treatment. The LLWMTG will share information with the Executive Director of the Committee on results of pertinent task initiatives in this Implementation Plan. This interaction will ensure the Committee has full use of information developed in response to Recommendation 94-2 for their use in developing recommendations on the possible external regulation of DOE LLW.

IV. SYSTEMS ENGINEERING APPROACH FOR LOW-LEVEL WASTE MANAGEMENT

A systems engineering approach for low-level waste management will be applied to provide a technical basis with clearly identified interfaces for the management of the Department's LLW. This process will be designed and applied to ensure the improvements are well-structured within an integrated program and are prioritized appropriately. The systems engineering approach will evaluate the privatization of LLW disposal as one scenario for process improvement.

The approach will form the basis for development of program planning documents which will fully define the integrated program for LLW management and methods for establishing LLW projects and prioritizing them. The systems engineering approach which will be used is an iterative process which utilizes periodic reassessments to ensure that program level and project documents are always kept current, and site activities are prioritized properly. This iterative process means that decisions are always made considering the most up-to-date information on program strategies, requirements, and performance.

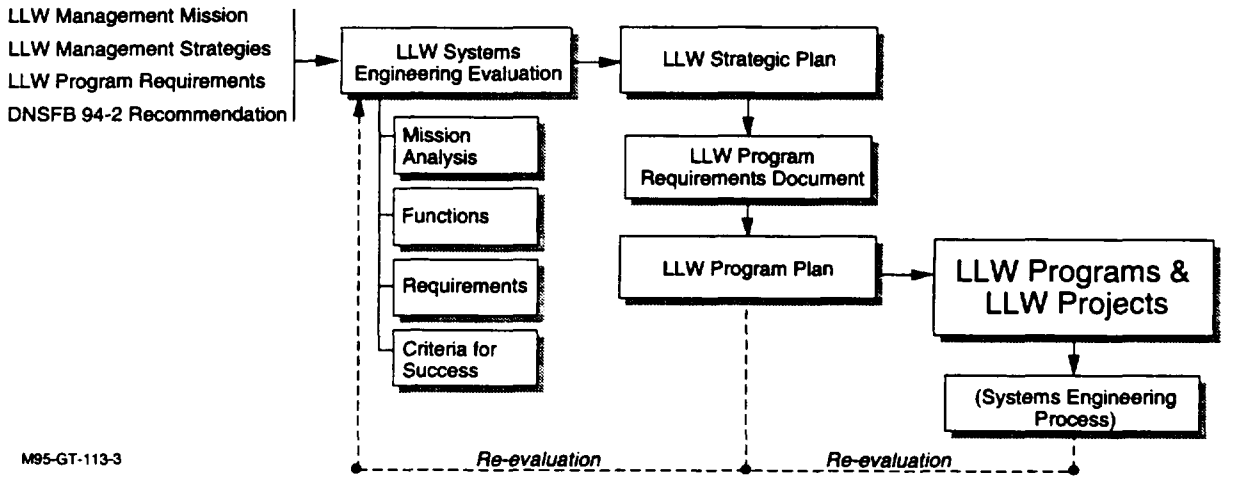


Figure IV.1: Systems Engineering Approach for LLW Management

A. Approach

The systems engineering approach for low-level waste management follows the process illustrated in Figure IV.1. The mission and program strategies of the LLW program and the bounding requirements are inputs to an initial system evaluation. The results of the initial system evaluation form the basis for refining the programs strategies where necessary and developing a strategic plan. This step in the process also includes development of a program requirements document which describes the requirements and constraints so that programs and projects can be properly designed. The next step is to develop a program plan which will provide information on priorities and actions necessary to achieve the desired program of LLW management. The program plan will include a program of either self- or independent assessments to continue the process of improvement started with the initial evaluation.

The systems engineering approach will evaluate the safety merits and demerits of privatizing disposal of DOE LLW. The results of this analysis will form the basis for including any, or parts of any, privatization strategies for improving the LLW management program.

B. Integrated Program Planning Documents

The following program documents detail the complete systems engineering evaluation of the LLW management system, and will form the foundation of the newly integrated LLW management program when they are completed. The following tasks reflect the iterative approach that will be pursued in the systems engineering analysis for LLW. The initial functional analysis (task initiative 1) will be revisited as the documents in the tasks that follow (task initiatives 2 - 4) are prepared.

1. Systems Engineering Evaluation

a. Description: The Department will complete and document a systems engineering evaluation to accomplish the mission of the LLW program by identifying the key technical and programmatic functions of the program, describing the input and output requirements and constraints for these functions, and establishing the criteria for effectively determining system performance. This will provide the technical basis for management of LLW, and the baseline inputs to focus the inquiries to be conducted in the complex-wide review.

b. Milestone: Prepare DOE LLW management system engineering evaluation report

c. Due Date: June 30, 1995

d. Responsibility: Low-Level Waste Management Task Group

2. Low-Level Waste Program Strategy

a. Description: The Department will complete and document a Program Strategy laying out the programmatic strategies, policy initiatives, and assumptions for achieving the integrated LLW program. This will guide development and prioritization of programs and projects needed to achieve the desired future state of LLW management.

b. Milestone: Prepare LLW management program strategic plan

c. Due Date: September 30, 1995

d. Responsibility: Low-Level Waste Management Task Group

3. Low-Level Waste Program Requirements Document

a. Description: The Department will complete and document LLW management system requirements and constraints, and prioritize the requirements based on the criteria used in the evaluation for measuring system performance. This will provide integration at the project and program level to begin achieving consistency in decision-making in the LLW program.

b. Milestone: Prepare LLW management system requirements document

c. Due Date: December 31, 1995

d. Responsibility: Low-Level Waste Management Task Group

4. Low-Level Waste Program Management Plan

a. Description: The Department will complete and document a Program Management Plan addressing the improvements needed in the LLW management system. Based on the previously described documents, the Program Management Plan will describe the near-term and longer term actions, schedules and responsibilities necessary to achieve the desired future state of the LLW management system. It will identify the key management interfaces, organization structure for management, and the appropriate divisions of responsibilities between DOE Headquarters and Operations Offices. This Implementation Plan serves as the baseline program plan for the LLW management program, and actions in it will be incorporated into the LLW Program Management Plan. The PJMP prepared to manage and track progress of the task initiatives in this Implementation Plan (see Section III) will be factored into the program plan where appropriate. The Program Management Plan will describe the dissolving of the LLW Management Task Group and how the responsibilities for continual improvement in the LLW program are assumed by other entities. The Program Management Plan will also include the process of reevaluation of the LLW management system to maintain the LLW management system improvement process.

b. Milestone: Prepare LLW Program Management Plan

c. Due Date: April 30, 1996

d. Responsibility: Low-Level Waste Management Task Group

5. Periodic Systems Assessment

Periodic reassessments of the LLW management system will be conducted using the systems engineering approach to maintain the process of improvement started by the initial systems engineering evaluation and subsequent program documentation. The necessary steps of the systems engineering evaluation are repeated to update information and perform the analysis to determine if any changes to the results are found. The reassessment process which will be used by the LLW management system is illustrated in Figure IV.2.

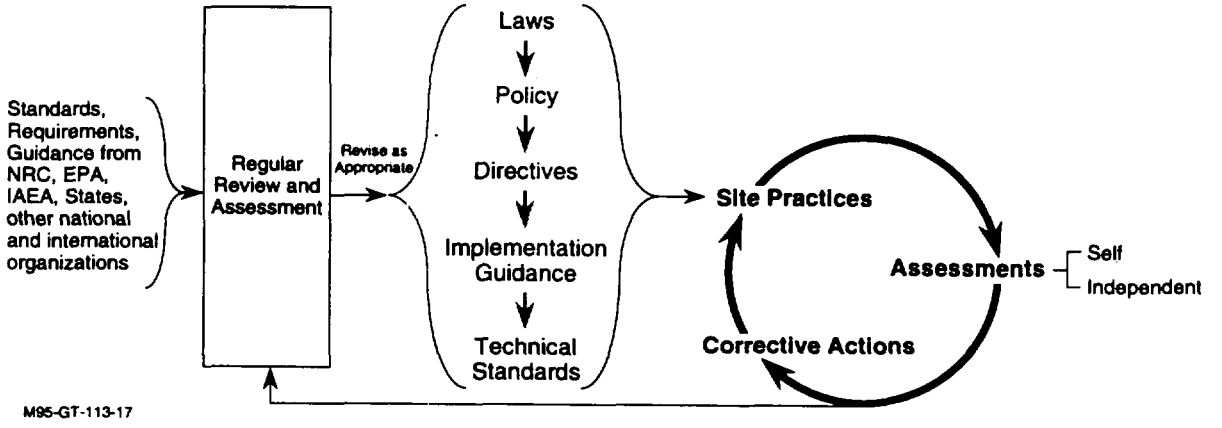


Figure IV.2: Process for Continuing Improvement of the Low-Level Waste Program

Assessments of site activities will be conducted for their effectiveness and compliance with LLW management systems requirements, and corrective actions will be closed or modified, or additional corrective actions identified to continue improving the management of LLW at the sites. The assessments conducted will either be self-assessments or independent assessments.

Utilizing input from a regular review and assessment of changes in standards, guidance, and practices of the commercial industry and international organizations, and feedback from the site assessments, revisions to LLW management system policy, directives, requirements, guidance, and standards will be made as appropriate. If necessary, the program requirements document, the strategic plan, and the program plan can be changed appropriately in order that priorities are changed properly, and resources and funding are channeled to the highest priority activities as determined by this continual process of reevaluation. This program for reevaluation will be described in the LLW Program Management Plan.

C. Systems Engineering Evaluation of Privatization

Once the systems engineering approach has progressed sufficiently to be factored into the complex-wide review and to initiate program planning documents, the safety merits and demerits of privatizing disposal of DOE LLW will be evaluated.

1. Evaluation of Privatization

a. Description: Information will be appropriately factored into the systems engineering approach to evaluate a privately operated facility located away from DOE sites for the exclusive disposal of DOE LLW, and using a private commercial disposal firm to operate a LLW disposal facility at a DOE site. Other options may also be examined as the process develops in the analysis.

b. Milestone: Prepare Privatization Evaluation Report

c. Due Date: March 31, 1996

d. Responsibility: Low-Level Waste Management Task Group

V. COMPLEX-WIDE REVIEW

A. Discussion

1. Scope

A complex-wide review of low-level radioactive waste treatment, storage and disposal sites will be conducted to identify environmental, safety and health vulnerabilities for which corrective actions will be developed. It will include the radioactive component of mixed low-level waste (MLLW). The review will address generation of low-level waste in terms of meeting waste acceptance criteria for receiving facilities, but will not address waste minimization practices of LLW generators. It will also not address LLW transportation. The review of individual sites will follow defined evaluation criteria and a process for screening deficiencies and weaknesses to identify vulnerabilities. It initially will include a comprehensive survey of all active and planned LLW treatment, storage and disposal facilities and all past disposal facilities. Following the survey, selected sites will receive an independent on-site assessment that will consider results of other recent evaluations and determine the rationale for additional on-site assessments at other facilities. The review will result in prioritized vulnerabilities as bases for corrective action plans and establish a process for closing-out corrective actions and monitoring ongoing performance. Stakeholder participation in this complex-wide review will be promoted and conducted through existing site advisory boards which interface with stakeholders.

2. Objective

The complex-wide review has four objectives: (1) To identify environmental, safety and health vulnerabilities associated with the Department's management of low-level radioactive waste; (2) To form the basis for an integrated and planned set of actions by field management to correct the identified vulnerabilities; (3) To prompt development of new requirements for managing LLW; and (4) To establish a process and methodology for periodic reviews in the future as a means to assure compliance with approved requirements. The complex-wide review will be considered complete when complex-wide LLW management vulnerabilities are being corrected effectively by field management and LLW management practices are being monitored by established audit or assessment organizations within DOE in accordance with existing or strengthened DOE requirements. The conditions for completing the complex-wide review and initiating on-going periodic vulnerability assessments and related corrective actions will be determined by the Office of the Deputy Assistant Secretary for Compliance and Program Coordination.

3. Approach

The approach to objectives (1) and (2) identified above will be based on a "Target-Barrier-Hazard" analysis: As a function of the "hazard" at a given site determined by waste form and radionuclide inventory, the review will focus on challenges to "barriers" represented by the waste packaging, the natural and engineered features of the facility, and the site's administrative controls. Identified weaknesses in the "barriers" will then be classified according to their impact on "targets": workers, the public, and the environment. The analysis will be conducted initially through a survey led by DOE Operations Offices and supported by contractor personnel. The analysis will continue through selected on-site assessments performed by DOE and contractor personnel independent from the site.

Both the surveys and the assessments will have defined measurement criteria (described below under Methodology) and be performed by trained and qualified personnel. The analysis will define vulnerabilities as a function of their likelihood of occurrence combined with their potential radioactive exposure or impact on workers, the public or the environment. Vulnerabilities will be prioritized according to their relative risks, and serve as the basis for recommended corrective actions to be approved by DOE management and implemented by DOE's field organizations. This analytical approach is illustrated in Figure V.1.

The approach to objectives (3) and (4) identified above will be based on implementation experiences and outcomes in achieving the first two objectives. This approach will address DOE's self-regulation effectiveness, the management process to ensure adherence to DOE Orders and directives, as well as the processes for identifying non-compliant conditions and closing-out related corrective actions. The approach will be through a continuing performance-based assessment program.

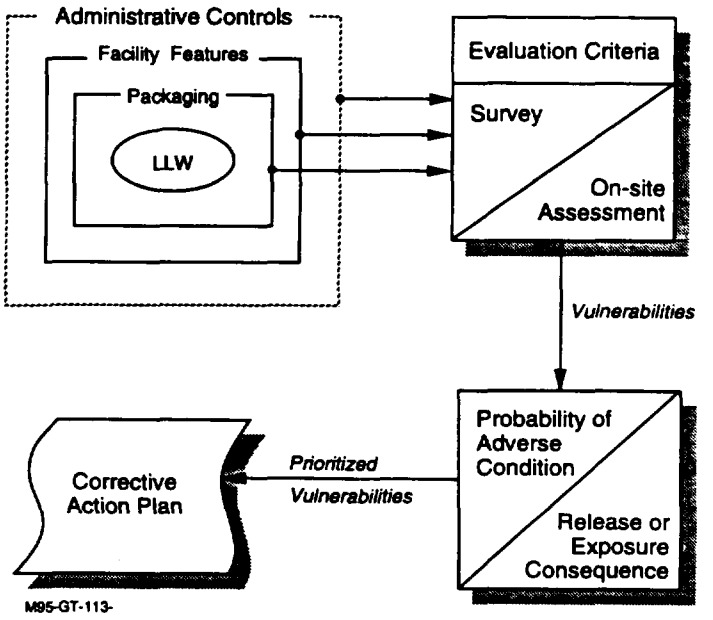


Figure V.1: Complex-Wide Review - Analytical Approach

4. Roles and Responsibilities

The complex-wide review is the responsibility of the Deputy Assistant Secretary for Compliance and Program Coordination, reporting to the Assistant Secretary for Environmental Management. The review is administered through an Assessment Working Group that reports to a dedicated manager in the OCPC and oversees the activities of Site Assessment Teams and Working Group Assessment Teams. An outline of the management organization for the complex-wide review is diagrammed in Figure V.2. The composition and responsibilities of these organizations follows:

OCPC: Specific complex-wide review responsibilities are:

- Ensuring that the review has sufficient priority and adequate resources to carry out related tasks and actions as scheduled.
- Reviewing and approving work products and recommendations from the Assessment Working Group.
- Communicating review progress to DOE management and the DNFSB.
- Resolving emerging issues related to DOE policy, directives or guidance, or to working relationships with or regulations of other Federal agencies.
- Establishing criteria and determining conditions for declaring completion of the complex-wide review.

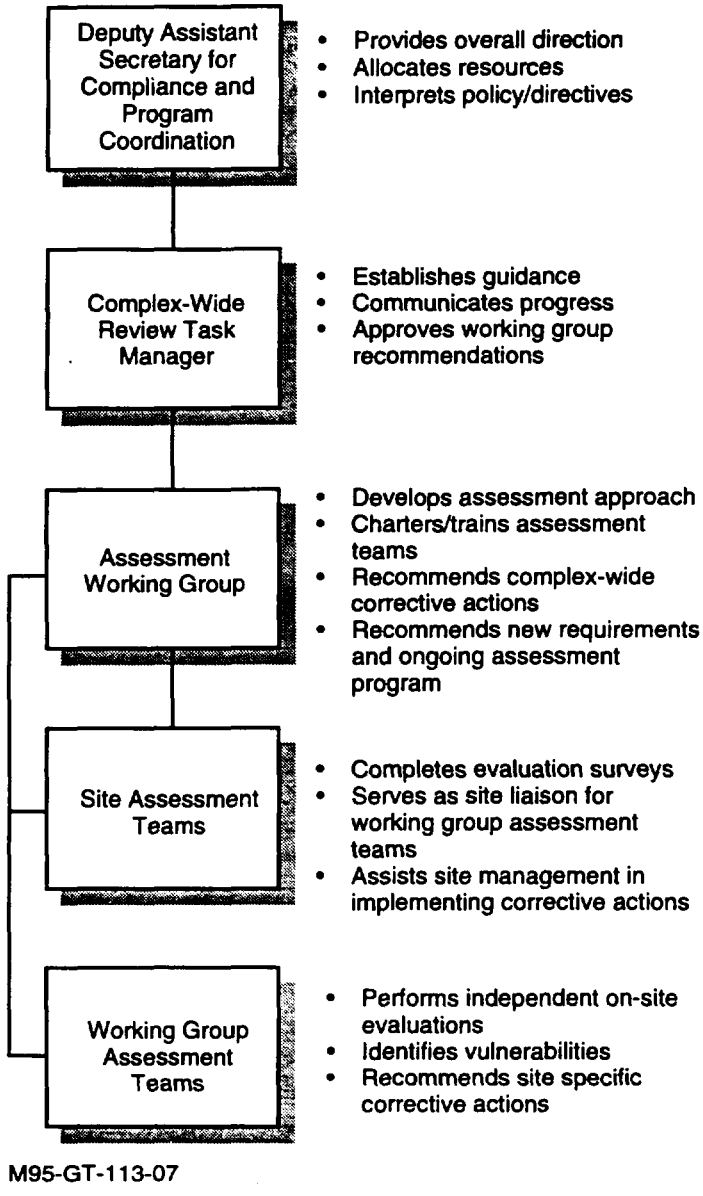


Figure V.2: Complex-Wide Review Management and Organization

Assessment Working Group: This group is composed of manager-level representatives from the Office of Waste Management (OWM), the Office of Environmental Restoration (OER), the Office of Environmental Policy and Assistance (OEPA), and affected DOE field organizations, including management & operating contractors and consultants with working knowledge of LLW disposal requirements and practices. It has responsibility for:

- Chartering, defining qualifications for, and appointing Site Assessment Teams and Working Group Assessment Teams.
- Developing a site evaluation survey instrument that includes Chapter III of DOE Order 5820.2A and considers 10 CFR 61.

- Ensuring that there is a clearly defined technical basis for determining overlap of source terms from LLW disposal sites.
- Developing an Assessment Plan that includes site assessment criteria and review approaches.
- Defining training needs of and conducting training for Site Assessment Teams and Working Group Assessment Teams.
- Defining the site selection process for prioritizing reviews.
- Defining a screening process for identifying vulnerabilities.
- Evaluating completed site surveys and assessment reports.
- Dispositioning stakeholder inputs.
- Preparing the complex-wide review report.
- Recommending complex-wide corrective actions.
- Ensuring preparation of site-specific corrective action plans by site management.
- Developing a continuing performance-based assessment program.

Site Assessment Teams: These teams are composed of DOE employees and M&O contractors from each site under review who have technical knowledge of LLW and of treatment, storage and disposal facilities at that site. The size of each team will be a function of the number and variety of LLW facilities at a given site, but is expected to range from four to twenty persons. For their respective site, each team is responsible for:

- Completing any training requirements designated by the Assessment Working Group.
- Preparing responses to the site evaluation survey.
- Supporting Working Group Assessment Teams during site visits in such areas as logistics, facility walkdowns, technical contacts, interview schedules and document reviews.
- Assisting site management in developing corrective actions to vulnerabilities identified by Working Group Assessment Teams.

Working Group Assessment Teams: These teams are composed of DOE employee and M&O contractor representatives from locations other than the site being reviewed plus one or more outside technical experts or consultants. Collectively, team personnel will have requisite technical knowledge of LLW requirements and practices, and experience in disposal facility assessments. The number and sizes of teams will be a function of survey results, but it is expected that two to four teams of four to ten persons each will be needed. The on-site period of the assessment will be a function of the number and variety of the LLW facilities at a given site, but is expected to range from one to three weeks. For their assigned site, each team is responsible for:

- Reviewing and understanding the completed site evaluation survey.
- Completing any training requirements designated by the Assessment Working Group.
- Conducting a performance-based evaluation of LLW management through appropriate document reviews, personnel interviews and observations in accordance with pre-defined assessment criteria and review approaches as set forth in the Assessment Plan.
- Documenting performance deficiencies or weaknesses and identifying potential vulnerabilities through application of a pre-defined screening process.

- Reviewing site recommended actions to correct weaknesses and vulnerabilities.
- Interfacing, as appropriate, with stakeholders through established on-site organizations.
- Preparing a site assessment report.

5. Methodology

Site Selection: All active and planned LLW treatment, storage and disposal facilities, including mixed ~~waste~~ LLW and all past disposal facilities will be surveyed. The identification of sites for further on-site reviews will be based on survey results and the scheduling of such reviews will be prioritized. First priority will be given to: All active LLW treatment, storage and disposal facilities; all disposal facilities under construction or constructed and not yet used; and any inactive disposal facilities which potentially add to doses from active or planned disposal facilities because of their relative proximity, their potential for overlap of groundwater plumes or some yet to be defined technical basis of source term overlap. At least seven sites within this priority will have in-depth on-site independent assessments: Hanford Site; Idaho National Engineering Laboratory; Los Alamos National Laboratory; Nevada Test Site; Oak Ridge Reservation; Savannah River Site; and Fernald Environmental Management Project. Second priority will be given to closed LLW disposal facilities which were not included in the first priority review. Up to 100 sites could fall into this priority. Some of these are expected to be subjected to on-site assessments which would begin during the evaluation period for first priority sites and reflect refinements in evaluation criteria from the first priority sites. Sites other than LLW facilities that may be considered in the complex-wide review are cribs, ponds, distinct release sites of spills and leaks, and ~~CERCLA~~ contaminated sites being addressed under the Formerly Utilized Sites Remedial Action Program (FUSRAP) and Uranium Mill Tailings Remedial Action (UMTRA), if they contribute to the doses from LLW disposal facilities. The site selection process is outlined in Figure V.3, and examples of priorities are shown in Figure V.4.

Assessment Criteria: Site and disposal facility surveys and evaluations will be completed following specific criteria for waste management, waste disposal facilities, and their related administrative controls. Criteria for waste management include the appropriate requirements of DOE Orders and regulations and guidance related to generating, characterizing, treating, storing, and disposing of LLW, such as Order 5820.2A and subsequent revisions to that order. Criteria for waste disposal facilities will be used to assess waste packaging and form, environmental monitoring, and facility siting, design, construction and performance assessments. Criteria for administrative controls will be used to assess procedures, records, training, monitoring and trending. Criteria will be applied to the facility under adverse conditions, accidents or postulated events such as those covered in applicable safety analysis reports, as well as to the facility's capability to respond with compensatory measures. Examples of site evaluation criteria and related review approaches are identified in Table V-1. Examples of survey contents are identified in Table V-2. These examples are for illustrative purposes only and will be further developed for use in the complex-wide review. Assessments of active and planned disposal facilities will consider the status of efforts in completing performance assessments as described in Section VII of this plan.

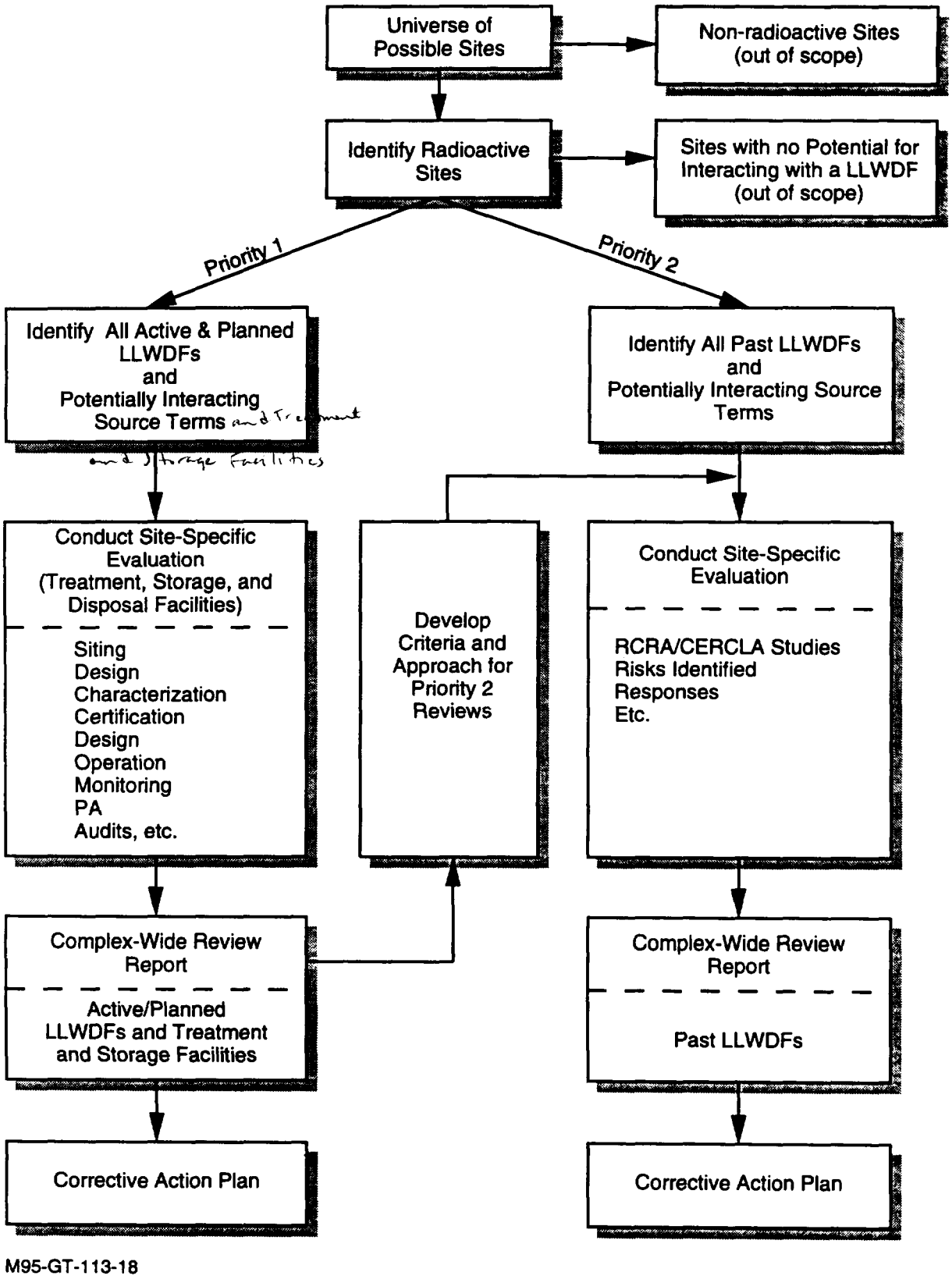
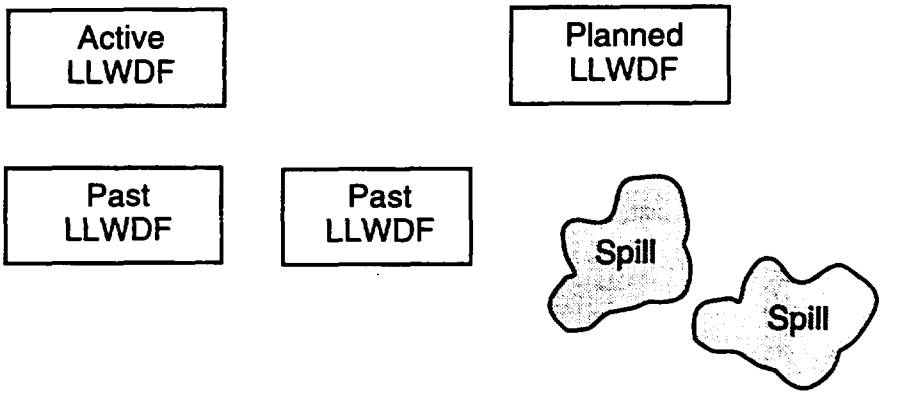


Figure V.3: Complex-Wide Review - Site Selection Process

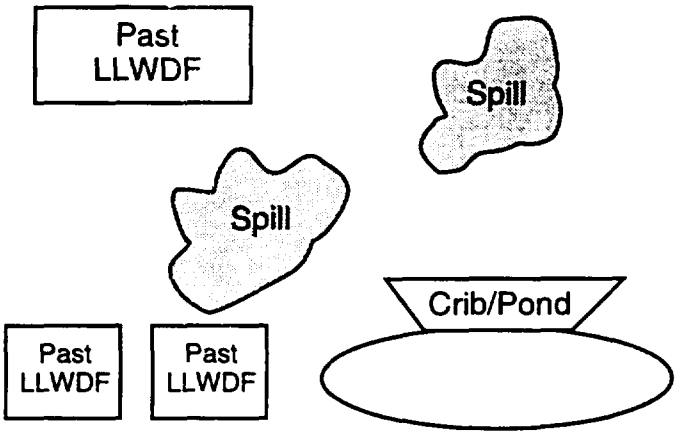
EXAMPLE:

Included in Priority 1 Review



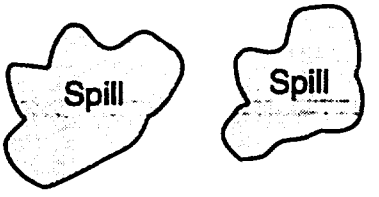
EXAMPLE:

Included in Priority 2 Review



EXAMPLE:

Not Included in Review



M95-GT-113-19

and UMTRAP & FUSRAP

Figure V.4: Complex-Wide Review - Examples of Priorities

Table V-1: Example Evaluation Criteria and Review Approaches

- **Criteria:** Facility inventories of LLW are well controlled and documented.

  Review Approaches
  - Review applicable inventory control procedures and records
  - Observe staging of LLW containers for disposal
  - Interview responsible individual who manages LLW inventory

- **Criteria:** LLW storage/disposal containers show no sign of corrosion, mechanical damage or loss of containment integrity.

  Review Approaches
  - Review inspection criteria and records for monitoring condition of containers
  - Inspect storage/disposal containers for degradation
  - Interview at least three operators about their responsibilities for packaging conditions and understanding of packaging requirements

- **Criteria:** Adverse conditions/events in treating, storing, or disposing of LLW are evaluated and documented, and any lessons-learned from past actions are routinely implemented.

  Review Approaches
  - Review facility's incident investigation program and incident reports over last three years
  - Interview person responsible for reporting or investigating adverse conditions/events about investigative methods and application of "lessons-learned"

- **Criteria:** Design requirements for LLW treatment, storage and disposal facilities are documented, and modifications to facilities are analyzed, documented and approved.

  Review Approaches
  - Review available documentation regarding functional requirements and any related safety bases for facility
  - Review any facility modification packages for recently completed design changes or installed modifications, including design engineering calculations if required
  - Interview responsible engineering supervisor regarding review process for initiating and approving facility modifications

- **Criteria:** Good housekeeping and maintenance practices are evident throughout the facility.

  Review Approaches
  - Complete facility walkdown to observe general level of orderliness and method by which maintenance deficiencies are documented.
  - As applicable to the facility, review documented backlog of maintenance requests and sample adequacy of completed maintenance orders (preventive and corrective)
  - Review maintenance program and related procedures related to the facility
  - Interview responsible maintenance manager regarding maintenance requirements and practices

- **Criteria:** Handling of LLW is in accordance with approved procedures within an administrative system that ensures procedures are current and accurate, and that address normal, abnormal and emergency conditions.

  Review Approaches

  - Review applicable handling procedures, including procedure for change control.
  - Observe activities, if possible, for evidence of procedure adherence
  - Interview a supervisor and operator regarding understanding of selected procedures and training in abnormal/emergency conditions

- **Criteria:** Appropriate monitoring and characterization activities exist for worker safety and environmental protection using acceptable sampling and analytical methods.

  Review Approaches

  - Observe operating status of applicable monitoring equipment and note any deficiencies
  - Observe if possible ongoing practices in handling samples, including use of analytical equipment and calculations
  - Review records on sampling, characterization, and monitoring equipment repair for past twelve months
  - Interview responsible technician regarding trending programs

- **Criteria:** Facility is staffed with personnel who demonstrate adequate awareness of safety and environmental protection requirements and who act in compliance with those requirements.

  Review Approaches

  - Observe conduct of operations appropriate to facility
  - Review available training records of selected personnel about training program requirements on personnel safety and environmental protection
  - Observe for adequacy of shift staffing

- **Criteria:** The point of responsibility transfer and acceptance criteria for LLW from generation to storage, to treatment, and to disposal is clearly identified and documented.

  Review Approaches

  - Review audit programs on waste acceptance criteria
  - Review existing interface agreements or organization responsibilities
  - Interview selected managers across waste management functions regarding their understanding of transfer in responsibility

Table V-2: Example Survey Instrument

Note: A portion of the survey may be represented by questions aligned to evaluation criteria which are a part of an on-site independent assessment. An example follows:

Criteria: Facility inventories of LLW are well controlled and documented.

1. What are the locations (e.g., by site area, facility name and/or building number) and quantities of LLW?
2. What information is maintained in a site or facility database or record to characterize the LLW identified above in responding to question 1?
3. Do any of the LLW described above contain non-radiological hazardous materials? If so, describe the location, type and quantity.
4. List any concerns regarding the control and documentation of LLW at this site/ facility.

Criteria: LLW storage/disposal containers show no sign of corrosion, mechanical damage or loss of containment integrity.

1. Identify any corrosion, damage or breaches in LLW containers.
2. What documents are used to record degradation of LLW containers?
3. Is there a monitoring or surveillance program for waste packaging or containers prior to disposal? If so, provide documentation describing the program.
4. List any concerns regarding current conditions of LLW containers or packaging.

Criteria: Adverse conditions/events in treating, storing, or disposing of LLW are evaluated and documented, and any lessons-learned from past actions are routinely implemented.

1. What adverse conditions/events have occurred during life of the facility that have led to either worker exposure to or environmental release of radioactive materials?
2. Have any of the responses to question 1 above resulted in radioactive releases to the ground water? If so, describe the incident and the quantity of release.
3. Does this facility have an incident investigation program? If so, provide a copy of related program documentation.
4. How is information about incidents at this facility shared with other facilities? How is information about incidents at other facilities communicated within this facility?
5. List any concerns regarding past incidents at this facility.

Vulnerability Classification: From the documented surveys and team assessments identifying deficiencies and weaknesses, vulnerabilities will first be categorized to determine if they relate, for example, to the waste container, to the facility's condition, or to an institutional problem. Examples of vulnerabilities are leaking drums, inadequate burial ground drainage, or incomplete source term analyses. Vulnerabilities are further classed in terms of radiation exposure to workers or the public, or radioactive release to the environment based on an evaluation of the probability of an adverse condition or accident occurring and the consequences due to the type and quantity of LLW. The likelihood of occurrence is typically simplified to "low," "medium," or "high" as a function of time, and the consequences are grouped similarly as "low," "medium," or "high" as a function of established dose limits. This classification scheme is then used to prioritize use of resources in addressing corrective actions. Example vulnerabilities are depicted in Table V-3.

Table V-3: Example Vulnerabilities

Category	Problem	Effect/Consequences
Packaging	Inadequate/improper sealing of waste packaging containers	Breach of waste containment/ Worker exposure and contamination
Facility Feature	Design deficiency: inadequate drainage	Increased potential for environmental contact/Environmental release.
Facility Feature	Through-wall cracks in concrete/ asphalt	Increased potential for environmental contact/Environmental release.
Institutional	Inexperienced/untrained personnel	Increased potential for accident/ Worker exposure, environmental release.
Institutional	No repackaging program	Continued container degradation/Worker exposure and contamination.

Team Training: Irrespective of the technical and professional qualifications of members of either the Site Assessment Teams or the Working Group Assessment Teams, all team members will receive core training in team-building and in assessment methods for reviewing documents, interviewing people, and observing activities. Further training may also be used to familiarize team members with the criteria and methods employed for site-specific surveys and reviews. Members of Site Assessment Teams may serve as members of Working Group Assessment Teams for any site other than their home site. For a given site, the work of the Site Assessment Team must be completed and reviewed by the Assessment Working Group prior to commencement of work by the Working Group Assessment Team.

B. Task Initiatives

1. Establish Review Organization and Management

a. Description: The OCPC assigned manager selects an Assessment Working Group (AWG) to administer the complex-wide review. The AWG identifies and selects Site Assessment Teams (SATs) from each site to perform surveys, and Working Group Assessment Teams (WGATs) from off-site to perform independent evaluations at selected sites.

b. Milestone: Persons and/or organizations to staff the Assessment Working Group, the Site Assessment Teams and the Working Group Assessment Teams, including DOE staff, M&O contractor staff and independent contractors, are assigned.

c. Due Date: July 31, 1995

d. Responsibility: OCPC

2. Conduct Site Evaluation Surveys

a. Description: LLW sites to be surveyed are identified and a survey instrument is prepared. Site Assessment Teams are trained on survey contents and survey methods, and perform surveys at their sites, beginning June 1, 1995.

b. Milestone: Site surveys are completed, with any requested additional documentation, and returned to the Assessment Working Group for review.

c. Due Date: August 31, 1995

d. Responsibility: OCPC

3. Conduct First Priority On-Site Independent Assessments

a. Description: LLW sites to receive an independent on-site evaluation are identified, and an assessment plan is developed for each that includes evaluation criteria and a vulnerability screening method. The plan also considers results of other recent assessments such as QA audits or Conduct of Operations reviews. Working Group Assessment Teams are trained on assessment plan contents and site evaluation methods, and perform assessments at assigned sites.

b. Milestone: On-site evaluations are completed for the first priority sites and an assessment report for these sites is issued.

c. Due Date: March 31, 1996

d. Responsibility: OCPC

4. Conduct Second Priority On-Site Independent Assessments

a. Description: Assessment methods are refined based on experiences from the first priority sites, and assessment plans are developed. Working Group Assessment Teams are trained as needed on plan contents and site evaluation methods, and perform assessments at assigned sites.

b. Milestone: On-site evaluations are completed for the second priority sites and an assessment report for these sites is issued.

c. Due Date: August 31, 1996

d. Responsibility: OCPC

5. Assess Implementation of Corrective Actions by Operations Offices

a. Description: Corrective action plans, developed by field management in response to identified vulnerabilities, are being monitored during implementation in view of any new LLW management requirements and in accordance with an on-going assessment process.

b. Milestone: A continuing periodic assessment program is established.

c. Due Date: August 31, 1996

d. Responsibility: OCPC

VI. DOE REGULATORY STRUCTURE AND PROCESS

A. Discussion

Disposal of low-level radioactive waste is conducted under the requirements in DOE Order 5820.2A Radioactive Waste Management, and other orders and regulations pertaining to the protection of the health and safety of workers, the public and the environment. Order 5820.2A is being revised as Order 5820.2B. The Board has pointed out several problems that can be traced back directly to the regulations and orders promulgated by DOE to control waste management and to protect the public health and safety, or to lack of effective enforcement of those requirements. Several of these problems have also been identified by the DOE Technical Working Group (TWG) that is responsible for re-writing Order 5820.2A. Among the problems identified by the Board and the TWG are:

- Performance assessments required by Order 5820.2A, issued in 1988 and immediately effective, have not been completed for most DOE disposal sites,
- The applicability of Order 5820.2A only to waste disposed of after September 1988,
- Order 5820.2A does not provide adequate coverage of storage,
- Waste packaging requirements in Order 5820.2A are not comparable to commercial requirements, and
- Without the PAs being complete, other requirements of Order 5820.2A, such as development of waste acceptance criteria based on PA results and monitoring to ensure that the PA results are being met, cannot begin.

These and other problems are now recognized by the Department as being of importance to the safe management of low-level waste. The problems may be traced back to the general nature of the requirements themselves, the lack of formal guidance that defines acceptable ways to meet the requirements, lack of procedures for review and approval of PAs, and the lack of an effective enforcement system to ensure that requirements are met. Some of these deficiencies are being addressed in the revision of the Order.

Based on the needs identified by the Department, this plan describes actions to restructure the regulatory framework that controls low-level waste management. The plan will build on the efforts of the Low-Level Waste TWG for the revision of Order 5820.2A. The restructuring will require both short-term and long-term actions. Short-term actions include development and implementation of policies to be issued by the Assistant Secretary for Environmental Management or Deputy Assistant Secretary for Waste Management, actions concerning the conduct, review and approval of performance assessments, and development of technical standards and implementation guidance. Longer term activities include issuance of the revised Order 5820.2B, development of technical requirements, implementation guidance and standards for low-level waste management and finally rulemaking to codify those requirements.

The Department will issue near-term policies, requirements, and guidance to effect immediate improvement in the Department's low-level waste management system. The Department will specifically define the roles and responsibilities of various Headquarters and field elements for implementing, overseeing and approving key low-level waste management requirements. Other policies will address and correct problems in the area of performance assessment completion, definition of acceptance criteria for low-level waste performance assessments, and applicability of Order 5820.2A (and eventually 5820.2B) to operat-

ing and planned disposal facilities, including those developed for low-level waste resulting from actions under CERCLA and RCRA.

Concurrently, over the longer-term, the Department will initiate its systems engineering analysis and complex-wide review to determine needs and parameters for more comprehensive policies, requirements, and guidance. A review of other requirements both commercial and international will be completed. These activities will be closely coordinated and integrated to ensure that interim improvements address currently understood needs for improvement, while longer term actions address both immediate needs and needs identified by the planned reviews.

The Department will undertake, the development of detailed requirements and standards for the management of low-level waste by continuing ongoing efforts to revise Order 5820.2A and issue the revision as Order 5820.2B. The rulemaking activities necessary to codify the resulting requirements will be initiated and finished as described in this plan in parallel with the finalizing of Order 5820.2B. Final Technical Standards and Implementation Guidance to support the Order will be prepared. The current regulatory framework, the framework that is expected to result after short term actions are finished, and the final regulatory framework are presented in Figure VI.1.

	CURRENT	NEAR TERM	FUTURE
Policy	Secretary of Energy Order (5820.2A)	Secretary of Energy Order (5820.2B)	Secretary of Energy Order (5820.2B) (10CFR8xx)
Rule			10CFR8xx
Order	Waste Management 5820.2A Chapter III, Management of Low-Level Waste	5820.2B Chapter IV Management of Low-Level Waste	5820.2B, Chapter IV Management of Low-Level Waste
Notice		Commitment to Regulatory Improvement and Application of Interim Guidance and Standards	
Manual			Low-Level Waste Management Manual (If needed based on length or detail of required procedures)
Safety/ Implementation Guidance	Informal Guides on: Implementation Conduct of Performance Assessments Standard Format and Content of PA Review Guide for PA	Interim Guidance on Application of Existing DOE Requirements for: Performance Assessment Waste Form and Packaging Waste Characterization Site Closure Site Monitoring Waste Acceptance Criteria	Formal Implementation Guidance DOE/EM-XXXX
Technical Standards			Formal Technical Standards DOE/EM-XXXX

M95-GT-113-12 backup

Figure VI.1: Regulatory Framework

B. Task Initiatives

A series of tasks have been defined to provide a means of organizing and then tracking and controlling activities planned to improve the regulatory framework for low-level waste management. Those tasks are:

1. Issue Policy on Pre-1988 Source Term and Composite Plumes;
2. Develop and Issue Policy to Strengthen Regulatory Structure;
3. Clarify and Formulate PA Development and Approval Criteria;
4. Clarify Applicability of Order 5820.2A to New Sites Including Mixed Waste Disposal Sites and CERCLA and RCRA Sites;
5. Improve PA Review Process and Diversify Peer Review Panel Membership;
6. Review Commercial and International Standards and Requirements and Compare to DOE Standards and Requirements;
7. Develop Uniform Technical Standards;
8. Conduct Rulemaking for Low-Level Waste Management

For each task, a brief description is provided, along with information on process, decision criteria where needed, and interfaces with other aspects of the implementation plan. For each task, a product is identified.

1. Directive to include pre-1988 source term and composite plumes

a. Description: Issue OWM directive on inclusion of pre-1988 waste and consideration of other sources of radioactive contamination. Require sites to submit revised schedules by April 1996 for revised PAs which will include pre-1988 waste and other sources of contamination. Further discussion of the inclusion of all sources in PAs is in Section VII.

b. Milestone: Issue directive ~~draft~~

c. Due Date: May 31, 1995 - signed out 5/31/95

d. Responsibility: LLW Management Task Group and OWM

2. Develop and Issue Policy to Clarify and Strengthen Low-Level Waste Management Regulatory Structure

a. Description: The Department will specifically define the roles and responsibilities of various Headquarters and field elements for implementing, overseeing, and approving key low-level waste management requirements. The responsibilities for regulatory oversight and enforcement within DOE will be identified; these responsibilities will be independent from the Deputy Assistant Secretary responsible for executing low-level waste program activities. Field elements will be required to commit to implementation of interim and future implementation guidance and technical standards as they are developed, adopted, and approved, as well as existing DOE low-level waste management requirements. Consequences for non-compliance with requirements will be clearly defined, including those conditions that could result in the shut-down of LLW management operations.

- EH has lead on developing draft
- letter to Bd w/ draft attached
-

b. Milestone: Policy statement issued

c. Due Date: May 31, 1995

d. Responsibility: Prepared by the LLW Management Task Group in consultation with the Office of Environmental, Safety, and Health staff and issued by the Assistant Secretary for Environmental Management and the Assistant Secretary of Environment, Safety, and Health.

3. Clarify and Formulate PA Development and Approval Criteria

a. Description: The timely development and approval of performance assessments are key elements of the low-level waste management system. The Department will issue performance assessment guidance that will provide minimum criteria for an acceptable performance assessment, and guidance on the preparation and approval of low-level waste radiological performance assessments. The guidance will address:

- Performance Assessment format and content;
- Standard Review Plan for Performance Assessments;
- Critical assumptions for performance assessment preparation; and
- Performance assessment maintenance program.

The guidance on performance assessment format and content will provide an annotated outline of the matters to be addressed in a performance assessment. The standard format and content and Standard Review Plan will consider existing DOE guidance as well as that developed by NRC. The Standard Review Plan will include technical criteria for the findings that must be made to determine that a performance assessment is technically acceptable. The Standard Review Plan will help provide for consistency of review. The guidance on critical assumptions on performance assessment preparation will address considerations that are fundamentally matters of DOE policy such as:

- time of active institutional control,
- relationship of active and passive institutional periods,
- time(s) of compliance,
- points of compliance for performance objectives,
- ownership and future land use following closure of a disposal facility,
- degree of certainty necessary for compliance demonstration,
- purpose of inadvertent intruder assessments,
- assumptions regarding human activities relative to demonstrations of protection of individuals and inadvertent intruder,
- use of standardized adult dose conversion factors,
- extrapolation to future environmental conditions,
- treatment of radon dose in performance assessments, and
- interpretation of groundwater protection requirements.

Guidance on inclusion of all source terms in the PAs will be issued under task initiatives described in Section VII. Any changes or updates to source term guidance will be included with this critical assumptions guidance, if warranted.

The guidance on performance assessment maintenance programs will specify criteria for periodic review of the performance assessments to ensure that the waste acceptance criteria and design and operational requirements derived from the performance assessments remain viable, as well as providing criteria for determining when revisions to the performance assessments are necessary. The performance assessment maintenance guidance will also address the need to reduce uncertainties in predictions about the long-term performance of disposal facilities.

b.1 Milestone: Publish guidance documents addressing critical assumptions for performance assessments

c.1 Due Date: August 31, 1995

d.1 Responsibility: Developed jointly by OWM and the Deputy Assistant Secretary of Environment in coordination with the Performance Assessment Task Team and the Peer Review Panel, and issued by OWM.

b.2 Milestone: Publish remaining PA guidance documents

c.2 Due Date: May 31, 1996

d.2 Responsibility: Developed jointly by OWM and the Deputy Assistant Secretary of Environment in coordination with the Performance Assessment Task Team and the Peer Review Panel, and issued by OWM.

4. Clarify Applicability of Order 5820.2A (5820.2B) to New Sites Including RCRA and CERCLA Sites

a. Description: The Department will issue interim Implementation Guidance that defines the applicability of its low-level waste requirements to all waste management operations involving low-level waste including those conducted under RCRA and CERCLA. Recognizing that RCRA and CERCLA disposal and storage sites are also regulated by EPA and in some cases the states, this guidance will identify the applicable low-level waste requirements for such activities and specify procedures necessary to demonstrate compliance with the requirements of Order 5820.2A. The guidance will be referenced in the Notice to be issued to strengthen the regulatory structure for implementing and enforcing the Department's low-level waste management requirements. The guidance will remain in effect until the requirements are issued in a revised Order or as a Rule or as other implementation guidance and technical standards address the issues.

b. Milestone: Interim guidance document issued

c. Due Date: September 30, 1995

d. Responsibility: The guidance will be developed by OWM in consultation with OER and will be issued by Assistant Secretary for Environmental Management.

5. Improve PA Review Process and Diversify Peer Review Panel (PRP) Membership

a. Description: The PRP is now composed of one representative of each site with a LLW disposal facility, one representative of a LLW generator site, and one representative of the Office of Environment, Safety, and Health. This roster of the PRP at present contains individuals with conflicts of interest concerning the performance assessments. To reduce the

potential for conflict of interest, the member from the site that is the subject of a PA is recused from the review. This makeup of the PRP has the advantage that the representatives are extremely knowledgeable about site conditions, LLW, and the LLW disposal facility PAs, and this knowledge facilitates the PA reviews.

The Department believes that the recusal process should be strengthened to alleviate the potential for conflicts of interest. The knowledge and experience of the current PRP will continue to be utilized. The Department will also explore ways to diversify the membership of the PRP, for example by adding individuals who are not employed at the sites with disposal facilities or from outside of the Department complex.

In addition, the approval process for performance assessments will be formalized. The Department will evaluate alternatives to clarify and strengthen the regulatory oversight and enforcement functions for performance assessments within DOE. Emphasis will be placed on independence of the oversight function from the Deputy Assistant Secretary for Waste Management, avoiding conflicts of interest, assuring that governmental decision making is not improperly delegated to contractor personnel, and providing adequate technical support to the decision maker. Organizational alternatives which might be considered could include specifying an existing organizational element, forming a new organizational element, or appointing either a permanent or ad hoc board or committee as the regulatory body responsible for approving performance assessments. The appropriate levels of administrative and technical review required of this DOE regulatory body will need to be determined to ensure a sufficiently critical examination of the performance assessments and supporting documentation and Peer Review Panel reports.

b.1 Milestone: Additions made to membership roster of PRP

c.1 Due Date: September 30, 1995

d.1 Responsibility: LLW Management Task Group

b.2 Milestone: Approval process reviewed, modified and formally established as Secretary of Energy Policy

c.2 Due Date: May 31, 1996

d.2 Responsibility: LLW Management Task Group, OWM, Assistant Secretary for Environmental Management, Assistant Secretary for Environment, Safety, and Health

6. Review Commercial and International Standards and Requirements and Compare to DOE Standards and Requirements

a. Description: The Department will initiate a process to compare its requirements and standards for low-level waste management with similar non-DOE systems. Using the results of the complex-wide review the Department will analyze the reasons for the differences and identify potential changes to DOE requirements and standards. The scope of the review will include as examples: applicable NRC requirements and guidance, such as 10 CFR 61 and similar Agreement State requirements, implementation guides, license conditions, and waste acceptance criteria. International efforts such as the IAEA RADWASS program will be considered. The specific deliverables from this process and their schedules will be designed to provide primary inputs to the development of short-term implementation guidance and longer term efforts to finalize Order 5820.2B and to develop and issue a rule concerning low-level waste management.

b. Milestone: Report comparing DOE and non-DOE requirements and standards for performance assessments and performance assessment maintenance and other waste management technical areas including waste form and packaging, waste characterization, site closure, site monitoring, and waste acceptance criteria.

c. Due Date: September 30, 1995

d. Responsibility: LLW Management Task Group

7. Develop Uniform Technical Standards

a. Description: The Department has initially identified needs for LLW program implementation guidance and technical standards for performance assessments, performance assessment maintenance, waste form and packaging, waste characterization, site closure, site monitoring and waste acceptance criteria. Implementation guidance addressing PAs and PA maintenance is being issued separately under task initiative VI.3. This initiative responds to the needs for guidance in the other technical areas.

The Department will establish Technical Standards Working Groups to develop or adopt technical standards and implementation guidance in the technical areas listed above (except for PAs), and any other areas as they are identified in the future. Existing commercial and international standards will be reviewed, compared to Department standards and evaluated for adoption by the Department. Interim implementation guidance will be issued in the near-term where critical needs exist.

Following the issuance of the revised Waste Management Order, the Standards Working Groups will develop and issue final implementation guidance documents and technical standards on all of the technical areas in LLW management.

b.1 Milestone: Issue interim implementation guidance on waste form and packaging, waste characterization, site closure, site monitoring, and waste acceptance criteria.

c.1 Due Date: September 30, 1995

d.1 Responsibility: LLW Management Task Group

b.2 Milestone: Final technical standards and implementation guidance issued to support 5820.2B.

c.2 Due Date: May 31, 1996

d.2 Responsibility: LLW Management Task Group

8. Proceed with Low-Level Waste Rulemaking

a. Description: The Department will complete a critical review of DOE Waste Management Draft Order 5820.2B to identify essential requirements that should be included in a Low-Level Waste Management rule. A critical review of requirements is currently being carried out to finalize Order DOE 5820.2B. The results of the complex-wide review for first priority facilities and the evaluations of U.S. commercial and international requirements and standards will then be used to confirm the results of the identification process. The process will also separate policy, requirements, and guidance. Policy and guidance sections of the Order that are not already being addressed by technical standards or implementation guidance may be issued as implementation guides or technical standards, as appropriate.

b.1 Milestone: Report identifying essential requirements that should be included in a Low-Level Waste Management Rule

c.1 Due Date: May 31, 1996

d.1 Responsibility: LLW Management Task Group in consultation with the Office of Environment, Safety and Health

b.2 Milestone: Issue draft rule

c.2 Due Date: August 31, 1996

d.2 Responsibility: The draft rule will be prepared by the LLW Management Task Group

b.3 Milestone: Issue final rule

c.3 Due Date: August 31, 1997

d.3 Responsibility: The LLW Management Task Group is responsible for developing the rule. The rule will be promulgated in accordance with responsibilities as described in DOE system directives requirements and the Administrative Procedures Act. It will be signed by the Secretary of Energy.

VII. PERFORMANCE ASSESSMENTS

A. Discussion

The low-level waste performance assessment required by DOE Order 5820.2A is a systematic analysis of the potential radiological risks posed to the public and environment from a waste disposal facility, and a comparison of those risks to established performance objectives. The Order specifies that PAs are required only for waste disposed of after the effective date of the Order (September 26, 1988). A significant effort to prepare the PAs has been undertaken over the years since the Order was issued. At this time, five PAs for active disposal facilities have been prepared and submitted to Headquarters for review and approval. Headquarters has completed its review and approval of one of the PAs. There are an additional four active disposal facilities for which PAs are at various stages of development and PAs have been or are being prepared for four planned disposal facilities.

The DNFSB included in Recommendation 94-2 that the PA process should be expedited for the above-referenced active facilities, and that the scope of the PAs should include past, present and future inventories of low-level waste. The DNFSB further recommended that the Department develop action plans for cases where the performance objectives are predicted to be exceeded. Separate from the complex-wide review (Section V), DOE recognizes that there is a vulnerability because the entire source term potentially impacting a receptor is not currently analyzed in the PAs and compliance with performance objectives cannot be determined.

The Department agrees in principle with the recommendation that the PAs for active and planned disposal facilities must account for other potential source terms in the soil and take action if performance objectives are exceeded. The task initiatives discussed in this section respond to the Board's specific recommendations by committing to schedules to complete the PA process, including the entire source term in PAs, and evaluating compliance with performance objectives. If performance objectives are exceeded, the Department will prepare and implement action plans which identify steps to mitigate the impacts determined by the PA. A cost-benefit analysis may be a necessary part of the process for selecting an appropriate mitigative action. And, although remediation decisions for past disposal facilities may be influenced by the composite analysis, final decisions will be made through the CERCLA process. Compliance for the composite analysis will be assessed versus the performance objectives of the Order or regulation that is applicable at the time of evaluation (see Section VI). The Department is aware of and will continue to monitor the development of a low-level waste standard by the U.S. Environmental Protection Agency.

For purposes of the PA analyses, other potential source terms include any sources of radioactive contamination in the ground that have a potential for contributing to the maximum calculated dose to a receptor. Potential sources may be waste disposed of prior to 1988, waste in adjacent solid waste disposal facilities, disposed transuranic or suspect transuranic waste (unless there is a decision to remove the waste), and plumes from liquid waste disposal, leaks, or spills. Transuranic waste in the ground in a storage configuration which the Department plans to recover for shipment to a transuranic waste repository will not be included as a potential source term.

Tasks defined in Section VI of this Plan will strengthen the PA process by clarifying requirements and developing an enhanced regulatory structure and improving the technical standards, guidance and policy directing the preparation of PAs. One clarification will address the equivalency of a risk assessment performed under the CERCLA process for meeting the PA requirements. Enhancement of the regulatory structure will include guidance or policy under Section VI.B.3 addressing the following PA considerations:

- PA Maintenance—Preparing and maintaining PAs is an iterative process. Policy and procedures are needed to guide continuing PA work and to detail the periodic revision and review of PAs.
- PA Details—Several aspects of PA preparation have not been formalized in DOE policy. Policy and/or guidance on the following topics will be developed and issued:
  - Time of Compliance—PA calculations can be carried out many millions of years into the future. Policy is needed as to whether calculated doses, irrespective of time (peak dose) is to be used to determine compliance or whether the maximum dose calculated within a time-frame is to be used.
  - Future Land Use—Long-term land use policy can significantly impact scenarios used in PAs. Establishment of policy in this area will provide definitive guidance for PAs.
  - Radon Dose—Radon is produced by decay of thorium and uranium isotopes which are common in DOE LLW. Policy is needed regarding the consideration of dose from radon in PAs.
  - Groundwater Protection—DOE 5820.2A performance objectives include groundwater protection. However, specifics such as the appropriate measure, the point of compliance, etc. are not defined.
  - Intruder Analysis—The use and applicability of inadvertent intruder analysis will be clarified.

The Department will follow a course of action that takes into consideration the status of PA development for the active and planned facilities. Experience to date shows that a more thorough analysis has been conducted once a PA has undergone review by the DOE Peer Review Panel (PRP) and Headquarters. Therefore, rather than direct that all PAs be revised to include all contributing source terms immediately, DOE will proceed with the review and a preliminary approval of those PAs that have been or are about to be submitted to Headquarters. These PAs will proceed through the review process as it is currently structured. The preliminary approval is a recognition that the PA is appropriate for the scope for which it was developed, but that the scope is incomplete until the composite analysis (other source terms) is included. PAs for the following facilities are included in this category:

- Hanford 200-W Burial Ground
- Hanford Grout
- Idaho Radioactive Waste Management Complex
- Nevada Radioactive Waste Management Site
- Oak Ridge Solid Waste Storage Area 6
- Savannah River Saltstone

It should be noted that the PA process is an iterative one. Normally, the first iteration is the preparation, review and approval of a PA in the early stages of development of a LLW disposal facility. For DOE, many of the facilities were in existence prior to the requirement to prepare a PA. During the facility operational lifetime, the PA is revised and resubmitted for approval as the situation changes (new waste is forecast, new data are obtained, etc.). At the end of facility operations, the final iteration of the PA will be done to validate closure. Thus, approval of the first PA iteration which, as noted above for several facilities, will not include the entire source term, will not preclude the review and approval of future iterations, the first of which will include the entire source term. A schedule for updating the PAs to include the entire source term will be required for each facility.

For those PAs which are in earlier stages of preparation, the entire source term will be included as the PA is developed. Although this will delay completion of these PAs, it will result in the complete analysis of the facility's performance. The following PAs fall in this category:

- Hanford Environmental Restoration Disposal Facility
- Hanford 200-E Burial Ground
- Los Alamos Area G
- Los Alamos Mixed Waste
- Nevada Area 3 Radioactive Waste Management Site
- Oak Ridge L-II Facility.

The PAs listed above and future updates of PAs will be subject to the PA review and approval process that is developed under initiatives in Section VI. Through these initiatives, the Department will ensure that the PAs for future facilities include the entire source term.

Completion of PAs for active facilities to include the entire source terms, whether in an update or initial submittal, will generally require longer than a year. The Department has decided that it is appropriate to conduct an analysis within a year to gain an early understanding of the potential for current LLW disposal facilities to be impacted by other sources of radioactive contamination. Therefore, the Department will conduct preliminary assessments using simple models to identify sites with potential problems as revealed by the composite analysis. Screening-level calculations will be used to bound the dose from the other source terms to receptors considered in the PA for the LLW disposal facility. The Performance Evaluation methodology developed by the DOE Federal Facility Compliance Act Disposal Working Group provides one tool that may be useful for this purpose. Another mechanism for performing the preliminary assessments is to complete a draft PA which includes the entire source term.

Guidance for conducting the analysis within one year will be issued. The guidance for this effort will include technical criteria to determine which other sources should be considered. Source terms may be excluded from consideration if the exclusion is technically justified. Criteria that will be considered for excluding potential source terms include hydrogeology, proximity, and contaminant travel time. The source term from pre-1988 waste and other sources will be derived using an appropriate combination of existing records (waste disposal records, production histories, monitoring data, etc.), field data from monitoring and sampling, and modeling. In collecting data to support the preparation of the preliminary assessments or PAs, information on other hazardous constituents in the waste will also be collected to the extent practical. These other data will not be used in the PAs, but may be useful in other evaluations to determine remedial actions. As in other aspects of performance assessment, a sensitivity and uncertainty analysis will be done on the source term.

An action plan will be developed if aggregate impacts, as calculated in the preliminary assessments or PAs exceed applicable performance objectives. The action plans will include proposed mitigating actions and associated costs. A cost-benefit analysis will be conducted to support decisions on the mitigating actions to be taken. Potential mitigating actions to be considered include refinement of the analysis, limitations on the receipt of waste disposed in the active or planned facility (including possible termination of disposal operations), and remediation of other sources. Final decisions on the remediation of past disposal sites and other sources will be effected through the CERCLA process. Another iteration of the PA will be conducted to validate the efficacy of the mitigating action.

B. Task Initiatives

Following are task initiatives to address commitments to complete the PA process for active and planned facilities, include the entire source term in PAs, and perform near-term evaluations of the potential impacts of including the entire source term. Action plans will be prepared as necessary based on the results of the PAs or preliminary evaluations.

1. Complete performance assessments.

a. Description: PAs will be completed for active and planned LLW disposal facilities. As described above, some of the PAs will be submitted for preliminary approval with their current scope which excludes the entire source term. The PAs will be submitted by the Operations Offices and will undergo review and approval (or preliminary approval) by Headquarters. This review includes a review for technical quality by the PRP.

b. Milestone: The PAs for active and planned facilities will be completed.

c. Due Date: The due dates for Operations Offices to submit a PA to HQ, and for HQ to review and approve PAs, are shown in Figure VII.1.

d. Responsibility: The responsible Operations Office Assistant Manager (see Table VII-1) must ensure preparation and submission of the PA to Headquarters. The Deputy Assistant Secretary for Waste Management is responsible for review and approval.

2. Preliminary assessment of the impact of the entire source term.

a. Description: Guidance will be prepared for including evaluation of the entire source term (in preliminary assessments or PAs) for the active low-level waste disposal facilities. The guidance will specify criteria for determining whether a source term potentially contributes to the dose from the active disposal facility. It will also address the approach and quality control for developing a source term for past disposal facilities. The assessment is to provide an understanding of the potential impact of the entire source term at the disposal facility.

Corrective action plans will be prepared in cases where the performance objectives are exceeded.

b.1 Milestone: Prepare guidance for conducting preliminary assessments.

c.1 Due Date: July 31, 1995

d.1 Responsibility: The LLW Management Task Group is responsible for preparing and distributing the guidance.

b.2 Milestone: Conduct preliminary assessments and develop corrective action plans.

c.2 Due Date: March 31, 1996

c.3 Responsibility: Operations Office Assistant Managers are responsible for the preparation of preliminary assessments and action plans.

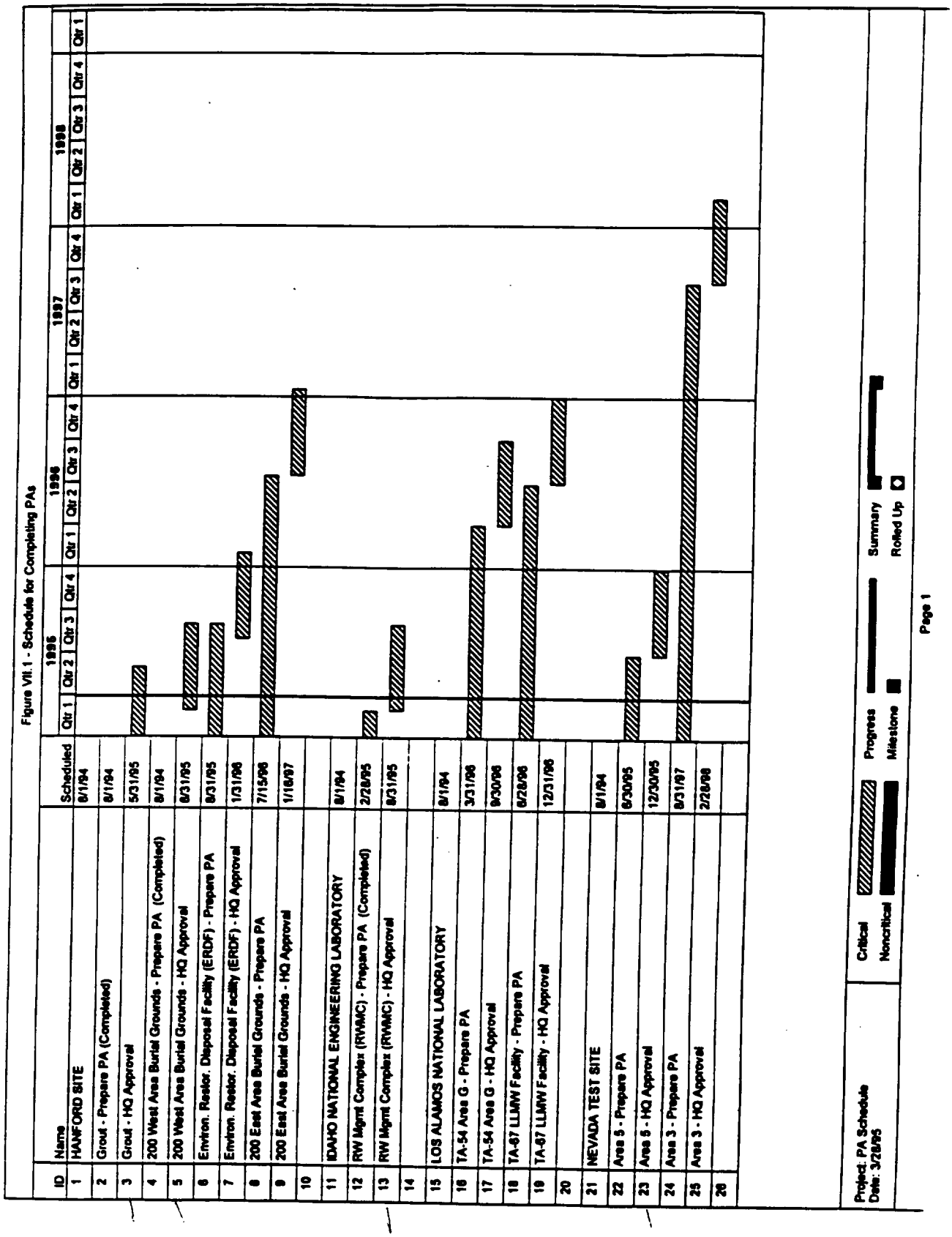


Figure VII.1. Schedule for Completion of the Initial Performance Assessment Process

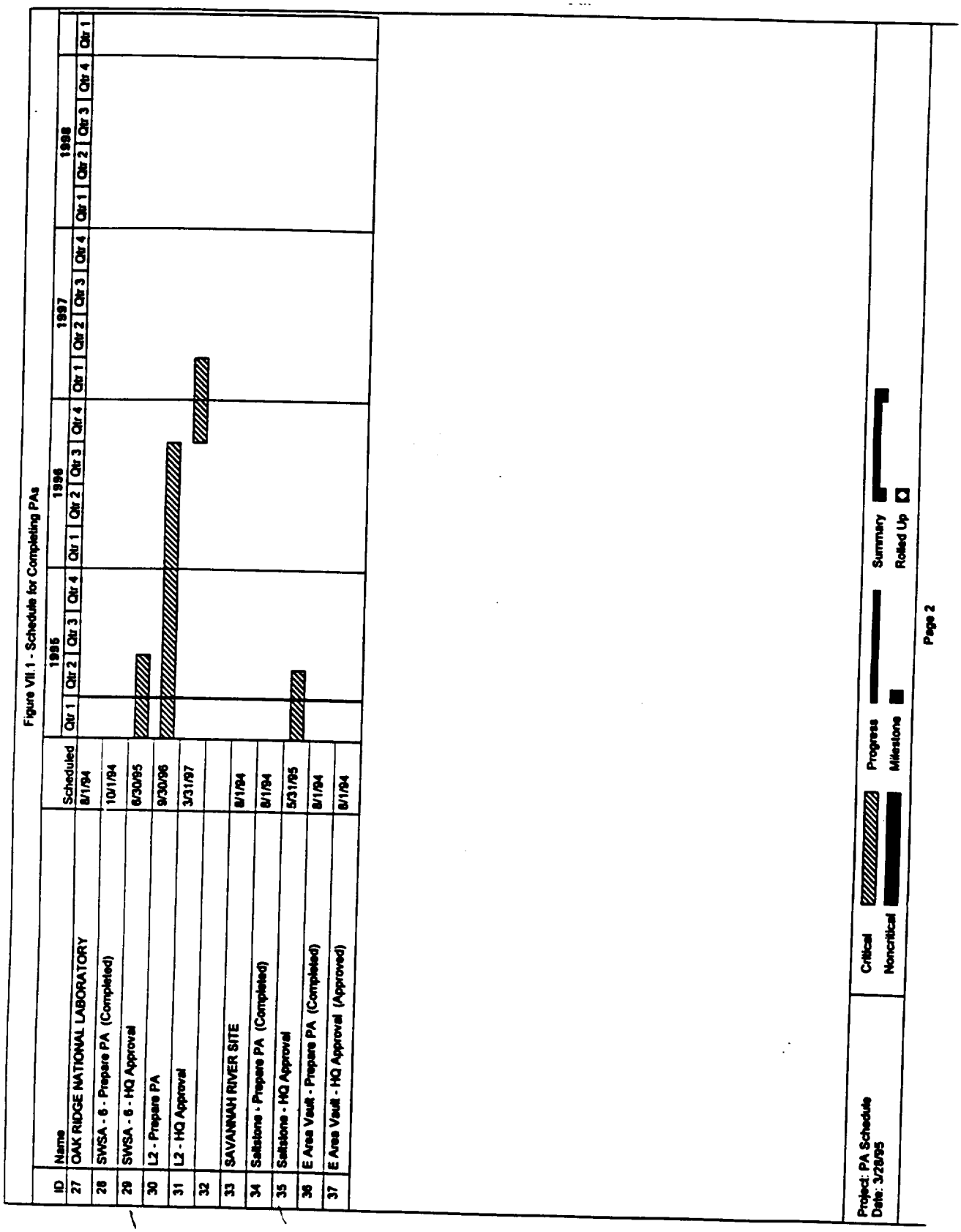


Figure VII.1 continued

Table VII-1: PAs to be Completed

Site	Facility	Responsible AM/POC	Status
Hanford Site	Grout	AM: Jackson Kinzer POC: George Sanders	Submitted to HQ for approval. PRP review complete.
Hanford Site	200 West Area Burial Grounds	AM: Charles Hansen POC: Allison Crowell	Submitted to HQ for approval. Being reviewed by PRP.
Hanford Site	200 East Area Burial Grounds	AM: Charles Hansen POC: Allison Crowell	Draft to RL 9/95 for preliminary review by PRP.
Hanford Site	Environmental Restoration Disposal Facility	AM: Linda McClain POC: Owen Robertson	Draft submitted for preliminary reiew by PRP.
Idaho Nat'l Eng'g Lab	Radioactive Waste Management Complex	AM: Tom Burns POC: Joel Case	Submitted to HQ for approval. Being reviewed by PRP.
Los Alamos Nat'l Lab	TA-54, Area G LLW Disposal Facility	AM: Ron Hanson POC: Jim Orban	Draft to AL 8/95 for preliminary review by PRP.
Los Alamos Nat'l Lab	TA-67, LLMW Facility	AM: Ron Hanson POC: Jim Orban	Draft to AL 10/95 for preliminary review by PRP.
Nevada Test Site	Area 3 RWMS	AM: Leah Dever, Acting POC: Joe Ginanni	Being developed.
Nevada Test Site	Area 5 RWMS	AM: Leah Dever, Acting POC: Joe Ginanni	To be submitted to HQ for approval 6/95.
Oak Ridge Nat'l Lab	SWSA-6	AM: Brian Walker POC: Bill Gilbert	Submitted to HQ for approval. PRP review complete.
Oak Ridge Nat'l Lab	L-II	AM: Brian Walker POC: Bill Gilbert	Draft to OR 8/96 for preliminary review by PRP.
Savannah River Site	Saltstone	AM: Steven Richardson POC: M.S. Glenn	Submitted to HQ for approval. PRP review complete.
Savannah River Site	E Area Vault	AM: Tom Heenan POC: W. Smith, IV	Approved by HQ.

AM = Assistant Manager; POC = Operations Point of Contact

3. Commit to schedule for updating PAs to include the entire source term.

a. Description: Some of the PAs will be submitted for review and preliminary approval without including the entire source term. The Savannah River Site E Area Vault PA has previously been approved by Headquarters. The Operations Offices will submit schedules for updating these PAs to include the entire source term.

b. Milestone: Submit a schedule for updating the PA and submitting to Headquarters for approval.

c. Due Date: April 30, 1996

d. Responsibility: Operations Office Assistant Managers (see Table VII-1).

VIII. LOW-LEVEL WASTE PROJECTIONS

A. Discussion

A number of the Department's currently operating low-level waste disposal facilities collect projections of future generation of LLW from their generators for budgeting and project planning purposes as part of the waste acceptance programs. These projections capture future expectations of waste generation from programs currently generating LLW. However, the information needed in the projections has been site-specific, depending, in part, on whether the disposal facility was operating on a system of charging generators for disposal of the waste. Also, there have not been any capacity issues at Department low-level waste disposal facilities while the LLW being received was from operating DOE generators. However, now that the mission of DOE has changed to one of environmental restoration, the Department is faced with a potential dramatic increase in the need for disposal capacity. Consequently, the current projections of LLW have the following weaknesses:

- disposal facilities do not receive the same quality of projections from on- and off-site generators;
- only current generators submit projections, therefore new and future generation of LLW (especially environmental restoration waste) is not captured;
- the projections of LLW received by the disposal facilities are not consistent; and
- the quality and detail (e.g., radiological characteristics and physical and chemical forms) of data received by the disposal facilities are insufficient.

Issues related to disposal capacity will likely be exacerbated as more environmental restoration projects are undertaken.

The Department has programs and activities underway which begin to address the issue of disposal capacity relative to the amounts of waste requiring disposal. These include a waste minimization program and recent efforts to develop better estimates of future waste volumes. In implementing the initiatives in this section, emphasis will be placed on adding to these programs and activities and making them more responsive to LLW program needs in order to avoid duplicative efforts.

In the area of waste minimization, an evaluation of current waste minimization methods will be undertaken. The purpose of this evaluation will be to identify methods and strategies by which DOE can further reduce the amounts of waste requiring disposal.

In the area of data collection, there are a number of efforts related to low-level waste projection. Information necessary to project future waste volumes associated with environmental restoration activities were obtained as part of a 1993 OER Contaminated Media/Waste Data Call. This data compilation provides specific contaminated media and waste information (including low-level waste) for each environmental restoration site. The Integrated Database also contains information on low-level waste inventories and will be utilized as appropriate.

Additionally, DOE is currently compiling the Baseline Environmental Management Report (BEMR) which provides a life-cycle cost estimate to Congress for all environmental management activities, including waste management, environmental restoration, and decommissioning. For environmental restoration and decommissioning portions of the BEMR, data are being collected on the proposed remediation strategy; contaminated medium and waste type (including low-level waste); total volume of waste; annual waste volumes requiring treatment, storage, and disposal; and planned site of disposal.

These data will comprise current estimates of the future LLW disposal needs for the remediation and decommissioning wastes.

As part of BEMR, OER and the Office of Facility Transition Management (OFTM) determined the number of contaminated surplus facilities that will be transferred to EM in the future. OFTM determined the schedule of these transfers and used a model to calculate the volume of contaminated materials generated by its deactivation activities. OER used another model, the Automated Remedial Assessment Methodology (ARAM), to calculate the volume of waste generated by its decommissioning activities. For the model, wastes from both OER and OFTM activities for these facilities were transferred to OWM for management. BEMR will be prepared annually; the first edition will be submitted to Congress in March 1995. Plans are to integrate and provide to OWM the information from the Contaminated Media/Waste Database and BEMR.

B. Task Initiatives

The purpose of the following task initiatives is to build on the ongoing DOE programs and activities, to encourage further waste minimization activities, and to develop a routine program for projecting waste volumes and characteristic, and disposal capacity. The projections will cover all low-level waste.

The Integrated Database, the OER Contaminated Media/Waste Database and the annual BEMR provide DOE with current low-level waste volume projections for environmental restoration, decommissioning, and current operations. The following two task initiatives will be undertaken to supplement these data for use in developing a routine program for low-level waste volume projections: (1) survey DOE-wide low-level waste disposal capacity (both current and planned), and (2) develop and implement a DOE-wide low-level waste projection program.

1. Biennial Survey of Current and Planned Low-Level Waste Disposal Capacity.

a. Description: A compilation of current and planned capacity for low-level waste disposal with field planning assumptions is needed to determine the baseline of the current available capacity for LLW disposal and the long-term capability to dispose of future-generated low-level waste. This survey will focus on data not currently being collected, such as the availability of waste disposal capacity over time, waste characteristics, permitting restrictions on disposal facilities, as well as various operational constraints. The survey will also take into account and document commercial disposal capacity and its use by DOE generators. A uniform definition of capacity will be developed, taking into account issues such as waste inventory, future land use, and other potential constraints. The survey will also document Operations Office assumptions regarding the rate of waste generation and disposal.

   The information on disposal capacity will be collected through the use of a survey form sent to the Operations Offices in coordination with OWM program managers. Operations Offices will conduct the surveys and report the information to OWM program managers and the LLW Management Task Group. Results of the survey will then be compiled into a survey report. Both disposal capacity and generation rates are dynamic, so the survey will be conducted initially on a biennial basis. This survey will be evaluated periodically to determine its adequacy.

b. Milestone: Issue Low-Level Waste Disposal Capacity Survey Report - preparing outline of rpt as of 6/6/95

c. Due Date: September 30, 1995

d. Responsibility: LLW Management Task Group

2. Development and Implementation of DOE-Wide Low-Level Waste Projection Program.

a. Description: Based on low-level waste inventory and projections information currently collected by operating disposal facilities and generated by the BEMR efforts and the survey of current and planned low-level waste disposal capacity (Task VIII.B.1), a DOE low-level waste projection program will be developed. Review of projection data will occur at Headquarters and will support the development of the projection program. This program will include current baseline generation and capacity information, and will specify projection techniques to be used to project future low-level waste generation and the required frequency of projections. The projection will also take into account low-level wastes resulting from treatment of mixed low-level wastes. The guidance will also discuss the importance of waste minimization activities for reducing the amount of waste scheduled for disposal. The projections of LLW generation resulting from this program will be used for the planning, design, and operational activities at the various LLW disposal sites, development of DOE-wide waste projections, BEMR updates, other data collection and baseline information efforts. The program will also have provisions for waste disposal sites to compare past projections to actual receipts, and to critique current projections with the purpose of improving projection techniques and increasing the quality of projections.

   The projection program will also describe the interrelation between volume projecting, disposal capacity planning, and project planning. For example, as new projects are identified, project planning activities will include reporting estimated low-level waste volumes and characteristics that will be generated, which will be factored into capacity information to determine if existing LLW disposal facilities can accommodate the new waste volumes. A more coordinated planning approach to new LLW disposal capacity will result.

   The low-level waste projection program will result in the issuance of an implementation guide to be developed in coordination with representatives from OWM, OER, OFTM, other DOE Program Offices (such as Defense Programs and Energy Research), and field representatives. The program will be implemented at both the field and Headquarters levels. Implementation will be coordinated with the Office of Field Management (FM), and will include integration of low-level waste projections into life-cycle planning. That is, the volume and characteristics of low-level waste to be generated and the capacity for disposal will become a consideration in the approval of future DOE projects, including decommissioning and environmental restoration projects. This will ensure that sufficient disposal capacity will be available for low-level waste projected to be generated in the future.

b. Milestone: Complete DOE Low-Level Waste Projections Program Documentation

c. Due Date: February 28, 1996

d. Responsibility: LLW Management Task Group

3. Develop LLW minimization strategy

a. Description: DOE will undertake an evaluation of its current LLW minimization efforts. The evaluation will identify efforts that are successful in reducing the amounts of LLW requiring disposal with the purpose of developing a strategy for extending successful practices to other applications.

b. Milestone: Complete and document an evaluation and strategy for improvements to LLW minimization.

c. Due Date: March 31, 1996

d. Responsibility: The Waste Minimization Division will be responsible to the LLW Management Task Group for developing the report.

IX. RESEARCH AND DEVELOPMENT

A. Discussion

The Department recognizes the need for research and development to support data needs and improvements in the LLW management program.

The Board has reviewed the Department's LLW Management Program and provided its 94-2 recommendations for program improvements. In particular, the Board has identified five LLW management program research and development (R&D) needs for improving the program:

- Improving modelling and predictive capabilities of radionuclide migration;
- Enhancing the stability of buried waste forms;
- Enhancing the deterrence of intrusion;
- Inhibiting the migration of radionuclides; and
- Reducing the volume of waste to be disposed.

Specific R&D needs will be identified to support LLW management program improvements in these five areas. Other areas will also possibly be identified in support of improvements to the LLW management program.

The task initiatives describe improving the LLW management R&D in two phases. The first phase will result in a strategy to address needed R&D in the technical areas listed above, which were identified in Recommendation 94-2. The second phase will address any needed R&D in other areas which may possibly be identified as the other task initiatives described in this Implementation Plan are accomplished.

Currently, there is no coordinated program to (1) identify, implement and guide LLW R&D projects, and (2) ensure that R&D needs are met. To be responsive to the Board's R&D recommendations and improve the LLW management program, the Research and Development Task Team (RDTT) (Figure III.1 and Section III.A.8) is organized to guide the LLW R&D program and provide increased priorities for LLW R&D projects.

Generally, the RDTT will provide a comprehensive catalog of LLW R&D activities that might apply to ***any*** LLW waste management function (Figure II.1). LLW R&D needs will be coordinated to identify those that need to be addressed. These needs will then be correlated with the cataloged R&D activities to identify (a) those needs already addressed and (b) those that are not addressed. The former will be reported to the field or LLWMTG element(s) where the need exists and to the LLWMTG. Recommended R&D program strategies for the initiation of projects to address the latter will be developed. The efforts to initiate projects to address these will be reported. Other reports will be provided on project progress and results for those R&D projects that address identified R&D needs.

The Assistant Secretary for Environmental Management (EM) has mandated in A New Approach to Environmental Research and Technology Development at the U.S. Department of Energy, Action Plan that a new approach be established to focus EM's OTD environmental research and technology development activities on DOE's most pressing environmental restoration and waste management problems. The new approach, as described and documented in the New Approach Action Plan, identifies five OTD Focus Areas:

- Contaminant Plume Containment and Remediation;
- Mixed Waste Characterization, Treatment and Disposal;

- High-Level Waste Tank Remediation;
- Landfill Stabilization; and
- Facility Transitioning, Decommissioning and Final Disposition.

Some technology development activities, such as characterization, chemical separations and robotics will be managed by cross-cutting programs that will work to fulfill the needs established by the individual focus areas.

Interfaces will exist between the RDTT and OTD and its five Focus Areas, the Department's Environmental Research and Development Steering Committee, and OWM Focus Area Representatives (Figure IX-1). These interfaces will serve to ensure effective and efficient R&D operations and to coordinate R&D activities related to LLW management program improvements. To the extent practical, the RDTT will rely on OTD and OWM resources for assistance in fulfilling its LLW R&D responsibilities.

RDTT interfaces will also exist with LLW facility operators, with the reviews, teams, etc. within the LLWMTG (Figure III.1). Preliminary R&D needs identified through these interfaces will be coordinated and processed. Results from related R&D projects will be reported to support final development and implementation of LLW management program improvements.

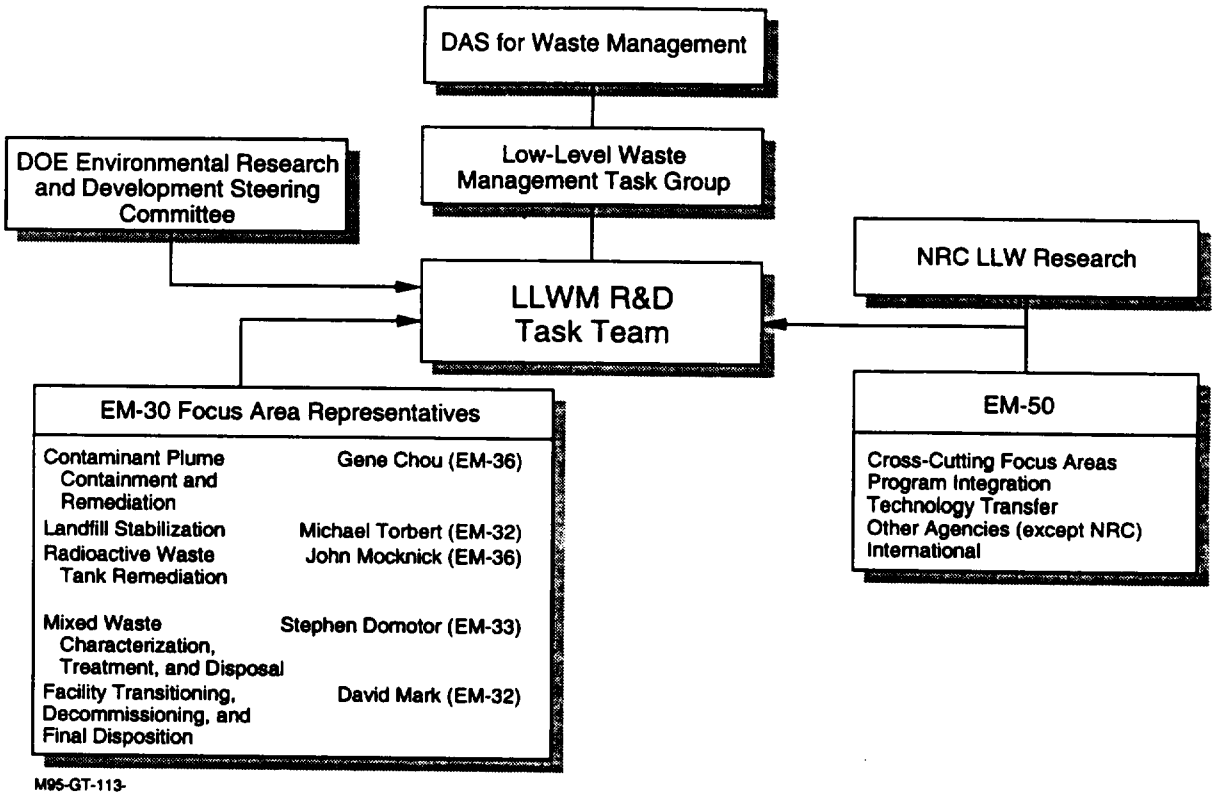


Figure IX.1: Organization for Coordination to Ensure Low-Level Waste Management Needs are Met

B. Task Initiatives

1. Catalog DOE and non-DOE LLW Management R&D Activities

a. Description: An R&D survey will be conducted to identify those activities where results and expected results are applicable to LLW management improvements. Existing technology development database systems will be utilized where available to support this survey.

The scope of this survey will be comprehensive:

- Past, present and planned R&D projects;
- OWM, OTD, other Department, other government, commercial and international supported R&D projects; and
- Local site initiatives and activities.

Information and data requirements will be established beforehand in order to expedite the survey. The desired structure and form of the acquired information and data will be defined so that results can be readily compiled and applied to determine which projects meet current or future LLW R&D needs.

A catalog of the research projects identified throughout the survey will be prepared. The cataloging will be conducted in two phases: The first phase will catalog the activities associated with the five areas of research identified by the Board in 94-2; the second phase will catalog R&D being conducted in other LLW management areas.

b.1 Milestone: Preliminary LLW management R&D Activities Catalog issued for initial needs identified by the Board

c.1 Due Date: June 30, 1995 – on track to meet this – database being built now by PNL

d.1 Responsibility: RDTT

b.2 Milestone: Other LLW management program R&D Activities Catalog issued

c.2 Due Date: December 31, 1995

d.2. Responsibility: RDTT

2. Coordinate the Identification of LLW Management R&D Needs

a. Description: The LLW R&D needs identified by the Board will be verified as the initial set of needs to be coordinated by the RDTT. Any changes or additions to the list of R&D needs identified by the Board, from recommendations of the PATT for example, will be made and justified by the RDTT.

Additional R&D needs will be identified through the LLW management program complex-wide review, the systems engineering evaluation of the program, and needs analyses and assessments conducted within the LLWMTG. These R&D needs will be coordinated by the RDTT with the pertinent identifiers. This coordination will ensure that the need is (a) correctly formulated and (b) properly focused to resolve a LLW management program deficiency or uncertainty. The RDTT will then process these coordinated LLW R&D needs.

b.1 Milestone: Initial LLW R&D Needs Statement issued

c.1 Due Date: September 30, 1995

d.1 Responsibility: RDTT

b.2 Milestone: Additional Coordinated LLW R&D Needs Statement issued

c.2 Due Date: March 31, 1996 ~~1995~~ ~~2 FY96 1996~~

d.2 Responsibility: RDTT

3. Correlation of Past, Current, and Planned LLW R&D Activities with Indentified LLW R&D Needs

a. Description: The RDTT will correlate results from Task 1 (Catalog of LLW R&D Activities) with results from Task 2 (R&D Needs Statements). The correlation has two purposes:

1) To identify R&D activities that meet identified LLW R&D needs

2) To identify LLW needs that are not being addressed

In cases where R&D needs are being addressed, improved reporting procedures to the LLW management program will be instituted for these activities. In cases where R&D needs are not being addressed, recommended strategies will be developed for meeting these R&D needs.

A systematic correlation method will be developed for use in this task. Preliminary correlated results for the initial set of R&D needs will be distributed for review in order to validate the method. The validated method will be applied to subsequent R&D needs to correlate them with pertinent R&D activities. As with the other R&D task initiatives, this task will be conducted in two phases, the first addressing the initial R&D needs identified by the Board, and the second phase addressing additional R&D needs identified by the LLWMTG evaluations and improvement process.

b.1 Milestone: Correlation of initial R&D needs with LLW R&D activities

c.1 Due Date: November 30, 1995

d.1 Responsibility: RDTT

b.2 Milestone: Correlation of additional R&D needs with LLW R&D activities

c.2 Due Date: May 31, 1996

d.2 Responsibility: RDTT

4. Develop and Recommend LLW R&D Strategy

a. Description: Recommended LLW R&D strategies will be developed for the LLWMTG. The strategy is to be based upon an identification of (a) LLW R&D needs that are not being addressed, and (b) demonstrated R&D capabilities and resources, DOE and non-DOE, that can be applied to meet these needs. The development of recommended strategies to meet these needs is a four-step process:

1) Identify pertinent R&D resource and approach options.

2) Develop preliminary strategies for applying these options to meet unaddressed LLW R&D needs.

3) Coordinate preliminary strategies with appropriate field elements or elements within the LLWMTG, and finalize strategies with the LLWMTG.

4) Present recommended strategies to the LLWMTG for action.

An initial strategy will be developed to address the Board identified R&D needs for the LLW management program based on the evaluations conducted on these initial needs as just described. The strategy will be developed in time to be coordinated and included as appropriate in the LLW Program Management Plan.

The LLWMTG will be responsible for appropriate action to promote strategy acceptance and obtain commitments for the required R&D support. The RDTT will provide semi-annual reports, organized by LLW management program facilities, on strategy promotion, commitments, activities and results related to meeting unaddressed R&D needs.

b.1 Milestone: Recommended strategy for initial Board identified R&D needs

c.1 Due Date: January 31, 1996

d.1 Responsibility: RDTT

b.2 Milestone: Recommended strategy for remaining LLW management program R&D needs

c.2 Due Date: July 31, 1996

d.2 Responsibility: RDTT

X. GLOSSARY

This glossary is intended to provide clarity to the Implementation Plan. It is recognized that some of the terms listed below may be defined in other ways. The definitions provided below reflect the meaning of the term as used in this plan.

10 CFR Part 61:	Licensing Requirements for Land Disposal of Radioactive Waste- Established for land disposal of radioactive waste, the procedures, criteria, and terms and conditions upon which the NRC issues licenses for the disposal of radioactive waste containing byproduct, source and special nuclear material received from other persons.
40 CFR Part 193:	Environmental Radiation Protection Standards for the Management, Storage, and Disposal of Low-Level Radiation Waste - Being developed by the Environmental Protection Agency as a generally applicable environmental standard on management of LLW. The standard, currently a proposal draft, consists of three parts: pre-disposal management and storage, post-disposal performance assurance requirements, and groundwater protection.
Active DOE LLW Disposal Facilities:	The DOE has currently operating facilities for LLW disposal at six sites. These sites are the Hanford Site (near Richland, Washington), Idaho National Engineering Laboratory (near Idaho Falls, Idaho), Nevada Test Site (Mercury, Nevada), Los Alamos National Laboratory (Los Alamos, New Mexico), Oak Ridge Reservation (Oak Ridge, Tennessee), and the Savannah River Site (Aiken, South Carolina).
Baseline Environmental Management Report:	A life-cycle cost estimate being provided to Congress for all environmental cleanup activities, including waste management, environmental restoration, and Decommissioning. Data collection efforts for the BEMR are currently obtaining information on a number of areas including proposed remediation strategy; contaminated medium and waste type (including LLW); total volume of waste; annual waste volumes requiring treatment, storage, and disposal; and planned site of disposal. BEMR provides volume and cost estimates from 1995 until the completion of cleanup activities, approximately 2080.
Capacity	As used in this document relative to waste volume projections, it is the quantity in terms of both volume or radionuclide inventory that can be accepted at a disposal facility.
Complex-Wide Review:	A criteria-based assessment of DOE low-level waste management facilities to identify environmental, safety and health vulnerabilities.

DOE Order 5820.2A, Radioactive Waste Management: This DOE Order, issued in 1988, established policies, guidelines, and minimum requirements by which DOE manages its radioactive wastes. The Order mandates that all radioactive wastes be managed in a manner that ensures the health and safety of the public, DOE and contractor employees, and the environment.

Federal Facility Compliance Act (FFCAct) Disposal Working Group Report: The DOE is required to prepare and submit Site Treatment Plans (STPs) pursuant to the FFCAct. Although the FFCAct does not require that disposal be addressed in the STPs, DOE and the states recognize that treatment of mixed low-level waste will result in treatment residues that will require disposal in either LLW or MLLW disposal facilities. As a result, DOE established the DOE FFCAct Disposal Working Group in June 1993 to work with the states to define and develop a disposal-site suitability process in concert with the FFCAct and development of the STPs. This site-suitability process and its findings are contained in the report.

Inactive DOE LLW Disposal Facilities: The DOE has many locations where disposal of solid low-level waste has taken place and the facilities are inactive. Most of these inactive LLW disposal facilities are at the same DOE sites as the six active facilities for the disposal of LLW. A few of the DOE inactive LLW disposal facilities are located at sites that do not have active disposal facilities.

Inadvertent Intruder: A hypothetical person who might occupy a disposal site after closure and engage in normal activities, such as agriculture, dwelling construction, mining and/or drilling in which the person might be unknowingly exposed to radiation from buried LLW. Inadvertent intrusion methodologies are included in radiological performance assessments to define general categories or classes of LLW and for deriving waste acceptance criteria and facility design and operations parameters.

Low-Level Waste (LLW): Waste that contains radioactivity and is not classified as high-level waste, transuranic waste, or spent nuclear fuel, or the tailings or waste produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content. Test specimens of fissionable material irradiated for research and development only, and not for the production of power or plutonium, may be classified as low-level waste, provided the concentration of transuranic waste is less than 100nCi/g, independent of the level of beta-gamma activity. Low-level radioactive wastes are generated in almost all activities involving radioactive materials and have generally been disposed of by shallow land burial.

Mixed Low-Level Waste: Waste that satisfies the definition of LLW in the Low-Level Radioactive Waste Policy Amendments Act of 1985 and contains hazardous waste as

	defined under RCRA. Generally, radioactive wastes also containing polychlorinated biphenyl (PCB) wastes subject to regulation under the Toxic Substances Control Act and 40 CFR Parts 702-799 are also managed as Mixed LLW.
Performance Assessment:	A systematic analysis of a LLW management disposal facility and its environs for the purpose of demonstrating compliance with specific radiological performance objectives. The assessment addresses not only the current status of the facility, but also projects future considerations for as long as a potential for significant radiological impacts may exist.
Peer Review Panel (PRP):	The PRP has the responsibility of reviewing each LLW disposal facility performance assessment that DOE submits to the PRP. This review by the PRP is mandated by DOE Order 5820.2A.
Performance Assessment Task Team (PATT):	The PATT was established by DOE-HQ (OWM) to provide guidance and recommend policy regarding PAs. Its purpose is to raise and propose resolution to issues that impact the radiological PAs and ultimately recommend policy and guidance to DOE-HQ. These issues include times and points of compliance, scenario development, and model/scenario usage.
Programmatic Environmental Impact Statement (PEIS):	This analysis will provide DOE with management alternatives for the LLW it generates. Because LLW has widely varying characteristics which depend on how the waste is generated, the PEIS has developed representative waste management technologies which can be applied to representative LLW streams for use in determining emissions and resource requirements which may result from consolidation alternatives considered in the document.
Radionuclide Migration:	The movement of radioactive substances from a disposal site by means of air, surface water, or ground water.
Stabilization:	Creation of a waste form intended to ensure that the waste does not structurally degrade and affect overall stability of the disposal site through slumping, collapse, or other types of failures that will lead to water infiltration into the waste. Stabilization will also limit exposure to an inadvertent intruder since it provides a recognizable and nondispersible waste.
Systems Engineering Approach:	A process applied to a system to provide a technical basis for management with clearly identified interfaces. This process is designed and applied to ensure that improvements to a management system are well-structured within an integrated program and are prioritized appropriately.

XI. LIST OF ACRONYMS AND ABBREVIATIONS

5820.2A	Department of Energy Order, 5820.2A, Radioactive Waste Management (1988)
ARAM	Automated Remedial Assessment Methodology
AWG	Assessment Working Group
BEMR	Baseline Environmental Management Report
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CSSD	Current State System Description
DNFSB	Defense Nuclear Facilities Safety Board
DOE	Department of Energy
EH	Office of Environment, Safety, and Health
EM	Office of Environmental Management
EM-1	Assistant Secretary for Environmental Management
EM-30	Deputy Assistant Secretary for Waste Management
EPA	Environmental Protection Agency
FEMP	Fernald Environmental Management Program
FFCAct	Federal Facility Compliance Act
FM	Office of Field Management
FUSRAP	Formerly Utilized Sites Remedial Action Program
GTCC	Greater-than-Class C
HQ	Headquarters
IAEA	International Atomic Energy Agency
INEL	Idaho National Engineering Laboratory
LANL	Los Alamos National Laboratory
LLW	Low-Level Waste
LLW SC	Low-Level Waste Steering Committee
LLWMTG	Low-Level Waste Management Task Group
M&O	Management and Operating (Contractor)
MLLW	Mixed Low-Level Waste
NEPA	National Environmental Policy Act
NRC	Nuclear Regulatory Commission
NTS	Nevada Test Site
OCPC	Office of Compliance and Program Coordination
ORNL	Oak Ridge National Laboratory
OEPA	Office of Environmental Policy and Assistance
OER	Office of Environmental Restoration
OFTM	Office of Facility Transition and Management
OTD	Office of Technology Development
OWM	Deputy Assistant Secretary for Waste Management
PA	Performance Assessment
PATT	Performance Assessment Task Team
PEIS	Programmatic Environmental Impact Statement

PMP	Project Management Plan
PRP	Performance Assessment Peer Review Panel
QA/QC	Quality Assurance/Quality Control
RADWASS	RADioactive WAste Safety Series
RCRA	Resource Conservation and Recovery Act
RDTT	Research & Development TasK Team
SATs	Site Assessment Teams
SRS	Savannah River Site
SWSA	Solid Waste Storage Area
TWG	Technical Working Group
UMTRAP	Uranium Mill Tailings Remedial Action Program
WAC	Waste Acceptance Criteria
WGATs	Working Group Assessment Teams
WIPP	Waste Isolation Pilot Plant

XII. REFERENCES

Radioactive Waste Management, DOE Order 5820.2A, US Department of Energy, September 1988.

Waste Management, DOE Order 5820.2B, US Department of Energy, January 1995, (PREDECISIONAL DRAFT).

Licensing Requirements for Land Disposal of Radioactive Waste, 10 CFR 61, US Nuclear Regulatory Commission, December 1982.

Low-Level Waste Current State System Description, DOE/LLW-202, Radioactive Waste Technical Support Program, November 1994 (DRAFT).

Waste Type Report, US Department of Energy, Technical Analysis Division (EM-332), February 1995 (PREDECISIONAL DRAFT).

Performance Assessment Review Guide for DOE Low-Level Radioactive Waste Disposal Facilities, DOE/LLW-93, Radioactive Waste Technical Support Program, October 1991.

Guidelines for Radiological Performance Assessment of DOE Low-Level Radioactive Waste Disposal Sites, DOE/LLW-62T, Radioactive Waste Technical Support Program, July 1988.

Recommended Format and Content for DOE Low-Level Waste Disposal Facility Radiological Performance Assessment Reports, DOE/LLW-81, Radioactive Waste Technical Support Program, April 1989.

A New Approach to Environmental Research and Technology Development at the U.S. Department of Energy, Action Plan, US Department of Energy, January 1994.

Technical Plan for Performance Evaluation of Mixed Low-Level Waste Disposal Sites, US Department of Energy, December 1994, (PREDECISIONAL DRAFT).

Low-Level Waste Disposal Policy for Department of Energy Defense Nuclear Facilities, Defense Nuclear Facility Safety Board (staff report), September 14, 1995.