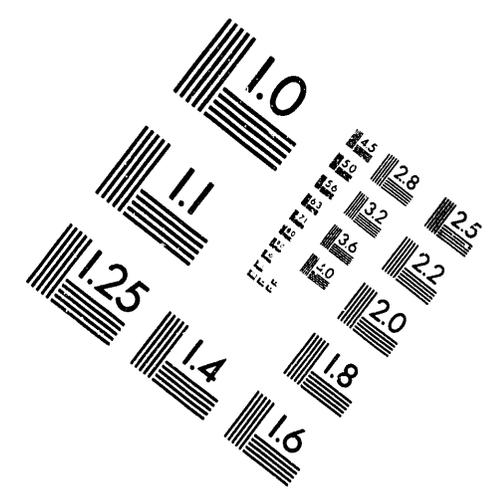
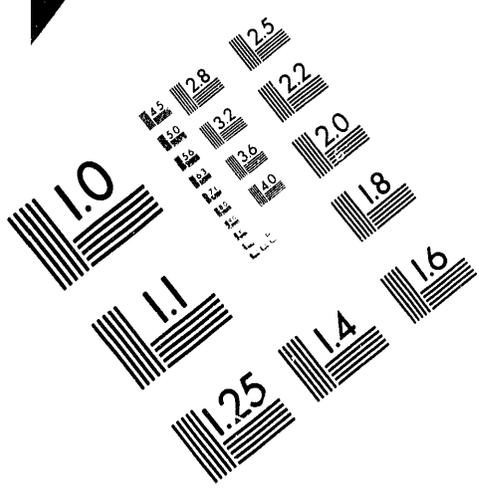




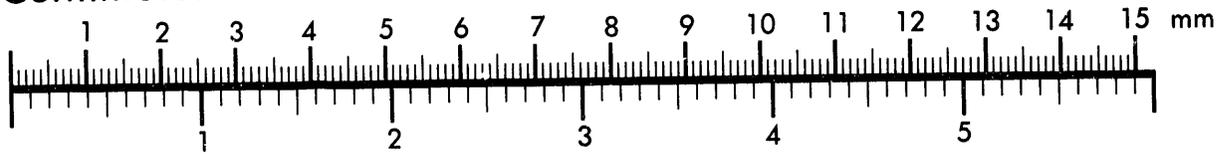
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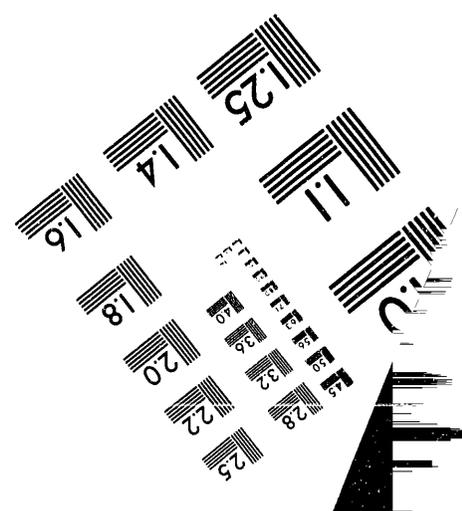
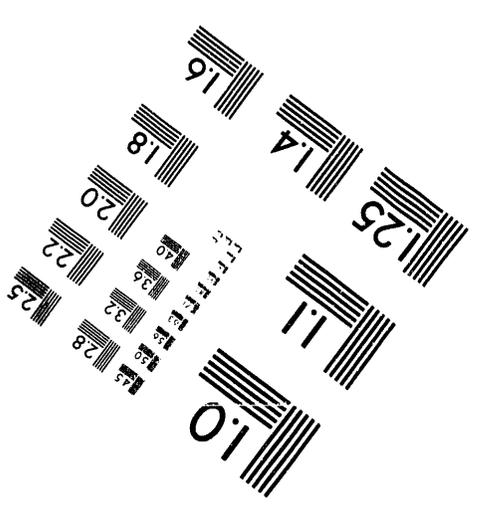
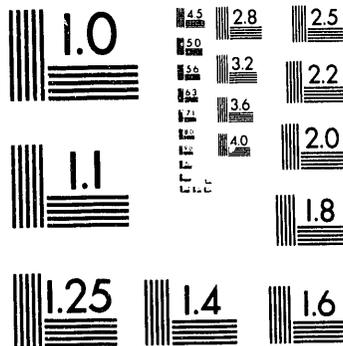
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Idaho National Engineering Laboratory Waste Management Operations Roadmap Document

Published April 1992

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Prepared for the
U.S. Department of Energy
DOE Idaho Field Office

MASTER

FOREWORD

This *INEL WMO Roadmap Document* reflects the roadmapping process initiated by the U.S. Department of Energy's Office of Environmental Restoration and Waste Management (EM) to improve its Five-Year Plan (FYP) and budget allocation process. Roadmap documents will provide the technical baseline for this planning process and help EM develop more effective strategies and program plans for achieving its long-term goals.

EG&G Idaho's Waste Management Operations (WMO) roadmap task force prepared this installation level roadmap for the Idaho National Engineering Laboratory (INEL). The WMO roadmap logically displays activities, issues, and installation commitments affecting Waste Management Operations at the INEL Site and depicts how these operations will be conducted in compliance with regulatory requirements.

Also included in the INEL's ongoing roadmapping process is the Environmental Restoration Program (ERP) roadmap, and the Westinghouse Idaho Nuclear Company, Inc. (WINCO) high-level waste roadmap. Eventually, these roadmaps will be cross-cut (systematically merged) with the WMO roadmap to form one installation document representing the INEL.

CONTENTS

FOREWORD	iii
ACRONYMS	xv
1. INTRODUCTION	1-1
1.1 Mission Statement	1-1
1.2 Project Organization	1-2
1.3 Project Schedule	1-7
2. INSTALLATION LEVEL WASTE MANAGEMENT OPERATIONS ROADMAP ASSUMPTIONS	2-1
2.1 Institutional Environment	2-1
2.1.1 Federal Government	2-1
2.1.2 INEL Environmental Restoration and Waste Management Baseline.	2-2
2.1.3 U.S. Department of Energy	2-2
2.1.4 Mission Offices	2-3
2.1.5 Third Parties	2-3
2.1.6 State	2-4
2.2 Regulatory Compliance Environment	2-4
2.2.1 General	2-4
2.2.2 Federal Regulations	2-4
2.2.3 State Regulations	2-5
2.2.4 New Requirements	2-6
2.3 Project Management	2-6
2.3.1 Resources	2-6
2.3.2 Budget Process	2-7
2.3.3 Project Baseline	2-7
2.3.4 External Support	2-8
2.3.5 Technical Support	2-9
2.3.6 Teamwork	2-9
2.4 Other Site-Specific Assumptions	2-10

2.5	References	2-11
3.	KEY REGULATORY REQUIREMENTS	3-1
4.	MILESTONE DOCUMENTS AND DIAGRAMS	4-1
4.1	Current Milestones	4-1
4.2	Previously Committed Milestones	4-17
4.3	Milestone Diagram	4-27
5.	WASTE TYPES	5-1
5.1	Low-Level Waste/Mixed Low-Level Waste	5-3
5.1.1	LLW/MLLW Stream Planning Baseline	5-3
5.1.2	Key Regulatory Drivers	5-6
5.1.3	Logic Diagrams	5-6
5.1.4	Low-Level Waste/Mixed Low-Level Waste Issue Statements	5-15
5.1.5	Vision of the Future	5-18
5.2	Transuranic/Mixed Transuranic Waste	5-23
5.2.1	Transuranic/Mixed Transuranic Planning Baseline	5-23
5.2.2	Key Regulatory Drivers	5-28
5.2.3	Logic Diagrams	5-28
5.2.4	Transuranic Waste Issue Statements	5-35
5.2.5	Vision of the Future	5-42
5.3	Municipal Sanitary Waste	5-47
5.3.1	Municipal Sanitary Waste Planning Baseline	5-48
5.3.2	Key Regulatory Drivers	5-48
5.3.3	Logic Diagrams	5-48
5.3.4	Municipal Sanitary Waste Issue Statements	5-51
5.3.5	Vision of the Future	5-51
5.4	Hazardous Waste	5-55
5.4.1	Hazardous Waste Planning Baseline	5-55
5.4.2	Key Regulatory Drivers	5-56
5.4.3	Logic Diagrams	5-56
5.4.4	Hazardous Waste Issue Statements	5-59
5.4.5	Vision of the Future	5-61

5.5 Spent Fuel	5-65
5.5.1 Spent Fuel Planning Baseline	5-66
5.5.2 Key Regulatory Drivers	5-69
5.5.3 Spent Fuel Types at the INEL	5-77
5.5.4 Logic Diagrams	5-83
5.5.5 Spent Fuel as a "Waste Stream"	5-89
5.5.6 Proposed Shipment to Monitored Retrievable Storage	5-91
5.5.7 Spent Fuel Materials, Locations, and Descriptions	5-92
5.5.8 Spent Fuel Issue Statements	5-95
5.5.9 Vision of the Future	5-98
5.6 Special Case/Greater-Than-Class C	5-101
5.6.1 Special Case/Greater-Than-Class C Waste Planning Baseline	5-101
5.6.2 Key Regulatory Drivers	5-101
5.6.3 Logic Diagrams	5-101
5.6.4 Special Case/Greater-Than-Class C Issue Statements	5-103
6. ISSUES ANALYSIS	6-1
6.1 Low-Level Waste Stream	6-3
6.1.1 Root Cause Analysis	6-3
6.1.2 Low-Level Waste Issue/Need Statements	6-13
6.1.3 Key Issue Action	6-23
6.2 Transuranic/Mixed Transuranic Waste Stream	6-33
6.2.1 Root Cause Analysis	6-33
6.2.2 Transuranic Issue/Need Statements	6-35
6.2.3 Key Issue Action	6-39
6.3 Municipal Sanitary Waste Stream	6-43
6.3.1 Root Cause Analysis	6-43
6.3.2 Municipal Sanitary Waste Issue/Need Statements	6-47
6.3.3 Key Issue Action	6-53
6.4 Hazardous Waste Stream	6-55
6.4.1 Root Cause Analysis	6-55
6.4.2 Hazardous Waste Issue/Need Statements	6-63
6.4.3 Key Issue Action	6-68
6.5 Spent Fuel Waste Stream	6-71

6.5.1	Root Cause Analysis	6-71
6.5.2	Spent Fuel Issue/Need Statements	6-79
6.5.3	Key Issue Action	6-84
6.6	Environmental Restoration/Waste Management Operations Interface	6-87
6.6.1	Root Cause Analysis	6-87
6.6.2	Interface Issue/Need Statements	6-87
7.	DESIRED ACTIVITIES/ADS INTEGRATION	7-1
7.1	Low-Level Waste/Mixed Low-Level Waste Desired Activities	7-3
7.2	Waste Types	7-19
7.2.1	Low-Level Waste/Mixed Low-Level Waste Desired Activities/ADS Integration	7-20
7.2.2	Transuranic Waste Desired Activities/ADS Integration	7-33
7.2.3	Municipal Sanitary Waste Desired Activities/ADS Integration	7-39
7.2.4	Hazardous Waste Desired Activities/ADS Integration	7-45
7.2.5	Spent Fuel Desired Activities/ADS Integration	7-53
7.2.6	Special Case/Greater-Than-Class C Waste Desired Activities/ADS Integration	7-67
7.2.7	Environmental Restoration Program/Waste Management Operations Interface	7-69
8.	DOE-HQ ISSUES	8-1
9.	CONCLUSION	9-1
	APPENDIX A—MIXED LOW-LEVEL WASTE LOGIC DIAGRAM STATUS	A-1
	APPENDIX B—KEY REGULATORY REQUIREMENTS	B-1

FIGURES

1-1.	Roadmap methodology deliverables, and products.	1-3
1-2.	INEL WMO roadmap project organization chart.	1-5
1-3.	The DOE-HQ Methodology Guidance Development Schedule.	1-7

3-1. Sample of Appendix B regulation format.	3-3
4-1. INEL WMO Milestone Diagram.	4-29
5-1. Proposed LLW/MLLW detail.	5-7
5-2. RWMC direct disposal without treatment-STATUS.	5-8
5-3. WERF treated waste-STATUS.	5-9
5-4. Liquid LLW/MLLW summary.	5-10
5-5. INEL liquid LLW/MLLW detailed.	5-11
5-6. LLW/MLLW solids summary.	5-12
5-7. INEL LLW/MLLW stored solids.	5-13
5-8. INEL LLW/MLLW newly-generated solids.	5-14
5-9. LLW/MLLW process model.	5-19
5-10. INEL newly generated TRU/TRU mixed.	5-29
5-11. Certified TRU & reclassified LLW in protected storage.	5-30
5-12. TRU/TRU mixed (earth covered/stored).	5-31
5-13. TRU/TRU mixed (protective storage).	5-32
5-14. Off-Site newly generated TRU/TRU mixed received for interim storage.	5-33
5-15. TRU/Mixed TRU process model.	5-43
5-16. Municipal sanitary waste.	5-49
5-17. Current municipal sanitary waste operations—STATUS.	5-50
5-18. Municipal sanitary waste process model.	5-53
5-19. INEL hazardous waste.	5-57
5-20. INEL hazardous waste operations—STATUS.	5-58
5-21. Hazardous waste process model.	5-63
5-22. Spent fuel storage alternative	5-83

5-23. Spent fuel.	5-84
5-24. Spent fuel process model.	5-99
5-25. INEL SCW and GTCC stored waste.	5-102
6-1a. Issue A.	6-4
6-1b. Issue B.	6-5
6-1c. Issue C.	6-6
6-1d. Issue D.	6-7
6-1e. Issue E.	6-8
6-1f. Issue F.	6-9
6-1g. Issue G.	6-10
6-1h. Issue H.	6-11
6-2a. Issue A.	6-34
6-3a. Issue A.	6-44
6-3b. Issue B.	6-45
6-3c. Issue C.	6-46
6-4a. Issue A.	6-56
6-4b. Issue B.	6-57
6-4c. Issue C.	6-58
6-4d. Issue D.	6-59
6-4e. Issue E.	6-60
6-4f. Issue F.	6-61
6-5a. Issue A.	6-72
6-5b. Issue B.	6-73
6-5c. Issue C.	6-74

6-5d. Issue D.	6-75
6-5e. Issue E.	6-76
6-5f. Issue F.	6-77
7-1. LLW/MLLW Desired Activity Schedule.	7-18
7-2. Municipal Sanitary Waste Disposal Timeline.	7-41
7-3. Updated Municipal Sanitary Analytical Tree.	7-43
7-4. Hazardous Waste Moratorium Recision Schedule.	7-49
7-5. Updated Hazardous Waste Analytical Tree.	7-51
7-6. Special Fuels Process Flow Model	7-53
7-7. Direct disposal process flow.	7-54
7-8. Custom processing process flow.	7-55
7-9. Spent Fuel Timeline.	7-56
7-10. Decision Tree for Spent Fuel Dispositioning.	7-57
7-11. Spent Fuel Schematic.	7-59
7-12. Spent Fuel Issue Resolution Analytical Tree.	7-65
9-1. The DOE-HQ Methodology Guidance Development Schedule.	9-2
A-1. LLW/MLLW generic logic diagram.	A-4
A-2. MLLW Stream 1 Aqueous FXXX	A-5
A-3. MLLW Stream 2 Aqueous DXXX	A-6
A-4. MLLW Stream 3 Aqueous DXXX & FXXX	A-7
A-5. MLLW Stream 4 Elemental Mercury	A-8
A-6. MLLW Stream 5 CMPO Dissolved in Kerosene/Instaged	A-9
A-7. MLLW Stream 6 FXXX & DXXX Sludge	A-10
A-8. MLLW Stream 7 Characteristic Waste Sludge	A-11

TABLES

3-1. INEL waste types and the key regulatory drivers that apply to each waste type.	3-2
5-1. Spent fuels at the INEL (includes only nonpropulsion Naval Fuels)	5-79
5-2. U.S. DOE spent fuel quantities located at the INEL.	5-91
5-3. Universities sending fuel elements to DOE-ID (INEL)	5-94
6-1a. A. System Performance Assessment	6-24
6-1b. B. Waste Minimization	6-25
6-1c. C. Waste Characterization	6-26
6-1d. D. Waste Treatment	6-27
6-1e. E. Mixed Low-Level Waste Storage	6-28
6-1f. F. Low-Level Waste/Mixed Low-Level Waste Disposal	6-29
6-1g. G. Transportation	6-30
6-1h. H. Facility Closure/D&D	6-31
6-2a. Key site issues for TRU waste.	6-40
6-3a. Key site issues for municipal sanitary waste.	6-54
6-4a. A. System Performance.	6-69
6-4b. B. Hazardous Waste Operations	6-69
6-4c. C. INEL Hazardous Waste Shipping Moratorium	6-70
6-4d. D. Develop New Treatment/Storage/Disposal options	6-70
6-5a. Key Site issues for spent fuel.	6-85
7-1. Desired activitie for Low-Level Waste/Mixed Low-Level Waste	7-13
8-1. Low-Level waste/Mixed Low-Level waste installation issues.	8-1
8-2. Municipal Sanitary waste installation issues.	8-6

8-3. Hazardous waste installation issues. 8-7

8-4. Spent Fuel installation issues. 8-9

A-1. Stated logic diagrams for LLW/MLLW streams A-3

ACRONYMS

ADS	activity data sheet
AEA	Atomic Energy Act (of 1954)
ANL-W	Argonne National Laboratory-West (INEL)
ARAR	applicable or relevant and appropriate requirement
BDAT	best demonstrated available technology
BWID	buried waste integrated demonstration
BWP	Buried Waste Program
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CHTRU	contact-handled transuranic (waste)
CMPO	Carbamoyl Methyl Phosphine Oxide
DF	Disposal Facility
D&D	Decontamination and Decommissioning
DOD	U.S. Department of Defense
DOE	U.S. Department of Energy
DOE-HQ	Department of Energy, Headquarters
DOE-ID	Department of Energy, Idaho Field Office
DOT	U.S. Department of Transportation
DP	Defense Programs
EA	environmental assessment
EIS	Environmental Impact Statement
EM	Environmental Restoration and Waste Management (DOE-HQ)
EOMA	Environmental Oversight and Monitoring Agreement
EPA	U.S. Environmental Protection Agency
ERP	Environmental Restoration Program
ERWM	Environmental Restoration and Waste Management (DOE-ID)
ESH&Q	environment, safety, health, and quality
FFCA	Federal Facilities Compliance Agreement
FY	fiscal year
GTCC	Greater-Than-Class-C
HEPA	high-efficiency particulate air (filter)
HLW	high-level waste
HW	hazardous waste
HWSF	Hazardous Waste Storage Facility
HWTF	Hazardous Waste Treatment Facility
IAG	Interagency Agreement
IBWP	Idaho Buried Waste Program
ICPP	Idaho Chemical Processing Plant (INEL)
INEL	Idaho National Engineering Laboratory
IWPF	Idaho Waste Processing Facility (PREPP-II)
LANL	Los Alamos National Laboratory (formerly LASL)
LDR	land disposal restriction
LICP	Line-Item Construction Project

LLW	low-level waste
LOFT	Loss-of-Fluid Test Program (INEL)
LWR	Light-Water Reactor
M&O	management and operations (contractor)
MRS	monitored retrievable storage
MSWLF	Municipal solid waste land fill
NDA	nondestructive analysis
NDE	nondestructive examination
NEPA	National Environmental Policy Act of 1969
NPR	New Production Reactor
NRC	U.S. Nuclear Regulatory Commission
NRF	Naval Reactors Facility
OCRWM	Office of Civilian Radioactive Waste Management
PA	Performance Assessment
PBF	Power Burst Facility (INEL)
PEIS	Programmatic Environmental Impact Statement
PRP	potentially responsible party (EPA term)
RDDT&E	research development and demonstration testing and evaluation
RCRA	Resource Conservation and Recovery Act (PL 94-580)
RHTRU	remote-handled transuranic (waste)
RWMC	Radioactive Waste Management Complex (INEL) (formerly RWSDA)
SAR	Safety Analysis Report
SARA	Superfund Amendments and Reauthorization Act of 1986
SARP	Safety Analysis Report for Packaging
SCW	Special Case Waste
SEN	Secretary of Energy Notice
SFDF	Special fuels dispositioning facility
STGWG	State and Tribal Government Working Group
SWTS	Solid waste transfer station
SWEPP	Stored Waste Examination Pilot Plant
TAN	Test Area North (INEL) (formerly ANP)
TBD	to be determined
TMI	Three-Mile Island Unit 2 Reactor
TRA	Test Reactor Area
TRU	Transuranic
TRUPACT	Transuranic Package Transporter
TSCA	Toxic Substances Control Act
TSD	treatment, storage and/or disposal
WAC	Waste Acceptance Criteria
WCF	Waste Characterization Facility
WERF	Waste Experimental Reduction Facility (INEL)(PBF)(now WROC)
WIPP	Waste Isolation Pilot Plant (DOE facility in New Mexico)
WROC	Waste Reduction Operation Complex (formerly WERF)
WMO	Waste Management Operations Program

Idaho National Engineering Laboratory Waste Management Operations Roadmap Document

1. INTRODUCTION

At the direction of the Department of Energy-Headquarters (DOE-HQ), the DOE Idaho Field Office (DOE-ID) is developing roadmaps for Environmental Restoration and Waste Management (ER&WM) activities at Idaho National Engineering Laboratory (INEL). DOE-ID has convened a select group of contractor personnel from EG&G Idaho, Inc. to assist DOE-ID personnel with the roadmapping project. This document is a report on the initial stages of the first phase of the INEL's roadmapping efforts.

Roadmaps provide a logical, documented basis for project planning for subsequent ER&WM activities. Roadmaps are individually structured to satisfy identified needs for planning documentation, and they communicate planning information from installations in the field to DOE-HQ. A roadmap methodology, developed by DOE-HQ and promulgated in the Roadmap Methodology Document dated May 15, 1991, has been adhered to by those taking part in the INEL's roadmapping project.

1.1 Mission Statement

Recognizing the value of the roadmap methodology at the pilot facilities, DOE-ID, on April 9, 1991, directed EG&G Idaho's Waste Management Operations (WMO) to develop a draft roadmap document that covers steps one through seven of the nine-step process for the following five waste streams: Low-Level waste (LLW) and Mixed LLW, Transuranic (TRU) and Mixed TRU waste, Hazardous waste, Municipal Sanitary waste, and Spent Fuel. The due date set by DOE-ID was June 17, 1991. The Director of DOE-HQ's Office of ER&WM directed 12 DOE sites to begin roadmap development for the LLW/Mixed LLW stream. The project began with his call letter at the DOE-HQ Roadmap Kick-Off Meeting on June 4, 1991.

Roadmapping is a process that enables DOE-HQ to develop, evaluate, and correct plans leading to the completion of long-range ER&WM goals. At both the installation and DOE-HQ program levels, roadmaps allow assessment of current status, identification of assumptions, analysis of issues, and assistance with issue resolution. (See Figure 1-1. Roadmap methodology, deliverables and products.)

The purpose of the roadmapping process is to help installation and DOE-HQ managers develop a clear understanding of the issues that could impede progress, the root causes of those

issues, and the actions required to resolve those issues in a timely and effective fashion. Comprehensive application of the roadmapping methodology enhances ER&WM's ability to develop effective strategies and program plans to achieve its goals. This enables DOE to fulfill its commitments to Congress, State governments, and the American public.

Completed roadmaps for all installations will serve as a basis for identifying technology needs, crosscutting program requirements, and developing future DOE Five-Year Plans. This information also will provide the basis for integrated long-range planning of cleanup and waste management activities across the DOE complex.

Components completed in FY 1991 will be reflected in the next ER&WM Five-Year Plan. Components completed in FY 1992 will be reflected in the subsequent Five-Year Plans. In future years, roadmap updates in the June-September period will precede each Five-Year Plan cycle.

1.2 Project Organization

The organization of WMO's roadmap project is presented in Figure 1-2.

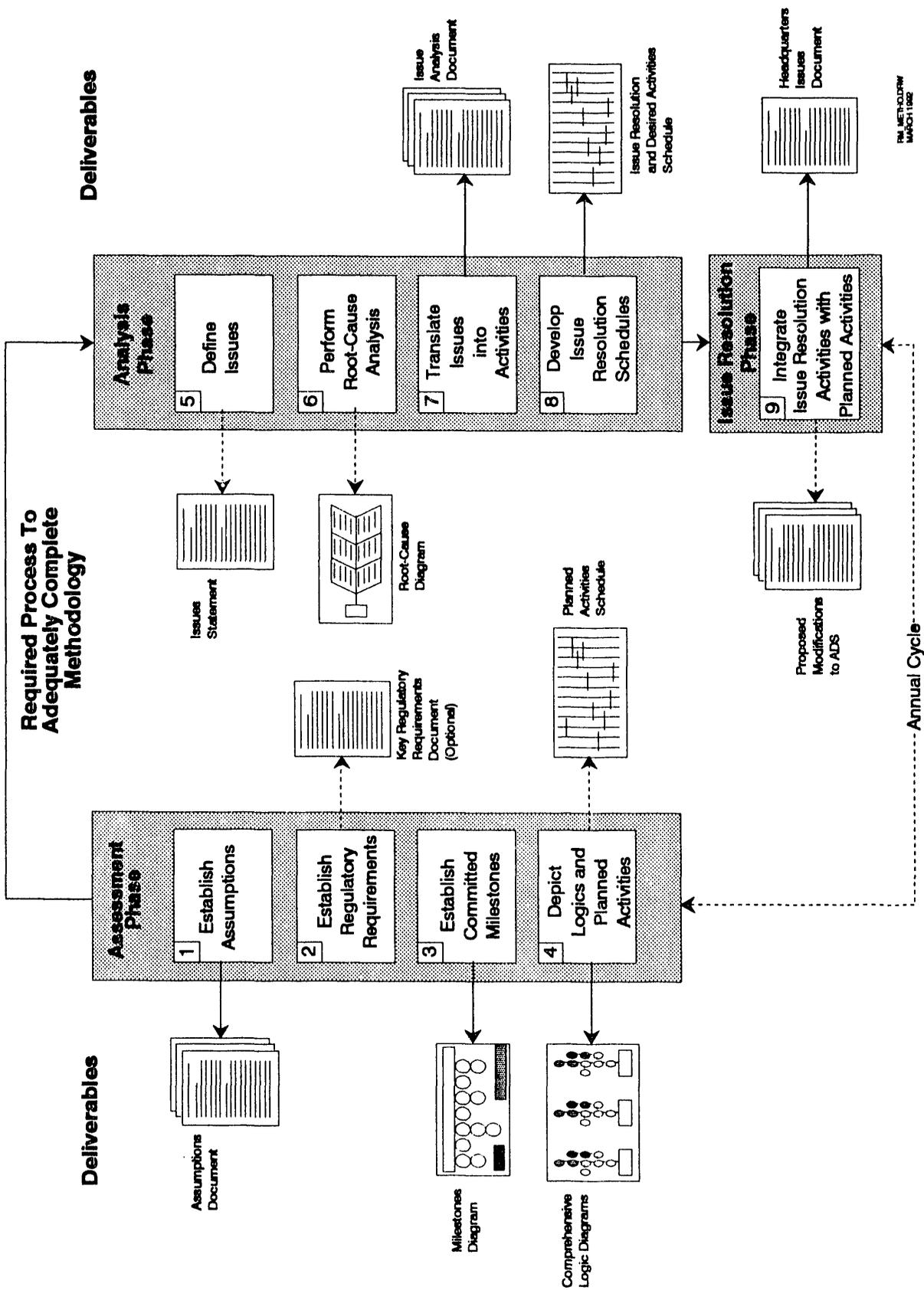
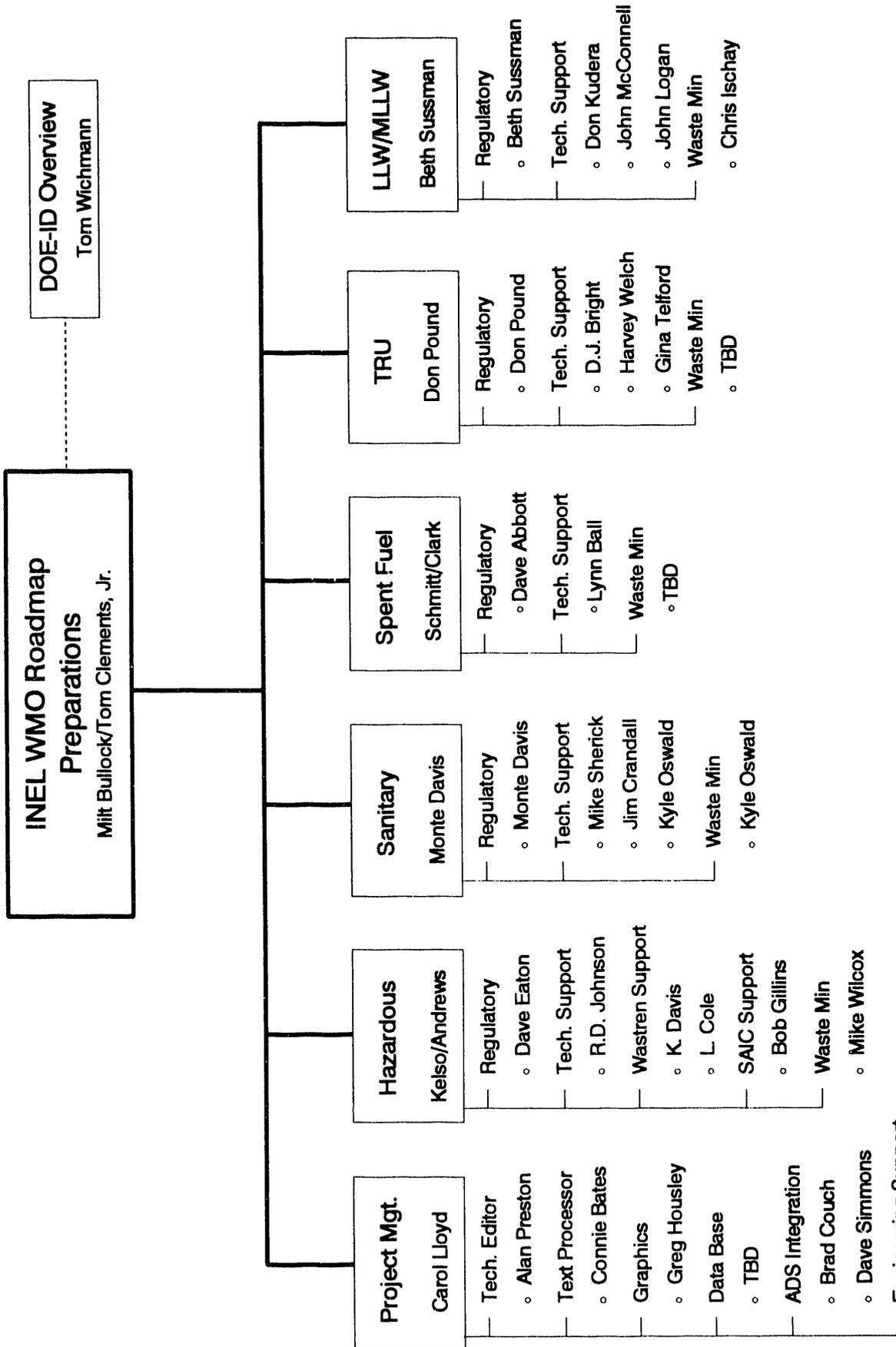


Figure 1-1. Roadmap Methodology Deliverables and Products.



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Figure 1-2. INEL WMO roadmap project organization chart.

1.3 Project Schedule

Figure 1-3, depicts the 18-month development schedule adopted to meet the DOE-HQ Methodology.

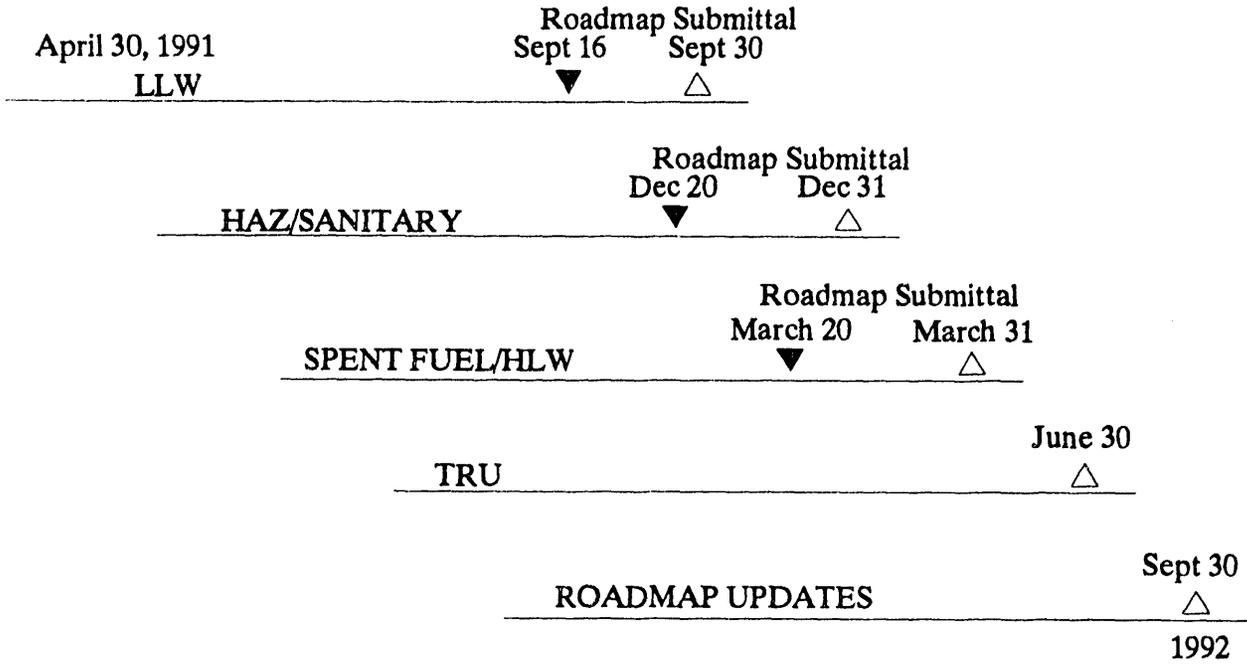


Figure 1-3. The DOE-HQ Methodology Guidance Development Schedule.

2. INSTALLATION LEVEL WASTE MANAGEMENT OPERATIONS ROADMAP ASSUMPTIONS

The purpose of this section is to identify assumptions that will establish a frame of reference or planning basis for all subsequent analysis. An assumption is typically used to fill a knowledge gap and normally covers situations over which a manager or installation has no control. Background information for these assumption statements is derived from DOE-HQ, field offices, regulatory agencies, and/or waste-handling facilities.

The assumptions that follow are installation-level assumptions that impact the working environment of roadmap project personnel. The assumption statements are divided into four standardized categories:

- Institutional
- Regulatory Compliance
- Project Management
- Other Site-specific Assumptions.

The assumptions do not include contingencies for uncertainties in the project's technical, cost, or budget baselines. The assumptions are made to establish the planning baseline for the INEL Environmental Restoration and Waste Management program.

2.1 Institutional Environment

The institutional environment assumptions are described below.

2.1.1 Federal Government

- A. Federal environmental and strategic policies and national priorities remain unchanged during the roadmap planning process.
- B. For life-cycle roadmap logic development, it is assumed the federal (for example, DOE and EPA) and State of Idaho environmental policies, statutes, codes, and orders, and the FFA/CO remain unchanged.
- C. Compliance with DOE, EPA, and New York State Department of Environmental Compliance guidance/regulatory requirements will be to the letter and spirit of the law.

- D. DOE must meet contractual obligations with the utility industry to begin accepting high-level nuclear waste by 1998.

2.1.2 INEL Environmental Restoration and Waste Management Baseline.

- A. The ER&WM Five-Year RDDT&E plans will be integrated with the institutional roadmaps. The focus on RDDT&E will be to assist with resolution of issues identified during the roadmapping process.
- B. DOE Installations will develop an infrastructure roadmap. These roadmaps will be integrated into the institutional roadmap (crosscut).
- C. Options for private sector participation will be considered for waste management functions specifically including municipal sanitary and hazardous wastes.
- D. DOE will develop interstate or regional/treatments/storage/disposal (TSD) systems for high-level waste (HLW), transuranic (TRU), Low-level waste (LLW), hazardous wastes (HW), and mixed.
- E. Other Federal agencies the State of Idaho, the State and Tribal Government Working Group (STGWG), local governments, and the public will continue to provide input to be included in INEL planning.

2.1.3 U.S. Department of Energy

- A. Source reduction will be a high priority in program formulation and execution.
- B. The Department of Energy and the State Department will negotiate recovery schedules for U.S. owned strategic nuclear materials located in foreign R&D programs.
- C. DOE and its contractors will develop a methodology for complying with the Price Anderson Amendments Act of 1988. The costs for compliance will not be included in this roadmap.
- D. For life-cycle roadmap logic development, it is assumed that remediation waste sampling, treatment, storage, and disposal technology capability and capacity will be available to achieve the individual OU Record of Decision (ROD) remedial action cleanups and meet INEL FFA/CO enforceable deadline schedules.
- E. Grants and cooperative agreements will be available to assist the State of Idaho and Indian tribes to participate in the development of the Five-Year Plan.

- F. All commitments and currently signed agreements made to date will be tracked and brought to closure.
- G. The five-year planning process will follow DOE National Security Authorization outlined in H-2100 Section 3135.
- H. Five-year planning process will include a description of activities and practices that the Secretary is undertaking or plans to undertake to minimize the generation of waste.
- I. The five-year planning process will be integrated with plans to recover, dispose, or reprocess SNM as a result of down-sizing the nations nuclear forces.

2.1.4 Mission Offices

- A. The missions of the ER&WM programs will remain unchanged from current statements (for example, cradle-to-grave management of all waste types).
- B. The INEL will continue to manage wastes on-Site, where generated, in accordance with DOE Order 5820.2A, FFA/CO, and applicable or relevant and appropriate requirements (ARARs).
- C. The INEL will continue to function as a nuclear engineering site, but the focus will be on ER&WM.
- D. Lead sites will be designated as regional waste management or processing centers.
- E. DOE will assign lead PSOs and field offices for development and Complex-wide issues; such as training, waste stream management, and safety analysis.
- F. This roadmap does not include continuity of operations.

2.1.5 Third Parties

- A. Third party involvement will be ensured through CERCLA and NEPA processes.
- B. The State of Idaho will use DOE grant funding to ensure that the broadest public participation occurs in the planning process.

2.1.6 State

- A. The Environmental Oversight and Monitoring Agreement (EOMA), FFA/CO, and FSFCA between the state of Idaho, state of New York, and EPA will remain in effect.
- B. The FFA/CO and FSFCA will not be reinterpreted with a change in State administrations.
- C. All radioactive material shipments into or out of the Sate covered under the Atomic Energy Act of 1954 (AEA) will be coordinated with the state governments.

2.2 Regulatory Compliance Environment

The sections that follow describe the regulatory compliance assumptions.

2.2.1 General

- A. Current policies, laws, and regulations will be obeyed.
- B. Legal precedents will nth drastically change current agreements.
- C. Negotiations between DOE and other federal and state agencies will continue in good faith.
- D. The draft Resource, Conservation, and Recovery Act (RCRA) Part B permit will be approved by the state of Idaho and EPA.
- E. The INEL FFA/CO as drafted July 1991, will be approved in December 1991. For life-cycle roadmap logic development, it is assumed the FFA/CO is the primary external controlling requirement and invokes all other ARARs.
- F. All projects will be managed in accordance with DOE Order 4700.1.

2.2.2 Federal Regulations

- A. RCRA reauthorization will occur in 1992, and will require significant reduction in all solid waste sources.
- B. DOE will provide comment to have mixed waste excluded form the "derived from mixture" rules listed in NOT Subtitle C.

- C. The NEPA process will follow Secretary of Energy Notice (SEN) 15-90 (Watkins 1990).
- D. For life-cycle roadmap logic development, it is assumed that NEPA and CERCLA (INEL FFA/CO) will be integrated.
- E. For life-cycle roadmap logic development, it is assumed that an INEL Sitewide programmatic ER/WM EIS will be approved in 1995.
- F. A nuclear weapons complex programmatic Environmental Impact Statement (EIS) or the Idaho Chemical Processing Plant (ICPP) PEIS.
- G. New regulations will be implemented through an implementation plan jointly agreed to by DOE and the regulating agencies.
- H. For life-cycle roadmap logic development, it is assumed that all DOE orders will be followed, even though "equivalent" requirements are being met by CERCLA documentation. for example, NEPA vs. CERCLA; Safety Analysis Reports (SAR) vs. sampling and Analysis Plans/Health and Safety Plan (SAP/HSP) and Risk Assessments; Nuclear Quality Assurance (NQA)-1 vs. Quality Assurance Management Staff (QAMS)-005.
- I. For radioactive material shipments regulated under 49 Code of Federal Regulations (CFR) 170-175, on-Site includes Idaho State Highway 33, Idaho State Highway 22, U.S. Highway 26, and U.S. Highway 20.
- J. The Clean Air Act will not alter existing permit limits.

2.2.3 State Regulations

- A. There will be no additional compliance agreements with the State of Idaho other than those resulting from routine inspections. State independent oversight will continue.
- B. All commitments for the FFA/CO will continue to be met on schedule.

INEL Waste Management Operations Roadmap Document	Title: Installation Roadmap Assumptions Section: 2. Issue date: 04-30-92
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- C. For life-cycle roadmap logic development, it is assumed that for all regulated wastes (hazardous/radioactive), below regulatory concern (BRC) or de minimis^a waste disposal criteria will be established and approved for the INEL.
- D. The State of Idaho and EPA will provide adequate staffing to conduct timely reviews of permits and applications. This includes permits to construct (PTC), prevention of significant deterioration applications, and FFA/CO documents.
- E. For environmental laws, state law will not be more restrictive than federal law where the State does not have primacy.

2.2.4 New Requirements

- A. Future on-Site audit teams will not generate significant new compliance requirements at DOE-HQ and DOE-ID levels.
- B. Best management practices identified by audit teams will be incorporated in out-year planning and budget cycles.

2.3 Project Management

The following sections discuss the project management assumptions.

2.3.1 Resources

- A. Major systems acquisition policies are affective for projects funded in excess of \$100 million and require EIS documentation.
- B. Activity Data Sheets (ADS) and backup documentation (BUDS) will support the latest published version of the roadmap document.
- C. All planned work can be accomplished through the available federal work force and private sector.

a. *De minimis* is a term used in this document to reflect a yet-to-be-determined criteria for radioactive and/or hazardous waste disposal by less restrictive means. The NRC and EPA may eventually include de minimis waste disposal criteria (numerical concentration limits, or BRC values) as a part of their regulations.

- D. Institutional roadmaps will be the basis for the EM strategic plan.
- E. DOE must develop private sector and international participation in technology development.

2.3.2 Budget Process

- A. To comply with policies, laws, and regulations, the budget will be developed on a phased-in funding profile based on intelligent vs. verbatim compliance and will be accomplished at three- or five-year intervals.
- B. Disposal Initiative
 - 1. Program specific programs will budget for all aspects of characterization, D&D, and final remediation.
 - 2. Non-program specific ER will fund life-cycle management of waste through D&D until remediation is completed. If no decontamination is required, the Landlord will budget restoration through the disposal initiative.
- C. For life-cycle roadmap logic development, it is assumed that for ERP Operating Units (OUs) that produce wastes, which will likely require waste treatment off the specific OUs, DOE will provide the treatment, storage, and/or disposal (TSD) capability/capacity for those wastes projected before FY 1995. TSD resources for wastes generated by EM-50 in excess of the projected target will be provided by EM-50.
- D. Resources will be available to accomplish the INEL FFA/CO enforceable deadlines.
- E. Funding for developing waste minimization strategies will be funded through the appropriate Program Senior Official (PSO). Facility--specific waste minimization plans and implementation of those plans will be budgeted through the specific programs.

2.3.3 Project Baseline

- A. The INEL will use the desired activities diagram in the roadmaps as the strategic plan that defines activities above baseline operations.
- B. Where necessary, base operations will be budgeted with escalation plus minimal growth.

INEL Waste Management Operations Roadmap Document	Title: Installation Roadmap Assumptions Section: 2. Issue date: 04-30-92
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- C. Looking at new starts and continuing projects, assume only one Line Item Construction Project (LICP) new start in a given year and that the funding profile for a given year does not fluctuate significantly.
- D. Full and separate funding is provided to comply with signed agreements above baseline budget.
- E. There will be no significant change in the level or amount of documentation required above that defined in the FFA/CO Action Plan.
- I. Adequate surge capacity will be available to handle waste streams from ER, Landlord, D&D and WFO activities.

2.3.4 External Support

INEL infrastructure will support increased activity due to ER&WM activities.

- A. Since all supporting ADS are part of the DOE-HQ Five-Year Plan (DOE 1991), the national Greater-Than-Class-C (GTCC), Low-Level Waste (LLW), and LLW Tech support Programs will be contained in the DOE-HQ roadmap.
- B. Institutional off-Site waste will not be accepted for storage.
- C. The Rocky Flats Plant will continue to generate transuranic (TRU) waste. Interim storage and characterization capability will be required, but has not been factored into INEL Site planning.
- D. The National Geologic Repository will accept fuel without special treatment or encapsulation if the cladding is intact.
- E. For life-cycle roadmap logic development, it is assumed that environmental laboratory analytical capability and capacity for waste sample analysis will be available to accomplish individual OU SAPs and meet INEL FFA/CO enforceable deadline schedules.
- F. Final Waste Isolation Pilot Plant (WIPP) Waste Acceptance criteria (WAC) will be defined by 1994.
- G. The technical work force will be available to support the INEL mission.
- H. Alternatives to the Federal Geologic Repository will be pursued.

- I. INEL performance assessment waste limits will be established at the same level as the U.S. Nuclear Regulatory Commission (NRC) limits contained in 10 CFR 61.55 with the exception of TRU. The TRU limit for subsurface disposal (SSD) is 10 η Ci/g.
- J. Environmental laboratory analytical capability and capacity will be a combination of federal and private laboratories. Waste samples analyzed at these laboratories will not trigger placement.
- K. Programmatic--additional attention will be directed towards removing unnecessary regulatory barriers.

2.3.5 Technical Support

- A. The Land Disposal Restrictions (LDR) National Capacity Variance will be extended beyond May 1992 until treatment technologies become available.
- B. All known RDDT&E needs are identified.
- C. DOE will provide direction on the movement of waste from one permitted facility to another.
- D. Technical capability will be available for sampling and analysis of Remote Handled(RH) and Contact Handled (CH) TRU waste.
- E. A national repository will be available for High-Level (HL), GTCC, and RH TRU waste.
- F. The best demonstrated available technology (BDAT) for LDR wastes will be established.
- G. Regional processes will be driven by the roadmaps.
- H. Technical capability will be available for sampling and analysis of RH and CH Mixed Low-Level Waste (MLLW).
- I. A national repository will be available for RH LLW.

2.3.6 Teamwork

- A. The INEL Management Board will provide overall direction and leadership to relative ES&H issues which cross organizational boundaries.
- B. DOE will adapt commercially available treatment processes.

- C. Coordination will exist between the DP, EM, Naval Reactor, and EH programs.
- D. There will be early integration of RDD&E concepts with existing waste streams.
- E. All waste streams will have been characterized.

2.4 Other Site-Specific Assumptions

(The additional waste stream-specific planning basis is in Section 5.)

2.5 References

DOE, 1991, *Environmental Restoration and Waste Management Five-Year Plan Fiscal Years 1993-1997*, FYP DOE/S-0089P, August.

EPA, 1991, *Risk Assessment Guidance for Superfund, Human Health Manual, Supplement Guidance; Standard Default Exposure Factors*, Office of Emergency and Remedial Response, Office of Solid Waste and Emergency Response, Directive No. 9285.6-03.

Watkins, J. D., DOE, 1990, to all department elements, Subject: "National Environmental Policy Act, " SEN-15-90, February 5.

3. KEY REGULATORY REQUIREMENTS

The purpose of this section is to briefly convey the regulatory status of the installation to the roadmap audience, and to provide substantive support for issues, needs, and activities identified in the analysis phase of the roadmap methodology.

Regulatory requirements are identified through discussions with installation personnel who understand compliance guidelines and agreement activities, current installation-specific plans, interagency agreements, and DOE orders.

These Key Regulatory Requirements, located in Appendix B, are a compilation of executive-level descriptions of compliance requirements and the status of INEL's compliance. This Appendix provides a resource which can help identify and/or substantiate installation issues and their priorities. Table 3-1 lists the waste types and the key regulatory drivers that apply to each waste type. Appendix B provides the title of each order or regulation, the source of the regulation, such as 10 CFR 71, a short summary including applicability, and if appropriate, the effective date. The status of the INEL with respect to the requirements, are shown within the specific waste stream discussions in Section 5.

Table 3-1. INEL waste types and the key regulatory drivers that apply to each waste type.

INEL Waste Type	Regulatory Drivers
Low-Level/Mixed Low-Level	DOE Order 5400.3 DOE Order 5820.2A CERCLA/SARA 40 CFR 264/265 TSCA 49 CFR (DOT Regulations) 10 CFR 61 and 71
Transuranic/Mixed Transuranic	DOE Order 5400.3 DOE Order 5820.2A CERCLA/SARA 40 CFR 264/265 Commitments to Idaho FFCA and IAG
Municipal Sanitary	RCRA Subtitle D DOE Order 5400.1
Hazardous	RCRA DOE Order 5400.3 40 CFR 262.41, 264, 268 40 CFR 262 Appendix B
Spent Fuel	DOE Order 5480.5 DOE Order 5820.2A State Agreements EPA (May assume authority) Atomic Energy Act of 1954 10 CFR 71 40 CFR 191 and 268 49 CFR 170-176

Note: The following regulations affect all waste types listed in this table: 29 CFR 1910 (OSHA), DOE Order 5483.1A (Contractor Safety and Health Program), and DOE Order(s) 4700 (Project Management System). Additional regulation driver requirements have been developed for these key documents, are formatted per the following sample, and contained in Appendix B.

INEL Waste Management Operations Roadmap Document	Title: Key Regulatory Requirements Section: 3. Issue date: 04-30-92
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*** SAMPLE ***

Regulation: DOE 5820.2A Radioactive Waste Management

Reg Authority: DOE

Applicability: DOE operations involving radioactive material generation, treatment, storage, disposal, or transportation.

Summary: Requirements for waste management program to follow Federal, State, and DOE guidelines are specified for various aspects of managing waste.

Requirements:

1. Development of waste acceptance criteria.
2. Development of a waste certification program.
3. Development of a waste verification program.
4. Proper and significant waste reduction, segregation, and minimization programs, processes, and procedures.
5. Develop and update approved waste management plan.
6. Meet performance objectives and assessment requirements.
7. Meet requirements for
 - treatment—meet required Waste Acceptance Criteria (WAC), segregation of mixed from radioactive, and provide Critical Design Report (CDR), Safety Analysis Report (SAR) & Operating Safety Requirements (OSR)
 - shipment—minimize shipments and shipment volumes and meet WAC certification
 - storage—meet performance objectives, provide CDR's, SAR's, & OSR's

Figure 3-1. Sample of Appendix B regulation format.

INEL Waste Management Operations Roadmap Document	Title: Milestone Documents and Diagrams Section: 4. Issue date: 04-30-92
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4. MILESTONE DOCUMENTS AND DIAGRAMS

DOE requires the establishment of committed milestones to serve as a basis for reviewing site activities. Milestones are used to confirm the logical sequence and timing of activities to reach ER&WM goals, and to identify conflicts among different commitments. This document contains only those milestones considered to be key INEL commitments.

4.1 Current Milestones

This section contains a page titled *Source Documents*, which is a key to the symbols used in roadmap diagrams. This is followed by a list of milestones from Waste Management's *Activity Data Sheets (ADSs)* the *DOE-HQ Draft ER&WM Five-Year Plan*, the *Draft INEL Site-Specific Plan for Fiscal Year 1992*, the *Federal Facility Agreement and Consent Order, Revision 7*, the *State Monitoring Agreement*, *Programmatic Environmental Impact Statement (PEIS)* and the *Sitewide Environmental Impact Statement (EIS)*, the *Environmental Restoration Program*, and *DOE's Program Execution Guidance*.

INEL WMO Milestones Legend

Symbol

	Activity Data Sheets	March 1991
	Draft DOE-HQ Five-Year Plan	May 1991
	Final DOE-HQ Five-Year Plan	August 1991
	State Monitoring Agreement	Latest
	Environmental Restoration Program Milestones	May 1991
	Draft Site-Specific Plan	May 1991
	The Federal Facility Agreement and Consent Order, Revision 7	March 1991
	Programmatic Environmental Impact Statement/Sitewide Environmental Impact Statement	May 1991
	Program Execution Guidance	March 1991

Activity Data Sheets

Symbol



Mile- stone No.	Description	Scheduled Completion Date
2	20E1 Reduce hazardous solvent use	4Q 1997
3	20E1 Reduce hazardous waste generation	2Q 1993
4	76E1 Sitewide EIS Implementation Plan	2Q 1992
5	76E1 Draft Sitewide EIS	2Q 1995
6	76E1 Final Sitewide EIS	2Q 1996
7	76E1 Record of Decision (ROD)	3Q 1996
8	71E1 Adverage treatment and disposal methods	2Q 1996
9	6E1 Issue procedures-Conduct of OPS - Maintenance	3Q 1991
10	6E1 Issue procedures for enviromental Regulations	4Q 1992
11	6E1 Issue procedure for Industrial Safety	4Q 1993
13	9E1 Transmit PH I SARS to ID (Final)	1Q 1995
15	9E1 Transmit PH II SARS to ID (Revised)	3Q 1996
16	7E1 Initiate Clean Air Act amendments	4Q 1994
18	15E1 Prepare Roadmap	3Q 1991
20	15E1 Complete modeling of all waste streams	4Q 1994
22	16E1 Implement the INEL nonradiological WM system	4Q 1991
25	69E1 Purchase remaining containers	4Q 1998
34	21E1 Conceptual design for HWTF	2Q 1995
35	21E1 Permitting for HWTF	4Q 1996
36	21E1 Title design/construction - HWTF	4Q 1997
38	25E1 Complete first cask	1Q 1995
39	25E1 Load first cask	1Q 1996
40	25E1 All fuel removed from TAN	3Q 1998
45	111E1 Select preferred disposal system	3Q 1993

Activity Data Sheets

Symbol



Mile- stone No.	Description	Scheduled Completion Date
46	111E1 Complete LT storage EIS	3Q 1994
47	111E1 Final design LT storage	1Q 1996
48	111E1 Interim storage to LT storage	4Q 1997
50	71E1 Conceptual design for transfer station	4Q 1991
51	71E1 Title II transfer station	2Q 1992
52	71E1 Construct transfer station	4Q 1992
54	71E1 Recycling center conceptual	1Q 1995
56	2E1 Submit revised LLW WAC	3Q 1991
60	2E2 Design engineered barriers complete	4Q 1992
61	2E2 GTCC storage design	4Q 1996
64	3E1 Finalize ID Order 5820.2A	3Q 1991
67	3E1 Prepare RWMC Site Closure Plan	4Q 1996
68	3E1 Complete installation of monitoring wells	4Q 1997
69	5E1 Issue F&OR for new LLW disposal system	1Q 1993
70	5E1 Prepare conceptual design	1Q 1995
71	5E1 Validate project	3Q 1995
72	5E1 Title I/II completed	4Q 1997
73	5E1 Perform construction	4Q 1999
76	5E2 Issue F&OR for LLW treatment Facility	1Q 1992
77	5E2 Validate project	3Q 1994
78	5E2 Title I complete	3Q 1996
79	5E2 Title II complete	3Q 1997
80	5E2 Perform construction	2Q 2000
82	1E1 Startup building 622 (sizing)	1Q 1993

Activity Data Sheets

Symbol



Mile- stone No.	Description	Scheduled Completion Date
84	1E1 Implement mixed waste incineration	3Q 1991
85	1E1 Implement enhanced grout tech	2Q 1994
86	1E1 Implement ash vitrification tech	3Q 1996
87	1E1 Replace WERF incinerator combustion chambers	3Q 1996
88	17E1 Enhanced stack monitoring - install	4Q 1991
89	17E1 Install WERF absorbers & burners	2Q 1992
90	17E1 Complete WEDF closure plan	3Q 1993
93	2E2 Post closure plan RWMC SDA	4Q 1998
95	3E1 Revise INEL WAC	4Q 1991
96	5E1 Select site for New LLW disposal system	2Q 1994
97	5E1 Prepare draft performance assessment	1Q 1994
98	5E2 Conceptual design report for LLW treatment facility	2Q 1994
99	5E2 Prepare NESHAP permit	1Q 1995
100	5E2 Prepare PSAR	3Q 1996
101	22E1 RH LLW disposal vaults	4Q 1994
103	8E1 Relocate containers ASWS II	3Q 1992
108	8E2 Complete TRU PACT-II Readiness Review	3Q 1991
109	8E2 Complete RH TRU strategy plan	4Q 1991
110	8E2 Non-RFP Waste certification plan	3Q 1992
112	8E2 RH-TRU Certify Conceptual Design	4Q 1992
113	8E2 Complete TRU inventory assessment	3Q 1993
114	8E2 RH QA plan to WIPP WAC	4Q 1993
115	8E2 RH TRU certify design	4Q 1993
118	8E3 Develop waste processing strategy	3Q 1995

Activity Data Sheets

Symbol



Mile- stone No.	Description	Scheduled Completion Date
84	1E1 Implement mixed waste incineration	3Q 1991
85	1E1 Implement enhanced grout tech	2Q 1994
86	1E1 Implement ash vitrification tech	3Q 1996
87	1E1 Replace WERF incinerator combustion chambers	3Q 1996
88	17E1 Enhanced stack monitoring - install	4Q 1991
89	17E1 Install WERF absorbers & burners	2Q 1992
90	17E1 Complete WEDF closure plan	3Q 1993
93	2E2 Post closure plan RWMC SDA	4Q 1998
95	3E1 Revise INEL WAC	4Q 1991
96	5E1 Select site for New LLW disposal system	2Q 1994
97	5E1 Prepare draft performance assessment	1Q 1994
98	5E2 Conceptual design report for LLW treatment facility	2Q 1994
99	5E2 Prepare NESHAP permit	1Q 1995
100	5E2 Prepare PSAR	3Q 1996
101	22E1 RH LLW disposal vaults	4Q 1994
103	8E1 Relocate containers ASWS II	3Q 1992
108	8E2 Complete TRU PACT-II Readiness Review	3Q 1991
109	8E2 Complete RH TRU strategy plan	4Q 1991
110	8E2 Non-RFP Waste certification plan	3Q 1992
112	8E2 RH-TRU Certify Conceptual Design	4Q 1992
113	8E2 Complete TRU inventory assessment	3Q 1993
114	8E2 RH QA plan to WIPP WAC	4Q 1993
115	8E2 RH TRU certify design	4Q 1993
118	8E3 Develop waste processing strategy	3Q 1995

Activity Data Sheets

Symbol



Mile- stone No.	Description	Scheduled Completion Date
152	101E2 Title design - WCF	2Q 1993
157	101E2 Complete WCF op doc	2Q 1995
158	101E2 Complete WCF	2Q 1995
159	101E2 Complete TSA-RE modifications	3Q 1996
161	113E1 Certify lab for qualified VOCs	4Q 1991
163	113E1 Lab certification for sludge VOCs	4Q 1992
165	113E2 Issue final QAPP	2Q 1991
167	113E2 Approved QAPP for sample anal. - liquids	3Q 1992
168	113E2 Approved QAPP for sample anal. - solids	3Q 1993
170	2E2 Establish inventory baseline-GTCC	4Q 1993
171	2E2 Develop TSD strategy-GTCC	4Q 1995
174	2E2 Negotiate disposal options w/NRC	4Q 1996
177	2E2 determine REQ for dedicated storage	4Q 1996
181	11E2 RWMC/TSA closure plan	4Q 1991
182	11E2 HWSF Part B permit application	1Q 1992
183	11E2 WERF Part B permit application	1Q 1993
184	11E2 TSD Facility upgrades	3Q 1994
185	11E2 RWMC WCF/TSAR modification	2Q 1998
186	18E1 Evaluation of storage capacity need	3Q 1991
187	18E1 Evaluate alternatives to new construction	3Q 1991
188	19E1 ISU Independent monitoring activities	4Q 1993
189	19E1 State of Idaho Monitoring Activities	4Q 1997

Draft DOE-HQ Five-Year Plan

Symbol



Mile- stone No.	Description	Scheduled Completion Date
1	Deactivation of PREPF	2QFY 1991
2	Begin construction of TRU waste storage modules	2QFY 1992
3	Initiate TMI cask lab and dry storage program	1QFY 1995
4	Support WIPP BIN test program	4QFY 1995

**Final DOE-HQ Five-Year Plan
(August 1991)**

Symbol



Mile- stone No.	Description	Scheduled Completion Date
1	Deactivation of PREPP	2QFY 1991
2	Begin construction of TRU waste storage modules	4QFY 1992
3	Initiate TMI cask fab and dry storage program	2QFY 1995
4	Support WIPP BIN test program	4QFY 1995
5	Complete municipal transfer station	1Q 1993
6	Recommend Complex-wide GTCC disposal	3Q 1993
7	Complete construction TRU characterization and storage facility	2Q 1995
8	Complete INEL EIS	4Q 1995

State Monitoring Agreement

Symbol



Mile- stone No.	Description	Scheduled Completion Date
SM-1	Meet with the State of Idaho to develop schedule and prioritize environmental restoration, compliance, and permitting activities.	Annually
SM-2	Submit to the State a preliminary inventory of toxic and hazardous air contaminants.	12 months after receiving list from State of toxic & hazardous contaminant definition.
SM-3	Report to the State on the facility-wide Waste Minimization Plan along with waste reduction or elimination operations.	Immediately, subsequent to DOE-HQ approval of the plan.
SM-4	Furnish to State the INEL Site Environmental Monitoring Data quarterly and annual report. Have other monitoring agencies provide the State (directly) with published reports and make data available.	Upon completion of reports.
SM-5	Submit draft reports based on available data of "background characterization" of groundwater and soils.	9 months
SM-6	Make INEL Waste Management/Environmental Restoration Site Specific Plan (WM/ER SSP) available for public comment in a timely manner.	Annually
SM-7	Meet with DOE-ID to develop advisory schedules and priorities for environmental compliance, permitting, and restoration activities.	Annually
SM-8	Inspect all INEL drinking water, wastewater, land applications, injection, monitoring, and production wells.	

INEL Waste Management Operations Roadmap Document	Title: Milestone Documents and Diagrams Section: 4. Issue date: 04-30-92
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State Monitoring Agreement

Symbol



Mile- stone No.	Description	Scheduled Completion Date
SM-9	Prepare a plan for independent oversight of program for monitoring the environment at the INEL and assessing compliance.	
SM-10	Sample and analyze air, water, soil, crops, milk, and other parameter, for contamination.	
SM-11	Increase state agency coordination on environmental matters pertinent to the INEL.	
SM-12	Provide annual reports to DOE-ID on emergency response.	
SM-13	Update and renegotiate State of Idaho Grant Agreement.	2Q 1995

Environmental Restoration Program

Symbol



Source--ERP Management Schedule 4/14/91
ERP Milestones that impact Waste Management Planning

Mile- stone No.	Description	Scheduled Completion Date
1	Pad A record of decision (ROD)	2Q 1994
2	Pad A Waste	3Q 1996
3	Vadose Zone ROD	3Q 1992
4	Vadose Zone Waste	3Q 1992
5	Rocky Flats Pits and Trenches ROD	1Q 1998
6	Rocky Flats Waste	2Q 1999
7	Pit 9 ROD	2Q 1993
8	Pit 9 Waste	3Q 1994

Draft Site-Specific Plan

Symbol



Mile- stone No.	Description	Scheduled Completion Date
1	Close WERF	4Q 2000
2	Close RWMC	4Q 2000
3	Commence operation treatment/disposal complex	4Q 2000
4	Receive final WIPP WAC	4Q 1996
5	Partial operation IWPF	2001
6	Reclassified TRU storage/disposal	2006
7	Close CFA landfill	4Q 1993
8	Dispose in regional landfill	4Q 1993
9	Ship products to final repository	2035
10	On-Site transportation compliance	4Q 1998

The Federal Facility Agreement and Consent Order, Revision 7

Symbol



Mile- stone No.	Description	Scheduled Completion Date
1	WAG-1 TAW injection well record of decision (ROD)	4Q 1994
2	WAG-2 TRA warm waste pond ROD	1Q 1992
3	WAG-4 CFA landfills ROD	4Q 1995
4	WAG-5 PBF/ARA ROD	4Q 1999
5	WAG-6 EBR-1/BORAZ ROD	3Q 2001
6	WAG-7 Pad A ROD	1Q 1994
7	WAG-7 VVE ROD	1Q 1992

**Programmatic Environmental Impact Statement/Sitewide
Environmental Impact Statement**

Symbol



Mile- stone No.	Description	Scheduled Completion Date
PI-1	Complete public scoping	2Q 1991
PI-2	Issue NOI	1Q 1991
PI-3	Draft PEIS	4Q 1991
PI-4	Start public scoping meetings	1Q 1991
EI-5	Issue ROD (Sitewide EIS)	3Q 1996
EI-6	Submit NOI to HQ (Sitewide EIS)	1Q 1992
EI-7	Distribute IP (Sitewide EIS)	2Q 1992
EI-8	Notice of availability (Sitewide EIS)	2Q 1996

Program Execution Guidance

Symbol



Mile- stone No.	Description	Scheduled Completion Date
1	Relocate clean lead storage	4Q 1991
2	Site-specific plan submittal	4Q 1991
3	QA/QC quality reports	4Q 1991
4	Complete Title II design of INEL sanitary landfill	1Q 1992
5	Submit RCRA permit for INEL sanitary landfill and complete construction	1Q 1993
6	Waste characterization facility construction complete	3Q 1996

4.2 Previously Committed Milestones

This section identifies previously committed milestones listed in current documents, many of which are in the public domain. As these current milestones are met, they will also satisfy the milestone commitments made in previous documentation.

INEL WMO Milestones Legend

SYMBOL



DOE-HQ Five-Year Plan

June 1990



INEL Waste Management Plan
(DOE-ID 10270)

February 1990



ER&WM Site-Specific Plan

February 1991



Environmental Restoration Program Roadmap

January 25,
1991



DOE-HQ EM SEN-25-90 Program Guidance
for Fiscal Year 1993

January 14,
1991



Program Execution Guidance (HQ) for Fiscal
Year 1991

March 4, 1991

DOE-HQ Five-Year Plan, June 1990

Symbol



Mile- stone No.	Description	Scheduled Completion Date
EM 1	Issue draft waste characterization implementation planning document	2Q 1990
EM 2	Complete facility upgrade priority list	2Q 1990
EM 3	Complete construction of first Type II TRU storage module	4Q 1991
EM 4	Complete construction of TRU waste retrieval containment facility	4Q 1991
EM 5	Complete LLW disposal system conceptual design report	1993
EM 6	Complete ID waste processing facility title I design	1993
EM 7	Complete Phase I environmental corrective activities	3Q 1990
EM 8	Complete design of ID waste processing facility Title II	1994
EM 9	Complete TRU waste characterization and storage facility	4Q 1994
EM 10	Complete draft groundwater monitoring implementation plan	3Q 1990
EM 11	Replace or leak test and upgrade all regulated active tanks installed between 1965 and 1974	1Q 1991
EM 15	Hot start PREPP (R&D only)	1992
EM 16	Obtain RCRA permit for new sanitary landfill and complete construction	1992
EM 18	Complete IAG	1990
EM 19	Complete cleanup of miscellaneous WAGs	1996

**INEL Waste Management Plan, Fiscal Year 1990
(DOE-ID 10270)**

Symbol



Mile- stone No.	Description	Scheduled Completion Date
WP 1	Initiate retrieval of TRU waste in a containment facility	4Q 1992
WP 2	Initiate conceptual design of new TWTSF	1992
WP 3	Start hot testing at TAN	Oct. 1993
WP 4	Closeout TMI - 2 program	Sept. 1990
WP 5	Transport spent fuel from West Valley to INEL for cask tests. Nuclear Fuel Services schedule subject to change by DOE (WVDP)	Sept. 1991
WP 6	Complete vapor vacuum extraction demonstration	June 30, 1990
WP 7	Complete in situ vitrification large scale cold test	Dec. 31, 1991
WP 8	Begin vapor vacuum extraction production	Dec. 31, 1991
WP 9	Complete retrieval demonstration	Dec. 31, 1992
WP 10	Complete remedial investigation/feasibility	Dec. 31, 1993
WP 11	Process 280,000 gal of radioactive HLLW (ICPP)	Sept. 30, 1990
WP 12	Construction completed	1994
WP 13	Retrieve RH/SC waste	4Q 1999
WP 14	Transport RH/SC waste to WIPP	4Q 1999
WP 15	Close RWMC	4Q 2000
WP 16	Complete WERF modifications	4Q 1992
WP 17	Submit Part B application for TRU	4Q 1995

ER&WM Site-Specific Plan

Symbol



Mile- stone No.	Description	Scheduled Completion Date
SS-6	Close WERF	FY 2000
SS-7	Close RWMC	FY 2000
SS-8	Commence operation treatment/disposal complex	FY 2000
SS-9	Construct 1st module WCSF	3Q 1990
SS-10	Construct retrieval enclosure	4Q 1990
SS-12	Partial operation IWPF	FY 2001
SS-13	Reclassified TRU storage/disposed	FY 2006
SS-14	Close CFA Landfill	FY 1993
SS-15	Complete solid waste transfer station	FY 1993
SS-16	Dispose in regional landfill	FY 1993
SS-17	Investigate advanced management/disposed	FY 2000

Environmental Restoration Program Roadmap

Symbol



Mile- stone No.	Description	Scheduled Completion Date
BW-1	Conclude interagency agreement	Sept. 30, 1990
BW-2	Complete ERP characterization anal. - solids	Sept. 30, 1990
PW-3	Complete construction type II transuranic (TRU) waste Storage Module	Sept. 30, 1991
BW-4	Complete construction TRU waste retrieval containment facility	Sept. 30, 1992
BW-5	Complete conceptual design report low level waste (LLW) disposal system	Sept. 30, 1993
BW-6	Complete Title I design of the Idaho Waste Processing Facility (IWPF)	Sept. 30, 1993
BW-7	Complete ERP (WAG-7 RWMC) RI/FS Report	Sept. 30, 1994
BW-8	Complete Title II design of the IWPF	Sept. 30, 1994
BW-9	Complete TRU waste characterization and storage facility (WCSF)	Sept. 30, 1994
BW-10	Initiate title design RWMC TRU waste treatment and storage facility	Dec. 30, 1989
BW-11	Assessment of SDA within RWMC ERP vapor vacuum extraction pilot test	Oct. 31, 1990
BW-12	Begin assessment of SDA with RWMC ERP Hot retrieval demonstration	Oct. 1, 1993
BW-13	Complete construction RWMC TRU WDSF project	Sept. 30, 1994
BW-14	Initiate conceptual design of new TRU waste treatment and storage facility	Sept. 30, 1990
BW-15	Complete VVE demonstration	June 30, 1990
BW-16	Complete in situ vitrification large scale cold test	Dec. 31, 1991
BW-17	Begin VVE production	Dec. 31, 1991

Environmental Restoration Program Roadmap

Symbol



Mile- stone No.	Description	Scheduled Completion Date
BW-18	Complete RI/FS studies on SDA	Dec. 31, 1993
BW-19	Complete VVE demonstration	Sept. 30, 1990
BW-20	Submit VVE production long-term alternative recommendation report	Sept. 30, 1990
BW-21	Complete demonstration of the ISV hot demonstration	Sept. 30, 1991
BW-22	Complete draft EIS	Sept. 30, 1993
BW-23	Complete construction of the retrieval demonstration containment facility	Sept. 30, 1994

INEL Waste Management Operations Roadmap Document	Title: Milestone Documents and Diagrams Section: 4. Issue date: 04-30-92
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DOE-HQ EM SEN-25-90 Program Guidance, Fiscal Year 1993

Symbol



Mile- stone No.	Description	Scheduled Completion Date
PEG-1	Complete construction of percolation pond #3	1Q 1993
PEG-2	Complete Title II design for Idaho Waste Processing Facility	2Q 1993
PEG-3	Complete evaluation of the stored transuranic waste strategy	3Q 1993
PEG-4	Complete construction of the transuranic storage area retrieval enclosure	4Q 1993
PEG-5	Complete sludge wash operations of the West Valley Demonstration Project (WVDP)	4Q 1993
PEG-6	Complete construction of 900177, RWMC TRU waste treatment and storage facility	4Q 1993
PEG-7	Complete 40% construction of 91-D-172, HLN tank farm replacement (ICPP)	4Q 1993

Program Execution Guidance (HQ), Fiscal Year 1991

Symbol



Mile- stone No.	Description	Scheduled Completion Date
HQ-1	Complete Title II design of the INEL sanitary landfill.	1Q 1992
HQ-2	Complete construction and start operations of TRA liquid radioactive waste clean-up - phase II.	1Q 1992
HQ-3	Complete installation of the Plasma Destructor System in the waste engineering development facility.	1Q 1993
HQ-4	Use TRU waste characterization to validate the data base.	1Q 1993
HQ-5	Start construction at sewage treatment plant at the Test Area North, Test Area Reactor and Central Facilities Area, etc.	2Q 1993
HQ-6	Complete construction of the TSA retrieval containment building.	4Q 1993
HQ-7	Complete construction of the RWMC TRU waste characterization, treatment and storage facility.	4Q 1996
HQ-8	Complete Title I design for the Idaho Waste Processing Facility project.	4Q 1996
HQ-9	Complete modifications to the WERF incinerator to enable burning of hazardous wastes at an increased rate including chlorinated wastes. DOE-ID will provide DOE-HQ with two copies of the report summarizing results of the WERF trail burns.	Sept. 1991

4.3 Milestone Diagram

The diagrams that follow shows key current INEL milestones and previously committed milestones as described in the preceding two sections.

Some previously committed milestones have been *replaced* by the current milestones. As these current milestones are met, they will also satisfy the milestone commitments made in previous documentation.

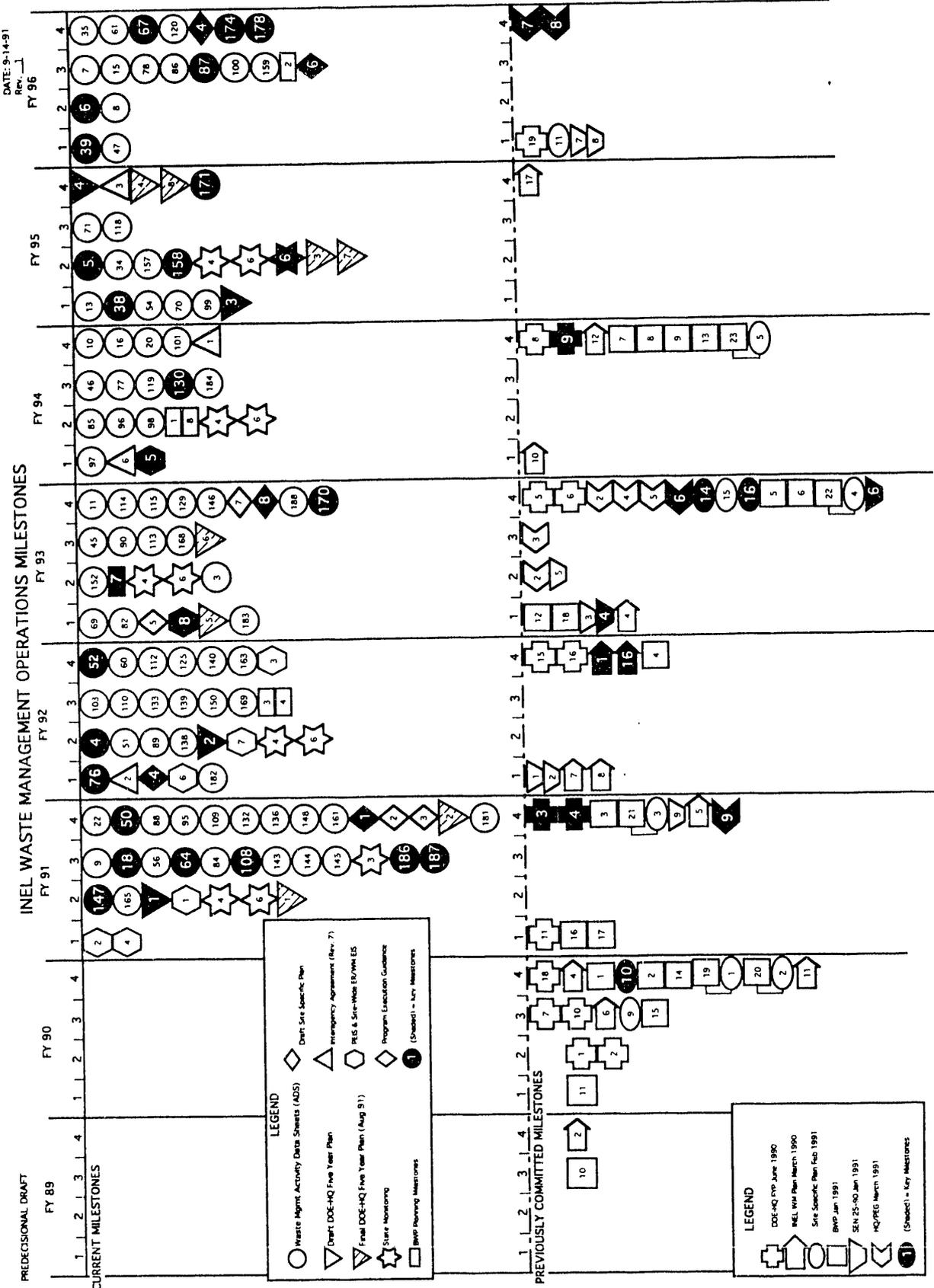


Figure 4-1. INEL WMO Milestone Diagram.

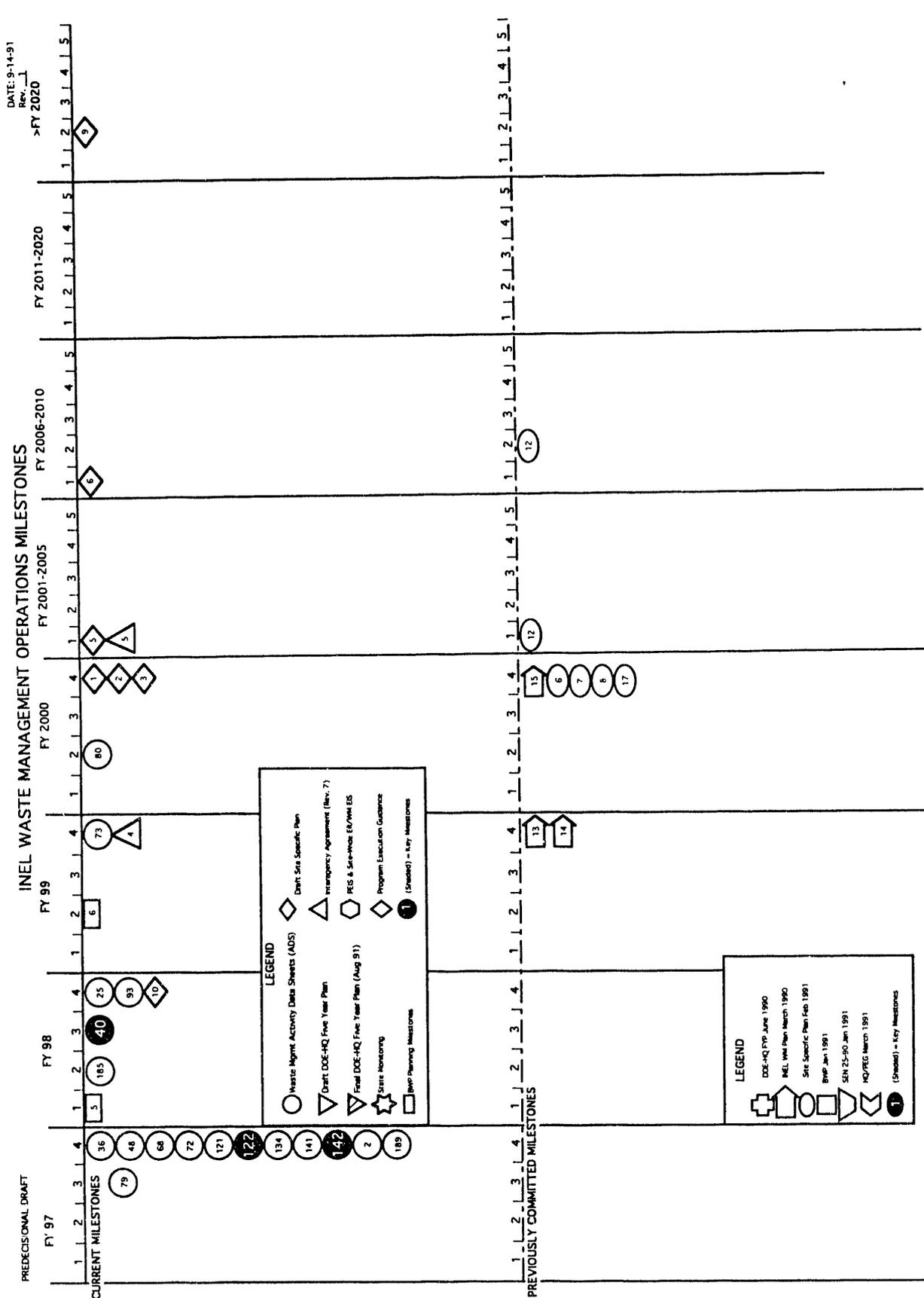


Figure 4-1. (continued).

INEL Waste Management Operations Roadmap Document	Title: Waste Types Section: 5. Issue date: 04-30-92
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5. WASTE TYPES

DOE-HQ's Roadmap Methodology requires the INEL to prepare roadmaps by waste type. Presently there are six waste types at the INEL: LLW/Mixed LLW, TRU/Mixed TRU, Municipal Sanitary, Hazardous, Spent Fuel, and Special Case/Greater-Than-Class C wastes.

5.1 Low-Level Waste/Mixed Low-Level Waste

The following is a brief description of the current status of LLW/MLLW requiring treatment and disposal at the INEL:

- A. A number of "orphan" LLWs exist with no final disposition
 - 1. Pad A waste
 - 2. Reclassified LLW (stored waste)
 - 3. GTCC waste
 - 4. Mixed LLW
 - 5. Performance assessment limiting waste
 - 6. ERP reclassified LLW (buried waste)
- B. 40% of the LLW currently-generated is not treated before disposal at the Radioactive Waste Management Complex (RWMC).
- C. On-Site transport of LLW between INEL facilities does not meet U.S. Department of Transportation (DOT) requirements.
- D. Large, unforecasted waste streams exist from D&D of current facilities.
- E. No permitted facility exists for disposal of treated MLLW.

5.1.1 LLW/MLLW Stream Planning Baseline

A. General

- 1. Generated LLW will meet the waste acceptance requirements for TSD facilities and new MLLW will be generated and temporally stored as determined by individual OU RODS until final TSD capabilities become available.
- 2. All waste will be characterized and packaged at the point of origin and not at the destination.
- 3. All LLW and MLLW generated on-Site will received from cradle-to-grave on-Site management.
- 4. Regulatory and DOE permits/requirements will be observed for each TSD facility.
- 5. WAC for TSD facilities are established.

6. Only LLW/MLLW generated by DOE-ID activities or assigned to DOE-ID jurisdiction will be treated, stored, or disposed at the INEL.

B. Treatment

1. ICPP will continue treating liquid LLW currently treated and a new capability will be provided to treat all liquid LLW/MLLW that cannot be treated at ICPP.
2. The Waste Experimental Resolution Facility (WERF) will continue to operate until additional treatment capability is available.
3. No LLW TRU or RH LLW/MLLW will be processed at LLW/MLLW treatment facilities. However, TRU LLW with trace quantities of contamination may be processed at these facilities.
4. LLW/MLLW treatment will meet disposal facility WAC.
5. Effluent discharges to the environment from LLW/MLLW treatment will be below regulatory limits.
6. TRU contaminated wastes not handled at LLW/MLLW facilities will remain in storage until a TRU treatment capability is available.
7. No off-Site waste will be treated at WERF in accordance with current State position.

C. Storage

1. Liquid LLW/MLLW will be stored in permitted tanks or in proper storage containers and locations before treatment.

D. Disposal

1. The RWMC will continue to receive and dispose of CH and RH LLW until a new disposal capability is available.
2. LLW and MLLW disposal will not be engineered for retrieval.
3. Special-case and GTCC LLW will be placed in a disposal facility only by a specific performance assessment approved by DOE-HQ.

4. Disposal facility WAC will be tied to the disposal area radiological performance assessment.

E. Generator

1. Waste streams are characterized by the generator before the beginning of a process that generates waste.
2. Temporary accumulation storage areas, that meet RCRA requirements will be available at the generator's facility for MLLW awaiting shipment to the storage or treatment facility.

F. Transportation

1. Approved transport plans and transport containers exist for shipments of LLW/MLLW to TSD facilities.

G. Waste Minimization/Recycling

1. Waste minimization plans will be implemented.
2. Recycling will be considered a viable and desirable alternative to treatment and disposal.

H. Characterization

1. Equipment used to analyze waste samples can detect required levels and limits.

5.1.2 Key Regulatory Drivers

The following are the regulatory drivers that require special attention to ensure compliance with all applicable laws and regulations:

- DOE Order 5400.3
- DOE Order 5820.2A
- CERCLA/SARA
- 40 CFR 264/265
- TSCA
- 49 CFR 268 (DOT regulations)
- 10 CFR 71

5.1.3 Logic Diagrams

The following pages contain the logic diagrams for the LLW/MLLW waste stream:

- **Figure 5-1.** Proposed LLW/MLLW detail.
- **Figure 5-2.** RWMC direct disposal without treatment-STATUS.
- **Figure 5-3.** WERF treated waste-STATUS.
- **Figure 5-4.** Liquid LLW/MLLW summary.
- **Figure 5-5.** INEL liquid LLW/MLLW detailed.
- **Figure 5-6.** LLW/MLLW solids summary.
- **Figure 5-7.** INEL LLW/MLLW stored solids.
- **Figure 5-8.** INEL LLW/MLLW newly-generated solids.

INEL WASTE MANAGEMENT OPS. ROADMAP

Proposed LLW/MLLW
Detail

DATE 8-10-91
Rev 1

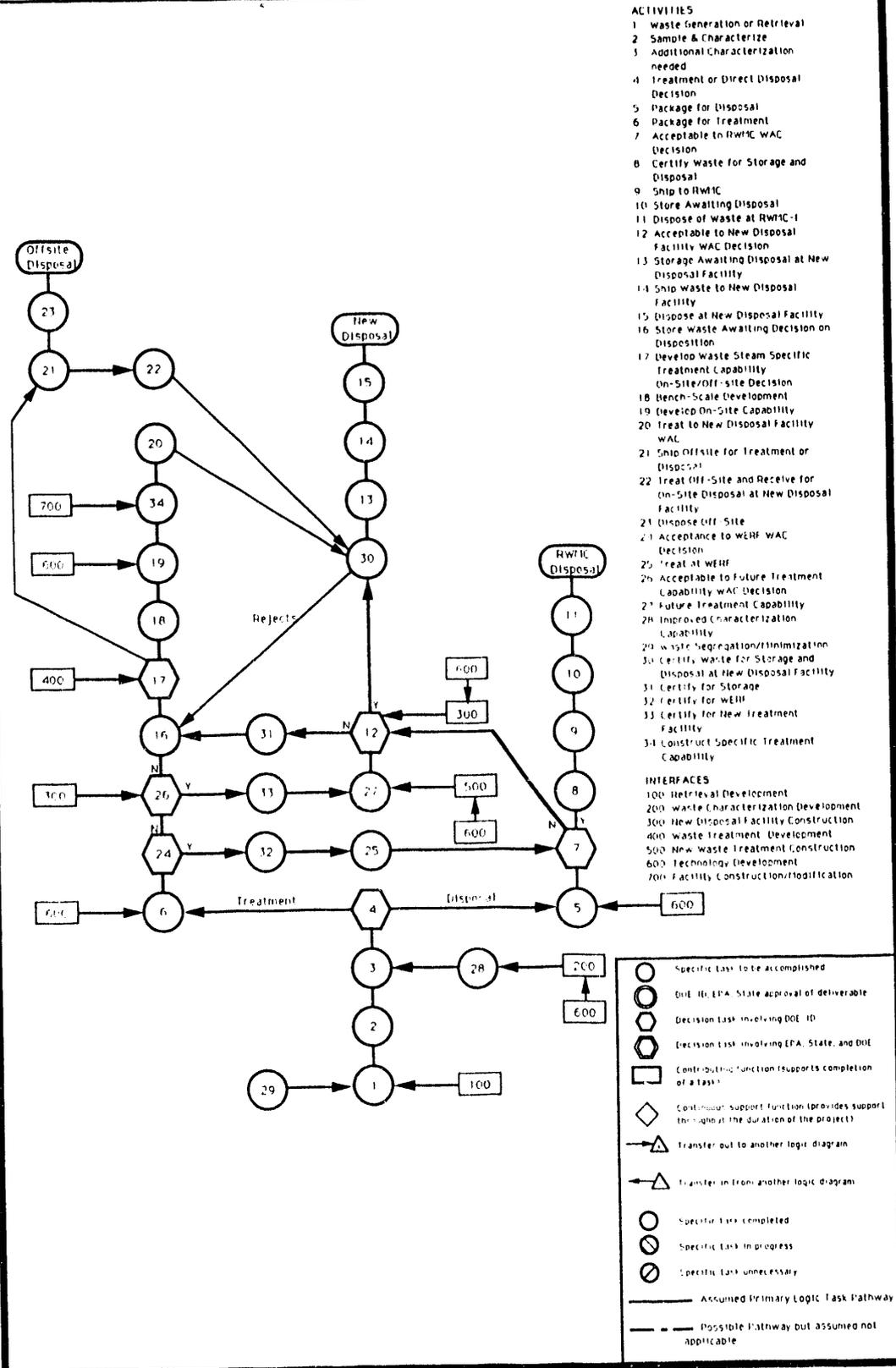


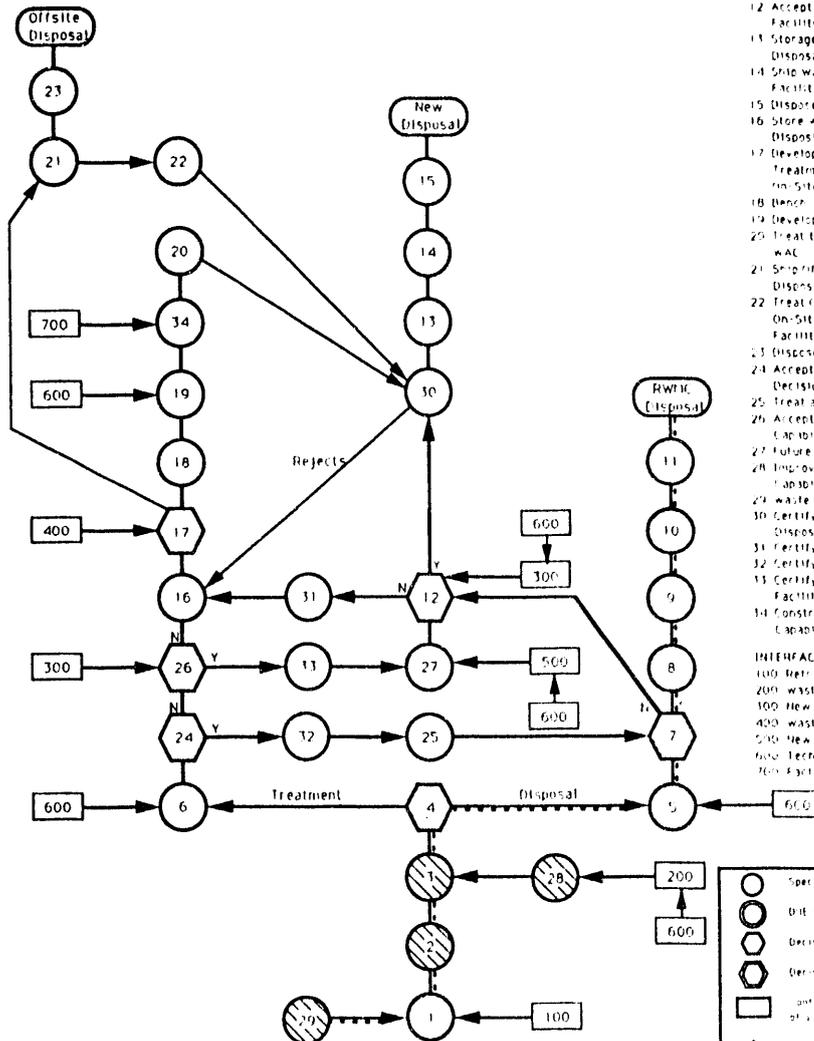
Figure 5-1. Proposed LLW/MLLW detail.

INEL WASTE MANAGEMENT OPS. ROADMAP

Proposed LLW/MLLW
Detail

DATE: 8-14-91
Rev: 1

STATUS
RWMC DIRECT DISPOSAL WITHOUT TREATMENT

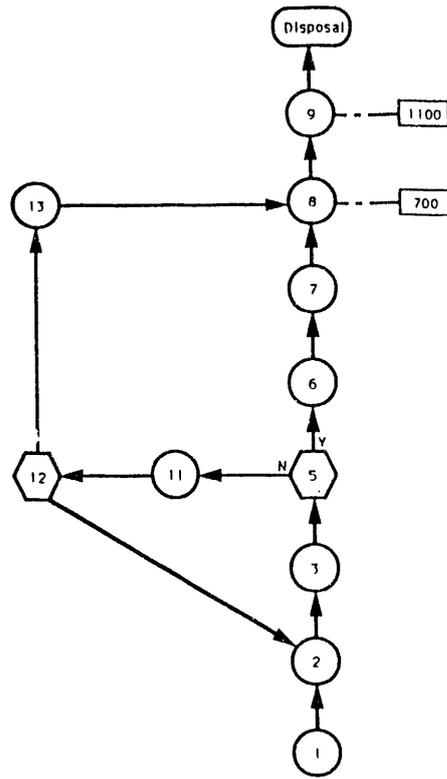


- ACTIVITIES**
1. Waste Generation or Retrieval
 2. Sample & Characterize
 3. Additional Characterization needed
 4. Treatment or Direct Disposal Decision
 5. Package for Disposal
 6. Package for Treatment
 7. Acceptable to RWMC WAC Decision
 8. Certify waste for Storage and Disposal
 9. Ship to RWMC
 10. Store Awaiting Disposal
 11. Dispose of waste at RWMC-F
 12. Acceptable to New Disposal Facility WAC Decision
 13. Storage Awaiting Disposal at New Disposal Facility
 14. Ship waste to New Disposal Facility
 15. Dispose at New Disposal Facility
 16. Store waste Awaiting Disposition Decision
 17. Develop waste stream Specific Treatment Facility
 18. Develop Site Decision
 19. Develop Site Capability
 20. Treat to New Disposal Facility WAC
 21. Ship waste for Treatment or Disposal
 22. Treat Off-Site and receive for On-Site Disposal at New Disposal Facility
 23. Dispose Off-Site
 24. Acceptable to RWMC WAC Decision
 25. Treat at WRF
 26. Acceptable to Future Treatment Capability WAC Decision
 27. Future Treatment Capability
 28. Improved Characterization Capability
 29. Waste Segregation/Minimization
 30. Certify waste for Storage and Disposal at New Disposal Facility
 31. Certify for Storage
 32. Certify for WRF
 33. Certify for New Treatment Facility
 34. Construct Specific Treatment Capability

- INTERFACES**
- 100. Retrieval Development
 - 200. Waste Characterization Development
 - 300. New Disposal Facility Construction
 - 400. Waste Treatment Development
 - 500. New Waste Treatment Construction
 - 600. Technology Development
 - 700. Facility Construction/Modification

- Specific task to be accomplished
- (D) EPA, State approval of deliverable
- (E) Decision task involving EOL (E)
- (E) Decision task involving EPA, State, and EOL
- Contributing function (supports completion of a task)
- ◇ Through Support Function (provides support throughout the duration of the project)
- Transfer out to another logic diagram
- ← Transfer in from another logic diagram
- Specific task completed
- (S) Specific task in progress
- (U) Note for task unnecessary
- Assumed Primary Logic Task Pathway
- Other Logic Pathway but assumed not applicable

Figure 5-2. RWMC direct disposal without treatment-STATUS.



ACTIVITIES

- 1 Generate Waste
- 2 Generator Waste Storage
- 3 Characterization
- 5 Does Waste Meet Treatment WAC?
- 6 Transfer to Treatment Facility
- 7 Treatment Facility Storage
- 8 Treat Waste
- 9 Dispose of Solid waste
- 11 Uncertifiable Waste Stored Awaiting Disposition
- 12 Develop Treatment or Return to Generator Decision
- 13 Develop Treatment Capability

INTERFACES

- 700 Waste Treatment Facility (LLW)
- 1100 Waste Disposal Facility (LLW)

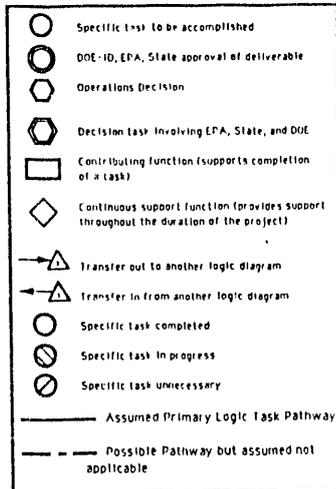


Figure 5-4. Liquid LLW/MLLW summary.

INEL WASTE MANAGEMENT OPS. ROADMAP

LLW/MLLW Solids
Summary

DATE 8-10-91
Rev 1

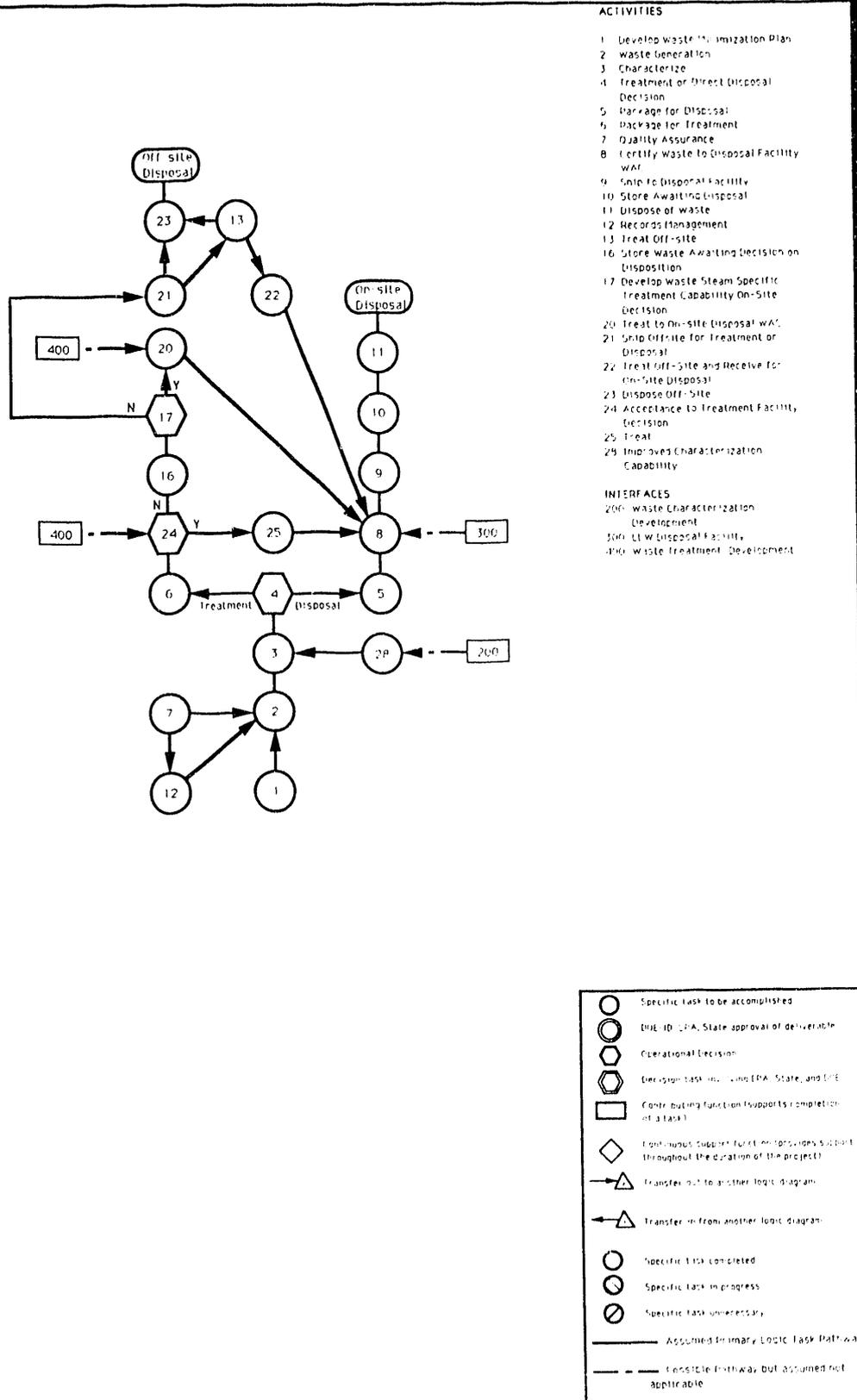


Figure 5-6. LLW/MLLW solids summary.

INEL WASTE MANAGEMENT OPS. ROADMAP

INEL LLW/MLLW Stored Solids

DATE: 9-14-91
Rev. 1

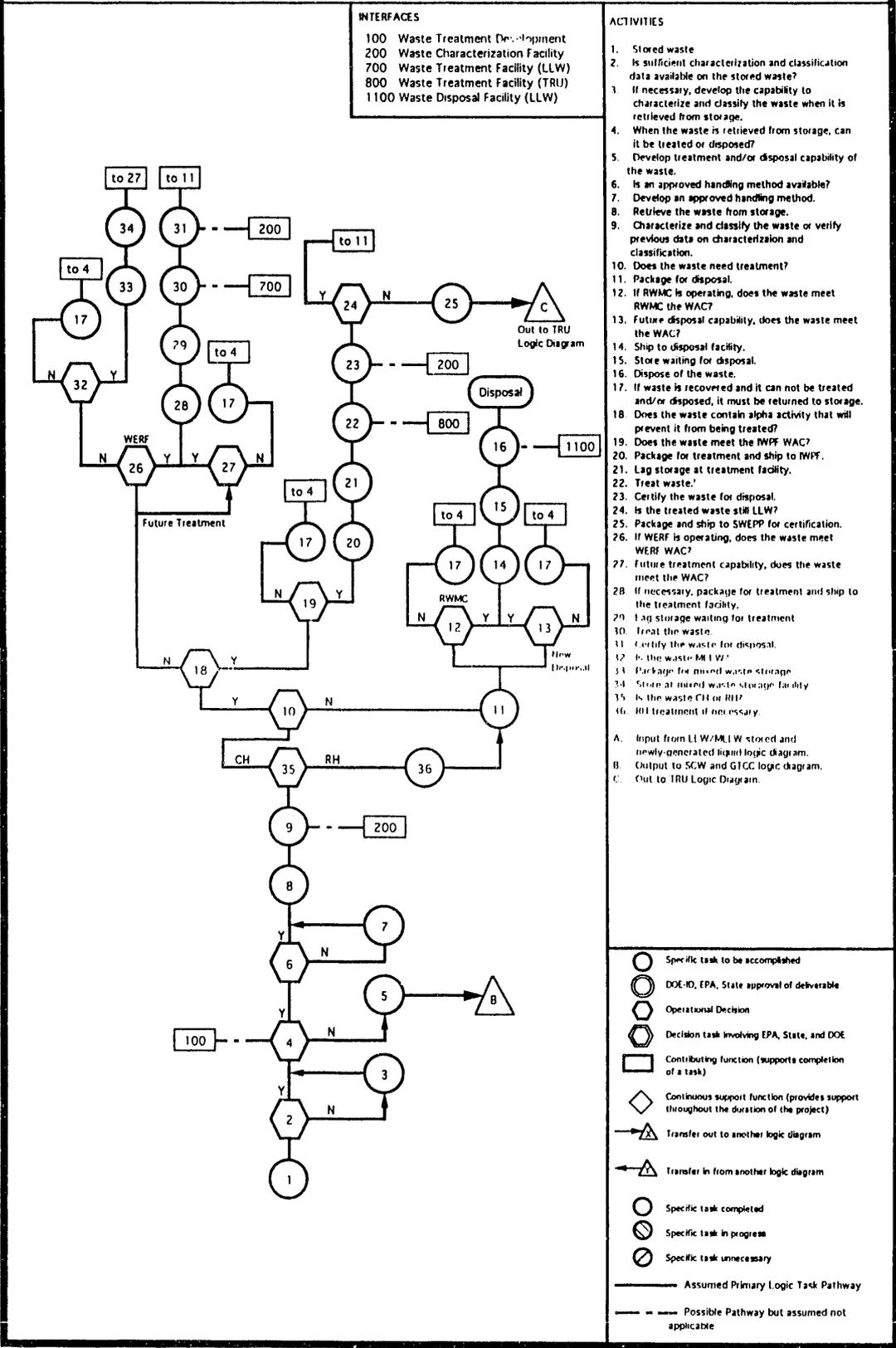


Figure 5-7. INEL LLW/MLLW stored solids.

INEL WASTE MANAGEMENT OPS. ROADMAP

INEL LLW/MLLW Newly-Generated Solids DATE 8-10-91
Solids Rev 1

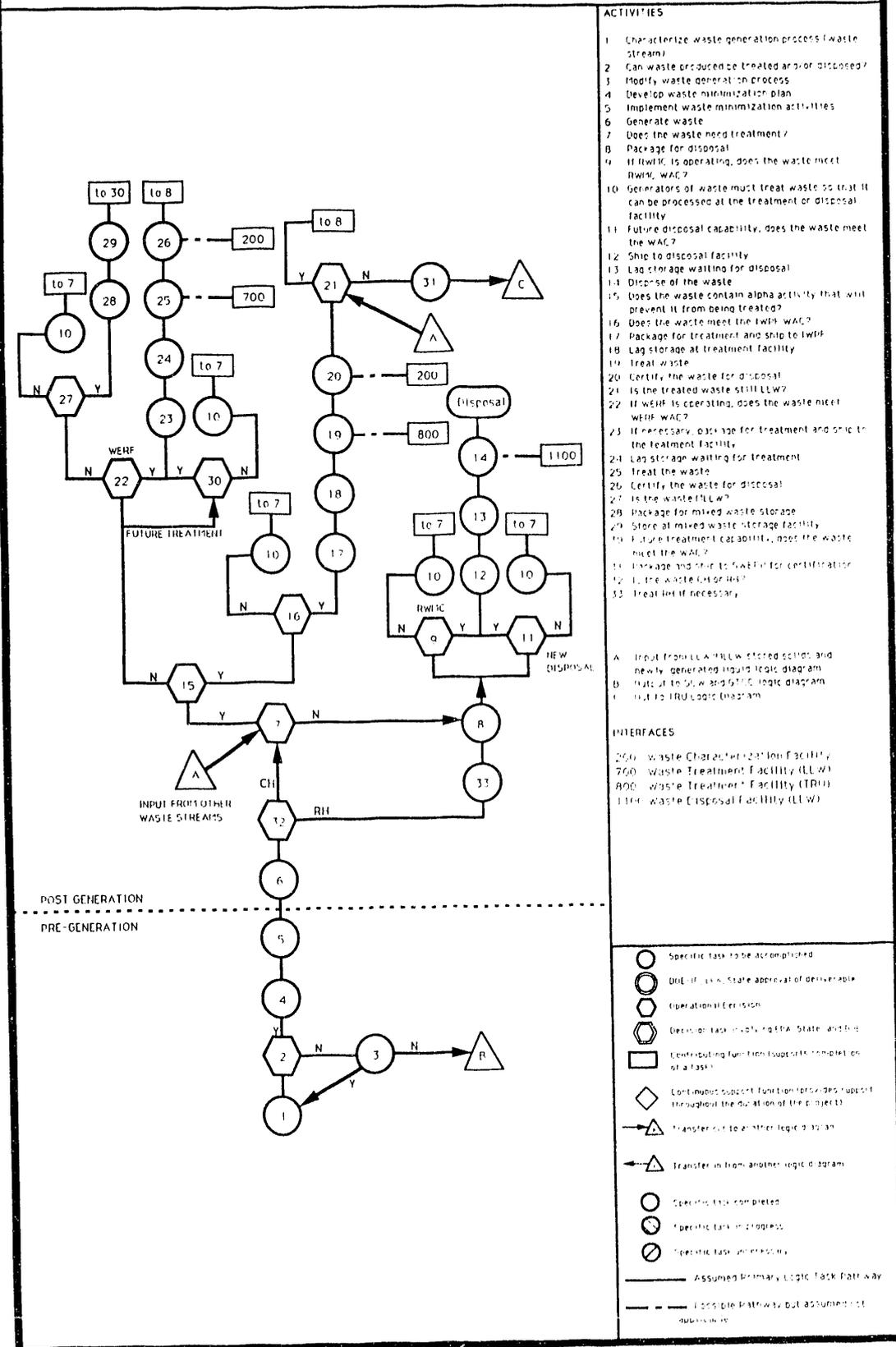


Figure 5-8. INEL LLW/MLLW newly-generated solids.

5.1.4 Low-Level Waste/Mixed Low-Level Waste Issue Statements

A. General

1. Effective waste management practices and compliance with waste minimization requirements cannot be accomplished without establishing below-regulatory-concern (BRC) radiological values or de minimis^a waste disposal criteria.
2. Disposition requirements, including waste types and volumes, for Environmental Restoration (ER) and Decontamination and Decommissioning (D&D) activities, including buried waste in the Subsurface Disposal Area, are not defined to support future TSD planning needs.
3. Changes in regulatory requirements are not being anticipated for waste management TSD activities and attention to future liabilities is not being considered in current practices, for example, disposal of LLW in a non-lined facility.
4. The Management and Operations (M&O) contractors do not have direct access to EPA and State Regulators to ensure compliance in their technical, not policy related, waste management activities.
5. DOE Order 5820.2A does not provide clear requirements for waste management including specific waste form requirements.
6. There is no systems approach to managing DOE Complex waste that considers the entire life-cycle of generation, waste minimization, and TSD.
7. TSD WAC are sometimes overridden on orders from M&O contractors and DOE-ID in favor of supporting production/waste generators.

B. Treatment

1. MLLW waste treatment capability and capacity on-Site are not adequate to meet RCRA treatment and disposal requirements.

a. *De minimis* is a term used in this document to reflect a yet-to-be-determined criteria for radioactive and/or hazardous waste disposal by less restrictive means. The NRC and EPA may eventually include de minimis waste disposal criteria (numerical concentration limits, or BRC values) as a part of their regulations.

2. No effort exists to coordinate national LLW/MLLW treatment utilizing common facilities, forcing the individual DOE sites to develop redundant capabilities.
3. Capability for treating stored PCB, lead, MLLW, and alpha contaminated LLW/MLLW (reclassified TRU) does not exist on the INEL.
4. Capability for treatment of RH/RH mixed waste does not exist.
5. Future treatment of alpha contaminated LLW/MLLW (reclassified TRU) waste may result in a final waste form that is classified as TRU waste, requiring acceptance and disposal at WIPP.
6. The volume of all disposed waste, is not being reduced to achievable ideal levels using available technology and facilities.

C. Storage

1. California-list and solvent-list mixed wastes are currently being stored out of compliance with storage prohibitions for hazardous waste (40 CFR 268).
2. The National Capacity Variance for storage of mixed waste will expire May 8, 1992, without treatment capabilities in place to process the wastes.
3. Storage of RH mixed waste is not in compliance with RCRA.
4. MLLW storage capacity is insufficient for future needs.

D. Disposal

1. An on-Site facility for mixed waste disposal (Subtitle C) does not exist.
2. Siting of a new LLW/MLLW disposal facility at the INEL may not be feasible due to the location of the aquifer and associated requirements.
3. Reclassified TRU waste cannot be disposed of at the RWMC due to high alpha content, and no alternative has been identified.
4. Site specific data is insufficient to validate performance assessment models for disposal.
5. Current disposal methods at the INEL do not provide for GTCC/Special Case waste.

6. Currently disposed waste contains large fractions of void volumes and future subsidence, degrading facility performance, is expected.
7. The RWMC currently does not have the capability to verify/validate waste package contents received from the generators or treatment facilities.
8. The RWMC burial room is limited and additional blasting or above grade vaults will be required to increase capacity.
9. Current funding for the RWMC is not adequate to audit generators and resolve issues.

E. Generator

1. There is insufficient incentive given to waste generators to motivate compliance with waste management requirements and best practice implementation, such as proper segregation of waste, volume minimization, and waste avoidance.
2. MLLW streams are currently generated on-Site and treatment for these waste streams have not been identified.

F. Transportation

TBD

G. Waste Minimization/Recycle

1. Detailed requirements and guidelines for waste minimization techniques are not adequate or being implemented by the generator.
2. A Lead Management Program is not being implemented at the INEL to eliminate large inventories of lead/mixed waste and to comply with RCRA storage restriction time limitations.

H. Waste Characterization/Classification

1. Knowledge (characterization and projected volumes) of existing and future wastes is inadequate to size and develop future TSD facilities.

INEL Waste Management Operations Roadmap Document	Title: Waste Types Section: 5 – Low-Level Issue date: 04-30-92
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2. INEL analytical capability and capacity are not adequate to evaluate the types and numbers of waste samples that will be required in the future.
3. EPA required SW-846 analytical procedures, to identify RCRA constituents of mixed wastes, are incompatible with currently available equipment and radiological control requirements.

I. Facility Closure/D&D

1. Existing TSD facilities should be considered for modification instead of closure since existing facilities are not currently being used to their maximum potential, such as WERF, and estimates for life-expectancy do not justify closure.
2. Adequate technical justification does not exist for closing existing TSD facilities and building new facilities.
3. In order to be conservative, some programs are not incorporating intelligent compliance by substantially avoiding over characterization of waste.

5.1.5 Vision of the Future

In future years the following LLW/MLLW waste stream actions will occur at INEL:

- RWMC will be closed in accordance with applicable regulations
- Final disposition will be completed for all "orphan" waste streams
- Waste generation will be reduced to the minimum possible
- All waste will be treated to the maximum possible; treatment and disposal systems will be in accordance with applicable regulations
- All on-Site transport of LLW/MLLW will meet DOT regulations
- Treatment and disposal systems will be in place for future waste streams; D&D waste stream, and New Production Reactor (NPR) waste stream
- Provide DOE systems treatment support.

The following figures contain a process model that provides details about the vision of the future for the waste stream.

Low Level/Mixed Low Level Waste Stream

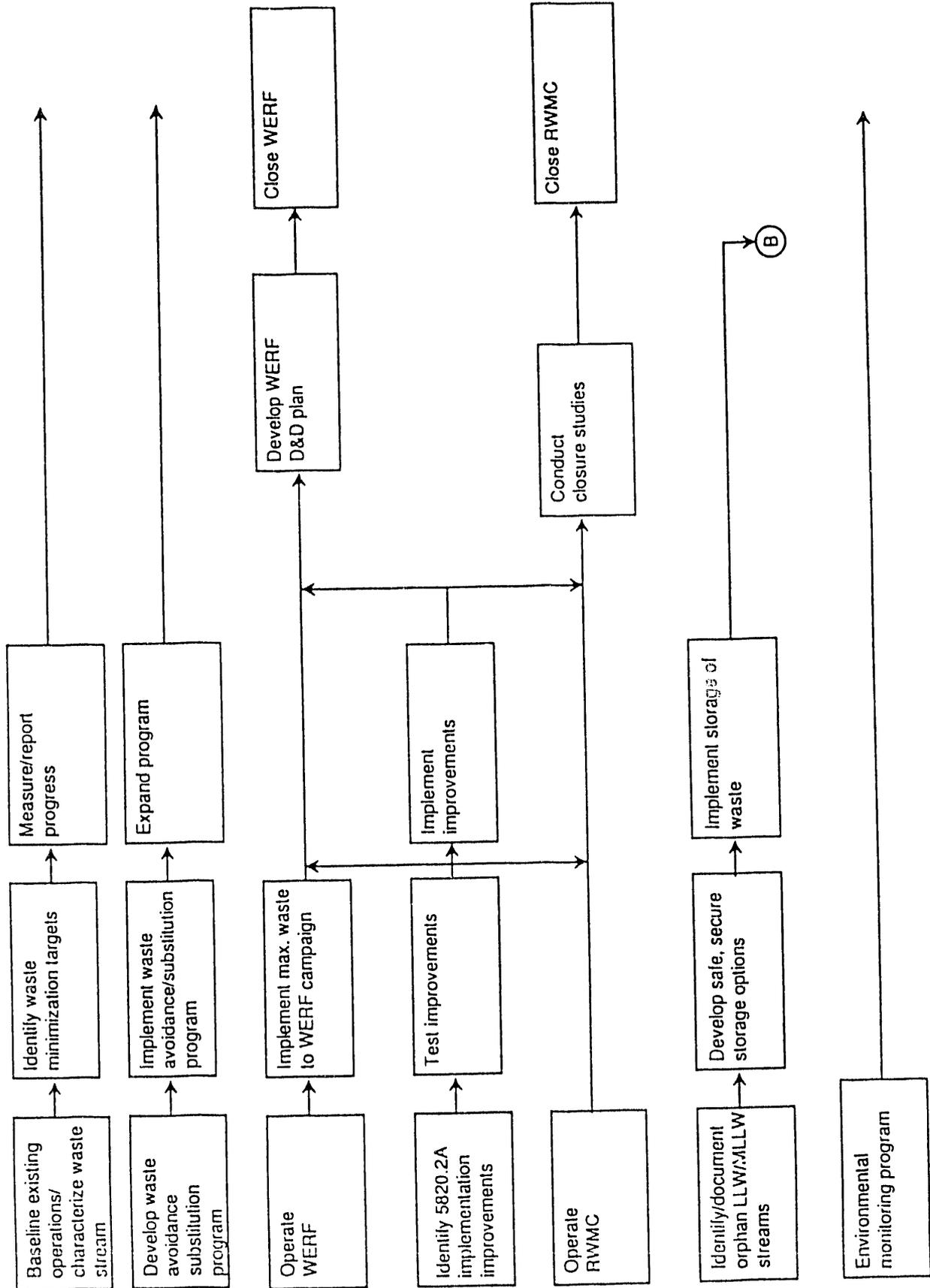


Figure 5-9. LLW/MLLW process model.

Low Level/Mixed Low Level Waste Stream

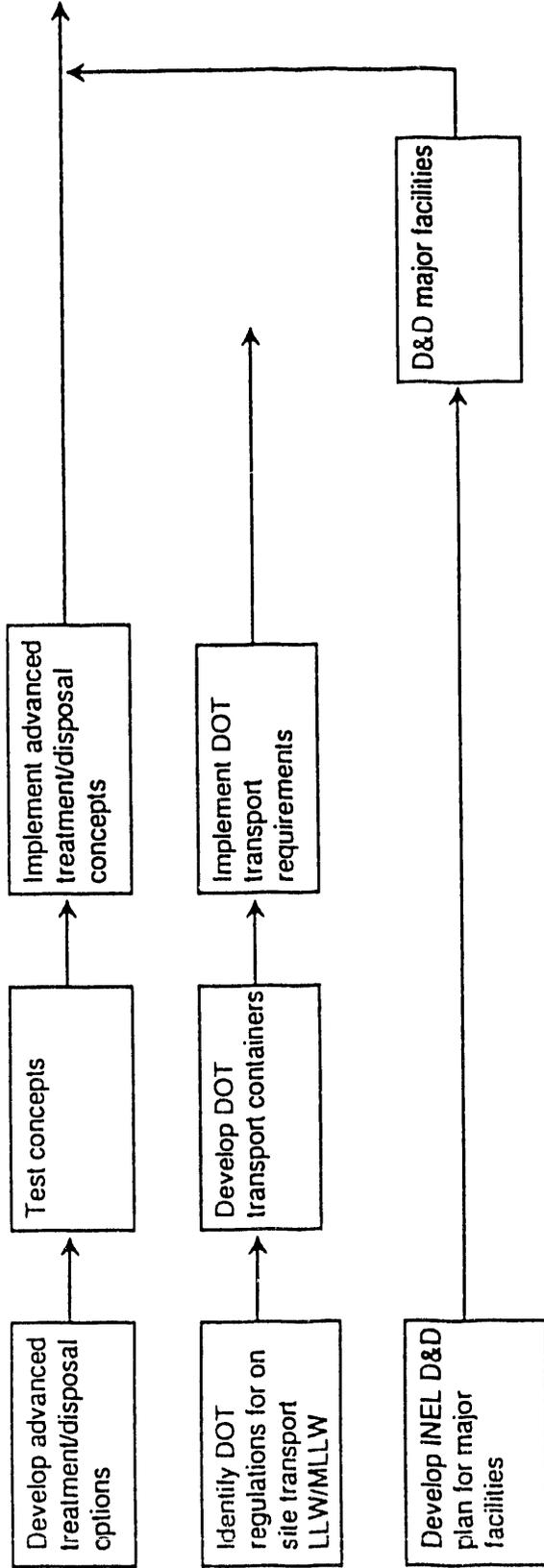


Figure 5-9. (continued).

5.2 Transuranic/Mixed Transuranic Waste

The following is a brief description of the current status of TRU/Mixed TRU requiring treatment, storage, and disposal TSD at WIPP:

- A. No national strategy/timetable exists for disposition of TRU/Mixed TRU waste.
- B. Delay in opening of WIPP has increased interim storage requirements for TRU waste.
- C. There is no assurance WIPP will ever open.
- D. EPA has issued a notice of noncompliance for current storage practices for waste-in-air support buildings.
- E. Stored waste containers are approaching design life.
- F. Condition of earth-covered storage is unknown.
- G. More than 60% of waste volume of the stored TRU waste is not compatible with the transuranic package transporter (TRUPACT-II) shipping container payload compliance.
- H. Final WIPP WAC and waste form requirements are unknown.
- I. No final disposition exists for buried TRU waste.
- J. Final requirements for RH TRU are unknown.
- K. No certification capability exists for TRU waste.
- L. No licensed transportation capability exists for RH TRU waste.
- M. WIPP will only accept stored TRU waste, not buried TRU waste.

5.2.1 Transuranic/Mixed Transuranic Planning Baseline

A. TRU Operations

1. The RWMC Transuranic Storage Area (TSA) will continue to receive and store TRU waste; maintain facilities to support receipt handling and storage; and maintain procedures, training and support facilities for waste examination, certification, and retrieval.
2. Necessary funding will be available to perform all required tasks to maintain the RWMC facility in operational readiness and in compliance with regulations.
3. RWMC will prepare TSA TRU waste retrieval.
4. RWMC support activities include compliance efforts, documentation upgrades to incorporate new requirements, and surveillance to assess compliance.

B. TRU Technical Programs

1. Required funding for various projects is approved on schedule.
2. An Alpha facility is available to perform sampling program activities.
3. Personnel are available to perform identified work scope.
4. No major programmatic scope changes are incurred.
5. An RH TRU assay system can be developed.
6. RH TRU certification, transportation, and disposal requirements, are determined by WIPP in FY 1991.

C. TRU Examination, Certification, Verification

1. Storage module construction will preclude venting operations until January 1993.
2. TSA retrieval operations will commence in FY 1994.
3. Full-scale drum venting operations will resume beginning of FY 1994.
4. Funding to provide all required tasks will be available.

D. TRU Retrieval Operations

1. Construction of the retrieval enclosure building will be completed by FY 1994.
2. A decontamination of the known contaminated portion of the TSA pad will be completed in FY 1994.
3. Sufficient storage will be available in completed storage modules to store boxes by September 30, 1993.
4. The confidence level in the budget estimate is moderate since this is a new task and no prior year reference data is available.

E. Mobile Nondestructive Examination/Nondestructive Assay

1. The operational status of the systems has been verified by Los Alamos National Laboratory (LANL).
2. Environmental documentation is available to support the operation of the system.
3. Off-Site operation can be performed based on the INEL operational documentation.
4. Funding beyond FY 1991 will be provided by DOE-HQ through DOE-ID.

F. WIPP Uncertainties

1. WIPP may open earlier than 1996.
2. A two-shift operation is necessary to meet shipping needs to WIPP.

G. TSA Retrieval Enclosure Facility

1. NEPA documentation will be completed in early FY 1991 to support FY 1991 start of construction.
2. RWMC utility upgrades will be provided by ADS-ID-101-E2.
3. This ADS provides funding for all facility specific activities necessary to begin operations in FY 1994. ADS-ID-8-E5 provides funding for qualification training of all non-project specific RWMC personnel before facility operation and for operation of the facility beginning in FY 1994.

H. Waste Characterization and Storage Facility

1. This ADS includes design, construction, and operational readiness for the activities described.
2. NEPA documentation will all be completed early in FY 1991 to support construction of the storage modules, Site improvements, and the operations control building.
3. Separate NEPA documentation will be prepared for the Waste Characterization Facility.

I. Idaho Waste Processing Facility - (IWPF)

1. The Idaho Waste Processing Facility (IWPF) detailed design and construction will be divided into two phases, with a common conceptual design.
2. Phased construction, 19 months apart, will be used for the Phase I and Phase II plants. Initial permit approvals for Phase I construction will have to be reworded for Phase II, increasing the cost over a single-phase project.
3. An EIS will be required for development of the IWPF. A substantial amount of the input for the IWPF EIS will be derived from data generated for the Site-wide INEL ER&WM EIS funded under ADS ID 76-El. The cost of developing this reference data is not funded under this ADS submittal.

J. Support to WIPP

1. The Planning Package estimates are based upon Revision 6.1 of the WIPP Waste Characterization Plan. The estimates do not include any changes required because of the WIPP No-Migration Petition or waste characterization requirements that may be imposed by the State of New Mexico Environmental Improvement Division.
2. A separate funding request will be provided by ANL-W for sampling and characterization of waste.
3. WIPP will provide funding for transportation of the waste from the INEL to WIPP.
4. Test bins made up of WIPP-certified waste drums will not require nondestructive examination/assay or recertification at the Stored Waste Experimental Pilot Plant (SWEPP) following the repackaging activity.
5. All waste for the Experimental Program must consist of only Rocky Flats generated waste which has been certified at either Rocky Flats or the INEL.
6. The B2 Cask will be used for the on-Site shipment of waste between RWMC and ANL-W. Alternate transportation methods must be identified for waste containers that do not comply with the B2 cask or TRUPACT-II Certificate of Compliance.
7. Certification of the SWEPP Facility to examine and assay waste boxes will not be available until FY 1993. At present, no requirement for utilizing boxed waste has been identified by the WIPP Program.

8. Sludge analysis will not be conducted until FY 1992.
9. Headspace gas sample will be obtained from all drums and bins.
10. Gas sampling of the inner bags is not presently required.
11. Analytical requirements are based on the November 30, 1990 draft Quality Assurance Program, Plan (QAPP).
12. Total program requirements for sample canisters have not been determined. A total of 550 canisters has been procured for the program.

K. Quality Assurance Program Plan for WIPP

1. Draft QAPP Rev. 1.0 will cover constraints imposed by the final ruling on the WIPP No-Migration Variance Determination.
2. DOE-HQ will concur with the QAPP task manager's recommendations relating to WAC and the operations responsibilities of the WIPP Program Office (WPO), Sandia, Westinghouse, and DOE-HQ.
3. DOE-HQ is responsible for obtaining all final approvals.
4. The performance demonstration program, as initially designed, will serve the dual function of providing analytical protocols and qualifying the analytical laboratories.
5. Budget estimates are based on DOE, EPA and State of Idaho regulations as understood at this time. Specific regulatory requirements imposed by these agencies may severely impact the scope and budget estimates given for all fiscal years.
6. Actual analytical method development is outside of the scope of this work.

5.2.2 Key Regulatory Drivers

The following are the regulatory drivers that require special attention to ensure compliance with all applicable laws and regulations:

- DOE Order 5400.3
- DOE Order 5820.2A
- Commitments to State of Idaho
- FFCA
- 40 CFR 264/265
- CECRLA/SARA
- IAG

5.2.3 Logic Diagrams

The following pages contain the logic diagrams for the TRU/Mixed TRU waste stream:

- **Figure 5-10.** INEL newly generated TRU/TRU mixed.
- **Figure 5-11.** Certified TRU & reclassified LLW in protected storage.
- **Figure 5-12.** TRU/TRU mixed (earth covered/stored).
- **Figure 5-13.** TRU/TRU mixed (protective storage).
- **Figure 5-14.** Off-Site newly generated TRU/TRU mixed received for interim storage.

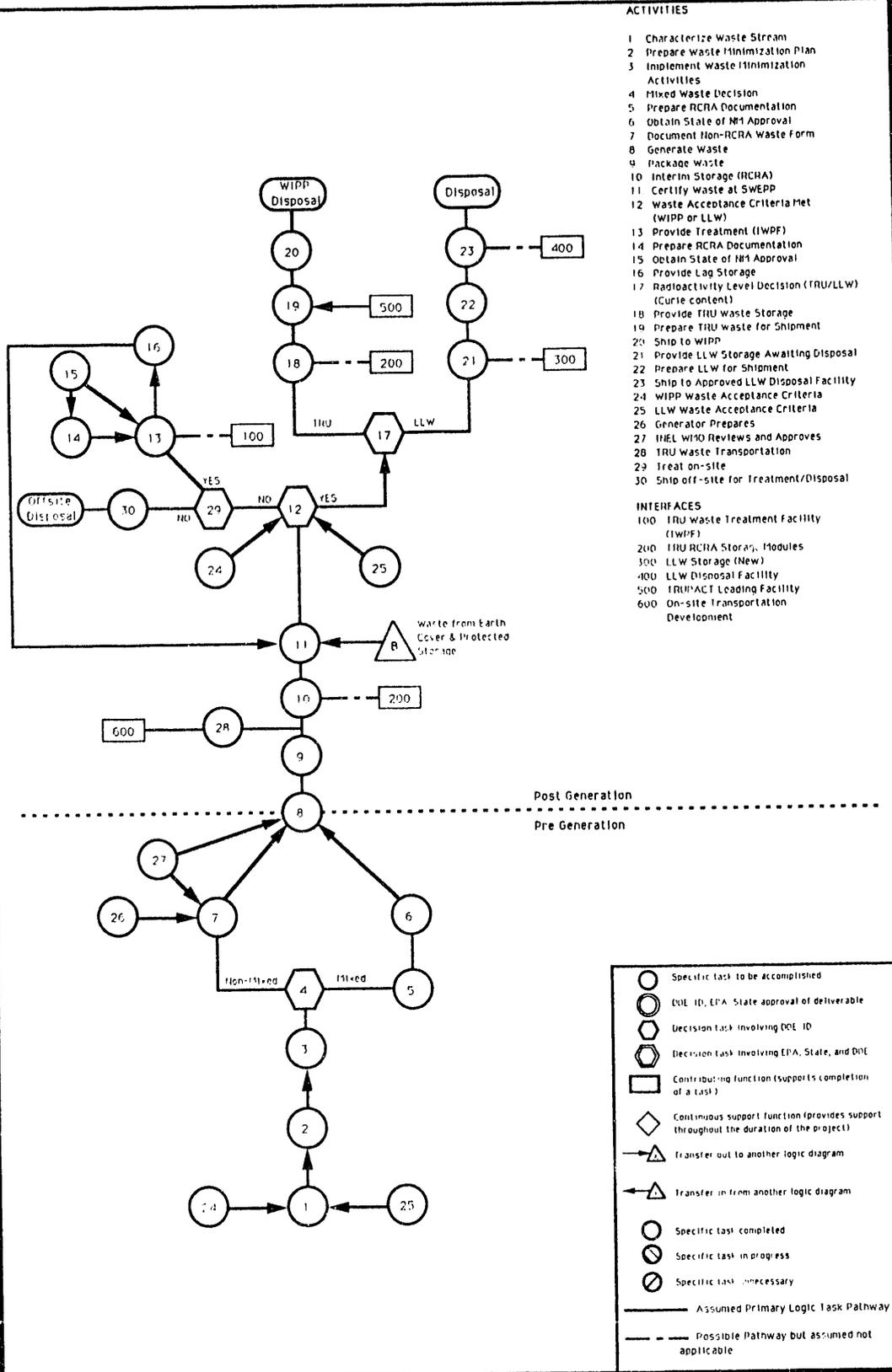
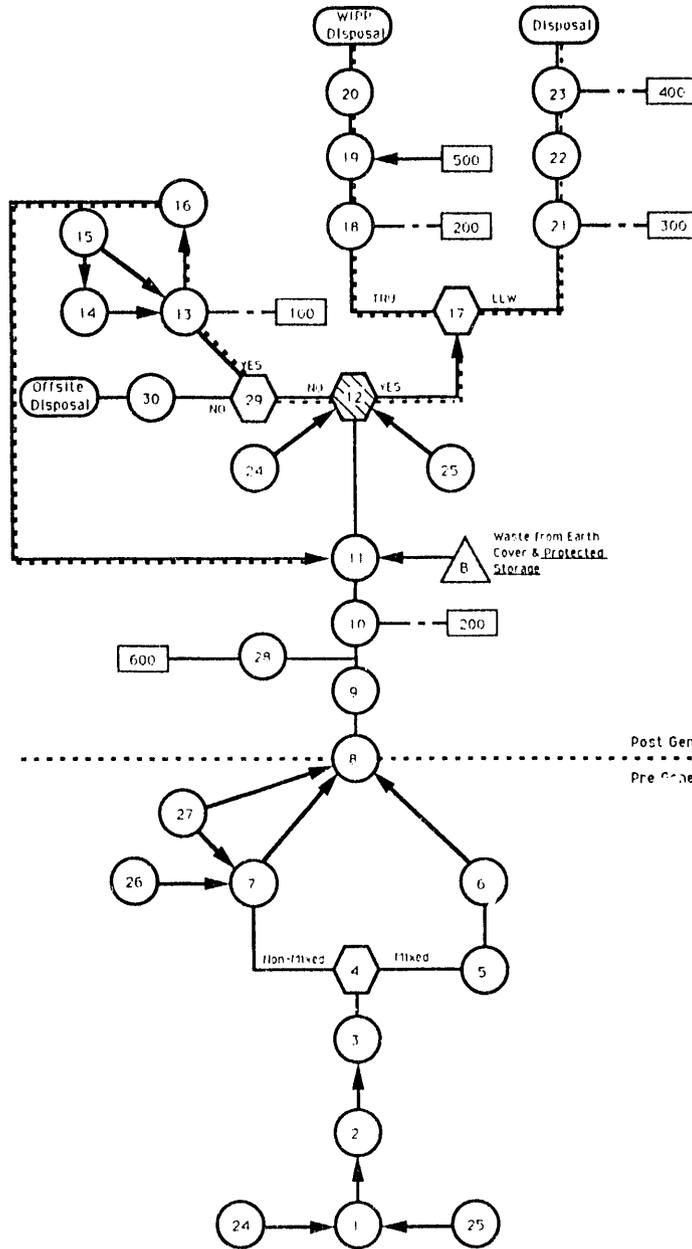


Figure 5-10. INEL newly generated TRU/TRU mixed.

STATUS
CERTIFIED TRU & RECLASSIFIED LLW IN PROTECTED STORAGE



ACTIVITIES

- 1 Characterize Waste Stream
- 2 Prepare Waste Minimization Plan
- 3 Implement Waste Minimization Activities
- 4 Mixed Waste Decision
- 5 Prepare RCRA Documentation
- 6 Obtain State of MI Approval
- 7 Document Non-RCRA Waste Form
- 8 Generate Waste
- 9 Package Waste
- 10 Interim Storage (RCRA)
- 11 Certify Waste at SWEDD
- 12 Waste Acceptance Criteria Met (WIPP or LLW)
- 13 Provide Treatment (TWPF)
- 14 Prepare RCRA Documentation
- 15 Obtain State of MI Approval
- 16 Provide Lag Storage
- 17 Radioactivity Level Decision (TRU/LLW) (Curie content)
- 18 Provide TRU Waste Storage
- 19 Prepare TRU Waste for Shipment
- 20 Ship to WIPP
- 21 Provide LLW Storage Awaiting Disposal
- 22 Prepare LLW for Shipment
- 23 Ship to Approved LLW Disposal Facility
- 24 WIPP Waste Acceptance Criteria
- 25 LLW Waste Acceptance Criteria
- 26 Generator Prepares
- 27 INEL WIPD Reviews and Approves
- 28 TRU Waste Transportation
- 29 Treat on-site
- 30 Ship off-site for Treatment/Disposal

INTERFACES

- 100 TRU Waste Treatment Facility (TWPF)
- 200 TRU RCRA Storage Modules
- 300 LLW Storage (New)
- 400 LLW Disposal Facility
- 500 WIPD Waste Acceptance Criteria
- 600 On-site Transportation Development

Post Generation

Pre Generation

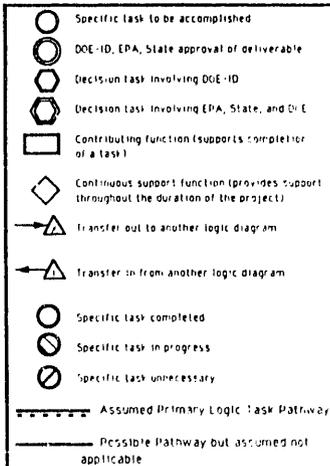


Figure 5-11. Certified TRU & reclassified LLW in protected storage.

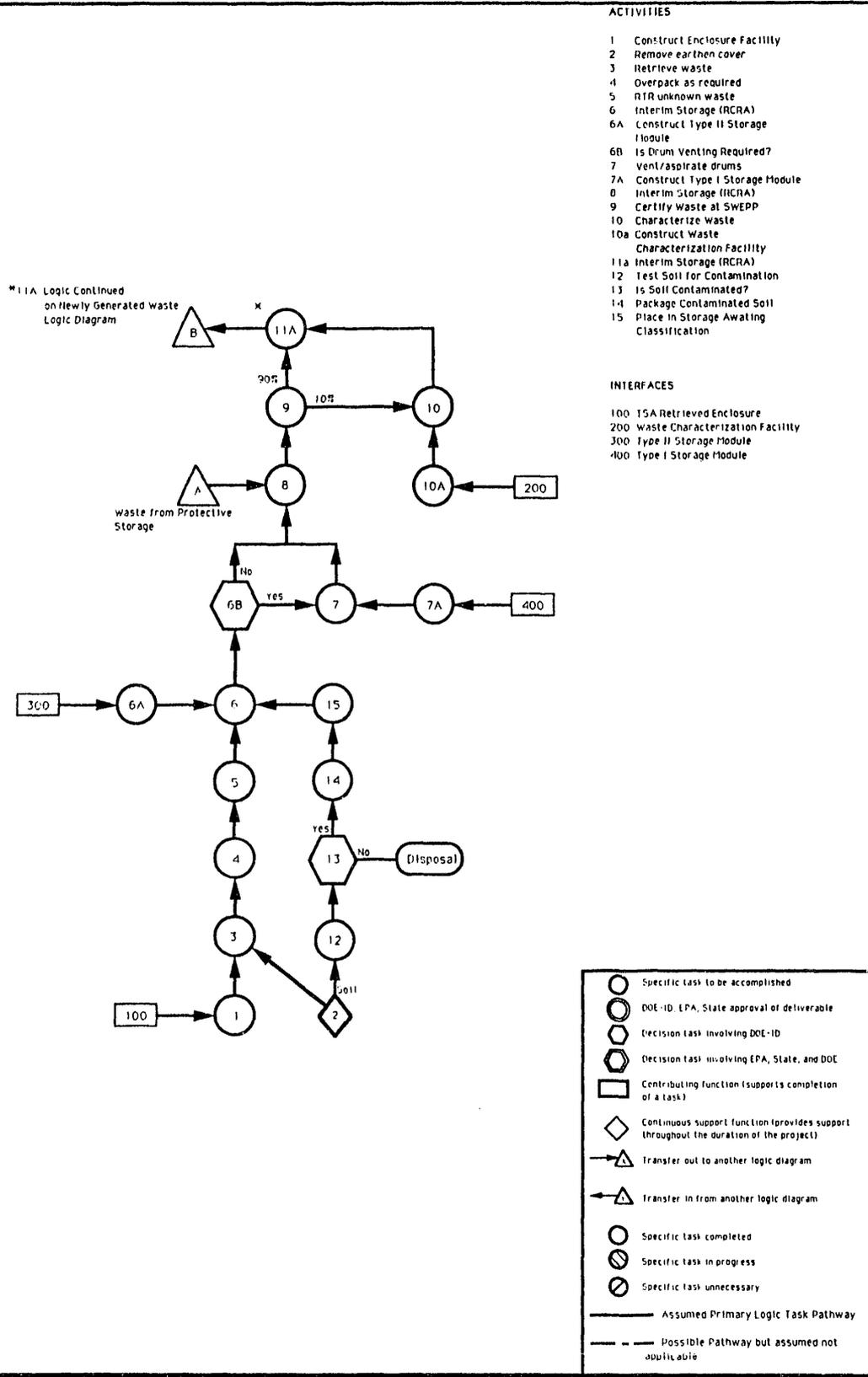


Figure 5-12. TRU/TRU mixed (earth covered/stored).

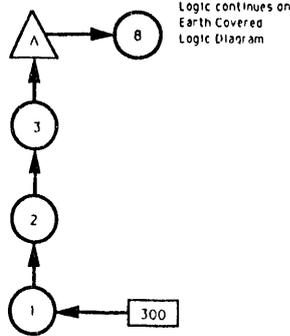
INEL WASTE MANAGEMENT OPS. ROADMAP

TRU/TRU Mixed (Protective Storage)

DATE 5-24-91
Rev 1

ACTIVITIES

- 1 Construct Type II Storage Module
- 2 Reconfigure Waste to New Storage
- 3 Interim Storage (RCRA)



INTERFACES

300 Type II Storage Module

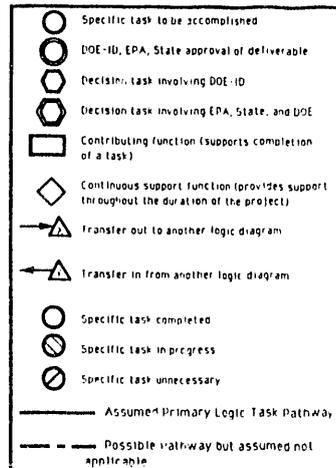
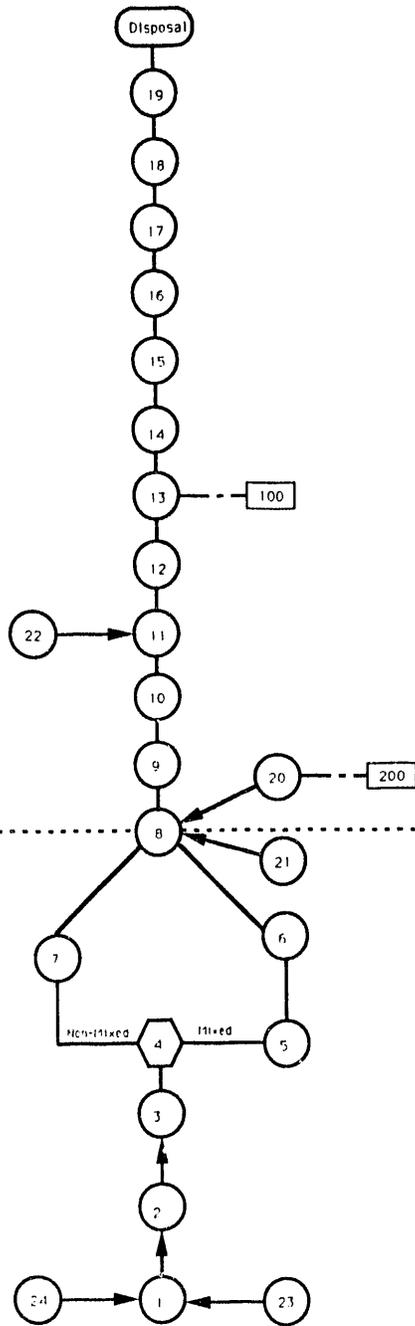


Figure 5-13. TRU/TRU mixed (protective storage).

INEL WASTE MANAGEMENT OPS. ROADMAP

Offsite Newly Generated
TRU/TRU Mixed Received for
Interim Storage

DATE: 8-14-91
Rev 1



ACTIVITIES

- 1 Characterize Waste Stream
- 2 Prepare Waste Minimization Plan
- 3 Implement Waste Minimization Activities
- 4 Mixed Waste Decision
- 5 Prepare RCRA Documentation
- 6 Obtain State of MI Approval
- 7 Document Non-RCRA Waste Form
- 8 Generate Waste
- 9 Package Waste
- 10 Summit Data Package for INEL Review
- 11 Obtain INEL Shipment Approval
- 12 Prepare TRUPACT Shipment to INEL
- 13 Interim Storage (ICRA) at INEL
- 14 Retrieve Waste from Storage
- 15 Transfer to TRUPACT Loading Station
- 16 Prepare WIPP Data Package
- 17 Obtain Shipping Authorization
- 18 Load TRUPACT I-II
- 19 Ship to WIPP
- 20 Sampling & Analysis
- 21 Generator Compliance Audit
- 22 WIPP WAC PML
- 23 Meet INEL WAC
- 24 Characterize per DOE Order 58202A

INTERFACES

- 100 Type II Storage Modules
- 200 Analytical Capability Development

Post Generation

Pre Generation

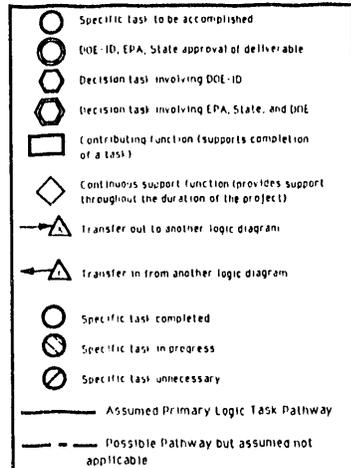


Figure 5-14. Off-Site newly generated TRU/TRU mixed received for interim storage.

INEL Waste Management Operations Roadmap Document	Title: Waste Types Section: 5 — Transuranic Issue date: 04-30-92
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5.2.4 Transuranic Waste Issue Statements

A. Issue 1 - WIPP Land Disposal Restrictions

What would happen if hazardous-waste land disposal restrictions are determined to apply to WIPP?

Basis

The 40 CFR 268 identifies wastes that are restricted from land disposal. A "no migration" petition has been filed with the EPA. Pending review by the EPA, DOE seeks a variance on treatment requirements until either mixed waste treatment standards are promulgated or the "no migration" petition is approved so Land Disposal Repository (LDR) mixed waste can be disposed of at WIPP without treatment.

Strategy

Continue with the current strategy to process some of the waste at IWPF. Re-evaluate the requirements when the "no migration" petition is resolved.

Alternative

New treatment facility

B. Issue 2 - WIPP Performance Assessment

What would happen if the WIPP Performance Assessment requires enhanced waste forms or restricts TRU waste disposal? Any delay in the opening of WIPP and the development of a TRUPACT system has serious impact on the C&S storage capacity and eventually the processing rate of SWEPP.

Basis

The 40 CFR 191, "Environmental Standards for Management and Disposal of Spent Nuclear Fuel, High-Level, and Transuranic Radioactive Wastes," states performance assessment criteria.

Current-draft congressional legislation concerning the withdrawal of public lands, requires compliance with performance assessment objectives before a decision is made to designate WIPP as a permanent repository. The performance assessment of WIPP could result in major impacts to the current INEL TRU waste management plans if: (a) the repository does not comply with 40 CFR 191 and cannot be used to dispose of TRU waste, and (b) improved waste forms are required to meet performance objectives.

Strategy

1. If WIPP is not designated a permanent repository, new storage of all currently stored waste will continue to ensure container integrity is maintained. Continuing storage will be required until a new repository is designated.
2. If improved waste forms are required, IWPF will be used to provide a viable treatment process to the extent possible. Evaluations would be performed, based on treatment requirements, to determine whether or not additional IWPF capability or capacity is needed.
3. No capital funds will be requested or expended on alternatives until the WIPP performance assessment is finalized.

Alternative

Pu Recovery - Plutonium recovery may be an alternative that could substantially reduced the volume of TRU waste.

C. Issue 3 - TRU Waste Storage RCRA Compliance

What can be done to assure that storage facilities for retrievable TRU waste are in compliance with applicable RCRA regulations?

Basis

40 CFR 264-265, RCRA Storage Requirements
INEL Negotiated Compliance Activity

Strategy

Negotiate compliance from the RCRA Storage Requirements based on the applicability of the RCRA requirements to mixed waste. (NOTE: A discussion paper has been prepared to try to resolve this issue with EPA.)

Alternatives

1. Upgrade existing storage facilities to comply verbatim with RCRA requirements.
2. No action could result in RCRA noncompliance at INEL RCRA mixed waste facilities, with subsequent civil and criminal litigation and/or enforcement actions.

D. Issue 4 - TRU Waste Storage Capacity

What is the impact of the anticipated WIPP shipment schedule on current TRU waste storage capacity? What can be done to remedy the situation?

Basis

The WIPP shipment schedule has not been issued. Strategy will be developed when schedule is issued.

Strategy

Upgrade existing storage facilities and construct new TRU storage facilities.

Alternative

No action, will result in inadequate storage capacity, due to the limited shipment capacity.

E. Issue 5 - TRU Waste Treatment

Is a new TRU Waste Treatment and Storage Facility (TWTSF) necessary to comply with the TRUPACT II Payload Compliance Plan?

Basis

TRUPACT II Certification of Compliance requires that waste be certified to qualify for transport.

Strategy

1. Build the proposed new TWTSF adjacent to RWMC.
2. Build a LLWPF adjacent to RWMC to reduce shipments to IWPF.

Alternative

1. Obtain waivers to TRUPACT II Certification of Compliance.
2. Develop alternative transport system that can transport drums and boxes.

Other Related Activities

The INEL RH Certification Implementation Project is developing capabilities for retrieving and certifying stored RH-TRU waste.

The Stored TRU Mixed Waste Characterization Task Force will develop methodology for identifying and quantifying hazardous constituents contained in TRU waste.

E. Issuc 6 - IWPF

If the decision is made not to use IWPF for processing stored uncertifiable TRU, how will this waste be processed?

Basis

The 49 CFR 172-173 and DOE Order 1540.1 shipping requirements make building a TRU waste thermal treatment facility adjacent to the RWMC more cost-effective. The TRU waste thermal treatment facility is necessary to process TRU mixed hazardous waste to meet 40 CFR 261 requirements, pursuant to DOE Order 5820.2A, Chapter II, in order to allow waste minimization and shipping to WIPP for disposal. This assumes the 40 CFR 268 land ban restrictions apply to WIPP.

Strategy

Design and construct a new TRU waste thermal treatment facility adjacent to the RWMC.

Alternative

1. Develop chemical, or other treatment as an alternative.

G. Issuc 7 - SWEPP

How will SWEPP address key issues it will face in the upcoming years?

Basis

Several key issues will face SWEPP in the upcoming years. These include the processing of Mound and other non-Rocky Flats TRU waste, C&S storage capacity, storage of precertified waste boxed outside, mobile NDE/NDA database interface, and the need for an evaluation on SWEPP box processing versus shipment.

With respect to the Mound waste, the plywood spacer that was placed between the lid and the liner could cause problems with venting. This problem will need to be addressed because there are 200 drums awaiting examination in the Air Support building. This building is due to be deflated with no plans for reuse.

H. Issue 8 - SWEPP Special-Case Waste

How will special-case wastes be disposed of?

Basis

Two key issues face the Special-Case Waste Program. The first is the availability of process capability for this waste stream both on-Site and off-Site. The second is the permitting of such facilities for hazardous waste processing. The decisions are not critical, and the work-off of special-case wastes has been delayed until other program issues such as the IWPF, oversize processing, waste transportation, etc. are resolved.

I. Issue 9 - TRU Waste Transport

What impact will approval of DOE Order 5480.3A have on TRU waste shipments?

Basis

The 49 CFR 172-173 and DOE Order 1540.1 define transportation requirements for transuranic waste. Draft DOE Order 5480.3A establishes policies for on-Site transport of waste.

This Order requires that all on-Site shipments comply with the same criteria as off-Site shipments. This requirement will have no impact on shipment of SWEPP LLW from SWEPP to IWPF, but shipment of noncertifiable TRU waste from SWEPP to IWPF, will be affected. The Order allows the cognizant DOE Field Office the authority to approve alternatives to 49 CFR 173 transportation systems, as long as equivalent safety is assured.

Strategy

Confirm that a TRUPACT I or Super Tiger or Poly Panther M-55 Transporter will satisfy all applicable safety requirements for shipment of uncertifiable TRU waste to IWPF.

Alternatives

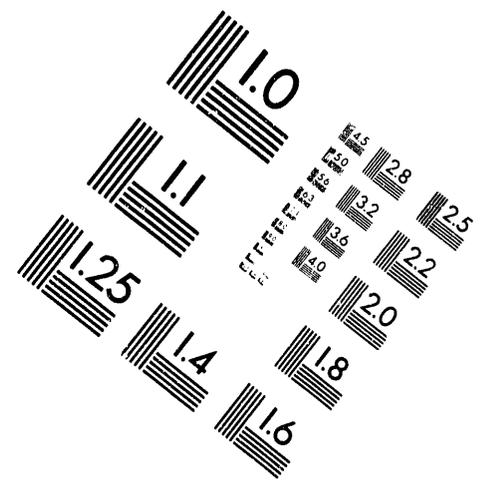
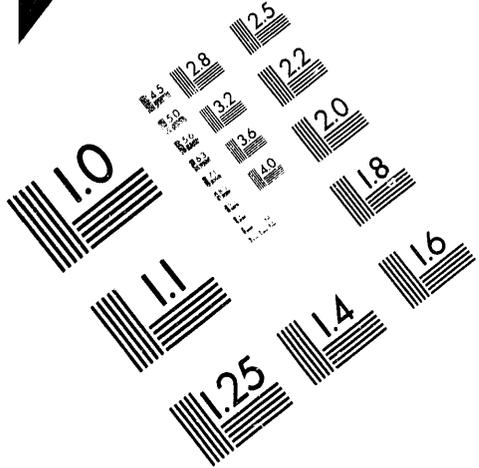
1. Obtain a waiver for the TRUPACT II container to allow shipment of uncertified TRU waste.
2. Ship boxes in a modified (rubber tire) ATMX railcar.
3. Build a rail spur to IWPF and maintain the waiver which has allowed shipment in ATMX railcars.
4. Design and construct a new thermal treatment facility adjacent to the RWMC to eliminate the transportation problem.



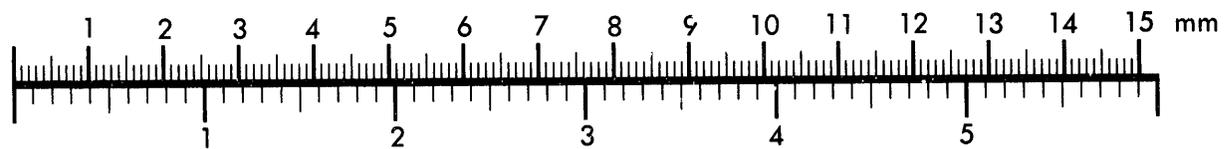
AIM

Association for Information and Image Management

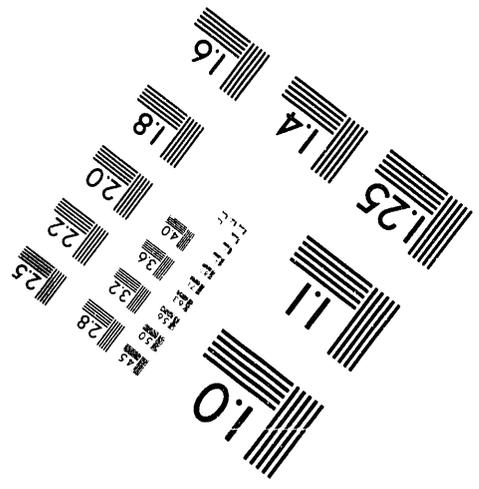
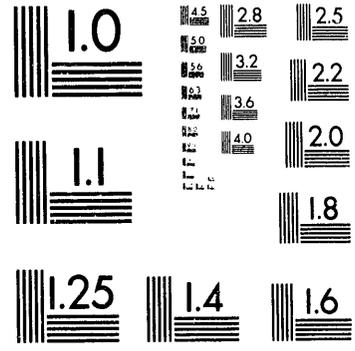
1100 Wayne Avenue, Suite 1100
Silver Spring, Maryland 20910
301/587-8202



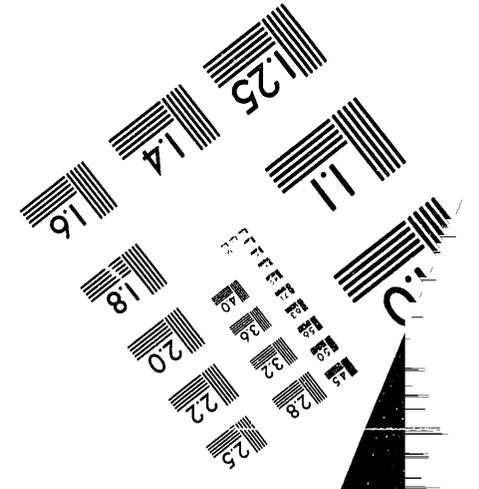
Centimeter



Inches



MANUFACTURED TO AIM STANDARDS
BY APPLIED IMAGE, INC.



2 of 5

J. Issue 10 - Buried TRU Waste

If buried TRU waste requires disposal, what are the viable options?

Basis

1. GAO report entitled, "Nuclear Waste - DOE's TRU Waste Disposal Plan Needs Revision," March 1986. This document does not make recommendations for disposal of buried TRU waste.
2. WIPP Environmental Impact Statement (EIS). Buried TRU waste was not included in the EIS for WIPP. DOE removed buried TRU waste from the scope of WIPP when it was established that the volume of stored, newly generated, and buried TRU greatly exceeded the design capacity of the WIPP facility. Even if the EIS is amended to include buried TRU waste, WIPP may not have the required capacity.
3. DOE Order 5820.2A, Ch. 2, establishes WIPP as a disposal option.

Strategy

Store all retrievable TRU waste in certified packages meeting all WIPP Waste Acceptance Criteria until a final resolution is reached.

Alternative

Chemical separation of transuranics (both Pu-239 and Am-241) from the waste effects a 50-95% volume reduction. (See Plutonium Recovery issue.) Note that simply removing the plutonium from the waste could still leave the waste transuranic by virtue of the remaining AM-241.

K. Issue 11 - Remote-Handled TRU

How will noncertifiable RH-TRU waste be processed?

Basis

DOE Document WIPP 88-028, *Long Range Master Plan for Defense Transuranic Waste Program*, December 1988, designates ORNL as a central processing facility for defense noncertifiable RH-TRU waste.

Strategy

The Waste Handling Pilot Plant (WHPP) is being designed and built at Oak Ridge to process RH-TRU which cannot be certified by inspection. All noncertifiable RH-TRU waste at INEL will be shipped to WHPP. However, an approved transport container needs to be developed. It is expected that an RH cask transport will be made available when INEL is ready to ship to WIPP.

Alternatives

1. Modify the TAN Hot Cells (October 1988 Alternative Document).
2. Design and construct a hot cell at the RWMC for processing noncertifiable RH-TRU.
3. Send selected RH-TRU to ICPP and process the RH-TRU waste for plutonium recovery.

L. Issue 12 - Plutonium Recovery

Should plutonium recovery from stored and buried TRU waste be completed prior to disposal?

Basis - ALARA Waste Reduction Guidance

DOE ID 5820.2A issues guidance for deferring shipment of stored TRU waste considered to have high concentrations of potentially recoverable Plutonium-239 until a decision is made regarding plutonium recovery. Plutonium is a primary transuranic contaminant in the INEL stored and buried TRU waste. Implementation of plutonium recovery could reduce the quantity of TRU waste requiring disposal and conserve a valuable resource. The processed waste may possibly be disposed of as a LLW. The document entitled *Investigation of Plutonium-239 Recovery from RWMC TRU Waste*, June 1989, outlines recommendations for implementing plutonium recovery.

Strategy

Develop and demonstrate the feasibility of plutonium recovery. Initiation of a Waste Reclassification Program is proposed for FY 1990 (pending available funds). Defer any decision until feasibility has been demonstrated.

Alternatives

1. Disposal of all TRU waste at WIPP.
2. Disposal of stored TRU waste at WIPP and buried TRU waste by other means.

M. Issue 13 - TRU Waste Reclassified as Low-Level Waste

What are the impacts to disposing of TRU waste reclassified as LLW?

Basis

Following are several key issues regarding the disposal of TRU waste reclassified as LLW:

1. The acceptability of disposing of TRU waste, which has been reclassified as LLW at the RWMC, should be resolved with the State of Idaho. Presently, the SWEPP-LLW is being stored at the C&S Building pending a decision. A decision is needed before storage capacity at the S&S Building is exceeded. This is expected to be prior to 1993.
2. Environmental documentation requirements will need to be addressed if the decision is made to dispose of part, or all of the SWEPP-LLW at the RWMC.
3. The degree of characterization of the SWEPP-LLW required to ensure that no hazardous constituents are present, may need to be agreed upon with the EPA--Region 10.
4. Although the C&S Building can support interim storage of the SWEPP-generated radioactive mixed wastes, long-range plans and funding will need to be established to ensure adequate storage capacity until treatment and disposal issues for these wastes can be resolved.

5.2.5 Vision of the Future

In future years the following TRU/Mixed TRU waste stream actions will occur at INEL:

- RWMC is closed in accordance with applicable regulations
- Generation of TRU waste is reduced to minimum
- All stored TRU waste has been removed from Idaho
- All buried TRU waste has been dispositioned
- All TRU waste is treated in accordance with applicable regulations
- All on-Site transport of TRU waste between INEL facilities is in DOT approved containers.

The following pages contain a process model that provides details about the vision of the future for this waste stream.

TRU/Mixed TRU Waste Stream

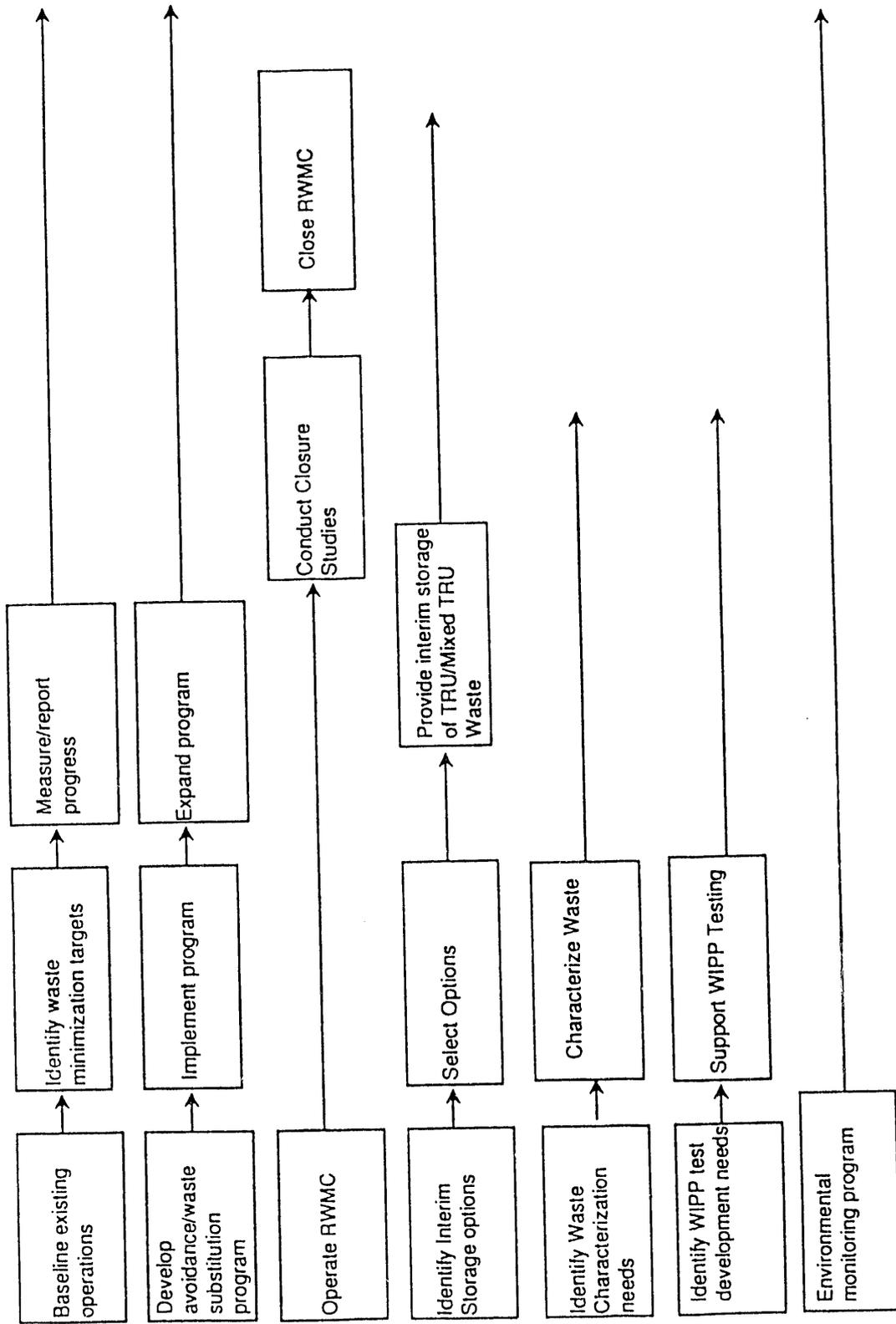
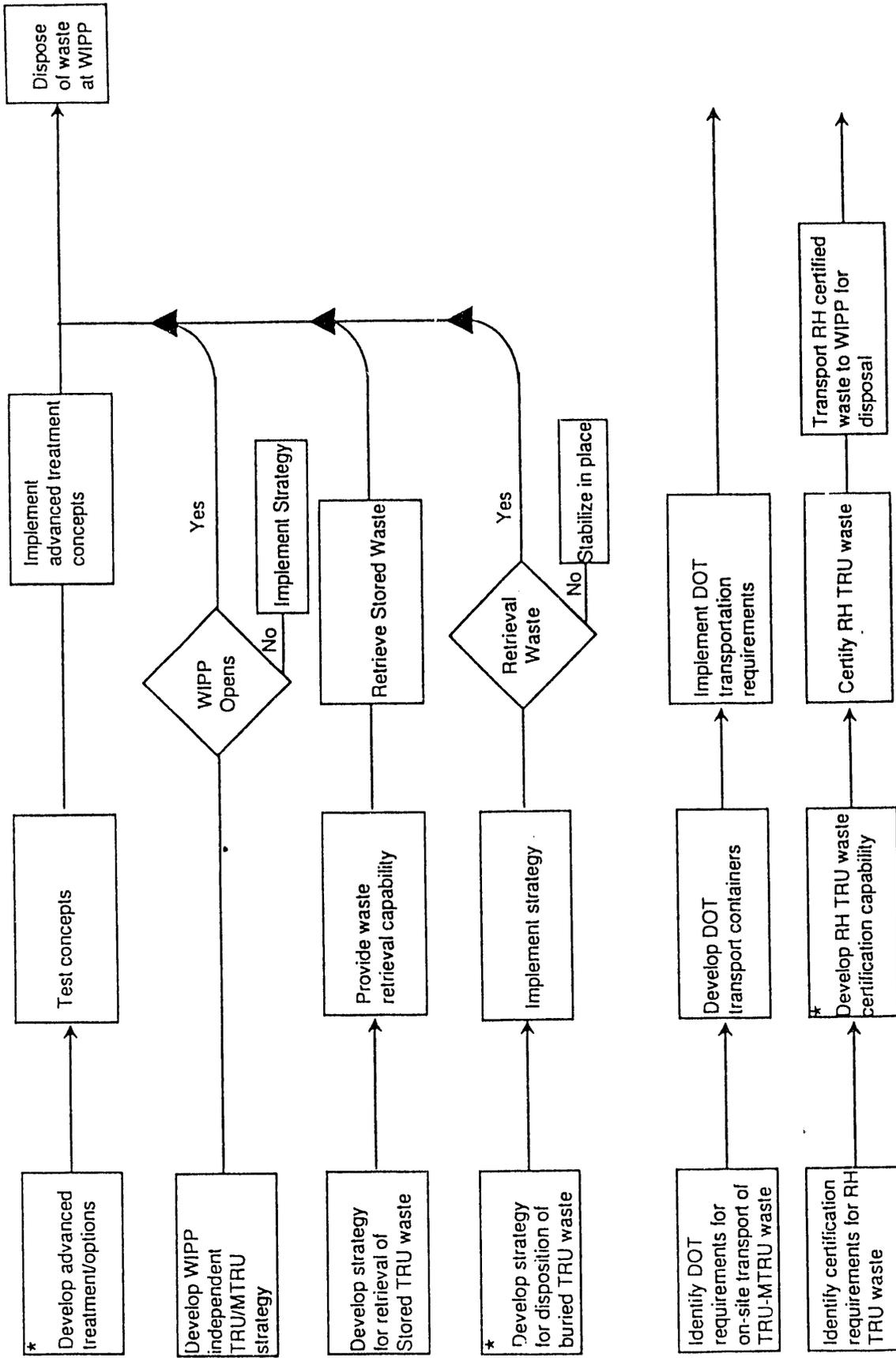


Figure 5-15. TRU/Mixed TRU process model.

TRU/Mixed TRU Waste Stream



* ERDP/MTD Development Areas

Figure 5-15. (continued).

5.3 Municipal Sanitary Waste

Municipal sanitary or solid waste is defined as any garbage, refuse, or sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility. In addition, "bunkhouse waste," as defined by 40 CFR 258 RCRA Subtitle D, is categorized as municipal sanitary waste. This includes discarded material, such as solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations, and from community activities. This does not include solid or dissolved material in domestic sewer, solid or dissolved materials in irrigation return flows, or industrial discharges. These materials are point sources subject to permits under section 402 of the Federal Water Pollution Control Act, as amended 86 Statute 880. Nor does this include point source special nuclear, or byproduct material, as defined by the Atomic Energy Act of 1954, as amended 68 Statute 923.

As discussed in this section of the roadmap document, municipal sanitary waste has no radioactive material added and contains no hazardous material. The following is a brief description of the current status of municipal sanitary waste disposal at the INEL:

- A. The landfill is currently not permitted.
- B. The landfill is small-scale and has a high unit-cost of operations.
- C. Landfill capacity is not utilized efficiently.
- D. There is a frequent occurrence of disposal of noncompliant waste materials in the landfill due to inadequate segregation/monitoring by waste generators. This requires removal of the non-compliant waste and return to the generators.
- E. Under current conditions and use, the INEL Municipal Solid Waste Landfill (MSWLF) will reach capacity around December 1992. (A MSWLF is a discrete area of land or an excavation that receives household waste, which includes any solid waste from households, single and multiple residences, hotels and motels, bunkhouses, ranger stations, crew quarters, campgrounds, picnic grounds, and day use recreational areas. A MSWLF may also receive other types of RCRA Subtitle D wastes, such as commercial solid waste, nonhazardous sludge, small quantity generator waste, and industrial solid waste.)
- F. There is disposal of materials with value, such as recyclable and excess materials.
- G. Disposal of materials not requiring a MSWLF, such as scrap lumber, use valuable disposal space required for future waste.

INEL Waste Management Operations Roadmap Document	Title: Waste Types Section: 5 — Municipal Sanitary Issue date: 04-30-92
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5.3.1 Municipal Sanitary Waste Planning Baseline

- A. The State of Idaho will adopt regulations as stringent as 40 CFR 258, Subtitle D.
- B. The current rate of sanitary waste generation will not increase.
- C. NEPA documentation will be approved for construction of the Solid Waste Transfer Station (SWTS) according to predetermined schedules. (The SWTS is a facility to monitor and consolidate INEL solid waste and prepare waste for shipment off-Site for disposal.)
- D. The regional landfill will accept INEL solid waste and enter into a long-term agreement. The operator of the proposed regional landfill, and the INEL, will enter into a long-term agreement under which INEL waste will be accepted at the regional landfill.
- E. The approved SWTS construction project is completed within schedule.
- F. INEL recycling program will be given high priority by DOE-ID, and expanded to all areas of the INEL.
- G. The current INEL landfill will be closed and enter into an institutional monitoring period.

5.3.2 Key Regulatory Drivers

The following are the regulatory drivers for the municipal sanitary waste stream:

- RCRA 40 CFR 257
- RCRA 40 CFR 258
- RCRA 40 CFR 763
- DOE Order 5400.1.

5.3.3 Logic Diagrams

The following pages contain the logic diagrams for the municipal sanitary waste stream:

- **Figure 5-16.** Municipal sanitary waste.
- **Figure 5-17.** Current municipal sanitary waste—STATUS.

INEL WMO ROADMAP

Municipal Sanitary Waste

DATE: 12-18-91
Rev. 3

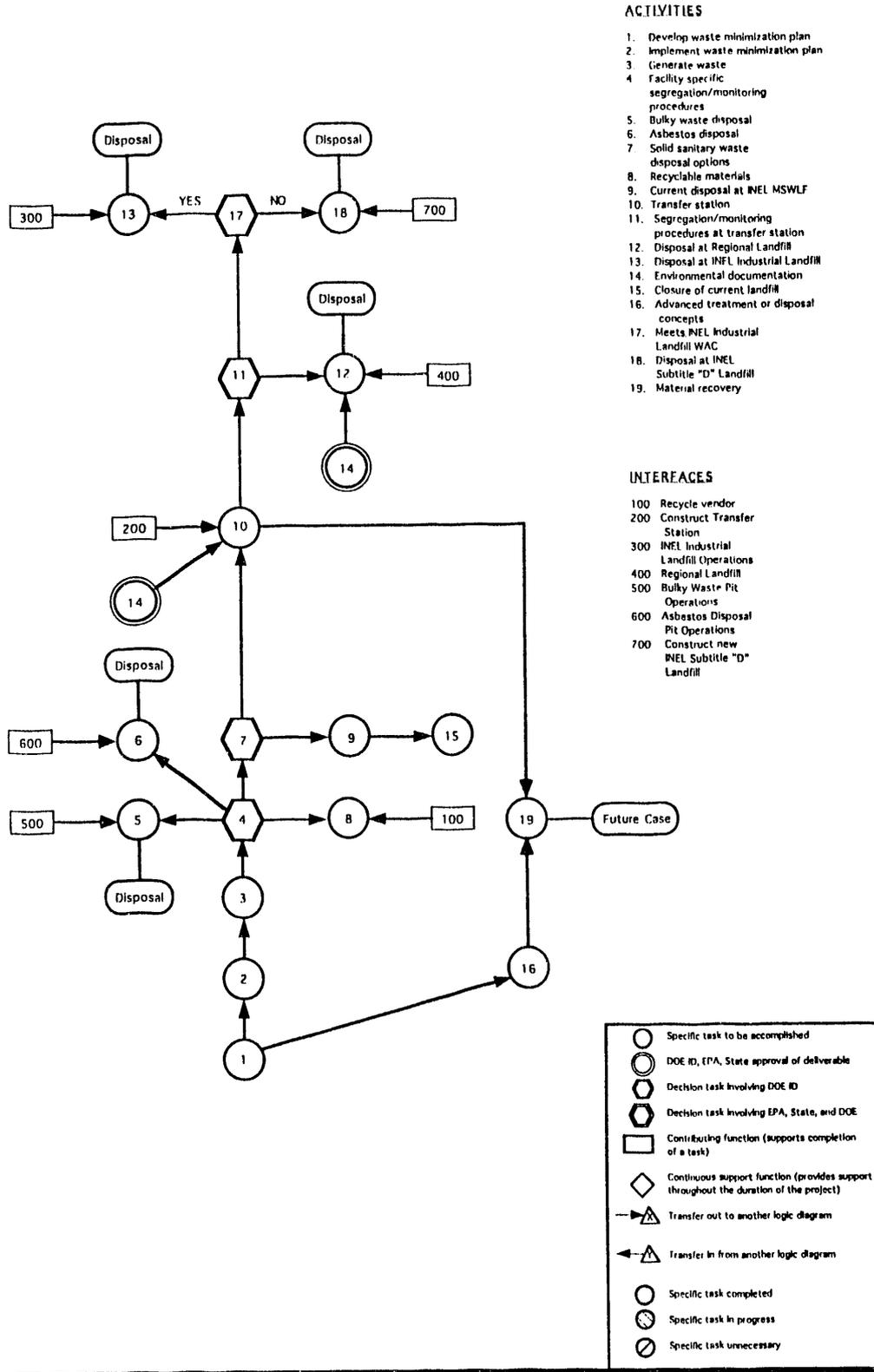


Figure 5-16. Municipal sanitary waste.

INEL WMO ROADMAP

Municipal Sanitary Waste

DATE: 12-18-91
Rev. 3

STATUS CURRENT SOLID SANITARY WASTE OPERATIONS

ACTIVITIES

1. Develop waste minimization plan
2. Implement waste minimization plan
3. Generate waste
4. Facility specific segregation/monitoring procedures
5. Bulky waste disposal
6. Asbestos disposal
7. Solid sanitary waste disposal options
8. Recyclable materials
9. Current disposal at INEL MSW F
10. Transfer station
11. Segregation/monitoring procedures at transfer station
12. Disposal at Regional Landfill
13. Disposal at INEL Industrial Landfill
14. Environmental documentation
15. Closure of current landfill
16. Advanced treatment or disposal concepts
17. Meets INEL Industrial Landfill WAC
18. Disposal at INEL Subtitle "D" Landfill
19. Material recovery

INTERFACES

- 100 Recycle vendor
- 200 Construct Transfer Station
- 300 INEL Industrial Landfill Operations
- 400 Regional Landfill
- 500 Bulky Waste Pit Operations
- 600 Asbestos Disposal Pit Operations
- 700 Construct new INEL Subtitle "D" Landfill

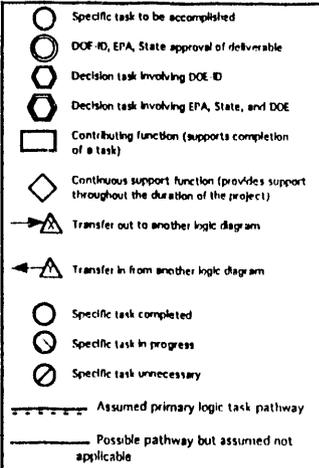
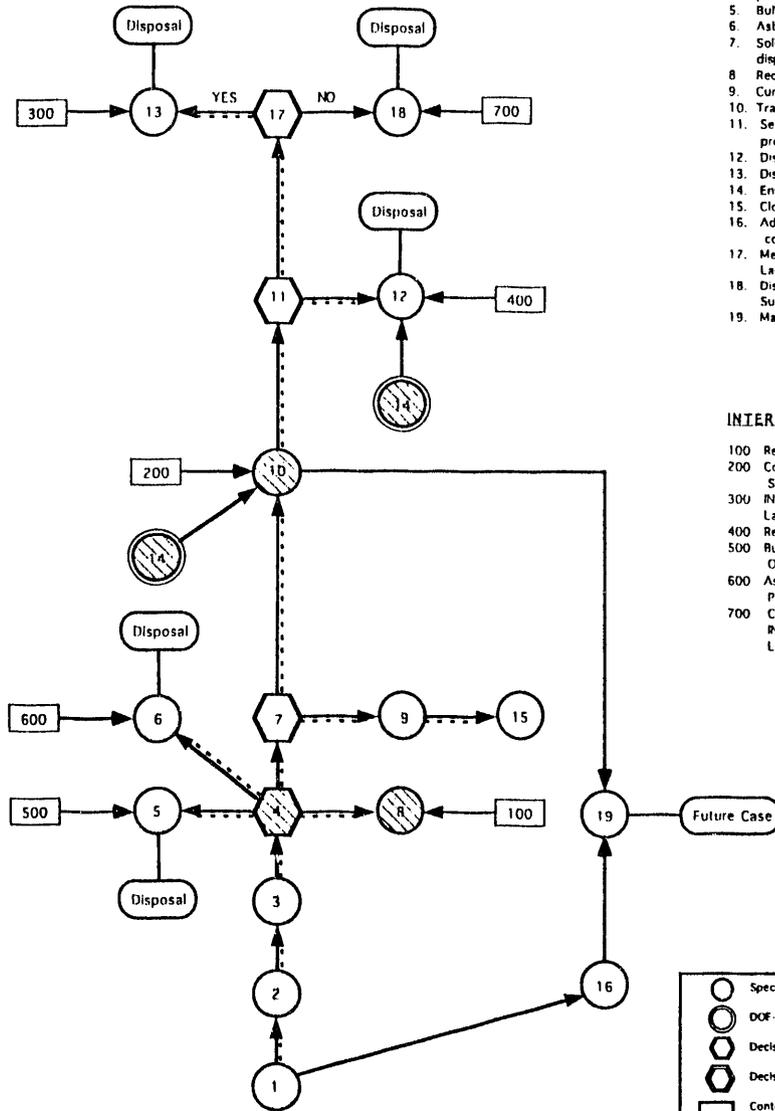


Figure 5-17. Current municipal sanitary waste operations—STATUS.

5.3.4 Municipal Sanitary Waste Issue Statements

- A. Current disposal practices do not optimize the capacity at the INEL municipal sanitary landfill (MSWLF). This is due to several reasons:
1. The landfill operations need state-of-the-art techniques and equipment to increase/extend the capacity of the landfill. This can be accomplished by improvement in landfill design such as utilizing 4-wide trenches instead of 2-wide trenches. In addition, trench wall angles can be increased to give more available volume and the soil-to-waste burial ratio can be reduced. This can be done by utilizing better compaction equipment as well as exploring the use of alternate materials for daily coverage.
 2. An effective Sitewide recycle/reuse program is not implemented. This results in disposal of material with value. Generator training and awareness is necessary for a recycle/reuse program to be effective.
 3. Due to misinterpretation of regulations, materials not requiring disposal at a MSWLF is being disposed there. This situation can only be rectified by generator education and awareness.
- B. The INEL sanitary landfill sometimes receives waste from generators that is considered non-compliant and must therefore be returned. If this non-compliant material is radioactive, the landfill is shut-down until the generator retrieves the non-compliant waste. Lack of training and proper communication between the generators and the landfill operators, are root causes of this problem. Another root cause is that the generators are not tied closely to the waste acceptance criteria (WAC) for the INEL landfill. The landfill can increase the cost effectiveness of its operations by minimizing the amount of disposal of noncompliant waste.
- C. Disposal of materials with some remaining value is occurring at the INEL MSWLF. The reason for this is that the waste generators are not implementing recycle/reuse programs at their facilities. The convenience of disposal at the INEL MSWLF, and the lack of knowledge by the generator on the resulting impacts, make recycling a low priority.

5.3.5 Vision of the Future

In future years the following municipal sanitary waste stream actions will occur at the INEL:

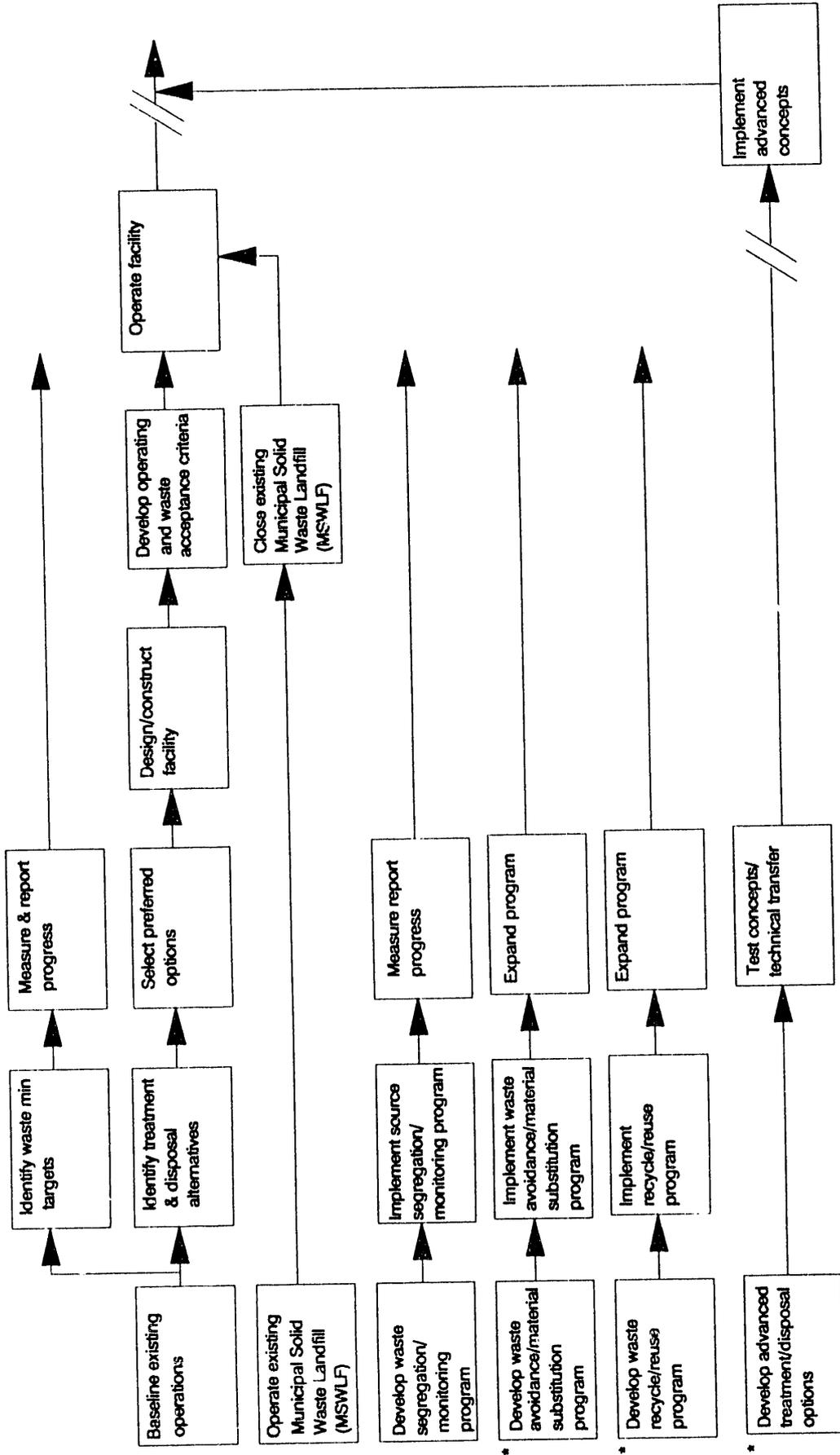
- Full implementation of waste avoidance/material substitution program
- Maximum recycle of waste materials

INEL Waste Management Operations Roadmap Document	Title: Waste Types Section: 5 – Municipal Sanitary Issue date: 04-30-92
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- Compliance to segregation/monitoring procedures by all INEL generators
- Cost effective operation by INEL solid waste management in compliance with applicable regulations
- Disposal of final waste residues using environmentally safe methods.
- Modify current disposal methods and conditions to extend the life of the INEL landfill (i.e., soil to waste ratio, compaction techniques, etc.).

The following page contains a process model that provides detail about the vision of the future for this waste stream.

Municipal Sanitary Waste Stream



* ERDP/WTD Development Areas

DECEMBER 1991
SWPMLDRW

Figure 5-18. Municipal sanitary waste process model.

5.4 Hazardous Waste

The following is a brief description of the current status of hazardous waste at the INEL:

- A. 500 - 1000 drums of hazardous waste (HW) are generated annually and sent off-Site for treatment and disposal.
- B. The current storage facility is inadequate to accommodate waste volume fluctuations.
- C. The current storage facility is in compliance with RCRA but is inadequate in regard to ESH&Q design requirements.
- D. Waste minimization, safe substitution, and recycling programs are not fully implemented.
- E. Annual EPA audits of hazardous waste generators at the INEL have resulted in regulatory noncompliance.

5.4.1 Hazardous Waste Planning Baseline

- A. Commercial off-Site treatment and disposal facilities, contracted to treat and dispose of the INEL hazardous waste, do so in accordance with laws and regulations for hazardous waste.
- B. INEL generated hazardous waste volumes will not increase appreciably due to new projects coming online or other unforeseen reasons.
- C. Off-Site treatment and disposal is available for all hazardous waste generated at the INEL.
- D. A line item project is planned in FY 1997 for on-Site hazardous waste treatment capacity.
- E. There will always be a need for interim storage of hazardous waste.
- F. Current on-Site treatment capability, storage capacity, and disposal, does not take into account waste generated by ERP and D&D projects.
- G. DOE-HQ/DOE-ID provides direct funding for hazardous waste administration and technical support. All other operating costs are funded through a cost recovery system (common support allocation).

INEL Waste Management Operations Roadmap Document	Title: Waste Types Section: 5 — Hazardous Issue date: 04-30-92
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5.4.2 Key Regulatory Drivers

The following are the regulatory drivers that require special attention to ensure compliance with all applicable laws and regulations:

- RCRA Regulations
- DOE Order 5400.3
- 40 CFR 262.41
- 40 CFR 262 and Appendix: Uniform Hazardous Waste Manifest and Reporting
- 40 CFR 264
- 40 CFR 268
- 40 CFR 761.

RCRA regulations govern the process of generating, identifying, storing, treating, and disposing of hazardous wastes. Key references are identified below:

- 40 CFR 261 Identification and Listing of Hazardous Waste
- 40 CFR 261.30 List of Hazardous Wastes
- 40 CFR 262.234 Accumulation Time
- 40 CFR 263 Standards Applicable to the Transportation of Hazardous Waste
- 40 CFR 265.13 General Waste Analysis
- 40 CFR 268 Land Disposal Restrictions
- 40 CFR 268.7 Waste Analysis
- 40 CFR 268.7(b) Treatment Facility Testing Requirements.

5.4.3 Logic Diagrams

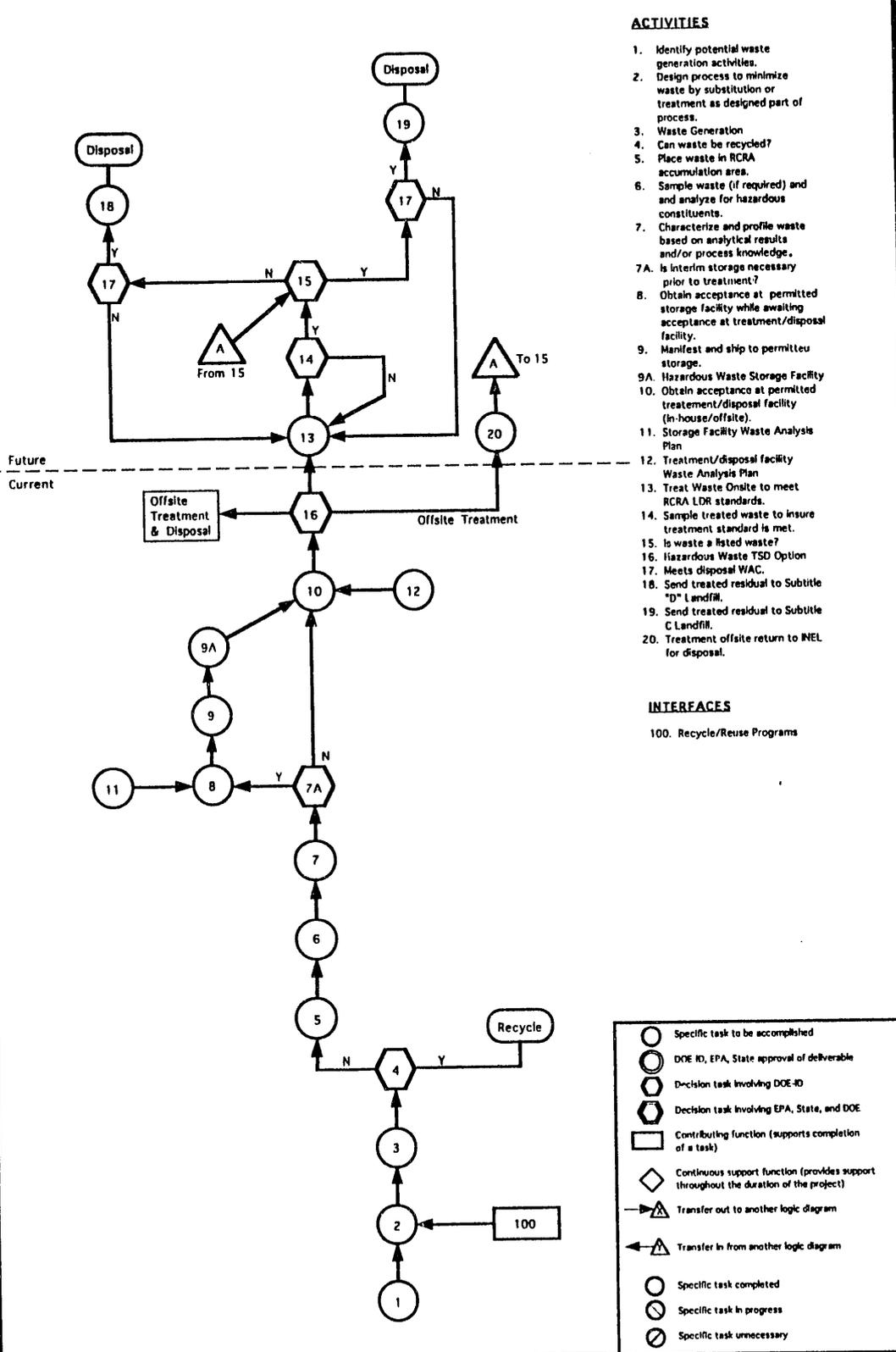
The following pages contain the logic diagrams for the hazardous waste stream:

- **Figure 5-19.** INEL hazardous waste.
- **Figure 5-20.** Hazardous waste operations-STATUS.

INEL WMO ROADMAP

INEL Hazardous Waste

DATE: 12-18-91
Rev. 3



ACTIVITIES

1. Identify potential waste generation activities.
2. Design process to minimize waste by substitution or treatment as designed part of process.
3. Waste Generation
4. Can waste be recycled?
5. Place waste in RCRA accumulation area.
6. Sample waste (if required) and analyze for hazardous constituents.
7. Characterize and profile waste based on analytical results and/or process knowledge.
- 7A. Is interim storage necessary prior to treatment?
8. Obtain acceptance at permitted storage facility while awaiting acceptance at treatment/disposal facility.
9. Manifest and ship to permitteu storage.
- 9A. Hazardous Waste Storage Facility
10. Obtain acceptance at permitted treatment/disposal facility (in-house/offsite).
11. Storage Facility Waste Analysis Plan
12. Treatment/disposal facility Waste Analysis Plan
13. Treat Waste Onsite to meet RCRA LDR standards.
14. Sample treated waste to insure treatment standard is met.
15. Is waste a listed waste?
16. Hazardous Waste TSD Option
17. Meets disposal WAC.
18. Send treated residual to Subtitle "D" Landfill.
19. Send treated residual to Subtitle C Landfill.
20. Treatment offsite return to INEL for disposal.

INTERFACES

100. Recycle/Reuse Programs

Figure 5-19. INEL hazardous waste.

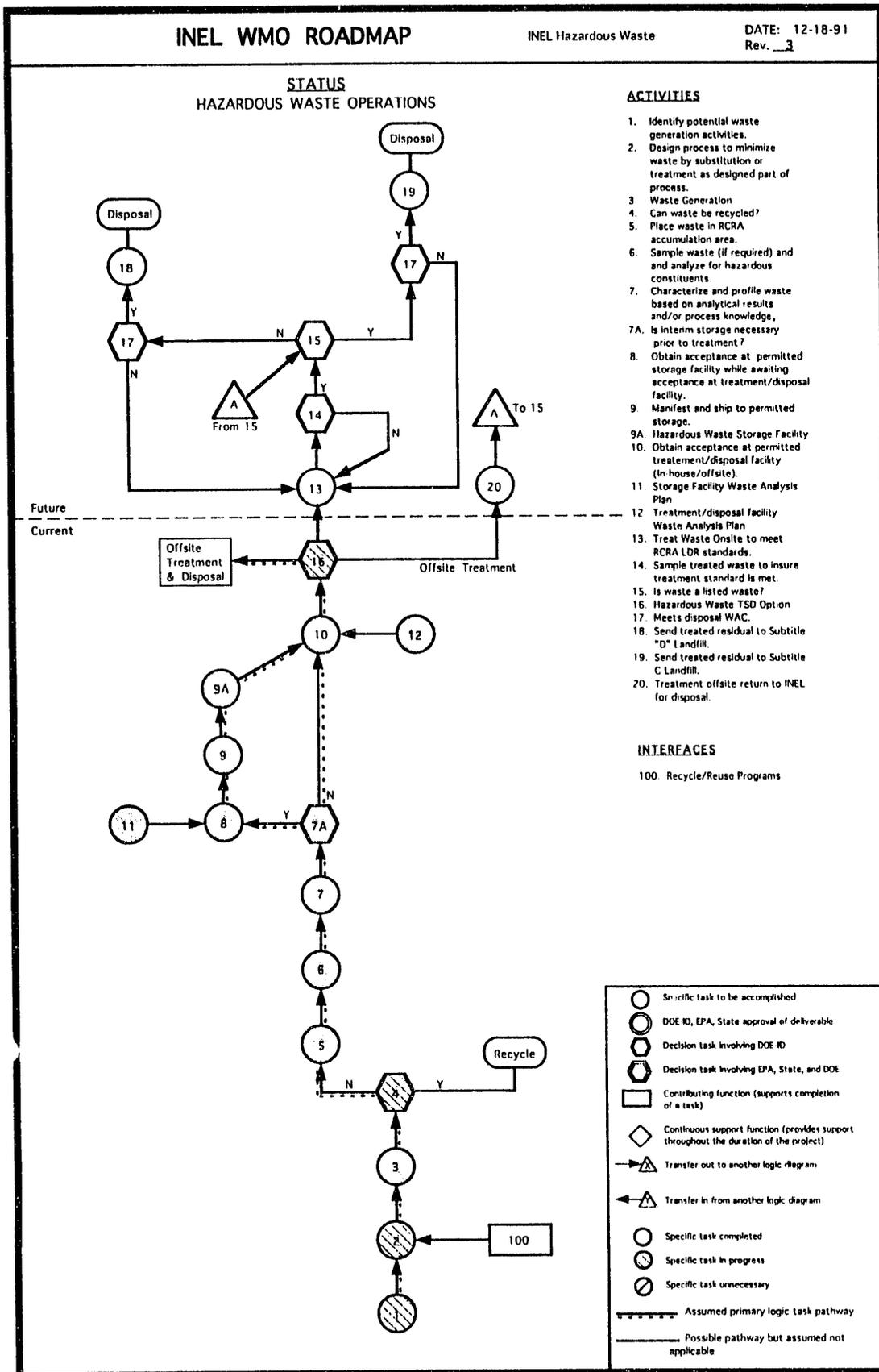


Figure 5-20. INEL hazardous waste operations—STATUS.

5.4.4 Hazardous Waste Issue Statements

The issues associated with hazardous waste were formulated by performing a root cause analysis to known problems. These issues are wide ranging in scope and include installation, regulatory, and DOE concerns.

- A. There is not an effective system in place at the INEL for analyzing new and or changing regulatory requirements and their resulting costs of implementation. This is due to several root causes.
1. There are no regulatory oversight personnel assigned the responsibility of comprehensively assessing the changing conditions and needs at the INEL. This results in ineffective planning, inadequate documentation, lack of project prioritization, and ineffective project implementation.
 2. The cost of continually changing requirements can not be supported adequately in the current funding structure (i.e., common support funding). An effort to secure programmatic based funding for documentation upgrades is currently being pursued. If the effort is successful, the initial step for maintaining current documentation will be in place.
- B. The EPA and other regulatory agencies have located numerous findings of non-compliance at INEL facilities regarding hazardous waste handling and storage practices.
1. Many of these findings are *recurring* violations, which indicates a need for root cause analysis. Some of the violations are occurring at the hazardous waste storage facility (HWSF), while others are being uncovered at waste generator facilities.
 2. The HWSF has design deficiencies relating to ESH&Q. The fire suppression, potable water, and ventilation systems are all considered to be marginal. Personnel emergency safety, restrooms, and office space are other aspects of the facility which are inadequate.
 3. The hazardous waste storage space is too small to accommodate surges of waste volumes which come at intermittent times. Unanticipated volume surges result from events such as the hazardous waste shipping moratorium and generator's shipping of large inventories from their temporary accumulation areas.

- C. The contractors of DOE who are the generators of hazardous waste are held responsible for compliance to all applicable rules and regulations. However, many noncompliances occur because of misinterpretation of the regulations. Many of the regulations are unclear and require the contractor to have direct contact with the regulating agency for resolution. Since this contact with the regulators is very limited, the contractor seeks direction from DOE. Inconsistencies between the DOE interpretation(s) and the regulator's interpretation(s) can result in findings/violations by the regulating agency.
- D. The liabilities associated with using off-Site treatment/disposal facilities needs to be assessed to determine if it is desirable to perform treatment and disposal of hazardous waste on the INEL Site. EG&G Idaho, Inc., was recently named as a potentially responsible party (PRP) for an inappropriate commercial disposal process. DOE and EG&G Idaho management must assess their official position on long-term liabilities associated with using the off-Site contractors for treatment and disposal of hazardous waste.
1. The current practice of using off-Site contractors is consistent with the "privatization" goals normally followed by DOE. However, disposal of hazardous waste, has inherent long-term liabilities not normally associated with commercial services.
 2. Current practices used to minimize the long-term liability associated with disposal of hazardous waste at off-Site facilities should be assessed and formalized. This would include such priorities as expanded audits of treatment/disposal facilities used for INEL waste disposal, and initial screening processes used to choose reputable hazardous waste disposal contractors when placing contracts for services.
- E. Decisions for the future of hazardous waste treatment/disposal at the INEL require accurate projections of future volumes in the waste stream. Currently these projections are unavailable.
1. Generators have no incentive to provide accurate forecasts of waste volumes, and thus overlook future needs regarding planning and budgeting for waste minimization and volume generation forecasts.
 2. D&D and environmental restoration projects continue to be very difficult to forecast accurately.

F. Certification of hazardous waste has not been adequate to demonstrate that no radioactivity has been added due to DOE operations. A *de minimis*^b level for radiological activity in hazardous waste has not been established. Therefore, we must pursue a formal policy that includes development of procedures for hazardous material tracking and certification of non-radioactive hazardous waste.

5.4.5 Vision of the Future

In future years the following hazardous waste stream actions will occur at the INEL:

- Full implementation of waste avoidance/material substitution program
- Full implementation of material reuse program
- Cost effective operation of facilities in compliance with applicable regulations
- Provide state-of-the-art treatment and storage capability with sufficient capacity for INEL generated hazardous waste
- Disposal of final waste residues using environmentally safe methods
- Minimize liability to DOE and its contractors.

The following page contains a process model that provides detail about the vision of the future for this waste stream.

b. *De minimis* is a term used in this document to reflect a yet-to-be-determined criteria for radioactive and/or hazardous waste disposal by less restrictive means. The NRC and EPA may eventually include *de minimis* waste disposal criteria (numerical concentration limits, or BRC values) as a part of their regulations.

5.5 Spent Fuel

Spent fuel is currently stored at Power Burst Facility (PBF), Test Reactor Area (TRA), Test Area North (TAN), Idaho Chemical Processing Plant (ICPP), Argonne National Laboratory-West (ANL-W), and Naval Reactors Facility (NRF) in various dry and wet storage facilities. Accurate records of spent fuel are being maintained by the accountability group with a detailed description of the fuel fissile amounts and where it is located.

The ICPP has compiled a record of spent fuel that is being stored at the INEL Site and has plans to take possession of it and either process or ship the unprocessable fuel directly to the Repository or monitored retrievable storage (MRS). At the present time all Navy fuel, and TRA test reactor fuel is sent to the ICPP for processing. ANL-W is in the process of developing their own system to process their spent fuel into new fuel elements for their reactor. The ANL-W and NRF spent fuel facilities plans will not be addressed in this document. Navy fuel is "classified" and no information is included here.

The following is a brief description of the current status of spent fuel at the INEL requiring treatment and disposal:

- A. A large inventory of spent fuel exists that requires a disposition schedule:
 - 1. Three Mile Island (TMI) core debris
 - 2. Commercial Light Water Reactor (LWR) fuel assemblies
 - 3. Loss-of-fluid test facility (LOFT) core
 - 4. PBF core
 - 5. PBF fueled test trains
 - 6. Miscellaneous core components/debris including pins, fuel rods, remnants, pieces, samples, met. mounts, pellets, residue, specimens, and scrap (stored at various locations on-Site)
 - 7. Naval reactor fuel (nonpropulsion)
 - 8. ANL-W (EBR-II) fuel.
- B. Current TAN storage configuration is not adequate for long-term custodial care and second generation storage modifications may be required.
- C. Current Hot Cell and Hot Shop facilities are not adequate for long-term maintenance/inspection of spent fuel "waste stream," but may provide stop-gap measures allowing time for facility development.
- D. Large DOE-wide inventory of spent fuel exists that will require a disposition schedule.

- E. The need for a canning and characterization facility exists, which may require modification to current Hot Cell facilities for a stop-gap measure.

5.5.1 Spent Fuel Planning Baseline

A. Critical Assumptions (have potentially major impacts)

1. The Environmental Protection Agency (EPA) will not assume purview over spent fuel owned by government agencies; however, spent fuel has been classified as waste in 40 CFR 191.12B and 40 CFR 261. Nevertheless, this roadmap considers spent fuel a resource until it is in a configuration verified to be acceptable at the Federal Repository and is waiting to be emplaced there, either in interim storage or in monitored retrievable storage (MRS).
2. An Environmental Assessment (EA) will be adequate for developing interim storage capability at Test Area North (TAN). [Supports Assumption Variations B.7(a) & (c).]
3. The environmental documentation for the spent fuel storage facility at the Waste Management (WM) Complex will be part of the Complex EIS.
4. An EIS will be required if a interim MRS alternative is developed at the INEL, such as the Special Fuels Dispositioning Facility (SFDF).
5. INEL special fuels will have first priority for receipt if an INEL interim MRS alternative is developed.
6. Transportation (rail and highway) requirements will be included in the ICPP, ER and WM programmatic EISs.
7. A custom designed cask transporter, configured to meet existing transport requirements and regulations for use with the storage casks for limited, low-speed, and on-Site transit, will be used to move loaded storage casks from TAN to the WM Complex spent fuel pad or to the proposed ICPP Special Fuels Dispositioning Facility (SFDF) when either becomes available. [Supports Assumption Variations B.7(a) & (c).]
8. Spent fuel will be in a configuration acceptable to the Federal Repository prior to shipment to MRS.
9. The WMO spent fuel roadmap applies to all INEL spent fuel (except ANL-W and NRF).

10. The INEL will assist in writing the WAC for the government-owned fuel section for the Repository. This includes fuel from NRC, VEPCO and TMI core debris as well as other external sources.

B. Programmatic Assumptions (guide overall logic/schedule development)

1. This waste stream roadmap reflects all INEL spent fuel. Spent fuels at ANL-W (Argonne), and NRF (Westinghouse), are maintained and dispositioned as separate waste streams involving reprocessing technologies at the ICPP and ANL-W (for new fuel) but can directly affect facility capacities at the INEL.
2. DOE-owned/managed spent fuel at the INEL, as addressed by this roadmap document, will require interim storage before implementation of a national policy for spent fuel disposition; a national repository, an off-Site MRS facility, or processing. Final disposition for government-owned miscellaneous "cats-&-dogs" spent fuels will not be made until after FY 2015.
3. Spent Advanced Test Reactor (ATR) fuel will be processed or stored at ICPP for the duration of ATR operations.
4. This roadmap will include spent fuel from external sources as well as fuel in currently operating reactors and where future operation is planned such as ATR and space reactor programs.
5. Commercial compacts will have to develop transportation systems and provide performance assessments that will support INEL acceptance of commercial fuel.
6. The TAN Hot Shop and auxiliary facilities will be deactivated beginning in FY 2000. The ICPP 603 underwater fuel storage facility will be retired in FY 1999. The anticipated storage mode at ICPP will consist of wet storage at ICPP 666 and a dry storage cask program.
7. A spent fuel storage pad will be located at the INEL (specific location to be determined) to receive and store casks until the national disposal scheme is ready to receive the INEL's miscellaneous spent fuels.
 - a. Variation -- Assumed Primary Logic:
A spent fuel storage pad at the WM Complex will not be available until well after FY 1994 (current projection, FY 2005) making it necessary to supply interim storage capability at TAN.

- b. **Variation -- Possible Alternate Pathway:**
The WM Complex spent fuel storage pad can be located, designed, and built in the future in order to be available for storage cask placement outside of the TAN facilities.
 - c. **Variation -- Possible Alternate Pathway:**
The spent fuel storage pad will remain at TAN until final disposition of the fuel; the WM Complex will not include spent fuel storage capabilities.
 - d. **Variation -- Possible Alternate Pathway:**
The ICPP will accept all fuel for the INEL and process or treat and ship directly to the repository from their SFDF.
- 8. The INEL spent fuel program will develop a shielded transfer system to move spent fuel or containers from storage casks to shipping casks before removing the fuel to its final disposition site such as a repository or off-Site MRS. This equipment will not be developed until final disposal requirements are established and implementation is imminent.
 - 9. M-130 casks can be modified to supplement current on-Site transportation needs.
 - 10. DOE Order 5820.2A will be rewritten to include regulations for both wet and dry storage of spent nuclear fuel at DOE-owned facilities.

C. Process Assumptions (provide activity decision basis)

- 1. Special, low-cost, vented, concrete storage casks (the design for which was competed in FY 1989) will be fabricated for storage of TMI fuel debris canisters (currently stored at the TAN pool) until they are shipped as spent fuel directly to the Repository or processed at the ICPP SFDF and then shipped as HLW to the Repository.
- 2. Cask fabrication for TMI spent fuel will be conducted locally on a seasonal basis; cask loading operations will be performed year-round.
- 3. Commercially designed and built NRC approved storage casks will be used for all other spent fuel, such as non-TMI.
- 4. A certified transport cask will be required for on-Site movement of PBF-generated spent fuel to an on-Site storage location.

5. TMI core debris canisters will not be subjected to sorting, segregating, or repackaging before loading into casks for interim storage at the INEL. (See Issue 5.) However, these canisters will be sorted, segregated, and repackaged or processed at the spent fuel WM Complex or the ICPP SFDF before shipping to the Repository.
6. All cask fabrication may be moved to ICPP if deemed appropriate.
7. Safety Analysis Reports for Packaging (SARPs) will be developed for existing and proposed transfer casks that will allow for multiple fuel type transportation.
8. On-Site rail upgrades will be made as required to make transport systems fully operable.
9. Equipment will be developed to verify that fuel scheduled for disposal in a Federal Repository meets both government and commercial WAC.

5.5.2 Key Regulatory Drivers

There are no DOE Orders,^c Environmental Protection Agency (EPA), or Nuclear Regulatory Commission (NRC) regulations that specifically address the matter of dry storage of spent fuels owned by DOE as a result of defense operations, contracts with commercial reactor operators, and other civilian agencies (dry cask storage).

The proposed storage system presented in the spent fuel roadmap documentation has been designed to meet the intent of DOE Orders 5480.5 and 5820.2A, 40 CFR 191, agreements with State officials, and potential EPA authority over spent fuel.

Current pool storage facilities other than ICPP 666, do not comply with all applicable codes and regulations. DOE Order 6430.1A, Sections 1300-3.3 and 1320-4 and -5 delineate specific requirements not met (or economically realistic) in current pool storage facilities. Major deficiencies include lack of positive, HEPA-filtered control of air spaces over storage pools, lack of redundant containment of pool water, for example, stainless steel pool liners, and lack of subsurface leak-detection capabilities. ICPP 666 meets all current codes and regulations for pool storage facilities.

c. DOE orders do not address the storage of spent nuclear fuel in storage casks. Similarly, 40 CFR 191 addresses only NRC licensed commercial storage casks and DOE operated spent fuel disposal facilities, such as the Geologic Repository.

Development of the spent fuel disposition processes will be done in accordance with the following key orders and regulations governing DOE spent fuel storage:

- DOE Order 6430.1A Irradiated Fissile Material Storage Facilities.
- DOE Order 1540.1 Materials Transportation & Traffic Management.
- DOE Order 1540.2 Hazardous Materials Packaging for Transportation.
- DOE Order 5480.3 Hazardous Materials Packaging and Transportation Safety Requirements.
- DOE Order 5480.5 Safety of Nuclear Facilities.
- DOE Order 5481.1 Safety Analysis Review System.
- DOE Order 5820.2A Radioactive Waste Management (update in process).
 - 10 CFR 60 Disposal of HLW in Geologic Repositories.
 - 10 CFR 61 Licensing Requirements for Land Disposal of Radioactive Waste.
 - 10 CFR 71 Packaging and Transportation of Radioactive Material.
 - 10 CFR 72 Licensing Requirements for the Independent Storage of Spent Nuclear Fuel and High-Level Radioactive Waste.
 - 40 CFR 191 Environmental Radioactive Protection Standards for Management and Disposal of Spent Nuclear Fuel, High-Level, and Transuranic Radioactive Waste.
 - 40 CFR 261 Identification and Listing of Hazardous Waste.
 - 40 CFR 263 Land Disposal Restrictions for Newly Listed Wastes and Contaminated Debris (proposed rule, Paragraph V.H.4.).
 - 49 CFR 105-179 Hazardous Materials Transportation Act NEPA.
 - 49 CFR 173 I Radioactive Materials.
 - 40 CFR 1500-1508 NEPA.

The following is an executive level description of compliance requirements and the status of compliance for the INEL.

Regulation: DOE Order 6430.1A (4/6/89) Section 1320 - Irradiated Fissile Material Storage Facilities.

Regulating Authority: DOE

Short Description: Provides design criteria for a new facility or facility addition for storing spent fuel. Primarily oriented toward fuel pools, with no guidance on dry storage in casks. Does not include spent fuel storage facilities that are part of a reactor facility. Requirements include:

- A. Provisions to verify efficiency of fixed neutron absorbers
- B. Pool shall be a safety class structure
- C. Safety class cooling water system
- D. Pool leak detection capability
- E. Consideration of 10 CFR 72, R.G. 3.49 and R.G. 3.54
- F. Building seals and ventilation filters
- G. Consider providing pool liner with leakage collection and detection system.

Status: TAN pool does not meet current requirements nor does ICPP 603. TRA and PBF pools are part of the reactor facility and covered by other regulatory requirements.

Regulation: DOE Order 5481.1B (9/23/86) and IDSD 5481.1A (4/11/89) - Safety Analysis Review System.

Regulating Authority: DOE

Short Description: These orders define requirements for Safety Analysis Reports and determine the hazard class for spent fuel storage. IDSD 5481.1A cites spent fuel storage facilities as a *moderate (2)* hazard — those that present considerable potential on-Site impacts to people or the environment, but at most only minor off-Site impacts. Requirements include review of existing operational facilities based on current technical criteria. When hazards are identified, they should be eliminated, controlled, or mitigated. Some generally applicable requirements include monitoring

and leak detection capability and method for assessing waste storage system integrity. Requires auditable review every five years.

Status: Safety Analysis Reports (SARs) will periodically require revision and approval. SAR approval may require adherence to current pool storage requirements or upgrades to other fuel storage systems.

Regulation: DOE Order 5480.5 (9/23/86) - Safety of Nuclear Facilities

Regulating Authority: DOE

Short Description: Establishes nuclear facility safety program requirements. Spent nuclear fuel is not specifically mentioned. However, any facility storing spent fuel must comply with the applicable requirements of this document. The orientation is primarily nuclear criticality safety.

Status: Fuel stored at TAN is covered by an existing, approved SAR that addresses this topic. No criticality issues have been identified related to criticality in the current storage configuration. The SAR is subject to revision and application of more stringent requirements in the future.

Regulation: DOE Order 5820.2A (9/26/88) - Radioactive Waste Management

Regulating Authority: DOE

Short Description: Provides DOE guidance on high-level waste, transuranic waste, low-level waste, and others, but does not specifically address spent fuel. The section on high-level waste also applies to "any other materials which, because of their highly radioactive nature, require similar handling."

Status: Spent fuel is not considered a waste, and storage is not addressed in this DOE Order. It may be desirable to revise the order to include wet and dry storage of spent fuel.

Regulation: DOE Order 5480.3 - Safety Requirements for the Packaging and Transportation of Hazardous Materials, Hazardous Substances, and Hazardous Wastes

Regulating Authority: DOE

Short Description: DOE requirements for packaging and transportation of radioactive materials such as spent fuel. Includes packaging requirements in areas such as fissile material, structural performance, and quality assurance. Also includes operating procedure requirements. Applies to INEL shipments of spent fuel.

Status: INEL complies with this order. Capability to ship fuel from TAN to another potential storage location is severely restricted.

Regulation: DOE-ID supplemental directive IDSD 5480.3 - Hazardous Materials Packaging and Transportation Safety Requirements.

Regulating Authority: DOE

Short Description: DOE-ID Order implementing requirements for packaging and transportation of radioactive materials such as spent fuel at the INEL. Requires adherence to all DOT and NRC regulatory requirements for off-Site shipments and on-Site shipments using public access highways. For strictly on-Site shipments, equivalent safety may be demonstrated in a DOE approved transport plan.

Status: INEL complies with this order. Capability to ship fuel from TAN to another potential storage location is severely restricted.

Regulation: 49 CFR 173 Subpart I - Radioactive Materials

Regulating Authority: DOT

Short Description: Contains Department of Transportation (DOT) requirements for packaging and shipping radioactive materials. These regulations apply to INEL shipments on public access highways 20 and 33. Defines Type A and greater than Type A quantities. Specifies tests and requirements for containers of each type, also requirements for fissile materials. Spent

fuel will always be a greater than Type A quantity and contain fissile materials. This will require a Type B shipping container.

Status: INEL complies with this order. Capability to ship fuel from TAN to another potential storage location is severely restricted. DOT permits exemptions that may make it possible to ship storage casks for a one-time only relocation to another on-Site storage location.

Regulation: 10 CFR 71 - Packaging and Transportation of Radioactive Material.

Regulating Authority: DOT

Short Description: NRC regulatory requirements for packaging, including requirements for Type B quantities and fissile materials. Stringent tests are specified for certifying Type B packages, such as those that would contain spent fuel. NRC certified casks or DOT exemptions are required for shipping spent fuel on INEL public access highways.

Status: INEL has NRC casks capable of shipping TMI canisters, but no casks capable of shipping intact fuel.

Regulation: 10 CFR 72 - Licensing Requirements for the Independent Storage of Spent Nuclear Fuel and High-Level Waste.

Regulating Authority: NRC

Short Description: Contains NRC regulatory requirements for licensing an Independent Spent Fuel Storage Installation (ISFSI). Also contains requirements for approval of spent fuel storage casks. NRC would not regulate an INEL storage facility. However, this regulation could guide DOE requirements. Six NRC Regulatory Guides provide additional guidance (3.44, 3.48, 3.49, 3.50, 3.53, and 3.45).

Status: INEL storage has not been assessed against the requirements of 10 CFR 72.

Regulation: 40 CFR 191 - Environmental Radiation Protection Standards for Management and Disposal of Spent Nuclear Fuel, High-Level, and Transuranic Radioactive Wastes, November 18, 1985.

Regulating Authority: EPA

Short Description: Subpart A provides limits on the combined annual dose equivalent to any member of the public. This regulation applies to facilities regulated by the Nuclear Regulatory Commission or storage of spent nuclear fuel at DOE facilities operated for disposal. This regulation does not apply to spent fuel storage at the INEL.

Status: The INEL is not required to comply; however, the management requirements at existing facilities should be easily demonstrated.

Regulation: 40 CFR 261 - Identification and Listing of Hazardous Waste

Regulating Authority: EPA

Short Description: Identifies solid wastes subject to regulation as hazardous waste under the Resource Conservation and Recovery Act (RCRA). The listing does not include spent nuclear fuel.

Status: An assessment is needed of some research fuels that may have metals covered under this regulation. DOE's Office of Civilian Radioactive Waste Management (OCRWM) is conducting experiments regarding the presence of regulated materials in commercial spent fuel.

Regulation: 40 CFR 268 - Land Disposal Restrictions for Newly Listed Wastes and Contaminated Debris, January 9, 1992, (proposed).

Regulating Authority: EPA

Short Description: Paragraph V.H.4. on Special Requirements for Radioactive Debris, defines mixed waste and high-level waste. This includes spent fuel from commercial nuclear power plants, and defense high-level radioactive waste from weapons production. This regulation proposes that mixed waste contaminated debris be required to comply with the treatment standards for contaminated debris, rather than to the treatment standards for the contaminated waste. (This is in addition to any regulation of that material under AEA.)

Status: An assessment is needed regarding INEL spent fuel treatment standards once this proposed rule is finalized by the EPA.

5.5.3 Spent Fuel Types at the INEL

A. The INEL receives spent fuel from the five following areas:

1. Thirty-three different university reactors
2. Commercial and industrial reactors
3. DOE-owned and operated reactors
4. Other U.S. Government owned and operated reactors
5. Return of U.S. fabricated fuels from other reactors including foreign returns.

B. The best estimate for the total mass of spent fuel in the DOE system (other than currently processable) is 730,000 Kg. About ninety percent of all that fuel is stored at the INEL.

Of the material stored at the INEL, ninety-five percent is accounted for by TMI and other commercial fuel (215,000 Kg), Fort Saint Vrain and Peach Bottom graphite fuels (308,000 Kg), L.W. Breeder reactor fuel (123,000 Kg), and Fermi Blanket fuel (64,000 Kg).

The ICPP has processing capabilities for the following fuels:

1. Aluminum fuel
2. Stainless steel fuel
3. Zirconium fuel
4. Graphite fuel
5. Others in the multi-curie cell.

INEL Waste Management Operations Roadmap Document	Title: Waste Types Section: 5 — Spent Fuel Issue date: 04-30-92
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C. Idaho Chemical Processing Plant (ICPP)

The ICPP assumes that all spent fuel elements, rods, pieces, scrap, etc., will be sent to them for processing or conditioning before disposal. They have identified 93 different spent fuel types at the INEL and have grouped them into 25 potential waste forms (see Table 5-1). At the present time they are unable to process all of these types of spent fuel elements. To this end they have proposed a custom facility to process these spent fuels elements. It appears that 29 of these 93 different spent fuel types will require custom processing. Some of these spent fuels are difficult to process and may be better disposed of by shipping them directly to the Repository or MRS. This will require that cladding integrity or other protective engineering barriers are provided.

Because the first repository will not accept all of the DOE-owned fuel, it is probable that most of the INEL fuel will have to be stored for an indefinite time until the next repository can be placed in operation or an MRS facility becomes available. Thus, all spent fuel at the INEL will be stored in interim facilities until such time that it can be shipped to MRS, Federal Repository, or processed at the ICPP. The current inventory of special fuels will increase very slowly over the next 40 years by no more than 5-15%. The ICPP 603 underwater storage facility is going to be retired by about FY 1999.

Two options for spent fuel disposition are envisioned, (1) processing, and (2) direct disposal. In either case a new facility or modification of an existing facility is required to complete the option. For the processing option, a new design, construction, and operation of the new facility is required. The direct disposal option includes the design, construction, and operation of a new facility to condition, immobilize, and package the various spent fuel in a form that can meet transportation and repository WAC. It is probable that both options will be required.

Interim storage capabilities will have to be in operation while the treated INEL DOE-owned spent fuel is waiting for space in a Repository. Once space is available, the spent fuel can be shipped. The method of interim storage, dry or wet, is an issue that can only be resolved by a very thorough examination and risk-cost-benefit analysis of each waste stream. It is possible that characteristics of certain spent fuels will make them acceptable for wet storage while others will only be able to be stored dry. In this case a method of dry storage must be chosen that best suits the spent fuel. (See Figure 5-24.)

D. High-Level Waste (HLW)

The INEL Site, except for the ICPP, does not have any HLW as defined (1st cycle raffinates). It may be possible, during the decontamination of certain facilities, to produce a HLW-like waste form. This will have to be studied and addressed at a later time. HLW will be addressed in the HLW Roadmap.

Table 5-1. Spent fuels at the INEL (includes only nonpropulsion Naval Fuels).

Potential Waste Form	Fuel Name	Uranium Compound	Fuel Cladding	Number of Elements	Fuel Form	Storage Location	
1.	AI	UZrHx	SST	12	--	CPP 603	
	ANL-6 (EBR-II test)	UZrHX	SST	4	Can	CPP 603	
	Ber-II-TRIGA	UZrHx	Zirconium	21	Assembly	CPP 603-IFSE	
	SNAP	UZrHx	None	11	--	CPP 603	
	TRIGA alum	UZrHx	Aluminum	554	Element	CPP 603	
	TRIGA FLIP	UZrHx	SST	11	Can	CPP 603	
	TRIGA sst	UZrHx	SST	263	Element	CPP 603	
	WAPD	UZrHx	Zr,SST	86	Pins	CPP 603	
	2.	APPR (AGE-2)	UO2	SST	1	--	CPP 603
		BMI	UO2	SST	3	--	CPP 603
BORAX V		UO2	SST	35	Element	CPP 603	
KAPL cans		UO2	SST	2	NA	CPP 603	
KAPL tubes		UO2	SST	3	Can	CPP 603	
SM-1A		UO2	SST	93	Can	CPP 603	
3.		AMF-1CPP	UAix	Aluminum	15	Assembly-15 plates	CPP 666
	ARMF-TRA	UAix	Aluminum	68	Element	TRA	
	ATR	UAix	Aluminum	700	Element	CPP 603/666, TRA	
	HFBR	UAix	Aluminum	240	Element	CPP 603/666	
	HIFR-Mark IV	UAix	Aluminum	--	Element	CPP 603/666	
	MURR	UAix	Aluminum	56	Assembly	CPP 603/666	
	ORR	UAix	Aluminum	17	Element	CPP 603	
	4.	GCRE can	UO2	Hastelloy	1	Can	CPP 603
GCRE Pellets		UO2	none	1	Pellets	CPP 603	
Tory IIA		UO2	none	102700	Hex tube	CPP 603	
Tory-IIC		UO2	Ceramic pellets	655	Tube	CPP 603 IFSF	

Table 5-1. (continued).

Potential Waste Form	Fuel Name	Uranium Compound	Fuel Cladding	Number of Elements	Fuel Form	Storage Location
5.	Shi'port PWR-C1-S4	UO2	Zirconium	1	Element	CPP 666
	Shi'port PWR-C2	UO2	Zirconium	21	Clusters	CPP 666
6.	PBF Damaged	UO2	Zirconium	3	Can	MTR Canal
	Shi'port PWR-C2-S1	UO2	Zirconium	23	Element	CPP Future
	Shi'port PWR-C2-S1	UO2	Zirconium	1	Subas, & Pieces	NRF
	Shi'port PWR-C2-S2	UO2	Zircalloy-4	20	Clusters	CPP 666
7.	Conn. Yankee	UO2	SST	200	Rod	TAN 607 Coffin K
	Dresden R00161	UO2	Zirconium	36	Rod	TAN 607 Coffin D
	Dresden UN0064	UO2	Zirconium	19	Rod	TAN 607 Coffin H
	Peach Bottom	UO2	Zirconium	40	Rod	TAN 607 Coffin A
	Peach Bottom	UO2	Zirconium	33	Rod	TAN 607 Coffin B
	Robinson, H.B.	UO2	Zirconium	113	Rod	TAN 607 Coffin C
	TMI-2	UO2	None	343	Cans	TAN 607 Pool
8.	Bettie scrap	Classified	Zirconium	50	Can	CPP 603
	KAPL scrap	Classified	Zirconium	4	Can	CPP 603
	PZB/EXF scrap	Classified	Zirconium	2	Can	CPP 603
	SIR	Classified	SST	18	Can	CPP 603
9.	Fermi I blanket	U-Mo alloy	SST	510	Can	CPP 749 Dry
	Shi'port PWR-C1 blanket	UO2	Zirconium	--	Miscellaneous	NRF
	Shi'port PWR-C2 blanket	UO2	Zirconium	14273	Element	NRF
	Surry MC-10	UO2	Zirconium	--	Element	TAN 607 Cask
10.	FSVR future	UC	Graphite	1516	Hex Block	CPP 603 IFSF
	FSVR present	UC	TRISO/BISO	726	Hex Block	CPP 603 IFSF

Table 5-1. (continued).

Potential Waste Form	Fuel Name	Uranium Compound	Fuel Cladding	Number of Elements	Fuel Form	Storage Location
11.	PARKA	UC	Graphite	542	Rod	CPP 603 IFSF
	Peach Bottom	UC	Graphite	2	Can	CPP 603 FECF
	Peach Bottom	UC	Graphite	796	Element	CPP 749 Dry Wells
	Peach Bottom	UC	Graphite	805	Element	CPP 603 IFSF
12.	Shi'port LWBR	UO ₂	Zirconium	47	Element	CPP 749 Dry Wells
	Shi'port LWBR unirr.	UO ₂	Zirconium	40	Element	CPP 749 Dry Wells
13.	ANP	UO ₂	Nichrome	9	Ribbon	CPP 603
14.	CFRMF	dU-238	none	1	Block	TRA ARMF
15.	VBWR (Geneva)	UAix	SST	4	Pins	CPP 603
16.	Fermi Core I&II	U-Mo alloy	Zirconium	214	Assembly	CPP 666
17.	SPSS (Spert)	UO ₂	Aluminum	1	Can	CPP 603
18.	BCD Loose Rod	UO ₂	Zirconium	128	Rod	TAN 607 Pool
	CANDU	UO ₂	Zirconium	--	Rod	TAN 607
19.	EBR-II	U-metal	SST	228	Assembly	CPP 603/666
20.	GAP CON	UO ₂	Zirconium	20	Rod	TAN 607
	GE	UO ₂	Zirconium	--	--	TAN 607
	Halden Assy	UO ₂	Zirconium	--	Rod	TAN 607
	Halden Assy #226 & #239	UO ₂ -PuO ₂	Zirconium	12	Rod	TAN 607
	IE	UO ₂	Zirconium	--	Rod	TAN 607
	LEU rods (10x10 rack)	UO ₂	Zirconium	67	Rods	TAN 607 Pool
	LLR	UO ₂	Zirconium	7	Rods	TAN 607
	LOC	UO ₂	Zirconium	60	Rod	TAN 607

Table 5-1. (continued).

Potential Waste Form	Fuel Name	Uranium Compound	Fuel Cladding	Number of Elements	Fuel Form	Storage Location
	LOFT	UO2	Zirconium	13	Element	TAN 607
	MAPI	UO2	Zirconium	--	--	TAN 607
	OPTRAN	UO2	Zirconium	--	--	TAN 607
	Pulstar Buffalo	UO2	Zircalloy	24	Rod	CPP 603
	RIA	UO2	Zirconium	23	Rod	TAN 607
	Saxton	UO2	Zirconium	--	Rod	TAN 607
	SFD	UO2	Zirconium	143	Rod	TAN 607
	Surry (GNS-V21)	UO2	Zirconium	21	Element	TAN 607 Cask
	Surry (TN24)	UO2	Zirconium	24	Element	TAN 607 Cask
	TC	UO2	Zirconium	--	Rod	TAN 607
	PCM	UO2	Zirconium	30	Rod	
21.	EMAD	U	--	10	Assembly	TAN 607
	EMAD	U	--	8	Rod	TAN 607
	SPSS (Orme)	U	SST	1	--	CPP 603
22.	GETR Filters	UO2-U3O8	none	10	Sintered Metal	CPP 603
23.	Patfinder	UO2	SST	417	Rod	CPP 603
24.	PBF	UO2	SST	2	Rod	MTR Canal
	PBF	UO2	SST	2419	Rods	PBF Canal
25.	PBF Damaged	UO2	Zirconium	1	Can	MTR Canal
	PBF Fiss. Chamb	Non-fuel	Unknown	4	Assembly	MTR Canal
	PBF Plug Stor.	UO2	SST	7	Can	MTR Plug Storage
	PBF Scrap	UO2	SST	91	Can	MTR Canal

5.5.4 Logic Diagrams

As identified in previous sections of this roadmap, the INEL will need a long-term storage contingency plan for spent fuel. The proposed INEL interim storage will consist of both dry and wet storage based on the criteria outlined in the following logic diagrams:

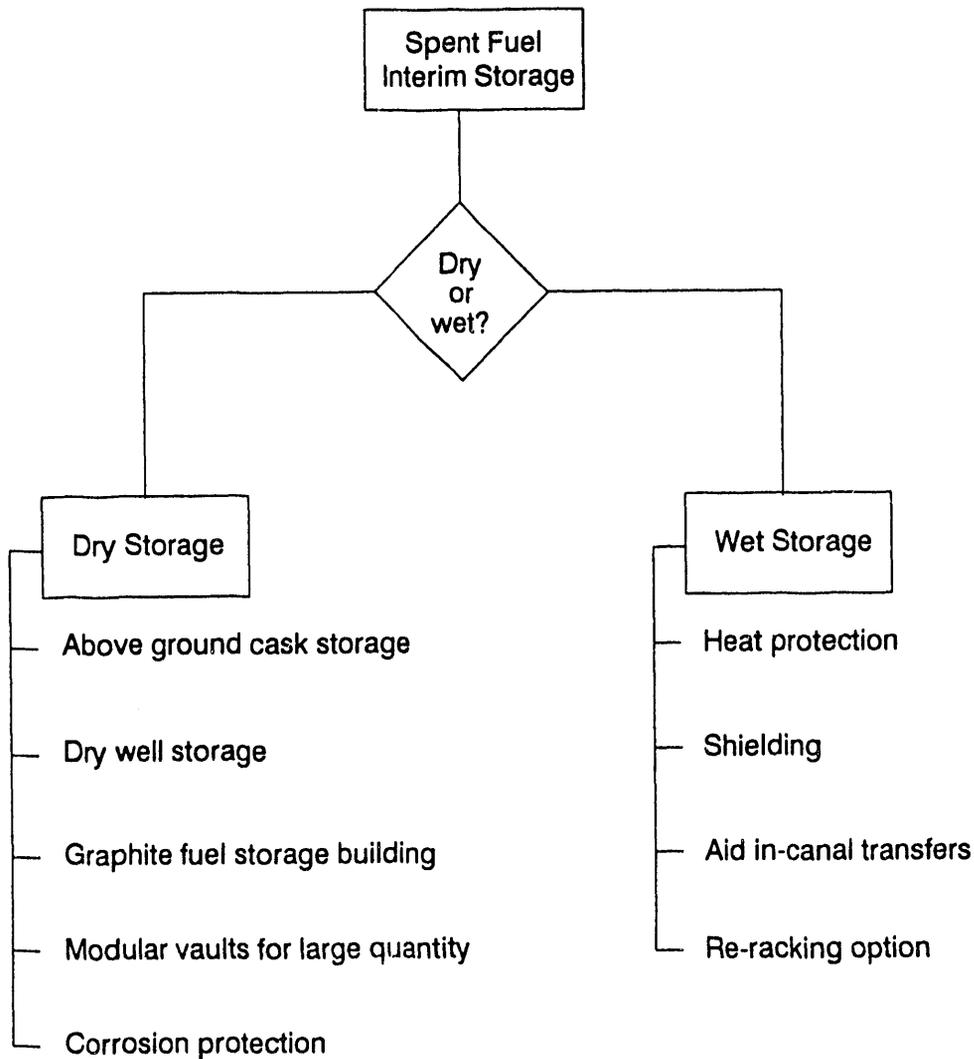


Figure 5-22. Spent fuel storage alternatives.

The following pages contain the logic diagrams for spent fuel management:

- Figure 5-23. Spent fuel.

INEL WASTE MANAGEMENT OPS. ROADMAP

Spent Fuel

DATE: 2-25-92

Page 1 of 5

Rev. 1

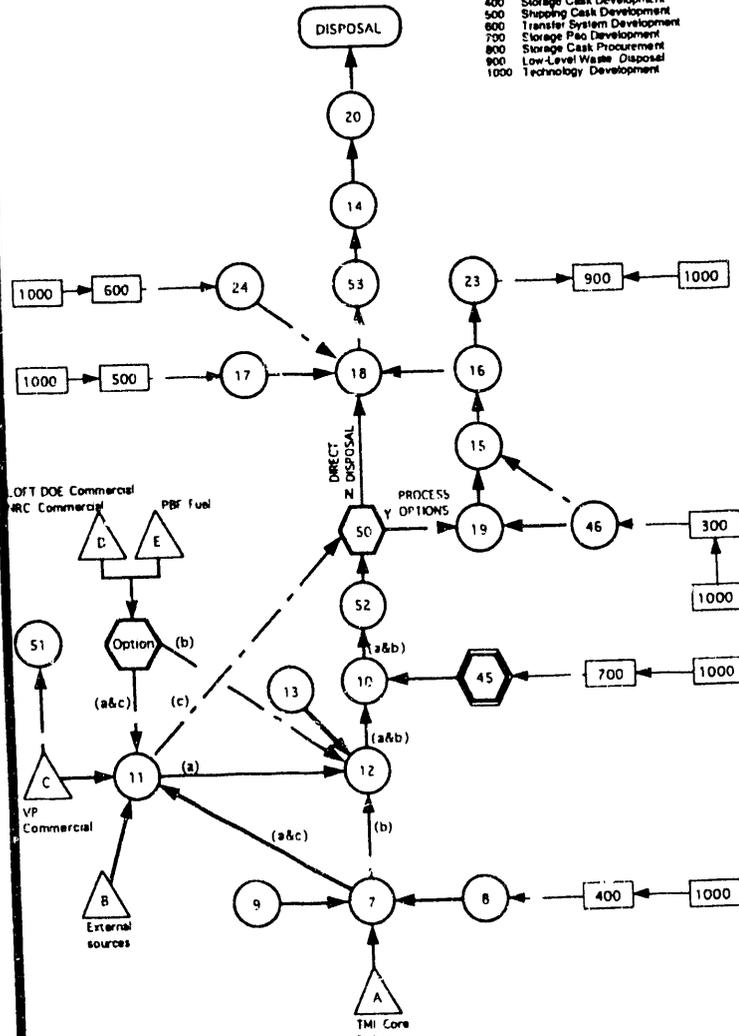
DRY STORAGE OPTION

INTERFACES

- 100 Cask Draining System
- 200 Cask Dewatering System
- 300 Spent Fuel Repackage Capability
- 400 Storage Cask Development
- 500 Shipping Cask Development
- 600 Transfer System Development
- 700 Storage Pad Development
- 800 Storage Cask Procurement
- 900 Low-Level Waste Disposal
- 1000 Technology Development

ACTIVITIES

1. Provide casker draining system
2. Remove core from TAN pool
3. Storage racks to LLW
4. Drain and dry
5. Provide bakesout system
6. Bakesout in TAN hot shop
7. Load storage cask
8. Provide storage cask
9. Provide transport tractor
10. Interim storage at selected site
11. Interim storage at preferred site
12. Transport to spent fuel complex
13. Transporter design and build
14. Transport to geologic repository
15. Consolidate and sort casker waste
16. Repackage for MRS/geologic repository
17. Transport cask for geologic repository/MRS
18. Transfer to transport cask
19. Treat for placement at geologic repository/MRS
20. Placement at geologic repository
21. Storage casks to LLW
22. Bakesout system to waste
23. Caskers to LLW
24. Transfer system cask-to-cask out-of-cell
25. Commercial fuel in VP storage casks in storage at TAN
26. Remove PBF bundles from pool storage
27. Transfer casks
28. Transfer equipment
29. Transfer to TAN hot shop
30. Load storage cask
31. Provide commercial storage cask
32. Transfer cask and equipment to LLW
33. Remove LOFT, DOG, NRC fuel from TAN pool
34. Load commercial storage casks
35. Provide commercial storage casks
36. Provide PBF fuel storage boxes (82"x15"x15")
37. Box PBF fuel
38. Cut off LOFT center fuel module
39. Provide cutoff equipment
40. Cut PBF fuel truss
41. Load into standard storage boxes
42. Unload non-standard boxes
43. Provide PBF type fuel transport cask
44. Receive fuel from external sources
45. Provide WMC storage pad
46. Provide facility and equipment to repackage waste
47. Consolidate PBF fuel
48. Load PBF transfer cask
49. Provide caskers for PBF fuel
50. Decision to repackage/custom process
51. Ship back to VEPCO
52. Inspection, characterization, process verification
53. Transport to MRS



- (a) Alternate Assumption: The WM Complex will not be available for spent fuel storage until 2005 or later, necessitating interim storage capability of casks at ICPP.
- (b) Alternate Assumption: The preferred site of the spent fuel storage pad will be located, designed and built at a later date in order to be available for Storage Cask placement at another location.
- (c) Alternate Assumption: The spent fuel storage pad will remain at TAN until final disposition of the fuel, the WM Complex will not include spent fuel storage capabilities.

CRITICAL ASSUMPTIONS:

1. The Environmental Protection Agency (EPA) will not assume purview over spent fuel owned by government agencies, however, spent fuel has been classified as waste in 40 CFR 191.12b and 40 CFR 261 nevertheless, this roadmap considers spent fuel a resource until it is in a configuration verified to be acceptable at the Federal Repository and is waiting to be placed there (either in interim storage or at an MRS)
2. An Environmental Assessment (EPA) will be adequate for developing interim storage capability at TAN [Supports Assumption Variations B 7(a) & (c)]
3. The environmental documentation for the spent fuel storage facility at the WM Complex will be part of the Complex Environmental Impact Statement
4. An EIS will be required if an MRS is developed at the INEL
5. NEL CATS and DOGS fuel will have first priority for consolidation if an INEL MRS is developed
6. Transportation (WAC) requirements will be included in the ICPP, ER, and WM programmatic EIS's
7. A custom-designed cask transporter, configured to meet existing transport requirements for use with the storage casks for limited, low speed, on site transit, will be used to move loaded casks from TAN to the WM Complex spent fuel pad when the latter becomes available [Supports Assumption Variations B 7(a) & (b)]
8. Spent fuel will be in a configuration acceptable to the Federal Repository prior to shipment to the MRS

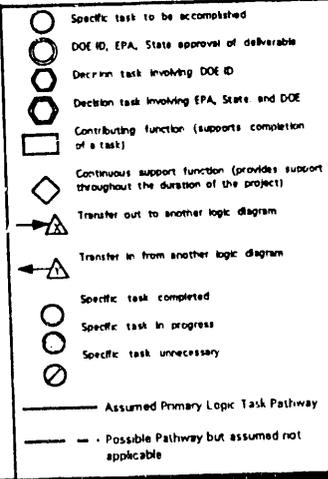
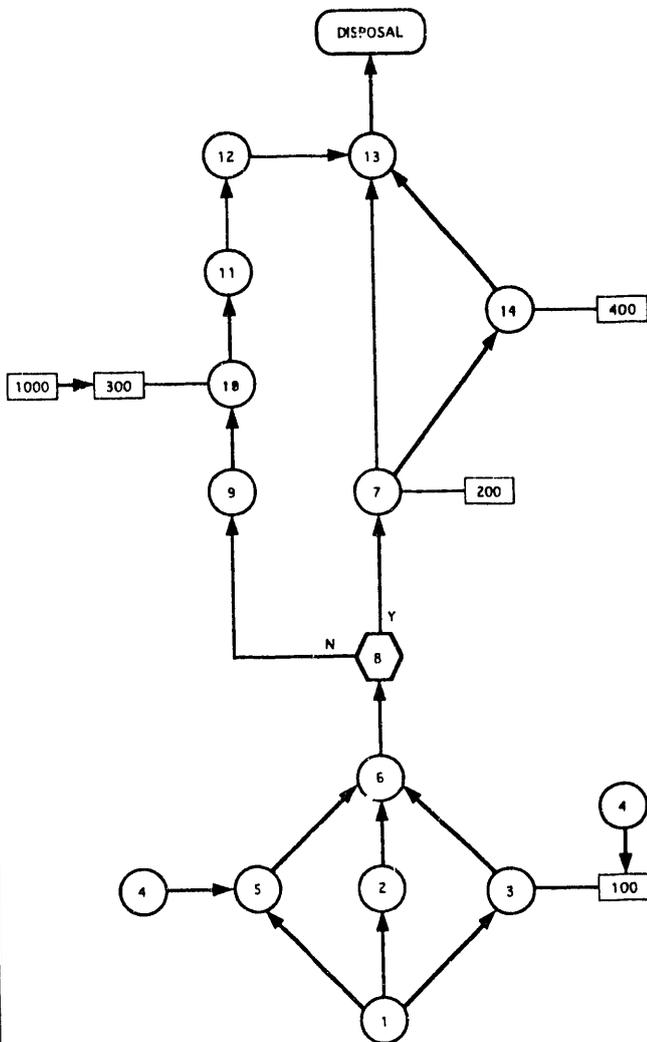


Figure 5-23. Spent fuel.

WET STORAGE OPTION

ACTIVITIES

1. Evaluate wet storage needs
2. Re-rack fuel to make additional space
3. Construct wet storage if required
4. Prepare NEPA documentation
5. Modify existing facilities
6. Interim storage of spent fuel
7. In-canal transfer into storage/shipping casks or processing
8. Continue wet storage?
9. Remove from wet storage
10. Dry the spent fuel
11. Place in interim storage
12. Transfer from dry storage to shipping cask
13. Ship to MRS/Federal Repository
14. Process prior to shipping in order to meet disposal WAC



INTERFACES

- 100 Development of additional wet storage
- 200 Storage/shipping cask development
- 300 Development of drying system
- 400 Process system development interfaces
- 1000 Technology development

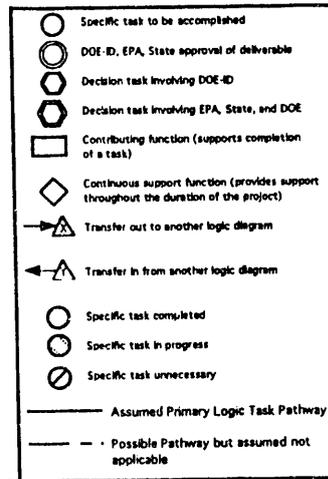
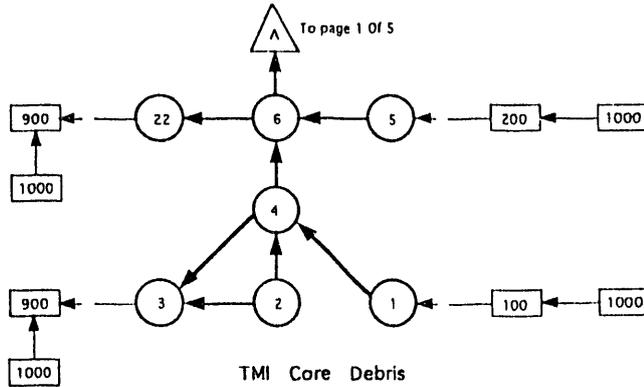


Figure 5-23. (continued).

ACTIVITIES

1. Provide Canister Draining System
2. Remove Core from TAN Pool
3. Storage Racks to LLW
4. Drain canisters
5. Provide Bakeout System
6. Bakeout canisters in TAN Hot Shop
22. Bakeout System to Waste



INTERFACES

- 100 Canister Draining System
- 200 Canister Bakeout System
- 900 Low-Level Waste Disposal
- 1000 Technology development

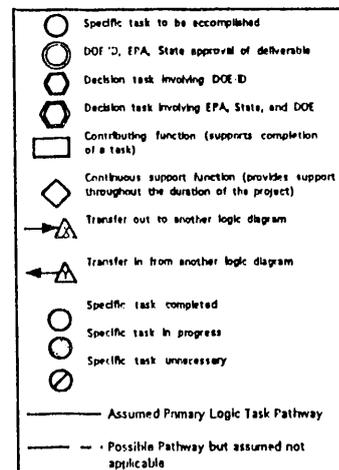
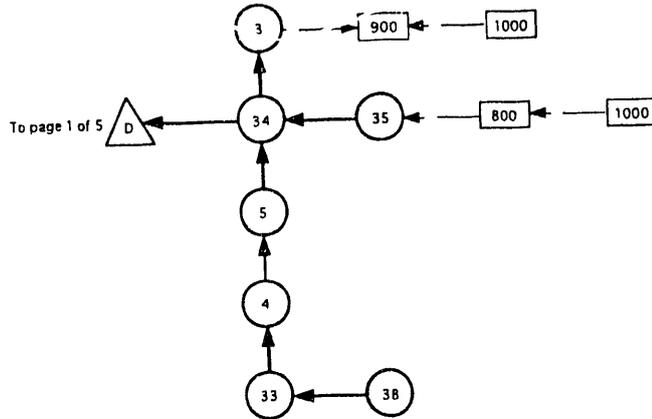
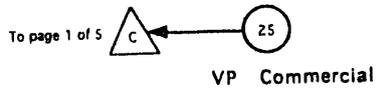
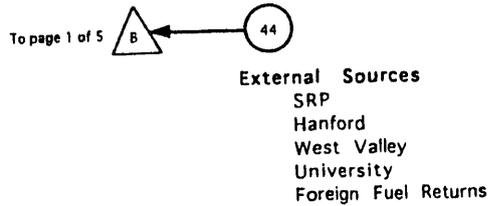


Figure 5-23. (continued).

ACTIVITIES

- 3. Storage Racks to LLW
- 4. Drain canister/fuel
- 5. Provide bakeout system
- 25. Commercial Fuel in VP Storage Casks in Storage at TAN
- 33. Remove LOFT, DOE, NRC Fuel from TAN Pool
- 34. Load Commercial Storage Casks
- 35. Provide Commercial Storage Casks
- 38. Cut off LOFT Center Fuel Module
- 44. Receive fuel from external sources



LOFT
DOE Commercial
NRC Commercial

Interfaces

- 800 Storage Cask Procurement
- 900 Low-Level Waste Disposal
- 1000 Technology development

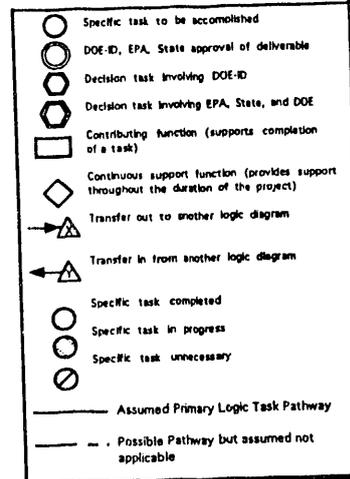
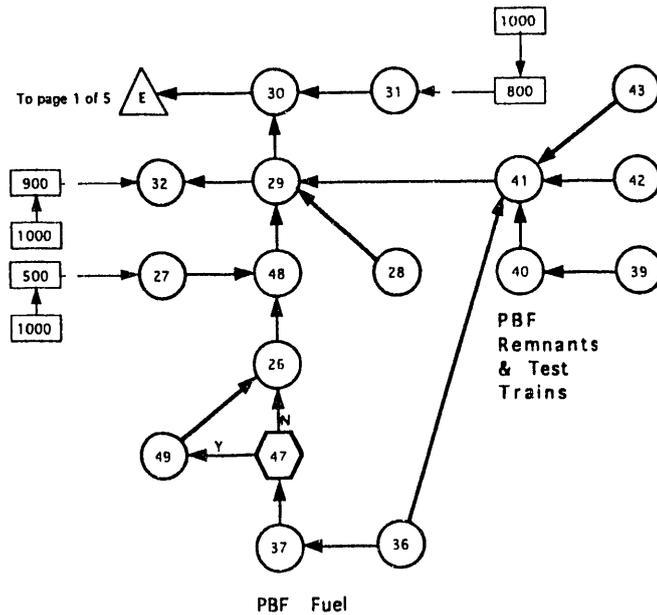


Figure 5-23. (continued).



ACTIVITIES

- 26 Remove PBF Bundles from Pool Storage (in Canisters)
- 27 Transfer Casks
- 28 Transfer Equipment
- 29 Transfer to TAN Hot Shop
- 30 Load Storage Cask
- 31 Provide Commercial Storage Cask
- 32 Transfer Cask and Equipment to LLW
- 36 Provide PBF Fuel Storage Boxes (62"x15"x15")
- 37 Box PBF Fuel
- 38 Cut off LOFT Center Fuel Module
- 39 Provide Cutoff Equipment
- 40 Cut PBF Test Trains
- 41 Load into Standard Storage Boxes
- 42 Unload Non-Standard Boxes
- 43 Provide PBF Type Fuel Transport Cask
- 47 Consolidate PBF Fuel
- 48 Load PBF Transfer Cask
- 49 Provide Canisters for PBF Fuel

INTERFACES

- 600 Shipping Cask Development
- 800 Storage Cask Procurement
- 900 Low-Level Waste Disposal
- 1000 Technology Development

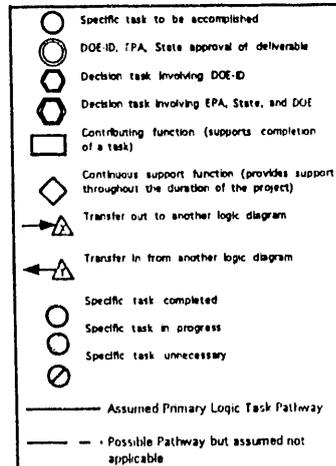


Figure 5-23. (continued).

5.5.5 Spent Fuel as a "Waste Stream"

Spent nuclear fuel is unique as a "waste stream" when viewed with respect to its four related streams such as TRU, low-level, hazardous, and municipal sanitary wastes. Technically, spent fuel *is not* designated as a "waste." Existing rulings identify it as a recoverable/reprocessable resource. Regulations governing the storage, treatment, and disposal of hazardous wastes, do not apply to this "waste stream." ^d

Current policy precludes processing commercial spent fuel to recover fissile materials. Instead, it establishes a Geologic Repository and a monitored retrievable storage (MRS) facility to provide for disposal of materials falling in this category. Current plans call for a MRS facility to open in FY 1998, with the Repository to follow sometime after FY 2010. The priorities for Government-owned materials awaiting disposal in these facilities have been established (see Table 5-2). First and second place in the listings go to commercially-owned spent fuel from the nation's nuclear power industry, DOE-owned commercial fuels listed in Table 5-2, and government-owned high-level waste from defense related processing. Most of the spent fuel stored at the INEL falls into the "cats-and-dogs" category. The exception is the ATR fuel, which is processed at ICPP (see the spent fuel quantities list in Table 5.2).

Government-owned special fuels such as miscellaneous fuel and fuel-bearing materials, are not currently on the priority list for national disposal.

Current policies and material related factors impose unusual predicaments on INEL spent fuels and the roadmap documentation under development:

- A. DOE spent fuels other than commercial will continue to have a very low priority because of the relatively low quantities as compared to the volumes of those materials occupying first and second places in the priority listings. However, this scenario could change drastically if the decision is made to consolidate the spent fuel from DOE-wide generators at the INEL.
- B. Even if MRS is available in FY 1998 (an arguable assumption), the receipt of commercial fuel is expected to stress the handling capabilities for as much as 20 years; handling demands on the Repository are expected to be similar, once it opens.
- C. Some INEL spent fuel is, by definition, classified as "miscellaneous" fuel, even though some of it is derived from commercial sources and has not been modified or destructively tested/examined.

d. Periodic discussions have taken place over the last five years concerning the applicability of EPA regulations to spent nuclear fuel. The existing "hands-off" position exhibited by the EPA could be reversed, significantly impacting storage-treatment-disposal plans and schedules.

- D. A substantial fraction of INEL spent fuel (by stored volume, over 80%) is not currently in a form that will be acceptable to the projected or proposed requirements for MRS or the Repository. This applies, as a minimum, to TMI core debris. Deficiencies include high void-volume fraction, high inventory of non-fuel materials (LLW), presence of gas-generating materials, such as water, cement, and organics. Recanning of suspect spent fuel might satisfy the proposed requirements, but this is not known.
- E. Projected costs to sort and repackage miscellaneous spent fuel in anticipation of MRS or repository requirements are very high.
- F. In the absence of applicable DOE orders and CFR requirements, the proposed program to implement dry (cask) storage of INEL spent fuel was developed to implement the intent of related requirements. (The correlation to the intent of the codes and standards will be discussed in the Environmental Assessment document.)
- G. Current large-scale remote-handling facilities such as the TAN Hot Shop, are scheduled for deactivation beginning in FY 2000, and will not be available in the time frame needed to retrieve, sort, repackage, and/or ship INEL spent fuel for shipment to a MRS facility or the Repository. In addition, the ICPP 603 underwater storage facility will be retired about FY 1999 and will not be available for spent fuel storage and handling.

5.5.6 Proposed Shipment to Monitored Retrievable Storage

The U.S. DOE has been allocated storage space for 156.5 metric tons of uranium (MTU) at a Monitored Retrievable Storage (MRS) facility over the first ten years of operation; starting in FY 1998. The first year allocation is for 18.1 MTU; second year is 11.1; third year is 3.2; fourth year is 4.5; fifth year is 7.3; sixth year is 72.8; seventh year is 16.3; eighth year is 0.0; ninth year is 3.3; and the tenth year is 19.9. A breakdown of specific spent fuels that will be sent to MRS from the INEL are listed in the following table.

Table 5-2. U.S. DOE spent fuel quantities located at the INEL.^a

Year	Commercial Spent Fuel	Number of Fuel Elements	MTU
1 (1998)	Big Rock 1	12	1.58
	Ginna	40	15.29
	Point Beach 1	3	1.19
2 (1999)	Big Rock 1	73	9.92
	Point Beach	3	1.17
3 (2000)	Dresden 1	2	0.20
	Peach Bottom 2	2	0.38
	Turkey Point 3	5	2.24
4 (2001)	Surry 2	10	4.50
5 (2002)	Surry 1	1	0.45
	Surry 2	2	0.91
	Turkey Point 3	13	5.93
6 (2003)	Fort St. Vrain	246	2.96
	Surry 2	8	3.66
	TMI 2 ^b	142	66.19
7 (2004)	TMI 2 ^b	35	16.31
8 (2005)	None	0	0.0
9 (2006)	Fort St. Vrain	240	2.87
10 (2007)	Surry 2	40	18.31

a. Big Rock 1 and Ginna spent fuel is located at the West Valley facility and will not be sent to the INEL as was originally scheduled. Point Beach 1 spent fuel is listed as being at the INEL. EG&G Idaho and ICPP show no record of this spent fuel.

b. The INEL has 343 canisters of TMI debris.

5.5.7 Spent Fuel Materials, Locations, and Descriptions

Materials: Three Mile Island (TMI) fuel debris canisters

Location: TAN Pool

Description: Defueling debris from the recovery of the TMI Unit 2 reactor is contained in 343 stainless steel canisters. Contents include enriched UO_2 and non volatile fission products (volatiles released by the reactor accident); heavily damaged and partially damaged reactor core components, including fuel rods, end-fittings, spacer grids, control and poison rod spiders, and reactor internals; filtration media; and miscellaneous defueling tools. Roughly 25-30% of the core debris has been thermochemically modified during the accident. Each canister is approximately 14 in. in diameter by 150 in. long, with gross weights between 1000 and 3000 lb; total *payload weight* of all canisters is approximately 341,200 lb; *gross weight* is approximately 754,150 lb.

Materials: DOE- and NRC-owned commercial fuel assembly remnants

Location: TAN Pool

Description: Remnants of commercial fuel assemblies and rods used in DOE- and NRC-sponsored tests of irradiated fuels.

Materials: LOFT fuel modules

Location: TAN Pool

Description: 13 PWR-like Loss-of-Fluid Test (LOFT) reactor fuel assemblies, each roughly 8.5 in.² by 70 in. long without the upper support structures; twelve intact assemblies and one destructively tested and examined assembly (containerized).

Materials: Virginia Power fuel storage demonstration

Location: TAN Cask Pad

Description: 69 DOE-owned commercial fuel assemblies and consolidated fuel rods in four DOE-owned storage demonstration casks (TN-29, MC-10, Castor V-21, and VSC-17).

Materials: PBF reactor core(s)

Location: PBF Facility

Description: One or more driver cores from the PBF reactor; 2419 enriched irradiated ternary ceramic (CaO-stabilized UO₂-ZrO₂) fuel in intact rods. This fuel is being held for the BCNT program.

Materials: PBF fuel-bearing experiments

Location: MTR Canal

Description: Remnants of fueled in-reactor experiments from the PBF reactor; destructively tested and examined.

Materials: ATR fuel assemblies

Location: ATR Canal

Description: High-enrichment Advanced Test Reactor (ATR) fuel elements; scheduled to be reprocessed at the Idaho Chemical Processing Plant (ICPP).

Materials: ARMF fuel

Location: ARMF Canal

Description: 99 high enriched ARMF, CFRMC fuel elements at the TRA, ten plates, one can of 29 pellets, six capsules from fuel element inserts, one assembly from the CFRMC core containing 217 Kg of depleted uranium, and uranium metal from the CFRMC core.

Materials: University Research Reactors.

Location: At the various university reactor sites. (See Table 5-3).

Description: Various percentages of enriched uranium fuel elements, plates, and pellets that are used in university research reactors. At the present time, there are 33 different universities that will be sending fuel elements, etc., back to DOE (INEL) for disposition. These elements, etc., will normally be processed at the ICPP. No firm dispositioning schedule has been determined.

Table 5-3. Universities sending fuel elements to DOE-ID (INEL) for dispositioning.

University Name	
University of Arizona	State University of New York Buffalo
University of California Irvine	North Carolina State University
Cornell University	Ohio State University
University of Florida	Oregon State University
Georgia Institute of Technology	Pennsylvania State University
Idaho State University	Purdue University
University of Illinois	Reed College
Iowa State University	Rensselaer Polytechnic Institute
Kansas State University	Rhode Island Nuclear Science Center
University of Lowell	Texas A&M
Manhattan College	University of Texas
University of Maryland	University of Utah
Massachusetts Institute of Technology	University of Virginia
University of Michigan	Washington State University
University of Missouri Columbia	University of Wisconsin
University of Missouri Rolla	Worcester Polytechnic Institute
University of New Mexico	

In addition to the previously listed sources, it is possible that the INEL will receive spent fuel from various external sources, which are not definitely known at this time. This may include foreign fuel return, and fuels from other DOE facilities.

5.5.8 Spent Fuel Issue Statements

The issues associated with spent fuel were formulated by performing a root cause analysis to known problems. These issues are wide ranging in scope and include installation, regulatory, and DOE concerns.

- A. There are several facilities on-Site that handle or store spent fuel, in some cases controlled by different contractors. This leads to unnecessary, duplicated efforts in dealing with this unique "waste" form. A study needs to be performed that will assess and evaluate all possible locations on the Site to determine which location is the most ideal for centralization of the INEL spent fuel.

DOE funding will be required to perform this evaluation. The controlling organizations within DOE and NRC need to be unified in purpose to give the INEL better direction. In performing this study accurately, the possibility of consolidation of DOE-wide spent fuel at the INEL must be considered. This proposed consolidation will affect facility requirements and processing needs.

- B. The disposition of most spent fuel at the INEL is uncertain at this point in time. The following identify areas of concern: (1) TMI fuels are stored in a form (most likely) not acceptable at the Federal Repository. (2) PBF spent fuels have some unique characteristics, which may require RCRA compliance. (3) With the D&D of PBF inevitable, the core in the PBF canal will enter the spent fuel waste stream. (4) External commercial and DOE fuel sources will have a significant impact on facility requirement decisions based on quantity and priority. The controlling agency for many of these external fuels is not clear. However, DOE will eventually be responsible for all spent fuel, which could impact the situation if this fuel is to be stored at the INEL.

If repackaging of spent fuel is required, remote-handling capabilities will have to be developed. This will require knowing the repackaging requirements. This is a problem because the history of some on-Site spent fuel requires analyses beyond currently available methods. The need to repackage is dependent on whether or not reprocessing is performed. Characterization of each waste stream needs to be accomplished to determine whether or not the fuel will be suitable for direct disposal or require processing.

This leads to the need for a Special Fuels Dispositioning Facility (SFDF) so that educated decisions can be made in regard to processing, packaging, and storage issues. Accurate dispositioning of the spent fuel will be dependent on the requirements of the Federal Repository WAC, which is not available at this time. Presently, there is no alternative to the Federal Repository, which means the INEL direction will focus on consolidation (long-term storage) and preparation of spent fuel for shipment to MRS.

- C. Spent fuel could require in-depth examination and characterization to make several key decisions concerning its disposition. Presently, the required methods and procedures do not exist. Characterization is necessary to determine the processing options. Some fuels will require direct disposal while others will necessitate predisposal processing. Direct disposal will require further characterization to determine packaging methods. Spent fuel examination and characterization may be necessary to determine the best storage method. Each waste type must be evaluated to determine if wet or dry storage is the best option. Dry storage requires further characterization to determine the best method of dry storage (dry well, cask, dry storage building, modular systems, etc.).

Characterization is also necessary to determine the shipping and handling requirements. Intra-Site transfers will have specific transportation criteria that must be determined. Also, the WAC for the Federal Repository will have specific transportation requirements when it is available. Spent fuel from external sources could have a history or configuration that requires special characterization. A spent fuel examination facility could be necessary to accomplish all these requirements.

- D. Each spent fuel waste stream will have a process option that is best suited for it. Examination and characterization of the waste streams will determine whether reprocessing or direct disposal is the best option. Reprocessing will require modifications to existing facilities, such as head-end changes at ICPP. Direct disposal will require remote-handling facilities to accomplish repackaging for disposal. TAN Hot Shop facilities might be able to fulfill this need in the near term, but closure of these facilities is scheduled for FY 2000. Identification of the process option is going to be difficult because there are many unique waste streams at the INEL, and there is not a WAC available for the Federal Repository that identifies the packaging requirements.

- E. The spent fuel storage facilities at the INEL are inadequate for current and projected needs. With the exception of ICPP 666, the spent fuel storage pools are out of compliance with regulatory requirements. This includes facilities at TAN, PBF and ICPP 603. This situation necessitates the construction of new storage facilities that are in compliance. The question of which storage method to utilize, dry or wet, still exists. An assessment must be made of all waste types to determine which storage technique is best for each waste type. This study may demonstrate a need exists for both storage mediums.

There are many factors affecting the overall picture of spent fuel storage at the INEL. One problem is the apparent wait for emplacement of INEL waste in the Federal Repository. The Federal Repository is still several years away from opening. The INEL spent fuel is considered a low priority and it probably will not even be accepted at the first repository. Estimates indicate that it may be another 40 years before any INEL waste is in a Federal Repository.

The proposed solution for this problem is a MRS facility that is scheduled to be available in FY 1998. However, the existence of this facility at this time is highly doubtful. This means that any new storage facilities will have to be designed for long-term storage. It is possible that some modified form of MRS could be developed at the INEL. Problems exist with current storage facilities in regard to long-term storage capabilities that would necessitate major modifications. Remote-handling capabilities that would be necessary for MRS operations at the INEL, do not exist.

TAN Hot Shop facilities could be modified and brought into compliance to extend their scheduled life past FY 2000. Several decisions need to be made to avoid some potential problems. Storage facility requirements must be determined (this may be difficult because regulations do not exist governing dry storage). This could possibly drive the development of additional pool storage facilities, a cask maintenance facility (probably at the proposed Spent Fuel Complex), modification of existing facilities, and eventual centralization of all spent fuel at the INEL.

The unavailability of a MRS facility is going to require taking some stop-gap measures as an interim fix. For example, modification of TAN Hot Shop or the ICPP facilities. It must be determined whether or not an interim storage facility (modified MRS facility) with long-term storage capability is going to exist at the INEL. If it is going to exist, a WAC must be developed for a modified MRS facility.

Short-term storage facilities will be impacted by facility closure and the volume of spent fuel from external sources. This will necessitate an effort be made to determine short-term storage requirements.

- F. There are several issues concerning transportation and handling of spent fuel on- and off-Site. The construction of the proposed Spent Fuel Complex would help centralize INEL dry storage of spent fuel. This will necessitate on-Site transfers of spent fuel, the requirements of which are unknown at this time. These questions arise: (1) Should the INEL implement a cask system that complies with DOT regulations or will it be necessary to request exemptions? (2) Can the storage casks be used for on-Site transfers? If not, this will require shielded, remote-handling capabilities at the INEL that currently do not exist (TAN Hot Shop facilities could be modified). These questions need to be studied and answered.

Due to the lack of a WAC for the Federal Repository or MRS alternative, the configuration requirements of transport casks are unknown. This makes shipping cask availability a significant issue. A definite direction for characterization, centralization, and storage requirements, must be determined. This includes all appropriate WACs before the answers to these questions can be properly identified.

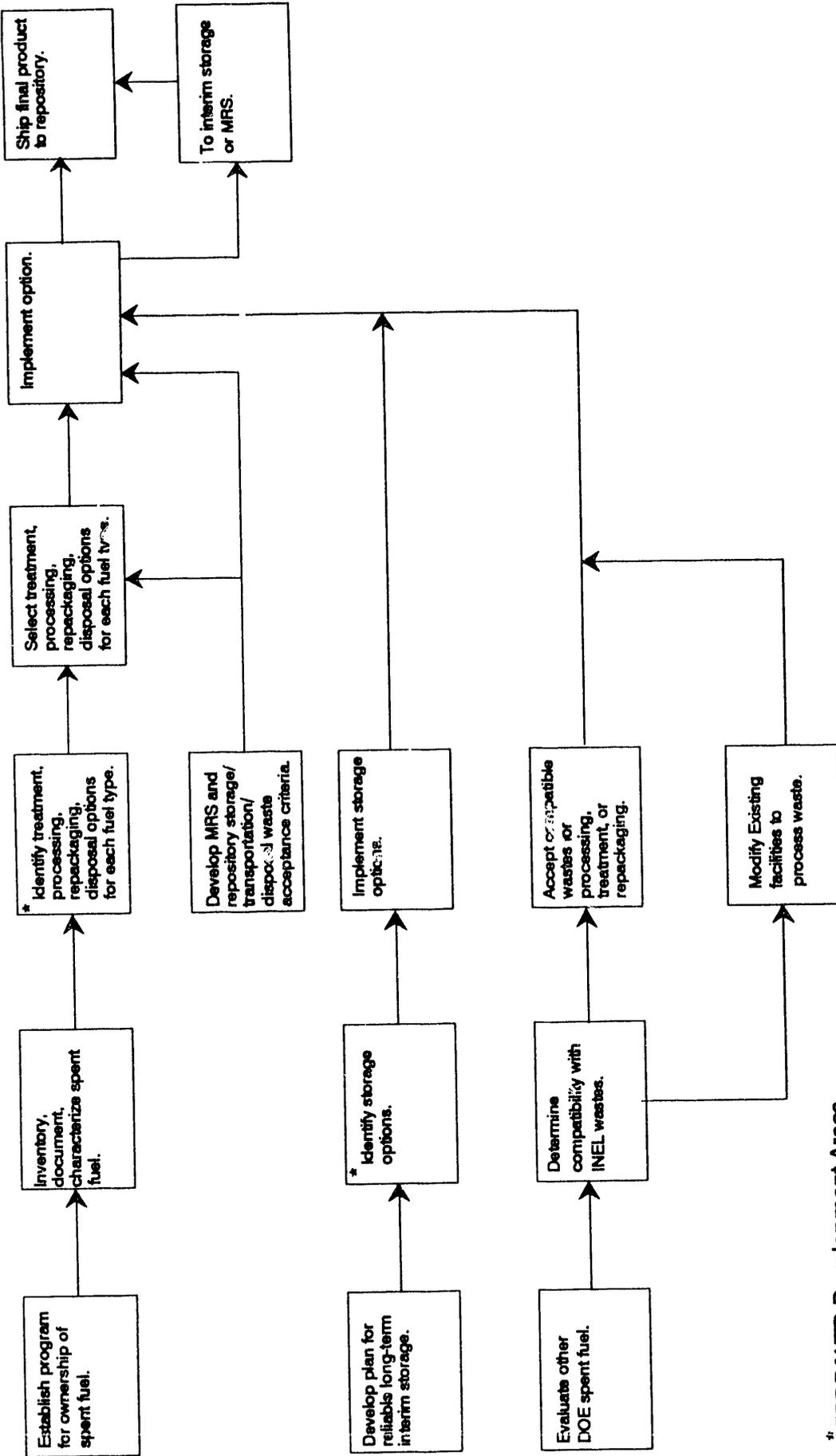
5.5.9 Vision of the Future

In future years the following spent fuel actions will occur at INEL:

- Facilities will be established for long-term custodial maintenance of spent fuel, and operating in compliance with applicable regulations.
- Final dispositioning and scheduling will be established for spent fuel.
- Spent fuel will be processed or permanently dispositioned.

The following page contains a process model about the vision of the future for spent fuel.

Spent Fuel Process Model



* ERDP/WTD Development Areas

Figure 5-24. Spent fuel process model.

5.6 Special Case/Greater-Than-Class C

The Special Case (SC) Waste/Greater-Than-Class C (GTCC) waste streams requiring treatment and disposal at the INEL were identified during the analysis of the LLW stream activities. Additional evaluation will be required during further development of this roadmap process.

5.6.1 Special Case/Greater-Than-Class C Waste Planning Baseline

The following assumptions apply to this waste stream:

- A. There will be no newly-generated SCW or commercial GTCC waste generated at INEL.
- B. SCWs are radioactive wastes that currently have no planned disposal alternatives.
- C. GTCC wastes are wastes that contain radionuclides in concentrations greater than those shown for Class-C waste in Tables 1 and 2 of 10 CFR 61.55. These wastes are generally not acceptable for near-surface disposal. The term GTCC refers to NRC-owned waste. DOE-owned waste, comparable to GTCC, is referred to as Specific Performance Assessment Required (SPAR) waste. This is because DOE Order 5820.2A requires a specific performance assessment through the NEPA process and the concurrence of DOE-HQ for disposal of this waste.

5.6.2 Key Regulatory Drivers

The following are the regulatory drivers that require special attention to ensure compliance with all applicable laws and regulations:

- 10 CFR 61.55
- DOE Order 5820.2A
- 49 CFR 170-176
- 10 CFR 71
- 10 CFR 38

5.6.3 Logic Diagrams

The following page contains the logic diagram for the SCW/GTCC waste stream:

- **Figure 5-25.** INEL SCW and GTCC stored waste.

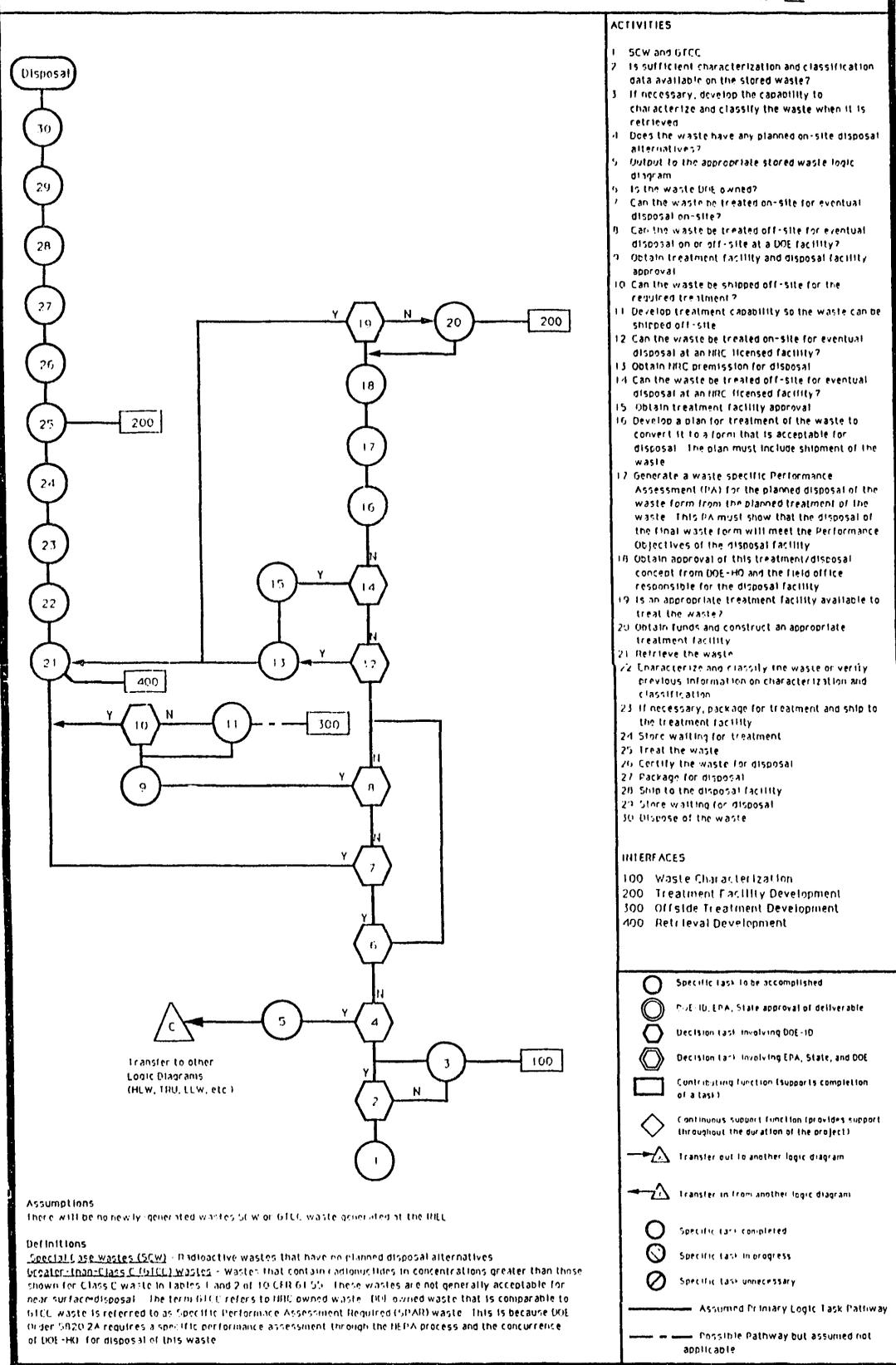


Figure 5-25. INEL SCW and GTCC stored waste.

5.6.4 Special Case/Greater-Than-Class C Issue Statements

A. General

1. DOE-HQ has not promulgated standards, requirements, and limits for subsurface disposal of SPAR waste.
2. Direction of GTCC Waste TSD strategy has not been adequately defined (WIPP WAC integrated with GTCC to allow for adequate review).
3. INEL and the DOE Complex does not have the capability to characterize and classify SCW and SPAR.
4. These wastes are generally not acceptable for near-surface disposal unless stabilized in a HIC.

6. ISSUES ANALYSIS

The primary purpose for defining installation issues is to determine what problems confront the INEL and hinder completion of the WMO mission. By gaining an understanding of existing issues, INEL managers can develop the basis for Site activity planning.

The production of issue statements is one of the primary goals mandated by DOE-HQ's roadmapping guidance. Issue statements are to identify situations that may affect the achievement of strategic objectives. In addition, the issues are to reflect information that management wants to communicate up the organizational chain of authority for resolution. The reduction and/or completion of these issues will facilitate completion of the WMO mission.

6.1 Low-Level Waste Stream

This section contains the detailed issue analysis and identifies needs for low-level waste (LLW) management at the INEL. It also contains root cause analysis, issue/need statements, and key issue/action tables.

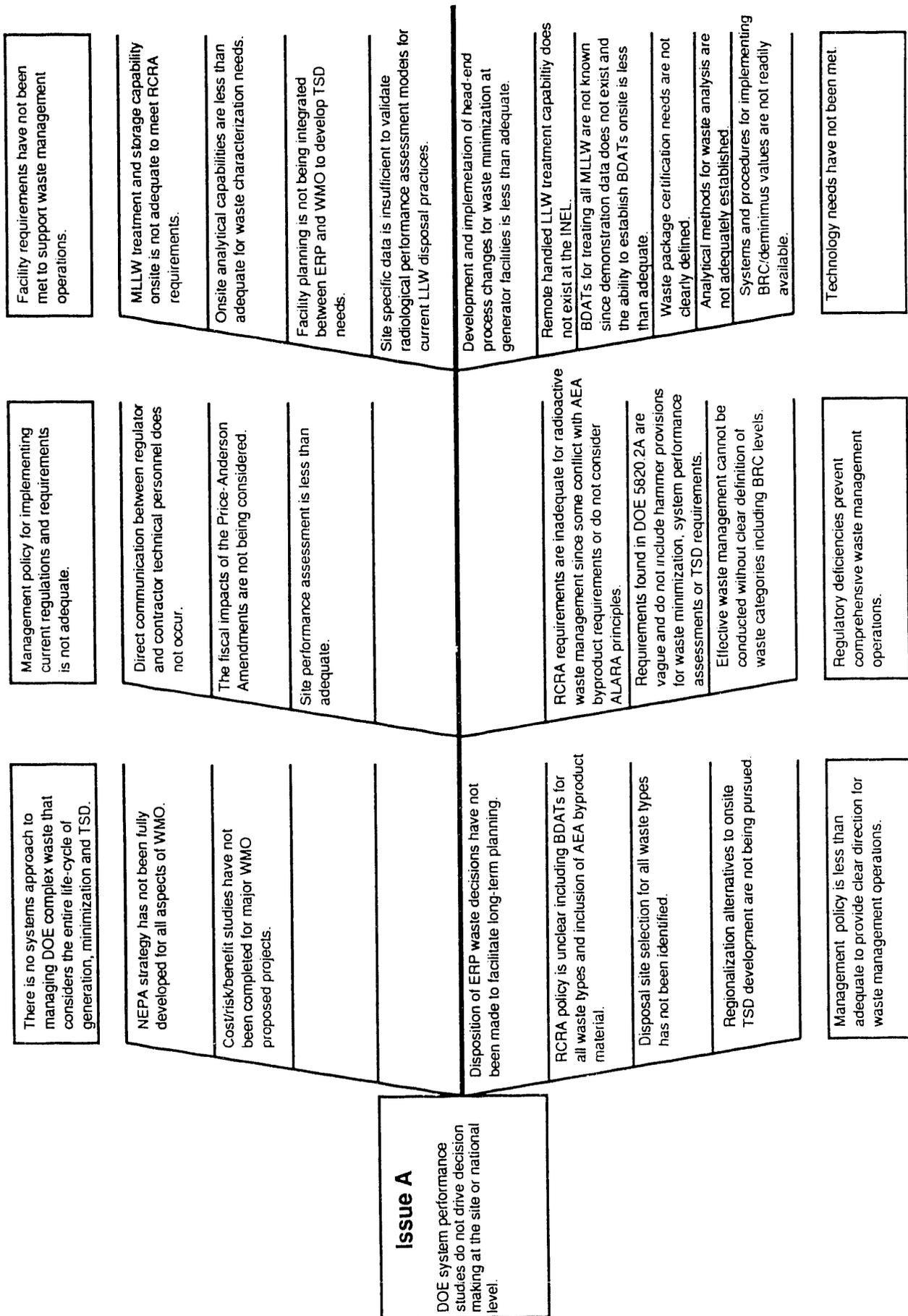
6.1.1 Root Cause Analysis

The root cause analysis is a systematic approach to identifying the hierarchy of issues needing resolution to successfully complete the WMO mission. The issues identified are categorized according to general fields of WMO such as treatment, storage, disposal, regulatory compliance, and so forth. Related issues are placed into the hierarchy as either primary, secondary, or tertiary issues. Each general field's hierarchy is presented as a Root Cause Analysis diagram.

Each issue is analyzed for root causes by identifying the sources of the issue and are expressed as additional issues. Additional issues are placed on each diagram according to the source to which they contribute. The process is continued until the point of diminishing return for identifying additional issues. The result is an extensive analysis of the issues that may detract from successful completion of the WMO mission if not resolved.

Root cause diagrams A thru H represent the final analysis of the LLW/MLLW issues. These issues have been correlated with Section 7 and included in the Analytical Tree.

Waste Management Operations Low-Level/Mixed Low-Level Waste Root Cause Analysis Diagram



Waste Management Operations Low-Level/Mixed Low-Level Waste Root Cause Analysis Diagram

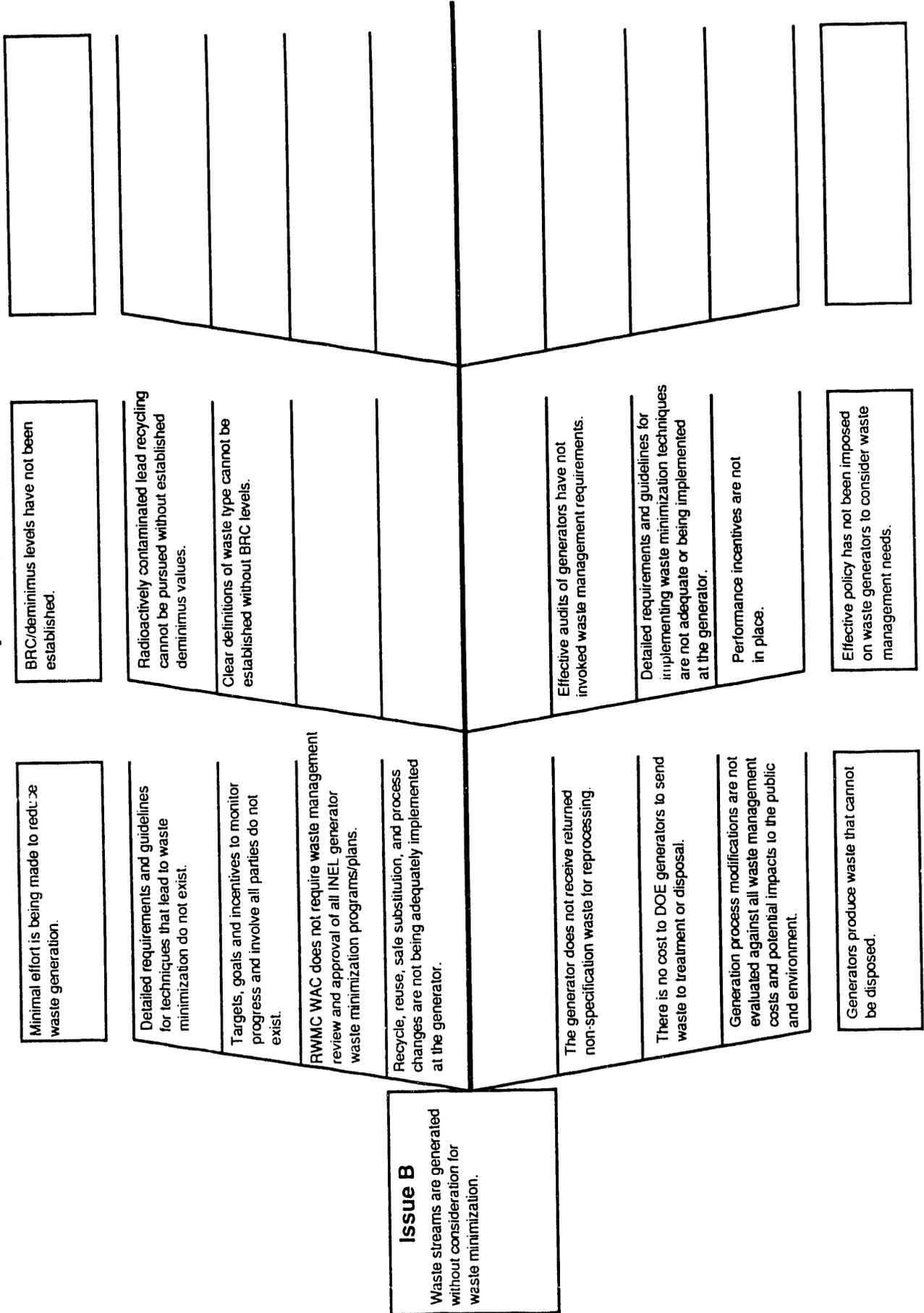
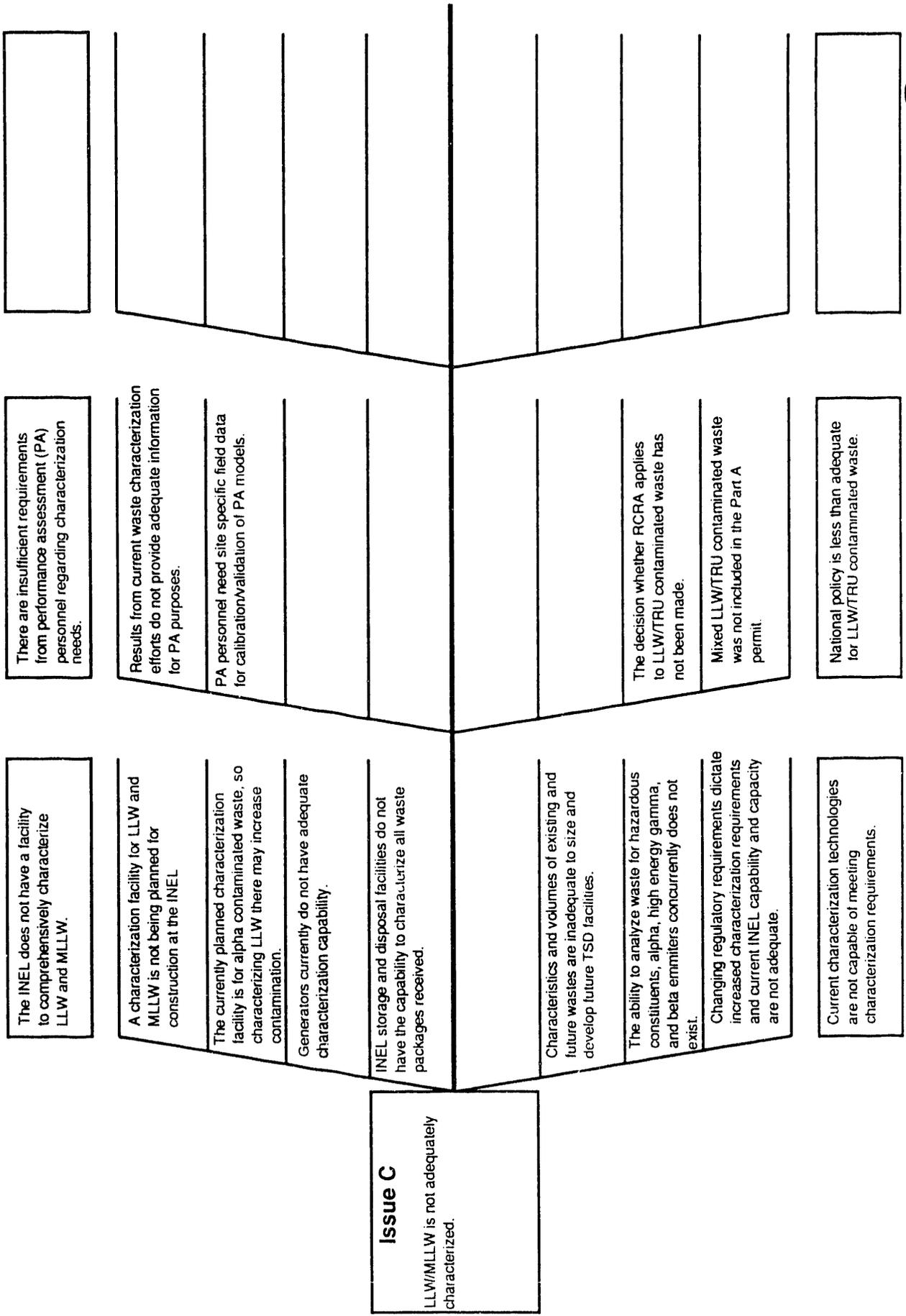


Figure 6-1b. Issue B.

Waste Management Operations Low-Level/Mixed Low-Level Waste Root Cause Analysis Diagram



Waste Management Operations Low-Level/Mixed Low-Level Waste Root Cause Analysis Diagram

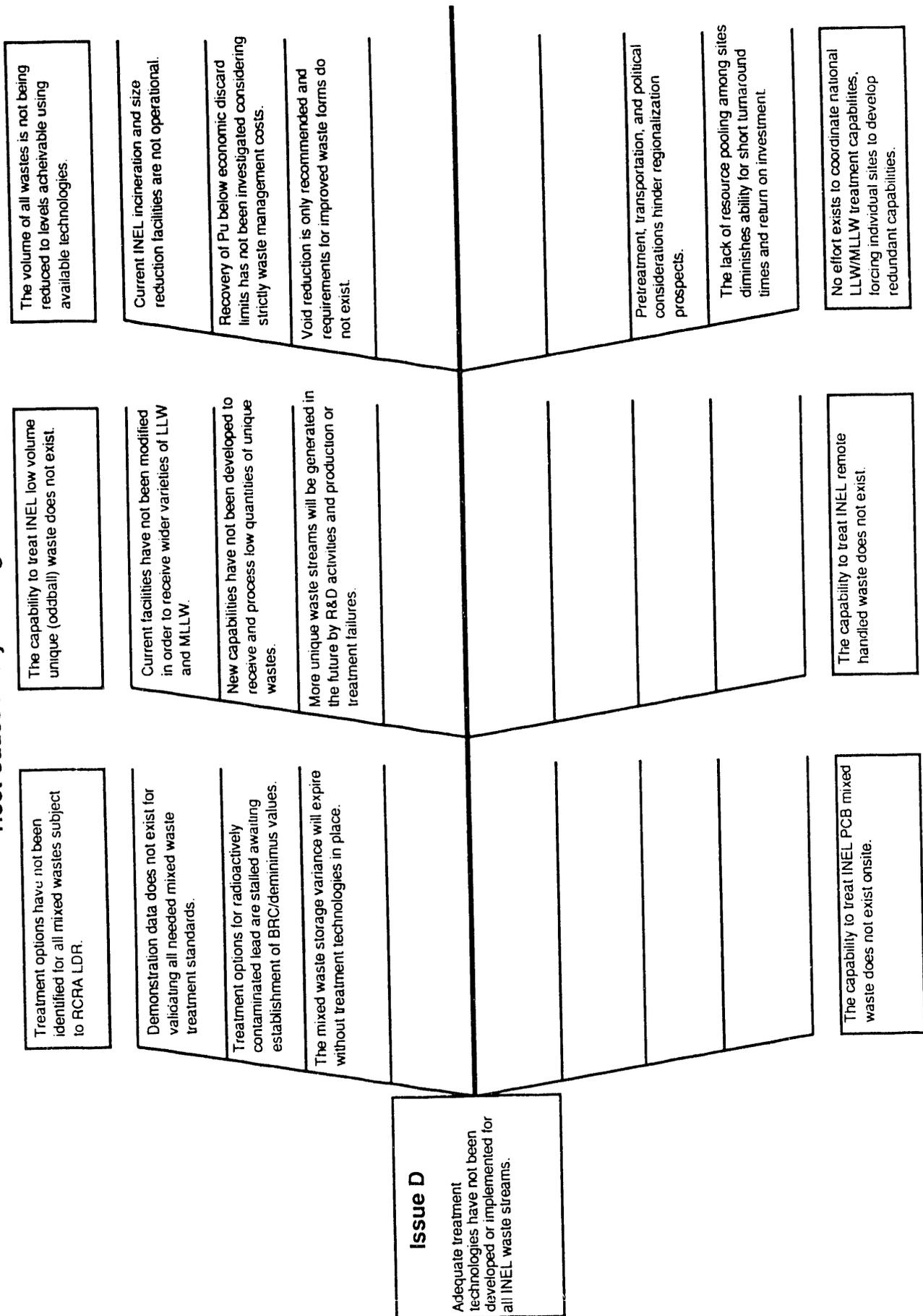
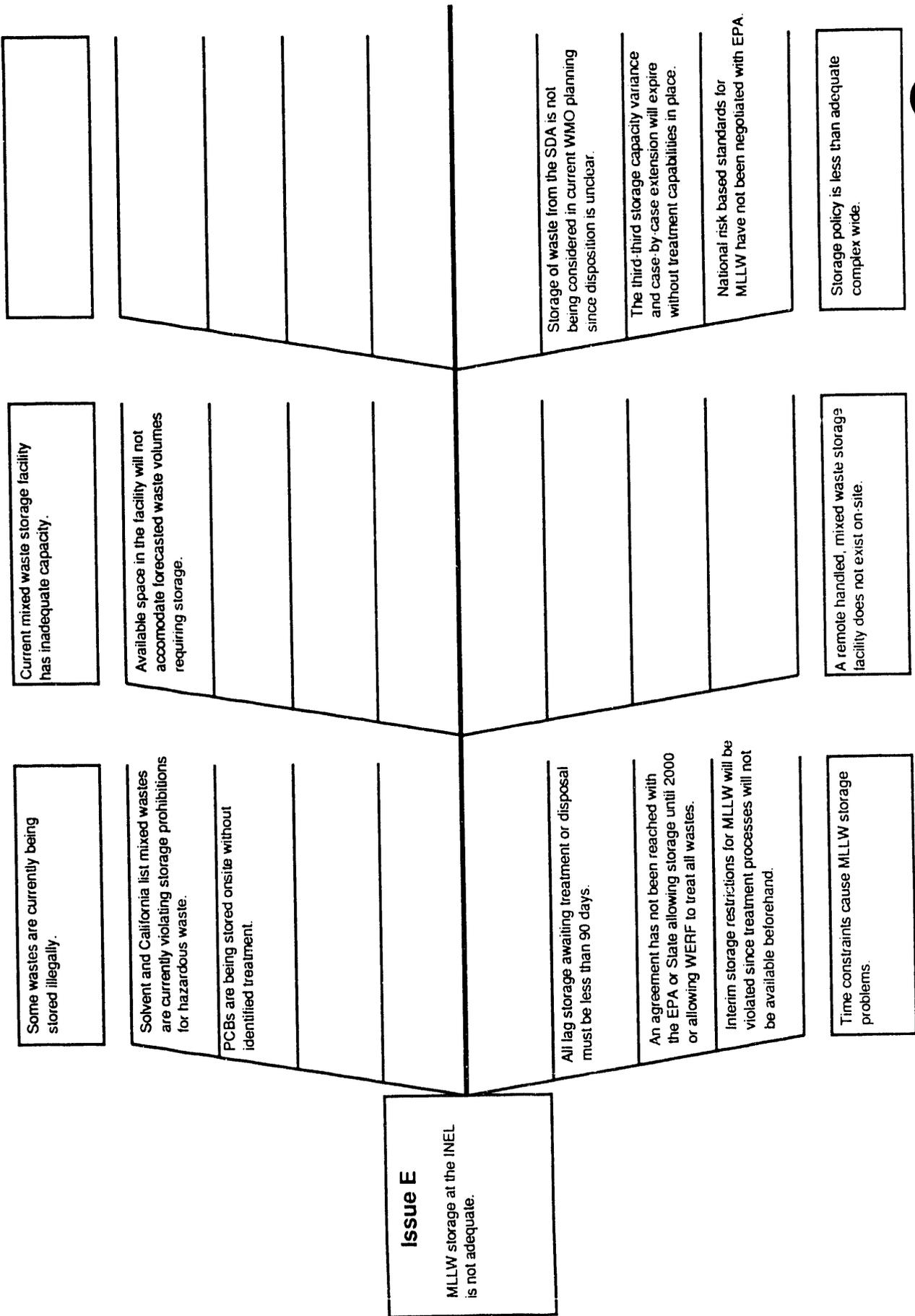


Figure 6-1d. Issue D.

Waste Management Operations Low-Level/Mixed Low-Level Waste Root Cause Analysis Diagram



Waste Management Operations Low-Level/Mixed Low-Level Waste Root Cause Analysis Diagram

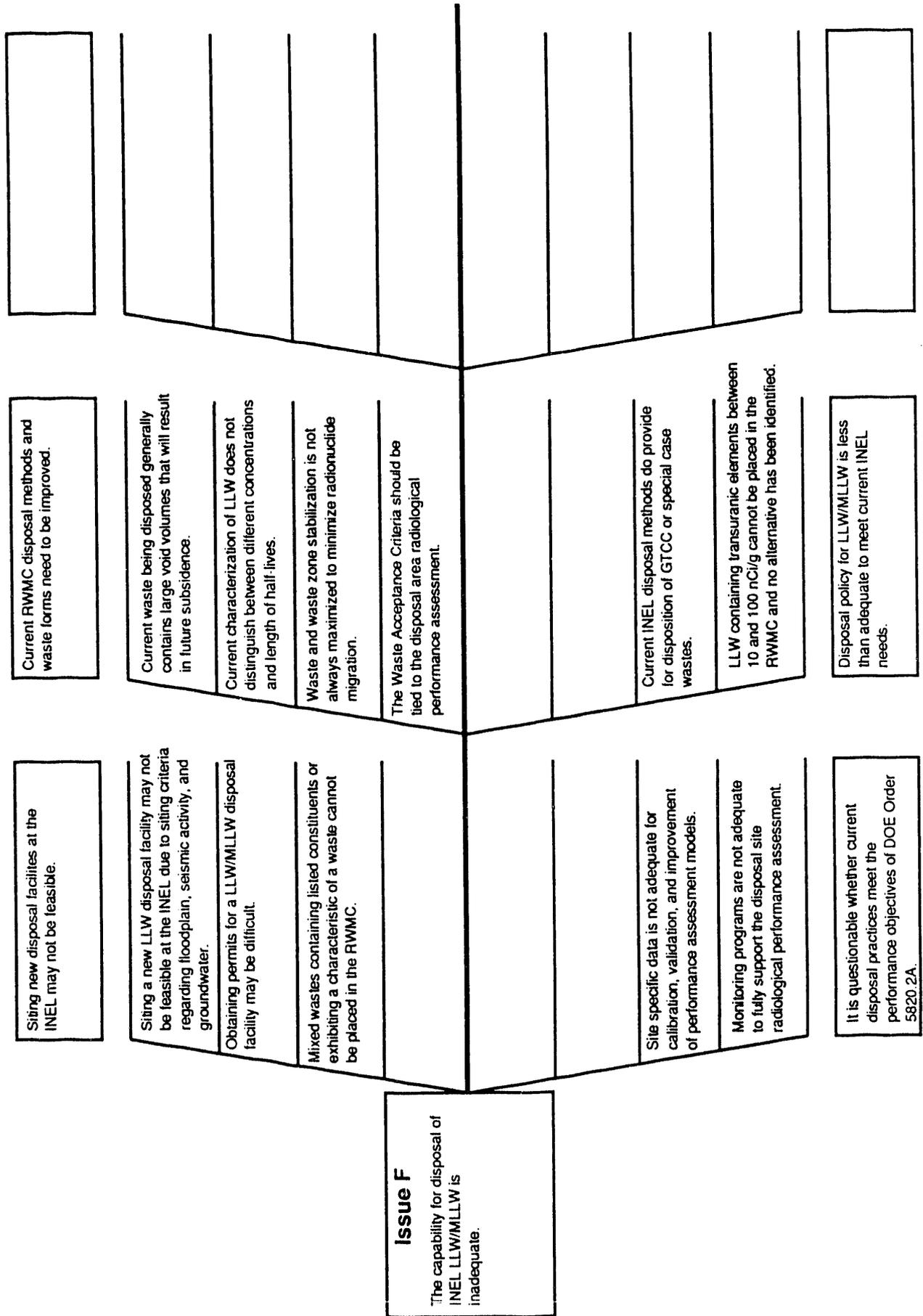
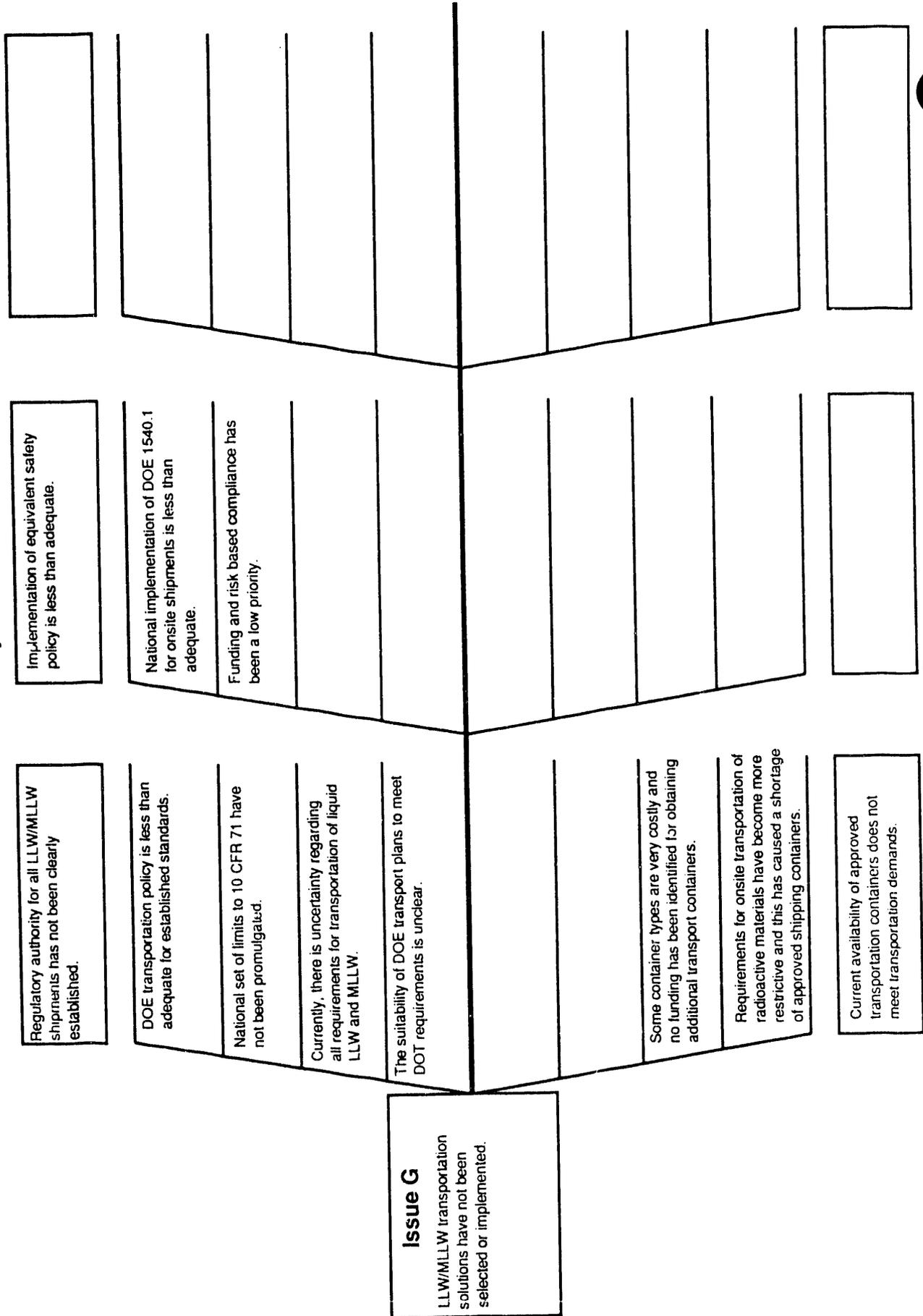


Figure 6-1f. Issue F.

Waste Management Operations Low-Level/Mixed Low-Level Waste Root Cause Analysis Diagram



Waste Management Operations Low-Level/Mixed Low-Level Waste Root Cause Analysis Diagram

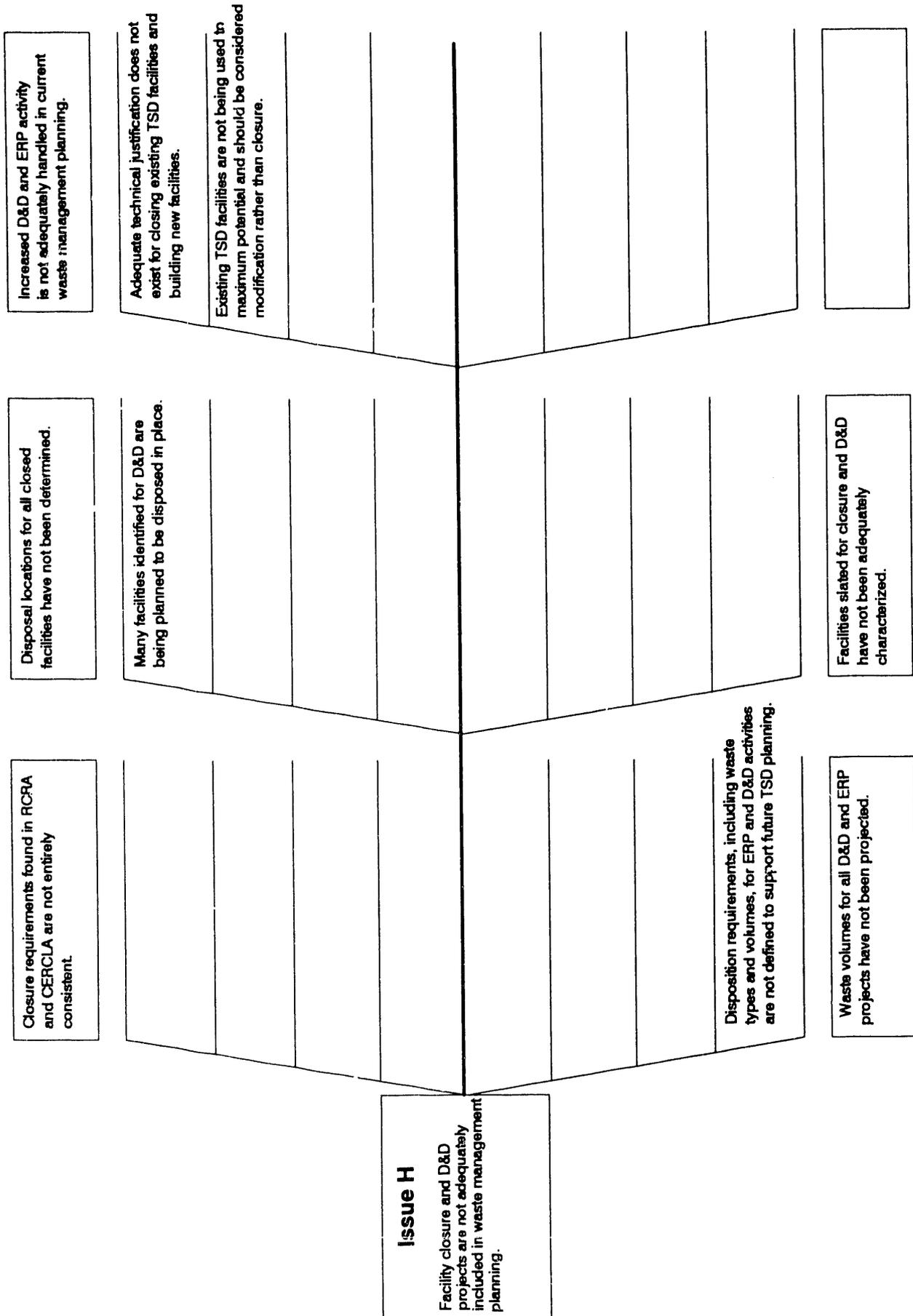


Figure 6-1h. Issue H.

6.1.2 Low-Level Waste Issue/Need Statements

Each issue identified in the root-cause analysis is analyzed to determine the needs that will resolve the issue. The applicable regulatory drivers associated with the issue are identified and recorded. The regulatory driver provides insight to the needs required for issue resolution. The status of the actions associated with the issue are identified by reviewing current planning documents such as Activity Data Sheets (ADSs). The needs are shaped by the regulatory drivers and the amount of consideration given to the issue in current planning. The status of the need is recorded, providing the basis for planning activities to resolve the issues.

INEL Waste Management Operations Roadmap Document	Title: Issues Analysis Section: 6 — Low-Level	Issue date: 04-30-92
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A. System Performance Assessment

Issue/Need: A system performance assessment (PA) has not been conducted for INEL Waste Management Operations.

ADS Number: New ADS

Waste Stream/Facility: LLW/MLLW

Regulatory Authority: DOE

Regulatory Driver: 5820.2A

Major Regulations: DOE 5820.2A

Description: Conducting a system performance assessment for Site Waste Management Operations.

Status: Guidance for conducting system performance assessments has not been issued by headquarters.

Related Regulations:

Related ADSs: 26-E1
2-E2

B. Waste Minimization

Issue/Need: Head-end process changes for generators are required for waste minimization.

ADS Number: 2-E1, 1-E1

Waste Stream/Facility: LLW/MLLW. Other waste streams and all WM facilities

Regulatory Authority: DOE

Regulatory Driver: RCRA

Major Regulations: 40 CFR 262.41 (a) (b)
40 CFR 262. Appendix
40 CFR 264.75 (h)
40 CFR 264.75 (i)
40 CFR 265.75 (h)
40 CFR 265.75 (i)
DOE 5400.3 Hazardous and Radioactive Mixed Waste Program 7d
5820.2A III.2.b

Description: Implementation of a hazardous and radioactive waste minimization program is mandated under this order which establishes DOE requirements and implements RCRA requirements within the framework of environmental programs.

Status: Initial waste minimization activities have been initiated, however those activities and waste minimization programs have not been established/completed for all wastes, programs and facilities. Technology Development Assistance needed to develop and implement head end process.

Related Regulations:

Related ADS: Sanitary (municipal solid waste), other waste streams.

INEL Waste Management Operations Roadmap Document	<p style="text-align: center;">Title: Issues Analysis</p> <p>Section: 6 — Low-Level Issue date: 04-30-92</p>
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C. Waste Characterization

Issue/Need: A LLW/MLLW waste characterization capability is needed for the INEL. Waste must be characterized to establish or meet requirements for treatment and packaging, for transportation, storage, and/or for disposal, and for other waste management activities.

ADS Number: NEW, 18-E1

Waste Stream/Facility: LLW/MLLW. Waste characterization facility.

Regulatory Authority: EPA, DOE

Regulatory Driver: 40 CFR 260-272 RCRA

Major Regulations: DOE 6430.1A Facilities Design Criteria
DOE 5820.2A Radioactive Waste Management

Description:

Status:

Related Regulations: 10 CFR 71 Packaging and Transportation of Radioactive Material
49 CFR 105-179 Hazardous Materials Transportation Act

Related ADSs: IBWP
BWID
TRU wastes
Spent fuel
Special case waste
LLW/MLLW
HW

D. Waste Treatment

Issue/Need: A qualified and approved MLLW treatment facility is needed for the INEL. Acceptable waste forms are required for transportation, storage, and/or for disposal, and for other waste management activities.

ADS Number: 5-E2, 11-E2

Waste Stream/Facility: LLW/MLLW. LLW/MLLW treatment facility.

Regulatory Authority: DOE

Regulatory Driver: 40 CFR 260-272 RCRA

Major Regulations: DOE 5400.3 Hazardous and Radioactive Mixed Waste Program.

Description: These regulations establish DOE requirements and implement RCRA requirements, within the framework of environmental protection programs, for all DOE operations involving hazardous or radioactive waste generation, treatment, storage, disposal, or transportation. Standards applicable to shippers and transporters, including packaging, documentation, record keeping, reporting, limitation of storage period, and other related standards are addressed in other regulations, also.

Status: Specific quantities of materials have not been established, or evaluated. Selection or specification of specific treatment technologies have not been completed for INEL LLW/MLLW waste streams. Technology development integration is needed.

Related Regulations: DOE Order 1540.2 Hazardous Materials Packaging for Transportation
DOE 5820.2A, C3, 3 Treatment, Storage & Disposal Methods
DOE Order 6430.1A Facilities Design Criteria

Related ADSs: LLW/MLLW transportation systems
BWID
IBWP
TRU

INEL Waste Management Operations Roadmap Document	Title: Issues Analysis Section: 6 – Low-Level	Issue date: 04-30-92
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E. MLLW Storage

Issue/Need: Current capacity of the current MLLW Storage Facility is inadequate for future waste generation projections.

ADS Number: 18-E1

Waste Stream/Facility: LLW/MLLW

Regulatory Authority: EPA, DOE

Major Regulations: 40 CFR 260-272
DOE 5400.3

Description: All MLLW is required to be placed in RCRA approved storage.

Status: Facility is being planned to increase MLLW storage capacity.

Related Regulations:

Related ADSs: 22-E1
17-E1
5-E1
11-E2

F. LLW/MLLW Disposal

Issue/Need: A RCRA land disposal facility for INEL LLW/MLLW is needed.

ADS Number: 5-E1

Waste Stream/Facility: LLW/MLLW. RWMC-2.

Regulatory Authority: EPA, DOE

Regulatory Driver: 40 CFR 260-272 RCRA; CERCLA/SARA; TSCA

Major Regulations: DOE 5400.3 Hazardous and Radioactive Mixed Waste Program
DOE 5820.2A
10 CFR 71 Packaging and Transportation of Radioactive Material

Description: These regulations establish DOE requirements and implement RCRA requirements, within the framework of environmental protection programs, for all DOE operations involving hazardous or radioactive waste generation, treatment, storage, disposal, or transportation. Standards applicable to shippers and transporters, including packaging, documentation, record keeping, reporting, limitation of storage period, and other related standards are addressed.

Status:

Related Regulations: DOE Order 6430.1A
Facilities Design Criteria
49 CFR (DOT Regulations)

Related ADSs: LLW/MLLW characterization
LLW/MLLW treatment
LLW/MLLW transportation systems

INEL Waste Management Operations Roadmap Document	Title: Issues Analysis Section: 6 — Low-Level Issue date: 04-30-92
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G. LLW/MLLW Transportation

Issue/Need: Radioactive and RCRA waste transportation solutions have not been selected and implemented.

ADS Number: 69-E1

Waste Stream/Facility: LLW/MLLW. LLW/MLLW transportation systems.

Regulatory Authority: DOT, DOE, EPA

Regulatory Driver: 40 CFR 260-272 RCRA

Major Regulations: 49 CFR 173 Shippers - General Requirements For Shipments and Packagings
 DOE 5400.3 Hazardous and Radioactive Mixed Waste Program
 10 CFR 71 Packaging and Transportation of Radioactive Material

Description: These regulations establish DOE requirements and implement RCRA requirements, within the framework of environmental protection programs, for all DOE operations involving hazardous or radioactive waste generation, treatment, storage, disposal, or transportation. Standards applicable to shippers and transporters, including packaging, documentation, record keeping, reporting, limitation of storage period, and other related standards are addressed.

Status: With few exceptions, transportation casks at INEL are not in compliance. Suitable, approved casks are needed for transport of LLW/MLLW at INEL.

Related Regulations: DOE Order 1540.1 Materials Transportation and Traffic Management
 DOE Order 1540.2 Hazardous Materials Packaging for Transportation

Related ADS: Special case waste

G. (continued).

Issue/Need: Approved/licensed casks/containers and transport plans are needed at INEL for transportation of LLW/MLLW; cask decontamination capability also may be required.

ADS Number: 69-E1

Waste Stream/Facility: LLW/MLLW. LLW/MLLW transportation systems.

Regulatory Authority: DOT, DOE, EPA

Regulatory Driver: 40 CFR 260-272 RCRA

Major Regulations: 49 CFR 173 Shippers - General Requirements For Shipments and Packagings DOE 5400.3 Hazardous and Radioactive Mixed Waste Program 10 CFR 71 Packaging and Transportation of Radioactive Material

Description: These regulations establish DOE requirements and implement RCRA requirements, within the framework of environmental protection programs, for all DOE operations involving hazardous or radioactive waste generation, treatment, storage, disposal, or transportation. Standards applicable to shippers and transporters, including packaging, documentation, record keeping, reporting, limitation of storage period, and other related standards are addressed.

Status: Suitable, approved casks are needed for transport of LLW/MLLW at the INEL.

Related Regulations: DOE Order 1540.1 Materials Transportation and Traffic Management
DOE Order 1540.2 Hazardous Materials Packaging for Transportation

Related ADS: Special case waste

H. Facility Closure/D&D

Issue/Need: Facility Closure and D&D is not adequately considered in current WMO planning.

ADS Number: NEW

Waste Stream/Facility: LLW/MLLW

Regulatory Authority: DOE

Major Regulations: DOE 5820.2A
40 CFR 265 110-124
40 CFR 264 110-120

Description:

Status:

Related Regulations:

Related ADSs: 18-E1
Facility ADS

6.1.3 Key Issue Action

The LLW issues are recorded and actions are developed based on the previously identified needs. Required actions consider the regulatory drivers and associated logistics for satisfying the needs that will resolve the issues. The impact of not conducting the action is also considered and the result is recorded. The identification of actions to resolve the issues provides a set of activities that will help assure the successful completion of the WMO mission. The actions are based on an analysis of Site issues and the status of needs regarding regulatory requirements. The result is a set of activities that will be incorporated into future plans based on current issues and regulatory requirements.

Key Site Issues — Low-Level Waste

Table 6-1a. A. System Performance Assessment

Issue	Action	Required	Impact
A system PA has not been conducted for INEL Waste Management Operations.	Conduct INEL System PA.	Should be included in planning as part of the 5820.2A implementation plan.	Facilities and operations will continue to be planned and implemented without benefit of a thorough systematic analysis.

Key Site Issues — Low-Level Waste

Table 6-1b. B. Waste Minimization

Issue	Action	Required	Impact
Waste minimization has not been given high priority by the generators.	There should be a program that charges the generator for the waste generated. This program must include a method of auditing the waste minimization programs.	This concept should be included in the Pollution Prevention (Waste Minimization) ADS sheets (20-E1).	Waste will continue to be generated with minor waste minimization efforts.
The generator is not charged for the amount of waste generated.			Out of compliance w/RCRA space utilization at new LLW disposal site.
Measurement of waste minimization is difficult because generation rates can vary from year to year or from task to task.	A2 B3-1 Consider privatization of waste minimization program.		
	A2 B3-1		

Key Site Issues — Low-Level Waste

Table 6-1c. C. Waste Characterization

Issue	Action	Required	Impact
<p>INEL has not validated the performance assessments for the current and proposed disposal facilities. (Site-specific data is lacking).</p> <p>Performance assessment indicators not providing required information.</p>	<p>Acquire Site-specific field data and validate the models used in the performance assessment.</p>	<p>Two ADS have been submitted in previous fiscal years, but were not funded. An ADS needs to be funded for this activity.</p>	<p>The impact from the disposed waste may exceed the performance objectives, even though the performance assessment did not predict it.</p>
<p>Waste is not adequately characterized for the new requirements from EPA and LLW-WAC or to determine if it is radioactive.</p>	<p>Need a new facility to perform characterization of LLW and MLLW.</p> <p>Need to perform cost benefit analysis to determine central characterization facility vs. individual facilities.</p>	<p>This should be incorporated as part of the next ADS submittal.</p>	<p>Could be out of compliance with storage, treatment, or disposal requirements.</p>

Key Site Issues — Low-Level Waste

Table 6-1d. D. Waste Treatment

Issue	Action	Required	Impact
DOE Order 5820.2A contains no clear requirements for treatment of waste.	DOE-ID and EG&G Idaho must include specific treatment requirements as part of the WAC for the disposal facility.	Should be incorporated as part of the next ADS submittal.	Waste being disposed could exceed the performance objectives of the disposal facility, and would have to be retrieved or remediated.
The complex requires a qualified and approved alpha contaminated LLW treatment facility.	(Continued from above)	Identify treatment in ADS 3E1.	(Continued from above)

Key Site Issues — Low-Level Waste

Table 6-1e. E. Mixed Low-Level Waste Storage

Issue	Action	Required	Impact
<p>MLLW storage at the INEL is not adequate.</p>	<p>Need to add permitted storage space for MLLW. Also, need to build a permitted treatment facility because there is a time limit on length of storage.</p> <p>Negotiations are required with EPA for case by case extensions of storage times until the treatment facility is operational (approx. FY 2000).</p>	<p>Continue funding to complete storage space that will be adequate for planned MLLW storage.</p> <p>Funding for a MLLW treatment facility must be continued.</p> <p>Waste Management personnel must be assigned the task of negotiating with EPA.</p> <p>(5-E2)</p>	<p>The INEL will be out of compliance with EPA requirements and will be subject to fines.</p> <p>The national capacity variance runs out in May 1992.</p>

Key Site Issues — Low-Level Waste

Table 6-1f. F. Low-Level Waste/Mixed Low-Level Waste Disposal

Issue	Action	Required	Impact
The INEL does not have a disposal facility for MLLW.	Develop disposal capability for INEL MLLW.	Subtitle C disposal facility.	Extensive MLLW Storage Facilities will be needed to accommodate wastes that are suitable for disposal.

Key Site Issues — Low-Level Waste

Table 6-1g. G. Transportation

Issue	Action	Required	Impact
<p>Requirements for on-Site transportation of radioactive materials have become more restrictive and this has caused a shortage of approved shipping containers.</p> <p>Some of these containers are very costly and there is no identified funding.</p>	<p>An evaluation of the extent of the problem must be done. Then we must obtain the required number of containers.</p>	<p>This concept should be included in the transportation Compliance System ADS sheet (69-E1).</p>	<p>Generators need to evaluate and obtain funding for their own shipping containers.</p> <p>Generators may not be able to ship waste to RWMC and this may cause non-compliances at the generator.</p> <p>Out of compliance w/DOT, 5480.3.</p>

Key Site Issues — Low-Level Waste

Table 6-1h. H. Facility Closure/D&D

Issue	Action	Required	Impact
Facility closure and D&D plans are not adequate to support WMO planning.	Develop and implement plans for characterizing and project waste volumes for facility D&D.	DOE 5820.2A	Future WMO TSD Facilities may not have the capability to accommodate future facility D&D projects.

6.2 Transuranic/Mixed Transuranic Waste Stream

This section contains the detailed issues analysis and identifies needs for transuranic (TRU) waste management at the INEL. It also contains root cause analysis, issue/need statements, and key issue/action tables.

6.2.1 Root Cause Analysis

The root cause analysis is a systematic approach to identifying the hierarchy of issues needing resolution to successfully complete the WMO mission. The issues identified are categorized according to general fields of WMO such as treatment, storage, disposal, regulatory compliance, and so forth. Related issues are placed into the hierarchy as either primary, secondary, or tertiary issues. Each general field's hierarchy is presented as a Root Cause Analysis diagram.

Each issue is analyzed for root causes by identifying the sources of the issue and are expressed as additional issues. Additional issues are placed on each diagram according to the source to which they contribute. The process is continued until the point of diminishing return for identifying additional issues. The result is an extensive analysis of the issues that may detract from successful completion of the WMO mission if not resolved.

Root cause diagram A represents the final analysis of the transuranic/mixed transuranic issues. These issues have been correlated with Section 7 and included in the Analytical Tree.

**Waste Management Operations
TRU/Mixed TRU Waste
Root Cause Analysis Diagram**

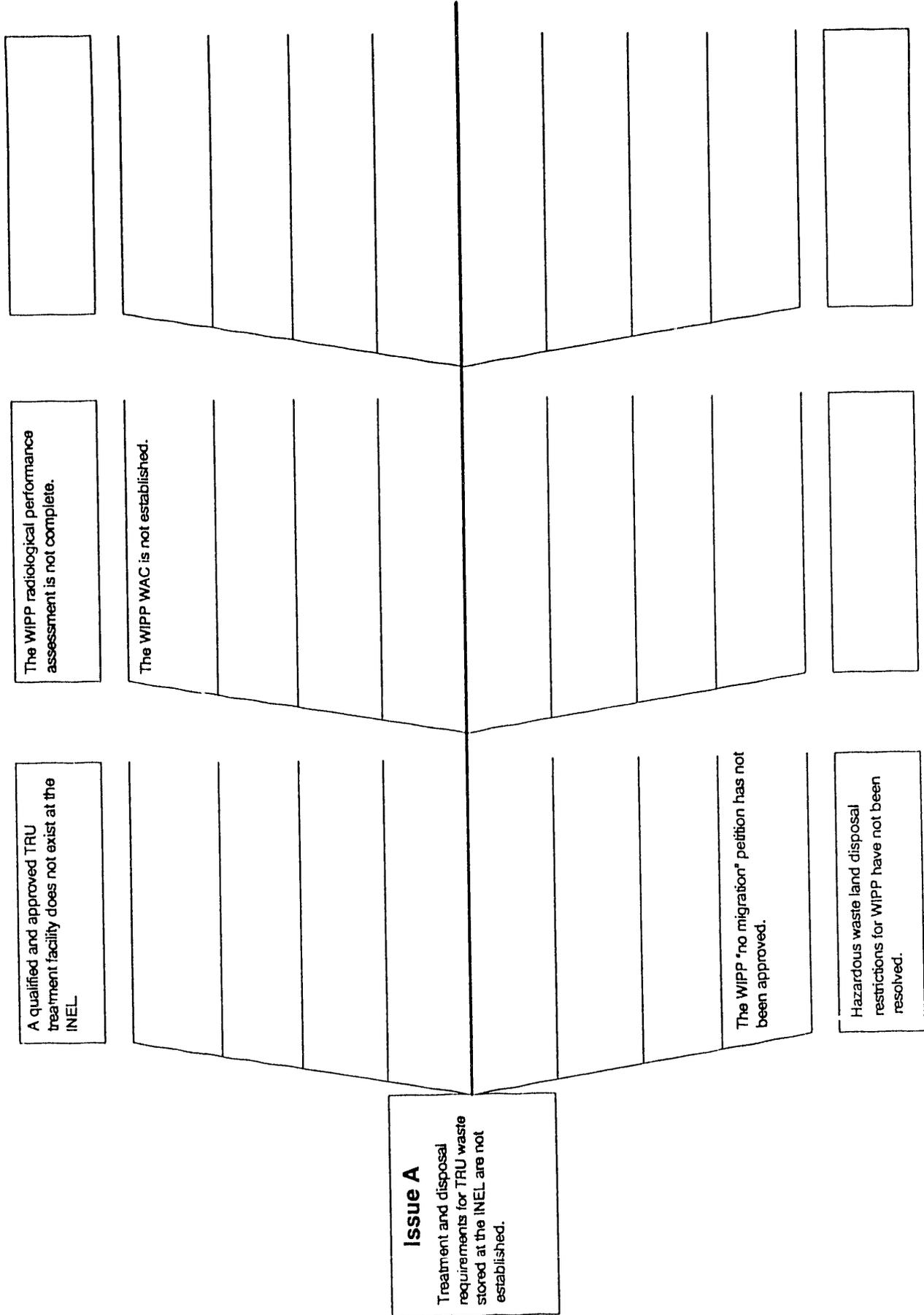


Figure 6-2a. Issue A.

INEL Waste Management Operations Roadmap Document	Title: Issues Analysis Section: 6 — Transuranic Issue date: 04-30-92
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6.2.2 Transuranic Issue/Need Statements

Each issue identified in the root-cause analysis is analyzed to determine the needs that will resolve the issue. The applicable regulatory drivers associated with the issue are identified and recorded. The regulatory drivers provide insight to what is needed for issue resolution. The status of the actions associated with the issues are identified by reviewing current planning documents such as Activity Data Sheets (ADSs). The needs are shaped by the regulatory drivers and the amount of consideration given to the issue in current planning. The status of the need is recorded, providing the basis for planning activities to resolve the issues.

INEL Waste Management Operations Roadmap Document	Title: Issues Analysis Section: 6 -- Transuranic Issue date: 04-30-92
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A. Waste Treatment, Transportation, Disposal, Performance Assessment

Issue/Need: A qualified and approved TRU treatment facility is needed at the INEL. Acceptable waste forms are required for transportation, storage, and/or for disposal, and for other waste management activities. Alpha contaminated LLW would also be treated.

ADS Number: 14-E1

Waste Stream/Facility: TRU/Mixed TRU waste. TRU treatment facility (IWPF)

Regulatory Authority: DOE, EPA

Regulatory Driver: CERCLA/SARA, State of Idaho

Major Regulations: DOE 5400.3 Hazardous and Radioactive Mixed Waste Program; 40 CFR 264/265; FFCA; IAG; commitments to State, DOE Order 5820.2A.

Description: These regulations establish DOE requirements and implement RCRA/CERCLA requirements, within the framework of environmental protection programs, for all DOE operations involving hazardous or radioactive waste generation, treatment, storage, disposal, or transportation. Standards applicable to shippers and transporters, including packaging, documentation, record keeping, reporting, limitation of storage period, and other related standards are addressed in other regulations.

Status: Specific quantities of materials have not been verified, or evaluated. Selection or specification of specific treatment technologies have not been completed for INEL TRU waste streams.

Related Regulations: DOE Order 1540.2 Hazardous Materials Packaging for Transportation
 DOE 5820.2A, C3, 3 Treatment, Storage & Disposal Methods
 DOE Order 6430.1A Facilities Design Criteria

Related ADSs: TRU transportation systems
 TRU treatment (IWPF)
 TRU disposal
 BWID
 IRWP

A. (continued).

Issue/Need: Approved/licensed casks/containers and transport plans are needed at the INEL for transportation of TRU/Mixed TRU waste; cask decontamination capability also may be required.

ADS Number: 69-E1

Waste Stream/Facility: TRU/Mixed TRU. TRU/Mixed TRU transportation Systems.

Regulatory Authority: DOT, DOE, EPA

Regulatory Driver: CERCLA/SARA, State of Idaho

Major Regulations: DOE 5400.3 Hazardous and Radioactive Mixed Waste Program; FFCA; IAG; commitments to the State.

Description: These regulations establish DOE requirements and implement RCRA/CERCLA, and DOT requirements. Standards applicable to shippers and transporters, including packaging, documentation, record keeping, reporting, limitation of storage period, and other related standards are addressed in other regulations, also.

Related Regulations: DOE Order 1540.1 Materials Transportation and Traffic Management
DOE Order 1540.2 Hazardous Materials Packaging for Transportation
49 CFR 173 Shippers - General Requirements For Shipments and Packagings
10 CFR 71 Packaging and Transportation of Radioactive Material

Related ADS: Special Case Waste

INEL Waste Management Operations Roadmap Document	Title: Issues Analysis Section: 6 — Transuranic	Issue date: 04-30-92
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A. (continued).

Issue/Need: Treatment, storage, disposal for performance assessment limiting TRU waste must be developed.

ADS: 8E3
8E4
8E5

Waste Stream/Facility: 10-100 nCi/gr TRU Mixed TRU

Regulatory Authority: DOE, EPA

Regulatory Drivers: CERCLA/SARA/RCRA, State of Idaho

Major Regulations: DOE 5820.2A Radioactive Waste Management
DOE 5400.3 Hazardous and Radioactive Mixed waste Program
FFCA (COCA, IAG), Commitment to the State

DESCRIPTION: These regulations establish DOE requirements and definition of TRU Waste at 100 nCi/gr. The draft performance assessment for the RWMC shows that intruder protection criteria of DOE 5820.2A will not be achieved at waste levels less than 100 nCi/gr. A treatment storage and disposal strategy must be developed for performance assessment limited waste. The Department of Energy should assess the viability of regulating TRU Waste at a level of 100 nCi/gr.

Related Regulations: DOE Order 5480.3, 1540.2, 1540.1, 49 CFR ITO-175, 10 CFR 71, 10 CFR 70, 40 CFR 264-268.

Related ADSs: 8E8 WIPP uncertainties
101E1 Retrieval Enclosure Facility
101E2 Waste Characterization and Storage Facility
113E1 Support to WIPP
5E1 New Low-Level Waste Disposal System
14E1 Idaho Waste Processing Facility

INEL Waste Management Operations Roadmap Document	Title: Issues Analysis Section: 6 – Transuranic Issue date: 04-30-92
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6.2.3 Key Issue Action

The TRU issues are recorded and actions are developed based on the previously identified needs. Required actions consider the regulatory drivers and associated logistics for satisfying the needs that will resolve the issues. The impact of not conducting the action is also considered and the result is recorded. The identification of actions to resolve the issues provides a set of activities that will help assure that the successful completion of the WMO mission. The actions are based on an analysis of the Site issues and the status of the needs regarding regulatory requirements. The result is a set of activities that will be incorporated into future plans based on current issues and regulatory requirements.

Key Site Issues — Transuranic

Table 6-2a. Key site issues for TRU waste.

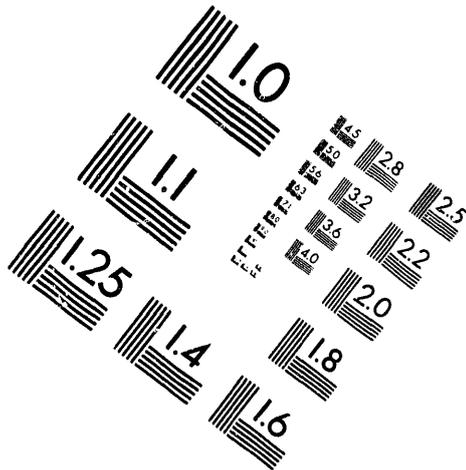
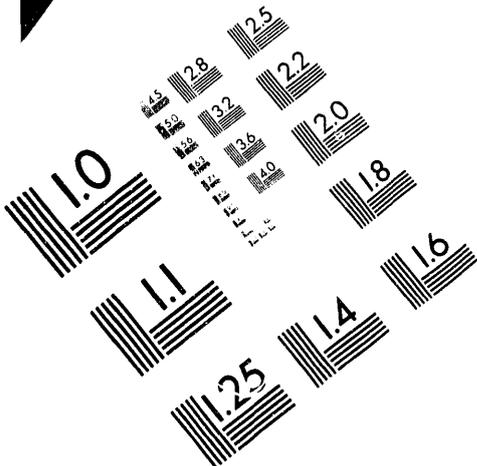
Issue	Action	Required	Impact
1. A qualified and approved TRU facility is needed at the INEL. Acceptable waste forms are required for TSD facilities.	1. A TRU treatment facility (IWPF) is being designed.	1. See ADS 14-E1	1. Failure to construct this facility will result in not being able to process TRU for disposal.
2. Hazardous waste land disposal restrictions for WIPP must be resolved.	2. A "no migration" petition has been filed with the EPA.	2. TBD	2. Failure to approve the "no migration" will result in further processing of TRU prior to disposal.
3. The WIPP Performance Assessment must be completed and the WIPP WAC finalized.	3. WIPP Bin Tests will be conducted in the future to establish the criteria for disposal of TRU wastes.	3. TBD	3. If WIPP is not designated a permanent repository, new storage of all currently stored TRU waste will continue to ensure container integrity is maintained. continuing storage will be required until a new repository is designated.



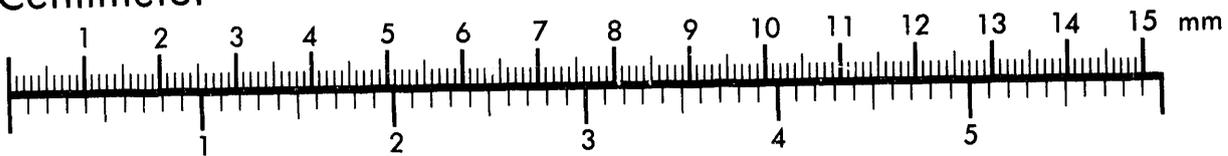
AIM

Association for Information and Image Management

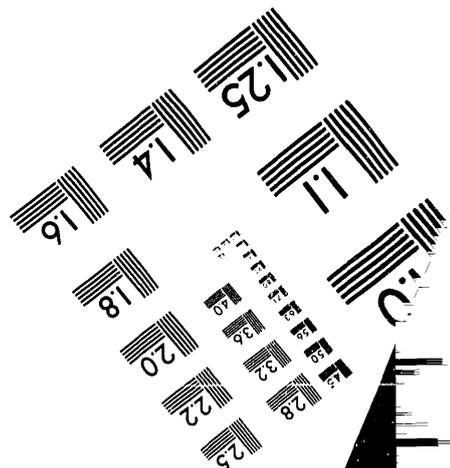
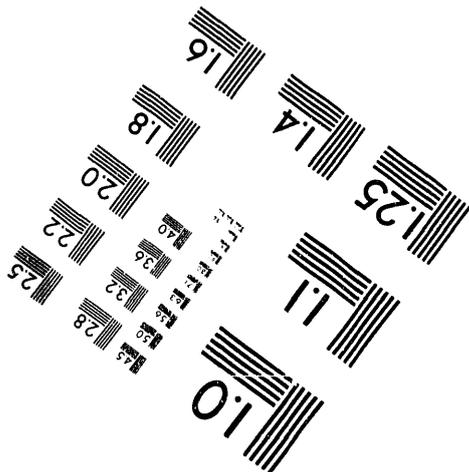
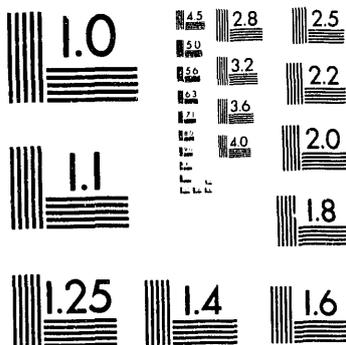
1100 Wayne Avenue, Suite 1100
Silver Spring, Maryland 20910
301/587-8202



Centimeter



Inches



MANUFACTURED TO AIM STANDARDS
BY APPLIED IMAGE, INC.

3 of 5

Key Site Issues — Transuranic

Table 6-2a. (continued)

ISSUE	ACTION	REQUIRED	IMPACT
4. The disposal logic for the buried TRU must be finalized. Buried TRU waste was not included in the EIS for WIPP.	4. R&D for processing technologies are being pursued and disposal options are being investigated. A Remedial Investigation/ Feasibility Study is being implemented for the buried waste areas.	4. TBD	4. All retrieved buried TRU waste must be stored until its permanent disposition.
5. Performance Assessment limiting TRU waste must be addressed for TSD Strategy.	5. DOE reevaluate 5820.2A limit.	5. Critical path decision first quarter FY 1992.	5. Failure to resolve, impacts amounts of TRU Waste to WIPP and compliance agreement with State of Idaho.

6.3 Municipal Sanitary Waste Stream

This section contains the detailed issues analysis and identifies needs for municipal sanitary waste management at the INEL. It also contains root cause analysis, issue/need statements, and key issue/action tables.

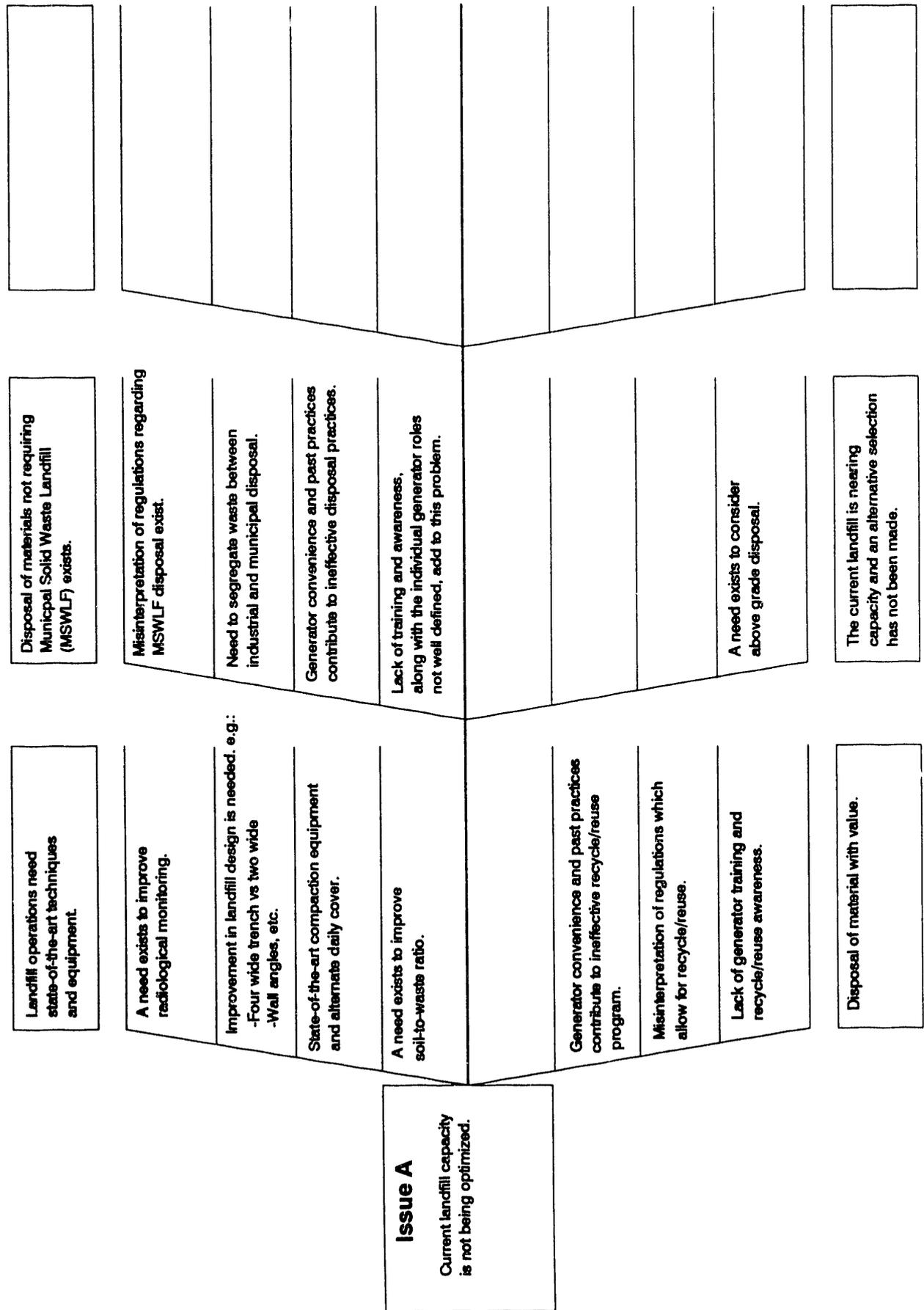
6.3.1 Root Cause Analysis

The root cause analysis is a systematic approach to identifying the hierarchy of issues needing resolution to successfully complete the WMO mission. The issues identified are categorized according to general fields of WMO such as treatment, storage, disposal, regulatory compliance, and so forth. Related issues are placed into the hierarchy as either primary, secondary, or tertiary issues. Each general field's hierarchy is presented as a root cause analysis diagram.

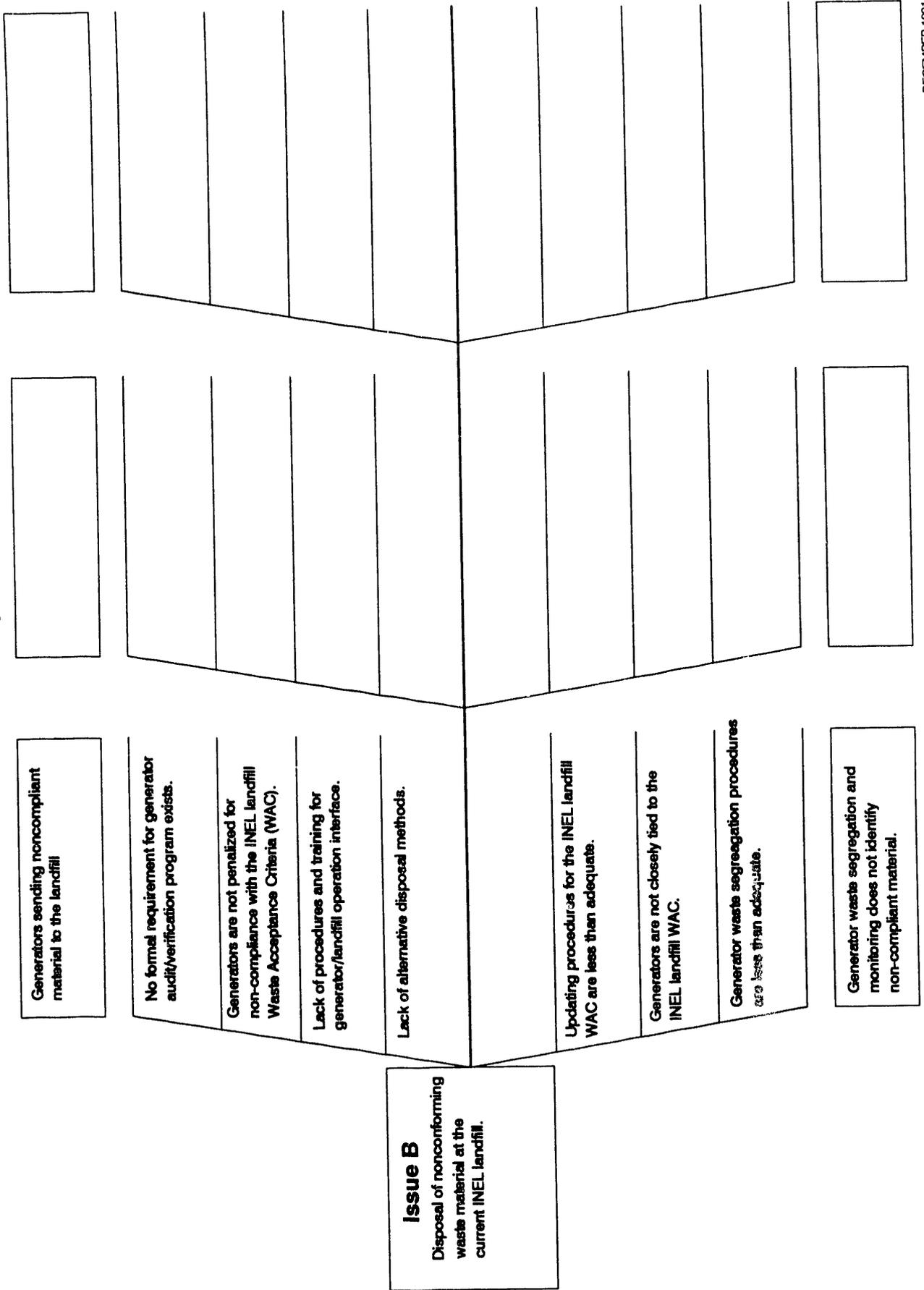
Each issue is analyzed for root causes by identifying the sources of the issue and are expressed as additional issues. Additional issues are placed on each diagram according to the source to which they contribute. The process is continued until the point of diminishing return for identifying additional issues. The result is an extensive analysis of the issues that may detract from successful completion of the WMO mission if not resolved.

Root cause diagrams A thru C represent the final analysis of the Municipal Sanitary issues. These issues have been correlated with Section 7 and included in the Analytical Tree.

Waste Management Operations Municipal Sanitary Waste Root Cause Analysis Diagram



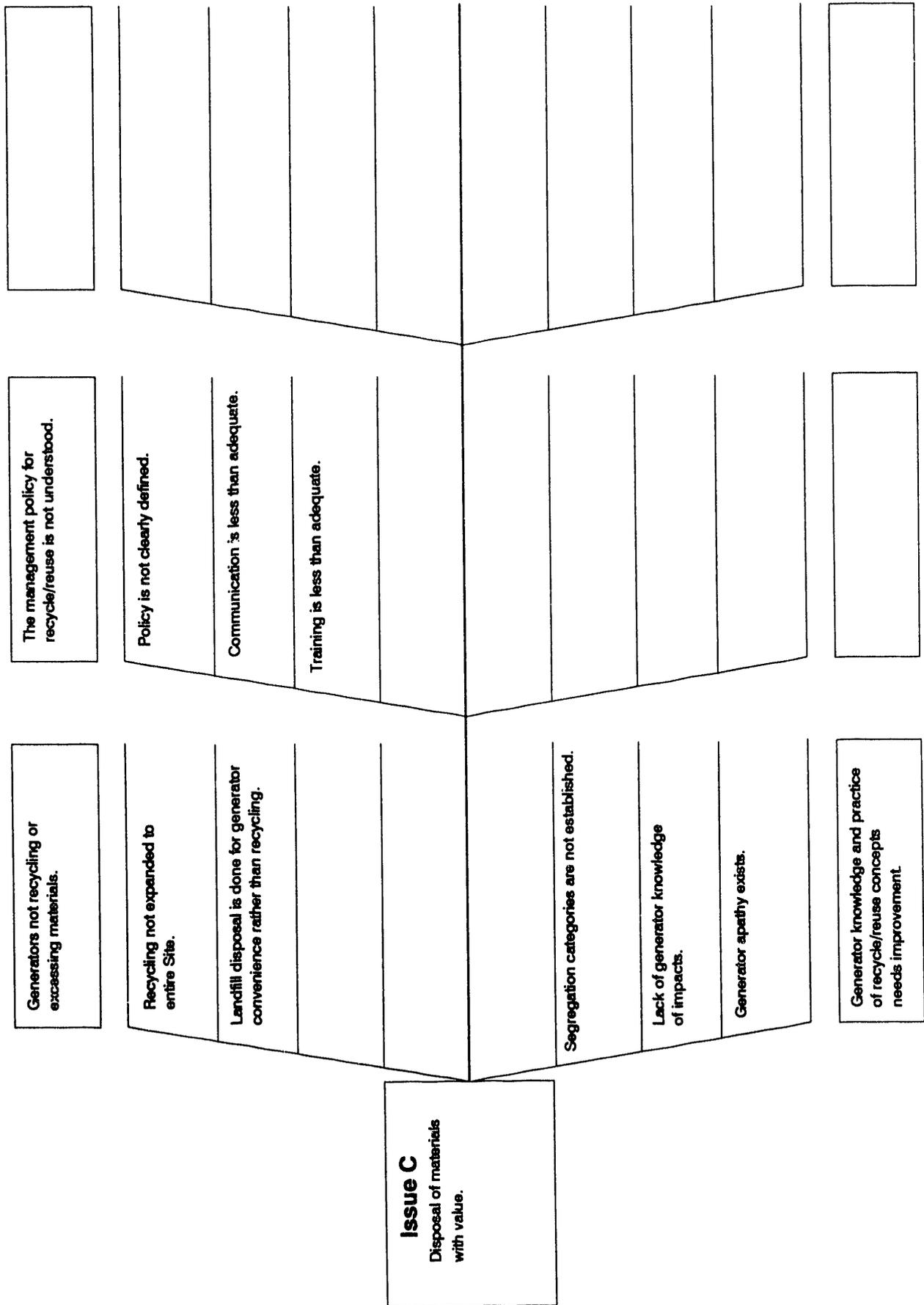
**Waste Management Operations
Municipal Sanitary Waste
Root Cause Analysis Diagram**



DECEMBER 1991
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Figure 6-3b. Issue B.

**Waste Management Operations
Municipal Sanitary Waste
Root Cause Analysis Diagram**



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2
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Figure 6-3c. Issue C.

INEL Waste Management Operations Roadmap Document	Title: Issues Analysis Section: 6 — Municipal Sanitary Issue date: 04-30-92
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6.3.2 Municipal Sanitary Waste Issue/Need Statements

Each issue identified in the root-cause analysis is analyzed to determine the needs that will resolve the issue. The applicable regulatory drivers associated with the issue are identified and recorded. The regulatory driver provides insight to the needs required for issue resolution. The status of the actions associated with the issue are identified by reviewing current planning documents such as Activity Data Sheets (ADSs). The needs are shaped by the regulatory drivers and the amount of consideration given to the issue in current planning. The status of the need is recorded, providing the basis for planning activities to resolve the issues.

Issue/Need: Under current disposal practices, the existing INEL MSWLF will reach capacity around December 1992. INEL disposal requirements dictate the need for extended MSWLF life to December 1994.

ADS Number: 71-E1

Waste Stream/Facility: Municipal Sanitary Waste

Regulatory Authority: DOE, EPA, and State of Idaho

Regulatory Driver: 40 CFR 257 and 258

Major Regulations: DOE Order 5400.1 (General Environmental Protection Program)

Description: The existing landfill operation will be evaluated for efficiency and modification made where applicable.

Status: Some modifications have been made to the landfill design to better utilize the space available.

Related Regulations:

Related ADS: 76-E1 (Sitewide EIS)

Issue/Need: The need for continued asbestos waste disposal will be required and decommission activities will continue at the INEL.

ADS Number: 71-E1

Waste Stream/Facility: Municipal Sanitary Waste

Regulatory Authority: DOE, EPA, and State of Idaho

Regulatory Driver: 40 CFR 61 Subpart M, 40 CFR 302.4 (CERCLA)

Major Regulations: DOE Order 5400.1 (General Environmental Protection Program)

Description: The disposal of asbestos waste will need to continue based on projections from D&D activities. This disposal is in compliance with 40 CFR Part 763.

Status: Currently, the asbestos waste is being disposed of in the INEL MSWLF. This practice will be evaluated and a determination made as where best to dispose of this waste.

Related Regulations: TSCA

Related ADS:

INEL Waste Management Operations Roadmap Document	Title: Issues Analysis Section: 6 — Municipal Sanitary Issue date: 04-30-92
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Issue/Need: Material segregation/monitoring procedures

ADS Number: 71-E1

Waste Stream/Facility: Municipal Sanitary Waste

Regulatory Authority: DOE, EPA, and State of Idaho

Regulatory Driver: 40 CFR 257 and 258

Major Regulations: DOE Order 5400.1 (General Environmental Protection Program)

Description: Segregation/monitoring procedures will be implemented by all INEL solid waste generators. These procedures will require all generators to segregate and monitor all solid waste to insure that the waste is properly disposed of.

Status: The segregation/monitoring procedures have been drafted and are currently being incorporated into the EG&G Idaho, Inc. company procedure manual. DOE-ID will need to require all INEL contractors to develop and implement procedures equivalent to these procedures.

Related Regulations:

Related ADS:

Issue/Need: A qualified and approved solid waste transfer station facility is needed at INEL to support INEL participation in a regional landfill. Acceptable waste would be accumulated and shipped to the regional landfill. Non-compliant waste would be retained and disposed to WMO or the generator, as appropriate.

ADS Number: 71-E1

Waste Stream/Facility: Municipal Sanitary Waste. Solid Waste Transfer Station Facility.

Regulatory Authority: DOE, EPA, and State of Idaho

Regulatory Driver: 40 CFR 257 and 258

Major Regulations: DOE 5400.1 General Environmental Protection Program

Description: These regulations establish DOE requirements and implement RCRA requirements, within the framework of environmental protection programs.

Status: Conceptual design complete. Commencing title design, EA to DOE-ID

Related Regulations: DOE Order 6430.1A Facilities Design Criteria

Related ADS: 76-E1 (sitewide EIS)

Issue/Need: At INEL, waste minimization must be incorporated into design and daily operations.

ADS Number: 20-E1

Waste Stream/Facility: Municipal Sanitary Waste

Regulatory Authority: DOE, EPA, and State of Idaho

Regulatory Driver: RCRA, DOE Orders

Major Regulations: 40 CFR 257 and 258
DOE 5400.1 General Environmental Protection Program

Description: Implementation of a solid waste minimization program is consistent with DOE orders which establish and implement DOE and RCRA requirements.

Status: Initial waste minimization activities have been initiated, however those activities and waste minimization programs have not been established/completed for all wastes, programs, and facilities.

Related Regulations:

Related ADS: 71-E1

6.3.3 Key Issue Action

The municipal sanitary issues are recorded and actions are developed based on the previously identified needs. Required actions consider the regulatory drivers and associated logistics for satisfying the needs that will resolve the issues. The impact of not conducting the action is also considered and the result is recorded. The identification of actions to resolve the issues provides a set of activities that will help assure that the successful completion of the WMO mission. The actions are based on an analysis of the Site issues and the status of the needs regarding regulatory requirements. The result is a set of activities that will be incorporated into future plans based on current issues and regulatory requirements.

Key Site Issues — Municipal Sanitary Waste

Table 6-3a. Key site issues for municipal sanitary waste.

Issue	Action	Required	Impact
1. INEL requires disposal or other alternatives of municipal sanitary waste.	1. Provide transfer station, landfill, and interface with local county to ensure waste disposal. Research alternate methods of disposal or material recovery.	1. See ADS 71-E1	1. If no disposal or other alternative for solid waste is available, the operations at the Site will cease.
2. Frequent occurrence of disposal of non-compliant wastes.	2. Develop facility specific procedures for the segregation and monitoring of all municipal sanitary waste.	2. See ADS 71-E1	2. Non-compliant materials will be sent to the transfer station.
3. Disposal of material with value.	3. Begin Site recycling for paper, beverage cans, and cardboard. Expand program when alternatives are developed.	3. DOE-ID approval for Site recycling.	3. Continued disposal of material with value, and ineffective use of valuable landfill space.

6.3.3 Key Issue Action

The municipal sanitary issues are recorded and actions are developed based on the previously identified needs. Required actions consider the regulatory drivers and associated logistics for satisfying the needs that will resolve the issues. The impact of not conducting the action is also considered and the result is recorded. The identification of actions to resolve the issues provides a set of activities that will help assure that the successful completion of the WMO mission. The actions are based on an analysis of the Site issues and the status of the needs regarding regulatory requirements. The result is a set of activities that will be incorporated into future plans based on current issues and regulatory requirements.

Key Site Issues — Municipal Sanitary Waste

Table 6-3a. Key site issues for municipal sanitary waste.

Issue	Action	Required	Impact
1. INEL requires disposal or other alternatives of municipal sanitary waste.	1. Provide transfer station, landfill, and interface with local county to ensure waste disposal. Research alternate methods of disposal or material recovery.	1. See ADS 71-E1	1. If no disposal or other alternative for solid waste is available, the operations at the Site will cease.
2. Frequent occurrence of disposal of non-compliant wastes.	2. Develop facility specific procedures for the segregation and monitoring of all municipal sanitary waste.	2. See ADS 71-E1	2. Non-compliant materials will be sent to the transfer station.
3. Disposal of material with value.	3. Begin Site recycling for paper, beverage cans, and cardboard. Expand program when alternatives are developed.	3. DOE-ID approval for Site recycling.	3. Continued disposal of material with value, and ineffective use of valuable landfill space.

6.4 Hazardous Waste Stream

This section contains the detailed issues analysis and identifies needs for hazardous waste (HW) management at the INEL. It also contains root cause analysis, issue/need statements, and key issue/action tables.

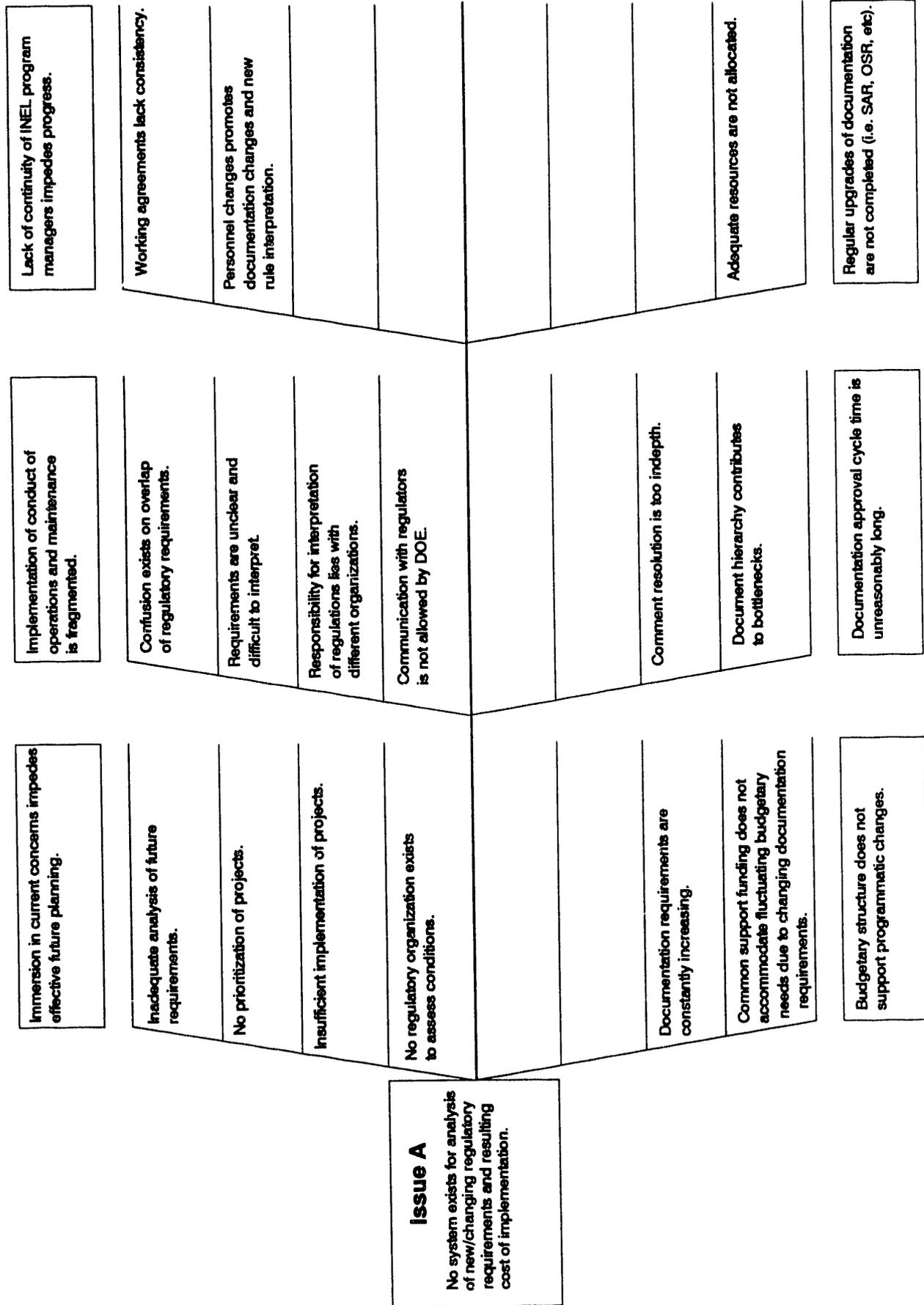
6.4.1 Root Cause Analysis

The root cause analysis is a systematic approach to identifying the hierarchy of issues needing resolution to successfully complete the WMO mission. The issues identified are categorized according to general fields of WMO such as treatment, storage, disposal, regulatory compliance, and so forth. Related issues are placed into the hierarchy as either primary, secondary, or tertiary issues. Each general field's hierarchy is presented as a Root Cause Analysis diagram.

Each issue is analyzed for root causes by identifying the sources of the issue and are expressed as additional issues. Additional issues are placed on each diagram according to the source to which they contribute. The process is continued until the point of diminishing return for identifying additional issues. The result is an extensive analysis of the issues that may detract from successful completion of the WMO mission if not resolved.

Root cause diagrams A thru F represent the final analysis of the hazardous waste issues. These issues have been correlated with Section 7 and included in the Analytical Tree.

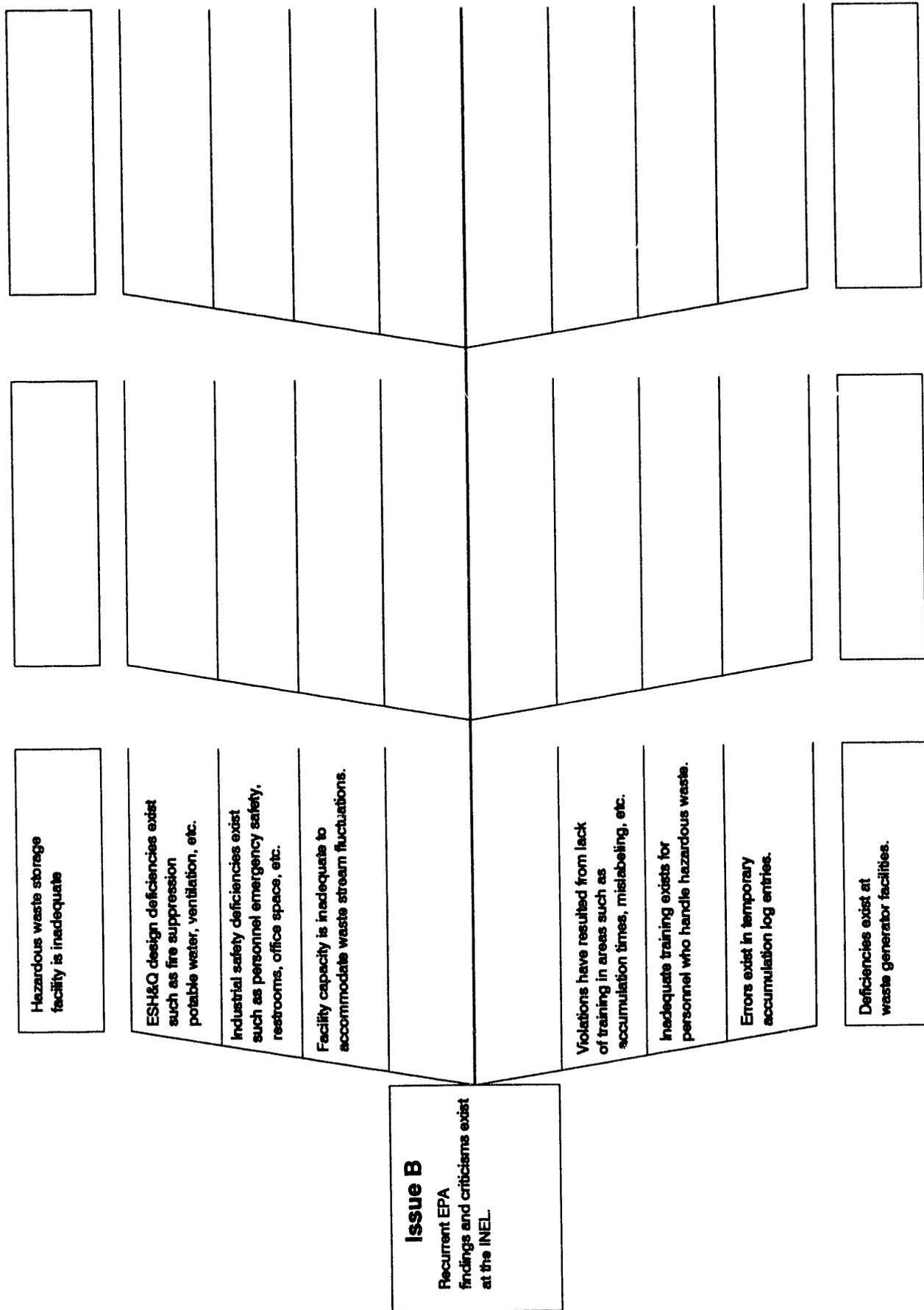
Waste Management Operations Hazardous Waste Root Cause Analysis Diagram



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Figure 6-4a. Issue A.

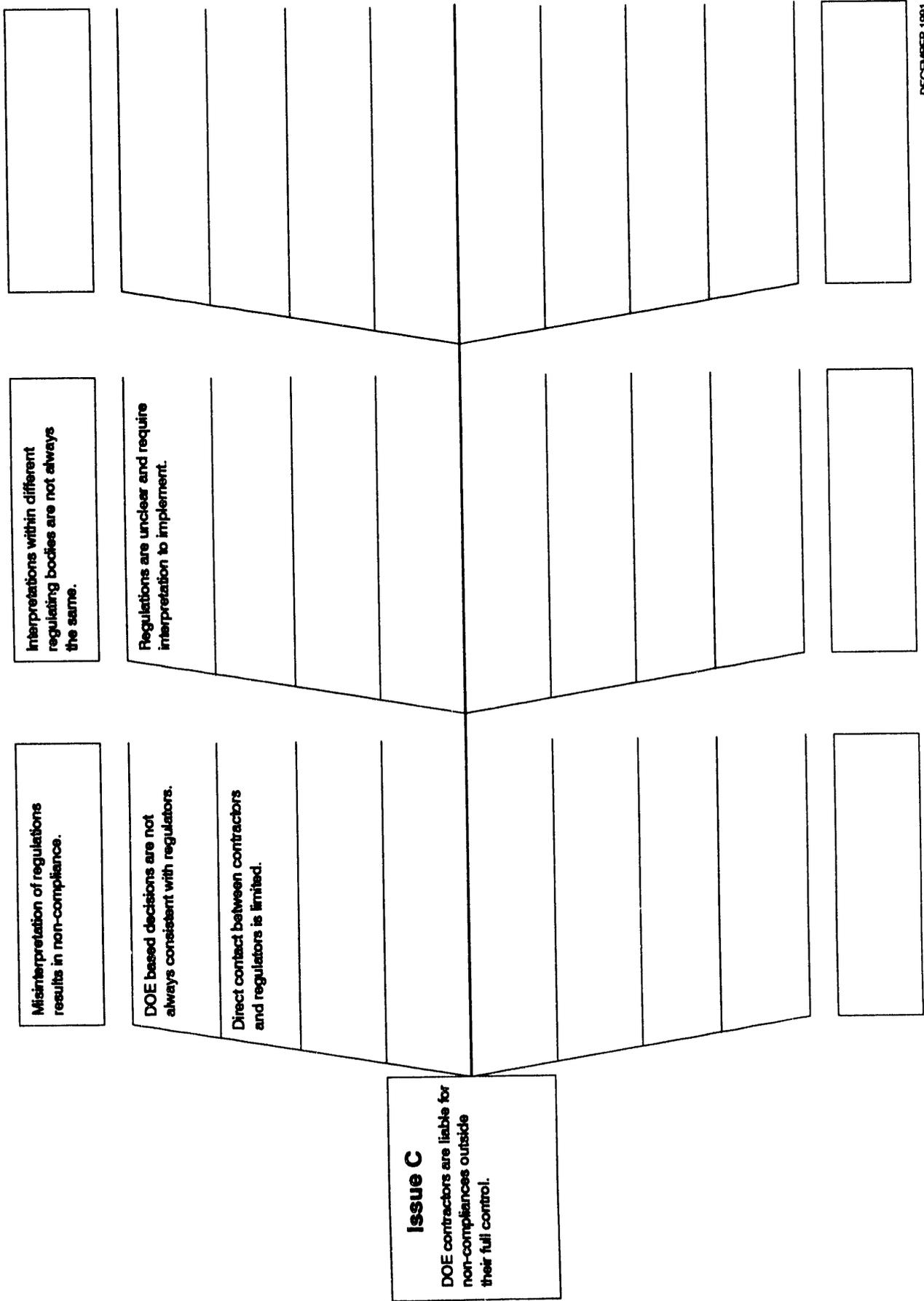
Waste Management Operations Hazardous Waste Root Cause Analysis Diagram



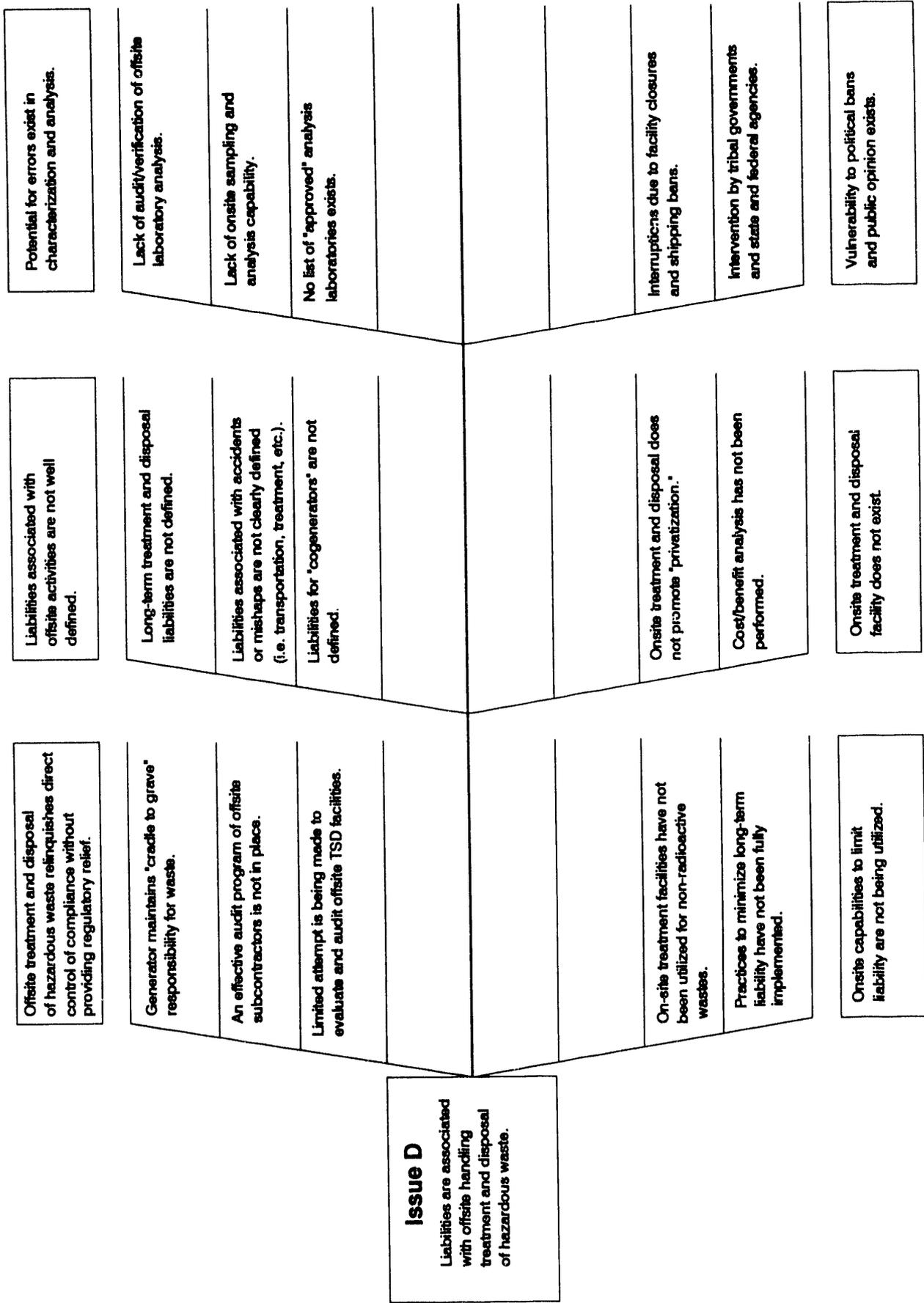
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Figure 6-4b. Issue B.

Waste Management Operations Hazardous Waste Root Cause Analysis Diagram



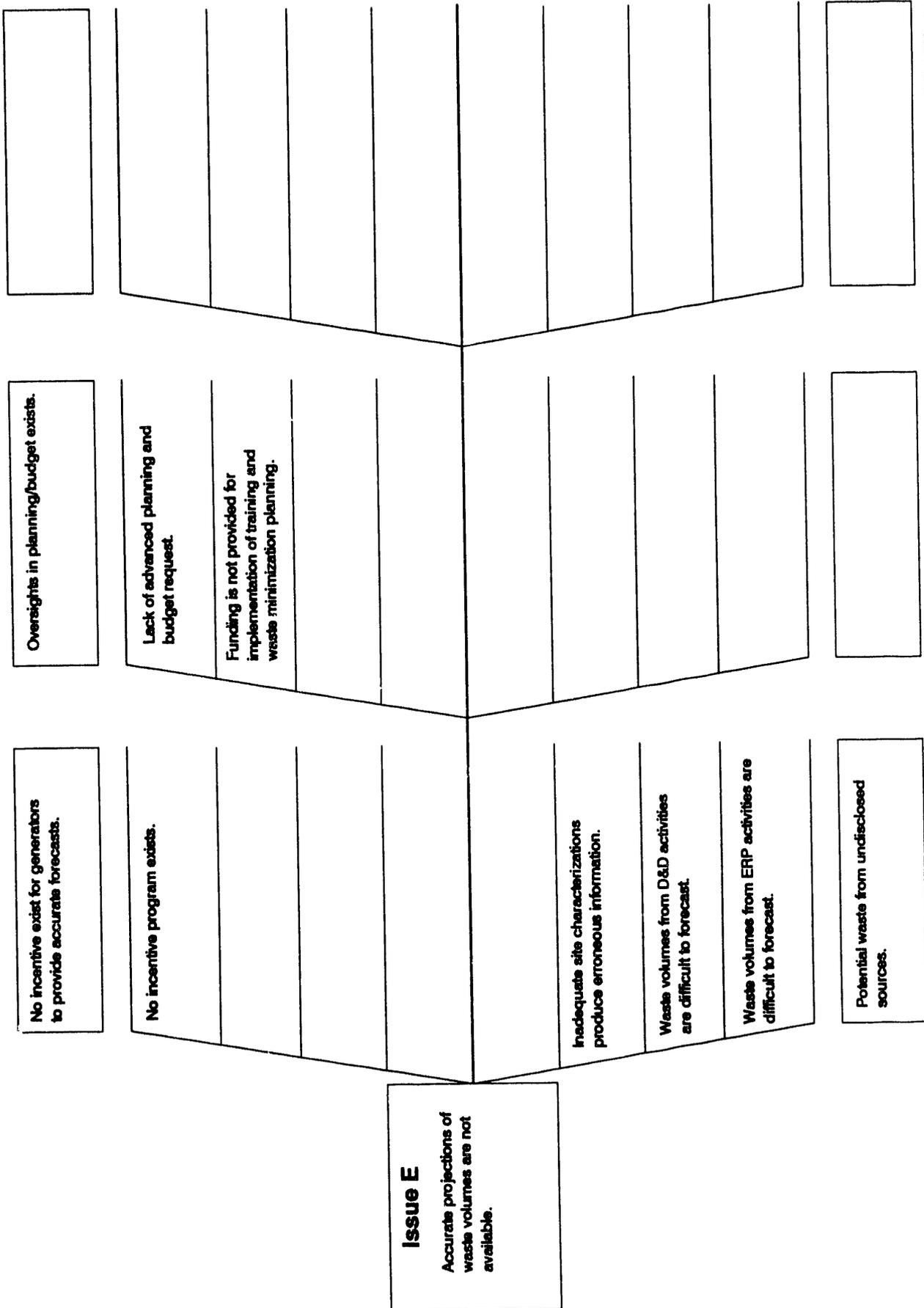
Waste Management Operations Hazardous Waste Root Cause Analysis Diagram



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Figure 6-4d. Issue D.

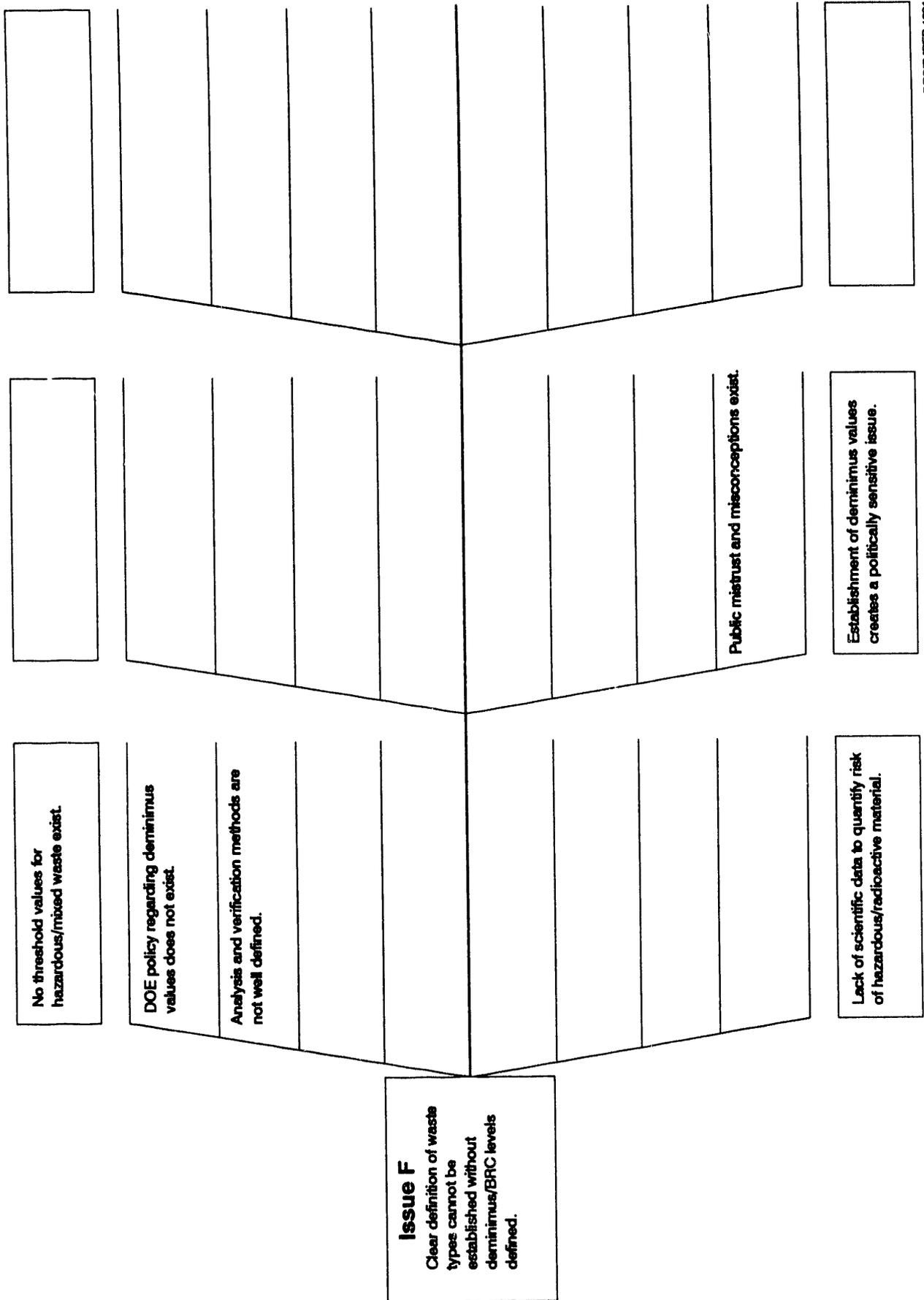
**Waste Management Operations
 Hazardous Waste
 Root Cause Analysis Diagram**



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Figure 6-4e. Issue E.

Waste Management Operations Hazardous Waste Root Cause Analysis Diagram



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Figure 6-4f. Issue F.



6.4.2 Hazardous Waste Issue/Need Statements

Each issue identified in the root-cause analysis is analyzed to determine the needs that will resolve the issue. The applicable regulatory drivers associated with the issues are identified and recorded. The regulatory driver provides insight to the needs required for issue resolution. The status of the actions associated with the issue are identified by reviewing current planning documents such as Activity Data Sheets (ADSs). The needs are shaped by the regulatory drivers and the amount of consideration given to the issue in current planning. The status of the need is recorded, providing the basis for planning activities to resolve the issues. Post closure plans for HW Sites under 40 CFR 260 will have to be negotiated on RCRA Part B process 40 CFR 270.

Issue: A hazardous waste (HW) characterization laboratory is needed at the INEL to meet the requirements of 40 CFR 264.

ADS Number: 18-E1

Waste Stream/Facility: RH, CH, HW, Nonradioactive HW

Regulatory Authority: DOE, EPA

Regulatory Drivers: 40 CFR 260-272, CERCLA/SARA

Major Regulations: DOE 6430.1A
40 CFR 262, 262 APPENDIX, 264, 268
40 CFR 105-179
DOE 5400.3

Description: A strategy for Complex-wide characterization of nonradioactive HW has not been developed. A cost benefit analysis for shipping HW samples to an off-Site DOE-EPA certified laboratory vs. construction of a new HW characterization facility on the INEL should be completed. Current regulations require characterization of all types of HW prior to storage.

Status: The INEL has limited characterization capability. Only nonradioactive HW is currently characterized. Treated waste cannot be analyzed for TCLP characteristics on the INEL.

Related Regulations: 40 CFR 262.34
40 CFR 261, 173, 750 (PCB's, asbestos, CFC's)

Related ADS: Environmental Restoration ADS

Issue/Need: A qualified and approved hazardous waste (HW) treatment facility is needed at INEL. Acceptable waste forms are required for transportation, storage, and/or for disposal, and for other waste management activities.

ADS Number: 21-E1

Waste Stream/Facility: HW, HW treatment facility

Regulatory Authority: DOE, EPA

Regulatory Driver: 40 CFR 260-272 RCRA

Major Regulations DOE 5400.3 Hazardous and Radioactive Mixed Waste Program
40 CFR 262, 262 Appendix, 264, 268

Description: These regulations establish DOE requirements and implement RCRA requirements, within the framework of environmental protection programs, for all DOE operations involving hazardous or radioactive waste generation, treatment, storage, disposal, or transportation. Standards applicable to shippers and transporters, including packaging, documentation, record keeping, reporting, limitation of storage period, and other related standards are addressed in other regulations, also. Cost benefit analysis of shipping HW off-Site to a commercial treatment facility vs. building a HW Treatment Facility on the INEL should be performed.

Status: Specific quantities of materials have not been established, or evaluated. Selection or specification of specific treatment technologies have not been completed for INEL HW waste streams.

Related Regulations: DOE Order 1540.2 Hazardous Materials Packaging for Transportation
DOE 5820.2A, C3, 3 Treatment, Storage & Disposal Methods
DOE Order 6430.1A Facilities Design Criteria

Related ADSs: C/MLLW transportation systems
HW characterization
Buried Waste Integrated Demonstration (BWID)
Idaho Buried Waste Program (IBWP)
TRJ and Special case waste

INEL Waste Management Operations Roadmap Document	Title: Issues Analysis Section: 6 — Hazardous Issue date: 04-30-92
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Issue/Need: Additional hazardous waste (HW) storage is needed at INEL. Permitted storage is limited and could adversely impact HW activities and possibly shutdown INEL operations.

ADS Number: 22-E1, 18-E1

Waste Stream/Facility: HW, HW Storage Facility

Regulatory Authority: DOE, EPA

Regulatory Driver: 40 CFR 260-272 RCRA, State of Idaho

Major Regulations: DOE 5400.3 Hazardous and Radioactive Mixed Waste Program
40 CFR 262, 262 Appendix, 264, 268

Description: These regulations establish DOE requirements and implement RCRA requirements, within the framework of environmental protection programs, for all DOE operations involving hazardous or radioactive waste generation, treatment, storage, disposal, or transportation. Standards applicable to shippers and transporters, including packaging, documentation, record keeping, reporting, limitation of storage period, and other related standards are also addressed in other regulations.

Status: Existing approved storage for HW is limited. The stored volume of HW awaiting treatment and disposal are expected to exceed available storage capacity.

Related Regulations: DOE Order 1540.2 Hazardous Materials packaging for Transportation
DOE 5820.2A, C3, 3 Treatment, Storage & Disposal Methods
DOE Order 6430.1A Facilities Design Criteria

Related ADSs: HW characterization
HW treatment

Issue/Need: A schedule and strategy for handling INEL PCBs, regulated under TSCA, has not been developed.

ADS Number: NEW

Waste Stream/Facility: PCB, Facility TBD

Regulatory Authority: DOE; EPA

Regulatory Drivers: 40 CFR 720-760
40 CFR 761 (exemptions)

Major Regulations: DOE 5400.3, 40 CFR 760

Description: These regulations establish DOE requirements and implement TSCA requirements for all DOE operations. A strategy, timetable, inventory, cost estimate and performance indicators should be developed to provide the most cost effective method for disposing of PCBs. This will include incidental by-products.

Status: Significant cost have been incurred due to a nonexistent methodology of handling generated/stored PCBs. PCBs must be shipped off-Site to a TSCA approved incinerator for destruction.

Related Regulations: DOE 1540.2 Hazardous Material packaging for Transportation.

Related ADSs: Need number titles
Technology development required

6.4.3 Key Issue Action

The hazardous waste issues are recorded and actions are developed based on the previously identified needs. Required actions consider the regulatory drivers and associated logistics for satisfying the needs that will resolve the issues. The impact of not conducting the action is also considered and the result is recorded. The identification of actions to resolve the issues provides a set of activities that will help assure the successful completion of the WMO mission. The actions are based on an analysis of the Site issues and the status of the needs regarding regulatory requirements. The result is a set of activities that will be incorporated into future plans based on current issues and regulatory requirements.

Key Site Issues – Hazardous Waste

Table 6-4a. A. System Performance.

Issue	Action	Required	Impact
Liabilities are associated with off-Site treatment and disposal of waste.	Develop practices to minimize the long-term liability. Utilize proposed mixed waste treatment facilities.	RCRA Subtitle C.	Contractor suffers consequences for noncompliant treatment or disposal at off-Site facilities.

Table 6-4b. B. Hazardous Waste Operations

Issue	Action	Required	Impact
Misinterpretation of regulations creates noncompliances.	Develop contractor/regulator interface Expand hazardous material training program	1Q93 3Q92	Regulatory deficiencies

Key Site Issues — Hazardous Waste

Table 6-4c. C. INEL Hazardous Waste Shipping Moratorium

Issue	Action	Required	Impact
A shipping moratorium currently exists for hazardous waste and could extend to other waste streams.	Establish de minimis waste disposal criteria.	NEW ADS	Does not meet performance objective for certification of non-radioactive waste for off-Site treatment/disposal.
	Implement hazardous material control programs	ADS 15E1 3Q92	

Table 6-4d. D. Develop new Treatment/Storage/Disposal options

ISSUE	ACTION	REQUIRED	IMPACT
A complete evaluation of the development of new treatment, storage and disposal facilities needs to be performed.	Evaluate utilization of existing or proposed MLLW facilities for processing hazardous waste.	1Q94	Long-term liability for waste shipped off-Site.
	Evaluate need to construct hazardous waste treatment facility.	ADS 21E1 4Q96	
	Evaluate need to construct hazardous waste storage facility.	ADS 22E1 2Q94	

INEL Waste Management Operations Roadmap Document	Title: Issues Analysis Section: 6 — Spent Fuel Issue date: 04-30-92
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6.5 Spent Fuel Waste Stream

This section contains the detailed issues analysis and identifies needs for spent fuel management at the INEL. It also contains root cause analysis, issue/need statements, and key issue/action tables.

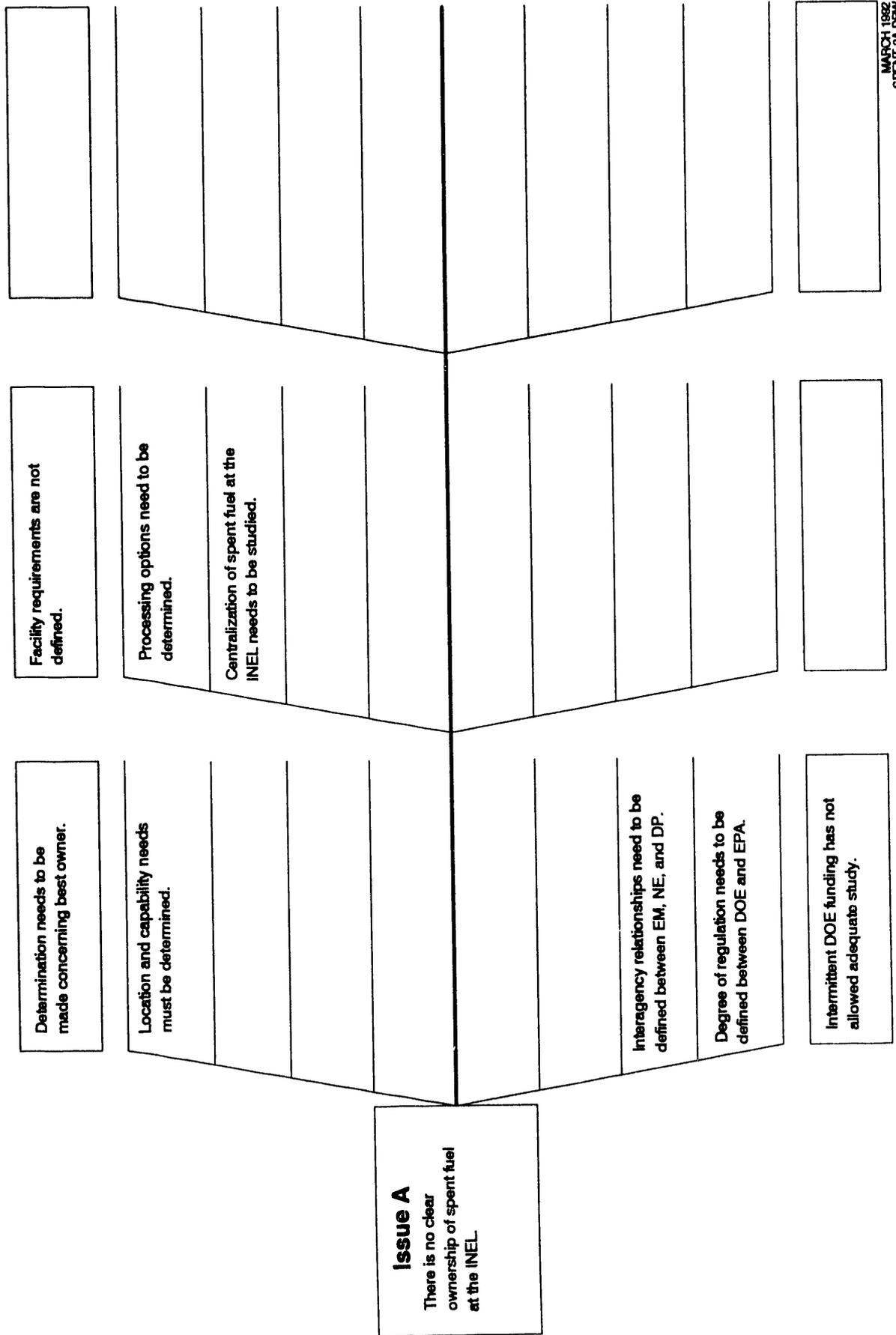
6.5.1 Root Cause Analysis

The root cause analysis is a systematic approach to identifying the hierarchy of issues needing resolution to successfully complete the INEL spent fuel mission. The issues identified are categorized according to general fields of WMO such as treatment, storage, disposal, regulatory compliance, and so forth. Related issues are placed into the hierarchy as either primary, secondary, or tertiary issues. Each general field's hierarchy is presented as a Root Cause Analysis diagram.

Each issue is analyzed for root causes by identifying the sources of the issue and are expressed as additional issues. Additional issues are placed on each diagram according to the source to which they contribute. The process is continued until the point of diminishing return for identifying additional issues. The result is an extensive analysis of the issues that may detract from successful completion of the WMO mission if not resolved.

Root cause diagrams A thru F represent the final analysis of the spent fuel issues. These issues have been correlated with Section 7 and included in the Analytical Tree.

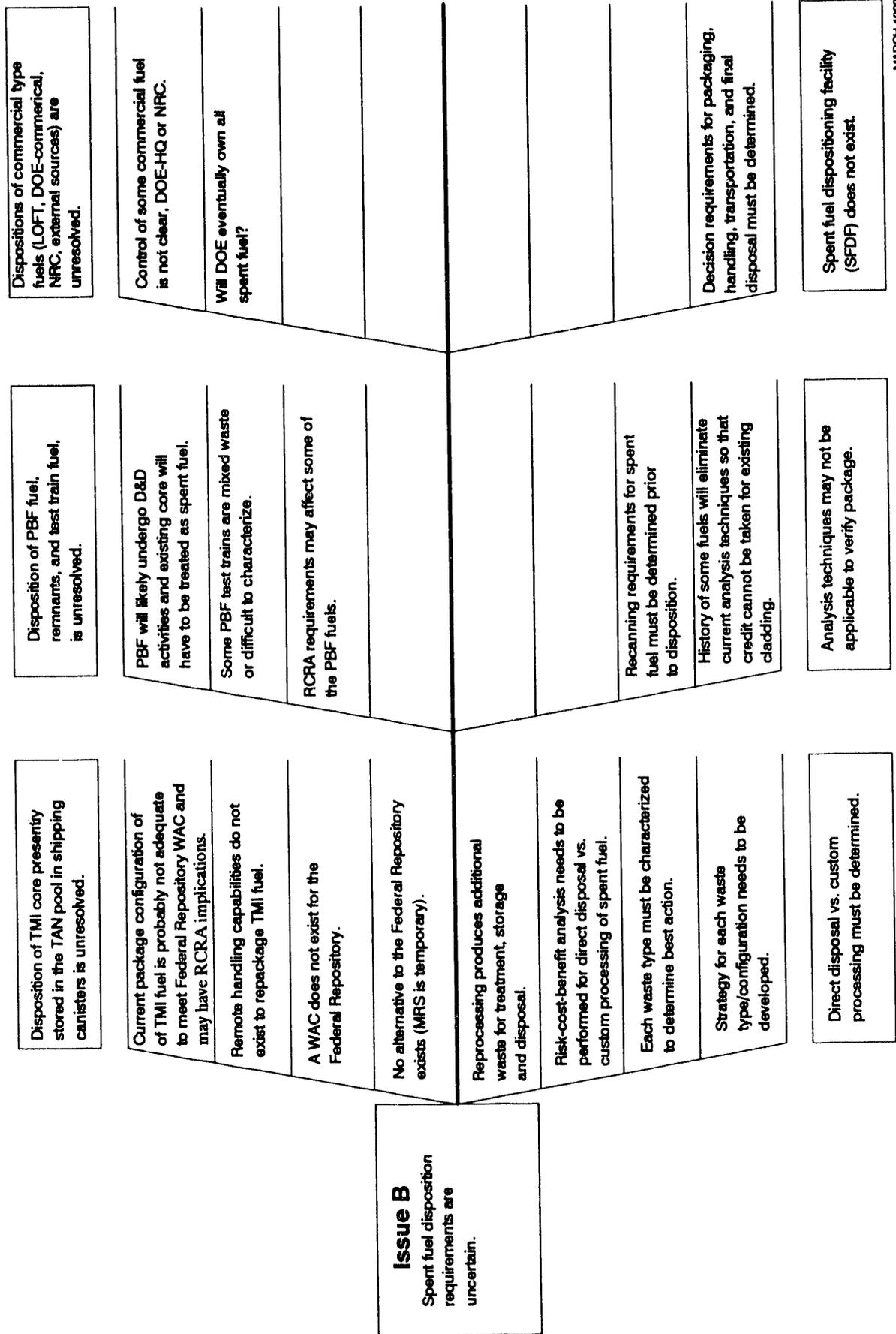
Waste Management Operations Spent Fuel Root Cause Analysis Diagram



MARCH 1992
SPENT-3A.DRW

Figure 6-5a. Issue A.

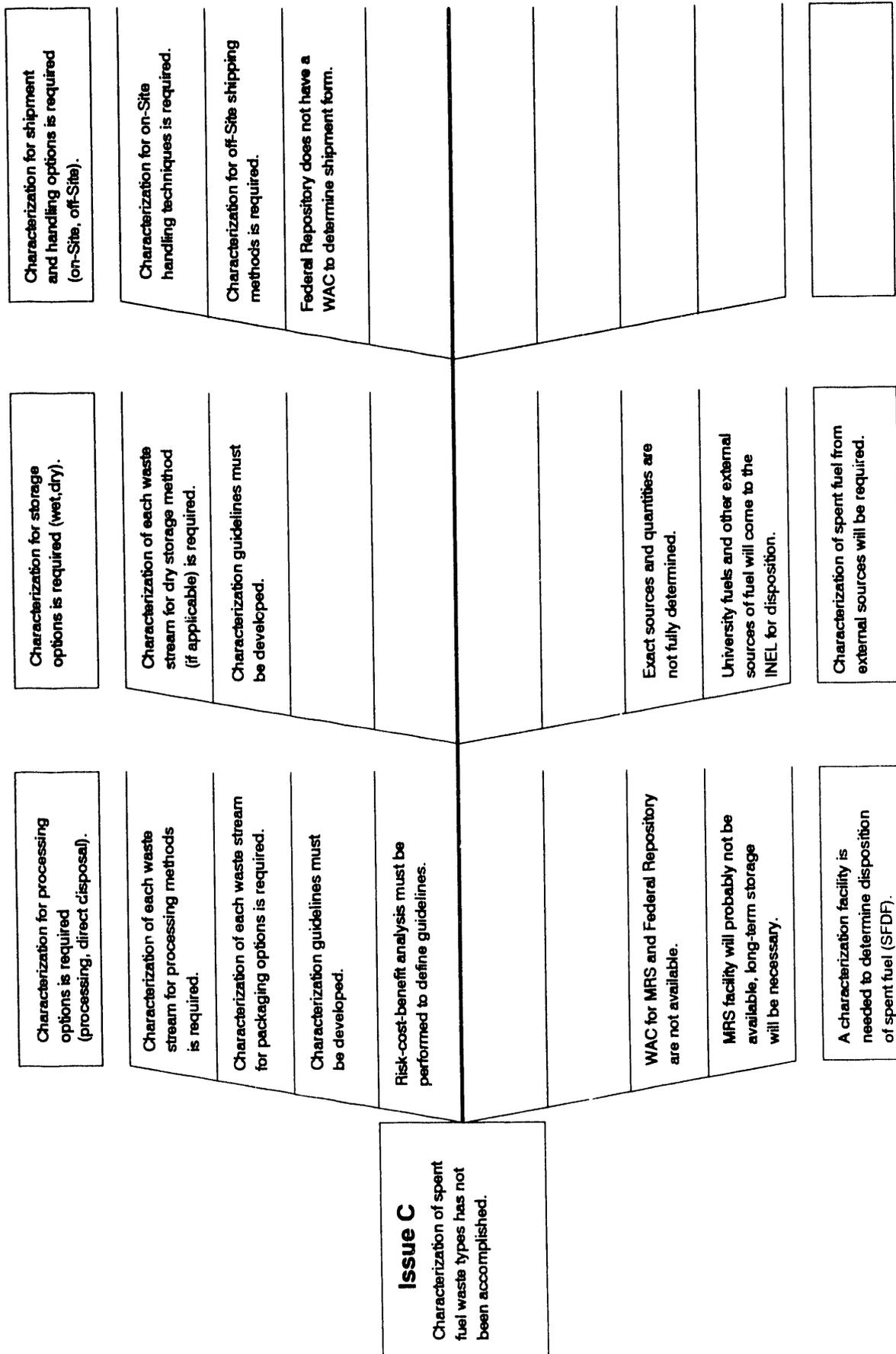
Waste Management Operations Spent Fuel Root Cause Analysis Diagram



MARCH 1992
SPENT-38.DRW

Figure 6-5b. Issue B.

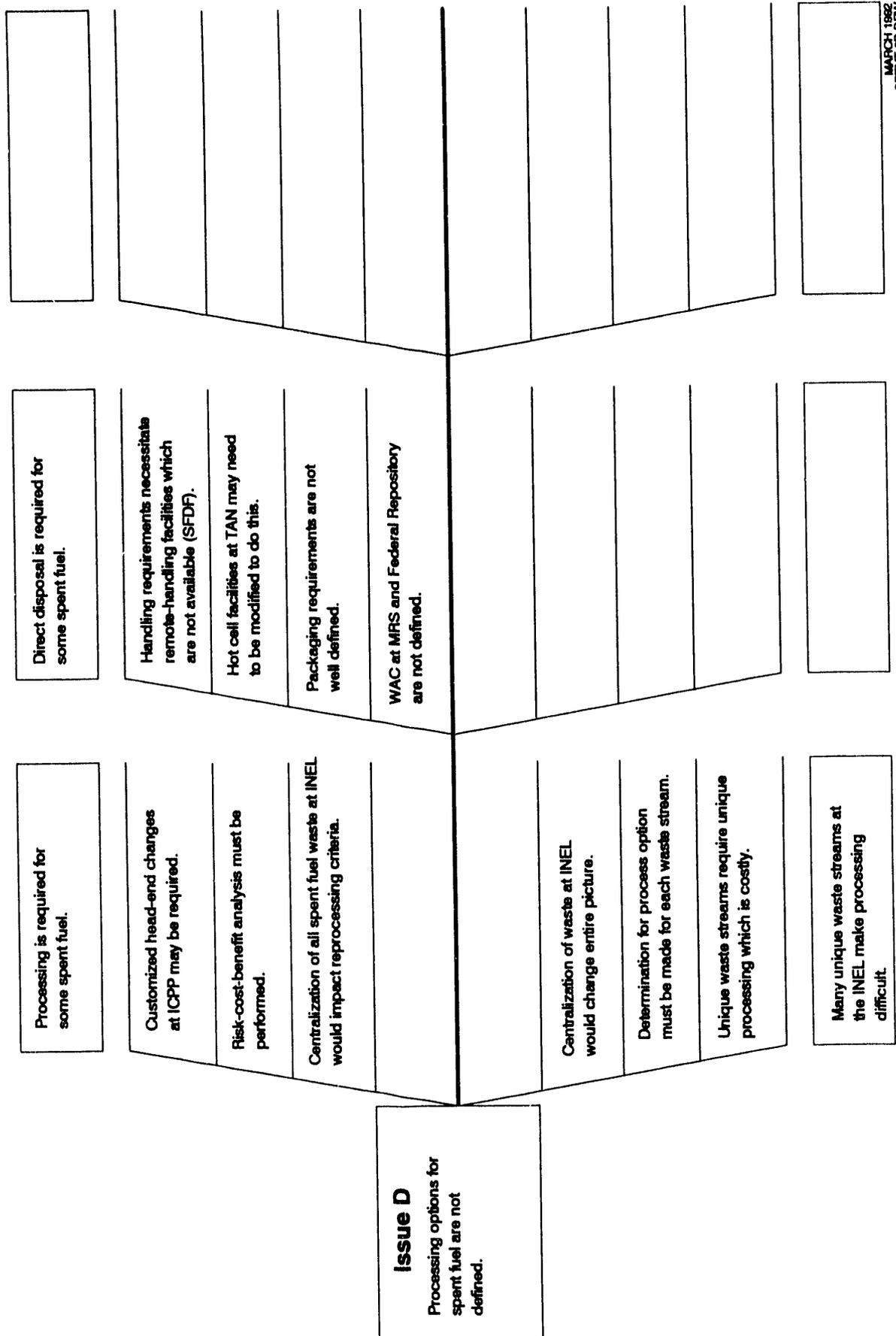
Waste Management Operations Spent Fuel Root Cause Analysis Diagram



MARCH 1992
SFENT-3C.DRW

Figure 6-5c. Issue C.

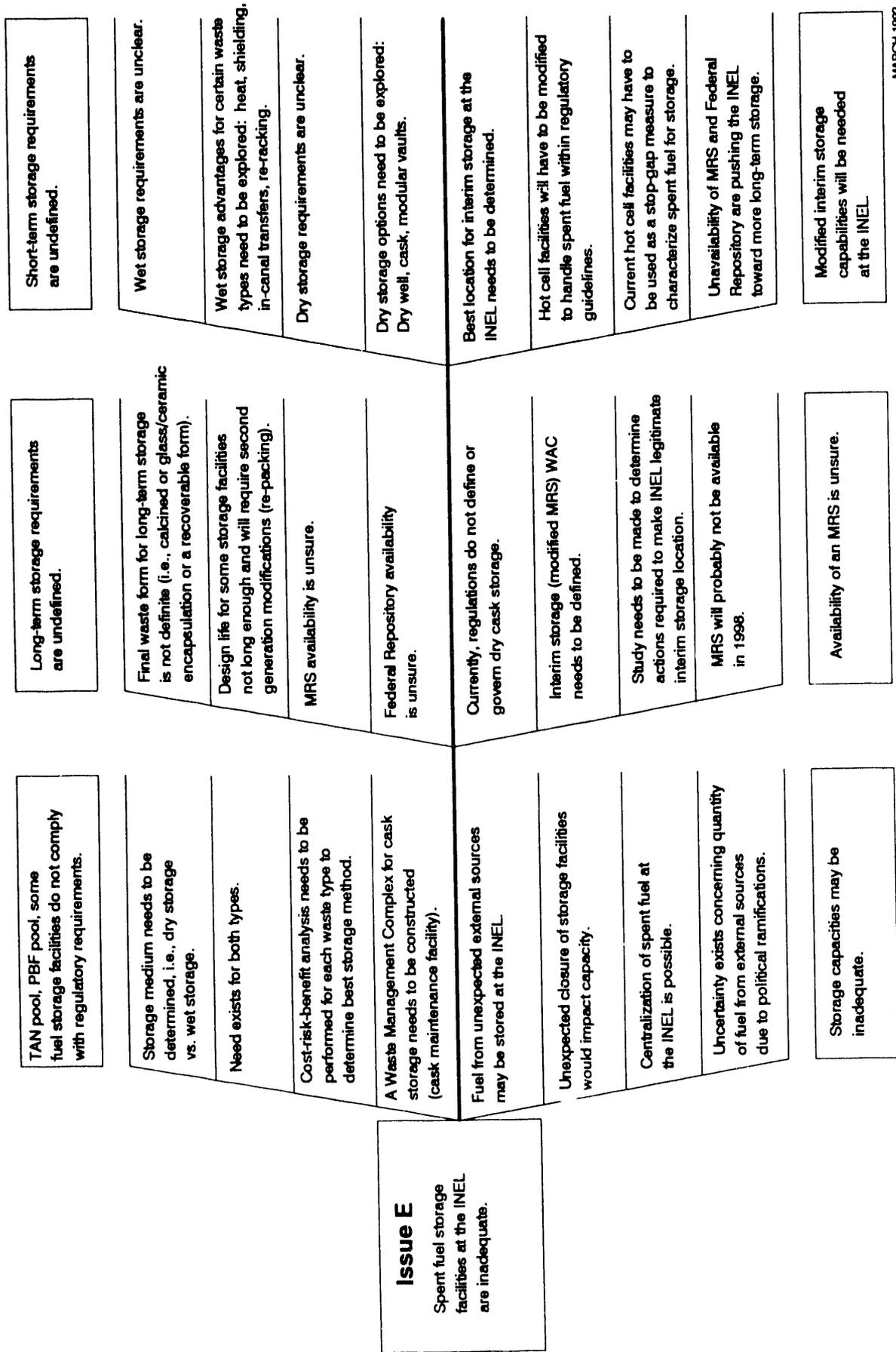
Waste Management Operations Spent Fuel Root Cause Analysis Diagram



MARCH 1992
SPENT-3D.DRW

Figure 6-5d. Issue D.

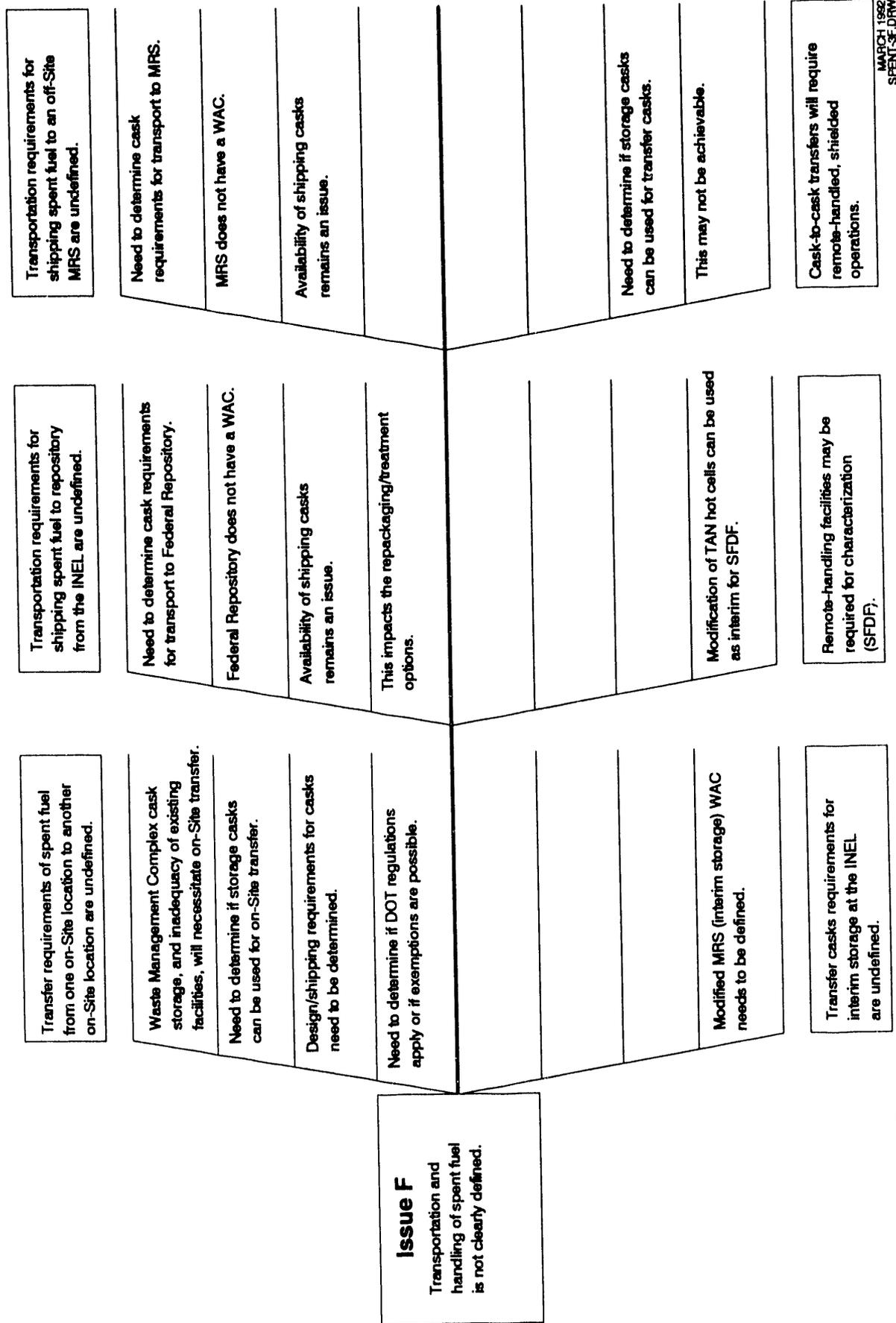
Waste Management Operations Spent Fuel Root Cause Analysis Diagram



MARCH 1992
SPENT-3E.DRW

Figure 6-5e. Issue E.

Waste Management Operations Spent Fuel Root Cause Analysis Diagram



MARCH 1992
SPENT-SF-DRW

Figure 6-5f. Issue F.

6.5.2 Spent Fuel Issue/Need Statements

Each issue identified in the root-cause analysis is analyzed to determine the needs that will resolve the issue. The applicable regulatory drivers associated with the issues are identified and recorded. The regulatory drivers provide insight to the needs required for issue resolution. The status of the actions associated with the issue are identified by reviewing current planning documents such as Activity Data Sheets (ADSs). The needs are shaped by the regulatory drivers and the amount of consideration given to the issue in current planning. The status of the need is recorded, providing the basis for planning activities to resolve the issues.

Special Fuels Dispositioning and Processing

Issue/Need: A facility for the handling and treatment of spent fuel may be needed at the INEL. Acceptable waste forms are required for transportation, storage, and/or for disposal. Disposal or transfer of INEL TMI spent fuel materials to a MRS facility could require removal or elimination of significant void, nonfuel diluent materials and moisture.

ADS Number: New

Waste Stream/Facility: Spent Fuel. Spent fuel treatment facility.

Regulatory Authority: DOE

Regulatory Driver: 5820.2A, Radioactive Waste Management -- HLW
40 CFR 191, Environmental Radioactive Protection Standards.

Major Regulations: 10 CFR 71 Packaging and Transportation of Radioactive Material
49 CFR 105-179 Hazardous Materials Transportation Act
40 CFR 1500-1508 NEPA

Description:

Status: Specific characterization for hazardous materials has not been accomplished, or evaluated. Need and specification of treatment technologies have not been evaluated. Specific acceptance criteria and requirements for final disposition have not been established.

Related Regulations: DOE Order 1540.2 Hazardous Materials Packaging for Transportation
DOE 5820.2A, C3, 3 Treatment, Storage & Disposal Methods
DOE Order 6430.1A Facilities Design Criteria

Related ADSs: Spent Fuel Transportation Systems 25-E2, 69-E1
Spent Fuel Characterization (New) (SFDF)
Spent Fuel Storage 25-E1

Spent Fuel Characterization

Issue/Need: A spent fuel characterization facility is needed at the INEL. This material must be characterized to establish or meet requirements for treatment, storage, packaging, transportation, and final disposition of this material.

ADS Number: New

Waste Stream/Facility: Spent fuel. Spent fuel characterization facility.

Regulatory Authority: DOE

Regulatory Driver: 5820.2A, Radioactive Waste Management -- HLW
40 CFR 191, Environmental Radioactive Protection Standards.

Major Regulations: DOE Orders 5480.3A, Safety in Non-reactor Nuclear Facilities

Description:

Status: Spent fuel may have to be treated and/or repackaged to meet acceptance criteria for final disposition (e.g., characterization, waste form, and packaging of TMI spent fuel material is not believed to be acceptable to support transfer to a MRS facility or disposal at a HLW repository).

Related Regulations: 10 CFR 71 Packaging and Transportation of Radioactive
49 CFR 105-179 Hazardous Materials Transportation Act
40 CFR 1500-1508 NEPA

Related ADSs: Spent Fuel Transportation Systems (25-E2, 69-E1)
Spent Fuel Storage Facilities (25-E1)
Spent Fuel Treatment/Packaging New

Spent Fuel Storage

Issue/Need: Pool storage of spent fuel at TAN and ICPP 603 is not in compliance. Facilities are needed to store INEL TMI spent fuel, PBF fuel (from PBF,TRA), VEPCO fuel (at TAN), and fuel materials from commercial external sources, until disposal is available. Packaging, storage, and transportation systems for these materials are not identical.

ADS Number: New and 25-E1 for TMI

Waste Stream/Facility: Spent fuel. Spent fuel storage facilities are needed at INEL. Storage alternatives may include:

- a. Spent fuel dry storage facility (interim/extended storage) at TAN
- b. Spent fuel dry storage at the proposed Spent Fuel Complex or other new location (ICPP)
- c. Evaluate additional wet storage needs.

Regulatory Authority: DOE

Regulatory Driver: DOE Order 6430.1A, Facilities Design Criteria Agreement with State Potential EPA responsibility for spent fuel.

Major Regulations: DOE Orders 5480.3A, Safety in Nonreactor Nuclear Facilities
5820.2A, Radioactive Waste Management -- HLW
40 CFR 191, Environmental Radioactive Protection Standards
40 CFR 1500-1508 NEPA

Description: These regulations mandate considerations for acceptable design, and function of facilities for dry and wet storage of spent fuel.

Status: INEL is proceeding to establish dry storage for spent fuel at TAN. Storage term is not established; final disposition of spent fuel is not determined.

Related Regulations: 10 CFR 71 Packaging and Transportation of Radioactive Material
49 CFR 105-179 Hazardous Materials Transportation Act

Related ADS: Transportation Systems For Spent Fuel (25-E2, 69-E1)

Spent Fuel Transportation

Issue/Need: Licensed transportation systems are needed at the INEL to transport spent fuel. Spent fuel materials may be transported from PBF and TRA to TAN, and from TAN to another location (e.g., ICPP) or directly to ICPP in compliance with regulations governing transportation and storage of those materials. Transportation to and from TAN is on a public highway. Shipments to and from ANL-W is also on a public highway.

ADS Number: 25-E2, 69-E1

Waste Stream/Facility: Spent fuel. Spent fuel transport systems.

Regulatory Authority: DOT; DOE

Regulatory Driver: 10 CFR 71 Packaging and Transportation of Radioactive Material
49 CFR 105-179 Hazardous Material Transportation Act

Major Regulations:

Description: These regulations prescribe measures to assure radioactive materials are packaged and transported with due consideration for safety of the public, personnel, environment, and equipment.

Status: INEL spent fuel transportation systems are in compliance with DOT requirements, but could not accommodate the present physical configuration of various spent fuel at the INEL. TAN Hot Shop may not be available for cask loading and/or fuel-handling in out years (post FY 2000).

Related Regulations:

Related ADS: Spent Fuel Storage Facilities (25-E1)

6.5.3 Key Issue Action

The spent fuel issues are recorded and actions are developed based on the previously identified needs. Required actions consider the regulatory drivers and associated logistics for satisfying the needs that will resolve the issues. The impact of not conducting the action is also considered and the result is recorded. The identification of actions to resolve the issues provides a set of activities that will help assure successful completion of the INEL spent fuel mission. The actions are based on an analysis of the Site issues and the status of the needs regarding regulatory requirements. The result is a set of activities that will be incorporated into future plans based on current issues and regulatory requirements.

Key Site Issues—Spent Fuel

Table 6-5a. Key Site issues for spent fuel.

Issue	Action	Required	Impact
1. Current pool storage facilities do not comply with regulations that require redundant water containment and positive control of pool area ventilation - exception ICPP 666.	1. Implement long-term interim dry (cask) storage of spent fuel and evaluate need for additional pool storage facilities.	1. See ADS 25-E1; FY-96 LICP	1. Failure to implement LICP will result in continued noncompliance.
2. INEL spent fuel will have low priority at its incorporation in the National Spent Fuel Disposal Facility.	2. Implement Action 1 above until National Spent Fuel Policy decision is implemented; improved priority position may negate part or all of this roadmap.	2. See ADS 25-E1; FY-96 LICP	2. Disposal of INEL spent fuel within the National Disposal System will not require implementation decisions until policy is implemented.
3. No ADS currently exist for placing PBF-generated spent fuel in interim storage.	3. Develop Work Authorization System (WAS) submittal to transfer PBF fuel materials from PBF/TRA to TAN, procure storage casks.	3. 3/94 budget call	3. Spent fuel not stored at TAN will not be included in interim dry (cask) storage if delayed beyond FY 2000. Hot Shop may not be available for cask loading.

Key Site Issues—Spent Fuel

Table 6-5a. (continued)

Issue	Action	Required	Impact
4. A certified cask will be required to ship PBF-generated spent fuel from PBF/TRA to TAN/ICPP.	4. Develop limiting requirements; survey existing C-of-C's for suitable certified casks. These activities to be included in PBF ADS.	4. ADS 60-E1 identifies funding for spent fuel cask and TFBP-2 cask exists. Transport plan update required.	4. Lack of a suitable transport cask will preclude inclusion of PBF-generated spent fuel in the proposed storage scheme.
5. Future disposal requirements (30+ years) for spent fuel and container materials may necessitate sorting, segregation, repackaging, and/or processing of INEL spent fuel.	5. No action required until national spent fuel policy decision is implemented; decision and technology may negate issue.	5. N/A	5. Future technologies must be applied (or will obviate the need) to provide capabilities to meet future requirements.

6.6 Environmental Restoration/Waste Management Operations Interface

This section contains the detailed issues analysis and identifies needs for interface between the Environmental Restoration Program (ERP) and Waste Management Operations (WMO) at the INEL.

6.6.1 Root Cause Analysis

The root cause analysis is a systematic approach to identifying the hierarchy of issues needing resolution to successfully complete the WMO mission. The issues identified are categorized according to general fields of WMO such as treatment, storage, disposal, regulatory compliance, and so forth. Related issues are placed into the hierarchy as either primary, secondary, or tertiary issues. Each general field's hierarchy is presented as a root cause analysis diagram.

Each issue is analyzed for root causes by identifying the sources of the issue and are expressed as additional issues. Additional issues are placed on each diagram according to the source to which they contribute. The process is continued until the point of diminishing return for identifying additional issues. The result is an extensive analysis of the issues that may detract from successful completion of the WMO mission if not resolved. (A root cause analysis has not been performed for these issues.)

6.6.2 Interface Issue/Need Statements

Each issue identified is analyzed to determine the needs that will resolve the issue. The applicable regulatory drivers associated with the issues are identified and recorded. The regulatory drivers provide insight to the needs required for issue resolution. The status of the actions associated with the issues are identified by reviewing current planning documents such as Activity Data Sheets (ADSs). The needs are shaped by the regulatory drivers and the amount of consideration given to the issue in current planning. The status of the need is recorded, providing the basis for planning activities to resolve the issues.

Issue/Need: Inadequate laboratory facilities are available on the INEL for waste characterization environmental research and process investigation for waste retrieved under the Environmental Restoration Program.

ADS Number:

Waste Stream/Facility: ERP. INEL laboratory facility.

Regulatory Authority: EPA, DOE

Regulatory Driver: 40 CFR 260-272 RCRA, CERCLA/SARA

Major Regulations: DOE 5400.3 Hazardous and Radioactive Mixed Waste Program
State of Idaho, INEL IAG, WAG-7
DOE 5820.2A Radioactive Waste Management
DOE 6430.1A Facilities Design Criteria

Description: These regulations establish DOE requirements and implement RCRA/CERCLA requirements, within the framework of environmental protection programs, for all DOE operations involving hazardous or radioactive waste generation, treatment, storage, disposal, or transportation.

Status: An INEL laboratory facility is needed for waste characterization. environmental research, waste characterization, process investigation and evaluation. Waste retrieved under the ERP must be characterized to establish or meet requirements for treatment and packaging, for transportation, storage, and/or for disposal, and for other Waste Management activities.

Related Regulations: 10 CFR 71 Packaging and Transportation of Radioactive Material
49 CFR 105-179 Hazardous Materials Transportation Act

Related ADSs: BWID
TRU wastes
Spent fuel
Special case waste
RA/MLLW
HW

Issue/Need: A disposal and treatment methodology from waste retrieved from SDA has not been developed because waste has been characterized.

ADS Number:

Waste Stream/Facility: ERP. Disposal needed for 10-100 nCi/g TRU, A, HW, and other waste streams.

Regulatory Authority: DOE, EPA

Regulatory Driver: 40 CFR 260-272 RCRA, CERCLA/SARA

Major Regulations: DOE 5400.3 Hazardous and Radioactive Mixed Waste Program
State of Idaho, INEL IAG, WAG-7
DOE 5820.2A Radioactive Waste Management

Description: These regulations establish DOE requirements and implement RCRA/CERCLA requirements, within the framework of environmental protection programs, for all DOE operations involving hazardous or radioactive waste generation, treatment, storage, disposal, or transportation.

Status: Disposal for waste retrieved from the SDA is needed. Wastes from Pad A and from Pre-1970 pits and trenches will have to be disposed. This waste cannot go to WIPP. The Pre-1970 buried waste will include TRU, A, HW; packaging may be deteriorated.

Related Regulations:

Related ADS:

INEL Waste Management Operations Roadmap Document	Title: Issues Analysis Section: 6 – Interface Issue date: 04-30-92
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Issue/Need: The volume of hazardous waste awaiting treatment and disposal are expected to exceed available storage capacity.

ADS Number:

Waste Stream/Facility: ERP. Special Case Waste.

Regulatory Authority: DOE, EPA

Regulatory Driver: 40 CFR 260-272 RCRA, CERCLA/SARA

Major Regulations: DOE 5400.3 Hazardous and Radioactive Mixed Waste Program
State of Idaho, INEL IAG, WAG-7
DOE 5820.2A Radioactive Waste Management

Description: These regulations establish DOE requirements and implement RCRA requirements, within the framework of environmental protection programs, for all DOE operations involving hazardous or radioactive waste generation, treatment, storage, disposal, or transportation. Standards applicable to shippers and transporters, including packaging, documentation, record keeping, reporting, limitation of storage period, and other related standards are addressed in other regulations, also.

Status: Qualified and approved facilities for storage of Special Case Waste (e.g., GTCC A) are needed at the INEL. Approved storage for GTCC A is limited. The stored volume of HW awaiting treatment and disposal are expected to exceed available storage capacity.

Related Regulations: DOE Order 1540.2 Hazardous Materials Packaging for Transportation
DOE 5820.2A, C3, 3 Treatment, Storage & Disposal Methods
DOE Order 6430.1A Facilities Design Criteria

Related ADSs: Disposal For Buried Waste From SDA
Treatment For Waste Retrieved For RCRA/CERCLA Compliance

Issue/Need: Specification and specific treatment techniques have not been completed for TRU waste streams including TRU in the SDA. TRU/Mixed TRU waste storage and disposal facilities are needed. TRU treatment is assumed to be at IWPF.

ADS Number:

Waste Stream/Facility: ERP. TRU/Mixed TRU waste storage and disposal facilities.

Regulatory Authority: DOE, EPA

Regulatory Driver: CERCLA/SARA, State of Idaho

Major Regulations: DOE 5400.3 Hazardous and Radioactive Mixed Waste Program; 40 CFR 264/265; FFCA; IAG; commitments to the State of Idaho

Description: These regulations establish DOE requirements and implement RCRA/CERCLA requirements, within the framework of environmental protection programs, for all DOE operations involving hazardous or radioactive waste generation, treatment, storage, disposal, or transportation. Standards applicable to shippers and transporters, including packaging, documentation, record keeping, reporting, limitation of storage period, and other related standards are addressed in other regulations, also.

Status: Specific quantities of materials have not been established, or evaluated. Selection or specification of specific treatment technologies have not been completed for INEL TRU waste streams. TRU treatment is assumed to be at IWPF.

Related Regulations: DOE Order 1540.2 Hazardous Materials Packaging for Transportation
DOE 5820.2A, C3, 3 Treatment, Storage & Disposal Methods
DOE Order 6430.1A Facilities Design Criteria

Related ADSs: TRU transportation systems
TRU treatment (IWPF)
TRU disposal
BWID

Issue/Need: Current INEL decon termination facilities are not adequate to support large scale remediation activities. A decontamination facility is needed to support intrusive operations of the ERP at the INEL.

ADS Number:

Waste Stream/Facility: IBWP. Decontamination Facility

Regulatory Authority: DOE

Regulatory Driver: 40 CFR 260-272 RCRA

Major Regulations: DOE 5400.3 Hazardous and Radioactive Mixed Waste Program
DOE 5480.11

Description: These regulations establish DOE requirements and implement RCRA requirements, within the framework of environmental protection programs, for all DOE operations involving hazardous or radioactive waste generation, treatment, storage, disposal, or transportation.

Standards applicable to shippers and transporters, including packaging, documentation, record keeping, reporting, limitation of storage period, and other related standards are addressed in other regulations, also.

Status:

Related Regulations: DOE Order 1540.2 Hazardous Materials Packaging for Transportation
DOE Order 5480.1 Radiation Protection for Occupational Workers
DOE Order 6430.1A Facilities Design Criteria

Related ADS: BWID

7. DESIRED ACTIVITIES/ADS INTEGRATION

This section compares desired activities against the current sets of activities and issues and conducts a careful analysis of the best method to incorporate new or changed activities. The results from this process are the proposed modifications to the ADSs.

It incorporates the designations of new activities as distinct additional tasks. Or in other cases, it documents where existing activities require revisions, which shifts the emphasis and affects the end products.

7.1 Low-Level Waste/Mixed Low-Level Waste Desired Activities

This written version of the LLW/MLLW Issue Resolution and Desired Activities Schedule reflect changes to the currently planned activities and represents incorporation of issue resolution activities into the schedule. Issues that are to be resolved by the installation, will be identified as *Installation Issues*. Issues that require DOE/HQ support to resolve, will be identified separately. Distinguishing between the two types of issues, facilitates understanding of the interface requirements.

A. SYSTEM PERFORMANCE ASSESSMENT — DOE system performance studies do not drive decision making at the Site or National level.

A1. There is no systems approach to managing DOE Complex waste that considers the entire life-cycle of generation, minimization and TSD.

- a. NEPA strategy has not been fully developed for all aspects of WMO.
- b. Cost/risk/benefit studies have not been completed for major WMO proposed projects.

A2. Management policy is less than adequate to provide clear direction for Waste Management Operations.

- a. Regionalization alternatives to on-Site TSD development are not being pursued.
- b. Disposal site selection for all waste types has not been identified.
- c. RCRA policy is unclear including BDAT for all waste types and inclusion of AEA by-product material.
- d. Disposition of ERP waste decisions have not been made to facilitate long-term planning.

A3. Management policy for implementing current regulations and requirements is not adequate.

- a. Direct communication between Regulator and Contractor Technical Personnel does not occur.

- b. The fiscal impacts of the Price-Anderson Amendments are not being considered.
- c. Site performance assessment (PA) is less than adequate.

A4. Regulatory deficiencies prevent comprehensive Waste Management Operations.

- a. Effective waste management cannot be conducted without clear definition of waste categories including BRC levels.
- b. Requirements found in DOE 5820.2A are vague and do not include hammer provisions for waste minimization, system performance assessments, or TSD requirements.
- c. RCRA requirements are inadequate for radioactive waste management since some conflict with ADA by-product requirements, or do not consider ALARA principles.

A5. Facility requirements have not been met to support Waste Management Operations.

- a. MLLW treatment and storage capability on-Site is not adequate to meet RCRA requirements.
- b. On-Site analytical capabilities are less than adequate for waste characterization needs.
- c. Facility planning is not being integrated between ERP and WMO to develop TSD needs.
- d. Site specific data is insufficient to validate radiological performance assessment models for current LLW disposal practices.

A6. Technology needs have not been met.

- a. Systems and procedures for implementing BRC/values or de minimis waste disposal criteria are not readily available.
- b. Analytical methods for waste analysis are not adequately established.
- c. Waste package certification needs are not clearly defined.
- d. BDAT for treating all MLLW is not known since demonstration data does not exist and the ability to establish BDAT on-Site is less than adequate.

- e. Remote-handled LLW treatment capability does not exist at the INEL.
- f. Development and implementation of head-end process changes for waste minimization at generator facilities is less than adequate.

B. WASTE MINIMIZATION — Waste streams are generated without considerations for waste minimization.

B1. Minimal effort is being made to reduce waste generation.

- a. Detailed requirements and guidelines for techniques that lead to waste minimization do not exist.
- b. Targets, goals, and incentives to monitor progress and involve all parties, do not exist.
- c. RWMC WAC does not require Waste Management review and approval of all INEL Generator Waste Minimization Programs/Plans.
- d. Recycle, reuse, safe substitution, and process changes are not being adequately implemented at the Generator.

B2. Generators produce waste that cannot be disposed.

- a. Generation process modifications are not evaluated against all waste management costs and potential impacts to the public and environment.
- b. Currently there is no charge or cost to DOE Generators to send waste to treatment or disposal.
- c. The Generator does not receive returned non-specification waste for reprocessing.

B3. BRC values or de minimis waste disposal criteria have not been established.

- a. Radioactively contaminated lead recycling cannot be pursued without established de minimis waste disposal criteria.
- b. Clear definitions of waste type cannot be established without BRC levels.

B4. Effective policy has not been imposed on waste generators that consider waste management needs.

- a. Performance incentives are not in place.
- b. Detailed requirements and guidelines for implementing waste minimization techniques are not adequate, and are not being implemented at the Generator.

C. WASTE CHARACTERIZATION — LLW/MLLW is not adequately characterized.

C1. INEL does not have a facility to comprehensively characterize LLW and MLLW.

- a. A characterization facility for LLW and MLLW is not being planned for construction at the INEL.
- b. The currently planned characterization facility is for alpha-contaminated waste, so characterizing LLW there may increase contamination.
- c. Generators currently do not have adequate characterization capability.
- d. INEL storage and disposal facilities do not have the capability to characterize all waste packages received.

C2. Current characterization technologies are not capable of meeting characterization requirements.

- a. Changing regulatory requirements dictate increased characterization requirements and current INEL capability and capacity are not adequate.
- b. The ability to analyze waste concurrently for hazardous constituents, alpha, high energy gamma and beta emitters, does not exist.
- c. Characteristics and volumes of existing and future wastes are inadequate to size and develop future TSD facilities.

C3. There are insufficient requirements from performance assessment (PA) personnel regarding characterization needs.

- a. Results from current waste characterization efforts do not provide adequate information for PA purposes.
- b. PA personnel need site-specific field data for calibration/validation of PA models.

C4. National policy is less than adequate for LLW/TRU contaminated waste.

- a. Mixed LLW/TRU contaminated waste was not included in the Part A Permit.
- b. The decision whether RCRA applies to LLW/TRU contaminated waste has not been made.

D. TREATMENT – Adequate treatment technologies have not been developed or implemented for all INEL waste streams.

D1. Treatment options have not been identified for all mixed wastes subject to RCRA LDR.

- a. Demonstration data does not exist for validating all needed mixed waste treatment standards.
- b. Treatment options for radioactively contaminated lead are stalled awaiting establishment of BRC/values or de minimis waste disposal criteria.
- c. The mixed waste storage variance will expire without treatment technologies in place.

D2. The capability to treat INEL PCB mixed waste does not exist on-Site.

D3. The capability to treat INEL low volume unique (oddball) waste does not exist.

- a. Current facilities have not been modified, in order to receive wider varieties of LLW and MLLW.
- b. New capabilities have not been developed to receive and process low quantities of unique wastes.

- c. More unique waste streams will be generated in the future by R&D activities and production or treatment failures.

D4. The capability to treat INEL remote-handled waste does not exist.

D5. The volume of all wastes is not being reduced to levels achievable using available technologies.

- a. Current INEL incineration and size reduction facilities are not operational.
- b. Recovery of Pu below economic discard limits, has not been investigated strictly considering waste management costs.
- c. Void reduction is only recommended, and requirements for improved waste forms do not exist.

D6. No effort exists to coordinate national LLW/MLLW treatment capabilities, forcing individual sites to develop redundant capabilities.

- a. The lack of resource pooling among sites diminishes ability for short turn around times and return-on-investment.
- b. Pretreatment, transportation, and political considerations hinder regionalization prospects.

E. STORAGE — MLLW storage at INEL is not adequate.

E1. Some wastes are currently being stored in noncompliance.

- a. Solvent and California list mixed wastes are currently violating storage prohibitions for hazardous waste.
- b. PCBs are being stored on-Site without identified treatment.

E2. Time constraints cause MLLW storage problems.

- a. Interim storage restrictions for MLLW will be violated since treatment processes will not be available beforehand.
- b. An agreement has not been reached with the EPA or the State of Idaho allowing storage until FY 2000, or allowing WERF to treat all wastes.
- c. All lag storage, awaiting treatment or disposal, must be less than 90 days.

E3. Current mixed waste storage facility has inadequate capacity.

E4. A remote-handled, mixed waste storage facility does not exist on-Site.

E5. Storage policy is less than adequate Complex-wide.

- a. National risk based standards for MLLW have not been negotiated with EPA.
- b. The third-third storage capacity variance and case-by-case extension will expire without treatment capabilities in place.
- c. Storage of waste from the SDA is not being considered in current WMO planning, since disposition is unclear.

F. DISPOSAL — The capability for disposal of INEL LLW/MLLW is inadequate.

F1. Siting new disposal facilities at the INEL may not be feasible.

- a. Siting a new LLW disposal facility may not be feasible at the INEL due to siting criteria regarding flood plain, seismic activity, and groundwater.
- b. Obtaining permits for a LLW/MLLW disposal facility may be difficult.
- c. Mixed wastes containing listed constituents, or exhibiting a characteristic of a waste, cannot be placed in the RWMC.

F2. It is questionable whether or not current disposal practices meet the performance objectives of DOE Order 5820.2A.

- a. Monitoring programs are not adequate to fully support the disposal site Radiological Performance Assessment.
- b. Site-specific data is not adequate for calibration, validation, and improvement of performance assessment models.

F3. Current RWMC disposal methods and waste forms need to be improved.

- a. Current waste disposal generally contains large void volumes that will result in future subsidence.
- b. The current classification of LLW does not distinguish between different concentrations and length of half-lives.
- c. Waste and waste-zone stabilization is not always maximized to minimize radionuclide migration.
- d. The Waste Acceptance Criteria should be tied to the disposal area Radiological Performance Assessment.

F4. Disposal policy for LLW/MLLW is less than adequate to meet current INEL needs.

- a. LLW containing transuranic elements between 10 and 100 η Ci/g cannot be placed in the RWMC and no alternative has been identified.
- b. Current INEL disposal methods do provide for disposition of GTCC or Special Case wastes.

G. TRANSPORTATION — LLW/MLLW transportation solutions have not been selected or implemented.

G1. Regulatory authority for all LLW/MLLW shipments has not been clearly established.

- a. DOE transportation policy is less than adequate for established standards.
- b. National set of limits to 10 CFR 71 have not been promulgated.

- c. There is uncertainty regarding all requirements for transportation of liquid LLW and MLLW.
- d. The suitability of DOE transport plans, to meet DOT requirements, is unclear.

G2. Current availability of approved transportation containers does not meet transportation demands.

- a. Requirements for on-Site transportation of radioactive materials have become more restrictive, and this has caused a shortage of approved shipping containers.
- b. Some container types are very costly and no funding has been identified for obtaining additional transport containers.

G3. Implementation of equivalent safety policy is less than adequate.

- a. National Implementation of DOE 1540.1 for on-Site shipments is less than adequate.
- b. Funding and risk-based compliance has been a low priority.

H. FACILITY CLOSURE/D&D — Facility closure and D&D projects are not adequately included in waste management planning.

H1. Closure requirements found in RCRA and CERCLA are not entirely consistent.

H2. Waste volumes for all D&D and ERP projects have not been projected.

- a. Disposition requirements, including waste types and volumes, for ERP and D&D activities are not defined to support future TSD planning.

H3. Disposal locations for all closed facilities have not been determined.

- a. Many facilities identified for D&D are being planned to be disposed in place.

H4. Facilities slated for closure and D&D have not been adequately characterized.

H5. Increased D&D and ERP activity is not adequately handled in current waste management planning.

- a. Adequate technical justification does not exist for closing existing TSD facilities and building new facilities.
- b. Existing TSD facilities are not being used to maximum potential and should be considered for modification rather than closure.

The desired activities for LLW/MLLW are listed in Table 7-1. The *Desired Activities Schedule* for LLW/MLLW is in a transitional stage and is shown in Figure 7-1. It is also outlined in the INEL WMO Roadmap Issue Resolution Analytical Tree.

Table 7-1. Desired activities for Low-Level Waste/Mixed Low-Level Waste.

Code	Activity	Start	End	Ongoing
A. System Performance Assessment				
A1	Conduct system performance assessment. <ul style="list-style-type: none"> • Conduct system PA for INEL. • Conduct system PA for DOE complex. • Rewrite DOE Order 5820.2A. 	1Q92	2Q93	
B. Waste Minimization				
A2	Establish and implement LLW/MLLW Minimization Program that considers incentives and backcharges. <ul style="list-style-type: none"> • Assess process changes and waste treatment development. 	1Q92	4Q92	1Q93-4Q10
A3	Establish BRC values or de minimus waste disposal criteria for the DOE Complex and INEL.	1Q92	4Q93	1Q94-4Q94
C. Waste Characterization				
A4	Improve current waste characterization capability and capacity. <ul style="list-style-type: none"> • Assess current capabilities and modify them to meet current requirements. • Conduct characterization and provide waste projections for current and future wastes needing TSD. 	1Q92	4Q93	1Q94-4Q99
A5	Acquire field data and validate disposal facility performance assessment.	1Q92	4Q92	

Table 7-1. (continued).

Code	Activity	Start	End	Ongoing
D. Waste Treatment				
A6	Conduct waste treatment R&D	1Q92	4Q94	1Q95-4Q96
	<ul style="list-style-type: none"> • Accelerate bench-scale treatment development for LDR wastes currently not having treatment technologies. • Implement treatment technologies required for transportation or final disposition of all INEL MLLW and PCBs. 			
A7	Implement available technologies for INEL LLW.	1Q92	4Q94	1Q95-4Q00
	<ul style="list-style-type: none"> • New waste treatment facility. • Enhance contact-handled LLW treatment capabilities to minimize void volumes and improve waste forms. • Develop and implement strategy for treating INEL remote-handled LLW/MLLW. 			
E. Waste Storage				
A8	Establish additional MLLW storage capacity for future needs.	2Q92	4Q98	
A9	Bring remote handles MLLW storage into compliance.	2Q92	4Q00	

Table 7-1. (continued).

Code	Activity	Start	End	Ongoing
A10	Develop and implement a storage strategy. <ul style="list-style-type: none"> • Expiration of national capacity variance and case-by-case extension without treatment capabilities in place. • Waste currently stored in noncompliance restrictions (California list, solvents, PCBs, and lead). • Waste management support for storage of ERP wastes. 	1Q92	4Q93	

F. Waste Disposal

A11	Develop a Subtitle C Landfill to host INEL MLLW (on-Site or off-Site). <ul style="list-style-type: none"> • Decide feasibility of siting a LLW <u>or</u> MLLW disposal facility at the INEL. • Establish official position on life-span and capacity on RWMC.
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INEL Waste Management Operations Roadmap Document	Title: Desired Activity/ADS Integration Section: 7 -- Low-Level Issue date: 04-30-92
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Table 7-1. (continued).

Code	Activity	Start	End	Ongoing
A12	Improve current disposal facility operations at the RWMC. <ul style="list-style-type: none"> • Audit and verification capability to ensure WAC compliance. • Implement improved waste forms requirements. • Develop engineered barriers. 	1Q92	4Q94	
A13	Develop disposal strategy for LLW/TRU contaminated waste that cannot be placed at the RWMC or WIPP (between 10 and 100 η Ci/g).	1Q93	4Q93	
G. Transportation				
A14	Establish state-of-the-art on-Site LLW/MLLW transportation system. <ul style="list-style-type: none"> • Establish regulatory authority of all MLLW/LLW shipments. • State of Idaho revisit in 1995. 	1Q92	4Q95	

Table 7-1. (continued).

Code	Activity	Start	End	Ongoing
H. Facility Closure and D&D				
A15	Establish WMO strategy for facility characterization and closure. <ul style="list-style-type: none"> • Integrate D&D and ERP activities with Waste Management Operations. • Conduct cost/benefit and feasibility studies for modifying current facilities and building new facilities. • Project waste volumes for D&D and ERP activities. • Develop closure plans that consider risk/cost/benefit of multiple disposal sites. • Institutional monitoring. 	1Q92	4Q96	1Q97-4Q10

LLW/MLLW DESIRED ACTIVITY SCHEDULE

8-15-91

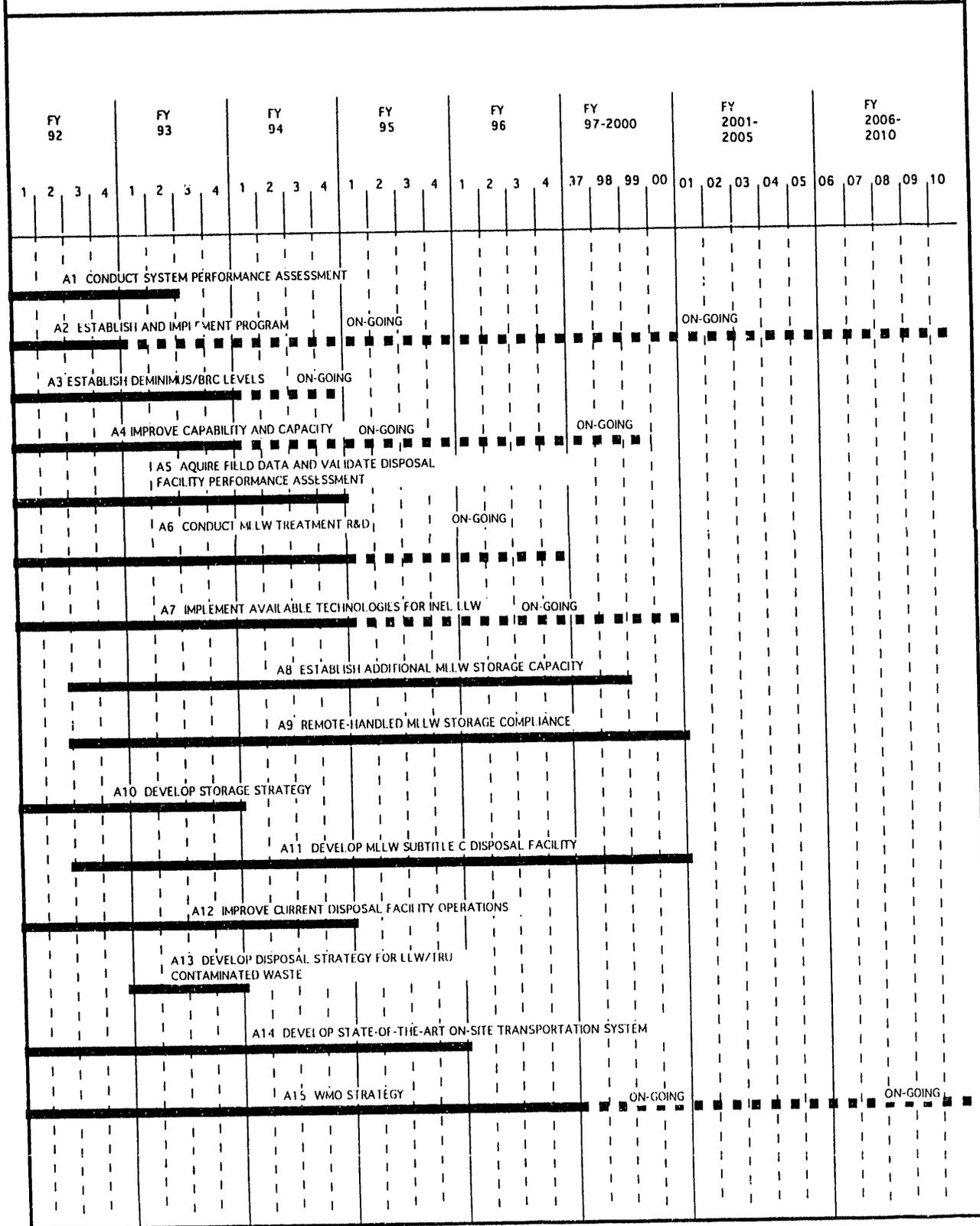


Figure 7-1. LLW/MLLW Desired Activity Schedule.

7.2 Waste Types

An overall pictorial representation of all waste type issues and desired activities are contained in the INEL WMO Roadmap Issue Resolution Analytical Tree. The following sections show Desired Activities/ADS Integration for these waste types:

- 7.2.1 Low-Level Waste/Mixed Low-Level Waste (LLW/MLLW)**
- 7.2.2 Transuranic (TRU) Waste**
- 7.2.3 Municipal Sanitary Waste**
- 7.2.4 Hazardous Waste**
- 7.2.5 Spent Fuel**
- 7.2.6 Special Case/Greater-Than-Class C (SC/GTCC) Waste**
- 7.2.7 Environmental Restoration/Waste Management Operations Interface.**

7.2.1 Low-Level Waste/Mixed Low-Level Waste Desired Activities/ADS Integration

A. System Performance Assessment

A-1. Below Regulatory Concern (BRC) Values

Issue: National standards and limits have not been set for BRC values or de minimis waste disposal criteria making it difficult to establish TSD requirements.

Resolution: Coordinate with DOE-HQ to establish standards and set BRC values for use throughout the DOE Complex.

ADS: 26-E1 National Low-Level Waste Program

A-2. ERP Waste Disposal

Issue: Need may exist to treat and dispose of waste retrieved from the SDA from the ERP.

Resolution: Assuming waste will be retrieved from the SDA, work with the ERP to project expected waste volumes that will be strictly LLW/MLLW, and use volumes in the design criteria for new facilities.

ADS: ERP ADS (NEW technology needed)

Related ADS: 5-E1 & 5-E2 Use projected volumes in design of MLLW treatment and disposal facilities.

2-E2 Support the ERP in effort of determining projected LLW/MLLW coming from SDA.

A-3. Regulatory Changes

(HQ) Issue: Current regulations such as RCRA do not address unique aspects of mixed waste. Changes are sure to come and to prepare properly should now be anticipated.

Resolution: Evaluate current regulations to anticipate future regulatory changes. Use the anticipated changes in preparing design criteria for new facilities.

ADS: 2-E2 LLW Technology Programs

Related ADS: 5-E1 & 5-E2 Use anticipated regulatory changes to build design criteria for new facilities.

26-E1 Coordinate with DOE-HQ and Regulators to establish new regulations.

A-4. Regulator Access

(HQ) Issue: Direct communication between Contractors and Regulators does not occur, making resolution of Technical Regulator related issues difficult.

Resolution: Coordinate with DOE-HQ to establish policy to allow for direct communication with Regulators.

ADS: 4-E1 Technical Support Program

Related ADS: 2-E1 & 2-E2 Determination of technical issues that require direct communication.

A-5. Order Requirements

Issue: DOE order 5820.2A does not provide clear requirements for all Waste Management waste streams for treatment, storage, and disposal, to ensure Complex-wide consistency and regulatory compliance.

Resolution: Work with DOE-HQ to help in development of an adequate DOE Order.

ADS: 3-E1 5820.2A

Related ADS: 26-E1 Help to coordinate with DOE-HQ, requirements for issuing revised order.

INEL Waste Management Operations Roadmap Document	Title: Desired Activity/ADS Integration Section: 7 — Low-Level Issue date: 04-30-92
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A-6. Complex-Wide Approach

(HQ) **Issue:** A Complex-wide approach for dealing with waste streams in life-cycle consideration of treatment, storage, and disposal.

Resolution: Work with DOE-HQ to help in development of Complex-wide approach.

ADS: 3-E1 5820.2A

Related ADS: 26-E1 Coordinate with DOE-HQ to aid in development.

A-7. Waste Acceptance Criteria

Issue: Facility WAC tend to be driven by the production facility's needs or desires, rather than on the receiving facility's operating requirements.

Resolution: Develop and tie the WAC for each waste management facility to the preparation of Performance Assessments.

ADSs: Several Facility ADSs
1-E1 WERF
2-E1 RWME
5-E1 MLLWDF
5-E2 MLLWTF
14-E1 IWPF
21-E1 HWTF
71-E1 SWTS

INEL Waste Management Operations Roadmap Document	Title: Desired Activity/ADS Integration Section: 7 — Low-Level Issue date: 04-30-92
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B. Waste Minimization

B-1. Waste Minimization Requirements

Issue: Waste minimization requirements have not been adopted by Generators and no method of enforcement exists.

Resolution: Incorporate as a part of the facility's WAC, a requirement to include the Generator's Waste Minimization Plan and evidence of pursuance.

ADS: 2-E1 RWMC OPS
1-E1 WERF

Related ADSs: 2-E2 Support to RWMC WAC development
17-E1 Support to WERF WAC development
20-E1 Generator education of Waste Minimization requirements

B-2. Lead Management

Issue: A program for management of lead at INEL does not exist.

Resolution: Implement and maintain a Lead Management Program at INEL.

ADS: 17-E1 WED (NEW technology needed).

Related ADS: 18-E1 Analysis of treatment options

B-3. Generator Motivation

Issue: Waste Management requirements do not provide motivation for generators to ensure waste minimization, volume reduction, forecasts, and waste packaging requirements.

Resolution: The RWMC WAC should stipulate evidence of a Waste Minimization Plan, WERF Waiver, Volume Forecasts, and Sampling Plan.

ADSs: 2-E1 Waste Generator education
2-E2 Support development of RWMC WAC

B-4. Continued Generation

Issue: A long-range INEL goal is that no waste will be generated prior to identifying a treatment and disposal option. MLLW is continuing to be generated without treatment or disposal options.

Resolution: Design and construct a MLLW T/DF.

ADS: 5-E1 MLLW-DF (NEW technology needed)
5-E2 MLLWTF

Related ADS: 18-E1 Mixed waste treatment options analysis and storage capacity
20-E1 Encourage use of alternate materials to eliminate mixed waste generation.

C. Characterization

C-1. Projected Volumes

Issue: Characteristics, and volumes of existing and future projections of wastes, are inadequate in establishing size criteria, and the development of future T/S/D facilities.

Resolution: Initiate a New Waste Characterization Program that will provide analytical lab support for characterizing waste that will help to determine waste volume projections, and support other waste characterization functions.

ADS: New

New ADS: Waste Characterization

Related ADS: 18-E1 Support Waste Characterization requirements

C-2. Analytical Lab

Issue: Capability exists to provide characterizations of hazardous, mixed, and low-level waste, to verify generator data prior to disposal, and to generate waste volume and type projections needed for new facility development.

Resolution: Develop a Waste Characterization Program, and as part of this program, provide analysis of analytical laboratory needs and options, to determine need for construction of new laboratory.

ADS: (NEW technology needed)

New ADS: Waste Characterization

Related ADS: 18-E1 Hazardous and mixed waste characterization analysis

D. Treatment

D-1. MLLW Treatment Requirements

Issue: A need exists for treatment of LLW/MLLW to ensure waste form meets regulations for acceptable storage, transportation, and disposal. Design of treatment facility should analyze cost/benefit, future waste volume projections, and capability of treating all waste types, such as custom wastes, PCBs, etc.

Resolution: Design and build MLLW TF as prescribed.

ADS: 5-E2 MLLW TF (NEW technology needed)

Related ADS: 1-E1 Use experience from WERF
2-E2 Aid in waste volume projection needs and custom waste needs
14-E1 Coordination with IWPF

D-2. National Coordination

(HQ) Issue: A DOE Complex-wide approach for utilizing consistent methods for dealing with mixed waste, needs to be developed.

Resolution: Coordinate with DOE-HQ to establish policy and strategy for dealing with mixed waste via development of DOE orders.

ADS: 11-E2 Mixed waste compliance

Related ADS: 2-E2 Ensure consistency with LLW approach

D-3. RH/RHM Treatment

Issue: A need exists for treatment of remote-handled LLW and remote-handled mixed waste.

Resolution: Build into the design of the MLLW TF the capability to treat RH waste.

ADS: 5-E2 MLLW TF (NEW technology needed)

Related ADS: 2-E2 Identify RH requirements.

D-4. Volume Reduction

Issue: Not all waste capable of volume reduction is being treated before disposal.

Resolution: Require that all waste that has the potential of volume reduction, be treated at the MLLW TF.

ADS: 5-E2 MLLW TF

Related ADSs: 5-E1 Ensure all waste is volume reduced prior to disposal by making it part of the WAC.

20-E1 Educate Generators, MLLW TF of volume reduction capabilities.

D-5. Stabilization

Issue: Stabilization of waste is required prior to disposal.

Resolution: Determine acceptable, stabilized waste form and use it in the design at MLLW TF end product. (NEW technology potential)

ADS: 5-E1 MLLW DF (determine waste form for disposal)

Related ADSs: 5-E2 Use determined waste form requirement to design end product of treated waste of the MLLW TF.

1-E1 & 17- E1 Utilize grouting activities at WERF/WED

2-E2 Use LLW disposal requirements.

E. Storage

E-1. MLLW Storage Requirements

Issue: Due to current volume and continued generation of mixed waste without the capability of treatment or disposal, the storage capacity for mixed waste is lacking. Also, storage must meet RCRA hazardous requirements.

Resolution: Continue to provide hazardous and mixed waste support and analyze need for additional storage capacity that satisfies RCRA requirements.

ADS: 18-E1 Hazardous and mixed waste support

Related ADSs: 22-E1 GPP construction projects will need to be constructed if additional mixed storage is required beyond the newly constructed Mixed Waste Storage facility.

17-E1 Will provide support to analysis of mixed waste treatment options.

5-E1 Will provide future treatment of mixed waste.

11-E2 Mixed waste compliance requirements.

E-2. National Capacity Variance

(HQ) Issue: EPA has granted an extension on storage durations for mixed waste but the extension expires in 1992. Without treatment technologies developed to handle the waste, EPA is not likely to provide further extension.

Resolution: Continue development of technologies and coordinate with DOE-HQ and EPA to work out extension.

ADS: 18-E1 Hazardous/Mixed Waste Support (work with EPA)
5-E1 MLLW TF (technologies) (Need for technical development)

Related ADS: 17-E1 Provide treatment options analysis
11-E2 Mixed waste compliance requirements

E-3. Remote-Handled Mixed Waste Storage

Issue: Remote-handled mixed waste is not stored in compliance with RCRA requirements.

Resolution: Provide storage modules that use RCRA requirements for RH mixed waste.

ADS: 101-E2 WCSF (Potential for NEW technology)

Related ADSs: 8-E2 Coordination with RH Technical support
18-E1 If storage modules can not accommodate RH waste potential for storage at MWSF.

F. Disposal

F-1. Mixed Disposal

Issue: No mixed waste disposal options currently exists.

Resolutions: Construct and build a facility to treat and dispose of MLLW.

ADS: 5-E1 MLLW DF (NEW technology needed)
5-E2 MLLW TF

Related ADS: 18-E1 Mixed waste treatment options analysis

F-2. MLLW DF Siting

(HQ) **Issue:** Due to aquifer location beneath the INEL, a permit to construct a disposal facility may not be feasible.

Resolution: Perform analysis for siting activities and coordinate with DOE-HQ to get variance on aquifer stipulation from the Regulators.

ADS: 5-E1 MLLW DF

Related ADSs: 5-E2 Treatment capabilities may render waste as strictly LLW rather than mixed.

2-E2 Provide LLW technical support

F-3. Performance Assessment Validation

Issue: Sufficient Site-specific data is not available to perform performance assessment models that are needed in the design for treatment and disposal facilities for LLW.

Resolution: Perform studies to provide sufficient data for the performance assessment.

ADS: 5-E1 MLLW DF

Related ADSs: 2-E1 Coordinate LLW Technical Programs

5-E2 Identify treatment design needs

F-4. Void Volumes

Issue: Current disposal practices allow large fractions of void volumes within the waste that will ultimately lead to subsidence of the disposal area.

Resolution: Establish WAC that stipulates a waste form that is provided by the Generator that eliminates the void volumes.

ADS: 2-E1 RWMC Operations

Related ADS: 2-E2 Support the establishment of the RWMC WAC.

20-E1 Aid in educating Generators concerning waste packaging that maximizes the space leading to waste volume reduction.

F-5. Generator Waste Package Validation/Audit

Issue: A need exists to provide certification of incoming LLW waste to the RWMC to ensure Generators meet WAC requirements.

Resolution: RWMC WAC requirements should include a requirement from all Generators to provide a sampling plan that identifies what waste is packaged and that it meets the RWMC WAC. As a quality check, RWMC should make random checks by sending samples through SWEPP to verify data in the Generator Sampling Plan, and perform audits.

ADS: 2-E1 RWMC OPS (provide WAC requirements)
8-E3 SWEPP (perform periodic LLW certification and audits)

Related ADS: 2-E2 Support development of RWMC WAC
20-E1 Waste Generator education

F-6. RWMC Capacity

Issue: RWMC capacity is fast approaching its limit, and opening new burial pits at RWMC is not authorized.

Resolution: Design and construct the MLLW DF (NEW technology needed)

ADS: 5-E1 MLLWDF

Related ADS: 3-E1 Encourage the maximum waste-to-WERF campaign to reduce volume of disposed waste.

G. Transportation

G-1. Transportation Requirements

(HQ) Issue: Uncertainty exists regarding on-Site transportation requirements.

Resolutions: Work with DOE-HQ to aid in the development of DOE Orders that meet requirements of Regulators.

ADS: 69-E1 Transportation Compliance

G-2 Transportation Containers

Issue: Requirements for on-Site shipping requires use of approved canisters that currently are not available.

Resolution: Purchase approved containers for on-Site transportation

ADS: 69-E1 Transportation Compliance

H. Facility Closure D&D

H-1. Closure Analysis

Issue: The full potential of existing facilities may not be maximized under current conditions, and with modifications, may satisfy the needs identified to be met with new facilities.

Resolution: Perform analysis of existing facilities and new proposed facilities to determine a cost benefit of either new construction or facility modifications.

ADS: 18-E1 Hazardous and mixed waste support

Related ADSs: 1-E1 WERF
2-E1 RWMC
5-E1 MLLW DF
5-E2 MLLW TF
21-E1 HW TF
14-E1 IWPF

7.2.2 Transuranic Waste Desired Activities/ADS Integration

1. Land Disposal Restrictions

Issue: Impact of EPA not granting the "no migration" petition.

Resolution: TRU treatment at IWPF will ensure WIPP-WAC is met whether the petition is granted or not.

ADS: 14-E1 IWPF

Related ADSs: 8-E2 Identifies and quantifies hazardous constituents for TRU mixed waste to show what waste is impacted.
8-E3 Provides certification and examination to separate affected waste.
101-E2 Provides adequate storage capacity until IWPF is completed.
113-E1 Provides support to WIPP in its test phase to aid in the issuance of the "no migration" petition.

2. Performance Assessment

Issue: Impact of WIPP-PA requiring enhanced waste forms or restrictions on TRU disposal.

Resolution: IWPF will ensure compliance with enhanced waste forms and new storage modules will provide adequate interim storage.

ADSs: 14-E1 IWPF
101-E2 WCSF

Related ADSs: 8-E2 Aids in developing characterization criteria and establishing TRUPACT-III requirements.
8-E3 Provides examination and certification for waste to ensure it meets requirements.
113-E1 Provides support to WIPP in establishing its WAC based on the test phase.

3. RCRA Storage Requirements

Issue: Impact of retrieved TRU waste on RCRA storage requirements.

Resolution: The WCSF will provide adequate RCRA compliance storage capacity for the retrieved waste.

ADS: 101-E2 WCSF

Related ADSs:

- 8-E2 Identifies and quantifies hazardous constituents present in the retrieved waste.
- 8-E3 Examines and certifies waste to determine waste storage requirements.
- 8-E5 Retrieval operations to remove and place into storage waste currently stored in earthen berms and to evaluate retrieval needs.
- 101-E1 Construction of retrieval enclosure necessary for safe and efficient retrieval of stored waste.

4. Storage Capacity

Issue: Impact of WIPP opening and shipping schedule on storage capacity.

Resolution: Provide adequate storage modules to accommodate all current and future storage needs.

ADS: 101-E2 WCSF

Related ADSs:

- 8-E5 Retrieval operations will generate need for additional storage modules.
- 101-E1 Retrieval enclosure necessary for retrieval operations.
- 113-E1 Results of the WIPP test phase will impact shipping schedule thus impacting storage capacity need.

5. Transuranic Waste Treatment/Storage Facility

Issue: TRUPACT-II Payload Compliance Plan requires certified waste that meets certain criteria.

Resolution: Provide TRU treatment that will ensure acceptance with TRUPACT-II criteria.

ADS: 14-E1 IWPF (NEW technology needed)

Related ADSs: 8-E2 Develop characterization criteria for establishing TRUPACT-II requirements.
8-E3 Provide support for TRUPACT-II loading.
113-E1 Support WIPP testing which will report opening of WIPP and initiation of TRUPACT-II shipping.

6. Idaho Waste Processing Facility

Issue: Impact of not building IWPF for TRU.

Resolution: Design and construct TRU thermal treatment facility.

ADS: NEW TRU thermal treatment facility (NEW technology needed)

Related ADSs: 14-E1 Identifies scope of thermal treatment.
1-E1 Establishes current cost estimates for operation of WERF.

7. SWEPP

Issue: Certification and characterization requirements placed on SWEPP in coming years.

Resolution: Coordinate and communicate needed requirements with all sources needing certification through SWEPP.

ADS: 8-E2 TRU Technical Programs

Related ADSs: 8-E1 Establish SWEPP requirements and ensure work is performed to accomplish regulations.
8-E3 Provides SWEPP operations and ensures all capability of SWEPP is available to accomplish regulations.

- 8-E6 Provides NDE/NDA requirements and support.
- 101-E2 Coordinate with waste characterization at WCF.
- 113-E1 WIPP-WAC requirements will drive certification criteria established at SWEPP.

8. Special Case Waste

Issue: Disposal of special case waste.

Resolution: Include special case waste processing requirements in the design of IWPF.

ADS: 14-E1 IWPF (NEW technology needed)

- Related ADS:**
- 2-E2 Studies to improve disposal options for GTCC.
 - 8-E3 SWEPP will support waste characterization efforts to identify special case waste.
 - 101-E2 Will provide characterization.
 - 111-E1 Provides insight from the national program established to deal with GTCC.
 - 113-E1 Supports testing of WIPP and establishment of WIPP-WAC that will impact potential disposal options for special case waste.

9. TRU Transport On-Site

Issue: On-Site transportation of TRU in compliance with orders.

Resolution: Ensure that all shipping containers used on-Site comply with requirements.

ADS: 69-E1 Transportation Compliance

- Related ADS:** 8-E2 Establishes characterization criteria for TRUPACT requirements.

10. Buried Waste

Issue: Disposal options for buried TRU.

Resolution: If the RI/FS determines that retrieval is the "preferred method" for dealing with the buried waste, then provide adequate storage and treatment and petition WIPP to accept the waste.

ADS: 101-E2 WCSF (storage)
14-E1 IWDF (treatment) (NEW technology needed)

Related ADS: 8-E2 Coordinate with HQ for potential need to petition WIPP to accept buried TRU once retrieved.
101-E1 Support buried retrieval if so chosen.
113-E1 Provide support to WIPP tests to encourage acceptance of potential retrieved buried TRU.

11. RH-TRU

Issue: Processing options on noncertifiable RH-TRU.

Resolution: The HWPP at Oak Ridge is expected to process the noncertifiable RH-TRU waste. If this cannot be accomplished, then another option must be provided. This analysis should be provided by the TRU Technical Program.

ADS: 8-E2 TRU Technical Programs.

Related ADS: 14-E1 IWPF may be adapted or enhanced to deal with this waste (NEW technology needed)

12. Plutonium Recovery

Issue: Plutonium (Pu) recovery is an option for TRU processing.

Resolution: Provide feasibility study for Plutonium Recovery Program.

ADS: NEW - Plutonium Recovery (NEW technology needed)

13. Reclassified LLW

Issue: Performance assessment limiting TRU Waste/Reclassified LLW lacks disposal option.

Resolution: IWPF will concentrate the waste volumes exceeding the PA limitation, classifying the waste form as TRU and acceptable for WIPP-WAC.

ADS: 14-E1 IWPF (NEW technology needed)

Related ADSs: 8-E2 Certification requirement identified.
8-E3 Certification and examination of waste to classify waste form.
101-E2 Waste characterization to determine classification of waste.
113-E1 WIPP support of WIPP-WAC.

7.2.3 Municipal Sanitary Waste Desired Activities/ADS Integration

1. Landfill

Issue: Subtitle D requires disposal of municipal solid waste in an approved landfill.

Resolution: Determine wastes requiring MSWLF disposal and participate in a regulated, approved, regional landfill.

ADS: 71-E1 Sanitary Waste/Transfer Station

Related ADS: 20-E1 Coordinates with generators to determine estimates of waste volumes.

2. Non-compliant disposal

Issue: Potential exists for disposal of non-compliant (radioactive or hazardous) wastes in the regional landfill.

Resolution: Implement waste segregation/monitoring procedures for all INEL generators to ensure non-compliant materials do not reach the transfer station. Construct an on-Site transfer station to accommodate and monitor waste from generator prior to transportation to the regional landfill.

ADS: 71-E1 Sanitary Waste/Transfer Station

Related ADS: 20-E1 Waste generator coordination.

3. Recycling

Issue: Potentially recyclable material is disposed of in the landfill.

Resolution: Provide recycling program at the point of waste generation, and at the transfer station prior to disposal.

ADS: 71-E1 Sanitary Waste/Transfer Station
20-E1 Waste minimization

4. Waste Minimization

Issue: Waste minimization must be incorporated into design and operations of facilities.

Resolution: Provide an aggressive waste minimization/pollution prevention program for all generators.

ADS: 20-E1 Waste minimization (pollution prevention)

The following Municipal Sanitary Waste Disposal Timeline shows the critical path of the desired activities associated with municipal sanitary waste operations. This graphic model indicates the crucial decisions that need to be made to ensure continuity of operations. A major element is the decision to create a new Subtitle "D" landfill at the INEL, especially if we can not totally meet the Regional Landfill Waste Acceptance Criteria (WAC).

Also included in this section is an updated INEL WMO Roadmap Issue Resolution Analytical Tree for Municipal Sanitary Waste.

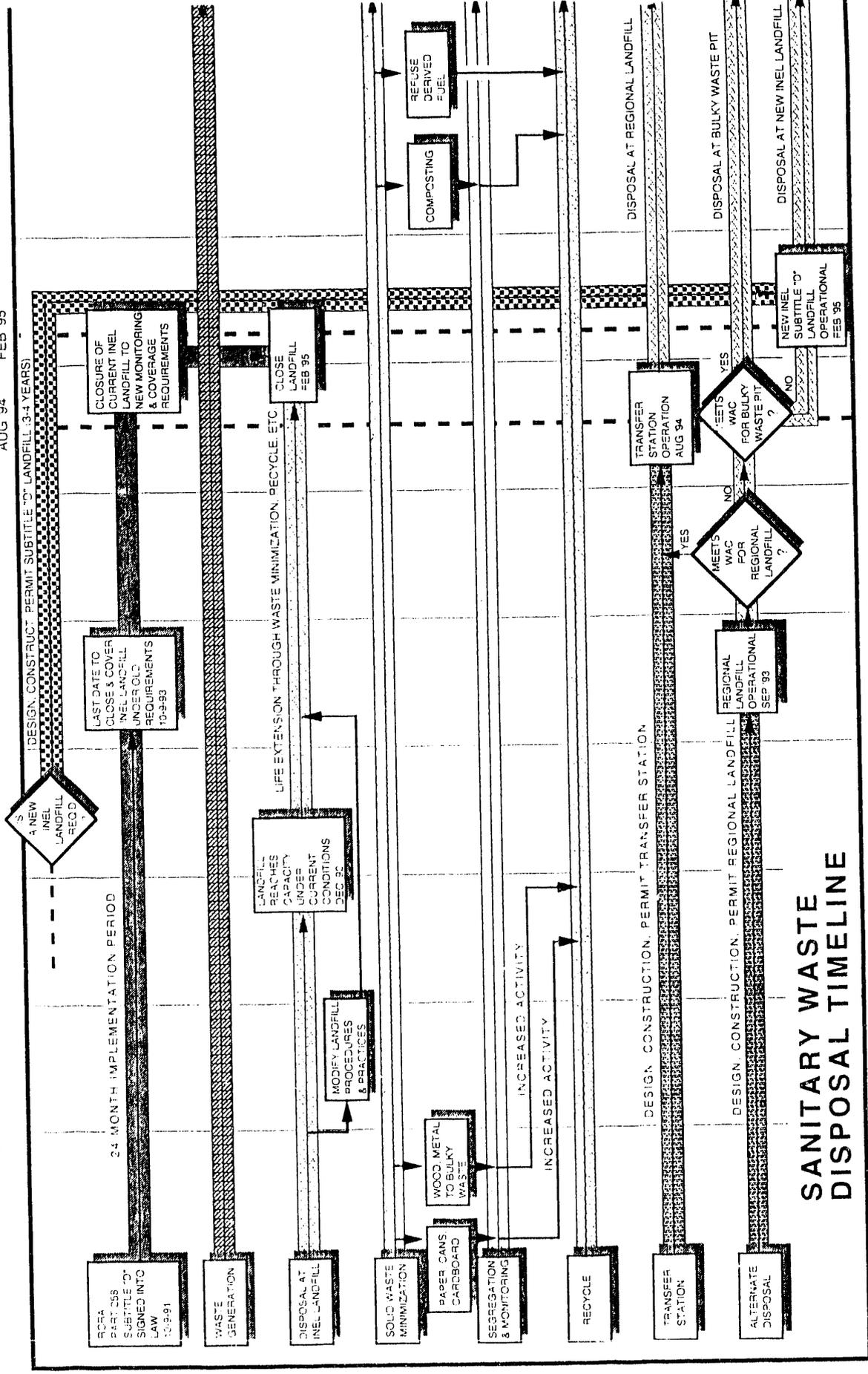
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FEB '95

AUG '94

JAN '93

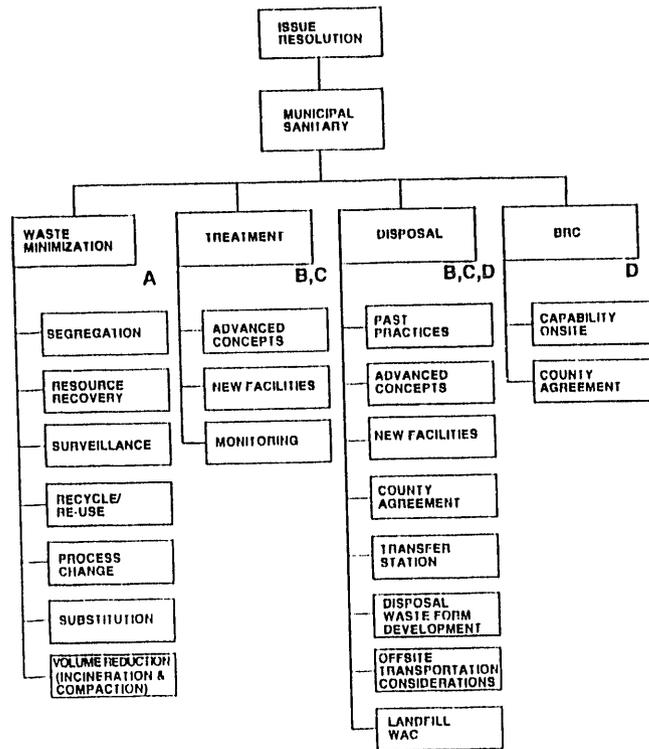
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SANITARY WASTE DISPOSAL TIMELINE

Figure 7-2. Municipal Sanitary Waste Disposal Timeline.

INEL WMO ROADMAP



DESIRED ACTIVITIES

A. WASTE MINIMIZATION

- A1 - FULLY IMPLEMENT THE INEL WASTE MINIMIZATION STRATEGY
- A2 - STRENGTHEN RESOURCE RECOVERY PROGRAM

B. TREATMENT, STORAGE, AND DISPOSAL OPTIONS

- B1 - EVALUATE ONSITE/OFFSITE DISPOSAL OPTIONS
- B2 - EVALUATE ADVANCED CONCEPTS SUCH AS REFUSE DERIVED FUEL, COMPOSTING, METHANE RECOVERY, LAND TREATMENT, ETC.

C. MUNICIPAL SANITARY WASTE OPERATIONS

- C1 - DEVELOP CONTINGENCY PLANS TO ENSURE CONTINUITY OF OPERATIONS
- C2 - IMPLEMENT PRACTICES TO EXTEND USE OF INEL LANDFILL (LANDFILL CONFIGURATION, SOIL TO WASTE RATIO REDUCTION, WASTE VOLUME REDUCTION, ETC.)
- C3 - CONSTRUCT TRANSFER STATION

D. REGULATORY COMPLIANCE AND MONITORING

- D1 - EVALUATE NEED FOR INEL SUBTITLE "D" LANDFILL
- D2 - CLOSE AND MONITOR EXISTING LANDFILL

MUNICIPAL SANITARY WASTE SCHEDULE

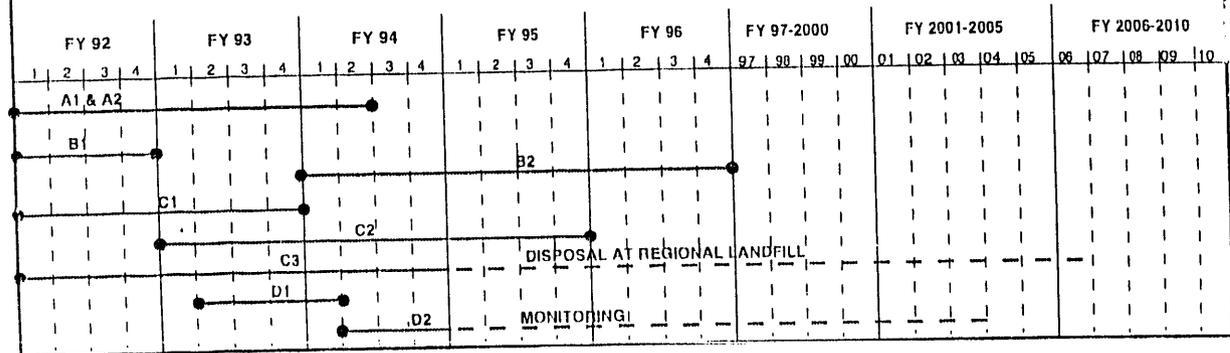


Figure 7-3. Updated Municipal Sanitary Analytical Tree.

7.2.4 Hazardous Waste Desired Activities/ADS Integration

1. Liabilities

Issue: Long-term liability exists from current practice of off-Site hazardous waste treatment and disposal.

Resolution: Provide indepth study of analysis and options for use in deciding appropriate action.

ADS: 21-E1 Hazardous Waste Treatment Facility

Related ADSs: 18-E1 Provides characterization of waste to establish projected volumes of hazardous waste.
20-E1 Waste minimization efforts focused at substantially reducing the separated volumes of hazardous waste.

2. MLLWTF vs HWTF

Issue: A cost-benefit analysis is needed to assess the need for construction of a Hazardous Waste Treatment Facility (HWTF) when the mixed Low-Level Waste Treatment Facility could be used but with a potential of generating additional LLW from the HW residues.

Resolution: Provide study to analyze the cost benefits of the options to determine need for HWTF.

ADS: 21-E1 HWTF

Related ADS: 5-E2 Capabilities of the MLLW TF
5-E1 Potential of disposal of radiated hazardous residues at the MLLW DF.

3. Disposal

Issue: Treatment of HW will require disposal of the remaining residue in a RCRA Subtitle C landfill (only listed).

Resolution: Provide study identifying potential need for RCRA Subtitle C landfill and search for such a location for disposal or design construction at INEL.

ADS: 21-E1 HWTF (for study)

New ADS: Subtitle C landfill (for disposal) (NEW technology needed)

Related ADS: 5-E2 Potential for treatment of MLLWTF
5-E1 Potential disposal at MLLWDF
71-E1 Coordination with construction of Subtitle D landfill.

4. Characterization

Issue: Complex-wide characterization for on-Site analysis does not exist.

Resolution: Provide study to analyze need for an on-Site characterization facility and perform design and construction if deemed necessary.

ADS: 18-E1 Hazardous and Mixed Waste Support (for study)

New ADS: Hazardous characterization facility (for construction) (NEW technology needed)

Related ADS: 22-E1 GPP activities could potentially provide for construction of the facility.

5. HWTF

Issue: The potential liability issue may dictate the need for on-Site HW treatment.

Resolution: Design and construct the Hazardous Waste Treatment Facility.

ADS: 21-E1 (NEW technology needed)

Related ADS: 18-E1 HW characterization required

New ADSs: Hazardous Waste Characterization Facility
Subtitle C Landfill required for HW residues
5-E2 Potential for treatment at MLLWTF
5-E1 Potential for disposal at MLLWDF

6. Storage

Issue: Inadequate storage capacity will be a problem if the decision is made to treat waste on-Site.

Resolution: Perform evaluation of storage capacity with existing facilities and determine potential need for additional storage.

ADSs: 18-E1 Hazardous Mixed Waste Support (for study)
22-E1 GPP Construction (for additional storage)

Related ADSs: 18-E1 Hazardous waste characterization required.
5-E2 MLLWTF as potential treatment
21-E1 HWTF as potential treatment

7. Hazardous Waste Shipping Moratorium

Issue: Hazardous waste requires certification that no bulk or volume radioactivity has been added. As a result of DOE operations prior to being shipped from DOE facilities to commercial TSD facilities.

Resolution: The INEL has established a task force to develop a plan of resolution to identify procedural and operational changes necessary to rescind the shipping moratorium. Scheduled completion is May 1992.

ADS: NEW

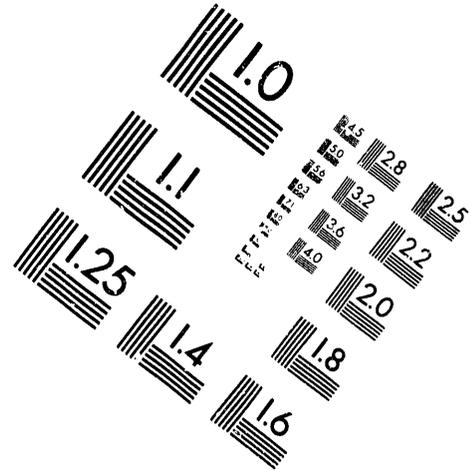
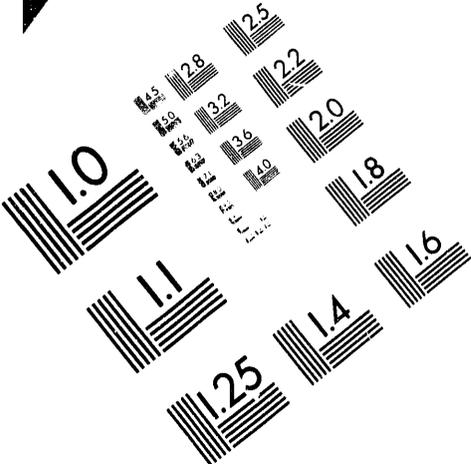
Related ADSs: 5-E1 Potential for disposal at MLLW DF
5-E2 MLLW TF as potential treatment
18-E1 Hazardous Mixed Waste Support



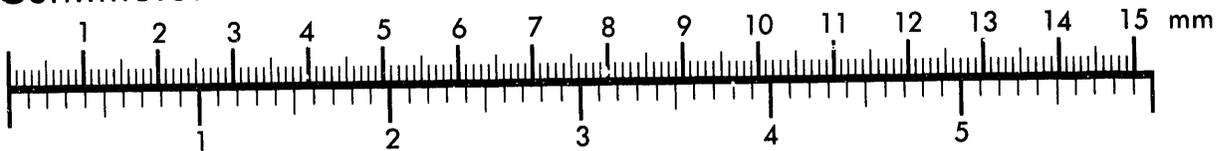
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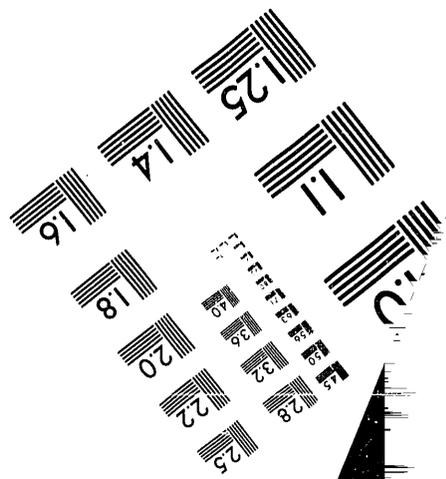
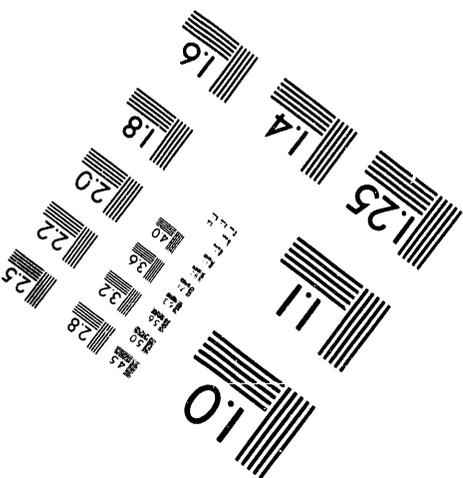
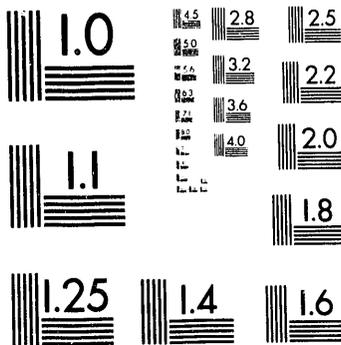
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Silver Spring, Maryland 20910
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Centimeter



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4 of 5

The hazardous waste shipping moratorium task force is currently in the process of improving and developing hazardous waste policy and procedures to demonstrate to DOE-HQ that the INEL can meet the performance objective for certification of nonradioactive hazardous waste. Key steps in this process include:

1. Hazardous waste tracking
2. Determination of radioactive materials management areas (RMMA)
3. No radioactivity added analyses.

Following is a proposed Recision Schedule that indicates the lifting of the hazardous waste shipping moratorium at the INEL by May 1992, and an updated section of the INEL WMO Roadmap Issue Resolution Analytical Tree for hazardous waste.

Hazardous Waste Moratorium Recision Schedule

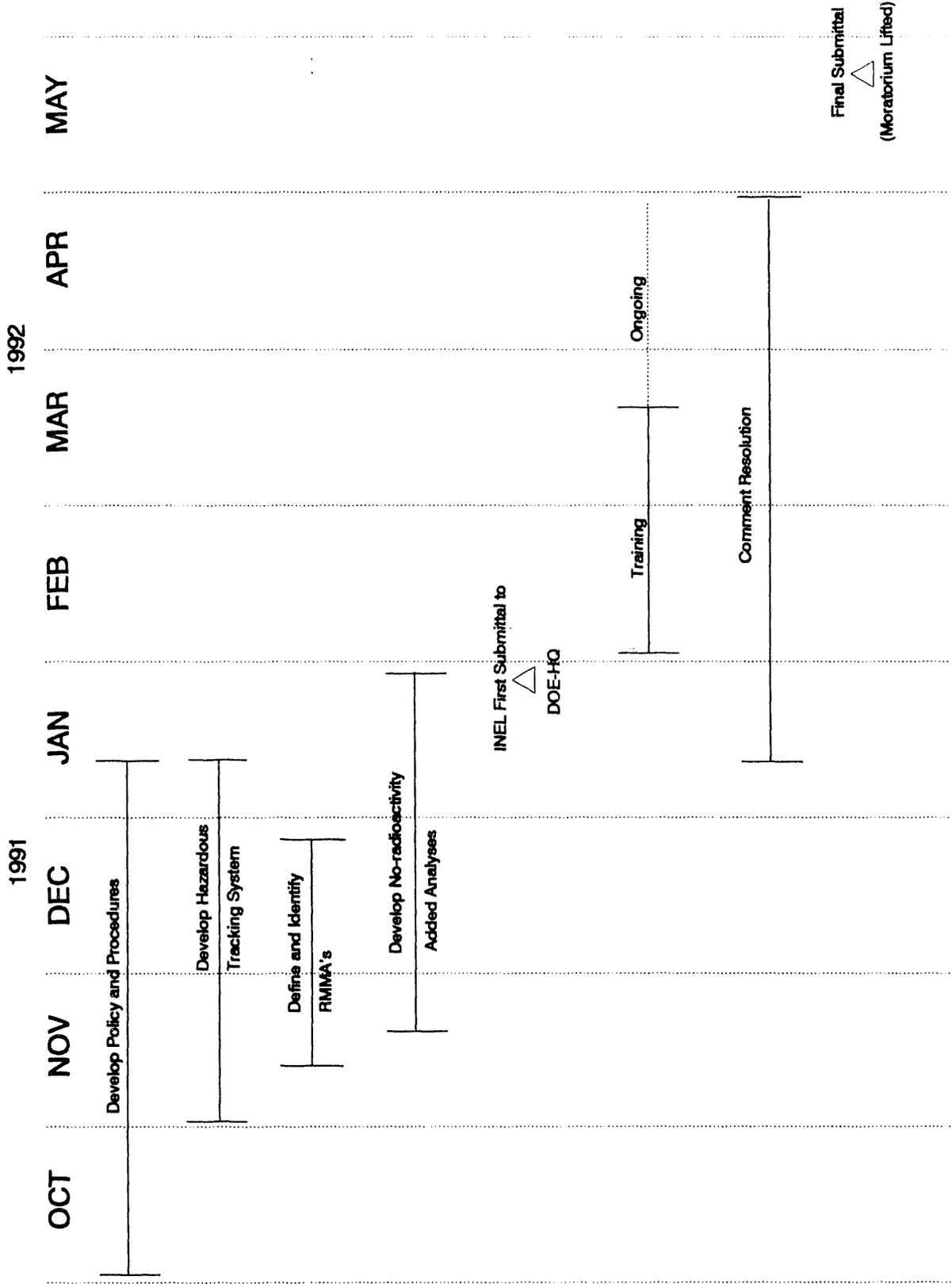
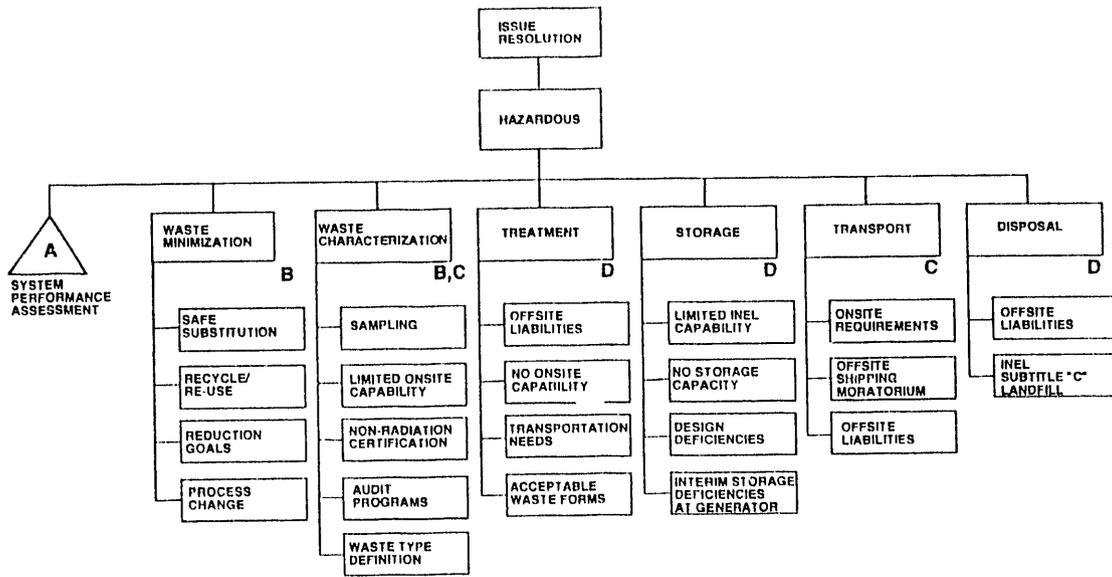


Figure 7-4. Hazardous Waste Moratorium Recision Schedule.

DECEMBER 1991
HAZWT-RS.DRW

INEL· WMO ROADMAP



DESIRED ACTIVITIES

A. SYSTEM PERFORMANCE

- A1 - PREPARE RISK-COST-BENEFIT ANALYSIS/FEASIBILITY STUDY COMPARING ONSITE VS. OFFSITE TREATMENT AND DISPOSAL

B. HAZARDOUS WASTE OPERATIONS

- B1 - DEVELOP INTERFACE PROGRAM BETWEEN CONTRACTOR AND REGULATORS
- B2 - EXPAND TRAINING PROGRAMS TO ELIMINATE DEFICIENCIES
- B3 - CONSTRUCT ADDITIONAL HAZARDOUS WASTE STORAGE FACILITIES
- B4 - DEVELOP PRACTICES TO MINIMIZE LONG-TERM LIABILITY

C. HAZARDOUS WASTE SHIPPING MORATORIUM

- C1 - ESTABLISH HAZARDOUS WASTE PROGRAM TO SATISFY HAZARDOUS WASTE SHIPPING MORATORIUM
- C2 - ESTABLISH DE MINIMIS VALUES TO CLARIFY WASTE TYPE DEFINITION

D. DEVELOP NEW/IMPROVED TREATMENT, STORAGE, AND DISPOSAL CAPABILITIES

- D1 - EVALUATE UTILIZATION OF CURRENT AND PROPOSED MIXED WASTE TREATMENT FACILITIES FOR HAZARDOUS WASTE TREATMENT
- D2 - CONSTRUCT HAZARDOUS WASTE TREATMENT FACILITY (HWTF)
- D3 - EVALUATE NEED FOR SUBTITLE "C" LANDFILL ONSITE AND THE SUITABILITY OF THE INEL FOR SITING (SEE DESIRED ACTIVITY A11 FOR MLLW)

HAZARDOUS WASTE SCHEDULE

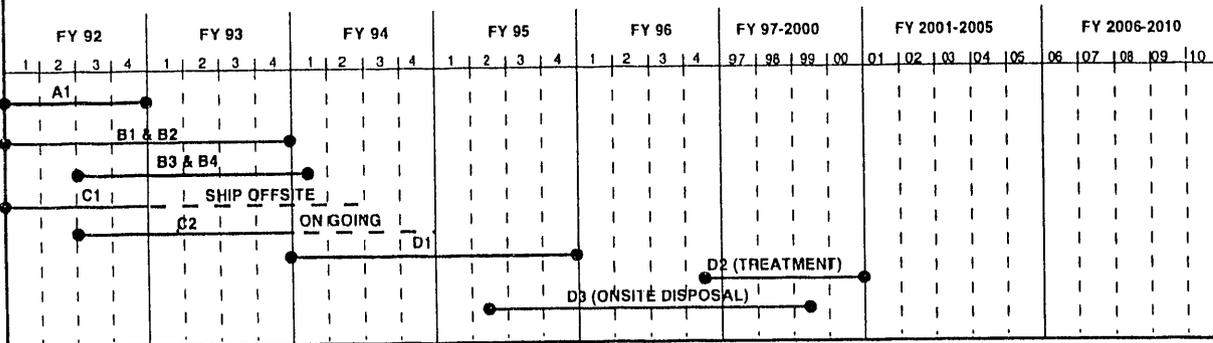


Figure 7-5. Updated Hazardous Waste Analytical Tree.

7.2.5 Spent Fuel Desired Activities/ADS Integration

This section identifies the needed activities to initiate issue resolution.

The Special Fuels Process Flow Model (Figure 7-6) identifies two processing options for special fuel:

- A. Direct Disposal
- B. Spent Fuel Processing Option
 - 1. Volume reduction
 - 2. Stabilized waste form.

Additional details on these two options can be found in Figure 7-7 and Figure 7-8.

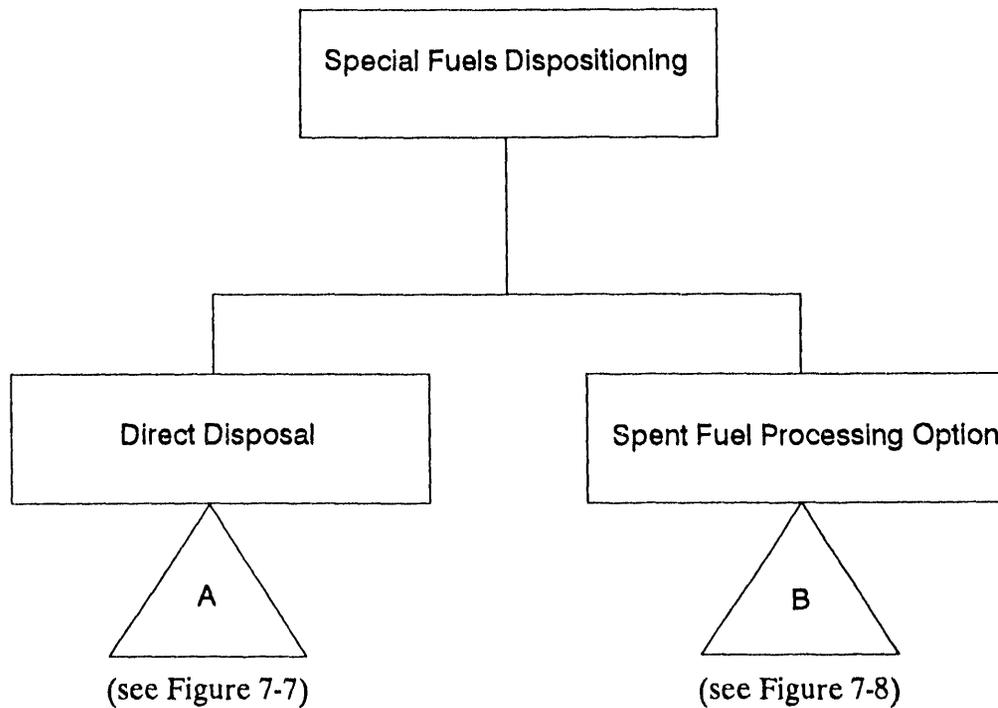


Figure 7-6. Special Fuels Process Flow Model.

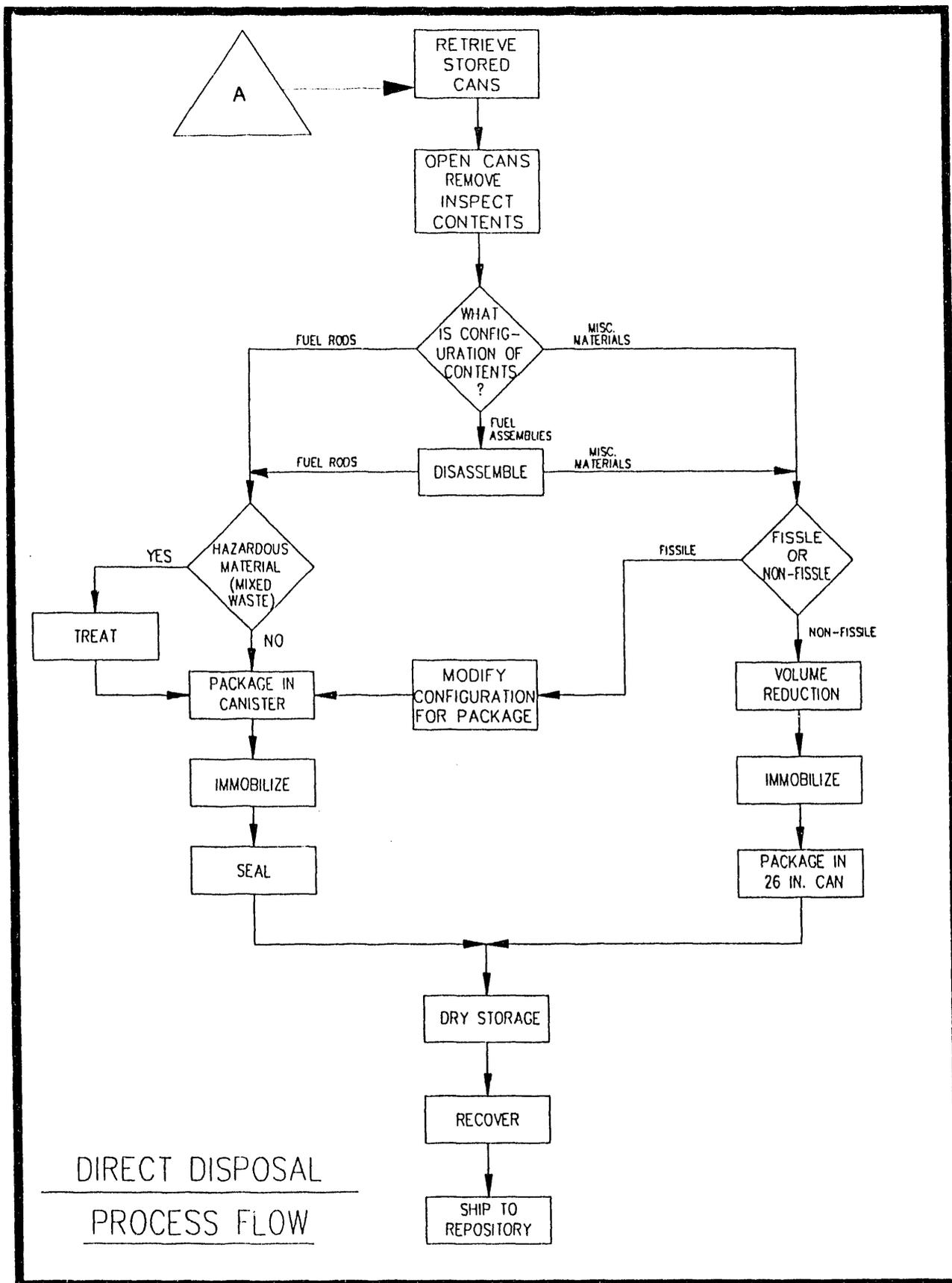


Figure 7-7. Direct disposal process flow.

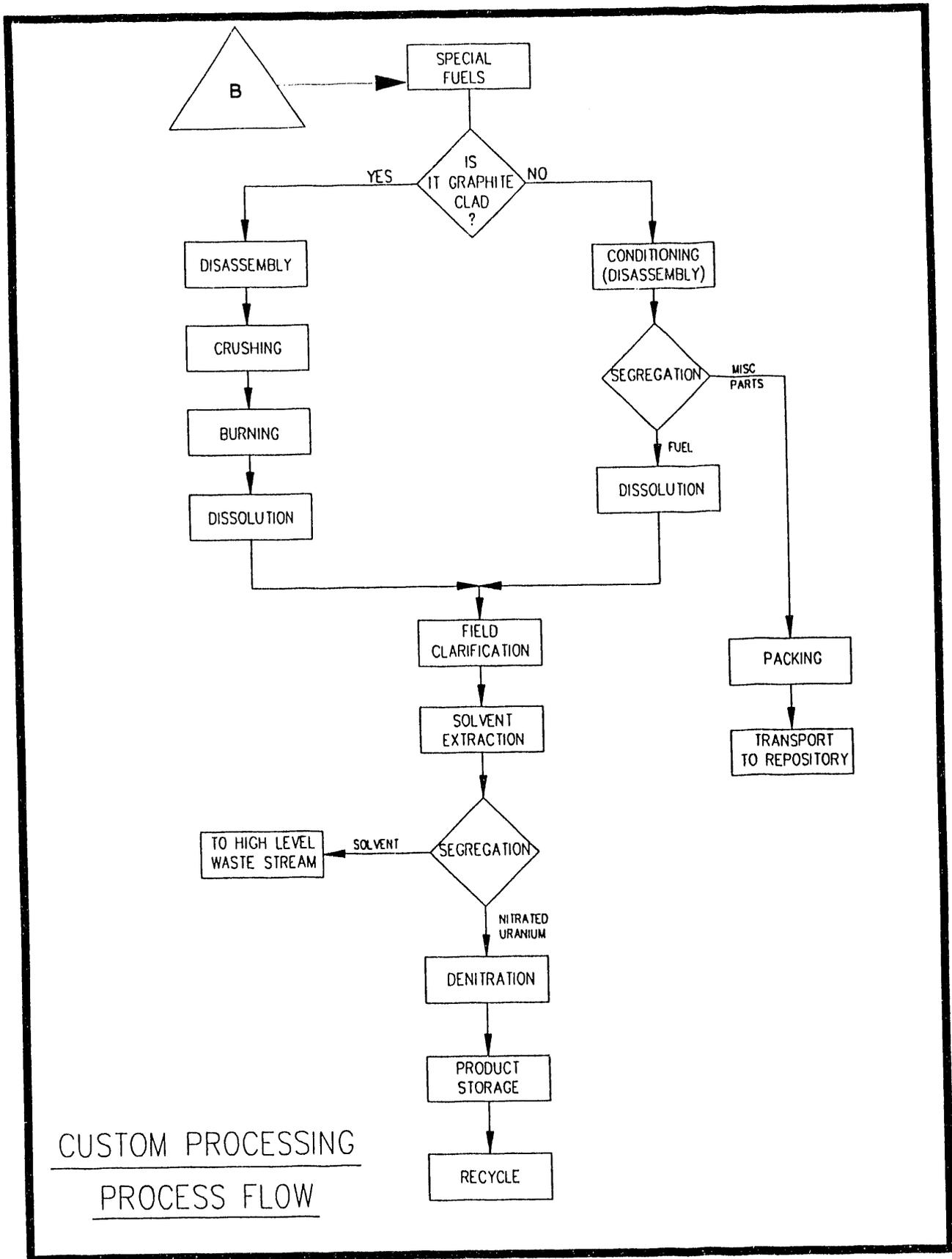


Figure 7-8. Custom processing process flow.

The Spent Fuel Timeline below (Figure 7-9) shows the critical path of the 18-year overall project schedule for special fuels (spent fuel) dispositioning, which identifies the activities leading to a new Special Fuels Dispositioning Facility (SFDF) at the INEL.

These activities are shown on the following pages in the Decision Tree for Spent Fuel Dispositioning (Figure 7-10) and Spent Fuel Schematic (Figure 7-11) that identify the key elements necessary for a spent fuel dispositioning plan.

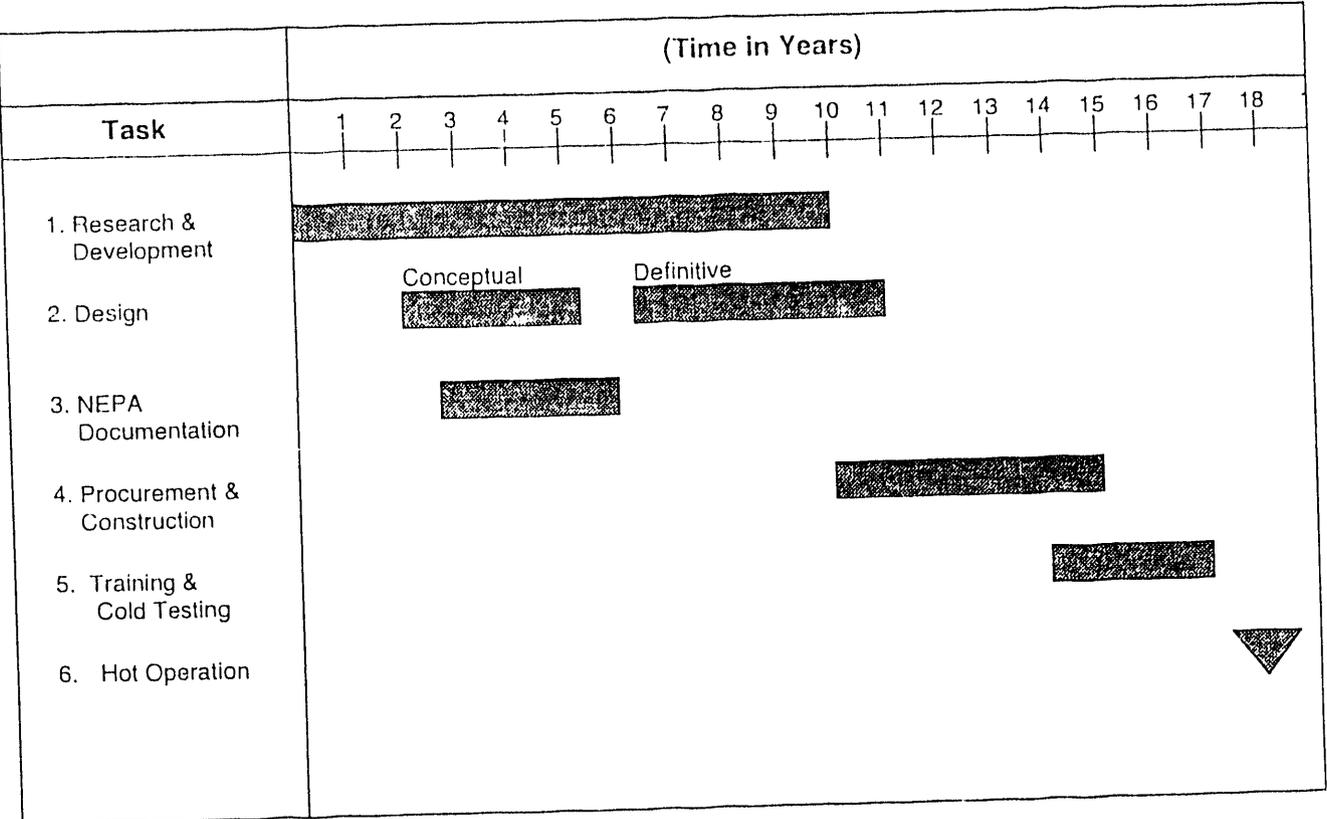


Figure 7-9. Spent Fuel Timeline.

Spent Fuel Schematic

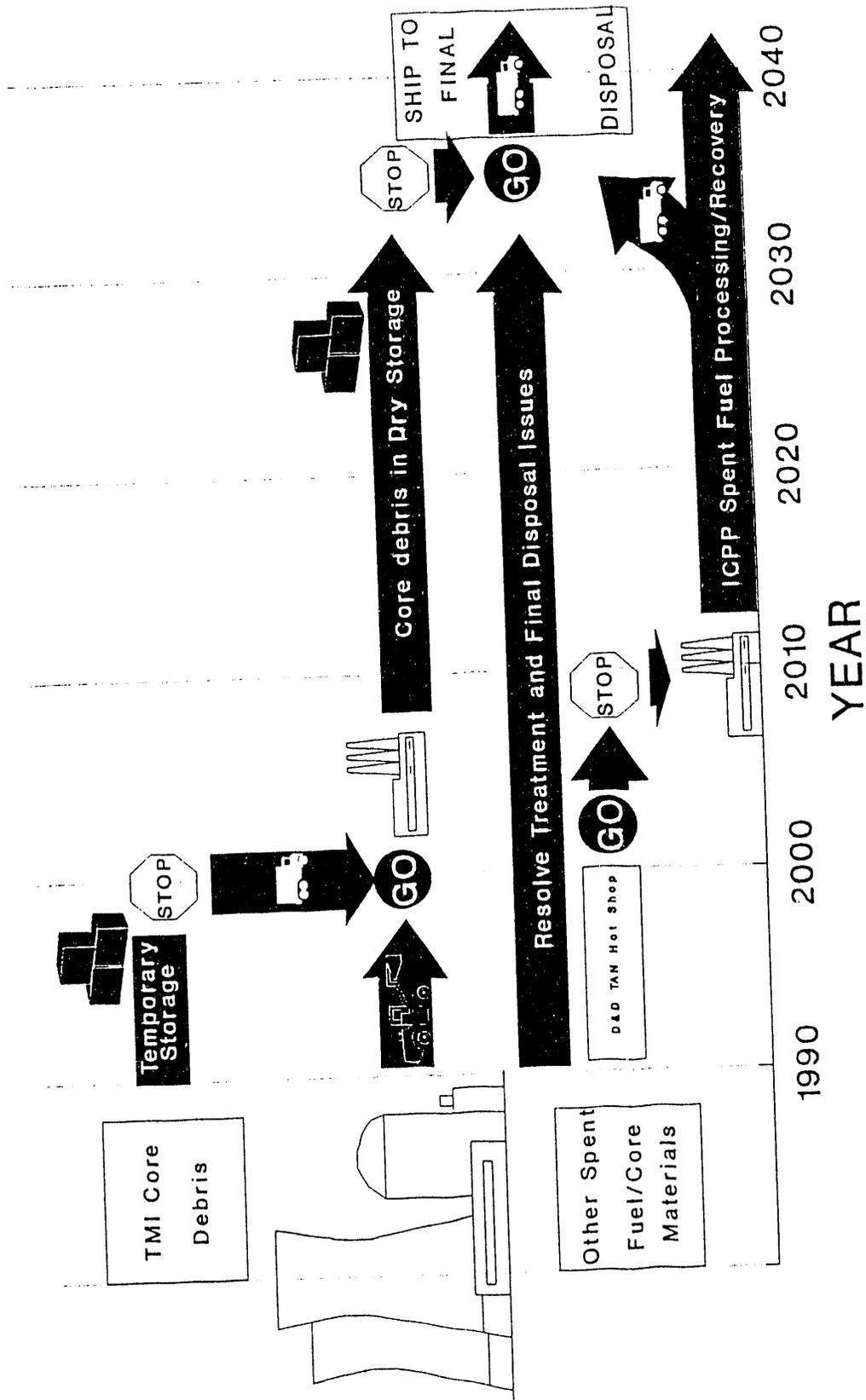


Figure 7-11. Spent Fuel Schematic.

The following are issues requiring resolution with their related ADS.

1. Orders

Issue: No formal DOE Orders exist for in-cask storage of DOE-owned spent nuclear fuel stored at DOE facilities.

Resolution: Coordinate with DOE-HQ to aid in development of formal orders.

ADS: 25-E1 Long-term storage

2. TAN Compliance

Issue: The TAN waste pool that housed the TMI core debris and various other spent fuel elements, does not comply with existing regulatory requirements.

Resolution: Design and build permitted dry storage casks and transfer the fuel housed in the Tan Pool into these casks for long-term storage until final dispositioning can be achieved.

ADS: 25-E1 Long-term storage.

3. Priority

Issue: DOE-owned spent fuels found at the INEL are likely to have low priority for acceptance in the National Repository upon opening. This low priority could lead to extended interim storage requirements.

Resolution: Design and build dry storage canisters to be acceptable for indefinite storage.

ADS: 25-E1 Long-term storage.

4. Transporters

Issue: NRC licensed transportation casks are required for transporting spent fuel materials from the INEL to the proposed Spent Fuel Complex or other on-Site storage where the dry storage casks may be located.

Resolution: Provide a program to evaluate existing casks on-Site and off-Site to determine availability of such, and procure licensed casks for transportation.

ADS: 69-E1

New ADS: Spent Fuel Transporter

5. Spent Fuel Complex

Issue: Assuming the decision is made to transfer the dry storage casks from the INEL to the proposed Spent Fuel Complex for storage, there exists a need for coordination of this effort and building the necessary storage pad.

Resolution: Develop a program for dry storage.

ADS: No ADS currently exist.

New ADS: Spent Fuel Complex Storage Program.

6. NRC Remnants

Issue: DOE and NRC have not formed an agreement on ownership of NRC remnants.

Resolution: Provide support to DOE-HQ to aid in development of a memorandum of agreement.

ADS: No ADS. This is part of the NRC Spent Fuel Programs.

7. TAN/ICPP Modifications

Issue: A need may exist for characterization, handling, and transportation requirements for spent fuel stored in the dry storage casks once the National Repository is open and disposal space is available. TAN Hot Shop facilities are not expected to be operational past FY 2000.

Resolution: Coordinate with DOE-HQ to maintain current status of the National Repository and availability of disposal space for INEL spent fuels. Evaluate options as the repository nears opening and WAC issues are identified.

ADS: 25-E1 Long-term storage.

8. Dispositioning

Issue: Ultimate dispositioning of INEL spent fuels is unclear.

Resolution: Coordinate and provide support to DOE-HQ in the development of a National Repository. In the interim, provide indefinite storage via dry storage casks.

ADS: 25-E1 Long-term storage

9. Storage

Issue: Current Storage configuration of INEL spent fuels is not in compliance with regulations and does not offer long-term storage options.

Resolution: Provide program to place into dry storage casks INEL spent fuel materials.

ADS: 25-E1 Long-term storage.

10. Special Fuels Dispositioning Facility

Issue: Current spent fuel processing is not applicable for all fuel stored at the INEL. Various fuels may not be able to be transferred to a repository without some kind of treatment or reconditioning.

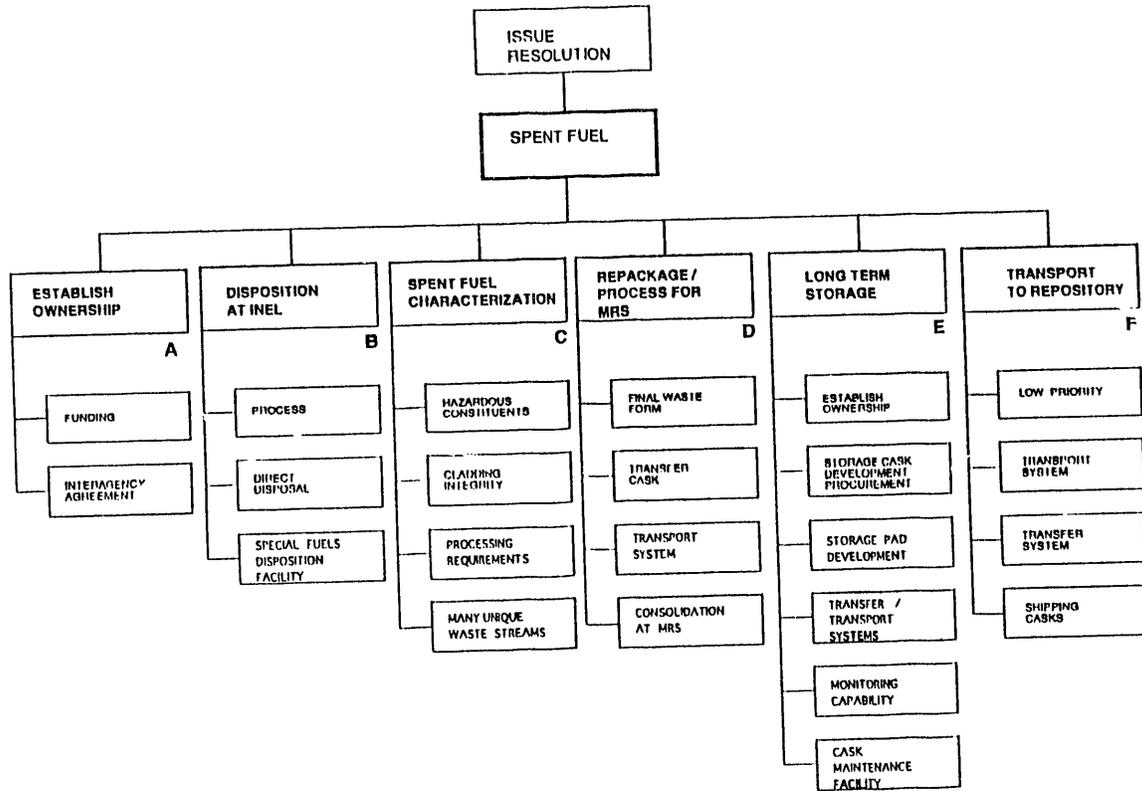
Resolution: Provide a program to fully evaluate the various spent fuels, pins, etc., and determine the best way to treat, consolidate, examine, and store the fuel before transferring it to a repository.

New ADS: Special Fuels Dispositioning Facility (SFDF)

Related ADS: ICPP HLW Immobilization

Following is an updated Spent Fuel Issue Resolution Analytical Tree that shows the integration of spent fuel issues analysis, desired activities, and a proposed activities schedule (see Figure 7-12).

INEL WMO ROADMAP



DESIRED ACTIVITIES:

- A. SPENT FUEL OWNERSHIP**
 - A1 - DETERMINATION OF LEVEL OF EPA REGULATION AND INTERAGENCY RELATIONSHIPS
 - A2 - DEVELOP NATIONAL SPENT FUEL POLICY STRATEGY
- B. SPENT FUEL DISPOSITION**
 - B1 - DEVELOPMENT OF SPENT FUEL DISPOSITION FACILITY (SFDF)
 - B2 - DEVELOPMENT OF WAC FOR FEDERAL REPOSITORY AND MRS
- C. SPENT FUEL CHARACTERIZATION**
 - C1 - DEVELOPMENT OF CHARACTERIZATION FACILITY (SFDF)
 - C2 - DEVELOPMENT OF CHARACTERIZATION GUIDELINES (WAC)
 - C3 - CHARACTERIZE MANY UNIQUE WASTE STREAMS
- D. SPENT FUEL PROCESS OPTIONS**
 - D1 - DETERMINE FINAL WASTE FORM OF REPROCESSED FUELS
 - D2 - DEVELOP DISPOSAL OPTIONS
- E. SPENT FUEL STORAGE**
 - E1 - DETERMINE NEED FOR MODIFIED MRS STORAGE AT THE INEL, DEVELOPMENT
 - E2 - DEVELOP CENTRALIZED WASTE MANAGEMENT COMPLEX (CASK MAINTENANCE FACILITY)
- F. SPENT FUEL TRANSPORTATION**
 - F1 - DEVELOP TRANSPORTATION FACILITIES (MODIFICATIONS)
 - F2 - DETERMINE TRANSPORTATION REGULATIONS, SHIPPING CASK CONFIGURATIONS

SPENT FUEL SCHEDULE

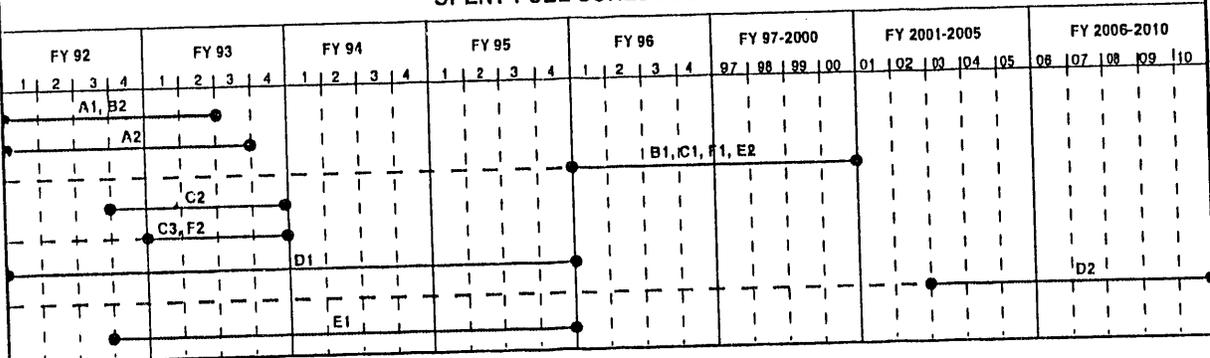


Figure 7-12. Spent Fuel Issue Resolution Analytical Tree.

7.2.6 Special Case/Greater-Than-Class C Waste Desired Activities/ADS Integration

1. Orders

Issue: There exists no standards, requirements, or limits for GTCC type wastes as should be outlined in DOE Orders.

Resolution: Coordinate with DOE-HQ to develop and establish DOE Orders.

ADS: 111-E1 GTCC

2. Strategy

Issue: The strategy for performing, treatment, storage, and disposal on GTCC wastes is not clear.

Resolution: Continue evaluation of options and coordinate with DOE-HQ to develop strategy.

ADS: 111-E1 GTCC

3. Characterization

Issue: Characterization capabilities for special case wastes are not available at the INEL or throughout the DOE Complex.

Resolution: Continue evaluation of options and work with DOE-HQ to develop strategy to identify characterization capabilities.

ADS: 111-E1 GTCC

4. Disposal

Issue: Disposal options do not exist for GTCC type wastes.

Resolution: Continue evaluation of alternatives and coordinate with design of IWPF to potentially utilize treatment capabilities.

ADS: 111-E1 GTCC

Related ADSs: 14-E1 Potential for treatment of GTCC wastes at IWPF.

7.2.7 Environmental Restoration Program/Waste Management Operations Interface

1. Characterization

Issue: Assuming retrieval of buried waste, the need exists to provide adequate characterization.

Resolution: Utilize characterization capabilities of the WCF.

ADS: 101-E2 Waste Characterization Facility.

Related ADS: 8-E3 SWEPP operations will provide support for certification efforts.

2. Methodology

Issue: A disposal and treatment methodology for buried waste does not exist.

Resolution: Once waste is retrieved and characterized a decision can be made regarding available options. Most likely will be the need for processing through IWPF and petition of WIPP for disposal.

ADS: 14-E1 IWPF (for processing)
101-E2 WCSF (for characterization)

Related ADS: 113-E1 Coordinate with WIPP to include buried waste as part of the WIPP-WAC.

3. Storage

Issue: Once waste is retrieved from the ERP, the need exists for storage capacity awaiting constitution at IWPF.

Resolution: Construct additional storage modules as required to accommodate retrieved waste.

ADS: 101-E2 WCF

4. Technologies

Issue: New technologies for treating retrieved buried waste may be required.

Resolution: Coordinate with Technology Development.

ADS: (TD ADS) (NEW technology needed)

5. Decontamination Facility

Issue: A decontamination facility is needed to support intrusive operations for buried waste.

Resolution: Evaluate the need for additional capabilities not offered by new waste management facilities such as WCSF and IWPF.

ADS: (ER ADS) (Possible NEW technology needed)

Related ADSs: 14-E1 IWPF capabilities
101-E2 WCSF capabilities

8. DOE-HQ ISSUES

The Roadmap Development Team has identified the Key Site Issues that will require resolution for successful completion of the WMO mission at the INEL. The issues were evaluated and divided into issues that can be resolved at the installation level and issues that will require DOE-HQ assistance for resolution. While some of the issues will require DOE-HQ assistance, The INEL recognizes its responsibility for resolving these issues in an expedient manner. The INEL will assist DOE-HQ by taking a lead role in resolving all issues for its installation. The INEL will provide assistance to any other sites that are restrained by issues similar to those found at the INEL. The installation issues are shown in the following tables, and issues requiring DOE-HQ assistance are noted.

Table 8-1. Low-Level waste/Mixed Low-Level waste installation issues.

IDENTIFIED KEY ISSUES WITHIN INEL WMO	ISSUE RESOLUTION RESPONSIBILITY	
	INEL	DOE-HQ
WASTE TYPE: LLW/MLLW		
A. System Performance Assessment		
INEL system approach	X	
DOE Complex approach	X	X
B. Waste Minimization		
Incentives/Backcharge	X	X
BRC Levels	X	X
C. Characterization		
Facilities	X	
Technologies	X	X
PA requirements	X	

INEL Waste Management Operations Roadmap Document	Title: DOE-HQ ISSUES Section: 8. Issue date: 04-30-92
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Table 8-1. (continued).

IDENTIFIED KEY ISSUES WITHIN INEL WMO	ISSUE RESOLUTION RESPONSIBILITY	
	INEL	DOE-HQ
WASTE TYPE: LLW/MLLW		
D. Treatment		
Only partial LLW capability	X	
No MLLW treatment	X	
No PCB capability	X	
No remote capability	X	
Regionalization	X	X
E. Storage		
Illegally stored waste	X	
Inadequate MLLW capacity	X	
MLLW Capacity variance/case-by-case	X	X
BWP wastes (long-term storage)	X	
F. Disposal		
No subtitle C (Mixed) facility	X	
Improved practices	X	
LLW/Alpha contaminated waste	X	X
Waste form	X	X
G. Transportation		
Regulatory authority	X	X

INEL Waste Management Operations Roadmap Document	Title: DOE-HQ ISSUES Section: 8. Issue date: 04-30-92
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Table 8-1. (continued).

IDENTIFIED KEY ISSUES WITHIN INEL WMO	ISSUE RESOLUTION RESPONSIBILITY	
	INEL	DOE-HQ
WASTE TYPE: LLW/MLLW		
H. Facility closure/D&D		
Facility characterization and closure	X	
Multiple disposal sites	X	
Projected volumes	X	
WMO planning	X	

The issues regarding DOE-HQ assistance are almost all related to the need for a Complex-wide System Performance Assessment, and decisions from DOE-HQ regarding regionalization of treatment and disposal facilities. The remaining issues involve areas where DOE-HQ needs to provide assistance in establishing policies, or making decisions regarding the direction of the DOE Complex in support of planning for WMO. The following section provides an issue description, the priority, the impacted activities, and issue resolution schedule required for each issue requiring DOE-HQ assistance for resolution.

DOE-HQ Issue: There is no systematic approach to managing DOE Complex waste that considers the entire life-cycle of waste generation, minimization, and TSD.

Priority: 1

- Impacted Activities:**
- Development of all WMO TSD and supporting facilities
 - INEL EIS
 - Revision of INEL WAC
 - Finalization of DOE Order 5820.2A

Required Resolution Date: 4Q92

INEL Waste Management Operations Roadmap Document	Title: DOE-HQ ISSUES Section: 8. Issue date: 04-30-92
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DOE-HQ Issue: Minimal effort is being made to reduce waste generation.

Priority: 2

- Impacted Activities:
- Implementation of INEL Waste Minimization Programs
 - Finalization of DOE Order 5820.2A

Required Resolution Date: 2Q92

DOE-HQ Issue: BRC/deminimus values have not been established.

Priority: 1

- Impacted Activities:
- Development of installation TSD facilities
 - Volume projections of waste stream generation
 - Waste Minimization Program implementation

Required Resolution Date: 2Q93

DOE-HQ Issue: Current characterization technologies are not capable of meeting characterization requirements.

Priority: 1

- Impacted Activities:
- Development of characterization facilities

Required Resolution Date: 4Q92

DOE-HQ Issue: No effort exists to coordinate national LLW/MLLW treatment capabilities, forcing individual sites to develop redundant capabilities.

Priority: 1

- Impacted Activities:
- Design of installation treatment facilities
 - Compliance schedules for MLLW treatment

Required Resolution Date: 4Q92

DOE-HQ Issue: Storage policy is less than adequate Complex wide for MLLW.

Priority: 1

- Impacted Activities:**
- Bench-scale development schedules
 - Treatment facility development

Required Resolution Date: 3Q92

DOE-HQ Issue: LLW containing transuranic elements with concentrations between 10 η Ci/g and 100 η Ci/g cannot be placed in the RWMC and no alternative has been identified.

Priority: 3

- Impacted Activities:**
- F&ORs and conceptual design for LLW treatment facility
 - F&ORs and conceptual design for LLW disposal facility
 - TRU waste processing strategy

Required Resolution Date: 4Q93

DOE-HQ Issue: Current RWMC disposal methods and waste forms need to be improved.

Priority: 2

- Impacted Activities:**
- Finalization of DOE Order 5820.2A
 - LLW/MLLW TSD facility development
 - Revision of RWMC WAC

Required Resolution Date: 2Q93

DOE-HQ Issue: Regulatory authority for all LLW/MLLW shipments have not been clearly established.

Priority: 3

- Impacted Activities:** On-Site waste shipments

Required Resolution Date: 4Q92

INEL Waste Management Operations Roadmap Document	Title: DOE-HQ ISSUES Section: 8.	Issue date: 04-30-92
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Table 8-2. Municipal Sanitary waste installation issues.

IDENTIFIED KEY ISSUES WITHIN INEL WMO	ISSUE RESOLUTION RESPONSIBILITY	
	INEL	DOE-HQ
WASTE TYPE: Municipal Sanitary		
A. Waste minimization		
Fully implement INEL program	X	
Strengthen resource recovery program	X	
B. TSD options		
Advanced concepts (composting, etc.)	X	X
On-Site vs off-Site disposal decision	X	
C. Municipal sanitary waste operation		
Construct transfer station	X	
D. Regulatory compliance and monitoring		
Close and monitor existing landfill	X	
Create new INEL Subtitle "D" landfill	X	X

The following section provides an issue description, the priority, the impacted activities, and issue resolution schedule required for each issue requiring DOE-HQ assistance for resolution.

DOE-HQ/DOE-ID Issue: Decision to create a new Subtitle "D" landfill at the INEL

Priority: 2

Impacted Activities:

- Current facility operation
- Off-Site disposal

Required Resolution Date: 4Q93

Table 8-3. Hazardous waste installation issues.

IDENTIFIED KEY ISSUES WITHIN INEL WMO	ISSUE RESOLUTION RESPONSIBILITY	
	INEL	DOE-HQ
WASTE TYPE: Hazardous		
A. System performance		
On-Site/off-Site disposal decisions	X	X
B. Hazardous waste operation		
Develop contractor/regulator interface	X	X
Expand hazardous material training program	X	
C. Hazardous shipping moratorium		
Establish de minimis waste disposal criteria	X	X
Implement hazardous material control program	X	
D. Develop new treatment/storage/disposal options		
Utilize proposed MLLW facilities	X	X
Construct HWTF	X	
Construct HWSF	X	

The following section provides an issue description, the priority, the impacted activities, and issue resolution schedule required for each issue requiring DOE-HQ assistance for resolution.

INEL Waste Management Operations Roadmap Document	Title: DOE-HQ ISSUES Section: 8.	Issue date: 04-30-92
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DOE-HQ Issue: The INEL hazardous waste shipping moratorium is in effect.

Priority: 1

- Impacted Activities:
- Limited on-Site hazardous waste storage capacity
 - Off-Site treatment and disposal availability

Required Resolution Date: 3Q92

DOE-HQ Issue: Long-term liability exists from current practice of off-Site HW treatment and disposal.

Priority: 1

- Impacted Activities:
- Future facility development
 - Audit/verification programs

Required Resolution Date: 1Q93

INEL Waste Management Operations Roadmap Document	Title: DOE-HQ ISSUES Section: 8. Issue date: 04-30-92
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Table 8-4. Spent Fuel installation issues.

IDENTIFIED KEY ISSUES WITHIN INEL WMO	ISSUE RESOLUTION RESPONSIBILITY	
WASTE TYPE: Spent Fuel	INEL	DOE-HQ
A. Spent Fuel Ownership		
1. Determination of best owner and location for centralization at the INEL.	X	
2. Inconsistent funding for study and unclear direction from controlling agencies.	X	X
3. Establish interagency agreements.	X	X
B. Special Fuels Dispositioning		
1. Need for a Special Fuels Dispositioning Facility (SFDF).	X	X
2. Need for Federal Repository WAC.	X	X
C. Spent Fuel Characterization		
1. Need for a characterization facility.	X	
2. Need for characterization guidelines (MRS and Federal Repository WAC).	X	X

INEL Waste Management Operations Roadmap Document	Title: DOE-HQ ISSUES Section: 8.	Issue date: 04-30-92
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Table 8-4. (continued).

IDENTIFIED KEY ISSUES WITHIN INEL WMO	ISSUE RESOLUTION RESPONSIBILITY	
	INEL	DOE-HQ
WASTE TYPE: Spent Fuel		
D. Spent Fuel Process Options		
1. Need characterization of the many unique waste streams.	X	
2. Need packaging requirements for MRS and Federal Repository (WAC).	X	X
E. Spent Fuel Storage		
1. Need centralized Waste Management Complex (cask maintenance facility) for dry storage.	X	
2. Better definition of long-term and short-term storage requirements (capacities, wet or dry).	X	
3. Determination of need for modified interim MRS at the INEL.	X	X
F. Spent Fuel Handling and Transportation		
1. Storage casks used for on-Site transfers.	X	
2. Transportation cask configuration requirements (MRS and Federal Repository WAC).	X	X
3. Remote-handling capability requirements at the INEL (MRS, SFDF, TAN modifications).	X	

The issues regarding DOE-HQ assistance are almost all related to the need for development of a WAC for the Federal Repository and MRS. The remaining issues involve areas where DOE-HQ needs to provide assistance in establishing policies or making decisions regarding the direction of the DOE Complex with respect to the dispositioning of spent fuel.

The following section provides an issue description, the priority, the impacted activities, and issue resolution schedule required for each issue requiring DOE-HQ assistance for resolution.

DOE-HQ Issue: Interagency agreements need to be finalized between DOE and regulating bodies (i.e., EPA).

Priority: 2

- Impacted Activities:**
- Determination of RCRA applications to spent fuel.
 - Determination of final waste form.

Required Resolution Date: 1Q96

DOE-HQ Issue: Availability of a MRS facility for interim storage of spent fuel must be determined.

Priority: 1

- Impacted Activities:**
- Determination of the need for modified MRS interim storage at the INEL
 - TAN modifications

Required Resolution Date: 4Q92

DOE-HQ Issue: There are not waste acceptance criteria (WAC) for either the Federal Repository or the MRS.

Priority: 1

- Impacted Activities:
- Characterization guidelines
 - Packaging requirements
 - Design of Special Fuels Dispositioning Facility (SFDF)

Required Resolution Date: 3Q93

DOE-HQ Issue: Funding has been inconsistent to properly establish clear control of spent fuel by DOE departments such as Waste Management, Nuclear Engineering, and Defense Programs.

Priority: 1

- Impacted Activities:
- Determination of ownership of spent fuel
 - Need for centralization of spent fuel and location
 - Design of Waste Management Complex

Required Resolution Date: 4Q93

DOE-ID is incorporating the resolution of the installation issues into desired activities. DOE-ID has made it very clear that WMO planned activities must be consistent with the Roadmap; resolution of issues is a high priority. To coordinate resolution of DOE-HQ issues, DOE-ID will require a prompt response regarding primary DOE-HQ contracts and process guidance for DOE-HQ issue resolution.

9. CONCLUSION

The Draft INEL WMO Roadmap Document is a living document under continual development and is only a portion of an overall INEL Installation Roadmap. The INEL WMO Roadmap scope encompasses six waste types: LLW/MLLW, TRU/MTRU, Municipal Sanitary, Hazardous, Spent Fuel, and Special Case/GTCC.

The HLW and ERP Roadmaps are also under development and will be included in the INEL Installation Roadmap at a future date.

The following outline illustrates the evolution of the INEL WMO Roadmap:

February 1991

- Initiated Roadmap preliminary documentation
 - Recognized value of the process
 - More emphasis required on Five-Year Plan Process

April 1991

- Contractor fully involved
 - DOE-ID internally completed preliminary assessment phase

June 17, 1991

- Predecisional draft Roadmap complete through Step 7 for various waste streams

August 15, 1991

- Draft Roadmap to DOE-HQ completed through Step 9 for LLW/MLLW
 - For Duffy & Aiken perusal

September 16, 1991

- INEL WMO Roadmap delivered to DOE-HQ for various waste types with the LLW/MLLW section the most fully developed

December 20, 1991

- Update of municipal sanitary and hazardous waste streams completed and delivered to DOE-ID.

March 20, 1992

- Update of spent fuel roadmap completed and delivered to DOE-ID.

INEL Waste Management Operations Roadmap Document	Title: Conclusion Section: 9. Issue date: 04-30-92
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The INEL WMO Roadmap Task Force is complying with DOE-HQ's 18-month Development Schedule as shown in Figure 9.1 below, based on the June 4, 1991, call letter.

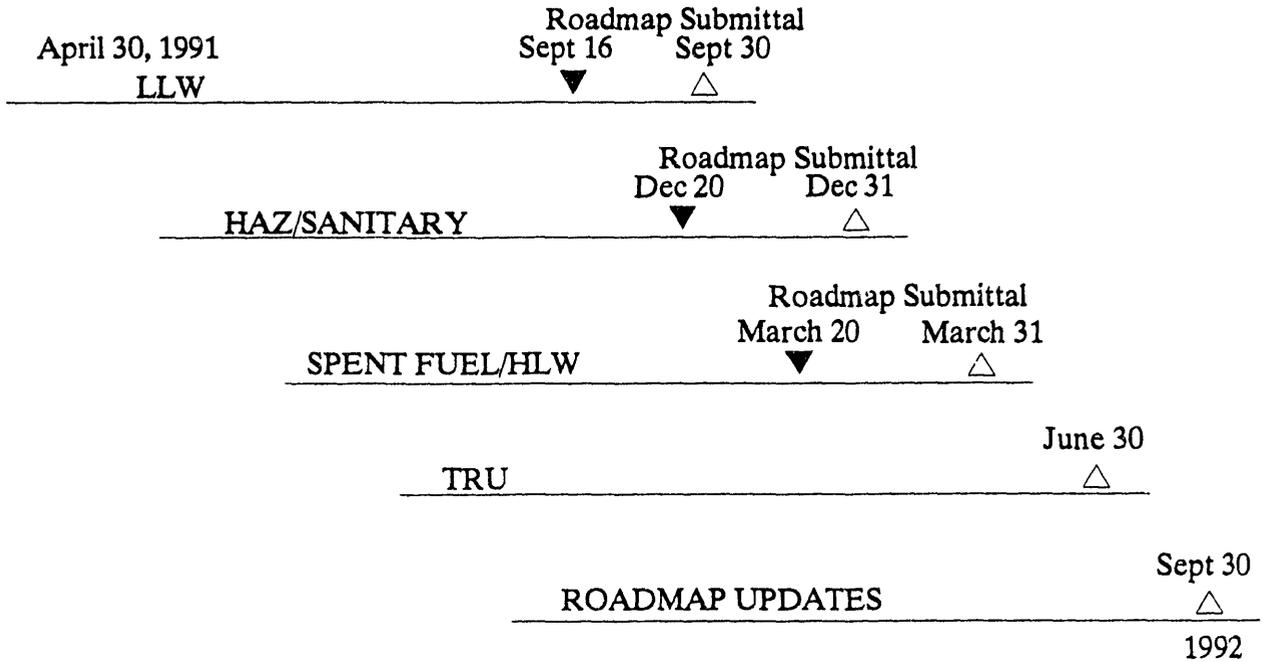


Figure 9-1. The DOE-HQ Methodology Guidance Development Schedule.

In accordance with the DOE-HQ's Roadmap Methodology Document, INEL WMO issues and activities were derived for each waste type. The issues and activities for each waste type are still under development and review.

Based on prioritization, the four biggest roadmap issues for all waste types are as follows:

1. Effective waste management practices and compliance with waste minimization requirements cannot be accomplished without establishing radiological below regulatory concern (BRC) values or de minimis waste disposal criteria.
2. Final waste form requirements for disposal have not been established for LLW/MLLW, TRU, and spent fuel.
3. Repositories for TRU and spent fuel have not been approved, which requires the INEL to provide long-term storage without alternatives for disposal identified.
4. There is no systems approach to managing DOE Complex waste that considers the entire life-cycle of generation, waste minimization, and TSD.

The four biggest roadmap issues that evolved for LLW/MLLW are as follows:

1. MLLW treatment capability and capacity on-Site, are not adequate to meet RCRA treatment and disposal requirements.
2. Site specific data is insufficient to validate performance assessment models for LLW disposal.
3. The RWMC does not have adequate capabilities to validate waste package contents.
4. No effort exists to coordinate national LLW/MLLW treatment utilizing common facilities, forcing individual DOE sites to develop redundant capabilities.

INEL Waste Management Operations Roadmap Document	Title: Conclusion	Issue date: 04-30-92
	Section: 9.	

The two biggest roadmap issues that evolved for municipal sanitary waste are as follows:

1. The current MSWLF at the INEL is nearing capacity, which will require alternative storage/disposal at the INEL.
2. Municipal sanitary on-Site vs. off-Site disposal must be evaluated including the creation of a subtitle "D" MSWLF on the INEL.

The two biggest roadmap issues that evolved for hazardous waste are as follows:

1. The hazardous waste shipping moratorium preventing shipment of hazardous wastes to off-Site TSD facilities results from the lack of BRC values or de minimis criteria for HW and MLLW.
2. On-Site vs. off-Site HW treatment and disposal options must be evaluated along with the associated liabilities.

The four biggest roadmap issues that evolved for spent fuel are as follows:

1. The lack of availability of the Federal Repository and an off-Site MRS facility is pushing the INEL toward long-term storage of spent fuel; the facilities to accomplish this do not exist.
2. The lack of a WAC for the Federal Repository or MRS is making the resolution of several key issues impossible, including waste characterization, repackaging, treatment, and transportation requirements to achieve final dispositioning.
3. The need exists for an INEL centralized Spent Fuel Complex but ownership, location, and handling requirements must be determined.
4. The need exists for a Special Fuels Dispositioning Facility (SFDF) so each waste type can be characterized and proper decisions made concerning processing and storage options prior to disposal.

In conclusion, the INEL WMO Roadmap Task Force will continue developing each waste type based on the quarterly deliverables of DOE-HQ's 18-month development schedule.

Appendix A

Mixed Low-Level Waste Logic Diagram Status

APPENDIX A MIXED LOW-LEVEL WASTE LOGIC DIAGRAM STATUS

The LLW/MLLW generic logic diagram (Figure A-1) was generated based on requirements for handling radioactive and hazardous waste. The subsequent diagrams (Figures A-2 thru A-8) were "stated" for the orphan wastes now stored at the INEL Mixed Waste Storage Facility. The wastes cannot be treated at existing INEL facilities. Seventeen waste streams were combined into seven treatability groups that would allow better economics of scale in developing unique treatment processes.¹ The current efforts for developing treatment processes² for the treatability groups are represented in the specific logic diagrams.

Some of the diagrams end at Step 18, which is development of on-Site capability to treat the waste groups. This status will remain unchanged until a new building is constructed or a current facility is modified to house bench-scale development projects.³ Most of the diagrams end at Step 24, which is satisfying the WERF WAC to burn the wastes in the INEL incinerator. The status will remain unchanged until modifications to the incinerator are complete and the WAC are modified to accept the hazardous portion of the waste.

Table A-1. Stated logic diagrams for LLW/MLLW streams.

Figure A-1	LLW/MLLW Generic Logic Diagram	
Figure A-2	MLLW Stream 1	Aqueous FXXX
Figure A-3	MLLW Stream 2	Aqueous DXXX
Figure A-4	MLLW Stream 3	Aqueous DXXX & FXXX
Figure A-5	MLLW Stream 4	Elemental Mercury
Figure A-6	MLLW Stream 5	CMPO Dissolved in Kerosene/Instaged
Figure A-7	MLLW Stream 6	FXXX & DXXX Sludge
Figure A-8	MLLW Stream 7	Characteristic Waste Sludge

1. *LDR MW Characterization and Categorization*, EDF-058, January 1991.
2. E. C. Garcia, *Mixed Waste Treatment Options*, EGG-WM-9451, January 1991.
3. *Planning Report for Treatment of LDR Mixed Wastes*, EDF-062, March 1991.

INEL WASTE MANAGEMENT OPS. ROADMAP

Proposed LLW/MLLW
Detail

DATE 8-10-91
Rev 1

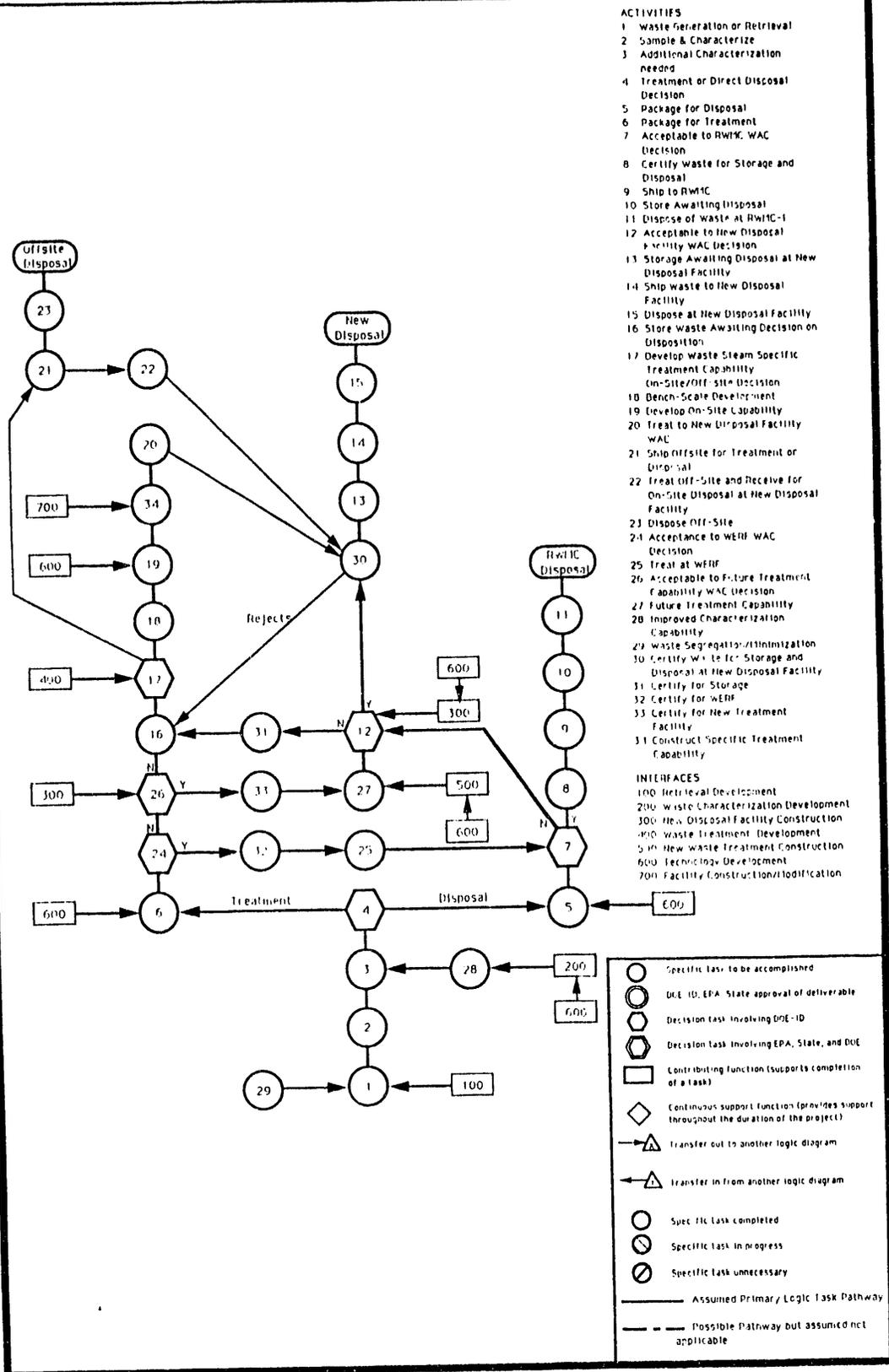
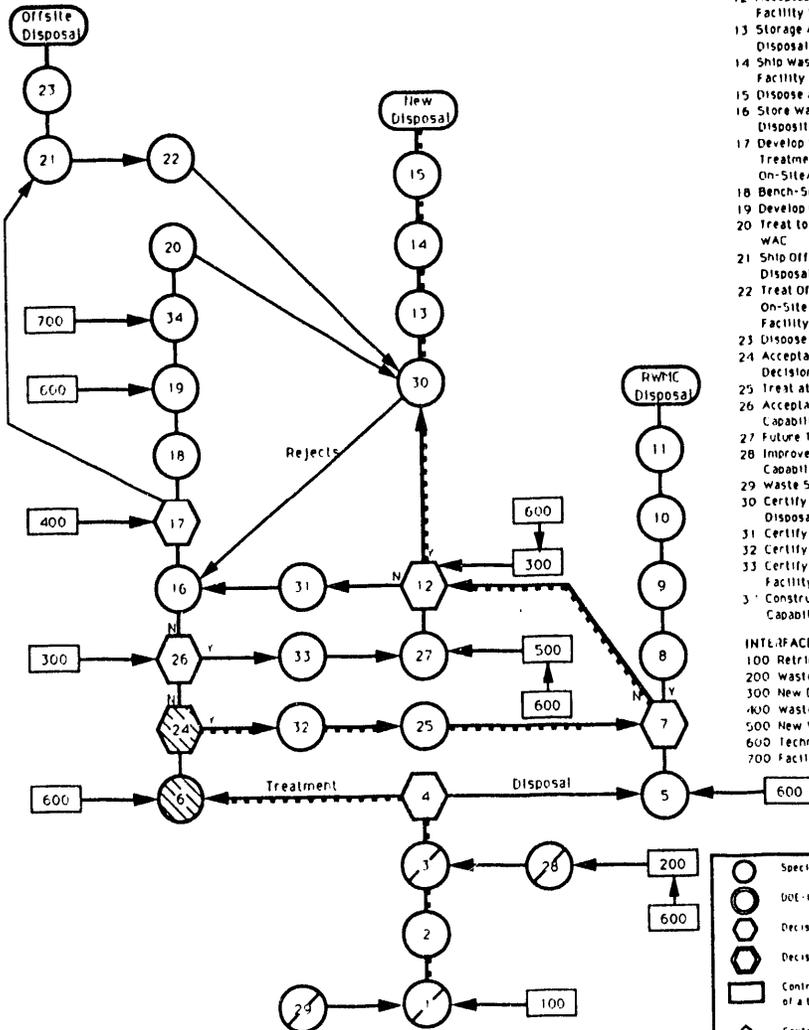


Figure A-1. LLW/MLLW generic logic diagram.

STATUS
AQUEOUS FXXX MLLW STREAM 1



- ACTIVITIES**
- 1 Waste Generation or Retrieval
 - 2 Sample & Characterize
 - 3 Additional Characterization needed
 - 4 Treatment or Direct Disposal Decision
 - 5 Package for Disposal
 - 6 Package for Treatment
 - 7 Acceptable to RWMC WAC Decision
 - 8 Certify Waste for Storage and Disposal
 - 9 Ship to RWMC
 - 10 Store Awaiting Disposal
 - 11 Dispose of Waste at RWMC-1
 - 12 Acceptable to New Disposal Facility WAC Decision
 - 13 Storage Awaiting Disposal at New Disposal Facility
 - 14 Ship waste to New Disposal Facility
 - 15 Dispose at New Disposal Facility
 - 16 Store Waste Awaiting Decision on Disposition
 - 17 Develop Waste Stream Specific Treatment Capability On-Site/Off-site Decision
 - 18 Bench-Scale Development
 - 19 Develop On-Site Capability
 - 20 Treat to New Disposal Facility WAC
 - 21 Ship Offsite for Treatment or Disposal
 - 22 Treat Off-Site and Receive for On-Site Disposal at New Disposal Facility
 - 23 Dispose Off-Site
 - 24 Acceptance to WERF WAC Decision
 - 25 Treat at WERF
 - 26 Acceptable to Future Treatment Capability WAC Decision
 - 27 Future Treatment Capability
 - 28 Improved Characterization Capability
 - 29 Waste Segregation/Minimization
 - 30 Certify waste for Storage and Disposal at New Disposal Facility
 - 31 Certify for Storage
 - 32 Certify for WERF
 - 33 Certify for New Treatment Facility
 - 34 Construct Specific Treatment Capability

- INTERFACES**
- 100 Retrieval Development
 - 200 Waste Characterization Development
 - 300 New Disposal Facility Construction
 - 400 Waste Treatment Development
 - 500 New Waste Treatment Construction
 - 600 Technology Development
 - 700 Facility Construction/Modification

- Specific task to be accomplished
- () DOE-ID, EPA, State approval of deliverable
- () Decision task involving DOE ID
- () Decision task involving EPA, State, and DOE
- ▭ Contributing function (supports completion of a task)
- ◇ Continuous support function (provides support throughout the duration of the project)
- △ Transfer out to another logic diagram
- ←△ Transfer in from another logic diagram
- () Specific task completed
- () Specific task in progress
- () Specific task unnecessary
- Assumed Primary Logic Task Pathway
- Possible Pathway but assumed not applicable

Figure A-2. MLLW Stream 1 Aqueous FXXX

STATUS
AQUEOUS DXXX MLLW STREAM 2

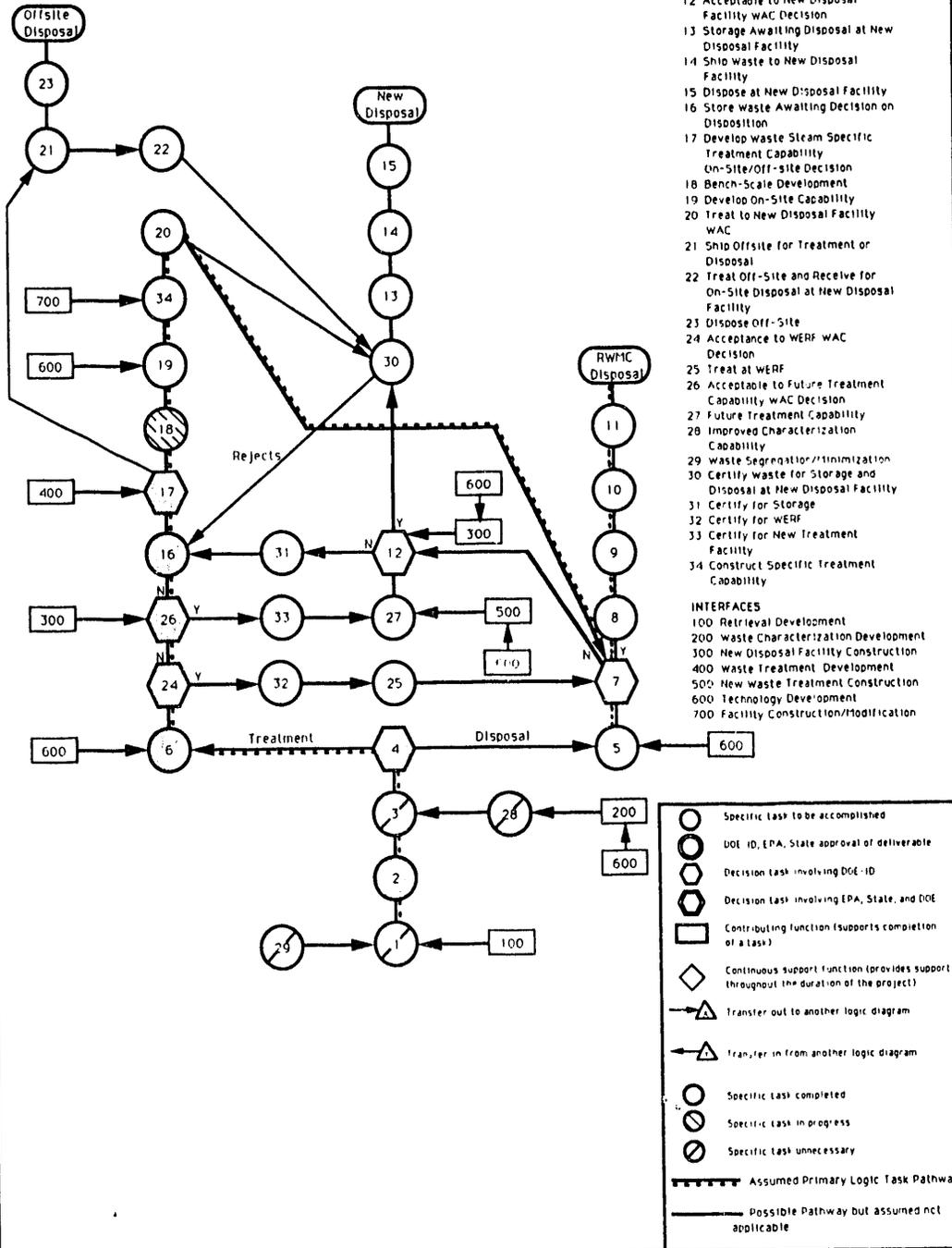


Figure A-3. MLLW Stream 2 Aqueous DXXX

STATUS
AQUEOUS DXXX & FXXX MLLW STREAM 3

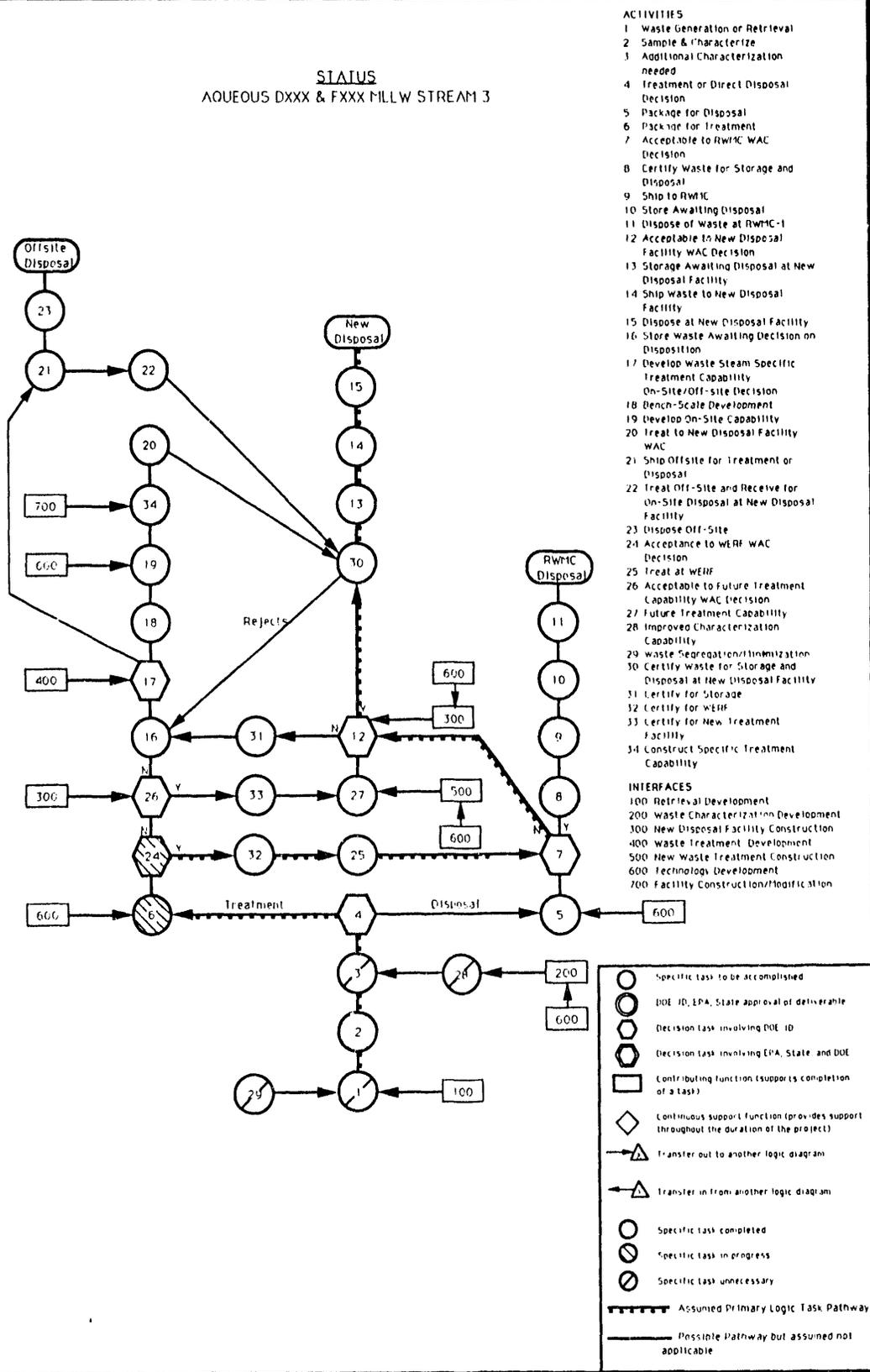


Figure A-4. MLLW Stream 3 Aqueous DXXX & FXXX

STATUS
CMPO DISSOLVED IN
KEROSENE/INSTAGEL - MLLW STREAM 5

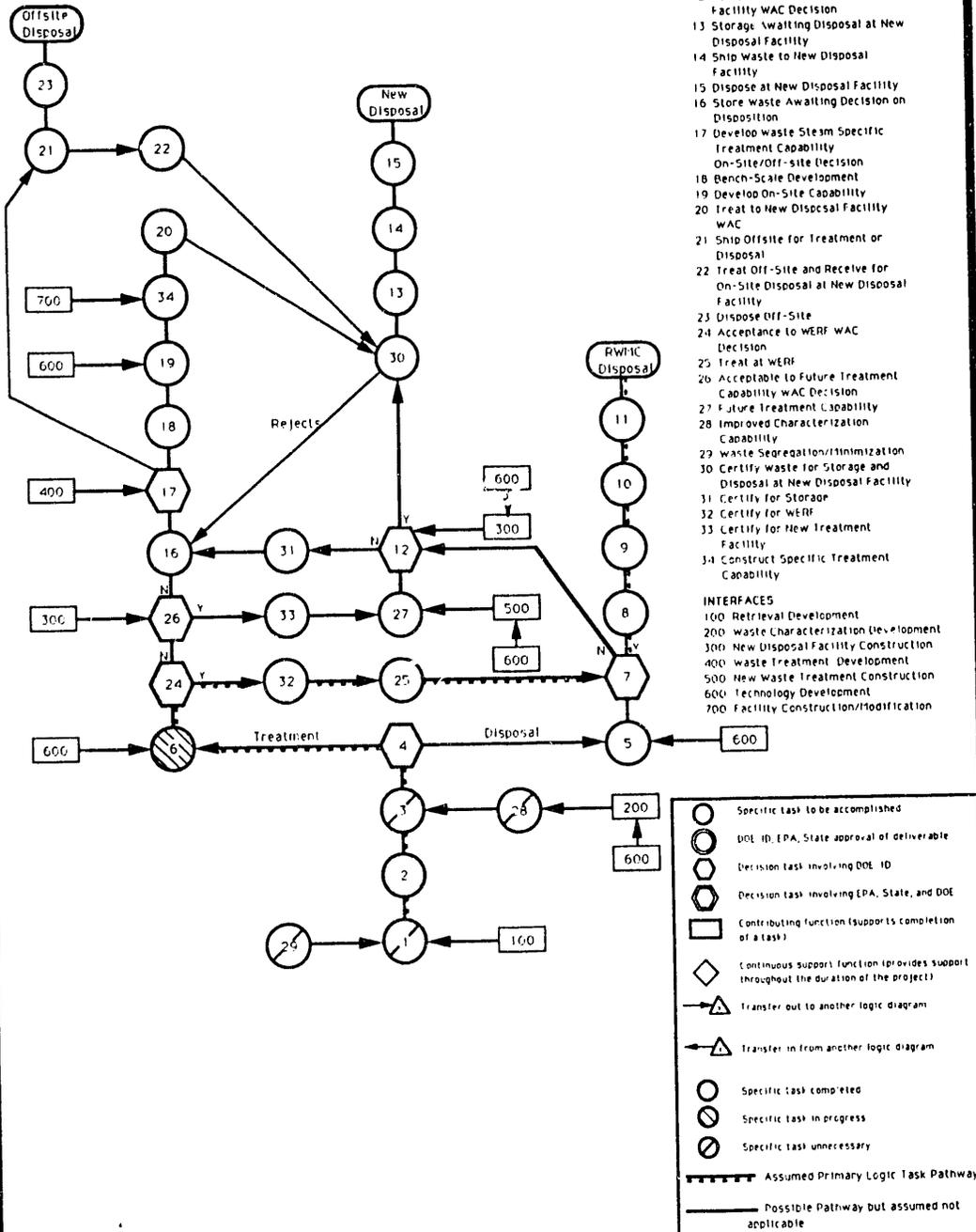


Figure A-6. MLLW Stream 5 CMPO Dissolved in Kerosene/Instaged

STATUS
FXXX & DXXX SLUDGE MLLW STREAM 6

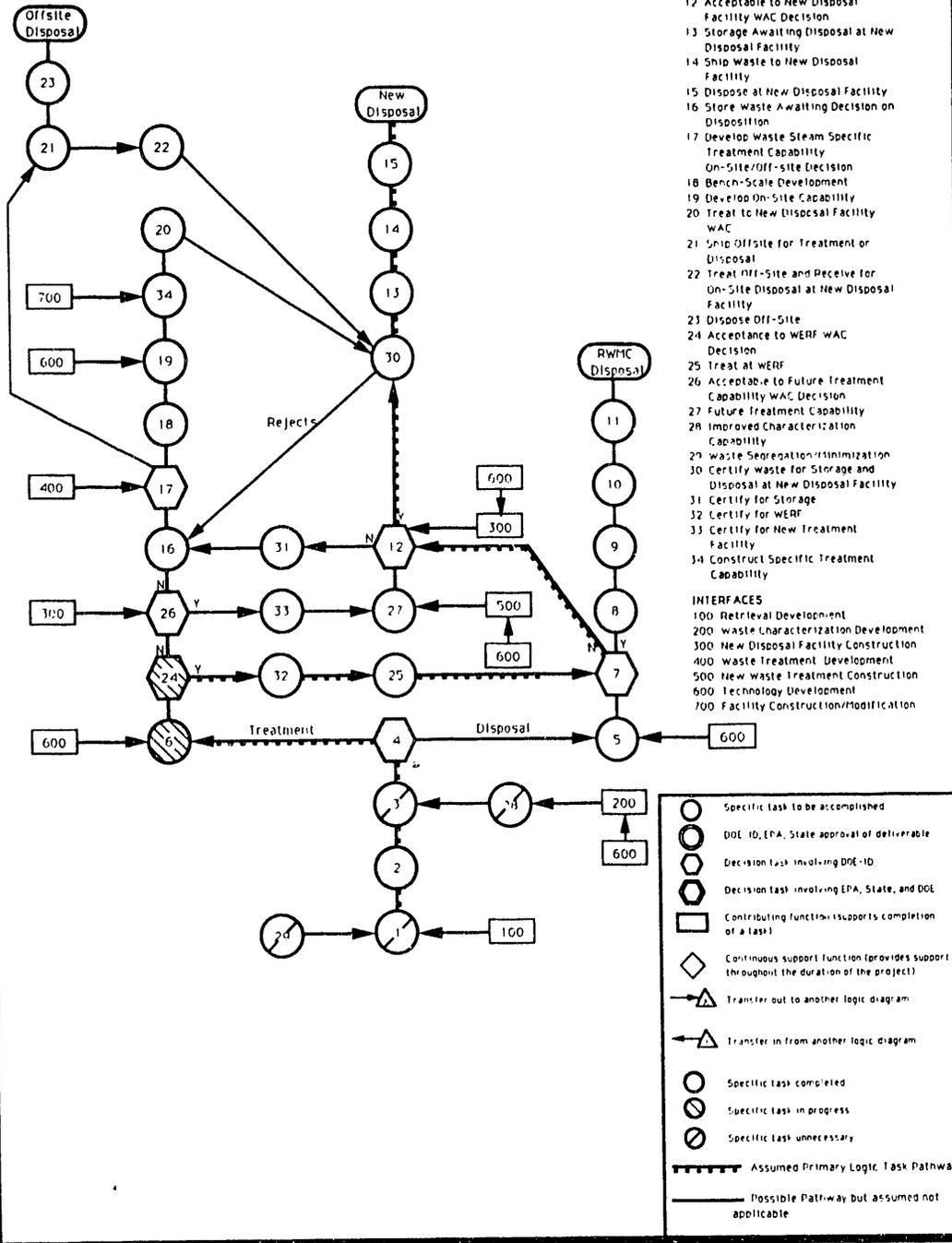


Figure A-7. MLLW Stream 6 FXXX & DXXX Sludge

STATUS
CHARACTERISTIC WASTE SLUDGE MLLW STREAM 7

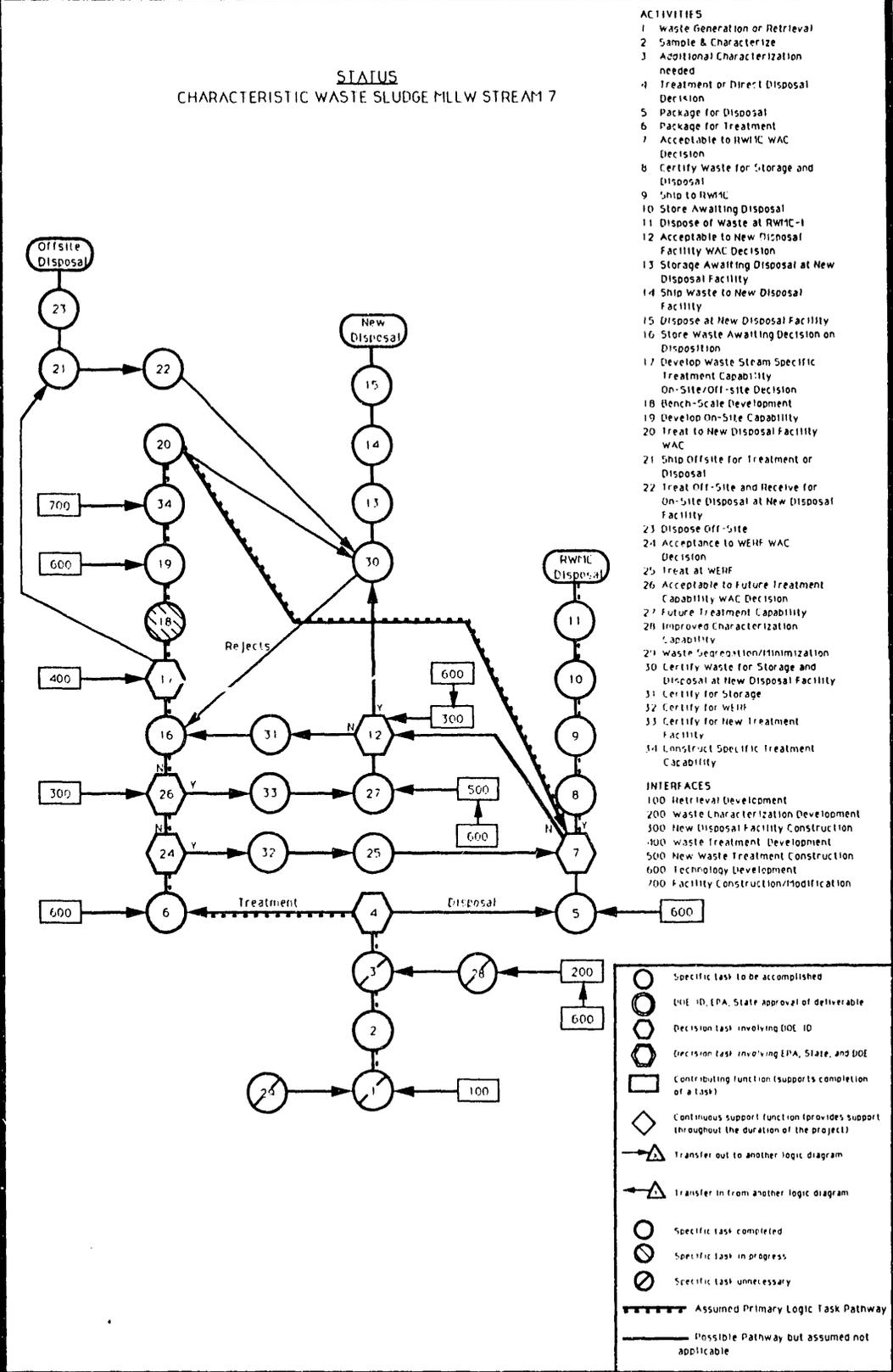


Figure A-8. MLLW Stream 7 Characteristic Waste Sludge

Appendix B
Key Regulatory Requirements

CONTENTS

DOE Order 1540.1 Materials Transportation and Traffic Management (9-19-90)	B-7
DOE 5400.1 General Environmental Protection Program	B-8
DOE 5400.3 Hazardous and Radioactive Mixed Waste Program	B-9
DOE 5400.4 Comprehensive Environmental Response, Compensation, and Liability Act Requirements	B-10
DOE 5400.5 Radiation Protection of the Public and the Environment	B-11
DOE 5440.1D National Environmental Policy Act	B-12
DOE 5480.1B Environmental, Safety, and Health Program for DOE	B-13
DOE 5480.3 Safety Requirements for the Packaging & Transportation of Hazardous Materials, Hazardous Substances, & Hazardous Wastes (07-09-85)	B-14
DOE 5480.4 Environmental Protection, Safety, & Health Protection Standards.	B-15
DOE 5480.5 Safety of Nuclear Facilities	B-16
DOE 5480.11 Radiation Protection for Occupational Workers	B-17
DOE 5820.2A Radioactive Waste Management	B-18
DOE 6430.1A General Design Criteria	B-19
DOE-ID 5480.1A Environmental, Safety, and Health Program for DOE	B-29
DOE-ID 5480.3 Hazardous Materials Packaging and Transportation Safety Requirements . .	B-30
DOE-ID 5480.4 Environmental Protection, Safety, & Health Protection Standards.	B-31
DOE-ID 5480.5A Safety of Nuclear Facilities	B-32
10 CFR 71 Packaging and Transportation of Radioactive Material	B-33
40 CFR 61 Hazardous Emissions	B-34
40 CFR 257 Criteria for Classification of Solid Waste Disposal Facilities and Practices	B-36
40 CFR 258 Criteria for Municipal Solid Waste Landfills	B-37

49 CFR 171 HMTA, Subpart C--Hazardous Materials Regulations; General Information, Regulations, and Definitions B-39

49 CFR 172 HMTA, Hazardous Materials Tables, Hazardous Materials Communications Requirements and Emergency Response Information Requirements B-40

49 CFR 173 HMTA, Shippers General Requirements for Shipments and Packagings B-41

 Subpart A General Requirements B-41

 Subpart B Preparation of Hazardous Materials for Transport B-41

 Subpart C Explosives and Blasting Agents; Defn.'s and Prep. B-42

 Subpart D through Subpart H 59 Specific Hazardous Materials Req. B-42

 Subpart J Other Regulated Materials B-42

 Subpart I Radioactive Materials B-43

40 CFR 265 Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities. B-45

 Subpart B General Facility Standards B-45

 Subpart C Preparedness and Prevention B-45

 Subpart D Contingency Plan and Emergency Procedures B-45

 Subpart E Manifest System, Recordkeeping, and Reporting B-46

 Subpart F Groundwater Monitoring B-46

 Subpart G Closure and Post-Closure B-46

 Subpart I Use and Management of Containers B-47

 Subpart J Tank Systems B-48

 Subpart K Surface Impoundments B-49

 Subpart L Waste Piles B-50

 Subpart M Land Treatment B-51

 Subpart N Landfills B-52

 Subpart O Incinerators B-53

 Subpart P Thermal Treatment Units B-54

 Subpart Q Chemical, Physical, and Biological Treatment B-55

 Subpart AA Air Emission Standards for Process Vents B-56

 Subpart BB Air Emission Standards for Equipment Leaks B-57

40 CFR 268 Land Disposal Restrictions (through subpart D) B-59

40 CFR 268 Land Disposal Restrictions (subpart E) B-60

40 CFR 761 Toxic Substances Control Act; PCBs Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions. B-61

Subpart B	Manufacturing, Processing, Distribution in Commerce, and Use of PCBs and PCB Items.	B-61
Subpart C	Marking of PCBs and PCB Items.	B-61
Subpart D	Storage and Disposal	B-62
Subpart G	PCB Spill and Cleanup Policy	B-63
Subpart J	General Records and Reports	B-63
Subpart K	PCB Waste Disposal Records and Reports	B-63
40 CFR 763 Subpart E--Asbestos Abatement Projects; Worker Protection		B-64

Regulation: DOE Order 1540.1 Materials Transportation and Traffic Management (chg. 3 9-19-90)

Reg. Authority: DOE

Applicability: Off-Site transportation of material.

Summary: Order asserts DOT regulations, State & local requirements, and further defines transportation requirements.

Requirements:

1. Adhere to DOT regulations governing shipping documentation to include waste certification, waste characterization, and waste description.
2. Participate in DOE's Shipment Mobility/Accountability Concept database; providing monthly data and an annual report.
3. Utilize the least expensive transportation.
4. DOE exemption from GSA & NRC--all applicable Federal regulations do apply.
5. Properly prepare and mark shipments according to 49 CFR 172-179.
6. Shipper and carrier must ensure material is properly loaded and restrained.
7. Inspection of received materials for damage or leaks; decontamination of vehicles responsibility of carrier.
8. Leakage reports of hazardous (including radioactive) materials reported to DOT.
9. Supply required DOT emergency response information.
10. Advanced written notice of unclassified high-level waste shipments and spent nuclear fuel provided to States through which the shipment will pass.
11. Shipping campaigns for highway route-controlled quantities of radioactive materials require a shipping plan.

Regulation: DOE 5400.1 General Environmental Protection Program

Reg. Authority: DOE

Applicability: All DOE programs.

Summary: Conduction of DOE operations in compliance with applicable environmental statutes, regulations, and standards to protect environment and public. Establishes environmental protection program.

Requirements:

1. Requires programs to comply with mandatory external requirements: EPA, State, and etc., unless exempt per individual requirement.
2. Requires Annual Site Environmental Report.
3. Requires facility environmental protection plans and corresponding implementation plan.
4. Requires monitoring programs to include monitoring of effluent and monitoring for environmental surveillance.
5. Environmental study must be conducted 1 year (preferably 2 years) prior to start-up of a facility.
6. Requires preoperational monitoring per NEPA.

Regulation: DOE 5400.3 Hazardous and Radioactive Mixed Waste Program

Reg. Authority: DOE

Applicability: All DOE operations involving hazardous or radioactive waste generation, treatment, storage, disposal, or transportation.

Summary: Establishes DOE requirements and implement RCRA requirements with framework of environmental protection programs.

Requirements:

1. Development of hazardous and mixed waste management programs to comply with RCRA and AEA.
2. Implementation of a hazardous and radioactive waste minimization program.

Regulation: DOE 5400.4 Comprehensive Environmental Response, Compensation, and Liability Act Requirements

Reg. Authority: DOE

Applicability: All DOE operations.

Summary: Establishes and implements CERCLA policies and procedures with framework of environmental protection programs.

Requirements:

1. Respond to imminent or actual releases of hazardous substances in accordance with CERCLA.
2. Interagency agreements for remedial investigations/feasibility studies and remedial actions.
3. Corrective actions must comply with NEPA.
4. Natural Resource Damage Assessment required if damage to natural resources.
5. Training of personnel to ensure compliance.

Regulation: DOE 5400.5 Radiation Protection of the Public and the Environment

Reg. Authority: DOE

Applicability: DOE operations

Summary: Establishes standards and requirements for operations with respect to protection of members of the public and the environment against due risk from radiation.

Requirements:

1. Capability to monitor and assess routine and unplanned radioactive releases.
2. Report effective dose equivalent contributions of 10 mrem/yr. This includes remediation activities and natural sources.
3. Primary dose equivalent is 100 mrem/yr. This includes remediation activities and natural sources.
4. Requires compliance with 40 CFR 61, 191, & 192 and 10 CFR 60 & 72.
5. Compliance determined by computer simulations or environmental and effluent monitoring.
6. DOE operated public drinking water supply comply with standards of 40 CFR 141.
7. DOE operations shall not cause drinking water systems downstream to exceed drinking water standards of 40 CFR 141.
8. Discharge of liquids to surface waters must comply with BAT if concentrations exceed the DCG.
9. Use of soil columns is discontinued.
10. Identify and characterize releases of radioactive material; provide adequate storage and records for these reports.

Regulation: DOE 5440.1D National Environmental Policy Act

Reg. Authority: DOE

Applicability: New and altered waste management operations and facilities.

Summary: Establishes policy and procedures which implement NEPA and to ensure environmental values and factors are considered in the decision making process. Requires coordination with the State.

Requirements:

1. Provide all NEPA documentation for new facilities, modernized old facilities, and clean-up operations.

Regulation: DOE 5480.1B Environmental, Safety, and Health Program for DOE

Reg. Authority: DOE

Applicability: All ES&H programs at GCCO facilities.

Summary: Establishes ES&H program and corresponding QA program.

Requirements:

1. Conduct Waste Management Operations according to approved ES&H program & plan.
2. Address all Waste Management ES&H requirements and activities in a ES&H implementation plan.
3. Support Waste Management with quality assurance program.
4. Support liaison with regional, State, and local officials.
5. Exemption from requirements and standards possible.

Regulation: DOE 5480.3 Safety Requirements for the Packaging & Transportation of Hazardous Materials, Hazardous Substances, & Hazardous Wastes (07-09-85)

SUPERSEDED by DOE Notice 5480.3: order being revised and should be replaced with 10 CFR 71 for interim.

10 CFR 71 Packaging and Transportation of Radioactive Material

Reg. Authority: DOE, AEC

Applicability: Transportation and packaging facilities/operations and packaging design projects.

Summary: Establishes requirements for packaging, preparation for shipment, and transportation of licensed radioactive material.

Requirements:

1. Comply with DOT regulations (49 CFR 170-189).
2. Packager, shipper, and transporter exemptions for low-level materials less than 0.002 microcurie/gram.
3. Package licensing requirements, package approval application requirements, approval standards, and package and special form tests.
4. Packaging and waste verification requirements for licensed shippers.
5. State notification requirements prior to shipment of nuclear waste.
6. Specific quality assurance requirements including packaging and waste content inspections.
7. Packaging standards include radiation activity limitations: Each package required to be designed and prepared for shipment so under normal conditions the radiation levels do not exceed 200 mrem/hr and the transportation index does not exceed 10, with exceptions.
8. Additional standards for Type B packaging include design, construction, and preparation requirements so that under required package testing there would be no loss or dispersal of radioactive contents, no significant increase in external radiation levels, and no substantial reduction in the effectiveness of the packaging; and there would be no escape of Kr-85 exceeding 10,000 cur./week, no escape of radioactive material, and no external radiation dose exceeding one rem per hour at a meters distance.

Regulation: DOE 5480.4 Environmental Protection, Safety, & Health Protection Standards.

Reg. Authority: DOE

Applicability: All DOE operations during facility design, construction, operation, modification, and decommissioning.

Summary: Presents standards for ES&H programs: mandatory external standards, mandatory internal standards, and good practice standards.

Requirements:

1. Possible permanent or temporary exemptions from mandatory standards as per each Federal or State regulation.
2. Comply with all applicable mandatory and good practice standards.

Regulation: DOE 5480.5 Safety of Nuclear Facilities

Reg. Authority: DOE

Applicability: The generation, treatment, and storage of radioactive liquid or solid waste. Waste disposal facilities are not included.

Summary: Defines safety program requirements for nuclear facilities.

Requirements:

1. Required Safety Analysis Reports as per DOE 5481.1B and the NRC.
2. Required Operating Safety Requirements to include administrative controls and procedural controls.
3. Personnel training program to include annual updates and biennial verification of training.
4. Approved QA program.
5. Identification and approval of all applicable ES&H standards is required to include siting, design, construction, modification, operation, maintenance, deactivation, and decontamination and decommissioning.
6. Review of safety design criteria, EA's, EIS's, and other ES&H required documentation is required for new or modified nuclear facilities.
7. Emergency programs and plans with medical response to radiation incidents.
8. Nuclear criticality program required--Waste Management Operations must remain subcritical under normal conditions.
9. Contractors must perform independent safety reviews and appraisals.

Regulation: DOE 5480.11 Radiation Protection for Occupational Workers

Reg. Authority: DOE

Applicability: All DOE operations performing work with radioactive materials.

Summary: Establishes radiation protection programs for workers and provides detailed DAC guidelines and levels.

Requirements:

1. Monitor workers to confirm compliance to standards.
2. Ambient air monitoring is required in areas with potential to release more than 10 percent above standards.
3. Surfaces outside radiation areas are required to be maintained free of removable contamination and never exceed specified levels.
4. Material and equipment in radiological areas are required to be controlled.
5. Radiation exposures limits in controlled work places are required to be reduced to ALARA level through proper facility design and control.
6. Access to controlled areas are required to be posted.
7. Establish entry control program.
8. All employees entering controlled areas are required to be trained within 19 months of original assignment.
9. Contractor internal audit of all functional elements of the radiation protection program are required to be conducted every 3 years.

Regulation: DOE 5820.2A Radioactive Waste Management

Reg. Authority: DOE

Applicability: DOE operations involving radioactive material generation, treatment, storage, disposal, or transportation.

Summary: Requirements for waste management program to follow Federal, State, and DOE guidelines are specified for various aspects of managing waste.

Requirements:

1. Development of waste acceptance criteria.
2. Development of a waste certification program.
3. Development of a waste verification program.
4. Proper and significant waste reduction, segregation, and minimization programs, processes, and procedures.
5. Develop and update approved waste management plan.
6. Meet performance objectives and assessment requirements.
7. Meet requirements for:
 - Treatment—meet required Waste Acceptance Criteria (WAC), segregation of mixed from radioactive, and provide Critical Design Report (CDR), Safety Analysis Report (SAR) & Operating Safety Requirements (OSR)
 - Shipment—minimize shipments and shipment volumes and meet WAC certification
 - Storage—meet performance objectives, provide CDR's, SAR's, & OSR's.
8. Develop disposal site closure and post closure requirements.
9. Meet applicable environmental monitoring requirements.
10. New disposal sites are subject to NEPA process.
11. Meet applicable waste characterization requirements.

Regulation: DOE 6430.1A General Design Criteria
Division 1 General Requirements

Reg. Authority: DOE

Applicability: Waste management facilities qualify as nonreactor nuclear facilities or nonnuclear facilities.

Summary: Criteria providing DOE prescribed and referenced standards for minimally acceptable requirements for facility design.

Requirements:

1. Alternative designs considered, developed, and evaluated during TI design; Final designs should be flexible enough to accommodate programmatic changes or operational modifications; designs should promote operational efficiency.
2. Safety analysis review required for all DOE facilities; preliminary review during conceptual design, further developed through TI & TII design, and finalized during construction; PSAR approved before construction begins.
3. Emergency plan required for facilities with possible on-Site/off-Site effects during normal or abnormal operations.
4. Fire protection design analysis reports (special & general) required for facilities that contain toxic chemicals or facilities where a fire could cause a radiation release. Reports included as TI summary documents.
5. Adhere to design standards for several aspects to include maintenance, operation, work space management, energy conservation, and physical protection.
6. Design requirements for nonreactor nuclear facilities required to follow additional requirements to include accessibility, storage of compressed gas cylinders, sharing of information with other DOE facilities, work space planning, isolation of stored hazardous materials, fire resistance of the structure, ALARA considerations, and etc.
7. Follow all structural (i.e., load) requirements and standards for all facilities and specific for nonreactor nuclear facilities.
8. Facility design requires a QA program compliant with NQA-1, DOE 4700.1, and DOE 5700.6B.
9. During construction of the facility, all efforts must be made to preserve the construction site and any temporary facilities/services should be coordinated with permanent facilities/services.

(continued)

INEL Waste Management Operations Roadmap Document	Title: Key Regulatory Requirements Section: Appendix B. Issue date: 04-30-92
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Regulation: DOE 6430.1A General Design Criteria
 Division 1 General Requirements
 Division 2 Site and Civil Engineering

Reg. Authority: DOE

Applicability: Waste management facilities qualify as nonreactor nuclear facilities or nonnuclear facilities.

Summary: Criteria providing DOE prescribed and referenced standards for minimally acceptable requirements for facility design.

Requirements:

10. Follow proper contract closeout procedures.
11. Utilize a Site development plan to locate new facilities assuring effective site utilization and to preclude future siting conflicts.
12. Special siting requirements and guidelines for radioactive facilities and nonreactor nuclear facilities to consider long-term and short-term consequences of releases of radioactive or other hazardous materials.
13. Subsurface investigations required for all critical facilities; survey of construction required to follow given standards.
14. Follow given standards and requirements for site and facility construction.
15. No interconnections among storm water systems, sanitary waste system, and radioactive or other hazardous waste stream.
16. Treatment of waste water should be compliant with CWA, FWPCA, SWDA, RCRA, TSCA, and any other Federal, State or local laws and regulations.
17. Compliance with Federal regulations concerning spills and releases are required.
18. For nonreactor nuclear facilities industrial waste required to be monitored for radioactivity and process waste required to properly collected, monitored, treated, and discharged.
19. Follow guidelines and regulations for construction in floodplains or wetlands.
20. Management of radioactive and/or hazardous solid waste requires compliance with RCRA.

(continued)

Regulation: DOE 6430.1A General Design Criteria
Division 1 General Requirements
Division 2 Site and Civil Engineering

Reg. Authority: DOE

Applicability: Waste management facilities qualify as nonreactor nuclear facilities or nonnuclear facilities.

Summary: Criteria providing DOE prescribed and referenced standards for minimally acceptable requirements for facility design.

Requirements:

21. Siting of TSD facilities prescribes several special considerations to include site geological, topographic, and aesthetic characteristics.
22. Site design for TSD requires inclusion of special considerations to include types and quantity of radioactive and hazardous waste handled; impact on groundwater sources; and TSD methods utilized.
23. Handling of radioactive and hazardous solid waste requires special designs and procedures to include segregation, temporary collection and storage, waste characterization, waste certification, waste volume reduction, and waste packaging and transport.

Further requirements governing all DOE facilities (DOE-owned, -leased, or -controlled sites where Federal funds are utilized) are given in extremely extensive detail and include:

General Requirements
Site and Civil Engineering
Concrete
Masonry
Finishes
Equipment
Special Facilities
Conveying Systems

Metals
Wood and Plastics
Thermal and Moisture Protection
Doors and Windows
Specialties
Furnishings
Mechanical
Electrical

Regulation: DOE 6430.1A General Design Criteria
Division 13 Special Facilities (General Requirements)

Reg. Authority: DOE

Applicability: Waste management facilities qualify as nonreactor nuclear facilities or nonnuclear facilities.

Summary: Criteria providing DOE prescribed and referenced standards for minimally acceptable requirements for facility design.

Requirements:

24. Special facility (nonreactor nuclear facilities) requirements reference all applicable laws, regulations, and standards--specifically RCRA (40 CFR 264, 265, 267, & 268) and DOE Orders 5400 series, 5480 series, and 5820.2A.
25. Facility design requires protection of personnel and the public (emphasizing ALARA), protection of property and operations during accidents, and compliance with DOE policies.
26. DBA releases of hazardous materials require design controls (confinement systems); planned releases require consideration for annual doses for the entire Site; and all releases require monitoring compliant with DOE 5400 series.
27. Special facility components, systems, and structures are required to be designed, fabricated, erected, and tested to standards and quality commensurate the hazards and potential consequences.
28. Special facilities require special design criteria to include detail design inclusion of specific systems, components, and procedures from conception through operation.

Examples required to be addressed are nuclear criticality safety, source and special nuclear material, radiation protection, confinement systems, decontamination and decommissioning, and human factors engineering.

29. The process systems are required to minimize the production of waste and minimize the mixing of radioactive and nonradioactive wastes.
30. Volume reduction equipment for liquid and solid wastes are required.
31. Radioactive mixed waste required to be avoided; mixed waste required to be characterized in the design process; and mixed waste required to be segregated and handled separately.

(continued)

Regulation: DOE 6430.1A General Design Criteria
Division 13 Special Facilities (General Requirements)

Reg. Authority: DOE

Applicability: Waste management facilities qualify as nonreactor nuclear facilities or nonnuclear facilities.

Summary: Criteria providing DOE prescribed and referenced standards for minimally acceptable requirements for facility design.

Requirements:

32. Facility design requires providing for waste segregation into compatibility groups.
33. Spill prevention and control are to be considered in the design stage of the facility.
34. The construction of a new facility or a major modification to an existing facility that releases or manages hazardous waste requires prior approval of the EPA or authorized State agency. Additional operating permits are required as presented in RCRA.
35. Environmental discharges of nonhazardous and hazardous waste required to be permitted and required to meet all applicable Federal, State, and local standards; design of facilities should include discharge limits.
36. During normal operations, the effluent concentrations of radionuclides measured at the site boundaries required to fall below DCG levels; the point of discharge of radionuclides required not to exceed DCG's.
37. All effluent streams required to be sampled and monitored in accordance with 5400 series; groundwater monitoring required.

(continued)

Regulation: DOE 6430.1A General Design Criteria
Division 13 Special Facilities (Rad Liquid Waste Facility)

Reg. Authority: DOE

Applicability: Waste management facilities qualify as nonreactor nuclear facilities or nonnuclear facilities.

Summary: Criteria providing DOE prescribed and referenced standards for minimally acceptable requirements for facility design.

Requirements:

38. Nuclear criticality control provisions are required for facilities that store or process enriched U, U-233, or TRU contaminated liquid waste.
39. The use of multiple barriers is required to restrict the movement of radioactive liquid waste having the potential for environmental or public contact. Several design specific requirements are specified and are required to be followed during the design process.
40. Storage and transfer systems require secondary volume storage and monitoring.
41. Treatment systems should allow for waste volume reduction and/or waste solidification for long-term isolation.
42. Treatment systems are required to be monitored.
43. Treatment systems are required to be designed to eliminate the possibility of an accidental release of radioactive waste to the environment or public.
44. RLWTF confinement systems are required to provide a secondary containment system capable of retaining the maximum rad liquid waste inventory from the primary confinement structure.
45. The direct use of UST's is required to be avoided.
46. High-level waste confinement stems are required to include a primary, secondary, and tertiary confinement systems to provide protection during normal operations, anticipated operational occurrences, DBA's, and severe natural phenomena.
47. Tank and piping systems for HLW collection, treatment, and storage are designed to strict specifications with extremely high integrity; system monitoring is required.

(continued)

Regulation: DOE 6430.1A General Design Criteria
Division 13 Special Facilities (Rad Liquid Waste Facility)

Reg. Authority: DOE

Applicability: Waste management facilities qualify as nonreactor nuclear facilities or nonnuclear facilities.

Summary: Criteria providing DOE prescribed and referenced standards for minimally acceptable requirements for facility design.

Requirements:

48. A dike or berm around the process system is required as secondary confinement for low-level wastes and is to be capable for containment of the maximum inventory from the primary confinement structure.
49. A system to monitor retention basins is required.
50. A storage or process building is required to provide secondary confinement for transuranic-contaminated liquid waste.
51. Tank and piping systems for TRU waste collection, treatment, and storage are designed to strict specifications with extremely high integrity; system monitoring is required.
52. TRU waste confinement systems are required to include a primary and secondary systems to provide protection during normal operations, anticipated operational occurrences, DBA's, and severe natural phenomena.
53. Liquid and solid radioactive waste associated with RLWTF's require consideration during the design process.
54. Soil columns and direct disposal of low-level liquid waste is prohibited; solidification is a preferred method of disposal.
55. Airborne effluents of RLWTF's require consideration during the design process.
56. All exhaust outlets that may contain radioisotopes require two monitoring systems.

(continued)

INEL Waste Management Operations Roadmap Document	Title: Key Regulatory Requirements Section: Appendix B. Issue date: 04-30-92
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Regulation: DOE 6430.1A General Design Criteria
Division 13 Special Facilities (Rad Solid Waste Facilities)

Reg. Authority: DOE

Applicability: Waste management facilities qualify as nonreactor nuclear facilities or nonnuclear facilities.

Summary: Criteria providing DOE prescribed and referenced standards for

Requirements:

57. Radioactive solid waste facilities require annual dose equivalents below a specified level.
58. Nuclear criticality control provisions are required for facilities that store or process enriched U, U-233, or TRU contaminated solid waste.
59. Process equipment off-gas treatment systems required to be designed to ensure integrity for normal operations, anticipated operational occurrences, and DBA's required to withstand.
60. Cooling water systems required for facilities and equipment associated with interim storage or treatment of high-level radioactive solid waste, and to ensure long-term integrity of the primary confinement system.
61. Instrumentation and control systems are required for RSWF's to provide monitoring and control.
62. High-level waste disposal facilities with short-lived nuclides dominating the facility hazard require a barrier effective for a period of time between 300 and 1000 years (short-term period).
63. Long-term disposal of high-level waste requires disposal in an acceptable geological setting (leaching, soil, and site characteristics; geologic stability; groundwater travel time; and etc.).
64. High-level waste disposal facility required to be designed to allow retrieval of wastes during the 50 year period following emplacement and before permanent closure of the facility.
65. Low-level solid waste disposal facility (ground disposal) required to be confined by site-specific system of barriers; barrier requires low permeability whether natural or man-made.
66. LLW disposal required to minimize contact with water, actively and passively.

(continued)

Regulation: DOE 6430.1A General Design Criteria
Division 13 Special Facilities (Rad Solid Waste Facilities)
Division 15 Mechanical (Special Facility Listings)

Reg. Authority: DOE

Applicability: Waste management facilities qualify as nonreactor nuclear facilities or nonnuclear facilities.

Summary: Criteria providing DOE prescribed and referenced standards for minimally acceptable requirements for facility design.

Requirements:

67. Radioactive solid waste facilities are required to include primary, secondary, and tertiary confinement systems to provide protection during normal operations, anticipated operational occurrences, and/or DBA's required to withstand.
68. Effluent control and monitoring require solid waste reduction and/or immobilization; consideration for nuclear criticality; and airborne effluents.
69. Laboratory facilities (including hot labs) required the installation of radioiodine absorber units in the exhaust ventilation/off-gas systems.
70. Laboratory facilities required to include primary, secondary, and tertiary confinement systems to provide protection during normal operations, anticipated operational occurrences, and/or DBA's required to withstand.
71. Laboratory confinement systems are required to maintain occupational radiation exposure below ALARA.
72. Laboratory facilities (including hot labs) required meet detailed criteria.
73. Radioactive airborne effluent systems require two monitoring systems.
74. Laboratory facilities require design consideration for uranium, plutonium, and contaminated solvents and oils.
75. Laboratory facilities require design consideration for a relatively short lived utilization-- therefore decontamination and decommissioning.

Regulation: DOE 6430.1A General Design Criteria
Division 13 Special Facilities (Rad Solid Waste Facilities)
Division 15 Mechanical (Special Facility Listings)

Reg. Authority: DOE

Applicability: Waste management facilities qualify as nonreactor nuclear facilities or nonnuclear facilities.

Summary: Criteria providing DOE prescribed and referenced standards for minimally acceptable requirements for facility design.

Requirements:

76. Incinerators used to dispose of toxic or other hazardous waste required to comply with 40 CFR 260, et seq., and Subpart O of 40 CFR 264; adequate pollution control capability and monitoring features required.
77. Any land disposal required to comply with RCRA and 40 CFR 241, et seq.
78. All special facilities required to followed detail specific requirements governing mechanical systems.

Regulation: DOE-ID 5480.1A Environmental, Safety, and Health Program for DOE

Reg. Authority: DOE-ID

Applicability: ES&H program at INEL facilities.

Summary: Provides responsibilities for and establishes ES&H program and corresponding QA program.

Requirements:

1. Conduct Waste Management Operations according to approved ES&H program & plan.
2. All ES&H requirements as specified in the associated DOE Order must be considered in design, construction, operation, maintenance, and D&D operations.
3. Provide liaison with State, regional, and local officials.
4. Prepare implementation plans for ES&H program & plan.
5. Exemption from requirements and standards possible as specified under the associated Federal or State regulation.
6. All proposals and program plans require appropriate ES&H program elements.

Regulation: DOE-ID 5480.3 Hazardous Materials Packaging and Transportation Safety Requirements

Reg. Authority: DOE-ID

Applicability: Transportation and packaging facilities/operations and packaging design projects. Distinction between on-Site and off-Site transportation.

Summary: Establishes requirements for packaging, preparation for shipment, and transportation of licensed radioactive material. Provides specific details and references for operations.

Requirements:

1. Comply with DOT regulations (49 CFR 170-189) and comply with DOE, EPA, NRC, OSHA, and IAEA standards and regulations governing transportation and shipping.
2. DOE-ID approval of packager, shipper, and transporter exemptions.
3. On-Site detailed packaging requirements, packaging approval application requirements and packaging approval hierarchy.
4. Packaging and waste verification requirements for licensed shippers.
6. Specific quality assurance requirements including packaging and waste content inspections.
7. All contractors must perform independent internal audits to assure compliance to on-Site transportation safety manual and shipping regulations.
8. Provide SARPs and/or transport plans for DOE-ID approval and resubmit minimum of every five years.
9. Specific details concerning on-site and off-site packaging, shipments, and handling are required.

Regulation: DOE-ID 5480.4 Environmental Protection, Safety, & Health Protection Standards.

Reg. Authority: DOE-ID

Applicability: All of DOE-ID and DOE-ID contractors during facility design, construction, operation, modification, and decommissioning.

Summary: Presents DOE-ID standards for ES&H programs: mandatory external standards, mandatory internal standards, and good practice standards.

Requirements:

1. Possible permanent or temporary exemptions from mandatory standards as per each Federal or State regulation.
2. Comply with all applicable mandatory and good practice standards.

INEL Waste Management Operations Roadmap Document	Title: Key Regulatory Requirements Section: Appendix B. Issue date: 04-30-92
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Regulation: DOE-ID 5480.5A Safety of Nuclear Facilities

Reg. Authority: DOE-ID

Applicability: The generation, treatment, and storage of radioactive liquid or solid waste. Waste disposal facilities are not included.

Summary: DOE-ID Order provides further clarification of approval levels and detailed specifications for facilities and programs.

Requirements:

1. Required SARs as per DOE 5481.1B and the NRC.
2. Required OSRs to include administrative controls and procedural controls.
3. Personnel training program to include annual updates and biennial verification of training.
4. Approved QA program required.
5. Identification and approval of all applicable ES&H standards is required.
6. Review of safety design criteria, EAs, EISs, and other ES&H required documentation is required for new or modified nuclear facilities.
7. Emergency programs and plans with medical response to radiation incidents.
8. Nuclear criticality program required--Waste Management Operations must remain subcritical under normal conditions.
9. Contractors must perform independent safety reviews and appraisals.
10. Contractors can not make significant changes in operations (equipment or procedural) without DOE-ID approval.
11. Contractors will shut down affected operations if a violation of a safety limit exists.
12. Follow the acceptable criteria for contractor criticality safety programs outlined in Chapter 1, to include:
 - Design principles and considerations
 - Facility design features
 - Process analysis
 - Process limits and controls.

Regulation: 10 CFR 71 Packaging and Transportation of Radioactive Material

DOE 5480.3 Safety Requirements for the Packaging & Transportation of Hazardous Materials, Hazardous Substances, and Hazardous Wastes (07-09-85) was SUPERSEDED by DOE Notice 5480.3: Order being revised and should be replaced with 10 CFR 71 for interim.

Reg. Authority: AEC

Applicability: Transportation and packing facilities/operations and packaging design projects.

Summary: Establishes requirements for packaging, preparation for shipment, and transportation of licensed radioactive material.

Requirements:

1. Comply DOT regulations (49 CFR 170-189)
2. Packager, shipper, and transporter exemptions for low-level materials less than 0.002 microcurie-gram.
3. Package licensing requirements, package approval application requirements, approval standards, and package and special form tests.
4. Packaging and waste verification requirements for licensed shippers.
5. State notification requirements prior to shipment of nuclear waste.
6. Specific quality assurance requirement including packaging and waste content inspections.
7. Packaging standards include radiation activity limitations: Each package required to be designed and prepared for shipment so under normal conditions the radiation levels do not exceed 200 mrem-hr and the transportation index does not exceed 10, with exceptions.
8. Additional standards for Type B packaging include design, construction, and preparation requirements so that under required package testing there would be no loss or dispersal of radioactive contents, no significant increase in external radiation levels, and no substantial reduction in the effectiveness of the packaging; and there would be no escape of Kr-85 exceeding 10,000 curies-week, no escape of radioactive material, and no external radiation dose exceeding one rem per hour at a meters distance.

INEL Waste Management Operations Roadmap Document	Title: Key Regulatory Requirements Section: Appendix B. Issue date: 04-30-92
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Regulation: 40 CFR 61 Hazardous Emissions
Subpart M National Emission Standard for Asbestos

Reg. Authority: EPA Region X

Applicability:

Summary:

Requirements:

1. Use of asbestos in roadways possible if encapsulated according to section 401 of *Standard Specifications for Construction of Roads and Bridges on Federal Highway*.
2. Determine applicability of regulation dependent on renovation, demolition, or condemnation and type of asbestos (RACM) being removed.
3. Follow EPA notification requirements for abatement projects to include notification 10 days prior.
4. Removal of RACM required before any activity with possibility of disturbing the asbestos, with exceptions.
5. Follow the extensive air emission requirements for asbestos removal.
6. Discharge no visible emissions to the outside air during activity or follow treatment methods of wetting, processing to nonfriable forms, or other approved method.
7. All asbestos waste material required to be deposited as soon as possible at a EPA approved material processor or a landfill operated according to regulations.
8. Mark asbestos material transportation vehicles.
9. Off-Site transportation requires use of a records and reporting system, waste characterization, and waste certification.
10. Disposal site must discharge no visible emissions, provide six inches of nonasbestos cover within 24 hours of disposal, covered with a resinous binding material, or use alternative EPA approved methods.
11. Deter public access to disposal area by natural barriers or fencing with signs.
12. Follow manifest system for transported waste.

(continued)

Regulation: 40 CFR 61 Hazardous Emissions
Subpart M National Emission Standard for Asbestos

Reg. Authority: EPA Region X

Applicability:

Summary:

Requirements:

13. Maintain until closure records detailing disposal site and material disposed.
14. Upon closure, disposal site must discharge no visible emissions, provide six inches of compacted nonasbestos cover (desert areas require additional three inches of rock) with proper grading and vegetation, cover with two feet of compacted nonasbestos material, or use alternative EPA approved methods; maintain public deterrent.
15. After closure, notify EPA 45 days before to disturbance of asbestos disposal site.
16. Publicly record location of disposal site with 60 days of closure.
17. Furnish all records to EPA upon closure.

INEL Waste Management Operations Roadmap Document	<p style="text-align: center;">Title: Key Regulatory Requirements</p> <p>Section: Appendix B. Issue date: 04-30-92</p>
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Regulation: 40 CFR 257 Criteria for Classification of Solid Waste Disposal Facilities and Practices (includes regulation as dated September 23, 1981 and proposed regulation as of August 30, 1988)

Reg authority: EPA Region X and State of Idaho

Applicability: Apply to all solid waste disposal facilities and practices, with exceptions.

Summary: Criteria given to determine if solid waste disposal facility not governed by other regulations requires regulatory control to protect public health and the environment.

Requirements: (proposed rules in bold)

1. Solid waste disposal facilities or practices which violate the criteria pose a reasonable probability of adverse effects on health or the environment. Criteria govern floodplains, endangered species, surface water, ground water, land application, disease, air, and safety.
2. **The owner or operator of a construction\demolition or industrial solid waste disposal facility must submit notification and exposure information to EPA.**
3. **Applicable criteria if facility manages RCRA solid waste that is not regulated as hazardous under Subtitle C of RCRA, and industrial or construction\demolition waste, and disposed of in a landfill, surface impoundment, land application unit or waste pile.**

Regulation: 40 CFR 258 Criteria for Municipal Solid Waste Landfills
(Proposed ruling as of August 30, 1988)

Reg authority: EPA Region X and State of Idaho

Applicability: Owners and operators of new and existing municipal solid waste landfills, with exceptions.

Summary: Establish minimum criteria under RCRA for municipal solid waste landfills and under CWA for municipal solid waste landfills that are used to dispose of sludge.

Requirements:

1. Follow location restrictions for landfill to include airport safety, floodplains, wetlands, fault areas, seismic impact zones, and unstable areas.
2. Implement a program for detecting and preventing the disposal of regulated hazardous waste (RCRA part 261) and PCB's (TSCA part 761) to include random inspections of incoming loads, inspection of suspicious loads, records of inspections, personnel training, and notification procedures.
3. Cover disposed waste with suitable materials at the end of each operating day.
4. Prevent or control on-site populations of disease vectors.
5. Prevent, control, and monitor on-site production of explosive gases to include routine methane monitoring and corrective action & remediation procedures and monitoring.
6. Present no violation of any SIP (CAA) requirement and no open burning.
7. Control public access, prevent unauthorized vehicular traffic, and prevent illegal dumping using both artificial and natural barriers.
8. Design, construct, and maintain run-on control system and run-off control system.
9. Do not violate CWA with any discharge of pollutants and do not discharge any pollutants as a non-point source in violation of applicable State-wide water quality management plan.
10. Do not dispose of bulk or noncontainerized liquid waste, with exceptions; and do not dispose of containers holding liquid wastes, with exceptions.

(continued)

Regulation: 40 CFR 258 Criteria for Municipal Solid Waste Landfills
(Proposed ruling as of August 30, 1988)

Reg. Authority: EPA Region X and State of Idaho

Applicability: Owners and operators of new and existing municipal solid waste landfills, with exceptions.

Summary: Establish minimum criteria under RCRA for municipal solid waste landfills and under CWA for municipal solid waste landfills that are used to dispose of sludge.

Requirements:

11. Follow all recordkeeping requirements.
12. Prepare and follow a written closure plan to describe procedures closing all landfill units; and follow all applicable closure requirements.
13. Prepare and follow post-closure plans involving two phases of post-closure to include 30 years of active maintenance, monitoring, and remediation and after the 30 years, to include a period of time (determined by State) of monitoring; and follow all applicable post-closure requirements.
14. Design new landfill units with liners, leachate collection systems, and final cover systems according to State derived design criteria.
15. Before disposing waste, a groundwater monitoring plan and system are required according to State derived specifications.
16. Follow groundwater sampling and analysis to include Phase I and Phase II monitoring programs according to State derived specifications.
17. Follow state requirements for "significant level detection" monitoring and the associated State corrective measure study.
18. Establish and implement a corrective action groundwater monitoring program, implement the State approved corrective action remedy, notify affected public, take interim measures, and follow State guidance for the corrective action remedy.

Regulation: 49 CFR 171 HMTA, Subpart C--Hazardous Materials Regulations; General Information, Regulations, and Definitions

Reg. Authority: DOT

Applicability: Transporters or offerors of hazardous waste for transport.

Summary: Subpart yields general requirements, definitions, and references; and further defines applicability.

Requirements:

1. Use required hazardous waste manifest system.
2. Emergency cleanup of hazardous waste release given authority by State, local, and/or Federal agencies.
3. Utilize hazardous materials incident reports and follow required notification of incidents.

INEL Waste Management Operations Roadmap Document	Title: Key Regulatory Requirements Section: Appendix B. Issue date: 04-30-92
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Regulation: 49 CFR 172 HMTA, Hazardous Materials Tables, Hazardous Materials Communications Requirements and Emergency Response Information Requirements

Reg. Authority: Department of Transportation

Applicability: Offeror of hazardous waste for transportation, carrier of hazardous waste, and performer of packaging/labeling.

Summary: Part of HWTA details waste specific requirements for manifesting, labeling, and transporting.

Requirements:

1. Follow proper utilization of shipping papers; describe waste accordingly.
2. Shipper required to certify waste.
3. Shipper required to utilize hazardous waste manifest system.
4. Shipper required to properly mark waste for transport; specific requirements for radioactive, liquid hazardous, and hazardous substances.
5. Shipper required to properly label waste for transport; specific requirements for radioactive waste.
6. Shipper and transporter required to properly placard transport vehicle.
7. Shipper and transporter required to supply outlined emergency response information and provide a emergency response phone number.

Regulation: 49 CFR 173 HMTA, Shippers General Requirements for Shipments and Packagings
Subpart A. General Requirements
Subpart B Preparation of Hazardous Materials for Transport

Reg. Authority: Department of Transportation

Applicability: Shippers of hazardous wastes and substances.

Summary: Defines hazardous materials; includes requirements outlining the preparation of materials for shipping and container construction, maintenance and testing requirements. Sets forth requirements for transporting radioactive material.

Requirements:

1. Follow general classification requirements for transporting of hazardous waste, to include use of a priority system for multiple constituent hazardous waste.
2. Follow general packaging requirements for transporting of hazardous waste.
3. Shipments of radioactive materials by DOE escorted by authorized personnel for the purposes of national security are not subject to HMTA.
4. DOE approved packages meeting 10 CFR 71 specifications may be used for the transportation of radioactive materials.
5. Differing waste material are excepted from the packaging requirements of HMTA if packaged in combination packages according to HMTA specifications and only transported by highway.
6. Follow general requirements for the preparation of hazardous materials for transportation, to include forbidden materials and packages, shipper requirements, use of exempt packaging, standard packaging requirements, previously authorized packaging, authorized packages and overpacks, quantity limitations, reuse of packagings, empty packagings, loading and unloading of transport vehicles, and the qualification, maintenance, and use of cylinders.
7. Follow general and specific requirements governing the qualification, maintenance, and use of tank cars and qualification, maintenance; use of portable tanks, approval of portable tanks; and cargo tank vehicles.
8. Prior to shipment of certain radioactive materials, notification to the consignee of the date of delivery and special handling instructions; also for spent fuel, specified protection requirements are required.

(continued)

Regulation: 49 CFR 173 HMTA, Shippers General Requirements for Shipments and Packagings
Subpart C Explosives and Blasting Agents; Defn.'s and Prep.
Subpart D through Subpart H 59 Specific Hazardous Materials Req.
Subpart J Other Regulated Materials

Reg. Authority: Department of Transportation

Applicability: Shippers of hazardous wastes and substances.

Summary: Defines hazardous materials; includes requirements outlining the preparation of materials for shipping and container construction, maintenance and testing requirements.

Requirements:

9. Follow all requirements governing the transportation of explosives and blasting agents, to include preparation, specific definitions, specific classifications, and specific requirements.
10. Follow all requirements governing the transportation of specific hazardous materials, to include flammable, combustible, and pyrophoric solids; flammable, solids, oxidizers, and organic peroxides; corrosive materials; gases; and poisonous materials, irritating materials, and etiologic agents.
11. Follow all requirements governing the transportation of specific hazardous materials listed as "other regulated materials (ORM's)", to include specific compounds, chemicals, metals, and ammunition classified as ORM-A, ORM-B, ORM-B, and ORM-D.

Requirements of the above listing include packaging, handling, and notification specifications.

(continued)

Regulation: 49 CFR 173 HMTA, Shippers General Requirements for Shipments and Packagings
Subpart I Radioactive Materials

Reg. Authority: Department of Transportation

Applicability: Shippers of hazardous wastes and substances.

Summary: Specifically define regulated radioactive material; includes requirements outlining the preparation of materials for shipping and container construction, maintenance & testing requirements.

Requirements: Requirements are in addition to 10 CFR 71.

12. Follow general design requirements for packaging of radioactive materials including additional requirements for Type A and Type B material packages; authorized packaging of fissile material; authorized packaging of pyrophoric radioactive materials; authorized packaging of oxidizing radioactive materials; and uranium hexafluoride.
13. Exemptions from requirements if limited quantities of radioactive material (activity per package) meet specifications, to include rad levels, package strength, marking, certification, multiple characteristic requirements, and mode of transport.
14. Follow transportation requirements for low specific activity radioactive materials, to include rad levels, packaging specifications, and bulk shipment specifications; and with exceptions for LSA waste transported for disposal and/or recovery meeting 20 CFR 20.306.
15. Exemption specifications for certification, marking, and labeling requirements for empty radioactive materials packaging.
16. Follow activity limits (see Table 173.435 in regulation) and determination values of Type A values for radionuclides.
17. Radiation activity limitations: Each package required to be designed and prepared for shipment so under normal conditions the rad levels do not exceed 200 mrem/hr and the transportation index does not exceed 10, with exceptions.
18. The level of removal (non-fixed) radioactive contamination required to be as low as possible.
19. Follow applicable labeling and placarding requirements as specified in 49 CFR 172.

(continued)

Regulation: 49 CFR 173 HMTA, Shippers General Requirements for Shipments and Packagings
Subpart I Radioactive Materials

Reg. Authority: Department of Transportation

Applicability: Shippers of hazardous wastes and substances.

Summary: Specifically define regulated radioactive material; includes requirements outlining the preparation of materials for shipping and container construction, maintenance & testing requirements.

Requirements:

20. Shipments required to be secured to prevent shifting during normal transportation.
21. Follow general transportation requirements, to include carrying specifications and mixing of differing material specifications.
22. Follow general requirements for transportation of fissile material.
23. All specified packages are required to meet testing specifications, including water-spray testing, free-drop testing, penetration testing, and compression testing.
24. Special form radioactive material required to meet specific testing requirements, including impact test, percussion test, bending test, and heat test.
25. Follow required DOT regulations governing NRC approved packages, to include registration, labeling, and authority Certifications.
26. Follow all applicable quality control requirements for construction of packaging and prior to each shipment of radioactive materials.

Regulation: 40 CFR 265 Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities.
Subpart B General Facility Standards
Subpart C Preparedness and Prevention
Subpart D Contingency Plan and Emergency Procedures

Reg. Authority: EPA Region X

Applicability: Standards apply to owners and operators of all facilities that treat, store, or dispose of hazardous waste during the period of interim permitting status.

Summary:

Requirements:

1. Perform chemical and physical waste analysis according to a waste analysis plan.
2. Perform required inspections of facility according to a written inspection schedule.
3. Provide proper training of personnel to perform work duties and to respond to emergencies. Provide job descriptions and training records.
4. The placement of any hazardous substance in a salt dome, salt bed formation, underground mine or cave is prohibited, except for WIPP.
5. Provide proper facility maintenance and safety systems.
6. Provide proper aisle space unless not required.
7. Notify and communicate with local authorities and emergency personnel of hazardous waste operations.
8. Provide access to communications and alarms.
9. Provide proper equipment and perform required equipment testing and maintenance.
10. Prepare and distribute emergency contingency plan, designate emergency coordinator, and establish emergency procedures.

Regulation: 40 CFR 265 Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities.
Subpart E Manifest System, Recordkeeping, and Reporting
Subpart F Groundwater Monitoring
Subpart G Closure and Post-Closure

Reg. Authority: EPA Region X

Applicability: Standards apply to owners and operators of all facilities that treat, store, or dispose of hazardous waste during the period of interim permitting status.

Summary:

Requirements:

1. Use waste manifest system for receipt of any off-Site shipments, maintain operating records, and submit biennial report, unmanifested waste reports, and other release-type reports. (Includes facility closure reports)
2. Surface impoundments, landfills, or a land treatment facility must implement a groundwater monitoring program and follow a sampling and analysis plan.
3. Prepare a groundwater quality assessment program and report and perform any required corrective actions; maintain appropriate records.
4. Disposal sites required to prepare and update a written closure plan to include waste inventory, removal requirements, closure schedule, year of closure, and any other activities required for closure.
5. Follow time requirements for notification and performance of partial and final closure of waste disposal facilities.
6. Perform closure monitoring, maintenance, and inspection requirements for 30 years.
7. Disposal sites required to prepare and update written post-closure plan to include description of post-closure activities--monitoring and maintenance; provide post-closure notices to EPA.

Regulation: 40 CFR 265 Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities. Subpart I Use and Management of Containers

Reg. Authority: EPA Region X

Applicability: Standards apply to owners and operators of all facilities that treat, store, or dispose of hazardous waste during the period of interim permitting status.

Summary: Owners and operators of all hazardous waste facilities that store containers of hazardous waste.

Requirements:

1. Transfer contents of waste container if container is not in good condition or leaks.
2. Container must be compatible with waste.
3. Container in storage required to be closed.
4. Handling of container required to be nondestructive.
5. Weekly inspections of containers required.
6. Proper and adequate incompatible waste segregation, waste segregation designs, and waste segregation procedures are required.

Regulation: 40 CFR 265 Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities. Subpart J Tank Systems

Reg. Authority: EPA Region X

Applicability: Owners or operators of facilities that use tank systems for storing or treating hazardous waste, with exceptions.

Summary:

Requirements:

1. Assessment of existing tank system integrity required.
2. Proper design and installation of new tank systems or components.
3. Proper secondary containment of existing tanks or tank systems (according to a time scale) and new tanks or tank systems.
4. General operating requirements to include tank and waste compatibility, appropriate spill control, maintenance of freeboard, and corrective actions for a leak or spill are required.
5. Follow and document daily tank and tank system inspections.
6. Proper response to leaks or spills and corrective actions for disposition of leaking or removal of unfit-for-use tank systems.
7. Follow required closure and post-closure care of tank systems.
8. Follow special requirements for storage of ignitable, reactive, or compatible wastes.

Regulation: 40 CFR 265 Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities. Subpart K Surface Impoundments

Reg. Authority: EPA Region X

Applicability: Facilities that use surface impoundments to treat, store, or dispose of hazardous waste, with exceptions.

Summary:

Requirements:

1. Surface impoundment must be doubly lined with a leachate collection system.
2. Follow proper freeboard requirements.
3. All earthen dikes must have a protective cover to prevent erosion.
4. Perform required waste analysis and trial tests on liner system.
5. Perform required inspections daily and weekly.
6. Provide for required closure and post closure care.
7. Follow special requirements for ignitable, reactive, or incompatible wastes stored in surface impoundments.

Regulation: 40 CFR 265 Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities. Subpart L Waste Piles

Reg. Authority: EPA Region X

Applicability: Facilities that treat or store hazardous waste in piles, with exceptions (or manage piles as landfills).

Summary:

Requirements:

1. Follow required design criteria to include wind protection and containment of waste leachate or run-off.
2. Perform waste analysis (according to waste analysis plan) of waste to determine compatibility with storage in a waste pile.
3. Provide for required closure and post-closure care, as specified in the closure and post-closure plans.
4. Follow design, construction, and operation requirements.
5. Obtain the necessary NPDES permit if surface waste is discharging through a point source.

Regulation: 40 CFR 265 Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities. Subpart M Land Treatment

Reg. Authority: EPA Region X

Applicability: Owners and operators of land treatment facilities, with exceptions.

Summary:

Requirements:

1. Design, construct, and operate a run-on control system and run-off control system.
2. Manage the treatment unit to control wind dispersion.
3. Perform waste analysis according to waste analysis plan; provide detailed information required.
4. Provide for required closure and post-closure care.
5. Follow requirements for specific wastes.

Regulation: 40 CFR 265 Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities.
Subpart N Landfills

Reg. Authority: EPA Region X

Applicability: Facilities that dispose of hazardous waste in landfills, with exceptions.

Summary:

Requirements:

1. Follow design and construction requirements to include liner requirements, leachate collection requirements, run-on and run-off control systems, and wind dispersion control.
2. Perform waste analysis (according to waste analysis plan) of waste.
3. Maintain a documentation system on locations and waste types of landfill cells.
4. Follow requirements for specific waste types, to include special requirements for ignitable waste, reactive waste, incompatible wastes, bulk and containerized liquids, container wastes, and lab packs.
5. Provide for required closure and post-closure care.
6. No disposal of free liquids, with exceptions.
7. Follow land disposal restrictions; **BEST MANAGEMENT PRACTICE:** maintain records on waste allowed to be disposed.

Regulation: 40 CFR 265 Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities. Subpart O Incinerators

Reg. Authority: EPA Region X

Applicability: Facilities that incinerate hazardous waste, with exceptions and specifications.

Summary:

Requirements:

1. Perform waste analysis according to waste analysis plan.
2. Follow specified design, control, monitoring, inspections, and operation requirements.
3. Remove all hazardous waste and hazardous waste residues.
4. Provide for required closure and post-closure care, as specified in the closure and post-closure plans.
5. Follow Clean Air Act requirements, including any required permitting.
6. Exemption for requirements for listed or characteristic ignitable and/or corrosive and reactive wastes.

Regulation: 40 CFR 265 Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities. Subpart P Thermal Treatment Units

Reg. Authority: EPA Region X

Applicability: Facilities that thermally treat hazardous waste, other than enclosed devices using controlled air combustion: with exceptions and specifications.

Summary:

Requirements:

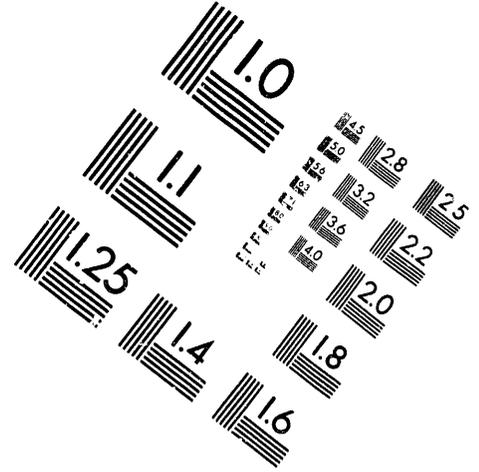
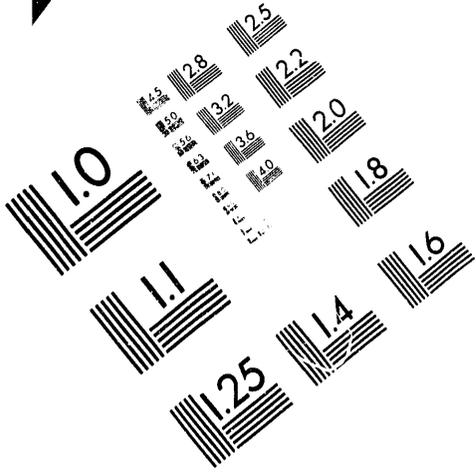
1. Perform waste analysis according to waste analysis plan.
2. Follow specified design, control, and operation requirements.
3. Follow monitoring and inspection requirements.
4. Provide for required closure and post-closure care, as specified in the closure and post-closure plans.
5. Follow specific requirements for the open air destruction of explosive materials.
6. Remove all hazardous waste and hazardous waste residues.



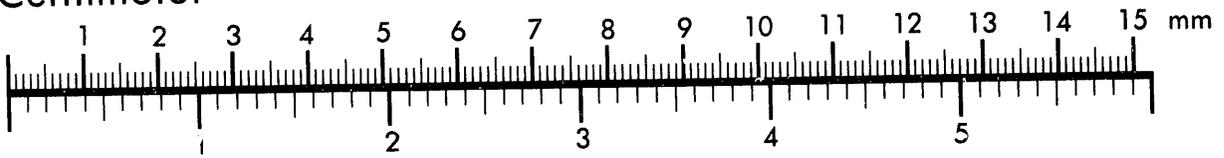
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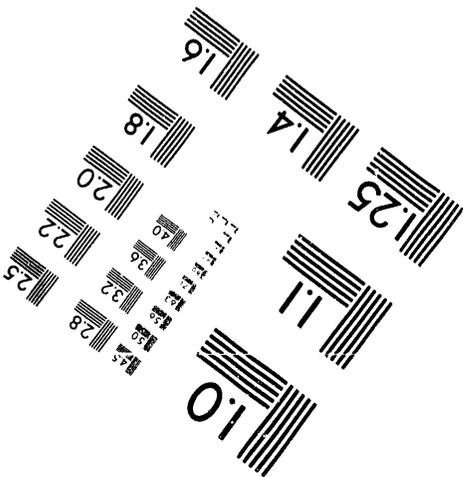
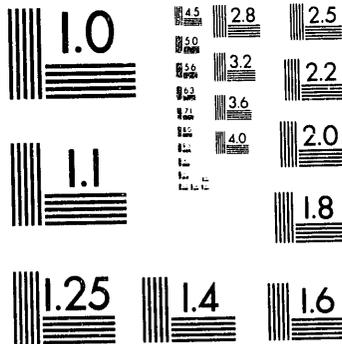
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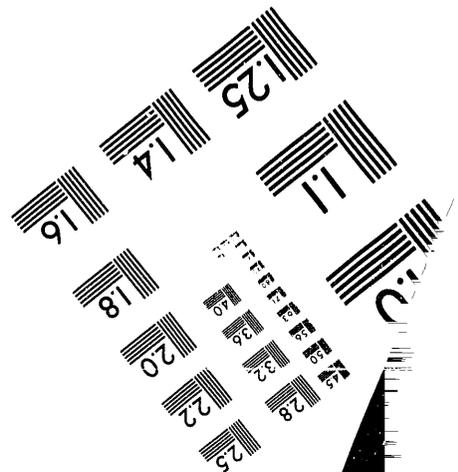
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Regulation: 40 CFR 265 Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities. Subpart Q Chemical, Physical, and Biological Treatment

Reg. Authority: EPA Region X

Applicability: Facilities that treat hazardous waste by chemical, physical, or biological methods with exceptions and specifications.

Summary:

Requirements:

1. Perform waste analysis according to waste analysis plan.
2. Follow specified design, control, and operation requirements. There are specific bans on the treatment of hazardous waste that is harmful to treatment equipment.
3. Follow monitoring and inspection requirements.
4. Remove all hazardous waste and hazardous waste residues.
5. Provide for required closure and post-closure care, as specified in the closure and post-closure plans.
6. Follow restrictions and requirements for specific wastes.

Regulation: 40 CFR 265 Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities.
Subpart AA Air Emission Standards for Process Vents

Reg. Authority: EPA Region X

Applicability: Facilities that treat, store, or dispose of hazardous waste with vents associated with distillation, fractionation, thin film evaporation, solvent extraction, or air or stream stripping operations.

Summary:

Requirements:

1. Reduce organic emissions to given standards.
2. Follow requirements for closed-vent systems and control devices.
3. Perform waste analysis according to waste analysis plan.
4. Follow specified design, control, and operation requirements. There are specific bans on the treatment of hazardous waste that is harmful to treatment equipment.
5. Follow monitoring and inspection requirements.
6. Remove all hazardous waste and hazardous waste residues.
7. Provide for required closure and post-closure care, as specified in the closure and post-closure plans.
8. Follow restrictions and requirements for specific wastes.

Regulation: 40 CFR 265 Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities.
Subpart BB Air Emission Standards for Equipment Leaks

Reg. Authority: EPA Region X

Applicability: Facilities that treat, store, or dispose of hazardous waste with vents associated with distillation, fractionation, thin film evaporation, solvent extraction, or air or stream stripping operations.

Summary:

Requirements:

1. Reduce organic emissions to given standards.
2. Follow requirements and standards for equipment; including pumps, compressors, pressure relief devices, sampling connecting systems, valves, and alternative equipment.

Regulation: 40 CFR 265 Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities.
Subpart BB Air Emission Standards for Equipment Leaks

Reg. Authority: EPA Region X

Applicability: Facilities that treat, store, or dispose of hazardous waste.

Summary:

Requirements:

1. Reduce organic emissions to given standards.
2. Follow requirements and standards for equipment; including pumps, compressors, pressure relief devices, sampling connecting systems, valves, and alternative equipment.

Regulation: 40 CFR 268 Land Disposal Restrictions (through subpart D)

Reg. Authority: EPA

Applicability: Hazardous waste generators, transporters, and TSD facilities, with exceptions and exemptions.

Summary: Regulation identifies hazardous wastes restricted from land disposal and defines limited circumstances under which an otherwise prohibited waste may continue to be land disposed.

Requirements:

1. Restricted wastes may continued to land disposed with extensions, exemptions, or specific exceptions.
2. Generators must perform waste analysis (according to Appendix II, 40 CFR 261--"Chemical Analysis Test Methods") or process knowledge to determine if restrictions apply.
3. Follow all reporting requirements and notification requirements.
4. Special rules allowing disposal of *characteristic* wastes meeting treatment standards in subtitle D facility.
5. Regulation contains specific (First Third, Second Third, and Third wastes, dioxin-containing wastes, and California listed wastes) land disposal restricted *listed* hazardous wastes.
6. Possible land disposal of several *listed* and *characteristic* wastes if an extract or treatment extract passes TCLP.
7. Possible land disposal of several *listed* and *characteristic* wastes using a corresponding specified treatment technology or equivalent.
8. Possible land disposal of *listed* and *characteristic* wastes if constituent concentrations do not exceed specified values.
9. Effective May 8, 1992 several *listed mixed* wastes are prohibited from land disposal.
10. Between May 8, 1990 and May 8, 1992 several *listed* wastes (including several *listed mixed* wastes) may be land disposed if the disposal facility is regulatory compliant.
11. A variance or site-specific variance from a treatment standard for *listed* and *characteristic* wastes which cannot be treated to the specified level or which the treatment technology is not appropriate to the waste.

Regulation: 40 CFR 268 Land Disposal Restrictions (subpart E)

Reg. Authority: EPA

Applicability: Hazardous waste generators, transporters, and TSD facilities, with exceptions and exemptions.

Summary: Describes storage of hazardous wastes restricted from land disposal prohibition requirements and defines limited circumstances under which an otherwise prohibited waste may continue to be stored.

Requirements:

1. Storage of land disposal restricted wastes (*listed* and *characteristic*) is prohibited with exceptions.
2. Exception for generators storing waste in tanks or containers on-Site solely for accumulation of such quantities to facilitate proper recovery, treatment, or disposal.
3. Storage of any hazardous waste for longer than 90 days by a generator requires a RCRA storage facility permit.
4. Exception for TSD's storing waste in tanks or containers for accumulation of such quantities to facilitate proper recovery, treatment, or disposal.
5. Exception for transporters storing manifested shipments at transfer facility for 10 or less days.
6. TSD's may store hazardous wastes beyond one year for accumulation of such quantities to facilitate proper recovery, treatment, or disposal.
7. Storage of land disposal restricted waste is not prohibited if the waste meets the corresponding treatment standard or if the treatment standards have not been specified, the waste is in compliance with the regulatory prohibitions.
8. Liquid hazardous wastes >50 ppm PCBs must be stored at a regulatory compliant facility and can only be stored for one year.

Regulation: 40 CFR 761 Toxic Substances Control Act; PCBs Manufacturing, Processing, Distribution in Commerce and Use Prohibitions.
Subpart B Manufacturing, Processing, Distribution in Commerce, and Use of PCBs and PCB Items.
Subpart C Marking of PCBs and PCB Items.

Reg. Authority: EPA Region X

Applicability: Treatment, storage, and disposal facilities and transporters dealing with PCBs.

Summary: Establish prohibitions and requirements for the manufacturing, processing, distribution, and marking of PCBs and PCB items. PCBs in excess of 50 ppm are fully regulated.

Requirements:

1. Restrictions on PCB waste oil burning and marketing for burning.
2. Waste certification and notification requirements for regulated PCB marketers and burners.
3. Authorized use of PCBs and regulations for transformers, heat transfer systems, and other PCB items. Includes servicing requirements and reporting requirements.
4. Marking requirements and specifications for transformers, equipment, capacitors, heat transfer systems, other PCB items, and each storage area used to store PCBs or PCB items.

(continued)

Regulation: 40 CFR 761 Toxic Substances Control Act; PCBs Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions.
Subpart D Storage and Disposal

Reg. Authority: EPA Region X

Applicability: Treatment, storage, and disposal facilities and transporters dealing with PCBs.

Summary: Establish the requirements for the disposal and storage of PCBs and PCB items. PCBs in excess of 50 ppm are fully regulated.

Requirements:

5. PCBs > 50 ppm are required to be disposed of in a compliant incinerator, with exceptions; exceptions include disposal of differing concentrations in a boiler, landfill, or other approved methodology.
6. Storage requirements for PCBs and PCB items waiting disposal > 50 ppm to include structural requirements of facility and closure plan.
7. Storage and disposal requirements for PCB articles, PCB containers, and spills.
8. Operating standards and requirements for incinerators to include EPA approval, operating limits, and possibility of a trial burn.
9. Operating standards and requirements for chemical waste landfills to include EPA approval requirements, structural requirements, and technical requirements (soil, liners, hydrologic conditions, flood protection, topography, and monitoring systems).
10. Requirements for monitoring systems to include preoperational, operational, and postoperational monitoring of surface and ground water.
11. Requirements for leachate collection systems to include collection and monitoring.
12. Preparation of a landfill Operation Plan.
13. Waste segregation and certification requirements.
14. Pretreatment/stabilization of liquid PCBs; packaging of PCB containers with absorbent material.
15. Possible waiver from requirements.
16. Decontamination requirements of PCB containers.

(continued)

Regulation: 40 CFR 761 Toxic Substances Control Act; PCBs Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions.
Subpart G PCB Spill and Cleanup Policy
Subpart J General Records and Reports
Subpart K PCB Waste Disposal Records and Reports

Reg. Authority: EPA Region X

Applicability: Treatment, storage, and disposal facilities and transporters dealing with PCBs.

Summary: Establish requirements for the cleanup of PCB spills. PCBs in excess of 50 ppm are fully regulated.

Requirements:

17. Requirements detailing and describing spill classifications to determine spill cleanup levels.
18. Spill notification requirements, cleanup standards and requirements, and post-cleanup sampling requirements.
19. Follow reporting and recordkeeping requirements for PCBs and PCB items to include incinerator stack monitoring data, annual EPA report, annual records (manifest records), landfill monitoring, sampling, and operation records, boiler burn records, and other special records (permits).
20. Assignment of an EPA identification number.
21. EPA notification requirements of PCB activities.
22. Use of established EPA manifest system for transportation of PCBs to include certificate of disposal.

INEL Waste Management Operations Roadmap Document	<p>Title: Key Regulatory Requirements</p> <p>Section: Appendix B. Issue date: 04-30-92</p>
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Regulation: 40 CFR 763 Subpart E--Asbestos Abatement Projects; Worker Protection

Reg. Authority: EPA Region X

Applicability: Applies solely to activities involved with asbestos abatement projects; and to State and local government employees performing the abatement activity.

Summary: Requirements for asbestos abatement projects. Provides additional requirements to NESHAPS (CAA), HWTA (DOT), and OSHA regulations for State and local government employees of State and local employees.

Requirements: Only recommendations!

1. Notify EPA with in 10 days of starting the abatement project for projects with over three linear feet or three square feet of friable material.
2. Report emergency abatements as soon as possible but with in 40 hours after the abatement begins.
3. Transportation requires asbestos waste be containerized in leak-tight containers with no visible emissions and wetted.
4. Follow proper manifest system (recordkeeping) for transportation and disposal.
5. Handle waste to avoid release of fibers both during transportation and disposal.
6. Accepted disposal is landfilling with at least six inches of nonasbestos material.
7. Dispose of asbestos in a separate area, in individual trenches (aligned perpendicular to prevailing winds), and record placement in area.
8. Upon closure of asbestos landfill, addition of 30 inches nonasbestos material cover; properly grade and vegetate or rock-over disposal area.
9. Control of public access to disposal area includes signs and fencing.

**DATE
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9/20/93

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