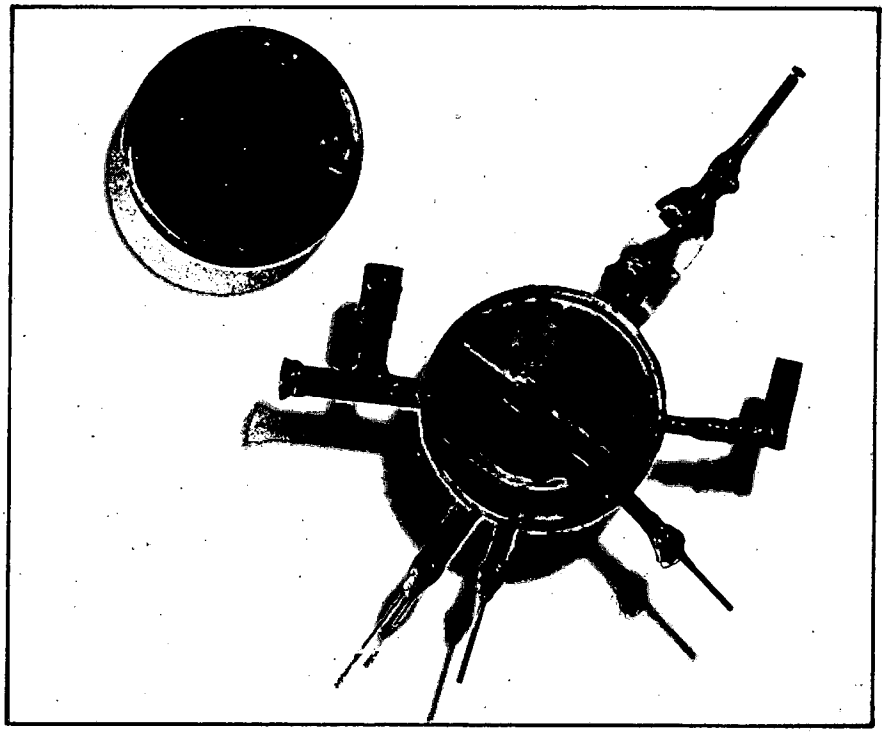
PUB-5356

Lawrence Berkeley Laboratory
UNIVERSITY OF CALIFORNIA

ENVIRONMENT, HEALTH AND SAFETY DIVISION

Hazardous Waste Certification Plan
Hazardous Waste Handling Facility

February 1992



Prepared for the U.S. Department of Energy under Contract Number DE-AC03-76SF00098

DISCLAIMER

PUB-5356

HAZARDOUS WASTE CERTIFICATION PLAN

HAZARDOUS WASTE HANDLING FACILITY LAWRENCE BERKELEY LABORATORY

February 1992

Prepared by

LAWRENCE BERKELEY LABORATORY

and

ENGINEERING-SCIENCE, INC.

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1.0

INTRODUCTION

1.1 PURPOSE

The purpose of this plan is to describe the organization and methodology for the certification of hazardous waste (HW) handled in the Lawrence Berkeley Laboratory (LBL) Hazardous Waste Handling Facility (HWHF). HW is defined in Appendix B. HW that is co-contaminated with radioactive waste is considered radioactive mixed waste and is addressed in the *Radioactive Mixed Waste Certification Plan* (LBL 1991b).

The plan also incorporates the applicable elements of waste reduction, which include both up-front minimization and end-product treatment to reduce the volume and toxicity of the waste; segregation of the waste as it applies to certification; an executive summary of the Quality Assurance Program Plan (QAPP) for the HWHF (Section 4); and a list of the current and planned implementing procedures used in waste certification (Appendix A).

The plan provides guidance from the HWHF to waste generators, waste handlers, and the Systems Group Manager to enable them to conduct their activities and carry out their responsibilities in a manner that complies with several requirements of the Federal Resource Conservation and Resource Recovery Act (RCRA), the Federal Department of Transportation (DOT), and the State of California, Code of Regulations (CCR), Title 22. Waste generators have the primary responsibility for the proper characterization of HW. The Systems Group Manager verifies and certifies that LBL HW is characterized, handled, and shipped in accordance with the requirements of the State CCR Title 13 regulations and other Federal RCRA and DOT regulations.

Certification is the governing process by which LBL personnel conduct their waste generating and waste handling activities in such a manner that the Systems Group Manager can verify that the applicable requirements are met.

1.2 SCOPE

This HW Certification Plan applies to that waste that is generated by LBL and becomes the responsibility of the HWHF. HW is defined in the Department of Energy (DOE) Order 5400.3 (DOE 1989). Definitions are provided in Appendix B for convenience. HW that also contains radioactive waste, called radioactive mixed waste (RMW), is addressed by the *Radioactive Mixed Waste Certification Plan* (LBL 1991b). The certification processes for transuranic (TRU) and low level waste streams are addressed by the *Transuranic Waste Certification Plan* (LBL 1991c) and the *Low Level Waste Certification Plan* (LBL 1991a), respectively.

1.3 FACILITY DESCRIPTION

1.3.1 Overall Facility

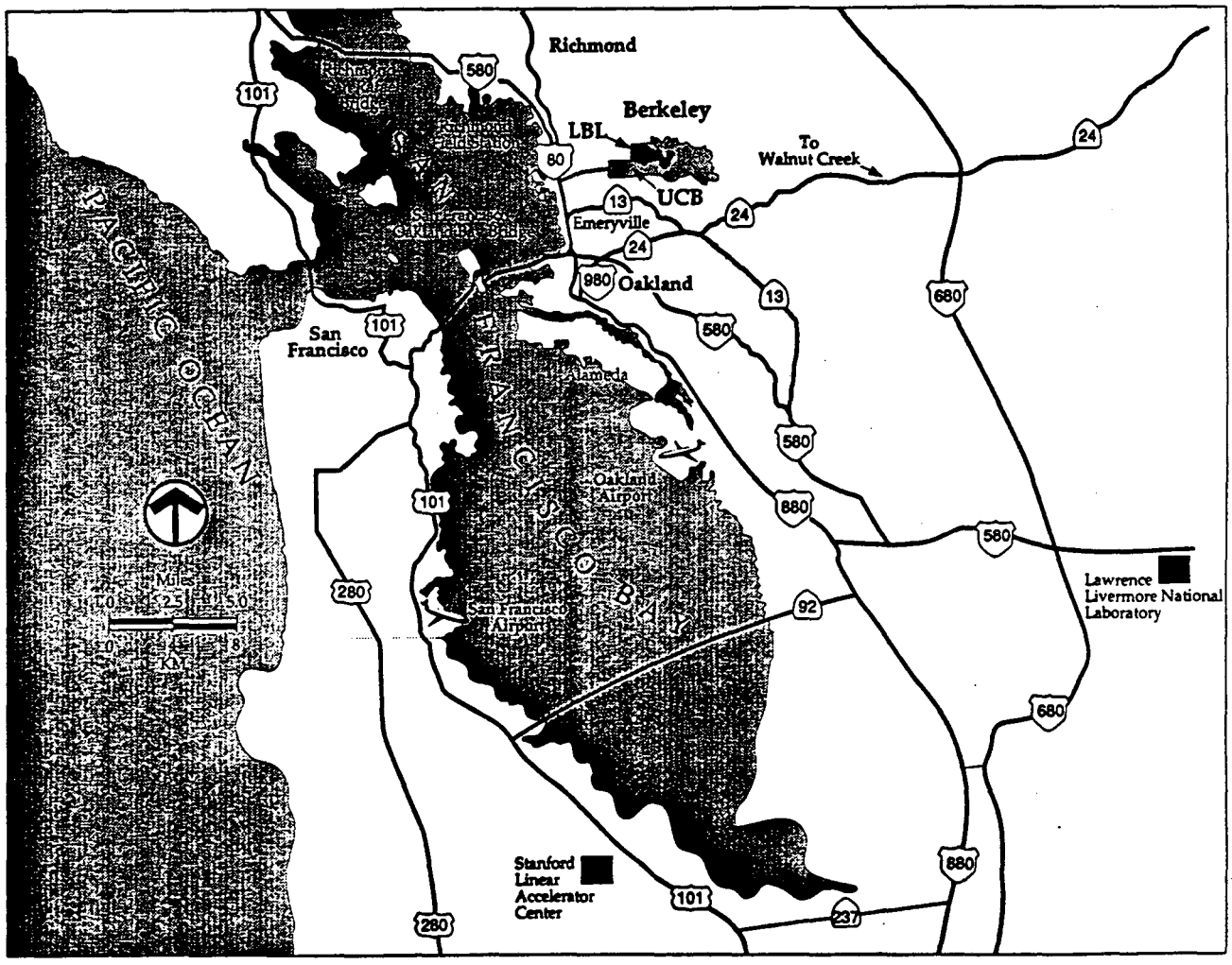
LBL is located in the Oakland-Berkeley hills, adjacent to the Berkeley campus of the University of California. Figure 1-1 is a map of the laboratory and surrounding area. LBL is a multipurpose national scientific laboratory whose mission is to conduct forefront scientific research in several areas related to energy sciences, general sciences, and life sciences.

These research activities result in the generation of radioactive and hazardous wastes, as well as RMW.

1.3.2 Hazardous Waste Handling Facility

Hazardous, radioactive, and RMW are stored, packaged, and prepared for offsite transport at the HWHF. The HWHF is a Resource Conservation and Recovery Act (RCRA) facility and consists of several indoor and outdoor handling and storage areas. Activities performed at the HWHF consist primarily of bulking, storage, and packaging of the waste for safe removal and transportation to an offsite treatment/storage/disposal

Figure 1-1 Location of LBL in Relation to its Surroundings



(T/S/D) facility. LBL has no waste disposal facilities. Figure 1-2 is the LBL site plan, showing the location of the HWHF. Figure 1-3 is a site plan of the HWHF, showing the location of the waste handling and storage areas.

HW is managed at LBL in accordance with applicable U.S. DOE, U.S. Environmental Protection Agency (EPA), and State of California laws and is packaged and transported to an approved treatment/disposal/storage facility in accordance with U.S. Department of Transportation (DOT) regulations.

A new HWHF is currently in the design phase and undergoing NEPA/CEQA review. The new facility will consolidate separate waste-handling operations into one modern facility with enhanced safety and waste-containment functions. A Part B Permit Application is being processed by the California Environmental Protection Agency (Cal-EPA) to cover operations at the new facility and to close the existing one.

1.4 FACILITY WASTE MANAGEMENT STRATEGY

The Environment, Health and Safety Division (EH&S) is responsible for the preparation of the Waste Management Plan (LBL 1991d), which governs treatment, storage, and shipment of HW. Individual generators are responsible for the characterization of wastes, including HW, in accordance with procedures established by the EH&S Division.

1.4.1 References

The LBL Waste Management Program meets the applicable guidance of the following:

- DOE Order 5400.3, *Hazardous and Radioactive Mixed Waste Program* (DOE 1989a)
- DOE Order 5820.2A, *Radioactive Waste Management* (DOE 1988)
- EPA Regulations, Title 40 CFR 261-264 (EPA 1991)
- DOT Regulations, Title 49 CFR 171-173 (DOT 1991)

Figure 1-2 LBL Site Map Showing Location of the HWHF

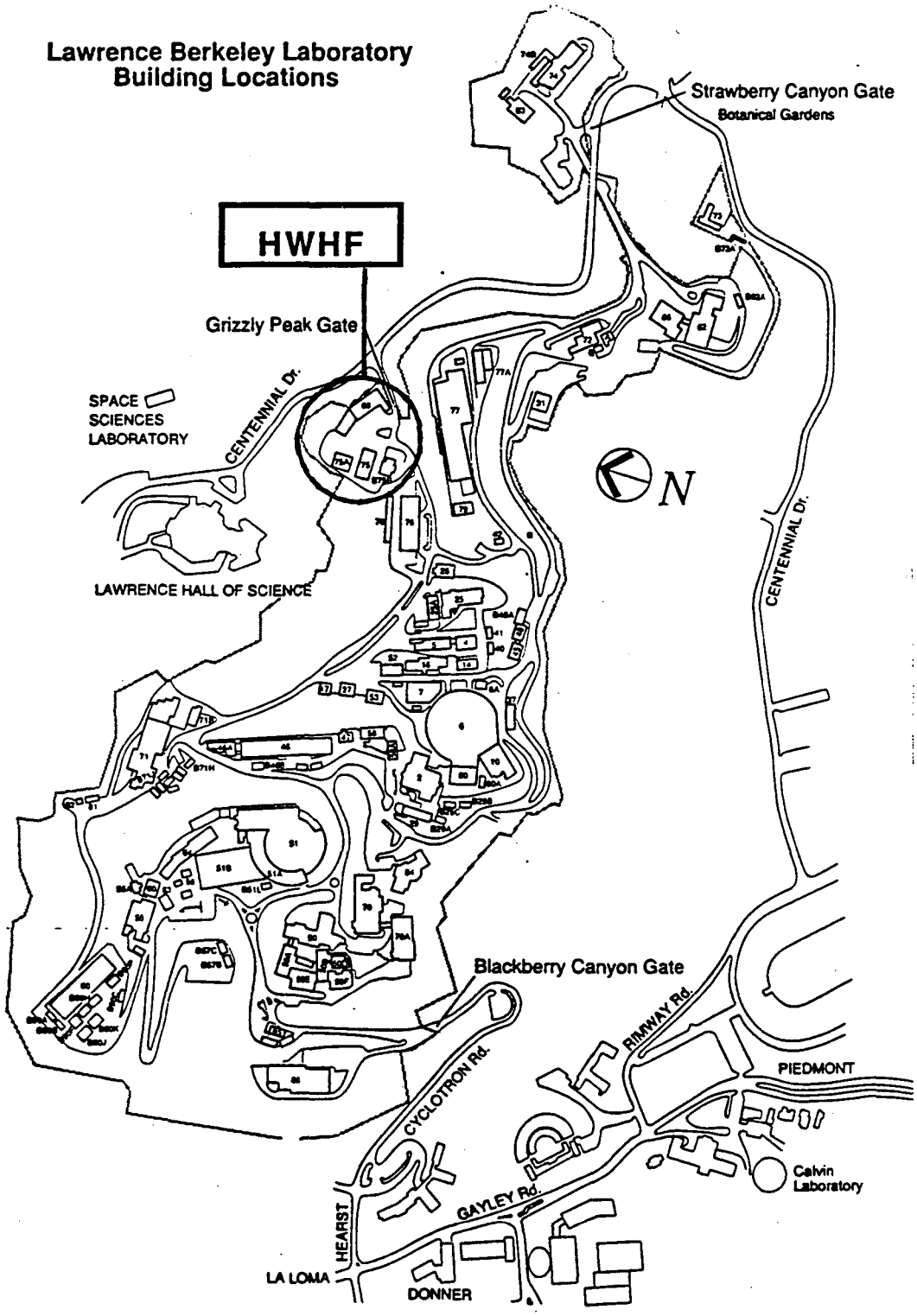
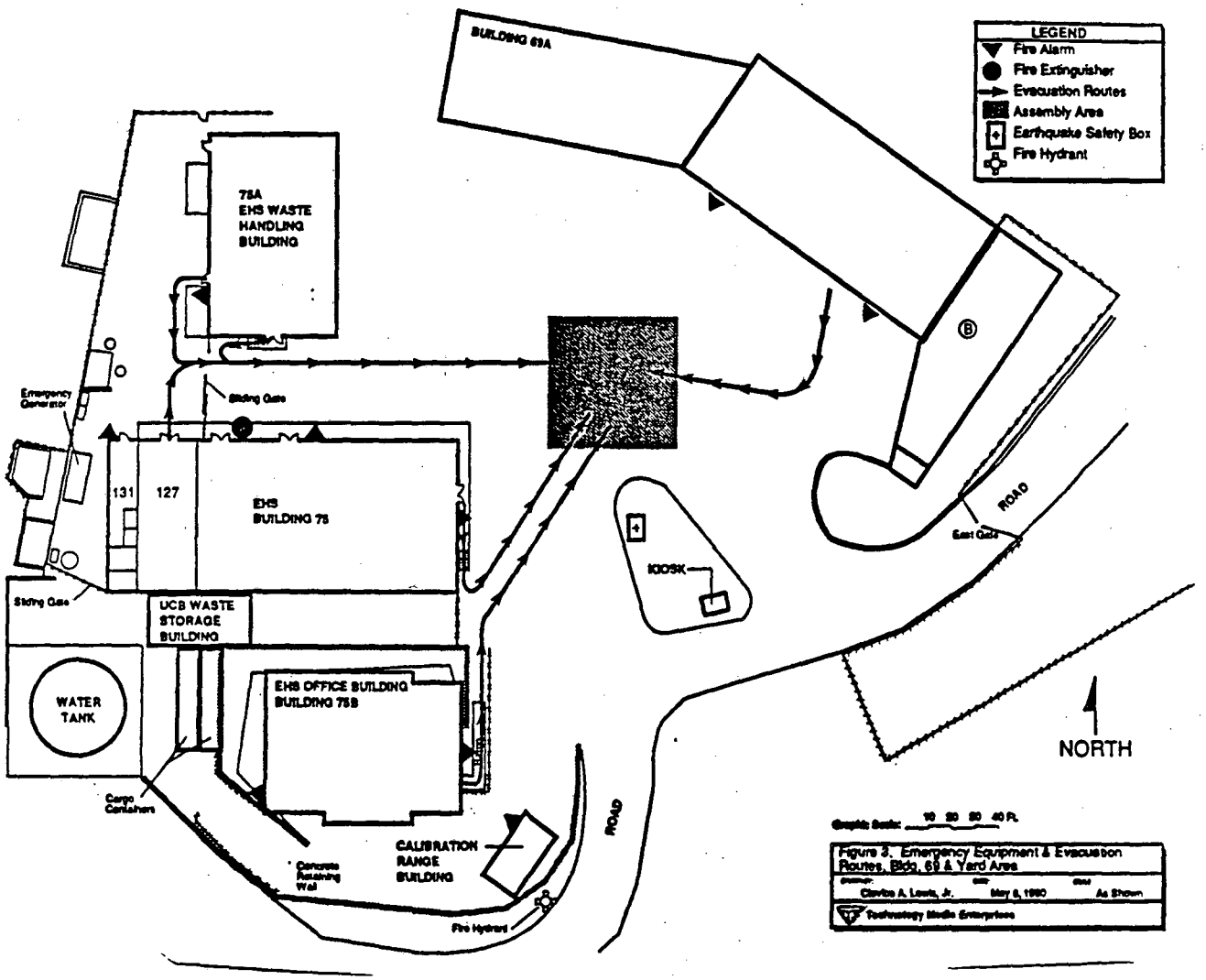


Figure 1-3 HWHF Site Plan



- Washington State, *Dangerous Waste Regulations*, Washington Administrative Code, Chapter 173-303 (Washington State 1989)

- State of California, Title 22, California Administrative Code, Chapter 30 (State of California 1991a)

- State of California, Senate Bill 14, *Hazardous Waste Source Reduction and Management Review Act*

- *Hanford Site Radioactive Solid Waste Acceptance Criteria* (WHC 1990), WHC-EP-0003-3

The Hazardous Waste Management Program (HWMP) at LBL is implemented through the following documents, in addition to this Waste Certification Plan:

- LBL Health and Safety Manual, PUB-3000 (LBL 1990a)

- HWHF Procedures (listed in Appendix A)

- Draft *Waste Management Plan* (LBL 1991d)

- Hazardous Waste Management Program, *General Policy Statement*, EH&S Policy 800

- *Guidelines for Generators of Radioactive and Mixed Waste at LBL and Guidelines for Generators of Hazardous Chemical Waste at LBL* (LBL 1991e)

- *Waste Minimization and Pollution Prevention Awareness Plan* (LBL 1991g)

- *Quality Assurance Program Plan for the Hazardous Waste Handling Facility (HWHF)* (LBL 1990b)

1.4.2 Summary of Waste Minimization, Segregation, Certification, Packaging, and Shipping Activities

1.4.2.1 Minimization

The *Waste Minimization and Pollution Prevention Awareness Plan* (LBL 1991g) provides the policy, strategy, objectives, and goals for waste minimization at LBL.

1.4.2.2 Segregation

Segregation activities include specific separation and storage instructions contained in the Guidelines for Generators (LBL 1991e) and detailed in specific waste stream procedures, as listed in Appendix A. Actions currently practiced at LBL to achieve waste segregation include:

- Handling hazardous wastes separately from all other wastes
- Using good housekeeping in hoods, glove boxes, and laboratories
- Accumulating hazardous wastes in separate, labeled, specially designated containers
- Transporting hazardous wastes separately from other types of waste
- Storing radioactive waste in separate areas at the HWHF
- Keeping sharp objects (e.g., hypodermic needles or scalpels) in separate protective containers

1.4.2.3 Certification

This HW Certification Plan is established by the HWHF to demonstrate compliance with the applicable requirements for the management of HW. The processes for identifying, packaging, labeling, marking, and documenting HW are identified in Section 3 of this HW Certification Plan.

LBL requires all waste generators to attend a training course that supports the detailed implementation of waste handling, sampling, and analysis activities sufficient to assure certification. The *Guidelines for Generators of Hazardous Chemical Waste and Guidelines for Generators of Radioactive and Mixed Wastes at LBL* has also been issued for use.

1.4.2.4 Packaging

Waste packaging criteria are identified in Section 3.21 for bulk wastes and lab packs. LBL practices for packaging of HW include:

- Packaging noncompactible waste separately
- Keeping sharp objects (hypodermic needles, scalpels) in separate protective containers
- Inspecting shipping containers upon receipt to assure that the containers are in acceptable condition and properly marked, and after packaging to assure marking, labeling, and closure area adequate, according to Quality Control (QC) Inspection Procedures
- Conducting inspection or surveillance during packaging operations to assure that the DOT regulations are being met prior to shipment

1.4.2.5 Shipping

Shipping requirements are identified in Section 3.17. LBL shipping practices include:

- Transporting HW separately in containers that meet all applicable regulations
- Inspecting all shipping containers for integrity and proper marking and labeling
- Inspecting the loaded vehicle to ensure that it is properly blocked and braced, and properly placarded
- Complying with DOT hazardous materials transportation regulations (49 CFR)

1.4.3 Waste Disposal QA Program Summary

A summary of the Quality Assurance Program Plan (QAPP) (LBL 1990b) requirements for HW certification is presented in Section 4. The following are some important requirements of the QAPP:

- Annual waste package inspections are performed by EH&S personnel.
- Internal audits are conducted on a two- or three-year basis; DOE external audits are done periodically.
- Waste disposal personnel periodically review packaging, storage, and disposal requirements.

- Waste disposal personnel periodically review the LBL Waste Management Plan (LBL 1991d) and DOE Order 5400.3 (DOE 1989a).

1.5 HW GENERATION

HW is generated by many divisions at LBL. These include the Material Sciences, Chemical Sciences, Accelerator and Fusion Research, Energy and Environment, and Biology and Medicine Divisions. Currently the HW streams are identified, based on the following forms and characteristics.

- HW acid, bulk, plus heavy metals, consisting of unwanted process solutions from metal finishing operations
- HW acid, small amounts, primarily batteries
- HW mercury, all streams, including discarded fluorescent light bulbs and other mercury-contaminated equipment
- HW caustics, bulk plus heavy metals, also consisting of unwanted process solutions from metal finishing operations
- HW organic liquids, consisting of coolants or waste oils that may be contaminated with metals or halogenated solvents, in addition to HW organic liquid flammables consisting of halogenated and nonhalogenated solvents
- HW PCBs, consisting of PCB oils, PCB-contaminated equipment, and smaller items such as fluorescent light bulb ballasts
- HW asbestos, bags, composed of insulation and instruments from asbestos removal operations throughout LBL
- HW contaminated soils, consisting of primarily soils contaminated with oil or diesel fuel
- HW empty drums, resulting from drums containing residuals that cannot be emptied.

2.0

ORGANIZATION AND RESPONSIBILITIES

2.1 DESCRIPTION OF FACILITY ORGANIZATION

The Hazardous Waste Management (HWM) Department of the Environment, Health and Safety (EH&S) Division has the responsibility for management of HW at LBL. Within HWM, the Operations Group is responsible for handling and shipping HW. Figure 2-1 shows the HWM Department organization, and Figure 2-2 shows the organization flow for these HW wastes. The draft *Waste Management Plan* (LBL 1991d) defines the minimum standards of operation for the HWHF.

2.2 DUTIES AND RESPONSIBILITIES

This section lists positions responsible for the management and handling of HW, with the responsibilities for each job title. Quality assurance (QA) responsibilities are listed where relevant. Additional responsibilities are listed in Section 4, "Quality Assurance."

2.2.1 Division Director, Environment, Health and Safety Division

- Has overall responsibility for environment, health, and safety issues at LBL
- Assures the resources necessary to conduct HWHF operations in a safe manner
- Has overall responsibility for implementation of the QAPP (LBL 1990b) at the HWHF
- Reviews and approves the HWHF QAPP and revisions

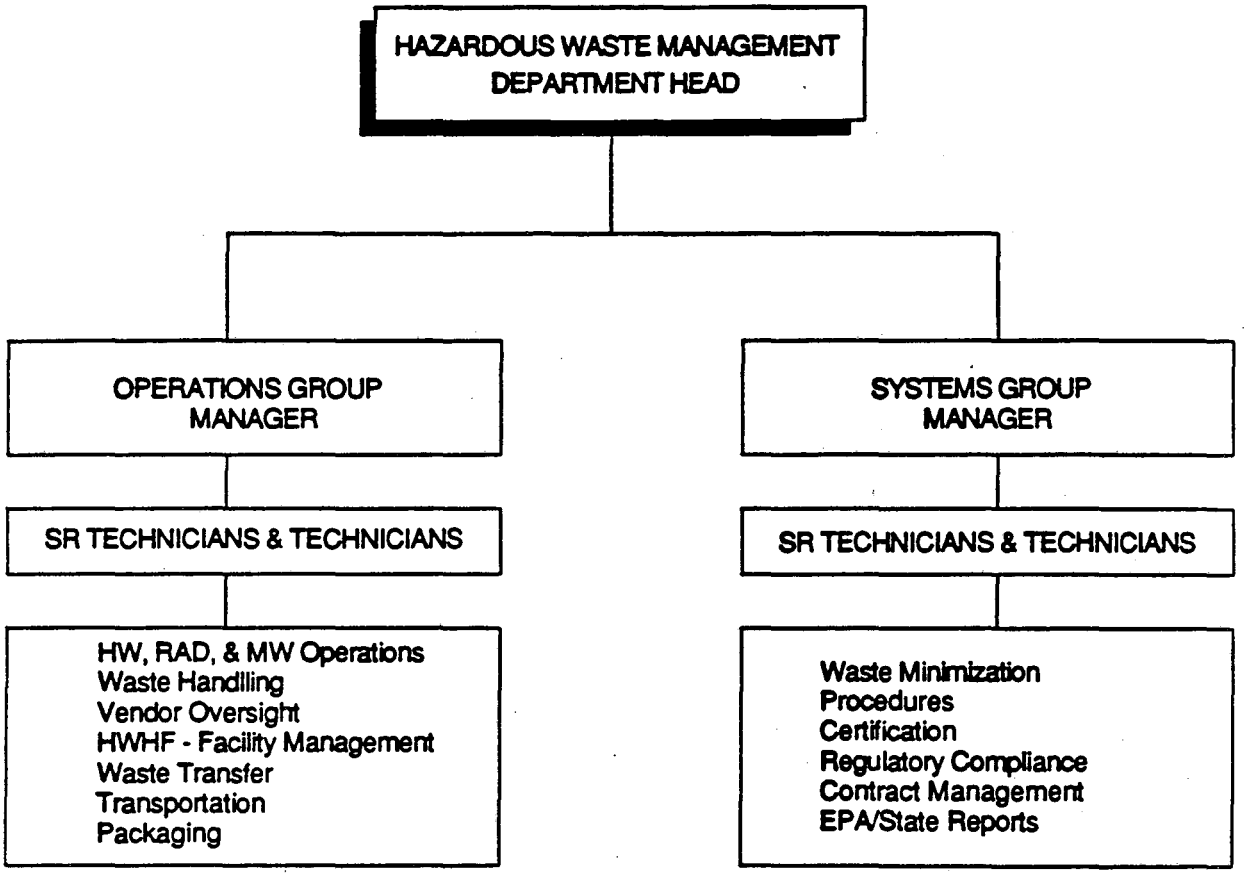


Figure 2-1
Hazardous Waste Management Organization Chart

ORGANIZATIONAL FLOW CHART

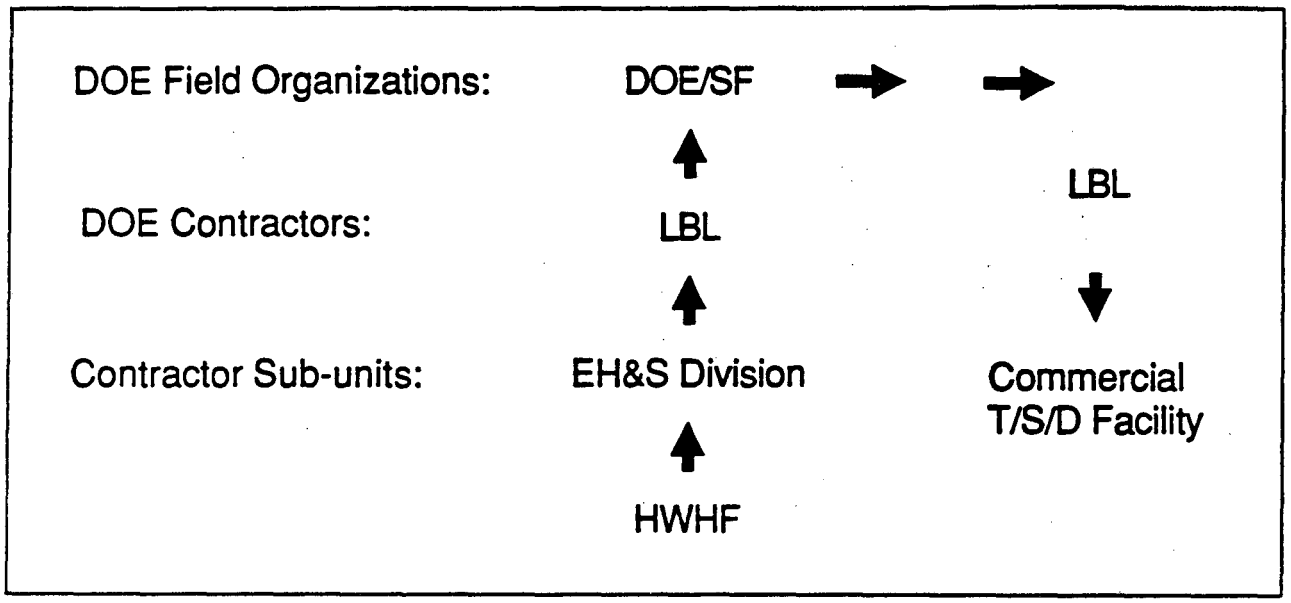


Figure 2-2
Organizational Flow for HW

2.2.2 Department Head, Hazardous Waste Management Department

- Is responsible for directing and monitoring all HWHF operations
- Is responsible for directing and monitoring the implementation of the HWHF QA program
- Reviews and approves the HW Management Procedures
- Assures that the procedures developed for LBL wastes are reviewed and updated annually
- Approves the development and use of calibration procedures and requirements for control of measuring the test equipment
- Develops and keeps current the LBL *Waste Management Plan* (LBL 1991d)

2.2.3 Operations Group Manager and Hazardous Waste Handling Facility Manager

- Is responsible for the supervision of the HW waste handling, processing, and transportation
- Evaluates waste disposal work, and issues assignments to section members
- Organizes and trains personnel and evaluates their performance
- Evaluates each LBL operation that generates HW
- Assures that waste is properly analyzed for safe waste disposal and that effective methods of minimizing and segregating wastes are instituted
- Advises and coordinates hazardous waste processing
- Supervises and coordinates job assignments
- Assures that each assigned person reads the HWHF QAPP and is briefed on the HWHF quality goals, areas of responsibility, and formal work controls, with emphasis on the individual's specific responsibilities

- Other responsibilities are listed in Section IX of the Part B Permit Application for the HWHF.
- Certifies that labeling and marking requirements of 49 CFR 171, 172, and 173 are met
- Certifies that the appropriate documentation and records are prepared
- Maintains up-to-date knowledge of all current Cal-EPA, DOE, and other regulations pertaining to hazardous waste disposal within the department
- Prepares for state and Federal audits and inquiries, and responds to various regulatory entities when required
- Assures that waste disposal files are maintained
- Interacts with regulatory agencies to maintain compliance with all regulations
- Assures that services, materials, equipment, and components of shipping containers are selected from a supplier that meets DOT requirements, as specified in 49 CFR
- Generates reports as required by DOE, EPA, or other regulatory agencies
- Maintains computer data on all waste streams

2.2.4 Systems Group Manager

- Signs generator certification on the Uniform Hazardous Waste Manifest
- Certifies compliance with waste acceptance criteria
- Certifies that HW storage, packaging, waste form criteria, and waste package criteria meet the applicable requirements
- Certifies that DOT shipping requirements are met
- Certifies that labeling and marking requirements of 49 CFR 171, 172, and 173 are met

- Certifies that the appropriate documentation and records are prepared
- Maintains up-to-date knowledge of all current Cal-EPA, DOE, and other regulations pertaining to hazardous waste disposal within the department
- Prepares for state and Federal audits and inquiries, and responds to various regulatory entities when required
- Assures that waste disposal files are maintained
- Interacts with regulatory agencies to maintain compliance with all regulations
- Assures that services, materials, equipment, and components of shipping containers are selected from a supplier that meets DOT requirements, as specified in 49 CFR
- Generates reports as required by DOE, EPA, or other regulatory agencies
- Maintains computer data on all waste streams

2.2.5 Senior Technician

2.2.5.1 Operations Group, Senior Technician

- Under limited supervision, collects, identifies, transports, prepares, stores, and disposes of hazardous and potentially radioactive wastes
- Cleans up spills and decontaminates equipment/areas as required
- Applies comprehensive knowledge of hazards associated with hazardous and radioactive materials for safe handling, possible reuse, and appropriate disposal
- Takes prompt and appropriate action, when necessary, to prevent the effects of a detected problem from spreading
- Assumes responsibility for equipment disposal based on economy and hazardous conditions
- Maintains an adequate disassembly and decontamination facility

- Other responsibilities are listed in Section IX of the part B Permit Application for the HWHF

2.2.5.2 Systems Group, Senior Technician

- Improves methods to minimize HW
- Maintains compliance with all applicable regulations
- Finds vendors to provide services for disposal, recycling, and transportation of HW and assures that such services comply with all applicable State of California, DOE, EPA, and DOT requirements
- Completes waste manifests and makes sure they reach the appropriate state offices on time
- Assures the return of a copy of the waste manifest from transporter and waste disposal site
- Takes prompt and appropriate action, when necessary, to prevent the effects of a detected problem from spreading
- Subjects HW generated at LBL to minimization and proper packaging for shipment to approved waste disposal sites
- Works with waste generators to effect waste reduction as much as practicable
- Investigates and implements chemical recycling programs, as practicable
- Maintains records of waste minimization efforts
- Other responsibilities are listed in Section IX of the Part B Permit Application for the HWHF.

2.2.6 Technician

2.2.6.1 Operations Group, Technician

- Under normal supervision, performs complex duties in hazardous waste disposal preparations (i.e., lab packing)
- Transports, stores, and ensures proper disposal of HW
- Keeps inspection records for all of above
- Evaluates contaminated laboratory equipment and reclaims it by chemical or physical decontamination
- Assumes responsibility for equipment disposal based on hazardous conditions
- Performs other duties as directed by the supervisor.

2.2.6.2 Systems Group, Technician

- Provides guidance and advice to HWHF and generators related to environmental/health compliance measures
- Prepares environmental reports and permit applications
- Conducts field surveys of materials, equipment, or operations that present a potential environmental/occupational health hazard
- Interacts and coordinates with regulatory agency personnel
- Performs other duties as directed by the supervisor

2.3 PRINCIPAL INTERFACES

2.3.1 Internal

HWM personnel interface with all generators of HW at LBL. Interactions occur in the case of an emergency and when calls for information regarding the handling of HW are received from a user.

2.3.2 External

External interfaces occur with the material haulers, commercial treatment/storage/disposal facility personnel, and DOE, OSHA, State of California, University of California, and City of Berkeley personnel.

HWM department management also monitor the activities of "participating external groups," e.g., non-LBL organizations that provide services or materials for HWHF operations. The role of these groups is defined in various vendor purchase agreements.

3.0

CERTIFICATION METHODOLOGY

3.1 CERTIFICATION PROCESS DESCRIPTION

3.1.1 Requirements

This plan for certification of HW is designed to assure that all HW from the LBL HWHF meets the waste acceptance criteria for the approved commercial treatment, storage, and disposal facilities. These criteria are established in previously cited state and Federal regulations. The certification methodology addresses the following areas:

- Waste Characterization. Any waste material that is known to be, or suspected of being, contaminated with hazardous components and/or radionuclides is fully characterized by the waste generators. All waste materials are also subject to a QA/QC random sample radiation survey and chemical characterization by the HWHF, as detailed in the HWHF *Waste Analysis Plan* (LBL, 1991f).

- Waste Segregation. LBL has developed technical and administrative procedures to identify and segregate radioactive wastes and RMW from hazardous waste.

- Waste Package and Shipment. All HW packages meet the appropriate packaging and shipment requirements imposed by state and Federal law.

- Waste Reduction. LBL imposes technical and administrative controls for the minimization of HW.

These criteria and LBL compliance are discussed in detail in the following sections.

3.1.2 Certification Process Description

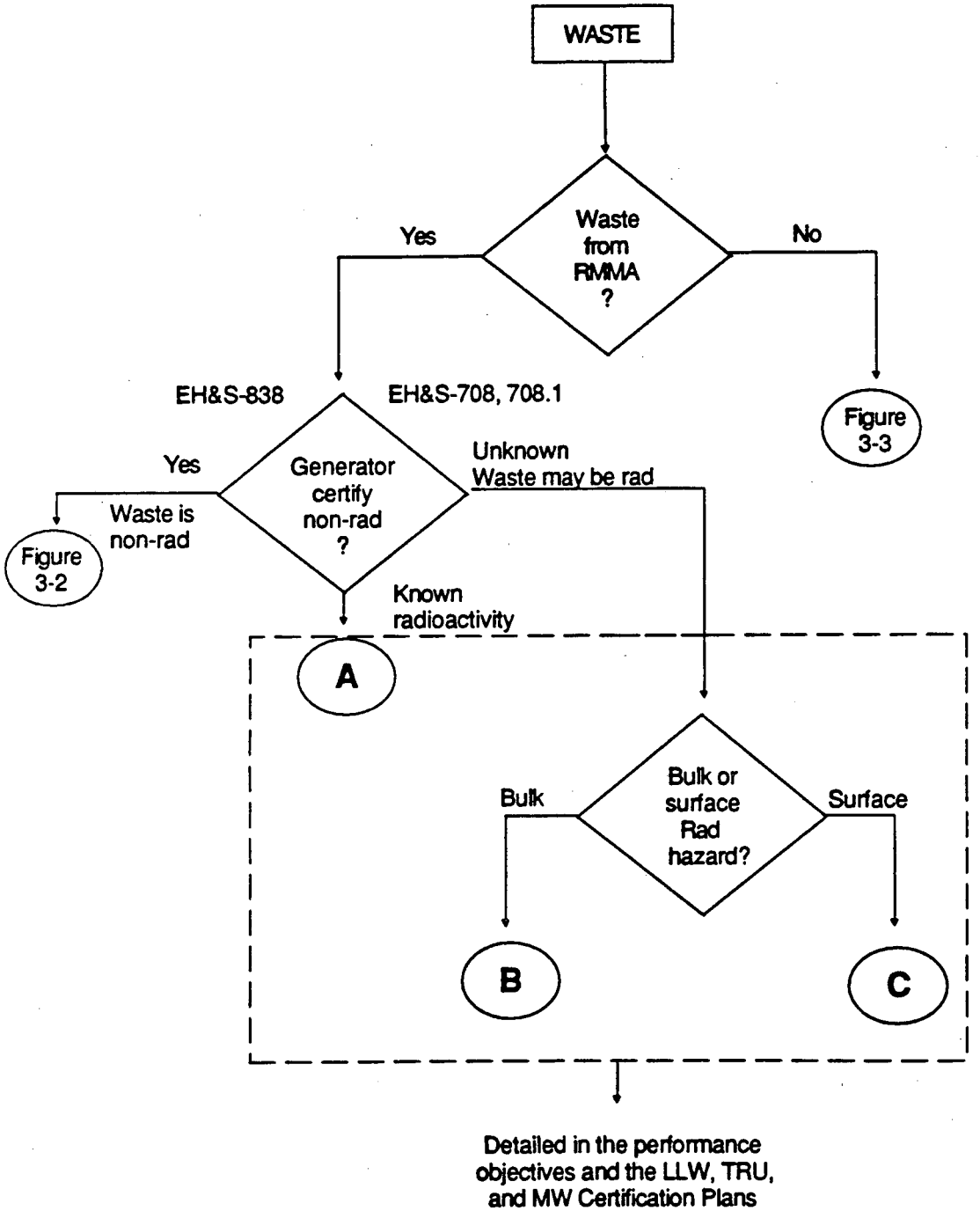
Detailed flowcharts are provided for the following discrete activities within the certification process:

- Schematic of LBL system to determine radiologic contamination in waste (Figure 3-1)
- Identification and characterization of nonradioactive waste originating in Radioactive Material Management Areas (RMMAs) (Figure 3-2)
- Identification and Characterization of Non-RMMA Waste (Figure 3-3)
- Generator packaging, verification, and transfer to HWHF (Figure 3-4)
- Approval of waste shipments - RMMA Waste (Figure 3-5)
- Approval of waste shipments - Non-RMMA Waste (Figure 3-6)

3.1.2.1 Identification and Characterization of Waste Type. Waste generated at LBL must be characterized as nonhazardous, hazardous, radioactive, or radioactive mixed before it can be stored at the HWHF or shipped to an offsite T/S/D facility. EH&S Policy No. 806 is used to determine if waste is adequately and properly characterized through generator certification or if the waste requires further sampling and analysis for radioactivity or chemical constituents. Waste generators are responsible for completing the Hazardous Waste Disposal Requisition, including the hazardous and/or radioactive character of the waste. The requisition and accompanying documentation are reviewed by HWM prior to waste transfer to the HWHF. Figure 3-1 is a general schematic of the LBL system used to determine the possibility of radiologic contamination in waste. This procedure is described below.

First, the waste generation location listed on the requisition is compared to the Radioactive Material Management Area (RMMA) location list. If the waste originates in an RMMA, it is subject to the DOE Performance Objective for the certification of non-radioactive hazardous waste (DOE 1991a). All samples of waste from RMMAs are screened using EH&S Policy No. 838. This screening is an HWHF internal verification check and an indicator for potential subsequent radiochemical analyses.

FIGURE 3-1
SCHEMATIC OF LBL SYSTEM TO DETERMINE RADIOLOGIC CONTAMINATION IN WASTE



RMMA Waste

- **Generator certifies that waste is nonradioactive** (detailed in Figures 3-2 and 3-4)

  If the generator has certified that no radioactivity was added to the waste, then the generator-supplied information relating to hazardous components or characteristics is evaluated by HWM as follows:

  1. If the generator stated that no hazardous components or characteristics were present, and backup documentation supports the statement, then the waste is handled as nonhazardous, and no analysis is required. In addition, if the waste meets the release criteria described in EH&S Policy No. 838, then the generator may dispose of the waste as nonhazardous.

  2. If the generator stated that hazardous chemicals were present with their identity and concentrations listed, and supporting documentation (i.e., process knowledge) is adequate, no analysis is required.

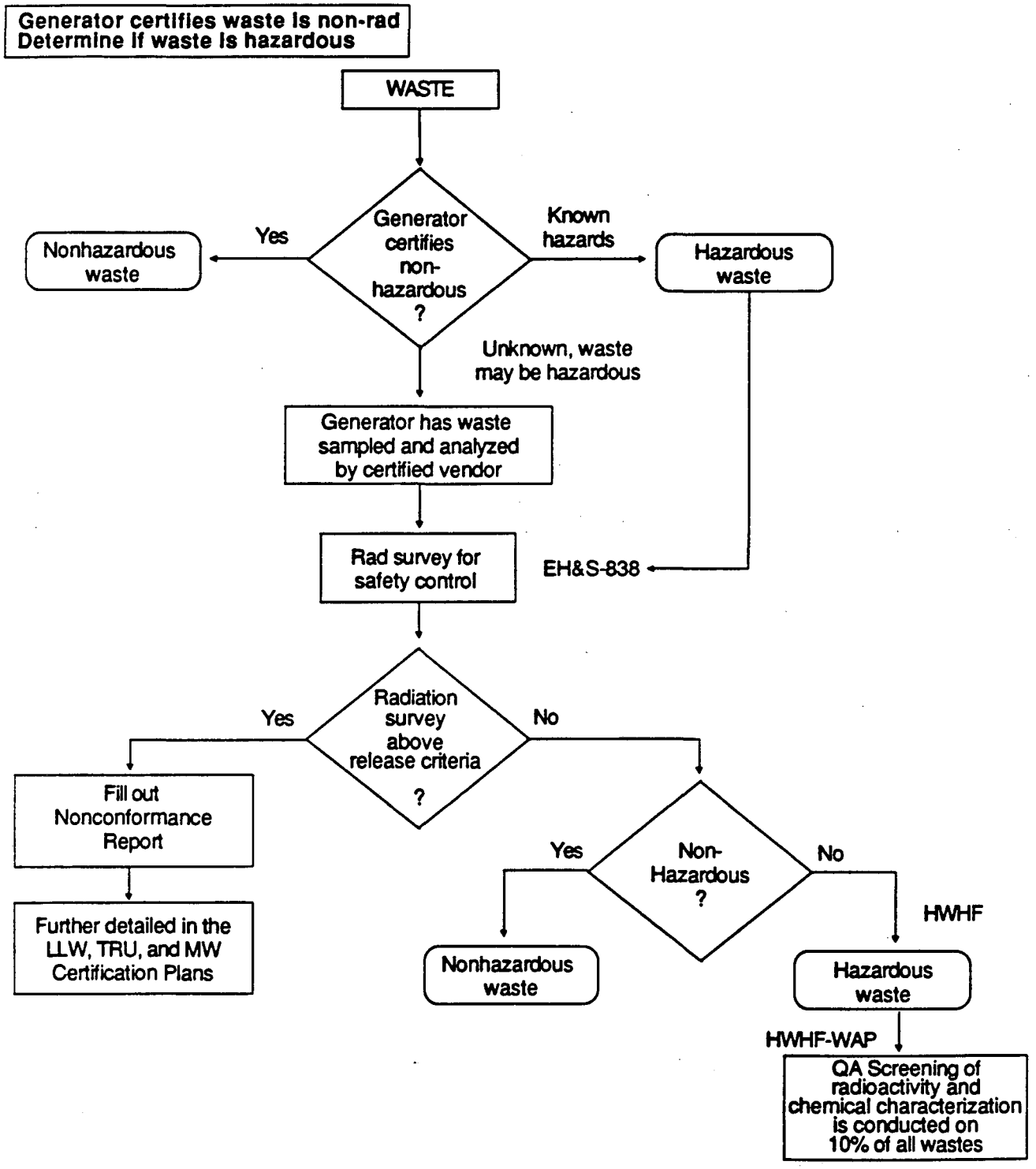
  3. If the generator does not know and has no information (i.e., process knowledge) as to what hazardous materials are present, then the waste must be sampled and analyzed by a certified vendor.

If the radiation QA screening required by EH&S Policy No. 838 shows radioactivity above the release criteria listed in the policy, then the information supplied by the generator is verified, the screening results are discussed, and the waste is handled as radioactive. The Field Technician must fill out a Nonconformance Report, as described in EH&S Policy 808.

- **Generator certifies that waste is radioactive or is uncertain of Radioactivity**

  If the generator has certified that a known amount of radioactivity was added to the waste, then the waste is handled as radioactive or radioactive mixed waste. If the generator does not know whether radioactivity was added to the waste or does not have sufficient knowledge to adequately characterize the radioactivity present, then the waste is assumed to be radioactive and is further sampled and screened to determine its classification (LLW, TRU, RMW, or HW). The certification

FIGURE 3-2
IDENTIFICATION AND CHARACTERIZATION OF NONRADIOACTIVE WASTE ORIGINATING IN RMMAs



procedures for the LLW, TRU, and RMW are further detailed in the LBL Performance Objectives and the respective waste certification plans.

Non-RMMA Waste (detailed in Figure 3-3)

If the generator certifies that the waste has no added radioactivity, then HWHF personnel use supporting documentation to determine if the generator-stated hazardous components or characteristics are present in the waste, as specified below. If they are present, then the levels of the specified components are evaluated and possibly verified.

1. If the generator stated that no hazardous components or characteristics were present, and supporting documentation is adequate, then the waste is handled as nonhazardous, and no analysis is required. The generator may dispose of the waste as nonhazardous.

2. If the generator stated that hazardous chemicals were present and has listed their identity and concentrations, and supporting documentation is adequate, then no analysis is required.

3. If the generator cannot identify the hazardous materials that are present, the waste must be sampled and analyzed by a certified vendor. The generator submits a Waste Analysis Request Form to EH&S.

3.1.2.2 Survey for Radioactivity. All materials and equipment to be removed from controlled or radiological areas at LBL are surveyed, for radioactivity according to the procedures detailed in EH&S Policies 708 and 708.1. The surveys for radioactive contamination and induced activity are accomplished with portable instruments and smears analyzed by EH&S Environmental Protection Department. Surveyed items are identified with a "Results Pending" tag and cannot be removed from the RMMA until the analysis show that the item meets the release criteria listed in EH&S Policy 838.

In addition, all RCRA and Toxic Substances Control Act (TSCA) hazardous wastes in RMMAs at LBL must be surveyed prior to offsite shipment. Procedures for surveying and recording potential radiological contamination on the surface of each shipping container are detailed in EH&S Policy 838. Release procedures are the same as those described above for materials and equipment in RMMAs.

FIGURE 3-3
IDENTIFICATION AND CHARACTERIZATION OF NON-RMMA WASTE

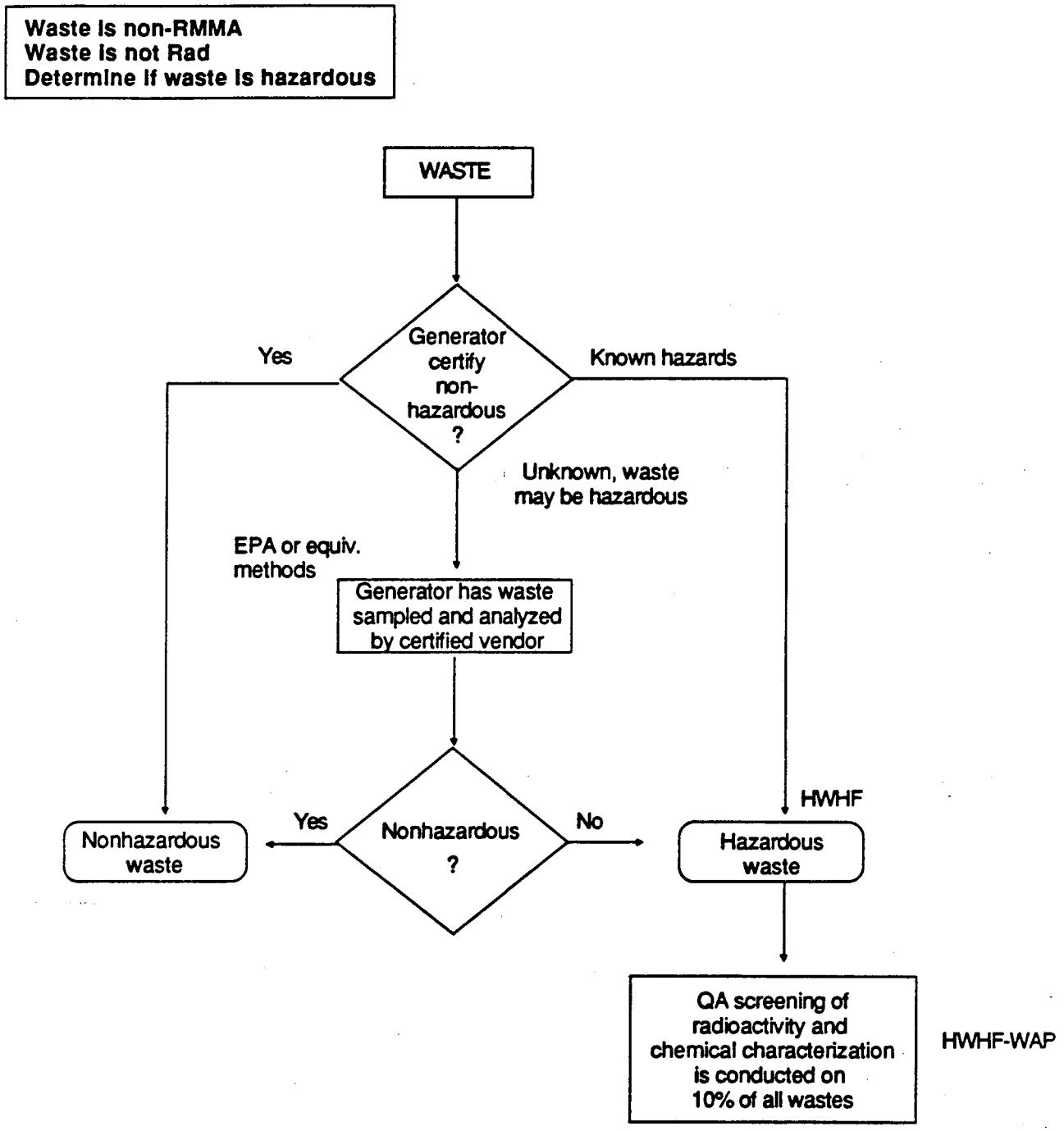
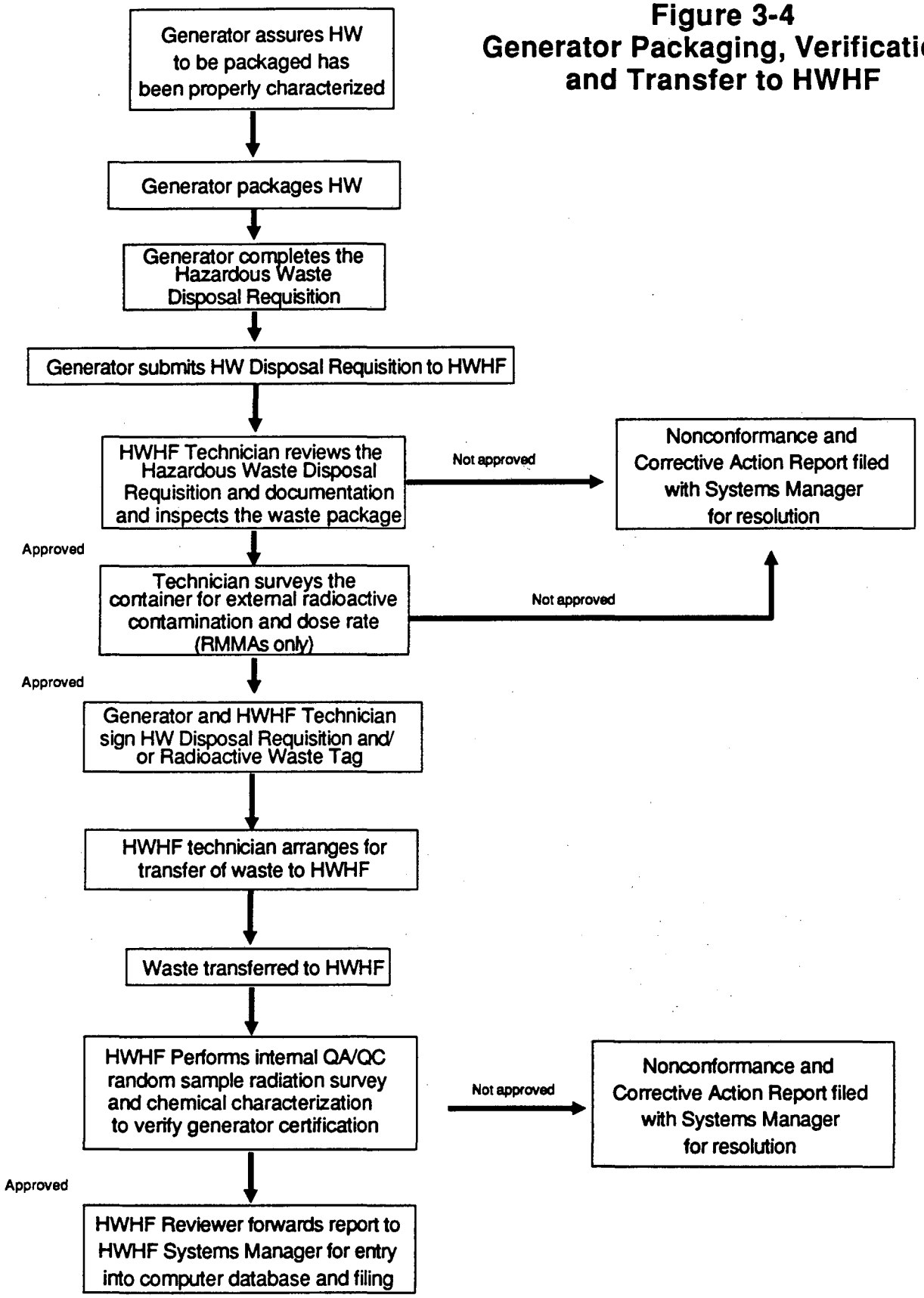


Figure 3-4
Generator Packaging, Verification, and Transfer to HWHF



Random samples of all waste stored at the HWHF are analyzed for alpha, beta, and gamma radiation as detailed in the HWHF *Waste Analysis Plan* (LBL 1991f). Hazardous wastes of unknown origin that have been stored at the HWHF prior to March 1991 are treated in the same manner as RCRA/TSCA wastes in RMMAs. EH&S Policy No. 838.1 details procedures for the release of these wastes to T/S/D facilities.

3.1.2.3 Approval of Waste Shipments. The approval of waste shipments to commercial T/S/D facilities for RMMA waste and non-RMMA waste is detailed in Figures 3-5 and 3-6. For RMMA wastes, files and documentation must be reviewed and officially closed prior to shipment.

3.1.2.4 Physical/Chemical Characterization. Waste certification includes the determination of the physical and chemical characteristics of the waste, including any void filling material or absorbent. Physical/chemical characterization is accomplished similarly to the method used to characterize the radionuclide content of the waste, i.e., by use of process knowledge, indirect correlation, laboratory analysis, and inventory accountability.

As a minimum, the characterization of waste includes the following information:

- Physical and chemical characteristics of the waste and any void-filling material or absorbent
- Volume of the waste (total of waste and any solidification or absorbent media)
- Weight of the waste (total of waste and any solidification or absorbent media)
- Packaging details
- Package date, package weight, and total volume.

3.1.2.5 Waste Handling and Packaging Activities. The waste certification process includes a review of the waste handling and packaging data, including:

- Volume of the waste (total of waste and any solidification or absorbent media)
- Weight of the waste (total of waste and any solidification or absorbent media)

Figure 3-5
Approval of Waste Shipments - RMMA Waste

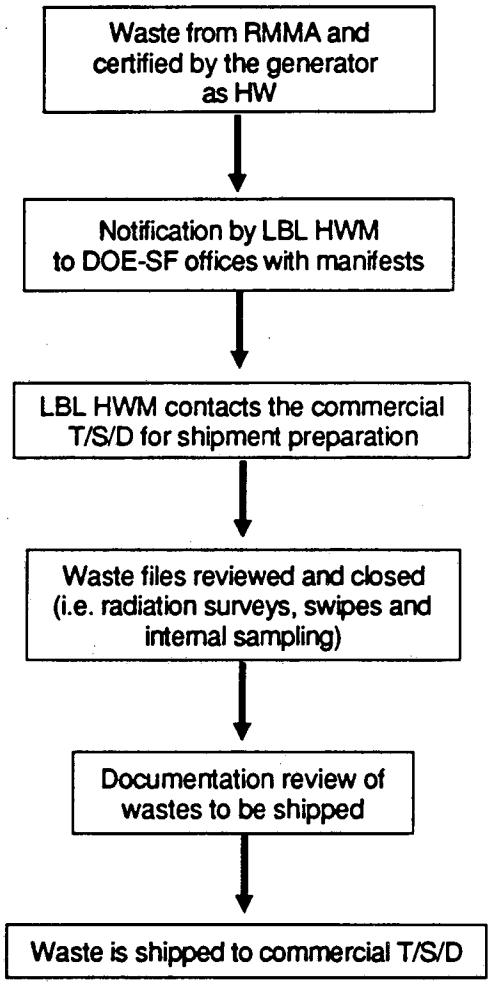
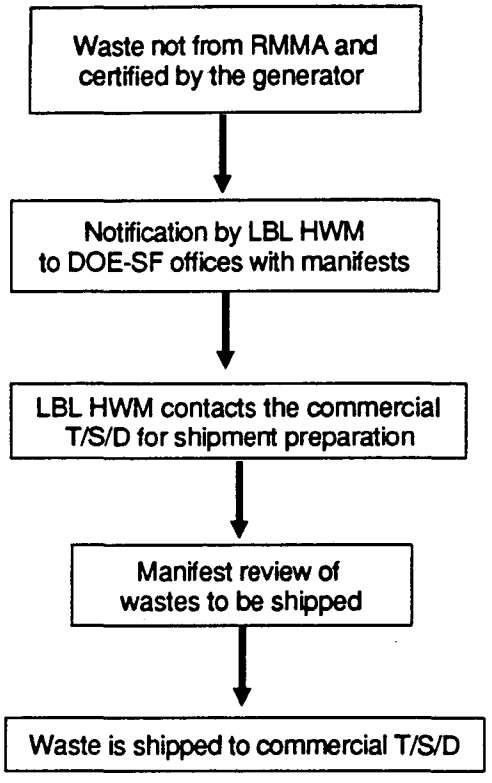


Figure 3-6
Approval of Waste Shipments - Non-RMMA Waste



- Packaging details including data, package weight, total volume, and land transportation category

The certification process includes handling and packaging waste in accordance with procedures that assure that the waste is packaged and records generated in a manner that fulfills the appropriate requirements of the state and Federal hazardous waste regulations. This also includes the means to identify and document what is placed in waste containers and the means to prevent unauthorized or incorrect material from being placed in waste containers.

For HW that is designated for storage, certification assures that all of the following criteria are met and documented:

- Container integrity is assured.
- Only DOT approved packages are used.
- Drum exterior surfaces comply with DOT and EPA specifications.
- Containers are noncombustible. External containment barriers are not wood, plywood, cardboard, or plastic.

The certification process ensures that:

- All labeling and marking conforms to the requirements in 49 CFR 171, 172, and 173.
- Packages are labeled with the following information:
  - Package Identification Number (PIN)
  - Gross weight (lb or kg)
  - "THIS END UP" legend or directional arrows for packages having inner containers for liquids
  - Asbestos warnings, as required

- Markings for drums that contain PCB contamination, as required by 40 CFR 761 subpart C or by the SDAR

- "LIQUID ORGANIC WASTE," if applicable, EPA hazardous waste sticker, and the flashpoint or flashpoint range for drums with free organic liquids in inner containers

- The manifest number is marked on the EPA Hazardous Waste sticker, the HW container, and the Uniform Hazardous Waste Manifest (UHWM) form.

- The transporting vehicle is placarded according to 49 CFR 172, subpart F (DOT 1991).

3.1.3 Procedures and Processes Common to All Waste Streams

3.1.3.1 Qualification and Training. HWHF personnel receive extensive training on the handling of hazardous wastes, as well as handling of radioactive wastes. A complete list of training received by HWHF personnel is contained in Section IX of the Part B Permit application. The HWHF also provides copies of the *Guidelines for Generators of Hazardous Chemical Waste at LBL* (LBL 1991e) to LBL generators.

3.1.3.2 Management Assessment. The HWHF QAPP (LBL 1990b) provides the oversight for HWHF certification activities to assure that these activities result in the management of waste in accordance with the applicable state and Federal regulations. This oversight is accomplished through the use of audits, quality surveillances, and reviews of related activities. Corrective actions and control of nonconforming items are addressed in the HWHF QAPP (LBL 1990b) and Section 4.0 of this document.

HWHF management reviews and assesses these procedures and processes to ensure that the generators characterize the waste adequately and provide adequate environmental, health, and safety protection. If deficiencies are found, HWHF management assess the need for changes and provide the mechanisms needed to make the required changes in the procedures and processes.

3.1.3.3 Activities Common to Most Waste Streams. A number of activities are common to all waste generators regardless of waste stream. These activities are handled in a uniform manner. Model procedures are prepared by EH&S. These model

procedures are then incorporated in the facility's procedural manual and tailored to suit the situation for each waste stream. A list of these common activities follows:

- Generators and HWHF personnel handle hazardous wastes separately from all other wastes.
- Generators keep the build-up of hazardous and radioactive wastes to a minimum. As soon as waste containers are filled, they are removed to the HWHF.
- Generators characterize and minimize all hazardous waste to the fullest extent possible.
- Generators provide the primary waste containers. HWHF personnel provide approved waste collection containers (galvanized waste cans, five-gallon carboys, etc.).
- All hazardous waste is collected from the generators and transported to the HWHF by HWHF or contract personnel. At the HWHF, personnel review each waste package for proper contents and accurate identification on the Hazardous Waste Disposal Requisition.
- HWHF personnel prepare, package, store, and arrange for off-site disposal of the waste.
- Hazardous material handling procedures prohibit the disposal of liquid hazardous waste down sanitary drains. The HWHF is notified immediately if liquid hazardous waste is inadvertently poured down a drain.
- No explosives, flammables, or highly toxic chemicals are discarded with radioactive dry wastes.
- All sharp objects (hypodermic needles, scalpels, etc.) are placed in protective containers.

3.2 HW ACID — BULK PLUS HEAVY METALS

3.2.1 Description

These wastes are corrosive, and may also be toxic due to elevated concentrations of heavy metals and sometimes cyanides. The bulk acids are generated as results of unwanted process solutions from metal finishing operations at Building 25 and 77; or they may be present in metal sludges generated as a result of separately permitted wastewater pretreatment units located at Building 25 and 77. The HWHF handles between 5 to 25 barrels of bulk acid per year, making bulk acid one of the major waste streams at the HWHF.

3.2.2 Characterization Methodology

The generator is responsible for characterizing the physical and chemical content of the wastes. Each waste shipment sent to the HWHF must be accompanied by a completed Hazardous Waste Disposal Requisition, along with all supporting characterization documentation verifying its composition (i.e., process knowledge, MSDS, standard composition, a request for profile analysis or analytical results), in accordance with the guidance provided in *the Guidelines for Generators of Hazardous Chemical Wastes* (LBL 1991e). For bulk wastes, the generator must also complete and attach an EH&S Hazardous Waste Label to each container. For smaller containers, the contents may be identified on the containers themselves. A copy of the requisition must be faxed to EH&S for approval prior to EH&S pickup.

In addition, HWHF personnel will sample the waste in accordance with the *Waste Analysis Plan* (LBL 1991f).

3.2.3 Segregation Methodology

Generators are trained to store only one type of waste in each drum, and to ensure that no other wastes are stored where corrosives are stored. Segregation methodology is provided in the Hazardous Waste Generator Guidelines (LBL 1991e).

3.2.4 Waste Handling, Packaging, and Shipping Operations

Bulk waste is packaged and sealed in the generator area in 55-gallon polyethylene drums, DOT type 17-E (barrel with bungs used for liquid. The waste is then picked up by either HWHF personnel, contractors or LBL's Transportation Section as appropriate.

Wastes are received in the staging area in the B/75 yard. Acid wastes are stored in the acid shed in the B/75 yard until further processing or removal.

The wastes are stored in drums until they are picked up for disposal. Handling, packaging, and record-keeping procedures are provided in EH&S Policy No. 871. Manifesting and shipping procedures are provided in EH&S Policy No. 861.

3.3 HW ACID — SMALL AMOUNTS (BATTERIES)

3.3.1 Description

These wastes are small in volume, originating from batteries that have been damaged or have missing caps. The spent batteries are generated primarily from the Motor Pool as a result of normal LBL maintenance activities.

3.3.2 Characterization Methodology

The generator is responsible for characterizing the physical and chemical content of the wastes. Each waste shipment sent to the HWHF must be accompanied by a completed Hazardous Waste Disposal Requisition, along with all supporting characterization documentation verifying its composition in accordance with the guidance provided in the *Guidelines for Generators of Hazardous Chemical Wastes* (LBL 1991e). However, since motor vehicle batteries have known contaminants of concern, process knowledge eliminates the need for sampling. A generic description such as "Waste Batteries" may be used since chemical compositions of spent batteries are relatively standard. A copy of the requisition must be faxed to EH&S for approval prior to EH&S pickup.

In addition, HWHF personnel will sample the waste in accordance with the *Waste Analysis Plan* (LBL 1991f).

3.3.3 Segregation Methodology

At the generator area, batteries are kept in plastic double containment in a separate location while waiting for pickup. At the HWHF, batteries are placed onto trays and segregated to the working area in the B/75 yard.

3.3.4 Waste Handling, Packaging, and Shipping Operations

At the HWHF, spent battery acids are drained and battery carcasses rinsed and stored in double contained polyethylene bags in accordance with EH&S Policy No. 872. The battery acids are consolidated into 55-gallon drums in accordance with EH&S Policy No. 865. Handling, packaging, and record-keeping procedures are provided in EH&S Policy No. 872. Manifesting and shipping procedures are provided in EH&S Policy No. 861.

3.4 HW MERCURY — ALL STREAMS

3.4.1 Description

Mercury is toxic, and mercury-containing wastes are treated as one waste stream. Mercury wastes generated at LBL originate form several sources, including:

- research laboratory activities,
- discarded fluorescent bulbs, and
- equipment contaminated by mercury.

3.4.2 Characterization Methodology

The generator is responsible for characterizing the physical and chemical content of the wastes. Each waste shipment to the HWHF must be accompanied by a completed Hazardous Waste Disposal Requisition. However, since only fluorescent bulbs, pure mercury, and equipment contaminated with pure mercury make up the mercury waste, an analytical profile is not necessary. Manufacturer's information contains adequate detail of mercury content in fluorescent bulbs. A copy of the requisition must be faxed to EH&S for approval prior to EH&S pickup.

In addition, HWHF personnel will sample the waste in accordance with the *Waste Analysis Plan* (LBL 1991f).

3.4.3 Segregation Methodology

Generators are trained to store mercury and mercury-contaminated equipment double bagged in a separate location awaiting for pickup. Segregation methodology is provided in the Generator Guide (LBL 1991e).

3.4.4 Waste Handling, Packaging, and Shipping Operations

Wastes picked up by HWHF personnel (in LBL tote box or compatible containers) are received in the working area in the B/75 yard. At the HWHF, consolidation of the wastes into polyethylene drums (DOT type 17H) is performed. Detailed step-by-step procedures for consolidation is provided in EH&S Policy No. 865. Fluorescent bulbs are shipped off site for recycling. Handling, packaging, and record-keeping procedures are provided in EH&S Policy No. 873. Manifesting and shipping procedures are provided in EH&S Policy No. 861.

3.5 HW CAUSTIC — BULK PLUS HEAVY METALS

3.5.1 Description

These wastes are corrosive, and may also be toxic due to elevated concentrations of heavy metals and sometimes cyanides. The bulk acids are generated as a result of unwanted process solutions from metal finishing operations at Building 25 and 77; or they may be present in metal sludges generated as a result of separately permitted wastewater pretreatment units located at Building 25 and 77.

3.5.2 Characterization Methodology

The generator is responsible for characterizing the physical and chemical content of the wastes. Each waste shipment sent to the HWHF must be accompanied by a completed Hazardous Waste Disposal Requisition, along with all supporting characterization documentation verifying its composition (i.e., process knowledge, MSDS, standard composition, a request for profile analysis or analytical results), in accordance with the guidance provided in the *Guidelines for Generators of Hazardous Chemical Wastes* (LBL 1991e). For bulk wastes, the generator must also complete and attach an EH&S Hazardous Waste Label to each container. For smaller containers, the

contents may be identified on the containers themselves. A copy of the requisition must be faxed to EH&S for approval prior to EH&S pickup.

In addition HWHF personnel will sample the waste in accordance with the *Waste Analysis Plan* (LBL 1991f).

3.5.3 Segregation Methodology

Generators are trained to stored only one type of waste in each barrel, and to ensure that no other wastes are stored where corrosives are stored. Segregation methodology is provided in Hazardous Waste Generator Guidelines (LBL 1991e).

3.5.4 Waste Handling, Packaging, and Shipping Operations

Bulk waste is packaged and sealed in the generator area in 55-gallon drums, DOT type 17E (barrel with bungs used for liquid) and 17H (for solid waste). The waste is then picked up either by HWHF personnel, by contractors, or by LBL's Transportation Section, as appropriate.

Wastes are received in the staging area in the B/75 yard. The wastes are stored in the corrosives shed in the B/75 yard until further processing or removal.

The wastes are stored in drums until they are picked up for disposal. Handling, packaging, and record-keeping procedures are provided in EH&S Policy No. 874. Manifesting and shipping procedures are provided in EH&S Policy No. 861.

3.6 HW CAUSTIC — SMALL AMOUNTS

3.6.1 Description

Small amounts of caustic wastes are generated as a result of laboratory research operations. These wastes are corrosive, and may also be toxic due to elevated concentrations of metals.

3.6.2 Characterization Methodology

The generator is responsible for characterizing the physical and chemical content of the wastes. Each waste shipment sent to the HWHF must be accompanied by a completed Hazardous Waste Disposal Requisition, along with all supporting

characterization documentation verifying its composition (i.e., process knowledge, MSDS, standard composition, a request for profile analysis or analytical results) in accordance with the guidance provided in the *Guidelines for Generators of Hazardous Chemical Wastes* (LBL 1991e). For small containers, the contents may be identified on the containers themselves. A copy of the requisition must be faxed to EH&S for approval prior to EH&S pickup.

In addition, HWHF personnel will sample the waste in accordance with the *Waste Analysis Plan* (LBL 1991f).

3.6.3 Segregation Methodology

Generators are trained to place wastes in out-of-the-way areas. Segregation methodology is provided in Hazardous Waste Generator Guidelines (LBL 1991e).

3.6.4 Waste Handling, Packaging, and Shipping Operations

Small containers of waste are packaged and placed in plastic tote boxes for HWHF personnel to pick up.

Wastes picked up by HWHF personnel (in 5-gallon or smaller containers) are moved directly to the chemical preparation area, Building 75, Room 131, where small-scale operations are performed.

At the HWHF, the primary procedure performed is lab packing. Lab packing is performed by a contractor. Detailed step-by-step procedures for contract oversight of lab packing is provided in EH&S Policy No. 812. The wastes are stored in the caustic shed in the B/75 yard until they are picked up for disposal. Manifesting and shipping procedures are provided in EH&S Policy No. 861.

3.7 HW ORGANIC LIQUIDS — WASTE OILS

3.7.1 Description

Waste oil is combustible and may be contaminated with various contaminants such as halogenated solvents and metals. Waste oils are generated as a result of normal motor

vehicle and equipment maintenance operations. Waste oil may also originate from area shops and contaminated soils.

3.7.2 Characterization Methodology

The generator is responsible for identifying waste oils, including the potential presence of contaminants. Each waste shipment sent to the HWHF must be accompanied by a completed Hazardous Waste Disposal Requisition Form, along with all supporting characterization documentation verifying its composition (i.e., process knowledge, MSDS, standard composition, a request for profile analysis or analytical results), in accordance with the guidance provided in the *Guidelines for Generators of Hazardous Chemical Wastes* (LBL 1991e). For bulk wastes, the generator must also complete and attach an EH&S Hazardous Waste Label to each container. For smaller containers, the contents may be identified on the containers themselves. A copy of the requisition must be faxed to EH&S for approval prior to EH&S pickup.

In addition, HWHF personnel will analyze a random sample of barrels containing waste oil for pH and the presence of halogens, in accordance with the *Waste Analysis Plan* (LBL 1991f). The laboratory analysis is perform by an outside contractor. The barrels are stored in the B/69 storage area until analytical results are received.

Barrels of oil not contaminated with halogens are transferred to the B/75 yard, and the oils are then bulked into 55-gallon drums. Eventually, the drums are transferred to storage at B/69. The accumulation date and a hazardous waste label are placed on the tank.

Hazardous waste labels with waste classification and generator information are placed directly on the barrels containing waste oil contaminated with halogens. The barrels will remain in the B/69 storage area until they are transported from the HWHF.

3.7.3 Segregation Methodology

Generators are trained to store only one type of waste in each barrel. The generator must also identify potential contaminants on the barrel.

Initially, all waste oils are stored in B/69 at the HWHF. Upon receiving analytical results for halogens, waste oils not contaminated with halogens are transferred to B/75 for storage and further processing.

3.7.4 Waste Handling, Packaging, and Shipping Operations

Bulk waste oils are packaged and sealed by the generators in small containers or in 55-gallon drums, DOT type 17E (barrel with bungs used for liquid). The waste is then picked up by either HWHF personnel, contractors, or LBL's Transportation Section, as appropriate.

Wastes picked up by HWHF personnel are received in the B/75 yard. At the HWHF, barrels containing waste oil with no halogen contamination are bulked. Detailed step-by step procedures for bulking is provided in EH&S Policy No. 865. The wastes are stored in drums prior to pick up by recycling/reclamation facilities. Handling, packaging, and record-keeping procedures are provided in EH&S Policy No. 877. Manifesting and shipping procedures are provided in EH&S Policy No. 861.

3.8 HW ORGANIC LIQUIDS — COOLANTS

3.8.1 Description

Waste oil is toxic based on aquatic bioassay analysis, and sometimes based on metal contaminations. Waste coolant is generated from operations in the metals shops in B/77. Coolant is used to cool metal fabrication equipment.

3.8.2 Characterization Methodology

The generator is responsible for characterizing the physical and chemical content of the wastes. Each waste shipment sent to the HWHF must be accompanied by a completed Hazardous Waste Disposal Requisition, along with all supporting characterization documentation verifying its composition, in accordance with the guidance provided in the *Guidelines for Generators of Hazardous Chemical Wastes* (LBL 1991e). A generic description such as "Waste Coolant" may be used, since chemical compositions of spent coolants are relatively standard. A copy of the requisition must be faxed to EH&S for approval prior to EH&S pickup.

In addition, HWHF personnel will sample the waste in accordance with the *Waste Analysis Plan* (LBL 1991f).

3.8.3 Segregation Methodology

Generators are trained to store waste coolant separate from other wastes.

3.8.4 Waste Handling, Packaging, and Shipping Operations

Coolant is spent when it can not be recycled by the centrifuge recycling unit in B/77. Spent coolant is treated by an evaporation unit at B/77 before it is transported to the HWHF. The evaporation unit utilizes hot water coils to evaporate water from the spent coolant. The concentrated coolant is accumulated in a 55-gallon drum until the drum is full or until the 90-day holding period at B/77 has expired. The drum is then transported to the HWHF.

Concentrated coolant drums picked up by HWHF personnel are received in the B/75 yard. The drums are stored in the chemical drum storage area in Building 69 prior to pick up by recycling/reclamation facilities. Handling, packaging, and record-keeping procedures are provided in EH&S Policy No. 878. Manifesting and shipping procedures are provided in EH&S Policy No. 861.

3.9 HW ORGANIC LIQUID — FLAMMABLES

3.9.1 Description

Flammable organic liquids consist of halogenated and nonhalogenated solvents. Nonhalogenated solvents may be both flammable (flash point <100°F) and combustible (flashpoint, 140°F). These wastes are generated by research activities, particle accelerator operations, and various LBL shop functions. These wastes are normally handled in small quantities.

3.9.2 Characterization Methodology

The generator is responsible for characterizing the physical and chemical content of the wastes. Each waste shipment sent to the HWHF must be accompanied by a completed Hazardous Waste Disposal Requisition, along with all supporting characterization documentation verifying its composition (i.e., process knowledge,

MSDS, standard composition, a request for profile analysis or analytical results), in accordance with the guidance provided in the *Guidelines for Generators of Hazardous Chemical Wastes* (LBL 1991e). For smaller containers, the contents may be identified on the containers themselves. A copy of the requisition must be faxed to EH&S for approval prior to EH&S pickup.

In addition, HWHF personnel will sample the waste in accordance with the *Waste Analysis Plan* (LBL 1991f).

3.9.3 Segregation Methodology

Generators are trained to store flammables in accordance with the segregation methodology provided in Hazardous Waste Generator Guidelines (LBL 1991e).

3.9.4 Waste Handling, Packaging, and Shipping Operations

Flammable organics are grouped by the generator and placed in plastic tote boxes or equivalent containers. The waste is then picked up by either HWHF personnel, contractors, or LBL's Transportation Section, as appropriate.

Flammable organic wastes are received in the flammable liquids shed in the B/75 yard. At the HWHF the following procedures are performed:

- Separate incompatibles
- Lab packing
- Bulking of solvents

The wastes are stored in drums until they are picked up for disposal. Handling, packaging, and record-keeping procedures are provided in EH&S Policy No. 879. Manifesting and shipping procedures are provided in EH&S Policy No. 861.

3.10 HW ORGANIC LIQUIDS — HALOGENATED SOLVENTS

3.10.1 Description

Halogenated organic liquids are generated (as waste solvents) by research activities, particle accelerator operations, and various LBL shop functions. These wastes are

received in small quantities (lab packs from research) and in large quantities (bulk from shops).

3.10.2 Characterization Methodology

The generator is responsible for characterizing the physical and chemical content of the wastes. Each waste shipment sent to the HWHF must be accompanied by a completed Hazardous Waste Disposal Requisition, along with all supporting characterization documentation verifying its composition (i.e., process knowledge, MSDS, standard composition, a request for profile analysis or analytical results), in accordance with the guidance provided in the *Guidelines for Generators of Hazardous Chemical Wastes* (LBL 1991e). For bulk wastes, the generator must also complete and attach an EH&S Hazardous Waste Label to each container. For smaller containers, the contents may be identified on the containers themselves. A copy of the requisition must be faxed to EH&S for approval prior to EH&S pickup. In addition, HWHF personnel will sample the waste in accordance with the *Waste Analysis Plan* (LBL 1991f).

3.10.3 Segregation Methodology

Generators are trained to store halogenated solvents in accordance with the segregation methodology provided in Hazardous Waste Generator Guidelines (LBL 1991e).

3.10.4 Waste Handling, Packaging, and Shipping Operations

Halogenated solvents are grouped by the generator and placed in plastic tote boxes or equivalent containers. The waste is then picked up by either HWHF personnel, contractors, or LBL's Transportation Section, as appropriate.

Halogenated organic wastes are received in the flammable liquids shed in the B/75 yard. At the HWHF the following procedures are performed:

- Separate incompatibles
- Bulk all halogenated solvents in drums and store in the flammable liquid shed until the drums are full (separate flammable organics from halogenated solvents)
- transfer full 55-gallon drums to B/69 storage area

- store reusable chemicals for recycling

The wastes are stored in drums until they are picked up for disposal. Handling, packaging, and record-keeping procedures are provided in EH&S Policy No. 880. Manifesting and shipping procedures are provided in EH&S Policy No. 861.

3.11 HW PCBs

3.11.1 Description

PCBs and PCB-contaminated equipment are generated as part of LBL's ongoing phaseout of the use of PCB-containing equipment. PCBs were traditionally used as insulating material in electrical transformers. PCBs are TSCA EPA-identified hazardous waste. The main sources of PCB wastes are large PCB-containing equipment and smaller items such as fluorescent light bulb ballasts.

3.11.2 Characterization Methodology

The generator is responsible for identifying the waste as PCB or PCB-containing. The generator is responsible for characterizing the physical and chemical content of the wastes. Each waste shipment sent to the HWHF must be accompanied by a completed Hazardous Waste Disposal Requisition, along with all supporting characterization documentation verifying its composition, in accordance with the guidance provided in the *Guidelines for Generators of Hazardous Chemical Wastes* (LBL 1991e). A generic description such as "fluorescent bulb ballast" may be used, since chemical compositions of ballasts are relatively standard. A copy of the requisition must be faxed to EH&S for approval prior to EH&S pickup. In addition, a standard "Caution-Contains PCBs" label must be place on the item or drum.

In addition, HWHF personnel will sample the waste in accordance with the *Waste Analysis Plan* (LBL 1991f).

3.11.3 Segregation Methodology

Generators are trained to store PCB-contaminated wastes separately from other hazardous materials at all times.

3.11.4 Waste Handling, Packaging, and Shipping Operations

PCB-contaminated wastes are handled and stored in the PCB shed in the B/75 yard. Small solid PCB-contaminated items are to be stored in DOT type 17H containers and liquid PCBs are to be stored in DOT type 17E containers. The only procedures performed on PCB-contaminated equipment are draining and consolidation. In addition to detailed step-by-step procedures for consolidation provided in EH&S Policy No. 865, PCB waste specific procedures included the following:

- draining
- use of absorbents
- disposal of equipment used for handling PCBs
- itemization of items placed in a drum (manufacturer, type, serial number)
- identification of date item was removed from service
- identification of date the item was placed in storage

The wastes are stored in drums until they are picked up for disposal. Handling, packaging, and record-keeping procedures are provided in EH&S Policy No. 876. Manifesting and shipping procedures are provided in EH&S Policy No. 861. In addition, for PCB-contaminated equipment, certification of proper disposal by the disposal firm, and records of all transactions, including phone memos, are retained in the file.

3.12 HW ASBESTOS — BAGS

3.12.1 Description

Asbestos waste is generated from insulation, instruments, and asbestos removal operations throughout LBL. Chrystotile asbestos is an OSHA-identified carcinogen.

3.12.2 Characterization Methodology

The generator is responsible for identifying the waste as asbestos waste with a special "Asbestos" label provided by HWHF personnel. Each waste shipment sent to the HWHF must be identified prior to its removal from its original location based on sampling and

analysis conducted by registered asbestos experts. The Hazardous Waste Disposal Requisition must be accompanied by analytical data or asbestos survey information. A copy of the requisition must be faxed to EH&S for approval prior to EH&S pickup.

3.12.3 Segregation Methodology

Asbestos wastes are already separated in bags, and generators are trained to store them separately from other hazardous materials.

3.12.4 Waste Handling, Packaging, and Shipping Operations

Asbestos wastes are handled and stored in the asbestos bin in the B/75 yard. Asbestos is consolidated in the B/75 yard. The wastes are stored in separate, labeled bins. Asbestos is shipped to an offsite landfill. Handling, packaging, and record-keeping procedures are provided in EH&S Policy No. 881. Manifesting and shipping procedures are provided in EH&S Policy No. 861.

3.13 HW CONTAMINATED SOILS

3.13.1 Description

Contaminated soils result from spills of hazardous materials at LBL. Historically, the most common contaminant has been oil or diesel fuel.

3.13.2 Characterization Methodology

The generator is responsible for characterizing the physical and chemical content of the wastes. The hazard classification is based on the identity of the contaminant. Each waste shipment to the HWHF must be accompanied by a completed Hazardous Waste Disposal Requisition, along with all supporting characterization documentation verifying its composition, in accordance with the guidance provided in the *Guidelines for Generators of Hazardous Chemical Wastes* (LBL 1991e).

Contaminated soils received by the HWHF are sampled and analyzed in accordance with the *Waste Analysis Plan* (LBL 1991f).

3.13.3 Segregation Methodology

Generators are trained to keep contaminated soil in a separate location until pickup.

3.13.4 Waste Handling, Packaging, and Shipping Operations

Large quantities of contaminated soils are loaded directly onto a truck at the spill site and hauled to a disposal facility without going through the HWHF.

Small quantities of contaminated soils are placed in 55-gallon drums. Drums of contaminated soils are received and stored in the B/75 yard. The wastes are stored in drums until they are picked up for disposal. Handling, packaging, and record-keeping procedures are provided in EH&S Policy No. 882. Manifesting and shipping procedures are provided in EH&S Policy No. 861.

3.14 HW EMPTY DRUMS

3.14.1 Description

New materials in drum containers are used throughout the laboratory. Drums with residuals that cannot be emptied such that they conform to the specifications in 40 CFR 261.7 are handled as hazardous wastes. All empty drums are sent to EH&S, except for drums that have deposits, which are returned to the material supplier.

3.14.2 Characterization Methodology

The generator is responsible for characterizing the physical and chemical content of the wastes. The hazard classification is based on the original material contained in the drum. Process knowledge eliminates the need for sampling and analysis of this waste stream.

3.14.3 Segregation Methodology

Generators are trained not to use empty dirty drums and to send all empty drums to EH&S except those identified above.

3.14.4 Waste Handling, Packaging, and Shipping Operations

Empty drums are inspected, upon arrival from the generator, to determine if the drums are reusable. Partially empty drums are drained or emptied by hand in the B/75 yard within double containment portable pans. After draining, if less than one inch of material remains, the empty drums are then stored in the B/75 yard. The drained material is

handled, as appropriate, by segregation into the waste stream of the original material. Only drums that cannot be emptied in accordance with 40 CFR 261.7 (less than one inch of residue remains) are shipped off site as hazardous wastes for shredding and disposal. Waste empty drums are manifested and shipped in accordance with EH&S Policy No. No. 861.

3.15 METHODOLOGY FOR INFREQUENT OR UNFORESEEN WASTE CERTIFICATION

The methodology for infrequent or unforeseen waste certification will follow the methodology established for the most similar existing waste stream, with those modifications necessary for health, safety, environmental protection, adequate characterization, and packaging of the waste. The basic methodology is as follows:

- Generators will be responsible for characterizing all aspects of the waste, as established in existing procedures for the various waste streams. Generators will also be responsible for segregating and separating the waste, as established in existing procedures for the various waste streams.
- Sampling will be done at the HWHF as necessary to characterize the waste.
- All other procedures will follow existing practice as closely as possible, allowing for the differences in the new waste streams.

3.16 MINIMIZATION

The *Waste Minimization and Pollution Prevention Awareness Plan* (LBL 1991g) provides the policy, strategy, objectives, and goals for waste minimization at LBL. Waste minimization techniques are applied through:

- Inventory management
- Operational procedures
- Maintenance program
- Material changes and process equipment modification
- Recycling and reuse

A training program provides LBL employees with instruction on the implementation of the waste minimization plans. Tracking and reporting systems and the HWHF QAPP (LBL 1990b) provide a means to verify the implementation of the waste minimization plan activities. Policies currently in place at LBL to achieve waste minimization include:

- Keeping contaminated and noncontaminated items separate
- Using good housekeeping in hoods, glove boxes, and laboratories
- Reusing or decontaminating solid noncompacted waste (drums, wooden boxes)
- Instructing researchers to avoid introducing items needlessly into hazardous environments
- Instructing researchers to use the minimum amount of material necessary
- Instructing researchers to use nonhazardous materials instead of hazardous material whenever possible
- Disposing of explosive, flammable, or highly toxic chemical wastes separately from other hazardous waste (no mixing)

3.17 SEGREGATION

Specific segregation instructions are contained in the *Guidelines for Generators of Hazardous Chemical Wastes* at LBL (LBL 1991e). Hazardous waste (HW) is treated or segregated to reduce any hazardous waste components using standardized treatment processes and methods in accordance with LBL's Part B Permit Application. HW is segregated into separate waste containers to avoid mixing with other waste streams.

The HWHF establishes the policy and procedures for the minimization and segregation of HW in the *Waste Minimization and Pollution Prevention Awareness Plan* (LBL 1991g) and the Hazardous Waste Management Program procedures listed in Appendix A.

3.18 WASTE CHARACTERIZATION, SAMPLING, AND ANALYSIS

3.18.1 Characterization

All HWs are properly characterized chemically and physically. Prior to HWHF approving any waste for transfer to HWHF, the generator is required to estimate the chemical concentrations of the waste using process knowledge or laboratory analysis, as defined in the *Waste Analysis Plan* (LBL 1991f). Upon completion, the generator certifies that the waste has been accurately and completely characterized. The HWHF Field Technician then reviews the information for accuracy in accordance with applicable regulations, and then monitors, tags, and packages the wastes for on-site transport to the HWHF.

The generator, with assistance from the HWHF, reviews each waste stream to determine if it is hazardous, based on the following criteria.

- Wastes listed in the California Code of Regulations (22 CCR 66680) and the Code of Federal Regulations (40 CFR Part 261)
- Wastes that exhibit one or more of the characteristics for identification of "hazardous waste" (22 CCR 66693-66723). These characteristics are
  - toxicity
  - persistent and bioaccumulative effect
  - ignitibility
  - reactivity
  - corrosivity

All HW must be identified chemically, by hazard category, amount, and physical state in accordance with the *Guidelines for Generators of Hazardous Chemical Wastes at LBL* (LBL 1991e) before they are accepted for disposal.

3.18.2 Waste Sampling and Analysis

HW sampling and analysis are performed in accordance with recognized industry methods and standards. The sampling procedures used by the HWHF to characterize hazardous waste are presented in the *Waste Analysis Plan* (LBL 1991f). Sampling and analysis provide an accurate representation of the waste in accordance with statistically valid or EPA-approved methods. The frequency of sampling at the HWHF varies from once every shipment to once every 20 shipments depending on the waste stream, and is detailed in the *Waste Analysis Plan* (LBL 1991f). Generators refer to the *Guideline for Generators of Hazardous Chemical Wastes at LBL* (LBL 1991e) for specific parameters of analysis, sampling techniques, and types of containers required for adequate waste sampling and analysis.

Some waste streams, such as asbestos, fluorescent light bulbs, batteries, and mercury wastes (identified in *Waste Analysis Plan* [LBL 1991f]), are sampled and analyzed only as part of the HWHF QA/QC verification of generator waste identification. Adequate information is available through process knowledge or MSDSs to ensure that proper handling of the wastes occurs at the HWHF and that the wastes are properly disposed.

3.19 WASTE FORM CRITERIA

Any HW generated at LBL is identified as one of the waste streams identified earlier in this section. The following waste categories are also subjected to packaging requirements:

Liquid Waste

Liquid HW is packaged in drums or lab packs. Waste oil may be transferred directly to a recycling contractor's tank truck.

PCB-Contaminated Organic Liquids

PCB oils packaged in liquid form must be in DOT specification 17E 55-gallon drums. Solids contaminated with PCBs are packaged in DOT specification 17C or 17H steel 55-gallon drums. Detailed packaging requirements are provided in 40 CFR 761.

Nonorganic Wastes

Nonorganic liquids are packaged in drums or lab packs.

Mercury

Materials contaminated with mercury are placed in bags and consolidated in 55-gallon polyethylene drums. Mercury wastes are shipped off-site for recycling.

Asbestos

Asbestos is prepacked by certified asbestos contractors, in accordance with the requirements of 40 CFR 61.152 (EPA 1991)

Waste Rags

Waste rags that are saturated with listed or characteristic wastes (typically oil or solvents) are handled as hazardous wastes because of their combustible characteristics. Waste rags are consolidated in 55-gallon drums.

Paint Materials

Paint materials are consolidated in 55-gallon drums. Latex and oil-based paints are handled separately. If necessary, latex paints are solidified with adsorbent before placement into the drums.

3.20 WASTE PACKAGE CRITERIA

All HW packages for disposal by the HWHF meet the requirements described in the following sections.

3.20.1 Bulk Wastes

Bulk wastes are packed in 55-gallon DOT drums (type 17E for liquids and type 17H for solids). Packaging guidelines include the following:

- Drums should be filled only to 90% of capacity (or 50 gallons for a 55 gallon drum) before being closed off. The extra volume allows for expansion of the liquid.

- All spigots and funnels should be removed from the drums prior to transport.

- Before transporting drums, check that labels are legible and bungs are on tight.

3.20.2 Lab Packs

Many waste streams are lab packed at the HWHF. Lab packing is done at the HWHF by contractors under the oversight of HWHF personnel. Lab packing oversight procedures are provided in EH&S Policy No. 812, and it includes the following general requirements:

- Ensure packing of compatible materials into DOT-approved drums (either 5, 20, 30, or 55 gallon size, depending on the amount of material to be lab packed).

- Make sure the type, quantity, and distribution of packing material (absorbent) meet requirements. Add twice the amount of absorbant needed to absorb the maximum amount of liquid present, or enough to cushion the material to prevent the containers from breaking.

- Inspect safety equipment, and separation procedures listed in the checklist of EH&S Policy No. 812.

3.21 CONTAINERS

At the HWHF, all wastes are packaged in containers that have been established by LBL and DOE as meeting all containment and compatibility requirements per Department of Transportation (DOT), Environmental Protection Agency (EPA), and equivalent specifications for onsite and offsite storage and transportation. Some hazardous wastes are moved to B/69 at the existing HWHF for storage. Other existing HWHF storage areas include B/75A and enclosed safety-storage-type lockers in the B/75A yard area.

Containers must be in good condition, with no visible cracks, holes, dents, bulges, corrosion, or other damage that could compromise integrity. Any containers that are bulged, corroded, or otherwise damaged are not used. EH&S Policy 807 governs procurement, receipt, and control of containers for the HWHF.

The container procurement, receipt, and inspection process is detailed in Figure 3-7. The container type is approved by the HWHF Systems Group Manager prior to actual procurement. The approval is based upon certification in writing from the vendor that the containers meet the design requirement.

Containers are not used for shipment or storage of waste that could react with or degrade the container by physical, chemical, or radiological mechanisms, unless internal container protection has been provided and documented.

Fifty-five-gallon drums are banded in groups of four and palletized to facilitate offloading by forklift.

3.21.1 Types and Specifications

Generators must ship HW to the HWHF in approved containers, as shown in Table 3.1. The types of containers used for each waste stream at the HWHF are shown in Table 3.2.

3.21.2 Procurement

All waste drums used in Waste Accumulation Areas (WAAs) should come from EH&S, unless the waste is placed into a product drum. As an example, waste oil can be put into an empty drum that once contained the same oil product. EH&S Policy 862 governs the issuance of waste containers for WAAs.

3.21.3 Receipt and Inspection

Prior to use of any containers, they are inspected inside and out by a trained HWHF Technician. Inspection is conducted upon receipt or prior to delivery to the field to ensure that the containers have not been damaged in a way that will affect their integrity.

The drum is inspected for:

- Dents
- Deformation of sealing surfaces
- Continuity of welds

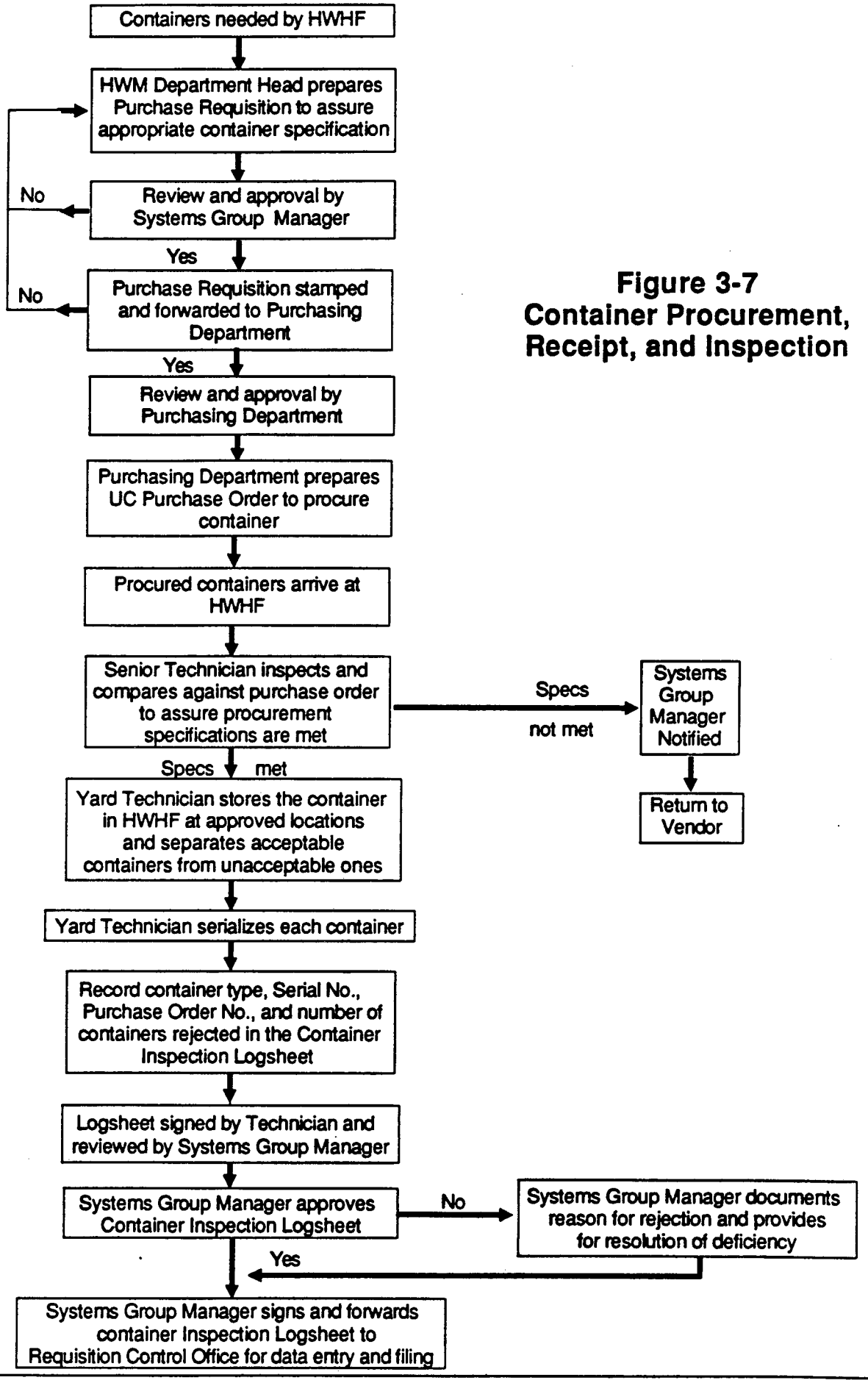


Figure 3-7
Container Procurement, Receipt, and Inspection

TABLE 3.1

CONTAINERS TYPES FOR GENERATORS

Waste Type	Approved Container
Liquid wastes (large quantities)	55-gallon DOT 17E drum
Solid waste (large quantities)	55-gallon DOT 17H drum
Small individual waste containers and lab-pack-quantity chemicals (for SAAs)	Plastic tote box
Liquid wastes, bulk, nonflammable (for SAAs)	5-gallon plastic or glass carboy, depending on chemical to be contained (one carboy for each hazard category)
Liquid wastes; bulk, flammable (for SAAs)	Red metal 5-gallon flammable liquid can
Asbestos	Double plastic bags labeled ASBESTOS
Mercury	Keep in original containers
PCB-containing	Call EH&S for details

Note: SAA = Satellite Accumulation Area

TABLE 3.2

CONTAINERS TYPES USED AT THE HWHF

Waste Stream	Container Volume(s)	Container type and Composition	DOT Classification
Corrosive liquids	55-gallon	Polyethylene (PE) bung-type drums	34
Waste solvents	55-gallon	Steel drums, bung-type	17E
Waste oils	55-gallon 2,000-gallon(1)	Steel drums, bung-type Double-walled steel underground tank	17E N.A.(2)
Waste coolants	55-gallon	Steel drums, bung-type	17E
Waste empty drums	55-gallon	Steel drums, bung and open-top	17E, 17H
Asbestos	Between 1-7 cubic feet (cu. ft.)	PE double bags stored in steel bin	N.A.(3)
Contaminated soils	55-gallon Trucks	Open-top steel drums with PE liners (15- or 40 mil)	17H
Fluorescent light bulbs	55-gallon	PE drums, open-top	35
Motor vehicle batteries	4.5 cu. ft.	Stainless steel bin(4)	N.A.(2)

(1) The replacement HWHF will have a 3,000-gallon UST.
(2) Not a shipping container.
(3) The disposal company supplies the shipping containers into which the PE bags are placed.
(4) Batteries are wrapped in plastic and sealed if broken or damaged before placement in bin.
Note: No overpacking is used.

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TABLE 3.2

CONTAINERS TYPES USED AT THE HWHF
(Continued)

Waste Stream	Container Volume(s)	Container type and Composition	DOT Classification
Metal sludges	55-gallon	Open-top steel drums with PE liners (15- or 40-mil)	17H
PCB's and PCB-contaminated equipment	55-gallon	Steel drums with PE liners (15- or 40-mil)	Liquid: 17E Solid: 17C
Mixed waste(5)	55-gallon	Open-top steel drums	17H
Lab packs	5- and 20-gallon 55-gallon	Open-top PE drums	Exempt(6) DOT-E-7768-55
Mercury	55-gallon	Open-top steel drums with PE liners (15- or 40-mil)	17H
Oily rags	55-gallon	Open-top steel drums with PE liners (15- or 40-mil)	17H
Paint materials			
Latex	55-gallon	Steel drums	17H
Oil-based	55-gallon	Steel drums	17E
Spent activated carbon	55-gallon	Bung-type PE drums Steel drums	34, E-680055 17H

(5) Refer also to Hanford Mixed Waste Acceptance Criteria (Appendix VI-2, Section 5.4).
(6) Refer to Appendix VI-1 for DOT exemption information for 5- and 20-gallon drums.
Note: No overpacking is used.

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- Surface coating, lack of imperfections
- Rust and nicks

The results of this inspection, as well as the name of the person conducting the inspection, are submitted to the Certification Officer, who is knowledgeable in the criteria for determining the extent of any damage to a container and corresponding reduction of its integrity. This receipt and inspection process is presented in EH&S Policy No. 807, *Container Procurement, Receipt, and Control.*

3.21.4 Control

Containers used for onsite transfer of HW to the HWHF from the generator facilities are approved for onsite use (Table 3.1) and in good condition, with no signs of damage that could affect the containment capability.

Containers used for packaging and transportation of HW from LBL to the disposal site are controlled by EH&S Policies 807 and 862 to ensure that the integrity to the container has not been affected during packaging or handling. These containers are also managed to avoid adverse influence from other factors on the contaminant capability of the waste package while it awaits packaging, is packaged, or awaits transfer after closure.

3.21.5 Containment

Hazardous wastes are stored primarily in 55-gallon drums, and in all cases the waste containers are placed in areas provided with secondary containment systems to prevent potential releases of the stored wastes should the primary containment fail. Storage areas include safety storage-type structures and buildings. Selection of storage locations has included consideration of separation requirements for incompatible waste types and requirements for adequate aisle space for unconstrained personnel and equipment movement.

3.21.6 Fire Retardancy

All containers used for disposal of HW with the exception of plastic wrap and PE drums are constructed of metal or are fire retardant. Containers for storage HW are constructed of metal.

3.22 SHIPPING

3.22.1 Labeling and Marking

All HW packages shipped off site for storage or disposal meet the labeling and marking criteria specified in 49 CFR 171, (DOT 1991) and 40 CFR. Drums containing hazardous wastes are labeled or marked with the words "Hazardous Waste." The composition, physical state of the waste, and other information required by 22 California Code of Regulations (CCR) 22-66508 are also marked on the drum label. When accumulation begins in each container of hazardous waste, required DOT labeling is applied to it.

3.22.2 Packaging

Packaging for the different HW streams are delineated in the EH&S Policies listed in Appendix A.

3.22.3 Handling

All waste packages from LBL are provided with permanently attached skids, cleats, offsets, rings, handles, or other auxiliary lifting devices to allow handling by means of a forklift, crane, or similar handling equipment. In rare cases, a two-wheeled dolly may be used to transfer drums by hand.

3.22.4 Manifests

Waste shipped off site is manifested. The generator retains two copies of the manifest (copies 2 and 4) and one copy of the packing list, and one copy of the disposal requisition form. The details for a waste manifest are delineated in EH&S Policy No. 861, "Manifesting and Shipping."

3.22.5 Transportation

The procedures for transporting HW waste on site and off site are as follows:

3.22.5.1 Onsite Transfers

HWs are transported in containers specified in Table 3.1 and secured to the trucks.

3.22.5.2 Offsite Transfers

Offsite transfers of HW are done in DOT specification containers in accordance with 49 CFR requirements. All wastes have shipping papers and DOT specification marking and labeling.

3.23 CERTIFICATION, DATA COLLECTION, AND RECORD KEEPING

Certified waste is waste that has been confirmed to comply with disposal/storage site waste acceptance criteria under an approved certification program.

Certification is the process of assuring that each waste package complies with all applicable criteria for offsite shipment, storage, and disposal. For LBL, this includes meeting 40 CFR, 49 CFR, 22 CCR, and EH&S Policies.

It is the responsibility of the LBL HWHF Systems Group Manager to ensure certification in accordance with EH&S Policy No. 861.

Compliance with waste acceptance criteria includes proper performance of the following:

- Identifying the waste through characterization or through sampling and analysis
- Packaging
- Labeling and marking
- Documenting the waste

For each waste package, the Systems Group Manager certifies adherence to

- All governing regulations
- All applicable storage/disposal site waste acceptance criteria
- All requirements specified in the EH&S policy for a particular type of waste

Overall, the Systems Group Manager certifies that all requirements are met.

4.0

QUALITY ASSURANCE

4.1 QA ORGANIZATION, DUTIES, AND RESPONSIBILITIES SUMMARY

The LBL HWHF Quality Assurance Program Plan (QAPP) (LBL 1990b) describes the Quality Assurance organization, duties, and responsibilities for the management of activities required to handle, store, and prepare for shipment HW at LBL. The program has been designed to ensure that generated waste meets the following:

- DOE Order 5700.6C, *Quality Assurance* (DOE 1991)
- Title 40 CFR (EPA 1991)
- Title 22 CCR

The HWHF QAPP is the written quality assurance program plan required by the University of California Lawrence Berkeley Laboratory Institutional Quality Assurance Program Plan (IQAPP) and EH&S activities related to the HWHF.

4.2 SUMMARY OF THE FACILITY QUALITY ASSURANCE PROGRAM

The HWHF QAPP (LBL 1990b) establishes the framework and requirements that are met in planning, implementing, documenting, and verifying HWHF activities. The subsections that follow identify the implementing plans and procedures.

4.2.1 Organization and Responsibilities

The organizational structure, functional responsibilities, level of authority, lines of communication, and the interface relationship required for activities affecting the quality

of the waste handling program are delineated in the QAPP. Figures 4-1, 4-2 and 2-1 show the organization relationships of positions.

Functional Responsibilities

Associate Laboratory Director, Operations

- Has overall responsibility for the implementation of the QAPP in the HWHF
- Assures that resources necessary to implement this QAPP are provided
- Approves the use of this QAPP and any revisions

Division Director, Environment, Health and Safety (EH&S) Division

- Is responsible for directing and monitoring the implementation of the HWHF QAPP
- Reviews and concurs in the use of this QAPP and any revisions

Department Head, Hazardous Waste Management Department

- Is responsible for directing and monitoring the HWHF QA Program
- Issues the HWHF QAPP and any revisions
- Assures that necessary corrections, identified as a result of the QA audits and reviews, are accomplished in a timely manner

Operations Group Manager, HWHF

- Is responsible for plans and supervision of the HWHF
- Evaluates disposal work and issues assignments to members of the section
- Organizes training for members of the HWHF, as well as LBL waste generators
- Assures that waste is properly analyzed and that effective methods of minimizing and segregating waste are instituted
- Assures that waste disposal files are maintained

Figure 4-1

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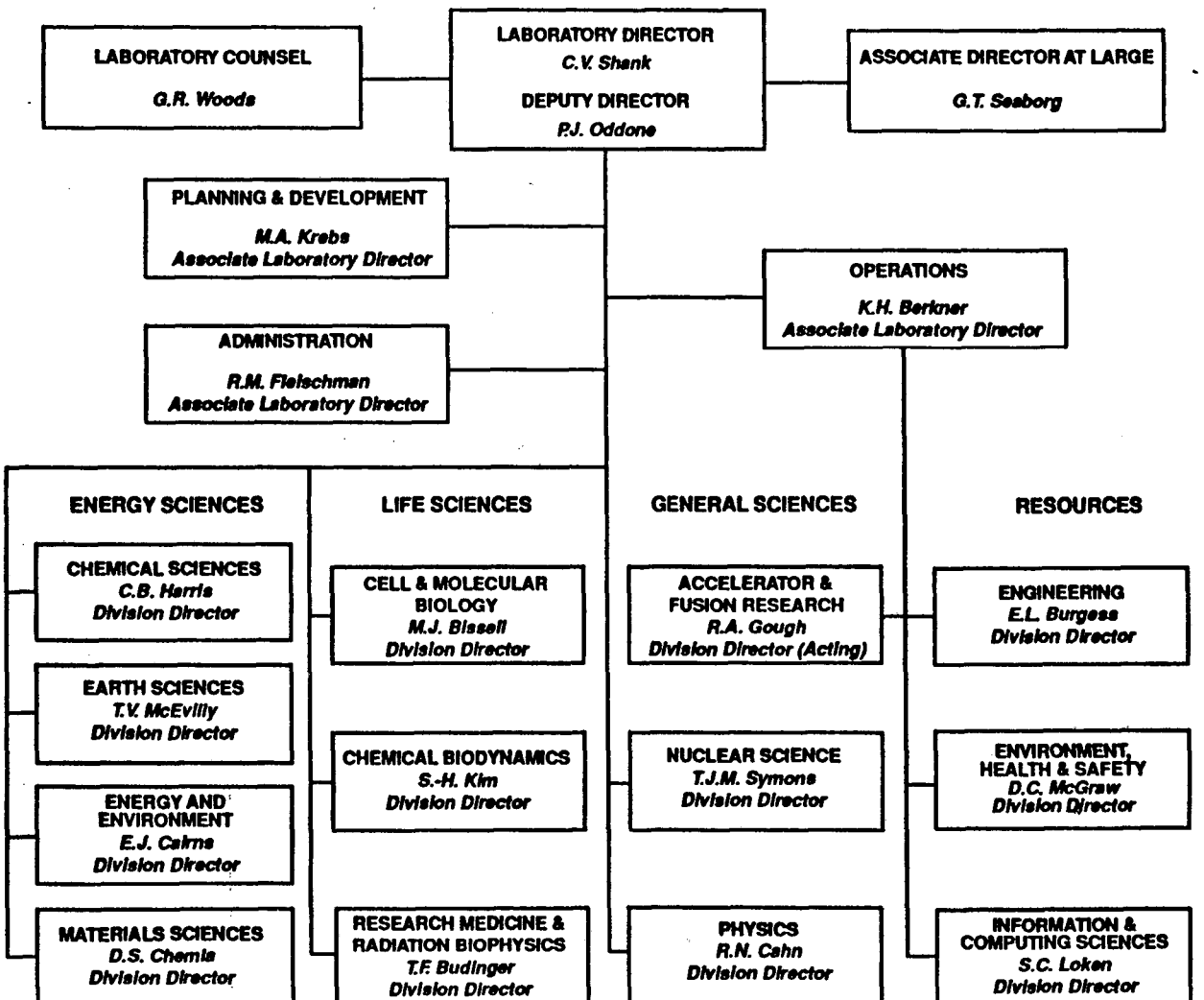
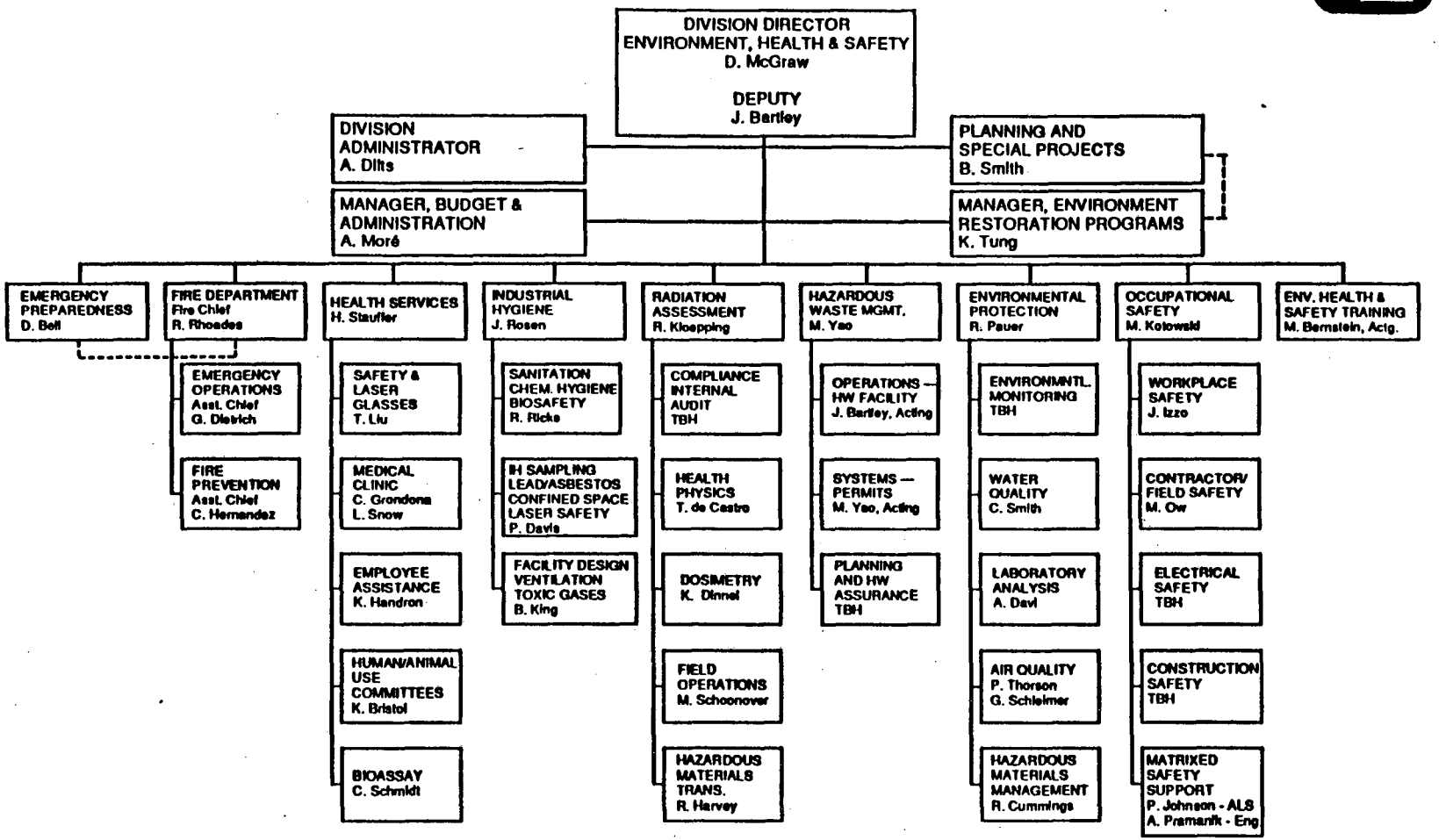


Figure 4-2

Lawrence Berkeley Laboratory
Environment, Health and Safety Division
Organization Chart



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Systems Group Manager, HWHF

- Certifies compliance with waste acceptance criteria
- Certifies that HW storage, packaging, waste form criteria, and waste package criteria meet the applicable requirements
- Certifies that DOT shipping requirements are met
- Maintains data records on all nonconformances and corrective actions
- Co-signs all QA/QC checklists when complete and signed by the responsible Technician.
- Assures that materials, items, systems, and services that are important to the waste certification process are procured in accordance with all required specifications.
- Assures that the vendors have certified, in writing, that their products or services meet the procurement specifications.
- Assures that purchased products are inspected upon receipt to verify that they meet the procurement specifications and are not damaged.
- Resolves, with the vendor, any discrepancies between the received products and the procurement specifications in any compliance and certification documentation prior to use of the items.
- Certifies that labeling and marking requirements of 49 CFR 171, 172, and 173 are met
- Certifies that the appropriate documentation and records are prepared
- Assures that waste disposal files are maintained
- Interacts with regulatory agencies to maintain compliance with all regulations
- Assures that services, materials, equipment, and components of shipping containers are selected from a supplier that meets DOT requirements, as specified in 49 CFR

EH&S QA Management

- Reviews QA training to ensure that competence is attained as required by the "LBL Institutional QA Plan"

EH&S QA Program personnel

- Assure that quality is achieved and maintained by those who have responsibility for the work
- Verify achievement of quality
- May delegate work but not responsibility
- Have the authority, access, and freedom to identify quality problems; initiate, recommend, or provide solutions to quality problems; verify implementation of solutions; and assure proper disposition of nonconformances or unsatisfactory conditions
- Have direct access to responsible management levels where appropriate action can be effected

4.2.2 Program

The QA program is designed to assure the quality and reliability of HWHF activities and that activities are planned, controlled, implemented, maintained, and documented in accordance with the NQA-1-1989 standard.

4.2.3 Design Control

The design and construction of new facilities and the modification of existing facilities are preformed in accordance with the design criteria specified in DOE Order 6430.1A (DOE 1989).

4.2.4 Procurement Document Control

Procurement of containers for HW is governed by EH&S Policy No. 807, *Container Procurement, Receipt, and Inspection.* This procedure assures that procurement documentation transmitted to the Systems Group includes technical, quality assurance,

source inspection, audit and surveillance, documentation and reports per procurement requirements.

4.2.5 Instructions, Procedures, and Drawings

The HW certification program is described in this Certification Plan as described in Section 3. Hazardous Waste Management Program procedures are listed in Appendix A.

4.2.6 Document Control

The HWHF Systems Group is responsible for document preparation, review, approval, revision, control, and distribution of documents related to waste disposal operations. Controlled documents include the following:

- EH&S Procedures
- HWHF QAPP
- The *HW Certification Plan*

4.2.7 Control of Purchased Items and Services

Procurement and Work Order Requests are used to assure that materials, equipment, and services important to the ES&H activities are procured to meet specific requirements. Supplier selections and qualification, receipt inspection, and audits and surveillance are controlled by HWMP.

4.2.8 Identification and Control of Items

Waste containers, waste samples, and disposal activities are controlled in a manner designed to provide unique container identification, unique sample identification, and tracking and labeling of waste. Instructions and procedures governing these activities are listed in Appendix A.

4.2.9 Control of Processes

Waste handling activities are performed in accordance with procedures specified in the *Waste Management Plan* (LBL 1991d). Waste certification is controlled by the applicable waste certification plan requirements.

4.2.10 Inspection

Inspections are conducted to verify waste characterization, container adequacy and packaging, and the correctness of records.

4.2.11 Test Control

Quality assurance tests are performed by the Hazardous Waste Handling Facility to verify characterization of waste and to demonstrate container and packaging adequacy. Tests are performed according to the applicable EPA and DOT regulations.

4.2.12 Control of Measuring and Test Equipment

Measuring and test equipment used in the waste certification process are calibrated on a schedule recommended by the vendor. In addition, calibration (operational readiness) checks are performed by analysts and technicians before instruments are used. California tags or stickers are attached to instruments and equipment to indicate the last calibration date and the next due date.

Instrument and equipment calibration procedures and records are maintained by the Radiation Assessment Department. The Department Head approves the development and use of calibration procedures and requirements for control of measuring and test equipment for HW.

4.2.13 Handling, Storage, and Shipping

The handling, storage and shipping of HW is accomplished in accordance with procedures and instructions specified in the EH&S Policies listed in Appendix A.

4.2.14 Inspection, Test, and Operating Status

The inspection, test, and operating status indicators used are in accordance with the requirements specified in the draft *Waste Management Plan* (LBL 1991d).

4.2.15 Control of Nonconforming Items

Nonconforming items can be out-of-specification waste containers, imperfect or malfunctioning test and measurement devices, or other out-of-specification or noncompliance items that could adversely affect waste certification, handling,

transportation or disposal. Items in the HWHF that are identified as nonconforming are segregated and marked until corrected or properly dispositioned (i.e., waste containers that do not meet approved standard), detailed in the EH&S procedures listed in Appendix A.

4.2.16 Corrective Action

The HWM staff are responsible for taking prompt and appropriate action to prevent the effects of a detected quality problem from spreading. The attendant HWM staff person notifies the Section Head and others whose work is affected, and documents the problem and the corrective action taken when any of the following apply:

- An approved documentation QA record is changed because of the problem or will be changed by the corrective action taken;
- The problem is not trivial, and there is a significant probability that it will reoccur; or
- A written agreement (maintenance agreement, vendor specification, etc.) related to HWHF work, cost, or schedule is affected by the problem or correction.

4.2.17 Certification Records

In general, QA records are retained for the lifetime of the HWHF; however, the HWM Department Head may limit or extend the retention period and may specify the method of disposal.

4.2.18 Surveillance and Audits

In accordance with the LBL QAPP, all divisions are audited on a rotating basis within a two- to three-year basis.

4.3 QA Program Index

In compliance with DOE Order 5700.6C (DOE 1991), the HWHF has selected ASME NQA-1-1989 as the national consensus standard basis of its QA Program. Table 4-1 identifies the NQA-1 criteria and the relevant HWHF QAPP Section.

Table 4-1

NQA-1 CRITERIA AND RELEVANT HWIIF QAPP SECTIONS

NQA-1 Basics (1) / HWIIF QA Program Plan	I Organization	II Quality Assurance Program	III Design Control	IV Procurement Document Control	V Instructions Procedures and Drawings	VI Document Control	VII Purchasing Control	VIII ID & Control	IX Special Processes	X Inspection	XI Test Control	XII MATE	XIII Handling, Shipping, & Storage	XIV Inspection, Test & OPS. Status	XV Nonconformances	XVI Corrective Action	XVII Records	XVIII Audits
2.1	✔																	
2.2		✔																
2.3			(2)															
2.4				✔														
2.5					✔													
2.6						✔												
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2.14														✔				
2.15															✔			
2.16	✔															✔		
2.17																	✔	
2.18																		✔

NOTE: (1) A "✔" in each of the 18 NQA-1 "Basics" columns indicates coverage of the criteria as described in the HWIIF QAPP Section. Specific audits and/or Quality Surveillances will determine the adequacy of coverage.

(2) Design control measures are not established for the HWIIF. See Section 2.3 of the HWIIF QAPP.

5.0

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APPENDIX A

HAZARDOUS WASTE MANAGEMENT PROGRAM PROCEDURES

MASTER PROCEDURE LIST
HAZARDOUS WASTE MANAGEMENT PROGRAM

Procedure No.	Short Title
800–819	GENERAL POLICY
800	General Policy Statement (Rev. 1, 3/20/92)
801	Emergency Procedures (Draft, 1/92)*
802	Facility Description (Draft, 1/92)*
803	Waste Management Documentation and Guides (Draft, 1/92)
804	Overview of Hazardous Waste Streams Handled (Draft, 1/92)*
805	Procedure for Writing Procedures (Rev. 0, 7/17/91)
806	Characterization Procedure (Rev. 0, 5/27/92)
807	Container Procurement, Receipt, and Control (Draft, 1/92)
808	Nonconformance Control (Rev. 0, 6/92)
809	Onsite Transportation of Hazardous Waste (Rev. 0, 5/27/92)
809.1	Offsite Transfer of Radioactive Waste to the HWHF (Rev. 0, 6/92)
810	General Vendor Oversight Policy Statement (Rev. 0, 7/17/91)
811	Oversight Procedures—Onsite Transportation (Draft, 1/92)*
812	Oversight Procedures—Lab Packing (Rev. 1, 3/20/92)
820–839	RADWASTE GENERAL
820	Personnel Protection for Radwaste Handling (Draft, 1/92)
821	Radiation Areas at the HWHF (Draft, 1/92)
822	Radiation Monitoring and Records (Draft, 1/92)
823	Safe Use of Radioactive Fume Hoods (Draft, 1/92)
824	Safe Use of Radioactive Fume Hoods/HEPA Filters (Draft, 1/92)
825	Safe Use of Radioactive Glove Boxes (Draft, 1/92)
826	LBL Radwaste Disposal Procedures—General (Draft, 1/92)
827	Classification of Radioactive Waste (Draft, 1/92)
828	Radwaste Segregation and Packing Procedures (Draft, 1/92)
829	Radwaste Tracking (Draft, 1/92)
830	SDARs (Draft, 1/92)
831	Radwaste Documentation/Release Procedures for Shipments to Hanford Burial Site (Rev. 0, 5/27/92)
831.1	Instructions on Filling Out SWS/DRs (Draft, 1/92)
832	Radioactive Waste Disposal QA Program (Draft, 1/92)
833	Labeling/Characterization/Segregation of Stored Radwaste (Draft, 1/92)
838	Release of RCRA/TSCA Waste from Uncontrolled Areas (Rev. 0, 5/27/92)
838.1	Release of RCRA/TSCA Waste (unknown origin) from HWHF (Rev. 0, 5/27/92)
708	Release of Materials/Equipment from RMMAs (Rev. 0, 5/27/92)

* Final version awaiting Part B Permit approval.
NOTE: All procedures have been implemented; procedures implemented in draft form are still undergoing independent review or field testing.

MASTER PROCEDURE LIST
HAZARDOUS WASTE MANAGEMENT PROGRAM (p. 2)

Procedure No.	Short Title
840–859	RADWASTE PROCEDURES (BY WASTE STREAM)
840	Compaction of Solid Low-Level Radioactive Waste (Rev. 0, 7/17/91)
841	Packaging of Noncompacted Solid Low-Level Radioactive Waste (Draft, 1/92)
842	Packaging of Noncompacted Solid Low-Level Radioactive Waste—Wooden Boxes (Draft, 1/92)
843	Packing of Induced Metals, Materials, and Equipment (Draft, 6/92)
844	Packing of Low-Level Animal Carcasses (Draft, 1/92)
845	Packing of Low-Level Absorbed Tritium (Draft, 1/92)
846	Scintillation Vial Crushing (Rev. 0, 7/17/91)
847	Solidification of Low-Level Radioactive Waste Liquid (Rev. 0, 7/17/91)
860–869	RCRA, GENERAL
860	List of Nonradioactive Waste Streams (Draft, 1/92)*
861	Manifesting and Shipping (Rev. 1, 5/27/92)
862	Waste Container Request, Issuance, and Control (Draft, 1/92)
863	Inspections (Draft, 1/92)
864	Sampling Procedure—Nonradioactive Hazardous Waste (Rev. 0, 5/27/92)
865	Consolidation Procedure (Draft, 1/92)*
866	Transfer Procedure from Inadequate Containers (Rev. 0, 3/20/92)
867	Hazwaste Tracking (Rev. 0, 5/27/92)
870–889	RCRA PROCEDURES (BY WASTE STREAM)
871	Handling of Bulk Acids (Draft, 1/92)*
872	Draining and Consolidation of Battery Acid (Draft, 1/92)*
873	Consolidation of Mercury Wastes (Draft, 1/92)*
874	Handling of Bulk Caustics (Draft, 1/92)*
876	Consolidation of PCBs (Draft, 1/92)*
877	Analysis and Consolidation of Waste Oils (Draft, 1/92)*
878	Handling of Bulk Coolants (Draft, 1/92)*
879	Organic Liquids—Flammable (Draft, 1/92)*
880	Organic Liquids—Halogenated Solvents (Draft, 1/92)*
881	Consolidation of Asbestos (Draft, 1/92)*
882	Consolidation of Contaminated Soil (Draft, 1/92)*

* Final version awaiting Part B Permit approval.

APPENDIX B

DEFINITIONS

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Dangerous Wastes
Dangerous waste means those solid wastes designated in WAC 173-303-070 through 173-303-103 (Washington State 1989) as dangerous or extremely hazardous waste. As used in this chapter, the words "dangerous waste" will refer to the full universe of wastes regulated by this chapter (including dangerous and extremely hazardous waste). (See also "extremely hazardous waste" and "hazardous waste" definitions).

Extremely Hazardous Waste
Extremely hazardous waste means those dangerous wastes designated in WAC 173-303-070 through 173-303-103 (Washington State 1989) as extremely hazardous. (See also "dangerous waste" and "hazardous waste" definitions).

Hazardous Wastes
Hazardous wastes means those solid wastes designated by 40 CFR Part 261, and regulated as hazardous waste by the United States EPA. (See also "extremely hazardous waste" and "hazardous waste" definitions).

Low-Level Waste
Low-level waste is waste that contains radioactivity and is not classified as high level waste, TRU waste, spent nuclear fuel, or by-product material as defined in DOE Orders 5820.2A and 5400.3. Test specimens of fissionable material irradiated for research and development only, and not for the production of power or plutonium, may be designated as LLW, provided the concentration of TRU radionuclides is $\leq$100 nCi/g of the waste matrix. The mass of the waste container shall not be used in calculating the concentrations of radionuclides in the waste.

Radioactive Mixed Waste
Radioactive mixed waste is radioactive waste (LLW or TRU waste) that is co-contaminated with dangerous waste as defined in WAC 173-303-040(18) (Washington State 1989).

Transuranic Waste
Without regard to source or form, TRU waste is waste contaminated with alpha-emitting TRU radionuclides with half-lives >20 yr and concentrations >100 nCi/g of the waste matrix. Transuranic radionuclides are radionuclides having an atomic number >92. In addition to TRU radionuclides, radium sources and ^{233}U in concentrations >100 nCi/g of the waste matrix are designated as TRU waste by Westinghouse Hanford because of hazards similar to TRU waste. The concentration limit (100 nCi/g of waste matrix) for TRU waste applies to the item at the time it is declared waste. Additional processing of the waste (e.g., grouting) cannot be used to dilute the concentration of the fissile material and thereby change its waste designation. The only acceptable methods to be used in reducing the concentration of fissile material in waste packages are approved, permitted decontamination or treatment processes. The mass of the waste container shall not be used in calculating the specific activity of the waste.

Packaged TRU waste with a surface dose rate that does not exceed 200 mrem/h is designated as contact-handled TRU. Packaged TRU waste with an external dose rate in excess of 200 mrem/h is designated as remote-handled TRU. Radioactive wastes with quantities of TRU radionuclides in concentrations of 100 nCi/g of the waste matrix or less is LLW.

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