Department of Energy
Field Office, Albuquerque
Los Alamos Area Office
Los Alamos, New Mexico 87544

NEW MEXICO ENVIRONMENT DEPARTMENT
1992 SEP -3 PM 2:50
OFFICE OF THE SECRETARY

SEP 3 1992

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Ms. Kathleen Sisneros
Director of Water and Waste Management
New Mexico Environment Department
P.O. Box 26110
Santa Fe, New Mexico 87502

Dear Ms. Sisneros:

The purpose of this letter is to provide you with information on the progress that has been made at the Los Alamos National Laboratory (LANL) to assure compliance with the New Mexico Environment Department's (NMED) Hazardous Waste Management Regulations (HWMR). This response is based on your staff's preliminary findings presented at the outbriefing of the May 1992 HWMR inspection at LANL as well as institutional changes that are being implemented to ensure compliance throughout the facility.

In a memorandum dated May 15, 1992, the LANL Director's Office summarized NMED's preliminary findings for the Associate Directors and assigned responsibility for correcting all deficiencies to the organizations who operate those facilities (Enclosure 1). Responsible Division and Group Leaders were also directed to identify and correct the underlying causes which led to the deficiencies. Actions being taken to identify and correct underlying causes that could potentially lead to regulatory non-compliance are discussed below.

1. Response to Preliminary Findings Cited During the Inspection Closeout

   Enclosure 2 lists each preliminary finding cited during the inspection closeout conducted by Coby Muckelroy of your staff on May 8, 1992. Based upon these findings, LANL acted immediately to correct them.

2. Training Program

   Enclosure 3 is a list of all relevant Resource Conservation and Recovery Act (RCRA) training which has been conducted at LANL beginning in Fiscal Year 1991, and the total number of personnel trained to date. LANL's training program for hazardous waste generators is designed to provide information needed to properly identify and manage waste, including completing waste profile and disposal forms. Training for waste management coordinators ensures that waste accumulation and storage areas are regularly inspected; appropriate regulations followed; accurate records kept; and inspection reports prepared correctly.

16537

3. Review of Hazardous Waste Generator Storage Areas

Because of the number of findings related to generator storage of hazardous waste during NMED's inspection, LANL tasked a contractor to survey all waste accumulation areas at the facility. The primary purpose of this task is to assist in identifying areas of potential noncompliance so that LANL can perform corrective action. Over 400 waste accumulation sites have been visited since the May inspection.

4. Environmental Management Division Budget Request

Because training is essential in ensuring compliance with all relevant waste management regulations, a full-time equivalent has been requested to provide additional support on developing and updating training programs, and oversight and inspection of hazardous waste management areas.

5. Moratorium on the Generation of Mixed Waste

As a result of the RCRA Land Disposal Restriction (LDR) storage prohibitions, LANL suspended all non-ES&H mixed waste generation on May 7, 1992 (see Enclosure 4). DOE is currently negotiating terms and conditions of a Federal Facilities Compliance Agreement (FFCA) with the Environmental Protection Agency (EPA), and this process include coordination with your staff.

The scope of the FFCA includes all mixed wastes currently subject to LDR and pre-authorization wastes (i.e., radioactive wastes containing hazardous wastes generated prior to July 25, 1990) which may become subject to LDR as a result of remediation activities. The FFCA consists of two parts: 1) terms and conditions; and 2) a compliance plan. The terms and conditions are binding agreements between DOE and EPA by which DOE will implement the compliance plan. The compliance plan details the manner by which LANL will treat and store mixed wastes during the life of the agreement.

6. Revision of Administrative Requirement (AR) 10-3

Hazardous and mixed waste management is addressed in LANL's AR 10-3. It summarizes generator requirements for identification and accumulation of hazardous and mixed waste in compliance with state and federal regulations. AR 10-3 was revised in July 1992 to address new DOE directives on identifying mixed wastes (see Enclosure 5).

7. Compliance Status Notebook

In response to the preliminary findings from the inspection, LANL has created an Environmental Compliance Status Notebook for use by upper management. The purpose of this notebook, which will be updated monthly, is to keep upper management informed of current environmental compliance status in all areas. It will also assign greater responsibility for environmental compliance issues to the Environmental Management Division.

8. Environmental Compliance Task Force

LANL recognizes that it continues to have deficiencies in compliance with environmental regulations, and established an Environmental Compliance Program Task Force on July 29, 1992, to develop and recommend a comprehensive LANL-wide environmental assurance program. Members of the Environmental Compliance Program Task Force have been meeting daily since that time, and are working to develop a draft report with recommendations for action by the middle of September 1992. Enclosure 6 consists of viewgraphs used to brief the LANL senior management about the task force, and a memorandum by the LANL Deputy Director requesting participation by the various LANL directorates in the task force.

9. Management Meeting Regarding Facility-wide Compliance and Inspections

The LANL Deputy Director called a meeting with all managers the week following the NMED inspection to discuss findings by your staff during the closeout. The Deputy Director, with support from the LANL legal counsel, explained the seriousness of the findings and potential ramifications to operations and personnel. Managers were informed that abiding by current environmental regulations was essential for continued operations and knowing disregard of these regulations by managers and staff would lead to disciplinary actions, including dismissal.

10. Waste Drums at TA-54 Area G, Pads 1, 2, and 4

On April 8, 1992, several drums containing cemented process wastes were found to exhibit various forms of internal and external corrosion. No release of waste was found. On April 13, 1992, DOE and LANL informed your staff of the findings. Two additional meetings were conducted in late April and mid-May. Based on discussions with your technical staff, DOE submitted an action plan on June 1, 1992, to remediate pads 1, 2, and 4. The action plan relies on construction of several drum remediation facilities and a container storage facility designed to meet all RCRA storage requirements in addition to radiation safeguards.

11. TA-3 SM-40 Waste Determination

LANL sampled the containment unit at TA-3, SM-40, for RCRA hazardous waste constituents in June 1992. Initial screening results were inconclusive and additional analyses are currently being performed to determined whether this unit is subject to HWMR. Data on sample analyses from this unit will be submitted to your staff upon completion. Analyses have been placed on a high priority basis.

If analytical results indicate that the unit held hazardous wastes, your office will be informed within 72 hours and closure plans will be submitted 30 days thereafter. A full RCRA closure will commence upon approval of the plans by your office.

My staff and LANL welcome your comments and recommendations regarding this matter. If you have any questions regarding the information provided, please contact Jon Mack of my staff at 665-5026.

Sincerely,

Jerry L. Bellows
Area Manager

LESH:1JM-074

Enclosures:
As stated

cc w/enclosures:
K. Hargis, EM-8, (EM-8:92-2541-1),
LANL, MS K490

Enclosure 1

Los Alamos

Los Alamos National Laboratory
Los Alamos, New Mexico 87545

memorandum

TO: Associate Directors

FROM: James F. Jackson, DIR OFC

DATE: May 15, 1992

MAIL STOP/TELEPHONE: A101/7-4168

SYMBOL: DD

SUBJECT: **ANNUAL RCRA INSPECTION**

During the week of 5/4/92 - 5/8/92, the New Mexico Environment Department (NMED) conducted its annual hazardous waste facility inspection of LANL. The purpose of the inspection was to assess compliance with the Resource Conservation and Recovery Act (RCRA) which regulates treatment, storage, and disposal of hazardous and mixed waste. Enclosure I is a list of findings informally provided by NMED during the closeout meeting of 5/8/92. Formal inspection results have not yet been issued, but prudence dictates that we take appropriate and immediate action.

Organizations who own or operate areas listed in the findings are responsible for correcting all deficiencies immediately. Furthermore, Division and Group Leaders are directed to identify and correct the underlying causes which led to the deficiencies, as well as initiating any disciplinary action that may be indicated. Responsible individuals who fail to take immediate action, or who allow deficiencies that are clearly under their control to persist or recur, may be subject to disciplinary action up to and including dismissal.

Technical guidance on hazardous waste regulations can be obtained by contacting the Environmental Protection Group's Hazardous and Solid Waste Section at 665-0451. Findings related to training should be addressed with the HS-3 Training Office.

JFJ:TG/gr

Cy: K. Hargis (EM-8:92-1253), EM-8, MS K490

Introduction

This administrative requirement summarizes the generator requirements for controlling, storing, and disposing of hazardous and mixed wastes at the Laboratory to help protect human health and the environment and to comply with federal and state regulations. Hazardous and mixed wastes are regulated by the Resource Conservation and Recovery Act (RCRA) and the New Mexico Hazardous Waste Management Regulations (NMHWMR). Compliance with these federal and state requirements is mandatory for all operations at the Laboratory that generate, store, treat, or dispose of hazardous or mixed waste.

High-explosive and radioactive wastes are special cases and are only partially addressed in this document. Refer to Administrative Requirement (AR) 6-6, "Explosives," AR 10-1, "Radioactive Liquid Waste," AR 10-2, "Low-Level Radioactive Solid Waste," and AR 10-5, "Transuranic (TRU) Solid Waste."

Definitions

Controlled Area—Any area, as defined in Administrative Requirement (AR) 3-7, "Radiation Exposure Control," to which access is controlled to protect individuals from exposure to radiation and radioactive materials.

Hazardous Waste—As defined by the Resource Conservation and Recovery Act (RCRA), any nonradioactive solid waste intended for disposal that is corrosive, toxic, ignitable, or reactive, or that contains a listed hazardous constituent (see Appendix A). Hazardous wastes commonly generated at the Laboratory include all types of laboratory research chemicals, solvents, acids, bases, carcinogens, compressed gases, and other solid waste contaminated with hazardous waste. This may also include equipment, containers, structures, and other items intended for disposal and contaminated with hazardous waste (for example, compressed gas cylinders). For further information, see the paragraph about empty containers in this document.

Low-Level Mixed Waste—A low-level radioactive solid waste (LLW) that is also a hazardous waste.

Low-Level Radioactive Solid Waste (LLW)—Any solid waste that is derived from a radioactive material, contaminated during process, or activated by a high-energy particle beam, excluding spent nuclear fuel, high-level radioactive waste, and transuranic (TRU) waste.

Non-RCRA-Regulated Chemical Waste—Any chemical or mixture of chemicals ultimately destined for treatment or disposal that is not regulated as a hazardous waste by the Resource Conservation and Recovery Act (RCRA) but may present a threat to human health or the environment and requires special administrative controls. Such wastes include waste oils that have not been contaminated with a listed hazardous constituent and do not exhibit a hazardous characteristic, nonregulated chemical reagents or reactants, nonregulated heavy metals, nonregulated solvents, and asbestos.

NOTE: These materials may be subject to regulations other than RCRA.

For further information see Administrative Requirement (AR) 9-1, "Air Pollution Control," AR 9-4, "Accidental Oil, Chemical, and Airborne Releases," AR 10-1, "Radioactive Liquid Waste," AR 10-2, "Low-Level Radioactive Solid Waste," AR 10-4, "Polychlorinated Biphenyls," AR 10-5, "Transuranic (TRU) Solid Waste," AR 10-6, "Excess Government Personal Property," and AR 10-7, "Managing Infectious Waste."

Radioactive Material Management Area (RMMA)—An area established to control the movement of materials and wastes that may become radioactive as a result of contact with radioactive materials, airborne contaminants, or high-energy particle beams. An RMMA boundary may coincide with the boundary of a radiological area (as defined in AR 3-7, "Radiation Exposure Control") or, in some cases, with the boundary of a controlled area.

Radiological Area—A generic term, as defined in AR 3-7, "Radiation Exposure Control," for a (1) contaminated area, (2) airborne radioactivity area, (3) radiation area, (4) high radiation area, or (5) very high radiation area.

Solid Waste—As defined by the Resource Conservation and Recovery Act (RCRA), any discarded material, either abandoned or recycled, including liquids, solids, semisolids, and contained gases. Solid waste can be hazardous, radioactive (including transuranic), or mixed hazardous and radioactive.

Suspect Mixed Waste—A suspect radioactive solid waste that is also a hazardous waste.

Suspect Radioactive Solid Waste—Any solid waste that may have added and/or induced radioactivity as a result of association with radiation sources or high-energy particle beams, but which is not readily detectable by radiation detection devices.

Transuranic (TRU) Mixed Waste—Any mixture of TRU waste and hazardous waste.

Transuranic (TRU) Solid Waste—Any solid waste that is derived from a radioactive material or becomes contaminated during a process, which contains a radionuclide with a half-life of greater than 20 years and exhibits an alpha activity of 100 nCi/g or greater at the time of survey, excluding naturally occurring and depleted uranium, spent nuclear fuel, and high-level radioactive waste.

Overall Responsibility

Unless otherwise stated in this administrative requirement, line managers must ensure that the requirements specified herein are met.

Identifying Hazardous and Mixed Wastes

Hazardous materials (including hazardous wastes) in work areas must be identified, and the Industrial Hygiene and Safety Group (HS-5) must be contacted if workers could be exposed while handling such materials. In general, hazardous and mixed wastes are categorized as characteristic waste or listed waste. Containers may also be hazardous or mixed waste. Information useful to categorize hazardous and mixed wastes can often be obtained from the container label, material safety data sheets (MSDSs), manufacturers' product descriptions, knowledge of the process (KOP) that generated the waste, past experience with the waste stream, or analysis of a waste sample. Waste sampling and analysis must be performed in accordance with methods specified in the Environmental Protection Agency (EPA) publication SW 846, "Test Methods for Evaluating Solid Wastes." This service is provided by the Environmental Protection Group (EM-8). Additional assistance in determining whether a material is a hazardous or mixed waste is also available from EM-8.

NOTE: The requirements for handling hazardous waste apply to so-called "consumer products" regardless of where they were purchased.

Characteristic Waste. A material may be a hazardous or mixed waste if it exhibits one or more of the following characteristics:

- Ignitability: The waste has a flash point of less than 60°C (140°F); is an ignitable compressed gas; is an oxidizer as defined in 49 CFR 173.151; or is not a liquid and, at standard temperature and pressure (STP), can cause a fire from friction, absorption of moisture, or spontaneous chemical changes.
- Corrosiveness: The waste is aqueous with a pH less than or equal to 2 or greater than or equal to 12.5, or the waste is a liquid and corrodes steel at a rate greater than 6.35 mm/yr (0.25 in./yr) at 55°C (130°F).
- Reactivity: The waste is normally unstable and readily undergoes violent change without detonating; reacts violently with water at STP; forms potentially explosive mixtures with water; generates toxic gases, vapors, or fumes when mixed with water; is a cyanide- or sulfide-bearing waste which, when exposed to a pH greater than 2 and less than 12.5, can generate toxic gases, vapors, or fumes; is capable of detonation or explosive reaction if subjected to a strong initiating source or if heated under confinement; is capable of detonation or explosive decomposition at STP; or is a forbidden Class A or Class B explosive.
- Toxicity Characteristic Leaching Procedure (TCLP): The waste is contaminated with one of the following metals, pesticides, or organic chemicals in the stated concentrations (mg/l) as determined by TCLP. Contact EM-8 for further information.

Constituent	mg/l
1,1-Dichloroethylene	0.7
1,2-Dichloroethane	0.5
1,4-Dichlorobenzene	7.5
2,4,5-TP (Silvex)	1.0
2,4,5-Trichlorophenol	400.0
2,4,6-Trichlorophenol	2.0
2,4-D	10.0
2,4-Dinitrotoluene	0.13
Arsenic	5.0
Barium	100.0

Benzene	0.5
Cadmium	1.0
Carbon tetrachloride	0.5
Chlordane	0.03
Chlorobenzene	100.0
Chloroform	6.0
Chromium	5.0
Cresol	200.0
Endrin	0.02
Heptachlor	0.008
Hexachlorobenzene	0.13
Hexachlorobutadiene	0.5
Hexachloroethane	3.0
Lead	5.0
Lindane	0.4
m-Cresol	200.0
Mercury	0.2
Methoxychlor	10.0
Methyl ethyl ketone	200.0
Nitrobenzene	2.0
o-Cresol	200.0
p-Cresol	200.0
Pentachlorophenol	100.0
Pyridine	5.0
Selenium	1.0
Silver	5.0
Tetrachloroethylene	0.7
Toxaphene	0.5
Trichloroethylene	0.5
Vinyl chloride (and its hydroxide)	0.2

Listed Wastes. Listed wastes are chemical compounds included in 40 CFR 261, Subpart D that are found in nonspecific process wastes (F-listed), specific process wastes (K-listed), acutely hazardous chemical products (P-listed), and hazardous chemical products (U-listed). See Appendix A for F-, K-, P- and U-listed chemical products. Chemicals known under manufacturers' trade names must also be considered if they contain chemicals listed in Appendix A. Sources of information on synonyms and trade names include MSDSs, manufacturers' representatives, technical bulletins, chemical dictionaries, handbooks of trade names, and the information access system (IAS) on the LANL ALL-IN-1 Mail System. Assistance is available from HS-5. They maintain a file of all MSDSs at the Laboratory and can obtain additional MSDSs if necessary.

Listed Process Wastes (F- and K-listed wastes). The Laboratory generates a limited number of process wastes, which include spent solvents, spent plating baths, and waste from high explosives processing. Appendix A, Table A-1, lists elements and compounds that are hazardous constituents of a listed process waste.

Discarded Unused Chemical Products (P- and U-listed wastes). Unused chemical products found in Appendix A, Tables A-2 and A-3 are regarded as hazardous waste. P-listed elements and compounds, found in Appendix A, Table A-2, are considered *acutely hazardous.*

Empty Containers. As defined by the Resource Conservation and Recovery Act (RCRA), containers of 110 gallons or less, holding less than three percent by weight of the total capacity, are considered *empty*. Empty containers are not hazardous waste. However, containers that once held an element or compound considered acutely hazardous are considered hazardous waste regardless of the volume of the residual product (see Appendix A, Table A-2). Empty drums must be disposed of through the Waste Management Group (EM-7).

Lead-Acid Batteries. Lead-acid batteries contain regulated amounts of lead and are also considered to be corrosive. However, RCRA exempts lead-acid batteries from certain requirements if they are reclaimed. The Laboratory's support services contractor (Johnson Controls World Services) provides recycling through their salvage operation.

Regulations Governing Hazardous and Mixed Wastes

Generators of hazardous or mixed waste must comply with the New Mexico Hazardous Waste Management Regulations (NMHWMR), Part III, and 40 CFR262 (Requirements for both regulations are included in this document.) For additional information about regulations (including conditions required by Laboratory environmental permits, clarification and interpretation of federal and state hazardous and mixed waste regulations, and questions concerning Laboratory and DOE waste policies), contact personnel from EM-8.

Standard Operating Procedures

Operations involving the handling and disposal of beryllium, carcinogens, suspected carcinogens, or certain other hazardous or mixed wastes require a Standard Operating Procedure (SOP) in accordance with Administrative Requirement (AR) 1-3, "Standard Operating Procedures and Special Work Permits." In addition, an SOP may be required for operations involving significant quantities of other particularly toxic or hazardous materials, as determined by HS-5. If an SOP is required, the Risk Management Support Group (HS-3) must review the SOP before it is implemented and as appropriate thereafter.

If an SOP is required, it must include procedures for segregating, storing, treating, packaging, and shipping the hazardous or mixed waste while under the control of the generator. The SOP must also include special handling procedures related to characteristics of the waste such as ignitability, corrosivity, reactivity, and toxicity. Personnel from EM-7 are available to help the waste-generating group prepare these SOPs; other groups from the Health and Safety (HS) Division, such as the Health Physics Operations Group (HS-1), HS-3, the Health Physics Measurements Group (HS-4), HS-5, and the Health Physics Policy and Programs Group (HS-12), may also be consulted.

Waste Management Coordinator

Each waste-generating group or division (depending on the rate of generation and volume) is required to designate a member of its staff (employed by the Laboratory) as a waste management coordinator. The waste management coordinator must ensure that waste collection and storage areas are regularly inspected and safe, appropriate regulations are complied with, accurate records are kept, and storage inspection reports are prepared correctly. The waste management coordinator may assist generators in completing waste profile and disposal forms, but the responsibility for certifying wastes remains with the generator. The current waste management coordinator must be listed with the Waste Minimization Program Office of the Environmental Management (EM) Division

New Operations

Before initiating any operation that will generate new hazardous or mixed waste or increase existing waste volume, the waste-generating group must discuss available treatment, storage, and disposal options with EM-7 and EM-8. In most cases, the existing waste management facilities, technology, and personnel at the Laboratory are able to handle new or increased waste, although the existing hazardous waste permit may have to be modified. In other cases, the EM-7 staff can help identify disposal options (including use of off-site treatment facilities) and methods for waste minimization.

Training

Operating personnel must receive appropriate waste generator training and follow waste management policies and procedures specified by EM and HS Divisions. Classroom instruction and/or on-the-job training must be used to teach personnel the duties necessary to ensure compliance with hazardous waste regulations and permit requirements. The training program, provided by the Policy and Guidance Section of HS-3, must be designed to train personnel in emergency procedures and systems to ensure that those personnel will respond effectively to chemical emergencies. Specific training requirements are based on job responsibilities. Contact EM-7 and EM-8 for additional information.

All environment, safety, and health (ES&H) training must be documented, whether it is a course or on-the-job training. See AR 1-4, "Environment, Safety, and Health Training," for more information on training records.

Additional training, in accordance with DOE Order 5480.11, may be required for generators who handle mixed waste. Contact HS-1.

Minimizing and Recycling Hazardous and Mixed Waste

Hazardous and mixed waste generation must be kept as low as possible by minimizing the amounts of materials purchased, substituting materials, recycling materials when possible, using waste minimizing technology, and segregating wastes at the point of generation. Examples of materials that must *not* be commingled are waste solvents or polychlorinated biphenyls (PCBs) with waste oil, radioactive or mixed waste with hazardous waste, and liquids with solids. Liquids must not be absorbed on sorbents unless approved by EM-7. Groups anticipating continuous, large-volume generation of hazardous or mixed waste or groups doing their own recycling must contact EM-7 and EM-8 for assistance in ensuring that all permit requirements are met before beginning their operation.

Recyclable Materials. When possible, hazardous and mixed wastes shall be recycled or salvaged according to appropriate Laboratory procedures. The following materials and items are prime candidates for recycling: elemental mercury, precious and strategic metals, compressed gas cylinders, lead-acid batteries, lead, solvents, unused laboratory chemicals, and empty drums. To recycle compressed gas cylinders (see Technical Bulletin 1402, "Compressed Gases"), return them to the Gas Processing Facility (MAT-14). Compressed gas cylinders above atmospheric pressure that cannot be returned to MAT-14 or sold as scrap must be handled as waste. Contact EM-7 for information on decontamination and recovery of all other recyclable items. (Also, see the paragraph about lead-acid batteries in "Identifying Hazardous and Mixed Wastes.")

Storing Hazardous and Mixed Waste

Regulations. If hazardous or mixed waste must be stored at the generating site before being removed for disposal, certain procedures must be followed to ensure compliance with applicable regulations (for example, RCRA and NMHWMR) and Laboratory policy. There are two types of temporary, on-site hazardous and mixed waste storage available to waste-generating groups: (1) storage that is limited to less than 90 days in duration and (2) storage at satellite sites that is limited to less than 55 gallons of hazardous or mixed waste or less than 1 quart of acutely hazardous waste, as defined in this document. Requirements for both types of storage are summarized in Appendix B.

NOTE: Chemical waste that is not a hazardous or mixed waste is not subject to the time or volume restrictions under RCRA although other requirements may apply.

Adherence to these requirements ensures compliance with 40 CFR 262.34. EM-8 must be contacted *before* hazardous or mixed wastes are stored on site. Notify EM-7 and EM-8 of any existing storage of hazardous or mixed waste.

Additional requirements exist for on-site storage of mixed waste. Satellite or <90-day storage areas for mixed waste must be identified as such and must be located within a radiologically controlled area. See AR 3-7, "Radiation Exposure Control," or contact HS-1 for further information. Generators must also know applicable fire codes.

Documentation. Formal records that indicate the composition of the hazardous or mixed waste and/or the generating process must be maintained by the waste-generating group. Waste-generating groups must submit a Waste Profile Form (WPF) to EM-8 describing the type and character of waste generated and must update the WPF when the waste stream changes. See AR 10-9, "Waste Profile Form." For copies of this form, contact the waste management coordinator or EM-8. When more than one batch of waste with varying compositions are placed in the same waste container, a list of the type, character, and approximate volume of each waste in the container shall be maintained. Good record keeping reduces the need for expensive, time-consuming, and sometimes dangerous analyses of the contents of waste containers.

Criteria for Determining Radioactive and Nonradioactive Wastes

The process by which waste is determined to be radioactive, suspect radioactive, or nonradioactive is largely based on a knowledge of the process that generates the waste. If waste is generated at or near a radiation source or a high-energy particle beam, the waste generator must determine whether the waste contains radionuclides or has been activated. The type of radiation source (for example, alpha, beta, gamma, or neutron) must be considered when determining whether the waste is radioactive and whether the waste is derived from a radioactive product (such as naturally occurring radioactive material [NARM]).

Scope. All waste generated within a controlled area (excluding nonhazardous waste) where a radiation survey of all surfaces is feasible and where shielding material is used solely for shielding X-ray radiation is subject to the above decision-making process. Affected wastes include all chemical wastes, discarded unused chemical products, compressed gas cylinders, containment or pressure vessels, and discarded vacuum pumps.

Criteria.

- Waste generated from a process that exposed it to radioactive materials must be regarded as radioactive waste regardless of whether any detectable activity exists;
- Waste generated from a process that did not involve radioactive material but is likely to have become radioactive by neutron or proton activation must be regarded as radioactive waste regardless of whether any detectable activity exists;
- Waste generated from a process at a controlled area that did not involve radioactive material but is likely to have become internally radioactive by neutron or proton activation or externally contaminated by surface contamination (such as where decontamination is not feasible) must be regarded as radioactive waste regardless of whether any detectable activity exists;
- Waste from NARM (such as uranium ore) must be managed as radioactive waste;
- Containers of wastes or discarded, unused chemical products originating at a controlled area whose external surfaces may have become contaminated must be checked for removable and fixed contamination. If a survey, based on release limits in AR 3-7, "Radiation Exposure Control," results in no radioactivity above background, the waste is deemed nonradioactive. Surfaces may be decontaminated when possible;

- Wastes or discarded, unused chemical products originating in areas outside a controlled area may be regarded as nonradioactive; and
- Depleted uranium (DU) by itself does not constitute a hazardous or mixed waste.

Disposing of Hazardous and Mixed Waste

When hazardous or mixed waste is to be disposed of, the waste generator must complete a WPF and either HS Form 10-3A, Chemical Waste Disposal Request (CWDR), or Form 1354 (ES&H Form 10-2A), Radioactive Solid Waste Disposal (RSWD) Record. (See AR 10-2, "Low-Level Radioactive Solid Waste."

NOTE: EM-7 can accept waste at TA-54 only if a valid WPF exists.

These forms can be obtained from the waste management coordinator or EM-7. Send the completed form to EM-8. For commercial products, a copy of the appropriate MSDS must be attached to the CWDR. See the paragraph about listed wastes in "Identifying Hazardous Mixed Wastes" for more information about MSDSs. The guidance contained in an MSDS shall be reviewed and observed by all waste generators.

Upon receipt of the CWDR, EM-7 determines the packaging, handling, treatment, transportation, and disposal requirements, based on the type and quantity of waste involved. In certain circumstances, the waste-generating group may be required to complete predisposal treatment, chemically analyze the waste, or repackage the waste before EM-7 assumes responsibility for disposal. (Contact EM-8 before performing any hazardous waste treatment.) Waste-generating groups must not transport hazardous or mixed waste without approval from EM-7.

NOTE: Do not pour chemicals down any drain without approval from EM-7 or EM-8. Hazardous or mixed waste must not be poured down any drain. The radioactive liquid waste collection system (popularly known as the "acid waste line") is intended only for disposal of radioactive liquid wastes meeting the criteria in AR 10-1, "Radioactive Liquid Waste."

Gases/Vapors. Do not vent or intentionally release gases considered hazardous or mixed waste to the atmosphere without approval from HS-5, EM-7, and EM-8. Evaporation of chemical compounds from items such as rags, adsorbents, or open containers as a method of disposal is prohibited. See AR 9-1, "Air Pollution Control," for further information.

Reactive Chemicals. Some hazardous or mixed wastes that are reactive chemicals (for example, water-reactive substances) must be rendered nonreactive before disposal. Such treatment must be performed only by EM-7.

NOTE: Elementary neutralization of acids and bases, in tanks or containers, is the only treatment generators may perform and requires approval by EM-8.

If EM-7 and EM-8 determine that predisposal treatment cannot be performed safely on site or in accordance with regulatory requirements, EM-7 helps the waste-generating group determine alternate disposal methods. High-explosive waste must be stored or treated by the appropriate groups in the Dynamic Testing (M) Division or the Design Engineering (WX) Division (see AR 6-6, "Explosives").

Equipment Contaminated by High Explosives (HE). Nonhazardous waste potentially contaminated with HE, equipment potentially contaminated with HE, and HE scrap must be disposed of at designated firing sites through the Fabrication and

Assembly Group (WX-3) (see AR 6-6, "Explosives") or through M Division. Contact WX-3 or M Division for assistance.

Oils. EM-7 must be notified before draining oil from any electrical or hydraulic system if PCBs may be present (see AR 10-4, "Polychlorinated Biphenyls"). Other oils, such as vacuum pump fluids and heating bath oils, may become contaminated with solvents, metals, or other hazardous constituents during use. The operating group must determine whether such oils have been contaminated with PCBs, other hazardous constituents, or radioactive substances. Contact EM-8 if contamination by PCBs or other hazardous materials is possible; contact the area health/environment technician (HS-1/-4/-12) if radioactive contamination is suspected. Oils are not hazardous or mixed waste unless they exhibit one or more of the characteristics listed in "Identifying Hazardous and Mixed Waste" or contain a listed hazardous waste.

Property (and Classified Waste) Disposal. Disposal of a property-numbered item or classified contaminated item must be documented on Form 252-R, Disposal of Contaminated and/or Classified Property (see AR 10-2, "Low-Level Radioactive Solid Waste"). The waste-generating group initiates this form (Stock No. ST-2623) and secures the appropriate signatures. Contact EM-7 and EM-8 for information about the proper procedures for handling classified waste. Classified waste that is also a hazardous or mixed waste is subject to all of the storage requirements herein.

Medical Waste. Infectious medical waste is disposed of through an off-site contractor. Contact EM-7 for further information about medical waste. (Also see AR 10-7, "Managing Infectious Waste.")

Cleaning Up Leaks and Spills

Hazardous or mixed waste leaks or spills must be cleaned up immediately. See AR 9-4, "Accidental Oil, Chemical, and Airborne Releases," for information on preventing and handling leaks and spills. If you are unable to *safely* clean up a spill or a release of hazardous or mixed waste, contact the Emergency Management Office (EMO).

References

"Accidental Oil, Chemical, and Airborne Releases," Administrative Requirement 9-4, in *Environment, Safety, and Health Manual*, Los Alamos National Laboratory Manual, Chapter 1 (most recent edition).

"Air Pollution Control," Administrative Requirement 9-1, in *Environment, Safety, and Health Manual*, Los Alamos National Laboratory Manual, Chapter 1 (most recent edition).

"Compressed Gases," Technical Bulletin 1402, in *Environment, Safety, and Health Manual*, Los Alamos National Laboratory Manual, Chapter 1 (most recent edition).

"Environment, Safety, and Health Training," Administrative Requirement 1-4, in *Environment, Safety, and Health Manual*, Los Alamos National Laboratory Manual, Chapter 1 (most recent edition).

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Forms

Form 1354 (ES&H Form 10-2A), Radioactive Solid Waste Disposal (RSWD) Record (found in AR 10-2)

HS Form 10-3A, Chemical Waste Disposal Request

Form 1346 (ES&H Form 10-9A), Waste Profile Form

Appendixes

Appendix A. Listed Hazardous Waste Constituents
Table A-1. F- and K-Listed Hazardous Waste Constituents
Table A-2. P-Listed Hazardous Waste Constituents (*Acutely Hazardous*)
Table A-3. U-Listed Hazardous Waste Constituents

Appendix B. Summary of Generator Requirements for Storing Hazardous and Mixed Waste. (Includes matrix for satellite versus <90-day storage.)

Table A-1. F- and K-Listed Hazardous Waste Constituents

Acenaphthalene
Acetic acid, (2,4,5-trichlorophenoxy)-
Acetone
Acetonitrile
Acrylamide
Acrylonitrile
Allyl chloride (3-chloropropene)
Amine and other salts
Aniline
Antimony
Benzo(a)anthracene
Benzo(a)pyrene
Benzo(b)fluoranthene
Benzotrichloride
Benzyl chloride
n-Butyl alcohol
Carbon disulfide
Chlordane
Chlorinated fluorocarbons
2-Chloro-1,3-butadiene
p-Chloro-m-cresol
Chloroacetaldehyde
Chloroethers
Chloroethylene
Chloromethane
2-Chlorophenol
Chlorophenoxy derivative acids
Chrysene
Creosote
Cresylic acid
Cyclohexanone
4-Diamine
Dibenzo(a)anthracene
Dichloromethane
2,4-Dichlorophenol
Dichloropropane
Dichloropropanol
Dichloropropene
Dimethyl sulfate
1,1-Dimethylhydrazine
2,4-Dimethylphenyl
2,4-Dinitrophenol
Diphenylamine
Endrin
Epichlorohydrin
Esters
2-Ethoxyethanol
Ethyl acetate
Ethyl benzene
Ethyl ether
Ethylene dibromide
Ethylene dichloride
Ethylene thiourea
Fluoranthene
Formaldehyde
Formic acid
Heptachlor
Hexachloro-1,3-butadiene
Hexachlorocyclohexane
Hexachlorocyclopentadiene
Hexachlorodibenzo-p-dioxins
Hexachlorodibenzofurans
Hydrocyanic acid
Indeno(1,2,3-cd)pyrene
Isobutanol
Lindane
Maleic anhydride
Meta-dinitrobenzene
Methanol
Methoxychlor
Methyl bromide
Methylene chloride
Naphthalene
1,4-Naphthoquinone
2-Nitropropane
Paraldehyde
Pentachlorobenzene
Pentachlorodibenzo-p-dioxins
Pentachlorodibenzofurans
Pentachloroethane
Perchloroethylene
Phenol
Phenol, 2,3,4,6-tetrachloro-
Phenol, 2,4,5-trichloro-
Phenol, 2,4,6-trichloro-
Phenol, pentachloro-
Phenolnaphthalene
Phenylenediamine
Phorate
Phosgene
Phosphorodithioic acid
Phosphorothioic acid
Phthalic anhydride
2-Picoline
Silvex (2,4,5-TP)
Tetrachlorobenzene
Tetrachlorodi-benzofurans
Tetrachlorodibenzo-p-dioxins
Tetrachlorodibenzofurans
1,1,1,2-Tetrachloroethane
2,3,4,6-Tetrachlorophenol
Toluene
Toluene diisocyanate
2,4-Toluenediamine
o-Toluidine
p-Toluidineaniline
Toxaphene
1,1,2-Trichloro-1,2,2-trifluoroethane
1,2,4-Trichlorobenzene
1,1,1-Trichloroethane
Trichlorofluoromethane
Trichloromethane
Trichloropropane
Vinyl chloride
Vinylidene chloride
Xylene

Table A-2. P-Listed Hazardous Waste Constituents (*Acutely Hazardous*)

Acetaldehyde, chloro-	P023
Acetamide, 2-fluoro-	P057
Acetamide, N-(aminothioxomethyl)-	P002
Acetic acid, fluoro-, sodium salt	P058
1-Acetyl-2-thiourea	P002
Acrolein	P003
Aldicarb	P070
Aldrin	P004
Allyl alcohol	P005
Aluminum phosphide (R,T)	P006
5-(Aminomethyl)-3-isoxazolol	P007
4-Aminopyridine	P008
Ammonium picrate (R)	P009
Ammonium vanadate	P119
Argentate(1-), bis(cyano-C)-, potassium	P099
Arsenic acid H_3AsO_4	P010
Arsenic oxide As_2O_3	P012
Arsenic oxide As_2O_5	P011
Arsenic pentoxide	P011
Arsenic trioxide	P012
Arsine, diethyl-	P038
Arsonous dichloride, phenyl-	P036
Aziridine	P054
Aziridine, 2-methyl-	P067
Barium cyanide	P013
Benzenamine, 4-chloro-	P024
Benzenamine, 4-nitro-	P077
Benzene, (chloromethyl)-	P028
1,2-Benzenediol, 4-[1-hydroxy-2-(methylamino)ethyl]-, (R)-	P042
Benzeneethanamine, alpha,alpha-dimethyl-	P046
Benzenethiol	P014
2H-1-Benzopyran-2-one, 4-hydroxy-3-(3-oxo-1-phenylbutyl)-, & salts, when present at concentrations greater than 0.3%	P001
Benzyl chloride	P028
Beryllium	P015
Bromoacetone	P017
Brucine	P018
2-Butanone, 3,3-dimethyl-1-(methylthio)-, O-[(methylamino)carbonyl] oxime	P045
Calcium cyanide	P021
Calcium cyanide $Ca(CN)_2$	P021
Carbon disulfide	P022
Carbonic dichloride	P095
Chloroacetaldehyde	P023
p-Chloroaniline	P024
1-(o-Chlorophenyl)thiourea	P026
3-Chloropropionitrile	P027
Copper cyanide	P029
Copper cyanide Cu(CN)	P029
Cyanides (soluble cyanide salts), not otherwise specified	P030
Cyanogen	P031
Cyanogen chloride	P033
Cyanogen chloride (CN)Cl	P033

2-Cyclohexyl-4,6-dinitrophenol	P034
Dichloromethyl ether	P016
Dichlorophenylarsine	P036
Dieldrin	P037
O,O-Diethyl O-pyrazinyl phosphorothioate	P040
Diethyl-p-nitrophenyl phosphate	P041
Diethylarsine	P038
Diisopropylfluorophosphate (DFP)	P043
1,4,5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexachloro-1,4,4a,5,8,8a-hexahydro-, (1alpha, 4alpha, 4abeta, 5alpha, 8alpha, 8abeta)-	P004
1,4,5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexachloro-1,4,4a,5,8,8a-hexahydro-, (1alpha, 4alpha, 4abeta, 5beta, 8beta, 8abeta)-	P060
2,7:3,6-Dimethanonaphth[2,3-b]oxirene, 3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-octahyro-, (1aalpha, 2beta, 2aalpha, 3beta, 6beta, 6aalpha, 7beta, 7aalpha)-	P037
2,7:3,6-Dimethanonaphth[2,3-b]oxirene, 3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-octahydro-, (1aalpha, 2beta, 2abeta, 3alpha, 6 alpha, 6abeta, 7beta, 7aalpha)-, & metabolites	P051
Dimethoate	P044
alpha, alpha-Dimethylphenethylamine	P046
4,6-Dinitro-o-cresol, & salts	P047
2,4-Dinitrophenol	P048
Dinoseb	P020
Diphosphoramide, octamethyl-	P085
Diphosphoric acid, tetraethyl ester	P111
Disulfoton	P039
Dithiobiuret	P049
Endosulfan	P050
Endothall	P088
Endrin	P051
Endrin, & metabolites	P051
Epinephrine	P042
Ethanedinitrile	P031
Ethanimidothioic acid, N-[[(methylamino)carbonyl]oxy]-, methyl ester	P066
Ethyl cyanide	P101
Ethyleneimine	P054
Famphur	P097
Fluorine	P056
Fluoroacetamide	P057
Fluoroacetic acid, sodium salt	P058
Fulminic acid, mercury(2+) salt (R,T)	P065
Heptachlor	P059
Hexaethyl tetraphosphate	P062
Hydrazine, methyl-	P068
Hydrazinecarbothioamide	P116
Hydrocyanic acid	P063
Hydrogen cyanide	P063
Hydrogen phosphide	P096
Isodrin	P060
3(2H)-Isoxazolone, 5-(aminomethyl)-	P007
Mercury fulminate (R,T)	P065
Mercury, (acetato-O)phenyl-	P092
Methanamine, N-methyl-N-nitroso-	P082
Methane, isocyanato-	P064
Methane, oxybis[chloro-	P016
Methane, tetranitro- (R)	P112
Methanethiol, trichloro-	P118

6,9-Methano-2,4,3-benzodioxathiepin, 6,7,8,9,10, 10-hexachloro-1,5,5a,6,9,9a-hexahydro-, 3-oxide	P050
4,7-Methano-1H-indene, 1,4,5,6,7,8,8-heptachloro-3a,4,7,7a-tetrahydro-	P059
Methomyl	P066
Methyl hydrazine	P068
Methyl isocyanate	P064
Methyl parathion	P071
2-Methyllactonitrile	P069
alpha-Napthylthiourea	P072
Nickel carbonyl	P073
Nickel carbonyl $Ni(CO)_4$, (T-4)-	P073
Nickel cyanide	P074
Nickel cynaide $Ni(CN)_2$	P074
Nicotine, & salts	P075
Nitric oxide	P076
p-Nitroaniline	P077
Nitrogen dioxide	P078
Nitrogen oxide NO	P076
Nitrogen oxide NO_2	P078
Nitroglycerine (R)	P081
N-Nitrosodimethylamine	P082
N-Nitrosomethylvinylamine	P084
Octamethylpyrophosphoramide	P085
Osmium oxide OsO_4, (T-4)-	P087
Osmium tetroxide	P087
7-Oxabicyclo[2.2.1]heptane-2,3-dicarboxylic acid	P088
Parathion	P089
Phenol, 2,4,6-trinitro-, ammonium salt (R)	P009
Phenol, 2,4-dinitro-	P048
Phenol, 2-(1-methylpropyl)-4,6-dinitro-	P020
Phenol, 2-cyclohexyl-4,6-dinitro-	P034
Phenol, 2-methyl-4,6-dinitro-, & salts	P047
Phenylmercury acetate	P092
Phenylthiourea	P093
Phorate	P094
Phosgene	P095
Phosphine	P096
Phosphoric acid, diethyl 4-nitrophenyl ester	P041
Phosphorodithioic acid, O,O-diethyl S-[(ethylthio)methyl] ester	P094
Phosphorodithioic acid, O,O-diethyl S-[2-(ethylthio)ethyl] ester	P039
Phosphorodithioic acid, O,O-dimethyl S-[2-(methylamino)-2-oxoethyl] ester	P044
Phosphorofluoridic acid, bis(1-methylethyl) ester	P043
Phosphorothioic acid, O,O-dimethyl O-(4-nitrophenyl) ester	P071
Phosphorothioic acid, O,O-diethyl O-(4-nitrophenyl) ester	P089
Phosphorothioic acid, O,O-diethyl O-pyrazinyl ester	P040
Phosphorothioic acid, O-[4-[(dimethylamino)sulfonyl]phenyl] O,O-dimethyl ester	P097
Plumbane, tetraethyl-	P110
Potassium cyanide	P098
Potassium cyanide K(CN)	P098
Potassium silver cyanide	P099
1,2,3-Propanetriol, trinitrate (R)	P081
Propanal, 2-methyl-2-(methylthio)-, O-[(methylamino)carbonyl]oxime	P070
Propanenitrile	P101
Propanenitrile, 2-hydroxy-2-methyl-	P069

Propanenitrile, 3-chloro-	P027
2-Propanone, 1-bromo-	P017
Propargyl alcohol	P102
2-Propen-1-ol	P005
2-Propenal	P003
1,2-Propylenimine	P067
2-Propyn-1-ol	P102
4-Pyridinamine	P008
Pyridine, 3-(1-methyl-2-pyrrolidinyl)-, (S)-, & salts	P075
Selenious acid, dithallium(1+) salt	P114
Selenourea	P103
Silver cyanide	P104
Silver cyanide Ag(CN)	P104
Sodium azide	P105
Sodium cyanide	P106
Sodium cyanide Na(CN)	P106
Strontium sulfide SrS	P107
Strychnidin-10-one, & salts	P108
Strychnidin-10-one, 2,3-dimethoxy-	P018
Strychnine, & salts	P108
Sulfuric acid, dithallium(1+) salt	P115
Tetraethyl lead	P110
Tetraethyl pyrophosphate	P111
Tetraethyldithiopyrophosphate	P109
Tetranitromethane (R)	P112
Tetraphosphoric acid, hexaethyl ester	P062
Thallic oxide	P113
Thallium oxide Tl_2O_3	P113
Thallium(I) selenite	P114
Thallium(I) sulfate	P115
Thiodiphosphoric acid, tetraethyl ester	P109
Thiofanox	P045
Thioimidodicarbonic diamide $[(H_2N)C(S)]_2NH$	P049
Thiophenol	P014
Thiosemicarbazide	P116
Thiourea, (2-chlorophenyl)-	P026
Thiourea, 1-naphthalenyl-	P072
Thiourea, phenyl-	P093
Toxaphene	P123
Trichloromethanethiol	P118
Vanadic acid, ammonium salt	P119
Vanadium oxide V_2O_5	P120
Vanadium pentoxide	P120
Vinylamine, N-methyl-N-nitroso-	P084
Warfarin, & salts, when present at concentrations greater than 0.3%	P001
Zinc cyanide	P121
Zinc cyanide $Zn(CN)_2$	P121
Zinc phosphide Zn_3P_2, when present at concentrations greater than 10% (R,T)	P122

Table A-3. U-Listed Hazardous Waste Constituents

Acetaldehyde (I)	U001
Acetaldehyde, trichloro-	U034
Acetamide, N-(4-ethoxyphenyl)-	U187
Acetamide, N-9H-fluoren-2-yl-	U005
Acetic acid ethyl ester (I)	U112
Acetic acid, (2,4-dichlorophenoxy)-, salts & esters	U240
Acetic acid, lead(2 +) salt	U144
Acetic acid, thallium(1 +) salt	U214
Acetone (I)	U002
Acetonitrile (I,T)	U003
Acetophenone	U004
Acetyl chloride (C,R,T)	U006
2-Acetylaminofluorene	U005
Acrylamide	U007
Acrylic acid (I)	U008
Acrylonitrile	U009
Amitrole	U011
Aniline (I,T)	U012
Arsinic acid, dimethyl-	U136
Auramine	U014
Azaserine	U015
Azirino[2',3':3,4]pyrrolo[1,2-a]indole-4,7-dione, 6-amino-8-[[(aminocarbonyl)oxy]methyl]-1,1a,2,8,8a,8b-hexahydro-8a-methoxy-5-methyl-, [1aS-(1aalpha, 8beta, aalpha, 8balpha)]-	U010
Benz[a]anthracene	U018
Benz[a]anthracene, 7,12-dimethyl-	U094
Benz[c]acridine	U016
Benz[j]aceanthrylene, 1,2-dihydro-3-methyl-	U157
Benzal chloride	U017
Benzamide, 3,5-dichloro-N-(1,1-dimethyl-2-propynyl)-	U192
Benzeneacetic acid, 4-chloro-alpha-(4-chlorophenyl)-alpha-hydroxy, ethyl ester	U038
Benzenamine (I,T)	U012
Benzenamine, 2-methyl-	U328
Benzenamine, 2-methyl-, hydrochloride	U222
Benzenamine, 2-methyl-5-nitro-	U181
Benzenamine, 4,4'-carbonimidoylbis[N,N-dimethyl-	U014
Benzenamine, 4,4'-methylenebis[2-chloro-	U158
Benzenamine, 4-chloro-2-methyl-, hydrochloride	U049
Benzenamine, 4-methyl-	U353
Benzenamine, N,N-dimethyl-4-(phenylazo)-	U093
Benzene (I,T)	U019
Benzene, (1-methylethyl)- (I)	U055
Benzene, (dichloromethyl)-	U017
Benzene, (trichloromethyl)-	U023
Benzene, 1,1'-(2,2,2-trichloroethylidene)bis[4-chloro-	U061
Benzene, 1,1'-(2,2,2-trichloroethylidene)bis[4-methoxy-	U247
Benzene, 1,1'-(2,2-dichloroethylidene)bis[4-chloro-	U060
Benzene, 1,2,4,5-tetrachloro-	U207
Benzene, 1,2-dichloro-	U070
Benzene, 1,3,5-trinitro-	U234
Benzene, 1,3-dichloro-	U071
Benzene, 1,3-diisocyanatomethyl- (R,T)	U223
Benzene, 1,4-dichloro-	U072

Benzene, 1-bromo-4-phenoxy-	U030
Benzene, 1-methyl-2,4-dinitro-	U105
Benzene, 2-methyl-1,3-dinitro-	U106
Benzene, chloro-	U037
Benzene, dimethyl- (I,T)	U239
Benzene, hexachloro-	U127
Benzene, hexahydro- (I)	U056
Benzene, methyl-	U220
Benzene, nitro-	U169
Benzene, pentachloro-	U183
Benzene, pentachloronitro-	U185
Benzenebutanoic acid, 4-[bis(2-chloroethyl) amino]-	U035
Benzenediamine, ar-methyl-	U221
1,2-Benzenedicarboxylic acid, bis(2-ethylhexyl) ester	U028
1,2-Benzenedicarboxylic acid, dibutyl ester	U069
1,2-Benzenedicarboxylic acid, diethyl ester	U088
1,2-Benzenedicarboxylic acid, dimethyl ester	U102
1,2-Benzenedicarboxylic acid, dioctyl ester	U107
1,3-Benzenediol	U201
Benzenesulfonic acid chloride (C,R)	U020
Benzenesulfonyl chloride (C,R)	U020
Benzidine	U021
1,2-Benzisothiazol-3(2H)-one, 1,1-dioxide, & salts	U202
Benzo[a]pyrene	U022
Benzo[rst]pentaphene	U064
1,3-Benzodioxole, 5-(1-propenyl)-	U141
1,3-Benzodioxole, 5-(2-propenyl)-	U203
1,3-Benzodioxole, 5-propyl-	U090
2H-1-Benzopyran-2-one, 4-hydroxy-3-(3-oxo-1-phenylbutyl)-, & salts, when present at concentrations of 0.3% or less	U248
p-Benzoquinone	U197
Benzotrichloride (C,R,T)	U023
2,2'-Bioxirane	U085
[1,1'-Biphenyl]-4,4'-diamine	U021
[1,1'-Biphenyl]-4,4'-diamine, 3,3'-dichloro-	U073
[1,1'-Biphenyl]-4,4'-diamine, 3,3'-dimethyl-	U095
[1,1'-Biphenyl]-4,4'-diamine, 3,3'-dimethoxy-	U091
Bromoform	U225
4-Bromophenyl phenyl ether	U030
1,3-Butadiene, 1,1,2,3,4,4-hexachloro-	U128
1-Butanamine, N-butyl-N-nitroso-	U172
1-Butanol (I)	U031
2-Butanone (I,T)	U159
2-Butanone, peroxide (R,T)	U160
2-Butenal	U053
2-Butene, 1,4-dichloro- (I,T)	U074
2-Butenoic acid, 2-methyl-, 7-[[2,3-dihydroxy-2-(1-methoxyethyl)-3-methyl-1-oxobutoxy]methyl]-2,3,5,7a-tetrahydro-1H-pyrrolizin-1-yl ester, [1S-[1alpha(Z),7(2S*,3R*), 7aalpha]]-	U143
n-Butyl alcohol (I)	U031
Cacodylic acid	U136
Calcium chromate	U032
Carbamic acid, methylnitroso-, ethyl ester	U178
Carbamic acid, ethyl ester	U238

Carbamic chloride, dimethyl-	U097
Carbamodithioic acid, 1,2-ethanediyl- bis-, salts & esters	U114
Carbamothioc acid, bis(1-methylethyl)-, S-(2,3-dichloro-2-propenyl) ester	U062
Carbon oxyfluoride (R,T)	U033
Carbon tetrachloride	U211
Carbonic acid, dithallium(1 +) salt	U215
Carbonic difluoride	U033
Carbonochloridic acid, methyl ester (I,T)	U156
Chlornaphazin	U026
Chloral	U034
Chlorambucil	U035
Chlordane, alpha & gamma isomers	U036
p-Chloro-m-cresol	U039
4-Chloro-o-toluidine, hydrochloride	U049
Chlorobenzene	U037
Chlorobenzilate	U038
2-Chloroethyl vinyl ether	U042
Chloroform	U044
Chloromethyl methyl ether	U046
beta-Chloronaphthalene	U047
o-Chlorophenol	U048
Chromic acid H_2CrO_4, calcium salt	U032
Chrysene	U050
Creosote	U051
Cresol (Cresylic acid)	U052
Crotonaldehyde	U053
Cumene (I)	U055
Cyanogen bromide (CN)Br	U246
2,5-Cyclohexadiene-1,4-dione	U197
Cyclohexane (I)	U056
Cyclohexane, 1,2,3,4,5,6-hexachloro-, (1alpha, 2alpha, 3beta, 4alpha, 5alpha, 6beta)-	U129
Cyclohexanone (I)	U057
1,3-Cyclopentadiene, 1,2,3,4,5,5-hexachloro-	U130
Cyclophosphamide	U058
2,4-D, salts & esters	U240
DDD	U060
DDT	U061
Daunomycin	U059
Di-n-octyl phthalate	U107
Di-n-propylnitrosamine	U111
Diallate	U062
Dibenz[a,h]anthracene	U063
Dibenzo[a,i]pyrene	U064
1,2-Dibromo-3-chloropropane	U066
Dibutyl phthalate	U069
1,4-Dichloro-2-butene (I,T)	U074
o-Dichlorobenzene	U070
m-Dichlorobenzene	U071
p-Dichlorobenzene	U072
3,3'-Dichlorobenzidine	U073
Dichlorodifluoromethane	U075
Dichloroethyl ether	U025
1,1-Dichloroethylene	U078
1,2-Dichloroethylene	U079

Dichloroisopropyl ether	U027
Dichloromethoxy ethane	U024
2,4-Dichlorophenol	U081
2,6-Dichlorophenol	U082
1,3-Dichloropropene	U084
1,2:3,4-Diepoxybutane (I,T)	U085
O,O-Diethyl S-methyl dithiophosphate	U087
Diethyl phthalate	U088
1,4-Diethyleneoxide	U108
Diethylhexyl phthalate	U028
N,N'-Diethylhydrazine	U086
Diethylstilbesterol	U089
Dihydrosafrole	U090
3,3'-Dimethoxybenzidine	U091
Dimethyl phthalate	U102
Dimethyl sulfate	U103
Dimethylamine (I)	U092
p-Dimethylaminoazobenzene	U093
7,12-Dimethylbenz[a]anthracene	U094
3,3'-Dimethylbenzidine	U095
alpha, alpha-Dimethylbenzylhydroperoxide (R)	U096
Dimethylcarbamoyl chloride	U097
1,1-Dimethylhydrazine	U098
1,2-Dimethylhydrazine	U099
2,4-Dimethylphenol	U101
2,4-Dinitrotoluene	U105
2,6-Dinitrotoluene	U106
1,4-Dioxane	U108
1,2-Diphenylhydrazine	U109
Dipropylamine (I)	U110
Epichlorohydrin	U041
Ethanal (I)	U001
Ethanamine, N-ethyl-N-nitroso-	U174
Ethane, 1,1'-[methylenebis(oxy)]bis[2-chloro-	U024
Ethane, 1,1'-oxybis-(I)	U117
Ethane, 1,1'-oxybis[2-chloro-	U025
Ethane, 1,1,1,2-tetrachloro-	U208
Ethane, 1,1,1-trichloro-	U226
Ethane, 1,1,2,2-tetrachloro-	U209
Ethane, 1,1,2-trichloro-	U227
Ethane, 1,1-dicholro-	U076
Ethane, 1,2-dibromo-	U067
Ethane, 1,2-dichloro-	U077
Ethane, hexachloro-	U131
Ethane, pentachloro-	U184
1,2-Ethanediamine, N,N-dimethyl-N'-2-pyridinyl-N'-(2-thienylmethyl)-	U155
Ethanethioamide	U218
Ethanol, 2,2'-(nitrosoimino)bis-	U173
Ethanol, 2-ethoxy-	U359
Ethanone, 1-phenyl-	U004
Ethene, (2-chloroethoxy)-	U042
Ethene, 1,1-dichloro-	U078
Ethene, 1,2-dichloro-, (E)-	U079
Ethene, chloro-	U043

Ethene, tetrachloro-	U210
Ethene, trichloro-	U228
Ethyl acetate (I)	U112
Ethyl acrylate (I)	U113
Ethyl carbamate (urethane)	U238
Ethyl ether (I)	U117
Ethyl methacrylate	U118
Ethyl methanesulfonate	U119
Ethylene dibromide	U067
Ethylene dichloride	U077
Ethylene glycol monoethyl ether	U359
Ethylene oxide (I,T)	U115
Ethylenebisdithiocarbamic acid, salts & esters	U114
Ethylenethiourea	U116
Ethylidene dichloride	U076
Fluoranthene	U120
Formaldehyde	U122
Formic acid (C,T)	U123
Furan (I)	U124
Furan, tetrahydro- (I)	U213
2-Furancarboxaldehyde (I)	U125
2,5-Furandione	U147
Furfural (I)	U125
Furfuran (I)	U124
Glucopyranose, 2-deoxy-2-(3-methyl-3-nitrosoureido)-, D-	U206
D-Glucose, 2-deoxy-2-[[(methylnitrosoamino)-carbonyl]amino]-	U206
Glycidylaldehyde	U126
Guanidine, N-methyl-N'-nitro-N-nitroso-	U163
Hexachlorobenzene	U127
Hexachlorobutadiene	U128
Hexachlorocyclopentadiene	U130
Hexachloroethane	U131
Hexachlorophene	U132
Hexachloropropene	U243
Hydrazine (R,T)	U133
Hydrazine, 1,1-dimethyl-	U098
Hydrazine, 1,2-diethyl-	U086
Hydrazine, 1,2-dimethyl-	U099
Hydrazine, 1,2-diphenyl-	U109
Hydrofluoric acid (C,T)	U134
Hydrogen fluoride (C,T)	U134
Hydrogen sulfide	U135
Hydrogen sulfide H_2S	U135
Hydroperoxide, 1-methyl-1-phenylethyl- (R)	U096
2-Imidazolidinethione	U116
Indeno[1,2,3-cd]pyrene	U137
1,3-Isobenzofurandione	U190
Isobutyl alcohol (I,T)	U140
Isosafrole	U141
Kepone	U142
Lasiocarpine	U143
Lead acetate	U144
Lead phosphate	U145
Lead subacetate	U146

Lead, bis(acetato-O)tetrahydroxytri-	U146
Lindane	U129
MNNG	U163
Maleic anhydride	U147
Maleic hydrazide	U148
Malononitrile	U149
Melphalan	U150
Mercury	U151
Methacrylonitrile (I,T)	U152
Methanamine, N-methyl- (I)	U092
Methane, bromo-	U029
Methane, chloro- (I,T)	U045
Methane, chloromethoxy-	U046
Methane, dibromo-	U068
Methane, dichloro-	U080
Methane, dichlorodifluoro-	U075
Methane, iodo-	U138
Methane, tetrachloro-	U211
Methane, tribromo-	U225
Methane, trichloro-	U044
Methane, trichlorofluoro-	U121
Methanesulfonic acid, ethyl ester	U119
Methanethiol (I,T)	U153
4,7-Methano-1H-indene, 1,2,4,5,6,7,8,8-octachloro-2,3,3a,4,7,7a-hexahydro-	U036
Methanol (I)	U154
Methapyrilene	U155
1,3,4-Metheno-2H-cyclobuta[cd]pentalen-2-one, 1,1a,3,3a,4,5,5,5a,5b,6-decachloro-octahydro-	U142
Methoxychlor	U247
Methyl alcohol (I)	U154
Methyl bromide	U029
Methyl chloride (I,T)	U045
Methyl chlorocarbonate (I,T)	U156
Methyl chloroform	U226
Methyl ethyl ketone (MEK) (I,T)	U159
Methyl ethyl ketone peroxide (R,T)	U160
Methyl iodide	U138
Methyl isobutyl ketone (I)	U161
Methyl methacrylate (I,T)	U162
4-Methyl-2-pentanone (I)	U161
1-Methylbutadiene (I)	U186
3-Methylcholanthrene	U157
Methylene bromide	U068
Methylene chloride	U080
4,4'-Methylenebis(2-chloroaniline)	U158
Methylthiouracil	U164
Mitomycin C	U010
5,12-Naphthacenedione, 8-acetyl-10-[(3-amino-2,3,6-trideoxy)-alpha-L-lyxo-hexopyranosyl) oxy]-7,8,9,10-tetrahydro-6,8,11-trihydroxy-1-methoxy-, (8S-cis)-	U059
1-Naphthalenamine	U167
2-Naphthalenamine	U168
Naphthalenamine, N,N'-bis(2-chloroethyl)-	U026
Naphthalene	U165
Naphthalene, 2-chloro-	U047
1,4-Naphthalenedione	U166

2,7-Naphthalenedisulfonic acid, 3,3'-[(3,3'-dimethyl[1,1'-biphenyl]-4,4'-diyl)bis(azo) bis[5-amino-4-hydroxy]-, tetrasodium salt	U236
1,4-Naphthoquinone	U166
alpha-Naphthylamine	U167
beta-Naphthylamine	U168
Nitric acid, thallium(1 +) salt	U217
5-Nitro-o-toluidine	U181
Nitrobenzene (I,T)	U169
p-Nitrophenol	U170
2-Nitropropane (I,T)	U171
N-Nitroso-N-ethylurea	U176
N-Nitroso-N-methylurea	U177
N-Nitroso-N-methylurethane	U178
N-Nitrosodi-n-butylamine	U172
N-Nitrosodiethanolamine	U173
N-Nitrosodiethylamine	U174
N-Nitrosopiperidine	U179
N-Nitrosopyrrolidine	U180
1,2-Oxathiolane, 2,2-dioxide	U193
2H-1,3,2-Oxazaphosphorin-2-amine, N,N-bis(2-chloroethyl)tetrahydro-, 2-oxide	U058
Oxirane (I,T)	U115
Oxirane, (chloromethyl)-	U041
Oxiranecarboxyaldehyde	U126
Paraldehyde	U182
Pentachlorobenzene	U183
Pentachloroethane	U184
Pentachloronitrobenzene (PCNB)	U185
1,3-Pentadiene (I)	U186
Pentanol, 4-methyl-	U161
Phenacetin	U187
Phenol	U188
Phenol, 2,2'-methylenebis[3,4,6-trichloro-	U132
Phenol, 2,4-dichloro-	U081
Phenol, 2,4-dimethyl-	U101
Phenol, 2,6-dichloro-	U082
Phenol, 2-chloro-	U048
Phenol, 4,4'-(1,2-diethyl-1,2-ethenediyl)bis-, (E)-	U089
Phenol, 4-chloro-3-methyl-	U039
Phenol, 4-nitro-	U170
Phenol, methyl-	U052
L-Phenylalanine, 4-[bis(2-chloroethyl)amino]-	U150
Phosphoric acid, lead(2 +) salt (2:3)	U145
Phosphorodithioic acid, O,O-diethyl S-methyl ester	U087
Phosphorus sulfide (R)	U189
Phthalic anhydride	U190
2-Picoline	U191
Piperidine, 1-nitroso-	U179
Pronamide	U192
1-Propanamine (I,T)	U194
1-Propanamine, N-nitroso-N-propyl-	U111
1-Propanamine, N-propyl- (I)	U110
1,3-Propane sultone	U193
Propane, 1,2-dibromo-3-chloro-	U066
Propane, 1,2-dichloro-	U083
Propane, 2,2'-oxybis[2-chloro-	U027

Propane, 2-nitro- (I,T)	U171
Propanedinitrile	U149
1-Propanol, 2,3-dibromo-, phosphate (3:1)	U235
1-Propanol, 2-methyl- (I,T)	U140
2-Propanone (I)	U002
2-Propenamide	U007
1-Propene, 1,1,2,3,3,3-hexachloro-	U243
1-Propene, 1,3-dichloro-	U084
2-Propenenitrile	U009
2-Propenenitrile, 2-methyl- (I,T)	U152
2-Propenoic acid (I)	U008
2-Propenoic acid, 2-methyl-, ethyl ester	U118
2-Propenoic acid, 2-methyl-, methyl ester (I,T)	U162
2-Propenoic acid, ethyl ester (I)	U113
n-Propylamine (I,T)	U194
Propylene dichloride	U083
3,6-Pyridazinedione, 1,2-dihydro-	U148
Pyridine	U196
Pyridine, 2-methyl-	U191
2,4-(1H,3H)-Pyrimidinedione, 5-[bis(2-chloroethyl)amino]-	U237
4(1H)-Pyrimidinone, 2,3-dihydro-6-methyl-2-thioxo-	U164
Pyrrolidine, 1-nitroso-	U180
Reserpine	U200
Resorcinol	U201
Saccharin, & salts	U202
Safrole	U203
Selenious acid	U204
Selenium dioxide	U204
Selenium sulfide	U205
Selenium sulfide SeS_2 (R,T)	U205
L-Serine, diazoacetate (ester)	U015
Streptozotocin	U206
Sulfur phosphide (R)	U189
Sulfuric acid, dimethyl ester	U103
1,2,4,5-Tetrachlorobenzene	U207
1,1,1,2-Tetrachloroethane	U208
1,1,2,2-Tetrachloroethane	U209
Tetrachloroethylene	U210
Tetrahydrofuran (I)	U213
Thallium chloride TlCl	U216
Thallium (I) acetate	U214
Thallium (I) carbonate	U215
Thallium (I) chloride	U216
Thallium (I) nitrate	U217
Thioacetamide	U218
Thiomethanol (I,T)	U153
Thioperoxydicarbonic diamide $[(H_2N)C(S)]_2S_2$, tetramethyl-	U244
Thiourea	U219
Thiram	U244
Toluene	U220
Toluene diisocyanate (R,T)	U223
Toluenediamine	U221
o-Toluidine	U328
p-Toluidine	U353

o-Toluidine hydrochloride	U222
1H,1,2,4-Triazol-3-amine	U011
1,1,2-Trichloroethane	U227
Trichloroethylene	U228
Trichloromonofluoromethane	U121
1,3,5-Trinitrobenzene (R,T)	U234
1,3,5-Trioxane, 2,4,6-trimethyl-	U182
Tris(2,3-dibromopropyl) phosphate	U235
Trypan blue	U236
Uracil mustard	U237
Urea, N-ethyl-N-nitroso-	U176
Urea, N-methyl-N-nitroso-	U177
Vinyl chloride	U043
Warfarin, & salts, when present at concentrations of 0.3% or less	U248
Xylene (I)	U239
Yohimban-16-carboxylic acid, 11,17-dimethoxy-18-[(3,4,5-trimethoxybenzoyl)oxy]-, methyl ester, (3beta, 16beta, 17alpha, 18beta, 20alpha)-	U200
Zinc phosphide Zn_3P_2, when present at concentrations of 10% or less	U249

Appendix B. Summary of Generator Requirements for Storing Hazardous and Mixed Waste

	<90-Day Storage Areas	Satellite Storage Areas
Special Conditions	No containers shall be stored for more than 90 days from the date accumulation begins before they are delivered to TA-54 or TA-50. The 90-day period includes transport time by the Waste Management Group (EM-7). For disposal, submit HS Form 10-3A, Chemical Waste Disposal Request (CWDR), or Form 1354 (ES&H Form 10-2A), Radioactive Solid Waste Disposal Record (RSWD), to EM-7. Give EM-7 a minimum notice of 10 working days. Waste Profile Form (WPF), must be completed before submitting the CWDR to EM-7 See Administrative Requirement (AR) 10-9, "Waste Profile Form."	Generators may accumulate a total of 55 gallons of hazardous or mixed waste or 1 quart of acutely hazardous waste (see Appendix A); contact the Environmental Protection Group (EM-8) for more information. *NOTE: This is the maximum allowable volume for a satellite storage area.* Waste in excess of these amounts must be picked up within three calendar days from the time the amount is exceeded. See labeling and dating requirements below. For disposal, submit a CWDR.
Loading and Unloading Areas	Loading and unloading areas must be free of obstacles or deterioration that could cause a spill or accident.	Same.
Storage Areas	Storage areas must be free of obstacles that could prevent access by emergency personnel and equipment. Containers must be placed at least 2 feet apart or placed in rows that are at least 2 feet apart to allow for visual inspection and access by emergency personnel with equipment. The area should be dry, sheltered, and if ignitable waste is stored, free of possible ignition sources. Secondary containment structures must be free of damage. Storage areas must be established by EM-8. Storage areas used for mixed waste must be located within a controlled area. Drums and other containers that are stored outside must be placed on pallets or similar devices. Consult AR 3-7, "Radiation Exposure Control," for more information.	Hazardous or mixed waste must be accumulated in containers at or near the point of generation and must be under the control of the generator. Storage areas must be free of obstacles or deterioration that could cause a spill or accident or prevent access by emergency personnel and equipment. Containers must be placed to allow for visual inspection and access by emergency personnel with equipment. The area should be dry, sheltered, and if ignitable waste is stored, free of possible ignition sources. Storage areas must be established by EM-8. Storage areas used for mixed waste must be located within a controlled area. Drums and other containers that are stored outside must be placed on pallets or similar devices. Consult AR 3-7,"Radiation Exposure Control," for more information.

	<90-Day Storage Areas	Satellite Storage Areas
Compatibility	Containers must be segregated according to the compatibility of the wastes that they hold. A storage container holding hazardous or mixed waste that is incompatible with any other waste or material nearby in other containers, piles, open tanks, or surface impoundments must be separated or protected from the other materials by a dike, berm, wall, or other device. Sound laboratory practices must be followed when storing hazardous or mixed waste. Container material must be compatible with the waste. Do not store a waste that will corrode or otherwise cause deterioration of the container. EM-7 can assist in choosing the appropriate container. Do not package solids and liquids together or use sorbents except in emergencies or if approved by EM-7.	Same.
Containers	Containers must be in good condition as determined by EM-7. Deteriorated or damaged containers must be replaced immediately. Drums for liquid waste must have "bung" tops. All containers must be closed properly when not in use.	Same.
Labeling	All hazardous or mixed waste containers must be properly labeled "HAZARDOUS WASTE" (stock number LAWA9011), and the major hazardous constituents must be listed. (Do not use this label for containers of nonhazardous waste.) In addition, mixed wastes must also be labeled as "RADIOACTIVE MATERIALS" (contact the area health/environment technician). If a container holds more than one type of hazardous or mixed waste, then the contents must be listed (for example, solvents, acids, and caustics). An accumulation start date must be properly marked on all containers at the time the container *first* receives waste.	All hazardous or mixed waste containers must be properly labeled "HAZARDOUS WASTE" (stock number LAWA9011), and the major hazardous constituents must be listed. (Do not use this label for containers of nonhazardous waste.) In addition, mixed wastes must also be labeled as "RADIOACTIVE MATERIALS" (contact the area health/environment technician). Waste in excess of the maximum allowable amount must also be labeled in this manner, and the containers must be marked with the date the excess amount began accumulating. The generator must properly dispose of all waste within three calendar days of that date.

	<90-Day Storage Areas	Satellite Storage Areas
Warning Signs	Warning signs with the legend "DANGER-UNAUTHORIZED PERSONNEL KEEP OUT" must be readable and prominently posted. The storage area must be identified by a sign that reads "HAZARDOUS WASTE LESS THAN 90 DAYS STORAGE AREA." Signs are provided by EM-8.	Warning signs with the legend "SATELLITE HAZARDOUS WASTE STORAGE AREA" should be readable and prominently posted. Signs are provided by EM-8.
Inspection	Storage areas must be inspected daily, and a *copy* of the inspection record form must be submitted weekly to EM-8. All original records *must* be maintained for a minimum of three years by the waste generator.	Although regulations do not require formal inspection and record keeping, good management practices dictate that satellite storage site operators perform periodic inspections and keep a log of inspection records.
Leaks and Spills	Hazardous or mixed waste leaks or spills must be cleaned up immediately, and the resulting material must also be handled as hazardous or mixed waste. For mixed waste spills contact the area health/environment technician. See "Cleaning up Leaks and Spills."	Same.
Disposal	For disposal of hazardous and mixed wastes, generators must properly complete a WPF and submit it to EM-8 at the address on the form. Incomplete or improperly completed WPFs will be returned to the generators for corrections. All WPFs submitted to EM-8 must be signed. When the generators receive their processed WPF, they should submit a CWDR to EM-7. The CWDR provides a space to record the waste profile number for each item to be disposed of. For new waste streams, a copy of the WPF must accompany the first CWDR.	Same.