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CP2-WM-0011/FR5

Waste Acceptance Criteria for the Treatment, Storage, and Disposal Facilities at the Paducah U.S. Department of Energy Site

DOE CONTRACTOR PERSONNEL ONLY

Waste Acceptance Criteria for the Treatment, Storage, and Disposal Facilities at the Paducah U.S. Department of Energy Site

Date Issued—February 2025

U.S. DEPARTMENT OF ENERGY
Office of Environmental Management

Prepared by
FOUR RIVERS NUCLEAR PARTNERSHIP, LLC,
managing the
Deactivation and Remediation Project at the
Paducah Gaseous Diffusion Plant
under Contract DE-EM0004895

DOE CONTRACTOR PERSONNEL ONLY

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APPROVALS

Waste Acceptance Criteria for the
Treatment, Storage, and Disposal Facilities
at the Paducah
U.S. Department of Energy Site

CP2-WM-0011/FR5

February 2025

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Nuclear Safety Documentation: FRNP-25-0029-S

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REVISION LOG

REVISION NUMBER	DATE	DESCRIPTION OF CHANGES	PAGES AFFECTED
FR0	10/21/2017	Bluesheet	All
FR1	01/18/2018	Rewrite	All
FR1A	4/27/2020	Incorporated C-746 Landfill disposal criteria. Made general editorial changes and updated document titles, number, positional titles, and reference information. Request for Disposal form and instructions changed. Added container selection information and table.	xii, xvii, xviii, 1, 2, 5, 7, 8, 10, 12, 15-17, 19, 21, 24, 27, 28, 33-36, 39, 44, A-3, A-4, B-5, B-6, C-5, C-6, C-7
FR1B	2/3/2021	Change use of Technical Services Director to Waste Management Director.	xviii, 2, 5, 27, & 31
FR2	6/29/2021	Addressed CA-003127 and AI-0004911 by correcting CP2-WM-0011-F02 and CP2-WM-0011-F03 form titles in Appendix B. Changed Section 3 title to "Request for Disposal Process." Added new Section 3.1, Request for Disposal. Added text in Section 5.3 and Appendix C, stating that RCRA containers must be labeled with the hazard of the contents (e.g., corrosive, toxic). Updated labels for TRU waste and asbestos in Appendix C. Added List of approved TSDFs to Appendix G. Modified form CP2-WM-0011-F02. Incorporated Standing Order 21-WM-014 R1, Potential Over Pressurized Containers and Use of Drum Vents, into Section 5.1.4.	All
FR2A	7/20/2021	Added Step 5.3.3 for Accountable Material Waste Container Labeling. Removed statement from Section 9 in regard to FRNP ASL. Updated Request for Disposal Instructions to match CP3-NM-3002. Updated RCRA, LLW, and box diagrams. Incorporated NMC&A labels and Termination of Safeguards labels from Standing Order 21-WM-0006 R0.	23, 39, B-8 through B-13, C-5, C-7, and C-18
FR2B	12/7/2021	To satisfy CA-003682, the following changes were made. In Section 7, language was changed in reference to the evaluation of groundwater contaminated with other radionuclides and organics. In Section 8.1.3, language was changed to add information in regard to using a graded approach for sampling/surveying relative to DOE/HS-004. Appendix E was revised. Appendix F was deleted and form CP2-WM-0011-F04 was deleted. References were updated to include DOE/HS-004.	32, 34, 47, E2-E5, F1

REVISION NUMBER	DATE	DESCRIPTION OF CHANGES	PAGES AFFECTED
FR2C	2/21/2022	To address CAPA #CA-003577, added instruction to request for disposal instructions in A.34 to ensure that users understand that uranium-235 mass must be tracked for all fissile waste, regardless of NCS exemption status (Appendix B). Updated Appendix G, *Potential Disposal Facilities for Waste Types from the Paducah Site and Transport Modes from the Paducah Site to Each Facility*.	B-13, G-3
FR2D	3/10/2022	Updated Appendix G, Disposal Facilities for Waste Types from the Paducah Site and Transport Modes from the Paducah Site to each Facility	G-3
FR2E	6/23/2022	Updated Appendix G, Disposal Facilities for Waste Types from the Paducah Site and Transport Modes from the Paducah Site to each Facility	G-3
FR2F	9/6/2022	Administrative change for cover page correction.	COVER PAGE
FR3	10/27/2022	Updated contact phone numbers in Section 1. Updated reference documents within List B. Removed Appendix F; therefore, the previous Appendix G is now Appendix F. Item A-31 in the request for disposal instructions was changed. General editorial changes were made throughout the document.	All
FR4	10/03/2023	Updated Appendix F, Potential Treatment and Disposal Facilities for Waste Types from the Paducah Site and Transport Modes from the Paducah Site to each Facility. Made changes to request for disposal form and instructions as well as added language at Section 8.1.12 to address CAPA CA-004527. Section 4.1.10, Lead Acid Batteries was added and revised from F02, as well as instructions to address CA-004079, AI-0006481.	All
FR4A	05/09/2024	Intent change to revise Appendix F to agree with the current Approved Supplier List.	F-3
FR4B	11/19/2024	General editorial changes were made throughout the document. Intent change was made to revise Appendix F to agree with the current Approved Supplier List.	All

REVISION NUMBER	DATE	DESCRIPTION OF CHANGES	PAGES AFFECTED
FR5	02/21/2025	Remove Appendices A and B, which were placed in CP3 procedures, and updated references to request for disposal. Added aerosol cans as a class of Universal Waste and deleted references to NCSE-RM-FISSMAT-0015, which has been deleted.	All

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CONTENTS

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TABLES

FIGURES

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ACRONYMS

ACM	asbestos-containing material
AD	accumulation date
AL	authorized limit
BCS	boundary control station
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	*Code of Federal Regulations*
D&R	deactivation and remediation
DOE	U.S. Department of Energy
DOT	U.S. Department of Transportation
DQO	data quality objective
DTS	date to storage
EPA	U.S. Environmental Protection Agency
FRNP	Four River Nuclear Partnership, LLC
GD	generation date
GSA	general staging area
KAR	*Kentucky Administrative Regulations*
KPDES	Kentucky Pollutant Discharge Elimination System
LLW	low-level waste
NCS	nuclear criticality safety
NCSE	nuclear criticality safety evaluation
O	order
PK	process knowledge
PPE	personal protective equipment
RACM	regulated asbestos-containing material
RAD	radiological
RADCON	radiological control
RAM	RADCON material
RCRA	Resource Conservation and Recovery Act
RFD	request for disposal
S&M	surveillance and maintenance
SAA	satellite accumulation area
SDS	safety data sheet
TID	tamper-indicating device
TOS	termination of safeguards
TRU	transuranic
TSCA	Toxic Substances Control Act
TSD	treatment, storage, and disposal
TSDF	treatment, storage, and disposal facility
U.S.C.	*United States Code*
UTS	universal treatment standard
WAC	waste acceptance criteria
WCO	waste certification official
WGF	waste generation forecast
WMP	waste management plan
WPC	waste package certifier

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DEFINITIONS

Accumulation Start Date—For Resource Conservation and Recovery Act (RCRA) waste, the date accumulation of hazardous waste begins. For waste originating from a satellite accumulation area, the accumulation start date is the date the waste container is filled or removed to a 90-day area or permitted storage facility (401 *KAR* 32:030). For newly discovered RCRA waste the accumulation start date would be the date it originally was determined to be a RCRA waste.

Acute Hazardous Waste—Hazardous wastes that are considered exceptionally toxic and are generally listed under 40 *CFR* § 261.33 (list of waste having codes beginning with "P"), but also include some under 40 *CFR* § 261.33 (e.g., F020, F021, F022, F023, F026, F027).

Asbestos-Containing Material (ACM)—Any material containing more than 1% asbestos.

Beryllium Waste—Any waste material that contains elemental beryllium and any insoluble beryllium compound or alloy in concentrations of 0.1% beryllium or greater that may be released as an airborne particulate.

Chelating Agent—An agent that mobilizes fixed heavy metals and radionuclides for migration in the environment. Decontamination solutions often include chelating agents. Examples include amine polycarboxylic acids (e.g., ethylenediaminetetraacetic acid, diethylenetriamine pentaacetate); hydroxy-carboxylic acids; and polycarboxylic acids (e.g., citric acid, gluconic acid).

Critical Items—Critical items are goods and services, including commercial items that require rigorous procurement and inspection processes to prevent significant personal injury to the workforce and public and/or an environmental noncompliance.

Containerized Waste—Any type of solid, gas, semisolid, or liquid waste contained by fixed boundaries such as drums, tanks, or bins.

Contaminants of Concern—Those regulated contaminants that have the potential to be present in a waste stream.

Data Quality Objectives (DQO)—A set of criteria established for the collection of data to ensure that the data is adequate to make the required decision. For waste characterization, the data quality objectives will include the analyses required, the analytes (the contaminants of concern), the type and number of samples, the quality control samples and analyses, and the degree of confidence required.

Date to Storage (DTS)—The date that the first polychlorinated biphenyls (PCBs) are placed in a container or the PCB item is removed from service for disposal (whichever is first). This date is placed on the container or the item by the generator (40 *CFR* Part 761).

Debris—For RCRA a solid material exceeding a 60 mm particle size that is intended for disposal and that is a manufactured object, plant or animal matter, or natural geologic material [40 *CFR* § 268.2(g)].

Environmental Media—Soil, groundwater, surface water, and sediments.

Etiologic Agent—A viable microorganism, or its toxin, that causes or may cause disease in humans or animals. Etiologic agents include those agents listed in 42 *CFR* § 72.3 of the regulations of the Department of Health and Human Services and any other agent that causes or may cause severe, disabling, or fatal disease. The terms infectious substance and etiologic agent are synonymous.

Fissile Material—In strict terms, fissile or fissionable materials are radionuclides capable of sustaining a neutron-induced fission chain reaction [e.g., uranium-233, uranium enriched in uranium-235 (U-235), neptunium-236, plutonium-239, plutonium-241, americium-242, curium-243, curium-245, curium-247, californium-249, californium-251]. As applied to plant operations, fissile material is uranium metal with an enrichment of > 0.93 wt.% U-235, uranium oxide compounds (e.g., uranium dioxide, triuranium octoxide, uranium trioxide) > 0.96 wt.% U-235, compounds of uranium and fluorine > 1.0 wt.% U-235 and in quantities > 15 g U-235, or materials containing other fissionable radionuclides capable of sustaining a chain reaction in quantities ≥ 1.6% of their maximum subcritical mass. It is also worth noting that the U.S. Department of Transportation (DOT) has its own exceptions for fissile material that can be found in 40 *CFR* § 173.453.

Free Liquids—Liquids that readily separate from the solid portion of a waste under ambient temperature and pressure. The presence or absence of free liquids is determined by the paint filter test or visual inspection [see Paint Filter Test (401 *KAR* 47:005)].

Friable Asbestos Material—A material that can be crumbled, pulverized, or powdered by hand pressure. If a friable ACM is damaged or disturbed, it presents an inhalation risk.

Generation Date/Origin Date—The date that the waste item was generated, declared a waste, and/or a collection container is filled. For bulking operations, the origin date for the newly generated waste (the bulked waste) will be the earliest origin date noted for any of the wastes bulked. If a waste is identified in the Agreed Order and is still managed and labeled as hazardous waste pending determination, then the generation date would be the date that the container went into the storage unit and would remain that after the determination is made, either hazardous or not hazardous.

Generator—See Waste Generator.

Generator Staging Area (GSA)—An area within a building or facility used for the accumulation of containers of all waste produced in the building or facility except hazardous waste. The GSA is the responsibility of the facility manager or the waste generator.

Hazardous Material—Hazardous material means a substance or material that the Secretary of Transportation has determined is capable of posing an unreasonable risk to health, safety, and property when transported in commerce, and has designated as hazardous under Section 5103 of federal hazardous materials transportation law (49 *U.S.C.* § 5103). The term includes hazardous substances, hazardous wastes, marine pollutants, elevated temperature materials, materials designed as hazardous in the Hazardous Materials Table (see 49 *CFR* § 172.101), and materials that meets the defining criteria for hazard classes and divisions in Part 173 of subchapter C of this chapter.

Hazardous Waste—See RCRA hazardous waste.

Incompatible Wastes—Wastes that when mixed together have the potential to generate heat, react violently, or generate a toxic vapor. (Note: Contact Waste Operations for further guidance.)

Laboratory Packs—A combination package with inner containers, absorbents, and configuration as specified in DOT regulations [49 *CFR* § 173.12(b)].

Land Disposal Restrictions—Provisions of the Hazardous and Solid Waste Amendments that prohibit the land disposal of hazardous waste into or on the land unless the U.S. Environmental Protection Agency (EPA) finds that it will not endanger human health and the environment. EPA specifies levels or methods of treatment that substantially diminish the toxicity and likelihood of hazardous constituents migrating from the waste. These levels and/or treatment standards must be met before the waste can be disposed at the landfill. (40 *CFR* Part 268).

Low-Level Waste (LLW)—Waste that contains radioactivity but is not, by definition, high-level waste, transuranic waste, spent nuclear fuel, or by-product material, as defined by U.S. Department of Energy (DOE) Order (O) 435.1 Chg 2 (AdminChg).

Mixed Waste—Waste containing both radioactive and hazardous components, as defined by the Atomic Energy Act and RCRA, respectively [DOE O 435.1 Chg 2 (AdminChg)].

Ninety (90)-Day Accumulation Area—Temporary staging area used to collect hazardous waste for 90 days or less before transfer to a permitted hazardous storage facility or shipment to a permitted hazardous waste treatment/disposal facility.

Nonfriable ACM—A nonfriable asbestos product is one in which the asbestos fibers are bound or locked into the product matrix, so that the fibers are not readily released. Such a product would present a risk for fibers release only when it is subjected to significant abrasion through activities such as sanding or cutting with electric power tools. Examples of nonfriable asbestos products include vinyl asbestos floor tile, acoustic ceiling tiles, and asbestos cement products.

Origin Date—See generation date.

Overpack—To place one or more containers into another larger container. Waste is not removed from the original container(s); the entire container is placed into the overpack container.

Paint Filter Test—An EPA-approved test to determine the presence or absence of free liquids to determine compliance with 40 *CFR* § 264.313 (SW-846 Method 9095B).

PCB Articles—PCB article means any manufactured article, other than a PCB container, that contains PCBs and whose surface(s) may have been in direct contact with PCBs [reference 40 *CFR* § 761.50 and 40 *CFR* § 761.60 (b) for disposal requirements]. "PCB Article" includes capacitors, transformers, electric motors, pumps, pipes, and any other manufactured item.

PCB Bulk Product Waste—PCB bulk product waste means waste derived from manufactured products containing PCBs in a nonliquid state, at any concentration where the concentration at the time of designation for disposal was ≥ 50 parts per million (ppm) PCBs. PCB bulk product waste does not include PCBs or PCB items regulated for disposal under 40 *CFR* § 761.60(a)–(c), 40 *CFR* § 761.61, 40 *CFR* § 761.63, or 40 *CFR* § 761.64. PCB bulk product waste includes, but is not limited to, the following:

- Nonliquid bulk waste or debris from the demolition of buildings and other man-made structures manufactured, coated, or serviced with PCBs. PCB bulk product waste does not include debris from the demolition of buildings or other man-made structures from regulated PCBs that have not been disposed of, decontaminated, or otherwise cleaned up in accordance with subpart D of this part.

- PCB-containing wastes from the shredding of automobiles, household appliances, or industrial appliances.

- Plastics (such as plastic insulation from wire or cable; radio, television and computer casings; vehicle parts; or furniture laminates); preformed or molded rubber parts and components; applied dried paints, varnishes, waxes or other similar coatings or sealants; caulking; adhesives; paper; asbestos; sound deadening or other types of insulation; and felt or fabric products such as gaskets.

- Fluorescent light ballasts containing PCBs in the potting material (reference 40 *CFR* § 761.50 and 40 *CFR* § 761.62 for disposal requirements).

PCB Remediation Waste—PCB remediation waste means waste containing PCBs as a result of a spill, release, or other unauthorized disposal (reference 40 *CFR* § 761.50, 40 *CFR* § 761.60, and 40 *CFR* § 761.61 for disposal requirements of PCB remediation wastes). PCB remediation wastes are debris generated as the result of a PCB spill cleanup, including, but not limited to, the following:

- Environmental media containing PCBs, such as soil and gravel; dredged materials, such as sediments and aqueous liquids decanted from sediment;

- Sewage sludge containing < 50 ppm PCBs; PCB sewage sludge; commercial or industrial sludge, including sludges located in or removed from any pollution control device and aqueous liquids decanted from an industrial sludge; and

- Buildings and other man-made materials (such as concrete floors, wood floors, or walls contaminated from a leaking PCB or PCB-contaminated transformer), porous surfaces, and nonporous surfaces.

PCB Laboratory Waste—Waste generated as a result of research and development activities authorized under 40 *CFR* § 761.30(j) and the chemical analysis of PCBs, including sample preparation, sample extraction, extract cleanup, extract concentration, addition of PCB standards, and instrumental analysis (reference 40 *CFR* § 761.50, and 40 *CFR* § 761.64 for disposal requirements). This does not include the original, unpreserved sample material that is returned to the generator.

PCB Radioactive Waste—Toxic Substance Control Act (TSCA)-regulated waste that contains radioactive constituent(s), as defined by the Atomic Energy Act.

PCB Waste—Those PCBs and PCB items that are subject to the disposal requirements of 40 *CFR* Part 761, Subpart D.

PCB/RCRA Mixed Waste—RCRA mixed waste that also is PCB waste.

Process Knowledge—As it applies to waste characterization and certification, process knowledge (PK) is documented knowledge of the processes and sources associated with generation of a waste or waste stream that allows a reliable estimation of the constituents and quantities for handling, storage, treatment, and disposal. PK is information, ultimately based on either analytical data or knowledge of the waste generating activity, that relates to the material to be characterized, but does not directly represent the material itself.

Radioactive Waste—Solid, liquid, or gaseous material that contains radionuclides regulated under the Atomic Energy Act of 1954, as amended, and of negligible economic value considering costs of recovery.

RCRA Hazardous Waste—Any solid, liquid, or contained gaseous material (compressed gas cylinder) that is characteristically hazardous or is a listed hazardous waste as defined by 401 *KAR* Chapter 31 (40 *CFR* Part 261), and/or any environmental media that contains a listed hazardous waste.

RCRA Mixed Waste—See Mixed Waste.

Regulated ACM (RACM)—Means (a) friable asbestos material; (b) Category I nonfriable ACM that has become friable; (c) Category I nonfriable ACM that will be or has been subjected to sanding, grinding, cutting, or abrading; or (d) Category II pulverized or reduced to powder by the forces expected to act on the material in the course of demolition or renovation operations.

Regulated Waste—Hazardous, radioactive, mixed, and solid waste that is managed and controlled by RCRA; TSCA; DOE O 435.1 Chg 2 (AdminChg); or other federal and state regulations.

Repackage—To move the contents of one or more waste container(s) into another waste container.

Satellite Accumulation Area (SAA)—A designated area for the temporary accumulation of hazardous waste that is located at or near the point of generation and under the control of the operator of the process generating the waste.

Solid Waste—Any discarded material (liquid, contained gas, semisolid, or solid) that is abandoned, including disposed of, burned, or incinerated, or accumulated, stored, or treated before or in lieu of being abandoned or incinerated; recycled; or inherently waste-like, such as those listed in 40 *CFR* § 261.2(d).

Thirty (30)-Day Temporary Storage Area—A temporary storage area used to collect PCB solid waste for 30 days or less before transfer to a waste storage facility or shipment to a permitted waste disposal facility.

Tamper-Indicating Device (TID)—A device that may be used on containers and that, because of the uniqueness in design or structure, may reveal violations of containment integrity. TIDs include seals, mechanisms, and enclosures.

Transuranic (TRU) Waste—Without regard to source or form, TRU is radioactive waste containing more than 100 nanocuries (nCi) [3,700 becquerels (Bq)] of alpha-emitting transuranic isotopes per gram of waste, with half-lives > 20 years, except for (1) high-level radioactive waste; (2) waste that the Secretary of Energy has determined, with the concurrence of the Administrator of the EPA, does not need the degree of isolation required by the 40 *CFR* Part 191 disposal regulations; or (3) waste that the Nuclear Regulatory Commission has approved for disposal on a case-by-case basis in accordance with 10 *CFR* Part 61.

TSCA Radioactive Waste—See PCB Radioactive Waste.

Underlying Hazardous Constituent—Any constituent listed in 40 *CFR* § 268.48, Universal Treatment Standards (UTS) table, except fluoride, vanadium, and zinc, which reasonably can be expected to be present at the point of generation of the hazardous waste, at a concentration above the constituent-specific UTS. Underlying hazardous constituents must be identified on land disposal restriction notification unless the generator will monitor for all regulated constituents.

Universal Waste—Universal waste means any of the following hazardous wastes that are managed under the universal requirements of 40 *CFR* Part 273: (1) batteries, (2) pesticides, (3) mercury-containing equipment, (4) lamps, and (5) aerosol cans.

Unknown Waste—Waste about which there is insufficient knowledge of its origin or generation.

Used Oil—Used oil is any oil refined from crude oil or synthetic oil that has been used and as a result of such use is contaminated by physical, chemical impurities. Used oil includes spent automotive lubricating oils, spent industrial oils, and spent industrial process oils. Used oil is subject to "Standards for the Management of Used Oil" (40 *CFR* Part 279).

Waste—See Solid Waste.

Waste Category—Groups of waste that are governed by common regulations (e.g., LLW, RCRA waste, PCB waste).

Waste Characterization—The process of identifying and quantifying the chemical, physical, biological, and other properties of waste in a manner adequate to determine regulatory category or to meet waste acceptance criteria (WAC) of the receiving organization.

Waste Container—A receptacle for waste, including any liner, shielding, or material that is intended to accompany the waste in disposal.

Waste Disposition—The planning, coordination, and direction of those functions related to generation, handling, treatment, storage, transportation, and disposal of waste, as well as associated surveillance and maintenance activities.

Waste Generator—Individual (such as facility manager, supervisor of a waste-generating activity, or appointee) or organization whose act or process produces waste to be managed for DOE.

Waste Oil—Waste oil is oils with no potential for recycle or energy recovery. Used oil means any oil that has been refined from crude oil, or any synthetic oil, that has been used and as a result of such use is contaminated by physical or chemical impurities.

Waste Stream—Waste material produced by a specific process or activity that is similar in material, physical form, radiological, and chemical constituents.

EXECUTIVE SUMMARY

The U.S. Department of Energy (DOE) owns and operates waste treatment, storage, and disposal facilities (TSDFs) at the Paducah Site. Four Rivers Nuclear Partnership, LLC (FRNP), the Deactivation and Remediation (D&R) Contractor for DOE, manages and operates these facilities. Currently, TSDFs include the C-746-USolid Waste Landfill, several hazardous waste storage facilities, Toxic Substances Control Act (TSCA) waste storage facilities, radioactive waste storage facilities, wastewater treatment facilities, Comprehensive Environmental Response, Compensation, and Liability Act storage areas, and waste treatment facilities. These facilities may be regulated by DOE, the Commonwealth of Kentucky, and/or the U.S. Environmental Protection Agency under the provisions of the Atomic Energy Act, the Resource Conservation and Recovery Act, TSCA, Kentucky Solid Waste Landfill Regulations, and/or the Clean Water Act.

This document establishes the site-specific waste generation and certification criteria, in addition to the state, federal, DOE, and treatment and disposal facilities criteria, which the various waste types must meet before being transferred to one of the Paducah Site TSDFs. The established criteria ensure that the wastes will be accepted for treatment, storage, and/or disposal at the various Paducah Site TSDFs and will be handled safely in compliance with all applicable regulations. It is stressed that while waste is being stored at a Paducah Site TSDF that the generator remains responsible for the waste, and that offering waste for storage does not imply the waste meets the acceptance criteria for off-site treatment and/or disposal. The following criteria must be met to ensure that waste can be handled and stored safely at any of the Paducah Site TSDFs. Various contractors and subcontractors may generate waste at the Paducah Site through general maintenance, environmental restoration projects, decontamination and decommissioning, and other daily plant process activities.

The following D&R Contractor procedures/documents or FRNP-approved alternative must be used in generation, characterization, packaging, certification, and disposition of waste.

- CP2-SM-1000, *Activity Level Work Planning and Control Program for the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*
- CP2-WM-0001, *Four Rivers Nuclear Partnership, LLC, Paducah Deactivation and Remediation Project Waste Management Plan*
- CP2-WM-0661, *Four Rivers Nuclear Partnership, LLC, Paducah Deactivation and Remediation Project Transportation Safety Document for On-Site Transport*
- CP3-NS-1031, *Nuclear Criticality Safety Program*
- CP3-NS-1033, *Enrichment and Exempt Waste Verification*
- CP3-QA-2500, *Procurement, Inspection, and Management of Items Critical for Paducah Off-Site Waste Shipments*
- CP3-QA-2501, *Waste Certification*
- CP3-SM-1101, *Work Package Development*
- CP3-SM-1102, *Activity Level Work Execution and Closeout*

- CP3-WM-0017, *Standard Operation for the C-746-S, -T, and -U Landfills*
- CP3-WM-0437, *Waste Characterization and Profiling*
- CP3-WM-1017, *Safe Handling and Opening of Sealed Containers*
- CP3-WM-1036, *Nuclear Criticality Safety Implementation Requirements for Handling and Storage of Fissile and Potentially Fissile Waste*
- CP3-WM-1037, *Generation and Temporary Storage of Waste Materials*
- CP3-WM-2100, *Operation of Temporary Fissile Storage Areas*
- CP3-WM-2110, *Waste Container Handling, Overpacking, and Transportation*
- CP3-WM-3014, *Waste Generating*
- CP3-WM-3015, *Waste Packaging*
- CP3-WM-3025, *Preparation and Processing of Paducah Landfill Packages*
- CP3-WM-3028, *Off-Site Shipping*
- CP4-WM-0019, *On-Site Transfer and Movement of Waste Containers and Other Support Equipment*

Before generating wastes that will be stored temporarily in a Paducah TSDF, each generator is required to comply with the requirements of CP2-WM-0001, *Four Rivers Nuclear Partnership, LLC, Paducah Deactivation and Remediation Project Waste Management Plan*. The CP3-WM-3014-F02, *Request for Disposal* (RFD), or approved equivalent is used to facilitate the transfer of waste to one of the various Paducah Site on-site TSDFs. Equivalent forms must be approved for use by the Waste Management Director.

1. INTRODUCTION

The U.S. Department of Energy (DOE) owns and operates waste treatment, storage, and disposal facilities (TSDFs) at the Paducah Site. Four Rivers Nuclear Partnership, LLC (FRNP), the Deactivation and Remediation (D&R) Contractor for DOE at the Paducah Site, manages and operates these facilities. Currently, these facilities include the C-746-U Solid Waste Landfill, several hazardous waste storage facilities, radioactive waste storage facilities, Toxic Substances Control Act (TSCA) waste storage facilities, and waste treatment facilities. These units may be regulated by DOE, the Commonwealth of Kentucky, and/or the U.S. Environmental Protection Agency (EPA) under the provisions of the Atomic Energy Act, Resource Conservation and Recovery Act (RCRA), TSCA, Kentucky Solid Waste Landfill Regulations, and/or the Clean Water Act.

This document was developed to ensure that wastes generated, certified, and accepted for treatment, storage, and disposal (TSD) at the various on-site TSDFs can be handled in a safe and efficient manner and are compliant with the federal, state, DOE, and waste treatment and disposal facility rules and regulations. The waste acceptance criteria (WAC) established in this document applies to all newly generated waste being offered for temporary on-site storage prior to treatment, storage, and/or disposal at various on-site TSDFs. It also applies to waste that will be sent to an off-site TSDF. The following criteria must be met to ensure that waste can be handled and stored safely at any of the Paducah Site TSDFs. This document does not supersede applicable federal and state regulations. The generator is responsible for ensuring that all wastes are generated, managed, and certified in accordance with the Paducah Site's waste management and quality assurance procedures and applicable federal, state, DOE, and off-site waste disposition facility requirements.

The following D&R Contractor's procedures/documents or D&R-approved alternative must be used in generation, characterization, packaging, certification, and disposition of waste.

- CP2-SM-1000, *Activity Level Work Planning and Control Program for the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*
- CP2-WM-0001, *Four Rivers Nuclear Partnership, LLC, Paducah Deactivation and Remediation Project Waste Management Plan*
- CP2-WM-0661, *Four Rivers Nuclear Partnership, LLC, Paducah Deactivation and Remediation Project Transportation Safety Document for On-Site Transport*
- CP3-NS-1031, *Nuclear Criticality Safety Program*
- CP3-NS-1033, *Enrichment and Exempt Waste Verification*
- CP3-QA-2500, *Procurement, Inspection, and Management of Items Critical for Paducah Off-Site Waste Shipments*
- CP3-QA-2501, *Waste Certification*
- CP3-SM-1101, *Work Package Development*
- CP3-SM-1102, *Activity Level Work Execution and Closeout*
- CP3-WM-0017, *Standard Operation for the C-746-S, -T, and -U Landfills*

- CP3-WM-0437, *Waste Characterization and Profiling*
- CP3-WM-1017, *Safe Handling and Opening of Sealed Containers*
- CP3-WM-1036, *Nuclear Criticality Safety Implementation Requirements for Handling and Storage of Fissile and Potentially Fissile Waste*
- CP3-WM-1037, *Generation and Temporary Storage of Waste Materials*
- CP3-WM-2100, *Operation of Temporary Fissile Storage Areas*
- CP3-WM-2110, *Waste Container Handling, Overpacking, and Transportation*
- CP3-WM-3014, *Waste Generating*
- CP3-WM-3015, *Waste Packaging*
- CP3-WM-3025, *Preparation and Processing of Paducah Landfill Packages*
- CP3-WM-3028, *Off-Site Shipping*
- CP4-WM-0019, *On-Site Transfer and Movement of Waste Containers and Other Support Equipment*

The D&R Contractor's Waste Management team is available to assist in understanding and interpreting the requirements in this document. For assistance, please call the following:

Waste Management Director
Telephone: (270) 441-5457
(270) 816-5100

Waste Facility Operations Manager
Telephone: (270) 441-5863
(270) 217-0344
Fax: (270) 441-5250
(270) 441-5225

Landfill Manager
Telephone: (270) 816-4164

Waste Compliance Manager
Telephone: (270) 441-6698
(270) 559-6295

Transportation Manager
Telephone: (270) 441-5310
(270) 816-4157

Waste Generator Services Manager
Telephone: (270) 441-5177
(270) 816-4106

2. PURPOSE AND SCOPE

This document establishes the WAC for Paducah Site TSDFs. The WAC provides the requirements, terms, and conditions under which waste will be accepted for treatment, storage, and/or disposal at Paducah Site TSDFs. The criteria apply to all newly generated or newly discovered wastes that are being offered for TSD to any Paducah Site Waste Management TSDF.

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3. REQUEST FOR DISPOSAL PROCESS

3.1 REQUEST FOR DISPOSAL

The waste generator must identify waste, quantify waste, and initiate a request for disposal (RFD). The CP3-WM-3014-F01, is used to facilitate the transfer of waste to one of the various on-site TSDFs. Each project at the Paducah Site should develop a waste generation forecast (WGF) per DOE-approved CP2-WM-0001, *Four Rivers Nuclear Partnership, LLC, Paducah Deactivation and Remediation Project Waste Management Plan*. The WGF should be the starting point for each project to determine the RFDs needed to support the project.

The RFD form and instructions for completing the form are found in CP3-WM-3014, *Waste Generating*. A list of all active RFDs is maintained on the shared drive (i.e., S:\Everyone\RFDs folder). RFDs will typically be closed out annually or when all the affected waste has been generated; however, exceptions for ongoing waste generation can be made, with Waste Management approval, pending no process changes that could alter the waste stream characteristics have occurred. Once RFDs are closed, they are removed from the active list of the shared drive.

Waste generation operators in the field should use the RFD to ensure waste containers meet all requirements outlined in the RFD and the instructions (e.g., waste description, waste type, approved container, recommended handling/survey requirements, absorbent recommendations, marking, labeling). Waste or packaging that does not meet the stated requirements of the RFD should not be generated, and work should be paused to determine if the RFD requires revision or if a new RFD needs to be developed.

Table 1 provides general responsibilities for transferring waste at the Paducah Site.

Table 1. Responsibilities for Transferring Waste

Personnel	Responsibilities
Project Manager	Waste generation forecasts
Waste Generator	Complete RFDs
Waste Engineers	Review/approve RFDs, characterize waste, sampling and analysis event plans, and waste characterization packages
Waste Managers	Provide oversight through established mechanisms (i.e., performance observations, self-assessments, management assessments) to ensure the RFD process is implemented per program requirements
Waste Specialists/Operators	Complete waste item container log per CP3-WM-3015, *Waste Packaging*; add waste to container
Database Personnel	Maintain the integrated waste tracking system
Waste Operations Personnel	Pick-up and deliveries
Transportation Specialist	Complete shipping papers and shipment package

3.2 WASTE VARIANCE REQUEST

CP2-WM-0001, *Four Rivers Nuclear Partnership, LLC Paducah Deactivation and Remediation Project Waste Management Plan,* requires the waste generator to meet requirements for generation, packaging, characterization, storage, treatment, and disposal for all wastes being transferred to a Paducah Site TSDF or shipped off-site to a TSDF.

If wastes being transferred to a Paducah Site TSDF do not meet one of the acceptance criteria established in this document, the generator may request a variance by submitting CP3-WM-3014-F03, *Waste Variance Request Form*. The variance may be granted if it is determined that conditions exist that make it exceedingly difficult or impossible to meet a requirement, or if it is determined that the compliance status of either the generator's or TSDF's site operations is not compromised by the variance. Variances will not be granted for convenience. The generator must document all requests, and the Waste Generator Manager or designee must approve them.

3.3 REQUEST FOR INTERIM STORAGE

Once waste is generated, characterized, containerized, appropriately labeled, marked, and certified, Waste Management shall verify that the RFD is complete, all necessary documents are present, and that waste meets the safety basis limits for that facility. Once verified, approval for transfer is given to the generator.

If the need for a variance is identified, a Waste Variance Request is required with the RFD. Additional time may be needed to evaluate the variance request, which may cause a delay in approval for the RFD.

Before any newly generated waste is accepted by the D&R Contractor for storage, the RFD must be reviewed and agreed upon by Waste Management. Wastes that are within three months of their required disposition date due to regulatory commitments may be accepted into interim storage at the discretion of the Waste Management Director. This waste may be shipped directly from the generator's staging or storage area after consultation with the Regulatory Compliance Manager.

A completed "Classification Office (CO)/Technical Information Office (TIO) and R8-Chg Paducah Site Derivative Classifier Review Request Form" (PGDP-SS-FO-001) must be included with RFD submittal, if required. This statement does not apply for collection containers where the RFD is submitted prior to generation.

3.4 TRANSFER OF WASTE TO WASTE MANAGEMENT

After the RFD is approved, generators will coordinate the delivery of wastes with Waste Facility Operations. On the day of delivery, Waste Operations will verify the appropriate documentation is present, waste containers are marked and labeled properly, and radiological (RAD) surveys have been performed by radiological control (RADCON), if needed.

Waste Operations may open waste packages to conduct visual verification of waste type and form. Industrial Hygiene and RADCON guidance is required prior to opening any container except for collection containers.

Generators must correct deficiencies found during receipt inspection of the waste before waste will be accepted. If generators are unable to correct the deficiencies, Waste Management will not accept the waste.

The following types of waste generated off-site may be accepted by Paducah Site TSDFs: waste generated as a result of environmental restoration/management, deactivation, or stabilization activities that are associated with released or potential releases from the Paducah Site, or residuals generated from the treatment or analysis of Paducah Site waste. Generators with these types of wastes must provide to Waste Management, at least three days in advance, written notification of planned transfers of waste to Paducah Site TSDFs. The notification may be transmitted with the RFD. Intent to transfer may be communicated to Waste Management via telephone in emergencies.

On-site generators requesting delivery of waste to Paducah Site TSDFs after 2:00 p.m. must obtain approval from Waste Operations at least 24 hours in advance.

3.5 DISPOSITION OF NEWLY GENERATED WASTE

All newly generated or discovered TSCA/radioactive, mixed waste (RCRA/radioactive), and low-level waste (LLW) must be disposed of within one year of generation per DOE Order (O) 435.1 Chg 2 (AdminChg), *Radioactive Waste Management*. Exemptions/variances may be obtained on a case-by-case basis with concurrence from Portsmouth/Paducah Project Office.

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4. WASTE CRITERIA

The criteria established in this document are for wastes being (1) disposed of in the C-746-U Contained Solid Waste Landfill, (2) treated at one of the on-site treatment facilities, and/or (3) stored in on-site waste storage facilities until shipment to an off-site TSDF. Although some requirements established in this document apply to waste generation, certification, and storage while in the possession of the generator, most requirements for the management of the waste while in the possession of the generator are outside the scope of this document (see CP3-WM-1037). The generator is responsible for managing waste during all phases of its life cycle, from generation to disposal (cradle to grave).

Generators should be aware that any waste transferred must meet the requirements of each facility in which the waste will reside. As an example, waste to be treated in one of the treatment facilities requiring storage before treatment would need to meet the criteria of Section 4.1.

4.1 WASTE SUBMITTED FOR STORAGE

The Paducah Site waste storage facilities safely store RCRA-hazardous wastes, TSCA-regulated wastes, LLW, mixed waste (RCRA and LLW), transuranic (TRU) wastes, universal wastes, and sanitary solid wastes. The Paducah Site waste storage facilities are designed to provide safe storage until the generator can facilitate the proper treatment and/or disposal for the waste. It is stressed that while waste is being stored at a Paducah Site TSDF that the generator remains responsible for the waste. The following criteria must be met to ensure that waste can be handled and stored safely at any of the Paducah Site TSDFs.

4.1.1 General Requirements

All waste submitted for storage must meet the specific WAC established in this section, in addition to being containerized in accordance with Section 5 and characterized in accordance with Section 6.

4.1.2 Hazardous Wastes

Hazardous wastes must be characterized and categorized in accordance with 40 *CFR* Parts 261–268 and 401 *KAR* Chapter 39. All hazardous waste must have the proper waste code assigned, to include underlying hazardous constituents, and be identified in RFD as such.

4.1.3 Specific hazardous waste requirements

The waste generator must report and certify the following information on the RFD for RCRA hazardous or potentially RCRA hazardous waste as a condition of waste acceptance.

Hydrogen potential (pH) (applies to aqueous liquids only)—The pH of the liquid must be reported for pH < 2 or > 12.5.

NOTE: For nonaqueous liquids that are suspected of being corrosive, the material should be tested to determine if it corrodes steel at a rate > 0.25 inches (6.35 mm) per year.

Flash Point—The flash point of liquid waste must be reported by using process knowledge (PK) or testing. The actual flash point of the waste must be reported if above 90°F and below 210°F [between these limits, the discrete value must be reported—not less than (<) or greater than (>) a value]. If using safety data sheets (SDSs) for characterization, the flash point may be reported with < or > values.

EPA Characteristics and Listed Waste Codes—Any EPA listed waste codes must be reported if the waste is generated by a specific source, a nonspecific source, an acute toxic chemical, or a toxic chemical that is listed in 401 *KAR* Chapter 39 (40 *CFR* Part 261). This includes any environmental media that contains a listed waste and that does not have an appropriate "contained-in" determination. The waste must carry the applicable EPA code, as specified.

4.1.4 Polychlorinated Biphenyls

Polychlorinated biphenyl (PCB) wastes are those that are subject to TSCA regulations in 40 *CFR* Part 761. PCB wastes submitted for disposal must meet all the applicable requirements in federal regulations and the Commonwealth of Kentucky regulations. The generator should consult DOE/EH-413-9914, *Storage and Disposal of PCB Waste,* when making classification and TSD decisions.

PCBs measured on nonporous surfaces (e.g., metal) are regulated by the same provisions as concentrations in Table 2.

Table 2. PCB Surface Contamination

Surface Contamination Measurement	Analogous Volumetric PCB Concentration
≤ 10 µg/100 cm^2	< 50 ppm
> 10 µg/100 cm^2 to < 100 µg/100 cm^2	≥ 50 ppm< 500 ppm
≥ 100 µg/100 cm^2	≥ 500 ppm

4.1.4.1 Specific PCB waste requirements

The generator must report the following information on the RFD for PCB waste.

TSCA-Regulated Constituents and Concentrations—The presence of TSCA-regulated PCBs in the waste must be identified. The PCB concentration in milligrams per kilogram and the source of the PCBs (i.e., capacitor spill, ventilation duct oil) must be reported.

Date-to-Storage (DTS)—Note the date removed from service for disposal or date PCB item was first containerized, whichever is first.

PCB Articles—Items such as capacitors and transformers that contain regulated or detectable levels of PCBs must be reported on the RFD and have the following special reporting requirements:

- Type of equipment;
- Manufacturer's name;
- Identification or serial number;
- Kilo Var rating, volume of liquid (electrical equipment only);
- Quantity of PCB dielectric liquids (regulated);
- Notation of whether the item is leaking or not leaking; and
- PCB concentration and source.

PCB Bulk Product Waste—Note on the RFD the following information: (1) a description of the bulk product waste (e.g., plastic, dried applied paint, fabric insulation) and (2) whether waste leaches or does not leach PCBs. If waste leaches ≥ 10 µg/L PCBs, waste must be marked/labeled, tracked, manifested, and disposed of as PCB waste, unless managed per note below.

NOTE: PCB bulk product that leaches < 10 µg/L does not have to be marked/labeled, tracked, manifested, or disposed of as PCB waste, but the disposal facility (facility that does not have TSCA storage or disposal approval) must be notified a minimum of 15 days prior to shipment [40 *CFR* § 761.62(b), and certain storage requirements may apply].

NOTE: PCB bulk product can be characterized using RCRA representative sampling and if less than 49 ppm, can be disposed of in the C-746-U Landfill per letter from Kentucky Division of Waste Management to DOE, "Polychlorinated Biphenyl Bulk Product Waste Characterization and Disposal Considerations for the C-746-U Landfill," dated August 11, 2008.

PCB Remediation Waste—Note whether waste satisfies requirements of 40 *CFR* § 761.61.

Containerized and Bulked PCB Waste—The source, volume (or quantity), and date for each addition or removal from the container must be identified. The disposition of any material removed from the container also must be noted on form CP3-WM-3015-F01, "Waste Item Container Log."

PCB Antidilution Rule—No person may avoid any provision specifying a PCB concentration by diluting the PCBs, unless otherwise specifically provided. If it touches or is mixed with PCBs or particularly spilled PCBs, then it must be handled as if the original PCB concentration.

4.1.5 Radioactive Waste

Radioactive waste is defined as solid, liquid, or gaseous material that contains radionuclides regulated under the Atomic Energy Act of 1954, as amended, and of negligible economic value considering costs of recovery. The Paducah Site has produced only LLW and potentially TRU wastes. LLW consists of two categories: LLW and Paducah Site Fissionable Wastes. LLW is discussed in Section 4.1.4.2. Paducah Site Fissionable Wastes are discussed in Section 4.1.4.3. Paducah Site Fissionable Wastes and NCS Spacing Exempt Waste are discussed in Section 4.1.4.3 under the heading of Fissionable Assay Waste. TRU is discussed in Section 4.1.4.4. Radioactive wastes must be identified as LLW, Paducah Site Fissionable Wastes, NCS Spacing Exempt Waste, or TRU on the RFD.

4.1.5.1 General radioactive waste requirements

Percent Enrichment—For waste containing uranium, the percent enrichment of the uranium in uranium-235 (U-235), in weight percent must be reported on RFD (for guidance contact Waste Management).

Absorbent Materials—The type and quantity of absorbent materials in mass and must be reported on the "Waste Item Container Log," CP3-WM-3015-F01, (see procedure CP3-WM-3015, *Waste Packaging,* and form CP3-WM-3014-F04, "Absorbent Determination Form," for guidance).

Ion Exchange Resins—The presence of ion exchange resins must be identified.

Chelating Agents—Report active chelating agents ≥ 1% of the weight of the waste. Report spent chelating agents in any quantity.

Sealed Source Radioactive Waste—The following reporting requirements apply:

NOTE: Any leak test that shows 0.005 µCi or more of removable contamination will be considered evidence that the sealed source is leaking its radioactive contents. If a leak test cannot be performed because of handling or measurement limitations, the source will be assumed to be leaking.

- Leak test results.

- A declaration, with descriptive justification, that the sealed source no longer is appropriate to the function for which it was produced or procured.

- Documentation that the sealed source is not suitable for recycle, reuse, or returnable to the manufacturer.

4.1.5.2 Low-level radioactive waste

LLW is defined as radioactive waste that is not high-level radioactive waste, spent nuclear fuel, TRU waste, by-product material [as defined in Section 11e (2) of the Atomic Energy Act of 1954, as amended], or naturally occurring radioactive material.

Waste must be categorized as LLW if it exceeds the surface contamination limits established in CP3-RP-1109, *Radioactive Contamination Control and Monitoring*. Potential volumetric contaminated waste also must be categorized as LLW until verified as not radioactive by project health physicist.

LLW meeting the criteria of greater-than-Class-C (10 *CFR* § 61.55) must be identified on the RFD as such.

4.1.5.3 Fissionable-assay waste

There are two procedures governing the handling and storage of fissile/potentially fissile waste depending on the applicable Nuclear Criticality Safety Evaluation (NCSE). The handling requirements of. CP3-WM-1036, *Nuclear Criticality Safety Implementation Requirements for Handling and Storage of Fissile and Potentially Fissile Waste*, applies to all fissile/potentially fissile waste. Ensure the appropriate nuclear criticality safety (NCS) requirements are met prior to transferring fissile/potentially fissile waste from one NCSE to another.

Waste containing fissionable radionuclides, other than U-235, will be assessed on a case-by-case basis. Evaluation by NCS is required for the other fissionable radionuclides as identified in the NCS program procedures CP3-NS-1031, *Nuclear Criticality Safety Program*, and CP3-NS-1033, *Enrichment and Exempt Waste Verification*.

Waste containing significant quantities of super-moderators (materials whose moderation properties are more effective than those of water, such as heavy water, oil, polyethylene, beryllium, and pure carbon graphite) cannot be accepted into areas/facilities controlled under an NCS facility exemption in CP2-WM-0006, *Facility Safety Basis Inventory Control Plan for the Paducah Waste Storage Facilities at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*.

4.1.5.4 Transuranic waste

TRU waste is radioactive waste containing more than 100 nCi (3,700 Bq) of alpha-emitting transuranic isotopes per gram of waste, with half-lives ≥ 20 years. All TRU waste must be identified on the RFD.

TRU Waste Reporting Requirements—In addition to all requirements above, the following must be reported for TRU waste:

- Combustible Materials Present—An estimate of percent of combustible materials by weight (e.g., 0%, 25%, 50%, 75%, 100%);

- Thermal Power—Reports the thermal power in watts for waste generating > 0.1 watts/ft^3;
- RAD Handling Type—Identify handling requirements (contact handle or remote handle);
- Heat-sealed Bags—Identify the presence of heat-sealed bags; and
- Sealed Layers of Packaging—Identify number and type, starting with the innermost layer and working outward.

4.1.6 Mixed Waste

Waste submitted for storage meeting this definition must satisfy the requirements for the storage of radioactive waste (Section 4.1.4) and the applicable hazardous component (Section 4.1.2).

4.1.7 Polychlorinated Biphenyl/Radioactive Waste

PCB radioactive waste must meet the requirements for both radioactive waste (Section 4.1.4) and PCB waste (Section 4.1.3).

4.1.8 Asbestos-Containing Material and Regulated Asbestos-Containing Material

Asbestos-containing material (ACM) is any material that contains more than 1% asbestos. ACM found at the Paducah Site may include, but is not limited to, transite, floor tiles and mastic, ceiling tiles, roofing materials, gaskets, thermal system insulation, etc. All asbestos-containing wastes placed in temporary storage must comply with the U.S. Department of Transportation (DOT) regulations; CP2-WM-0661, *Four Rivers Nuclear Partnership, LLC, Paducah Deactivation and Remediation Project Transportation Safety Document for On-Site Transport*; 49 *CFR* Part 173; 40 *CFR* Part 61; 29 *CFR* Part 1910; and 401 *KAR* requirements, as applicable, and the disposal facility WAC. An estimate of the total volume of asbestos containing wastes (friable or nonfriable), in cubic yards must be annotated in Block R10 of the RFD.

Requirements for packaging, handling, producing shipping papers, and TSDF's WAC vary depending on whether the waste material is ACM or regulated ACM (RACM). If adequate PK is not available, evaluation by an asbestos competent person may be required prior to declaring disposal options.

4.1.9 Waste Not Fully Characterized

In some cases, the need may exist for waste to be transferred to a Paducah Site TSDF before all applicable requirements in this document and off-site receiving facility WAC are fulfilled [i.e., waste may need to be removed from a full satellite accumulation area (SAA) before characterization is complete]; therefore, all documentation may not be complete. Waste Management must be contacted for concurrence and plans to complete all requirements must be made.

Certain minimum requirements must be met before waste is accepted including the following.

Assay Determination—Required before waste will be accepted if waste has the potential to be radioactive. Contact Waste Management for guidance.

Characterization Data (Analytical Data)—Data and associated documents that are used to characterize the waste stream. This may include laboratory analytical data, the sampling and analysis plan, process operating procedures and any other documentation that allows the data to be related to the waste stream. Any waste that will be shipped off-site for treatment and/or disposal or on-site disposal must have its analytical data loaded into the Paducah Oak Ridge Environmental Information System database or have an approved Waste Variance Request form. Certain data are required before waste can be accepted. These include the following:

- pH, if the waste is liquid and has the potential to be RCRA corrosive;
- Flash point, if the liquid waste has the potential to be RCRA ignitable;
- Independent assays, if the waste has the potential to be fissile; and
- PCB concentration and source.

RFD and Associated Attachments—Required before waste will be accepted.

Waste Item Container Log—For all containerized waste, form CP3-WM-3015-F01, "Waste Item Container Log," accompanies the RFD and is required before waste will be accepted (See CP3-WM-3015, *Waste Packaging*).

Routine waste generated by surveillance and maintenance (S&M) activities [such as boundary control station (BCS) trash, used oil, fluorescent lamps, etc.] and placed into collection containers should be documented using form CP3-WM-3015-F01, "Waste Item Container Log." In some instances, such as Deactivation or Remediation Project waste that is being packaged for shipment/disposal, the waste may require waste certification official (WCO)/waste package certifier (WPC) oversight and packaging in accordance with CP3-WM-3015, *Waste Packaging*, using form CP3-WM-3015-F01, "Waste Item Container Log." This decision will be made during the waste generation planning process.

Waste Variance Form —The variance request CP3-WM-3014-F03 will document the reason the waste needs to be transferred before all requirements can be met. In addition, the variance request will describe actions being taken to satisfy the waste acceptance criteria and the associated time lines.

4.1.10 Universal Waste

4.1.10.1Universal waste rule

The Universal Waste Rule enables recycling and proper disposal of certain hazardous wastes, while reducing the time and money required to manage them as hazardous waste. In Kentucky, a generator has the option to manage batteries, unused pesticides, mercury thermostats, and spent lamps either as hazardous waste or as universal waste. If one of these wastes is radiologically contaminated, it cannot be designated as universal waste; however, if radiologically contaminated, it must be managed as a mixed waste.

4.1.10.2Universal waste types

The following items are classified as universal waste types.

- Batteries, such as nickel-cadmium (Ni-Cd), lithium ion, and small sealed lead-acid batteries that are found in electronic equipment, bar codes scanners, mobile telephones, portable computers, and emergency backup lighting.

- Agricultural pesticides that have been recalled or banned from use, are obsolete, have become damaged, or no longer are needed due to changes in cropping patterns or other factors. These often have been stored for long periods of time in sheds or barns.

- Thermostats, which can contain as much as three grams of liquid mercury, are located in almost any building, including commercial, industrial, agricultural, community buildings, and households.

- Spent lamps, which include incandescent, fluorescent, high-pressure sodium, mercury vapor, metal halide, high intensity discharge, and neon bulbs or tubes.

- Aerosol Cans, which includes unpunctured spray cans containing paints, lubricants, cleaners, etc.

4.1.10.3Handling requirements for universal waste

All universal waste must be managed in a way that prevents releases of the waste or its components to the environment. Universal waste may be accumulated for up to one year. Following are handling requirements for the waste types listed below.

All Types

- Containerize the waste in a container that has no evidence of leaks, spills, or damage that could cause leaks. The container must be closed, structurally sound, and compatible with its contents.

- The container must be labeled or clearly marked with the words "Universal Waste" and either "Batteries," "Pesticides," "Mercury Thermostats," "Spent Lamps," or "Aerosol cans."

- Overpack or repackage wastes that are not in an acceptable container.

- Mark each item in the container with the date it became a waste, or mark each container with the earliest date that any waste in the container became a waste.

Batteries

- Batteries should be sorted by type, such as Ni-Cd and other nickel-bearing batteries, lead-acid, lithium ion, silver oxide, or mercury.

- Discharge batteries to remove any electrical charge and tape terminals.

- The casing of each individual battery must stay intact and closed (except that cells may be opened to remove electrolyte but shall be closed immediately after removal). If any electrolyte is removed, it must be characterized to determine whether or not it is a hazardous waste.

Unused Agricultural Pesticides

The container should have the original label that was on the product at the time of purchase. If the original label is not legible or available, then use an appropriate label, as required by DOT.

Mercury Thermostats

The mercury-containing ampoules may be removed from thermostats under the following conditions:

- They are removed in a manner that prevents breakage and over a containment device (tray or pan);
- A mercury cleanup system is readily available;
- Leaks or spills from broken ampoules are cleaned up immediately;
- The work area is well ventilated and monitored in compliance with Occupational Safety and Health Administration exposure standards; and
- The removed ampoules are put in a container with enough packing materials to prevent breakage during storage, handling, and transportation.

Spent Lamps

- Sort lamps by type [e.g., fluorescent (mercury), incandescent (lead), or others].
- Lamps that are broken must be cleaned up and containerized as hazardous waste.
- Leaking or damaged lamps must be containerized.

Aerosol Cans

- Universal waste aerosol cans that show evidence of leakage must be packaged in a separate closed container or overpacked with absorbents.

4.1.11 Lead Acid Batteries

Lead Acid Batteries

- Lead acid batteries may be considered recyclable and managed in accordance with 40 *CFR* Part 266 Subpart G, Spent Lead-Acid Batteries Being Reclaimed. There are no hazardous waste labeling and/or marking requirements when handling batteries under this regulation.
- A generator staging area must be set up for recyclable non-waste batteries with signage applied that states "40 *CFR* Part 266 Subpart G Recyclable Battery Area."
- An RFD shall be used to designate the batteries as recyclable "non-waste" material. A waste item container log sheet shall be utilized to document the packaging of a battery or batteries (e.g., on a pallet). A unique number shall be assigned to each battery to track the item on the radiological survey and corresponding radiological free release documentation. An example of the unique numbering used for tracking is to use the waste item identification number followed by a -01, -02, -03, etc., until all batteries in a package are accounted for. The unique number shall be recorded on the waste item container log sheet.
- Discharge batteries to remove any electrical charge and then tape the battery terminals.
- The casing of each individual battery must stay intact and closed, except that cells may be opened to remove battery electrolyte, but shall be closed immediately after removal is completed. If any electrolyte is removed, it must be characterized to determine whether or not it is a hazardous waste.

5. CONTAINERIZATION

The generator is responsible for containerizing the waste, which includes assistance in selection and procuring appropriate containers, packaging the wastes, marking and labeling waste packages, and storing waste packages before transfer. All containers and waste packaging activities must comply with the applicable requirements of these documents:

- DOT hazardous materials transportation regulations 49 *CFR* or approved alternatives, as addressed in CP2-WM-0661;
- DOE M 435.1-1 Chg 3 (LtdChg), *Radioactive Waste Management Manual*;
- *Nevada National Security Site Waste Acceptance Criteria*, DOE/NV-325, latest revision;
- Off-Site Commercial TSDF WAC;
- CP3-QA-2500, *Procurement, Inspection, and Management of Items Critical for Paducah Off-Site Waste Shipments*;
- CP3-WM-3015, *Waste Packaging*; and
- CP3-WM-2110, *Waste Container Handling, Overpacking, and Transportation*.

5.1 CONTAINER SELECTION

Containers are selected based on the waste matrix, the compatibility of the waste material with the container, venting requirements, and the expected disposal option for the waste. All container selection, absorbent selection, procurement, and inspections must be in accordance with CP3-QA-2500, *Procurement, Inspection, and Management of Items Critical for Paducah Off-Site Waste Shipments*, for off-site shipments. For containers that will be used for chemicals such as solvents, acids, or bases, additional information is needed for determining proper packaging. Information such as pH, flashpoint, chemical name, and percent concentration may be required to make an appropriate packaging decision. This information may be found in SDS or from other sources and should be provided to Waste Transportation personnel who will work in conjunction with engineering to assist with selecting the correct container. Table 3 provides some recommended packaging materials for commonly used acids, bases, and solvents at the Paducah Site.

5.1.1 Compatibility with Waste

The generator must place waste and selected absorbents in containers that are compatible with the waste, as determined by testing, literature, or past operating experience and DOT requirements. Incompatible wastes shall not be placed in the same container. The generator must contact Waste Management for procuring suitable containers. All container selections and procurement must be in accordance with CP3-QA-2500 for off-site shipments.

Table 3. Recommended Packaging Materials for Common Chemicals

Chemical	Drum Type	Liner Type	Gasket Type*
Trichloroethene	Steel	N/A	PTFE, FKM
Gasoline	Steel	N/A	PTFE, BUNA N RUBBER, NEOPRENE
Diesel Fuel	Steel	N/A	PTFE, BUNA N RUBBER, NEOPRENE
Ethylene Glycol	LDPE, HDPE or Steel	LDPE or HDPE when required	PTFE, EPDM, BUNA N OR NATURAL RUBBER, NEOPRENE
Propylene Glycol	LDPE, HDPE or Steel	LDPE or HDPE when required	PTFE, EPDM, BUNA N OR NATURAL RUBBER, NEOPRENE
Sulfuric Acid (72 wt.%)	LDPE or HDPE	LDPE or HDPE when required	PTFE, EPDM, BUNA N RUBBER, NEOPRENE
Sulfuric Acid (36 wt.%)	LDPE or HDPE	LDPE or HDPE when required	PTFE, EPDM, BUNA N RUBBER, NEOPRENE
Potassium Hydroxide	LDPE or HDPE	LDPE or HDPE when required	PTFE, EPDM, BUNA N RUBBER, NEOPRENE
Sodium Hydroxide	LDPE or HDPE	LDPE or HDPE when required	PTFE, EPDM, BUNA N RUBBER, NEOPRENE
Hydrochloric Acid	LDPE or HDPE	LDPE or HDPE when required	PTFE, FKM

Note: Assume pure chemical (i.e., 100%) unless specifically noted otherwise.
*PTFE or PTFE-coated gasket is acceptable in all cases. PTFE is the chemical name for Teflon™. FKM is the chemical name for Viton™. EPDM = ethylene propylene diene terpolymer is a synthetic rubber roofing membrane. BUNA, a synthetic rubber derived from butadiene and sodium.

5.1.2 Container Condition

Containers must be in good condition with no visible cracks, holes, bulges, significant dents, significant corrosion, missing rings or bolts, or other damage that could compromise current or future container integrity. Bungs must be tight and have gaskets in place. Containers must be inspected in accordance with CP3-QA-2500 and CP3-WM-3015 for large D&R projects and CP3-WM-2110 for routine S&M and maintenance activities.

5.1.3 Container Documentation

DOT-compliant packaging, closure instructions, and receipt inspection report must be provided with RFD or must be retrievable by reference to the appropriate receipt inspection number or pre-service inspection number. Container inspections maintained in accordance with CP3-QA-2500 do not have to be attached to the RFD, but shall be referenced by assigned inspection number on form CP3-WM-3015-F01, "Waste Item Container Log."

Interchanging container parts may void compliance with DOT packaging.

5.1.4 Venting Pressure Relief Devices

All drums must have bungs. In addition, the generator must ensure that containers of hazardous and nonhazardous waste that have the potential to generate gas pressure due to decay, elevated temperature, volatility, or chemical reaction are stored in approved containers equipped with approved pressure relief devices (vents). Once subject matter expert evaluations are complete, a waste engineer will assist with packaging determination. Document the determination in Section R27, Special Handling/Surveying Instructions and Additional Information, of CP3-WM-3014-F01, "Request for Disposal."

The following wastes typically produce gas pressure build-up and must be evaluated to determine if venting devices are required:

- Material contaminated with waste oil;
- Waste from painting operations;
- Solutions from laboratory operations;
- Uranium tetrafluoride sludge/rust;
- Uranium metal turnings;
- Sludges;
- Waste containing vegetation or other organic matter (e.g., grass, wood, wet cardboard/paper);
- Aerosol cans—valve stems removed;
- Volatile organics;
- Aqueous/organic mixtures;
- Low pH solutions;
- Biological wastes;
- RCRA ignitable waste (flash point < 140°F) (i.e., gasoline, diesel fuel); and
- TRU waste.

For all hazardous wastes, Regulatory Compliance must approve the use and type of venting devices prior to use. For ignitable wastes, drum vents must be Factory Mutual Insurance Company or Underwriters Laboratories listed. For corrosive waste, drum vents must be compatible with the waste material.

If the potential for over pressurization exists and drum vents cannot be applied, open the container(s) in accordance with CP3-WM-1017, *Safe Handling and Opening of Sealed Containers*, to verify the absence of pressure at least once a week. While the containers remain in staging/accumulation areas prior to relocation by Waste Management, the responsible generator shall perform this inspection. The inspection shall be documented and sent via email to the assigned waste engineer. Once the containers are transferred to Waste Management storage facilities, waste operations will perform the pressure checks in accordance with to CP3-WM-1017.

5.2 PACKAGING

5.2.1 Waste Package Certifier

For waste being packaged for release from the Paducah Site for disposal at Nevada National Security Site, a WPC must be present during all waste packaging activities. Contact WCO for scheduling of WPCs.

5.2.2 Void Space

All containers containing solids and liquids should be filled to the maximum extent possible as required by the disposal facility WAC. Contact Waste Management for assistance if necessary.

5.2.3 Overpacking and Repackaging

Waste packaging must be maintained so that the contents are suitably confined for the duration of the anticipated storage life and subsequent shipment to an on-site or off-site TSDF. If the integrity of a container fails due to age, incompatibility with the waste, or other physical damage, the waste must be repackaged or overpacked, as appropriate, for that waste type. Refer to CP3-WM-3015 or CP3-WM-2110 for requirements.

5.2.4 Packaging Requirements by Waste Type/Matrix

The waste media or matrix affects the container selection. Contact Waste Management for designated containers of typical Paducah Site waste types.

Asbestos or Asbestos-Containing Waste—Asbestos-containing waste must be packaged in accordance with 401 *KAR* 58:040 § 4(1)(o), 49 *CFR*, and the applicable off-site TSDF WAC. ACM waste destined for the C-746-U Landfill must be wetted and packaged in accordance with 49 *CFR* Part 173, 40 *CFR* Part 61, 29 *CFR* Part 1910, and 401 *KAR* requirements, as applicable, and CP2-WM-0661.

Beryllium-Containing Waste—Beryllium-containing waste and beryllium-containing equipment must be packaged in sealed, impermeable bags (minimum 6 mil), containers, or enclosures to prevent release of beryllium dust during handling and transportation.

Laboratory Packs—Waste Management personnel must approve laboratory packs of small containers, absorbent material, and packaging. Lab packs must be packaged in containers with enough approved absorbent to absorb 100% of the laboratory packs' contents. Incompatible materials cannot be packed together.

Liquid or Free Liquid Over Solid Waste—Free or drainable liquids (identified by a paint filter test, EPA SW-846 Method 9095B) must be placed in containers that are approved for liquids. Small amounts of free liquids, which cannot be drained, may be absorbed using an approved sorbent.

Mercury and Articles Containing Mercury—Mercury must be drained from all glass mercury manometers, the tubing, segments of which must not exceed 2.5 ft in length. Free liquid mercury must be placed in DOT-approved containers, the volume of which must not exceed 1 liter. All mercury-containing thermometers must be double-packaged and properly labeled.

Miscellaneous Equipment—Waste Management should be consulted for guidance for packaging miscellaneous equipment which contains light bulbs, fire extinguishers, lead acid and Ni-Cd batteries, circuit boards, fuses, capacitors, and other related materials.

PCB and PCB Articles—Leaking PCB and detectable-PCB equipment must be packaged with enough absorbent to absorb 100% of any remaining liquid. Nonleaking PCB and detectable-PCB equipment that cannot be containerized must be drained of all free liquids whenever possible before being moved. If the equipment cannot be drained, all openings must be sealed to prevent the liquid from leaking during movement and storage.

Sealed Source Radioactive Waste—Sealed source wastes that are known to be leaking or that contain more than 5 Ci of radioisotopes with half-lives > 5 years must be packaged in accordance with CP3-WM-3015.

Radioactive Waste—Packaging must meet DOE O 435.1 Chg 2 (AdminChg), *Radioactive Waste Management*, and must meet the definition of radioactive material per 49 *CFR* § 173.403.

Radioactive waste also requiring management as fissionable assay or fissile/potentially fissile waste must be packaged in accordance with requirements in the current NCS evaluations for the appropriate facility safety basis.

Refrigerants and Liquids Contained in Articles—All liquids and any refrigerants must be drained from equipment and reservoirs are to be plugged. Any oil-bearing equipment must have the oil characterized for PCBs and analytical results attached to the RFD. All drained reservoirs must have absorbents added to absorb any residue that may accumulate during storage. Addition of absorbents or the inability to drain a reservoir must be noted on the appropriate RFD or container log sheet.

Sludge—Sludge must be decanted or dewatered so that the container contents will pass the paint filter test. Small amounts of free liquids that cannot be drained may be absorbed using an approved absorbent.

5.2.5 Documentation of Waste Package Contents

For all waste packages, a detailed record must be kept of the contents, volume, and weight, as well as any added void fillers, sorbents, stabilization agents, or solidification agents. This information is to be documented in "Waste Item Container Log," form CP3-WM-3015-F01.

5.2.6 Liquid and Liquid Containing Waste

For waste being stored as other than liquid waste, all free liquids must be absorbed in accordance with form CP3-WM-3014-F04, "Absorbent Determination Form," or otherwise removed from the waste (see procedure CP3-WM-3014).

- For liquid-containing waste where condensate could form in the inner plastic packaging (e.g., bags) subsequent to containerization, free liquid condensate shall be eliminated to the maximum extent practical by placing sorbents within the inner plastic packaging. The type and amount of sorbent required can be found in CP3-WM-3014. In any case, the amount of liquid cannot exceed 1% of the volume of the waste when the waste is in a disposal container or 0.5% of waste processed to a stable form.

- Residual liquids in large debris items shall be absorbed or removed. In cases where it is not practical to remove suspected liquids and it is impossible to sample to determine if liquids are present, the liquids shall be removed to the maximum extent possible by draining suspected liquids at low points and placing an adequate amount of sorbent around each item. In any case, the amount of free liquid cannot exceed 1% of the volume of the waste.

- For liquid-containing waste items that are sealed (e.g., oil-filled capacitors), the quantity of liquid shall be noted on RFD.

- A free liquid mitigation plan shall be included in the waste certification package for on-site disposal of solid material (See Appendix A).

5.2.7 Tamper-Indicating Devices

Generators must ensure that containers are protected against unauthorized entry. Tamper indicating devices (TIDs) must be used on waste containers that will not be further processed by Waste Management prior to disposition. Typical collection containers established for routine S&M wastes (such as BCS trash, used oil, fluorescent lamps, etc.) do not require the use of a TID.

TIDs are placed on each container in such a position that the container cannot open without breaking the TID. Each TID has a unique identification number that is recorded on the waste item container log sheet and the RFD form.

Alternate methods of securing the sampled containers also may be employed at the discretion of the generator, such as placing the containers in a controlled area that has limited access.

Alternative methods for securing containers for the Nevada National Security Site must be approved by the WCO in writing.

5.3 MARKING AND LABELING

The generator must label and mark all containers consistent with information on the RFD and as shown in Appendix B. All labels and markings must be legible and properly positioned on the container. All waste containers must have the labels and marking shown below:

- Waste container label (see Appendix B);
- Appropriate waste category or identification labels (see Sections 5.3.3 through 5.3.9 and Appendix B);

  NOTE: Generators must label containers with the expected category if characterization has not been completed. If characterization confirms that waste is not categorized as labeled, then inappropriate labels must be removed and the correct ones affixed.

- RFD container number (for collection containers RFD number will be applied once filled and ready to be transferred to storage);
- The appropriate date [generation date (GD), and/or DTS and/or the accumulation start date(AD)], and contents written on the container in permanent marker;
- RCRA containers must be clearly marked "Hazardous Waste" [40 *CFR* § 262.17(a)(5)(i) and 40 *CFR* § 262.17(a)(5)(ii)] with an indication of the hazard(s) of the contents (e.g., corrosive, toxic, reactive, ignitable);
- Classified material label, if applicable (see Appendix B); and
- RADCON Material (RAM) tag, if container's contamination cannot be removed.

Additional information by waste category is shown in Sections 5.3.3–5.3.9. For waste that exhibits more than one category, marking and labeling requirements for all pertinent categories apply.

5.3.1 Label/Marking Placement

It is recommended that labels should be placed to the left of the drum seam and written markings should be placed to the right of the drum seam. All labels and markings should be placed on the upper one-third of the container. Barcodes should be placed on the lower one-third of the drum to the left of the seam. One set of labels/markings on the side of a drum is acceptable (see Appendix B). Bulk containers (such as ST-90 and B-25 boxes) require additional labeling on opposite sides of the container (see Appendix B). It should be noted however, these labels and markings shall not cover any markings applied by the vendor (e.g., United Nations specifications, lot numbers) and in this case it is acceptable to place in another portion of the container.

Markings must be written legibly in a color that contrasts with the container color.

5.3.2 Durability

Labels and markings must be durable, fade-resistant, water-resistant paints, vinyl stickers, or must be sufficiently durable to remain intact and legible during management of the waste before disposal.

5.3.3 Accountable Material Waste Container Labeling

Termination of safeguards (TOS) waste containers must be clearly marked at the point of generation. TOS containers will be all waste generated from C-400 or C-360. When TOS waste containers are transferred to permanent storage facilities, steps will be taken to keep TOS containers in specifically indicated areas using signs and ropes. All other nuclear material accountability waste containers must be clearly marked upon completion of final characterization according to CP3-WM-0437, *Waste Characterization and Profiling*, or identified in accordance with CP3-NM-3002, *Intraplant Shipments and Receipts*. The marking must be applied within five days of final characterization.

A CP-26002 label (Figure 1) shall be applied to all TOS waste containers generated from C-400 and C-360, and a CP-26001 label (Figure 1) shall be used for all other nuclear material control and accountability material.

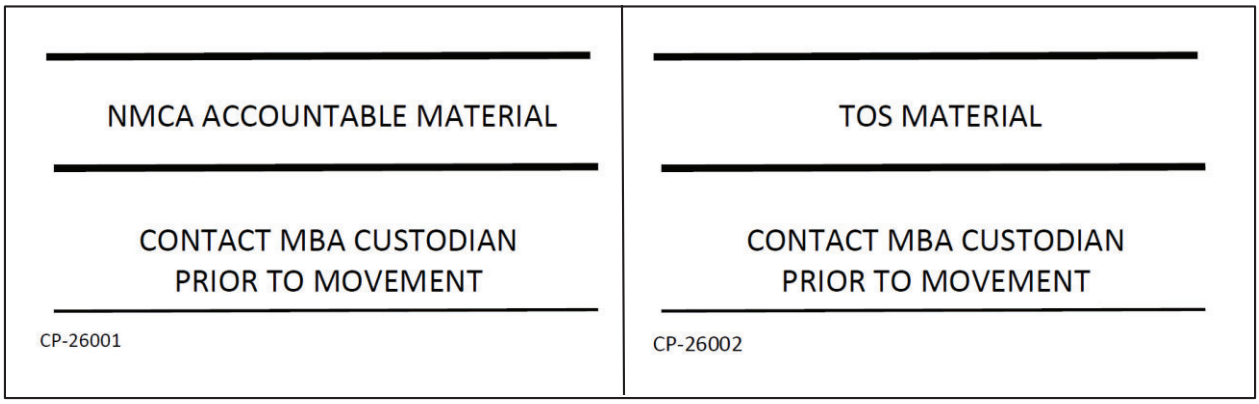

Figure 1. Examples of Nuclear Material Control and Accountability Material Label and TOS Material Label

5.3.4 Hazardous Wastes

The Hazardous Waste Label must be applied to waste packages of confirmed hazardous waste (see Appendix B).

The accumulation date (AD) must be marked on all hazardous and mixed waste containers. The date accumulation begins is the date that the first drop of waste is generated and placed into a container. It is not the date when the generator receives the waste analysis results. In order to avoid confusion regarding the regulatory status of unknown (suspect hazardous) wastes, labeling that says "Hazardous Waste Pending Analysis" is recommended. For waste originating from an SAA, the AD is the date an excess accumulation begins (i.e., > 55 gal hazardous waste or 1 quart of acutely hazardous waste), or it is the date the waste goes into a 90-day area or permitted storage. For Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) waste, the AD is the date removed from the CERCLA area. The accumulation date may be written as AD, followed by the date (see Figure 2 for Hazardous Waste Accumulation Date Flowchart).

5.3.5 Polychlorinated Biphenyl

The PCB label (M_L) must be applied to containers of TSCA-regulated PCB waste (waste containing or coming from a source containing ≥ 50 ppm PCBs) (Appendix B).

PCB start date [DTS] must be marked on the container. This is the date that the first PCB article or item is placed in a container or the PCB item is removed from service (whichever is first). It may be written as "date to storage or DTS," followed by the date. For PCB equipment or articles, the PCB start date is the date the item was removed from service for disposal.

A unique identifying number must be marked on the PCB item or container (e.g., RFD number-container number) and a description of the waste [e.g., personal protective equipment (PPE), spill cleanup, waste oil].

5.3.6 Radioactive Waste

The GD must be marked on all containers of radioactive waste. This is the date that the container is filled. It may be written as either "Generation Date" or "GD" followed by the date.

Any waste container with radioactivity from technetium-99 (Tc-99) of > 0.3 and ≤ 3 Ci per m^3 volume of waste from must be marked as "Class C." Any container that exceeds radioactivity from Tc-99 of 3 Ci per m^3 volume of waste must be marked as "> Class C" (10 *CFR* § 61.55).

5.3.7 Fissionable-Assay or Fissile/Potentially Fissile Waste

CP3-WM-1036, *Nuclear Criticality Safety Implementation Requirements for Handling and Storage of Fissile and Potentially Fissile Waste*, applies to all other fissile/potentially fissile waste. Ensure the appropriate NCS requirements are met prior to transferring fissile/potentially fissile waste from one NCSE to another.

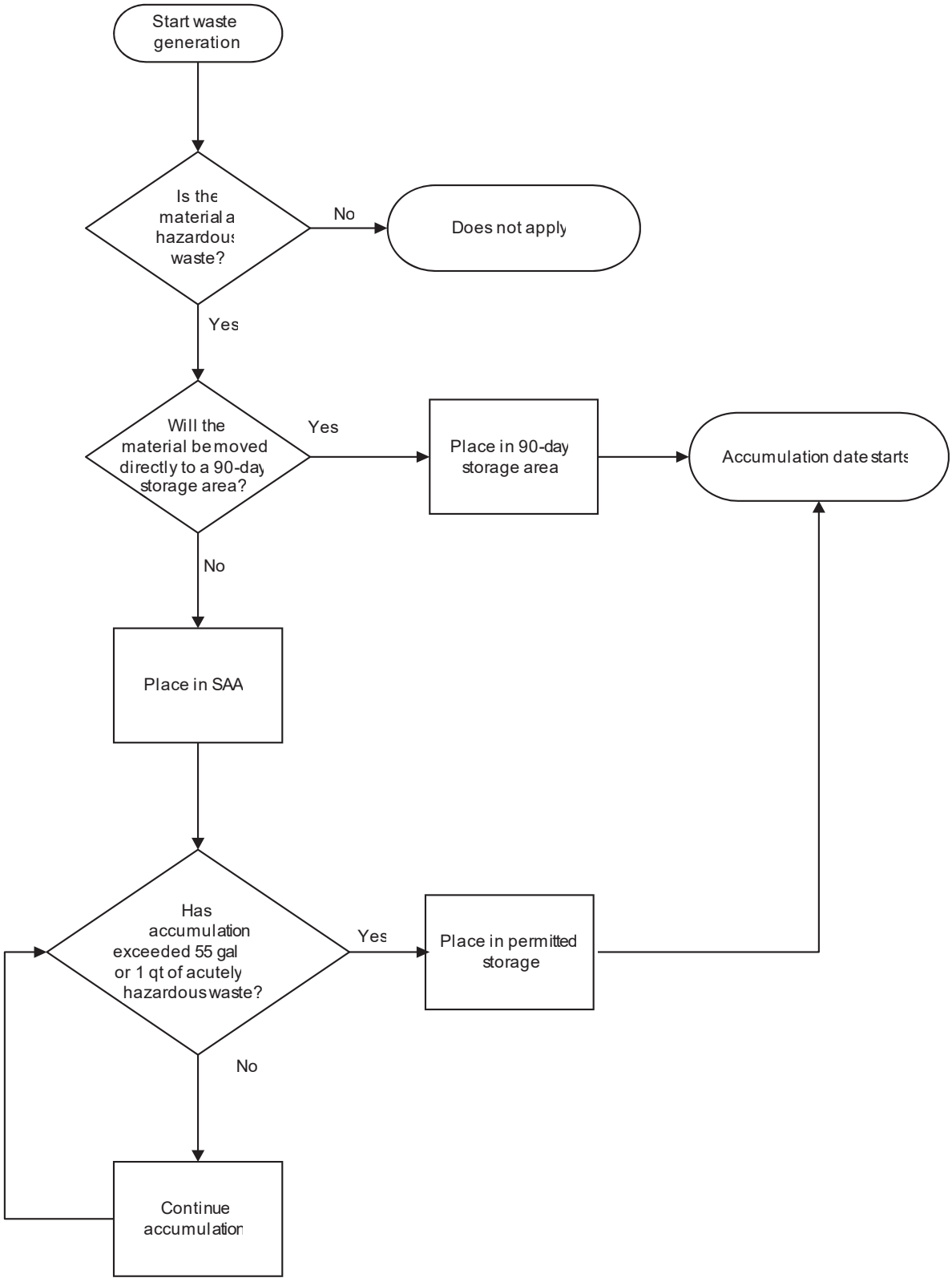

Figure 2. Transportation and Storage of Fissionable Materials for Waste Projects

5.3.8 Transuranic Waste

Waste packages containing TRU (concentrations > 100 nCi/g) are to be labeled with the TRU waste label (see Appendix B).

5.3.9 Asbestos

Containers of RACM are to be labeled with the asbestos label (see Appendix B.

5.3.10 Wastewater

Wastewater tanks are to be labeled, as appropriate for the waste category. Other labeling will be affixed by the facility operator.

5.3.11 Beryllium

Containers of beryllium waste are to be labeled with the beryllium label (see Appendix B).

5.3.12 Universal Waste

Containers of universal waste must be labeled and clearly marked with the words "UNIVERSAL WASTE" and either "BATTERIES," "PESTICIDES," "MERCURY THERMOSTATS," or "SPENT LAMPS," or "AEROSOL CANS."

5.4 MISCELLANEOUS

5.4.1 Lid Ring Placement

For removable head drums, the ring must be placed on the lid so that the bolt is situated over the seam.

5.4.2 Exterior Contamination

The outside of each container must be free of radioactive or chemical surface contamination, with no oily residue or debris on the outside, including the bottom and must be surveyed by a RADCON technician.

5.4.3 Use of Pallets

Waste accepted for storage at Paducah Site TSDFs must be delivered on appropriately sized, approved pallets constructed of oak wood, metal, or plastic; stackable; and having a minimum of a two-way fork entry. Standard shipping pallets are not acceptable. The containers must be placed on the pallets so that the labels and markings are visible from the aisle.

5.4.4 Container Closures

Containers must be kept closed, except when filling, emptying, or sampling a container. Containers shall be closed according to manufacturer's instructions when container is full (not to be opened again and prior to transfer to Waste Management). Rings and bolts must be applied properly. Bolts must be tightened properly to specific ft-lb of force as recommended in manufacturer's closure instructions for specific containers.

6. CHARACTERIZATION

All waste offered for treatment, storage, and/or disposal must be characterized to allow for proper segregation, container selection, packaging, handling, storage, and treatment/disposal of the waste.

Characterization involves the determination of regulated constituents present in the waste, and some additional analyses, which may be required for reporting purposes. All waste must be characterized using CP3-WM-0437, *Waste Characterization and Profiling*. It is recommended that generators consult EPA/600/R-96/055, *Guidance for the Data Quality Objectives Process*; CP3-ES-5003, *Quality Assured Data*; and waste disposition facility's WACs. These documents will assist generators to "clarify the objective of the characterization plan; define the most appropriate data to collect; determine the most appropriate conditions to collect the data; and specify tolerable limits on decision errors which will be used as the basis for establishing the quantity and quality of data needed to support the decision."

6.1 GENERAL REQUIREMENTS

The characterization methods and procedures shall ensure that the physical, chemical, and RAD characteristics of the waste are recorded and known during all stages of the waste management process.

Waste streams must be recharacterized if a process, operational change, or activity occurs that impacts chemical, physical, or biological characteristics or the categorization of the waste. The generator is responsible for repeating characterization as necessary to ensure that it is accurate and up to date. Waste Generator Services may assist generators as an integrated part of the project as outlined in FRNP Waste Management Plan (WMP).

6.2 PROCESS KNOWLEDGE

When the constituents of a waste stream are well known and properly documented, the generator may use PK for characterization. PK, as it applies to waste characterization, is documented knowledge of the processes and sources associated with generation of a waste or waste stream that allows a reliable estimation of the constituents and quantities for handling, storage, treatment, and disposal. PK is information, ultimately based on either analytical data or knowledge of the waste generating activity that relates to the material to be characterized.

Some examples of PK which may be used to characterize a waste stream, or to eliminate a contaminant of concern, are shown below.

- Sampling and analysis results for the process;
- Procurement specifications;
- Vendor data (including hazardous materials analytical results);
- Material balance and concentration calculations;
- Analytical results from similar processes;
- Results from laboratory or pilot studies (e.g., treatability studies);
- Administrative/procedural controls; and
- SDSs.

If the generator wishes to use process knowledge for waste characterization, the generator must complete required documentation according to Appendix B of CP3-WM-0437. Info should be included with RFD for

review and approval by Waste Management. Existing PK forms located at S:\Everyone\PK Forms may be used if they meet the requirements outlined in CP3-WM-0437. Equivalent forms of PK documentation may be approved by the Transportation Manager. When historical analytical data is used, the data limitations must be documented.

6.3 RADIONUCLIDE DETERMINATION

For the purpose of determining uranium assay, any of the following are acceptable methods:
(Note these methods are generally accepted for NCS purposes.)

- Thermal ionization mass spectrometry;
- Nondestructive assay;
- Inductively coupled plasma mass spectrometry;
- PK (e.g., uranium contaminated material from the C-315 facility is depleted); and
- Method established in CP3-NS-1033.

Exemptions from the use of these methods must have an approved Waste Variance Request; however, fissionable-assay or fissile/potentially fissile waste must be analyzed for NCS purposes in accordance with appropriate NCS requirements.

6.4 DATA QUALITY OBJECTIVE FOR NUCLEAR CRITICALITY SAFETY AND ANALYSIS

CP3-WM-1036, *Nuclear Criticality Safety Implementation Requirements for Handling and Storage of Fissile and Potentially Fissile Waste*, applies to all other fissile/potentially fissile waste. Ensure the appropriate NCS requirements are met prior to transferring fissile/potentially fissile waste from one NCSE to another. Ensure data quality objectives (DQOs) used in sampling and analytical methods producing data used in making NCS decisions at Paducah meet the appropriate NCSE requirements.

6.5 CONTAMINANTS OF CONCERN

The generator must consider all contaminants of concern during the characterization of a waste stream. Contaminants of concern are those regulated contaminants that have the potential to be present in a waste stream. Not all RCRA hazardous, TSCA, or RAD contaminants are found in waste generated at the Paducah Site. Refer to CP3-WM-0437 for requirements.

6.5.1 RCRA Hazardous Material Spot Contamination on Personal Protective Equipment and Plastic

All PPE and plastic shall be segregated based on visual inspection. Waste must be handled in the following manner.

- If no visible signs of chemical stain are seen, then the PPE may be categorized as nonhazardous.

- If visible stains are seen, the stained area may be cut away, if practical, and segregated from unstained. If the stained article was generated while handling listed RCRA waste, the article must be managed as listed RCRA waste.

- If the stained article was generated while handling characteristically hazardous RCRA waste, then the categorization must be based on the amount of contamination, or the article may be representatively sampled.

6.5.2 Polychlorinated Biphenyls

PCBs that have the potential to exist in waste at the Paducah Site include the following:

Aroclor 1016, Aroclor 1221, Aroclor 1232, Aroclor 1242, Aroclor 1248, Aroclor 1254, Aroclor 1260, Aroclor 1262, and Aroclor 1268.

Waste must be characterized adequately to facilitate proper identification of PCB contamination, as required by 40 *CFR* Part 761. PK can be used to identify or eliminate the presence of PCBs. Each constituent must be considered and either eliminated by PK or measured.

6.5.3 Polychlorinated Biphenyl Spot Contamination on Personal Protective Equipment and Plastic

Discarded PPE articles, generated while managing PCB waste, which is ≥ 50 ppm, shall be visually inspected for stains and handled in one of the following ways:

- If no areas of stains are seen, then the PPE may be categorized as non-PCB waste.
- If visible stains are visible, the stained area may be cut away, if practical, and segregated as PCB waste.
- If the PPE articles are generated while managing non-PCB waste, then the PPE articles must be categorized as non-PCB waste for disposal.

6.6 CHARACTERIZATION DOCUMENTATION

Refer to procedure CP3-WM-0437, for required characterization documentation. Waste characterization documentation, as specified in CP3-WM-0437, must be submitted or referenced with the RFD. All referenced information must be readily retrievable from an appropriately maintained document control center or electronic record archive. Equivalent forms of documentation may be approved by the Waste Management Director or designee. Equivalent documentation must include the minimum requirements outlined in DOE O 435.1 Chg 2 (AdminChg) including the following:

- Physical and chemical characteristics;
- Volume, including the waste and any stabilization or absorbent media;
- Weight of empty container, weight of content (waste), and gross weight (weight of container and content);
- Identities, activities, and concentrations of major radionuclides;
- Characterization date;

- Generating source; and
- Any other information that may be needed to prepare and maintain the disposal facility performance assessment, or demonstrate compliance with applicable performance objectives.

7. WASTEWATER TREATMENT AND STORAGE

Wastewater is acceptable for storage if it is categorized as RCRA hazardous, PCB, radioactive waste, mixed waste, or if it exceeds Kentucky Pollutant Discharge Elimination System (KPDES) permit limits. Some wastewater may be treated in the C-752-A Waste Management treatment units, the C-752-C Decontamination Facility, and/or the C-612 Northwest Plume Pump-and-Treat Facility to reduce the level of contamination and/or render the wastewater dischargeable under the KPDES permit.

Wastewater will not be accepted for treatment at the C-752-A treatment units if it exhibits any of the following:

- Uranium enrichment > 5.5 wt.% U-235
- Liquid waste containing < 50% water
- A flash point of < 140°F
- Total suspended solids > 10% by weight

Wastewater will not be accepted for treatment at the C-752-C Decontamination Facility if it exhibits any of the following:

- Uranium enrichment ≥ 1 wt.% U-235
- Flashpoint of < 140°F

Groundwater contaminated with trichloroethene and/or Tc-99 can be treated at the C-612 Northwest Plume Pump-and-Treat Facility. Groundwater contaminated with other radionuclides and organics shall be evaluated and approved on a case-by-case basis by utilizing the waste discharge approval process and by documenting this on form CP3-WM-0022-F01, "Waste Water Discharge Approval Form." Groundwater will not be accepted for treatment if it exhibits any of the following:

- Groundwater containing large quantity of sediments, or
- Wastewater not associated with the contaminated groundwater plumes.

If waste is to be treated at the C-612 Northwest Plume Pump-and-Treat Facility, then the generator must submit a copy of the request for treatment to C-612 Operations for approval. Other requirements that may be necessary by the C-612 operations procedures are not included in this document.

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8. LANDFILL WASTE ACCEPTANCE CRITERIA

8.1 C-746-U SOLID WASTE LANDFILL CRITERIA

8.1.1 General Requirements

The C-746-U Landfill is one that is permitted to dispose of nonhazardous, residual radioactive material per the authorized limits (ALs). Only waste that meets the AL can be disposed of. It is not permitted to accept RCRA hazardous waste, TSCA-regulated waste (except PCB remediation waste containing ≤ 49 ppm PCB, PCB bulk product and asbestos), and LLW (above the AL). The waste must be solid with no free liquids. Due to the potential for free liquids and nonconforming items to exist in waste containers destined for disposal in the C-746-U Landfill, an approved management plan for mitigation of potential free liquid and nonconforming items has been developed and is included in this document as Appendix A. Environmental media that contained a listed waste must have an appropriate "contained-in" determination to be classified as nonhazardous and must meet any applicable land disposal restriction treatment standards. The specific WAC is defined below.

Before waste disposal at the C-746-U Landfill can begin, the waste generator must develop a landfill waste package and receive final approval from the Certified Landfill Manager. Waste generators must use the latest version of CP3-WM-3025, *Preparation and Processing of Paducah Landfill Packages*, in the development of all landfill waste packages.

Radiological materials disposed of at the C-746-U Landfill shall contain no fissile materials; shall be exempted per CP2-NS-1000, *Nuclear Criticality Safety Program Description Document at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*; or shall be evaluated in an NCS document that concludes that segmentation or nature of process precludes potential for criticality (HAD-PH-C746U-0004).

Waste from uranium production facilities and items that have been in intentional direct contact with process gas or fissile uranium holdup material (e.g., process system piping and components, previously used packaging, protective wrappings or covers, foreign material exclusion plugs) may not be disposed of in the C-746-U Landfill. Exceptions may only be considered after documented evaluation, including evaluation against landfill source term inventory. Exceptions will be approved by FRNP Waste Management Director and the Program Manager.

For specific waste disposal instructions, refer to CP3-WM-0017, *Standard Operation for the C-746-S, -T, and -U Landfills*.

8.1.2 Landfill Personnel

Landfill personnel shall visit generator sites at least once during the waste generation process. Landfill personnel shall observe paint filter tests being performed on a representative basis. The paint filter test will be performed according to EPA reference SW-846 Method 9095B (or current equivalent testing method). The "Plan of Correction to Mitigate Disposal of Waste Containing Free Liquids at the C-746-U Contained Landfill," submitted to the Kentucky Division of Waste Management on March 30, 2007, requires the use of SW-846 Method 9095B. If the waste generator, or any of the landfill package reviewers, determine that the waste has the potential to contain or release free liquids (such as soils), then the waste generation process is reviewed to ensure the free liquid potential is mitigated. Practices currently utilized include adding absorbents, allowing waste to free drain or be decanted and/or dried, and blending the waste material with dry material. Prior to transport to the landfill, additional measures are implemented as described in Section 8.1.6, Repackaging Controls.

8.1.3 Radiological Requirements

Radiological surveys for potentially surface contaminated materials that are candidate materials for disposition at the C-746-U Landfill shall be performed in accordance with survey plans. These plans will define survey elements necessary to meet DQOs consistent with landfill acceptance criteria and DOE-approved AL request, as specified in Appendix C, *Waste Characterization Radiological Survey Plan for Materials Destined for Disposal in the C-746-U Landfill Using the "Authorized Limit" Criteria*. The development of these survey plans will be completed pursuant to the requirements of the C-746-U Landfill Authorization Limits Implementation Requirements which state the following:

> **Sampling/Survey Date**
>
> "The data generated to determine if a material meets the requirements of this document shall be based on sampling/surveying using a graded approach consistent with the requirements of DOE/HS-004, *Multi-Agency Radiation Survey and Assessment of Materials and Equipment Manual (MARSAME),* January 2009 or latest version. Specific Radiological Survey Procedures will be developed by contractor organizations and approved by DOE."

Waste for disposal in the C-746-U Landfill must meet one of the following requirements depending on the type of contamination.

- Surface contamination levels must not exceed limits established in Attachment B of CP3-RP-1109.
  - — Surface contamination levels that exceed limits established in Attachment B of CP3-RP-1109 must have a DOE-approved AL request for the surface contaminated waste stream.
  - — Volumetric waste streams shall not exceed the mass concentration in a DOE-approved AL request.

8.1.4 Preparation of Container for Movement to C-746-U Landfill

Containers will be tarped or otherwise covered prior to leaving the RAD area in which they are stored. Immediately prior to loading onto/into final conveyance for movement to C-746-U, radioactive material labels, as required by RADCON procedures, shall be removed and containers and dump trucks will be marked with the following: **"AUTHORIZED LIMITS RESIDUAL RADIOACTIVE MATERIAL FOR DISPOSAL IN C-746-U LANDFILL ONLY"** in accordance with this procedure. Containers and dump trucks shall be marked with either a weather-proof sticker/label or removable magnetic label. Removable magnets are to be reused and should be removed once conveyance arrives at the C-746-U Landfill. Containers marked using a weather-proof sticker/labeling material can be buried at C-746-U Landfill with the marking. Containers will be surveyed in accordance with applicable release limits by RADCON prior to leaving the RAD area in which they are stored. AL containers will remain stored in a RAD area until transported to the landfill. Waste generator will notify RADCON representative of the projected transport date and will confirm at least 24 hours prior to transport that the containers will be moved. Containers and dump trucks being transported to the C-746-U Landfill **shall not** be labeled with Radioactive Material Labels. FRNP's procedure for radiological posting and labeling, CP3-RP-1108, *Posting and Labeling*, exempts labeling when marked in accordance with regulations of the DOT **or** DOE Orders governing radioactive material transportation [10 *CFR* § 835.606(a)(3)]. Because DOE O 460.1D Chg 1 (LtdChg) allows for the use of an approved Transportation Safety Document in lieu of full DOT hazardous materials regulations compliance, this exemption can be used by complying with the CP2-WM-0661, *Four Rivers Nuclear Partnership, LLC, Paducah Deactivation and Remediation Project Transportation Safety Document for On-Site Transport*.

Prior to movement of the waste container from its generation/storage location to the C-746-U Landfill, the waste containers will be inspected again for free liquids.

8.1.5 Boxes and Containers

Boxes and containers that have been in storage after packaging for a period of approximately six months or longer must have the waste contents repackaged. Any free liquids shall be drained, collected, and disposed of.

8.1.6 Repackaging Controls

Waste that has been drained and/or segregated is observed and inspected as it is repackaged to ensure no nonconforming items are present and are compliant with regard to moisture. The receiving container is prepared with absorbent materials that are applied at concentrations equal to or greater than the manufacturer's recommended concentration. Absorbent material is applied above the plastic liner (when used) and concentrated at the tailgate end of the container. Use form CP3-WM-3015-F03 to determine the correct amount of absorbent to add. The waste generator may add additional absorbent (pads, rolls) to absorb condensate in a closed container.

8.1.7 Transport of Container to Landfill

Containers shall be transported out of the Limited Area via Post 15, follow Dyke Road to property protection area Gate 23 (must be left in locked position), to Gate 43-A, pass through Gate 43-A, cross Ogden Landing Road, and proceed north to the landfill. Containers also may exit the Limited Security Area through Gate 43, pass through Gate 43-A, cross Ogden Landing Road, and proceed to the landfill. Unless documented exception is provided by the Waste Transportation manager, containers or dump trucks SHALL NOT leave DOE property at any time which requires performance of a temporary road closure in accordance with current Traffic Control training. Containers must be transported to the landfill in accordance with the CP2-WM-0661, *Four Rivers Nuclear Partnership, LLC Paducah Deactivation and Remediation Project Transportation Safety Document for On-Site Transport*. Waste Facility Operations personnel will coordinate with FRNP Safeguards and Security for protective force resources or approved equivalent to open/close Gate 43. Driver (or escort) shall be a qualified RAD Worker II, as radioactive material is being transported. Use of commercial motor vehicles for transporting containers to the landfill must comply with CP3-WM-3030, *Commercial Motor Vehicle Operations*.

8.1.8 Transport of Bulk and Non-Bulk Containers Back to Plant

The driver (or escort) shall be qualified RAD Worker II if radioactive material is being transported. Bulk and non-bulk containers shall be checked for and free from liquids (water) that could leak during transport. Non-bulk containers typically do not return empty once transported to the landfill and are usually landfill disposed.

After leaving the landfill, the empty container or dump truck may be released in one of two ways:

- The container or dump truck may be retarped, the exterior surveyed, labeled, and sent back to the plant. Upon entry into the Limited Area, containers or dump trucks must be stored in a RAD-posted area (see Section 8.1.6, General Requirements).

- The container or dump truck may be left untarped, the interior and exterior surveyed, and sent back to the plant. Containers or dump trucks surveyed and released from the landfill will not be radiologically tagged or labeled and may be stored in nonradiological areas. Containers or dump trucks that are found

to be contaminated will be tarped, tagged, and transported to a suitable decontamination facility for cleaning.

Unless documented exception is provided by the Transportation Manager, containers or dump trucks SHALL NOT leave DOE property at any time which requires performance of a temporary road closure in accordance with current highway flagger training module. Projects/Container Management will coordinate with Swift & Staley Team Security for protective force resources to open/close Gate 43-A and to close Ogden Landing Road. Containers must be transported to the plant in accordance with CP2-WM-0661. Use of commercial motor vehicles for transporting containers to the plant must comply with CP3-WM-3030.

8.1.9 General Container Requirements

All containers will be free of excess dirt and debris prior to loading. RADCON cannot perform an accurate survey of a container's inner surfaces if it is caked with excess dirt/mud/debris. It is the project's responsibility to maintain its containers and to clean the containers periodically at a suitable decontamination pad. RADCON will provide job coverage for the decontamination operation. Use of container liners may be incorporated to prevent buildup of dirt and debris. RADCON periodically will perform surveys of containers that are not surveyed at the landfill (see Section 8.1.3). Containers found to have removable radioactive contamination must undergo decontamination and additional surveys prior to reuse. Containers with RAM tags and/or labels will be stored in a RAD area at all times. Operations involving removal of the tarps will require RADCON job coverage. Container inner surfaces will be considered radiologically contaminated until surveyed and proven otherwise. Containers with RAM tags and/or labels shall be attended by a RAD Worker II-trained employee at all times when not stored in a RAD area. Containers shall not be left unattended during transport to and from the landfill. Any free liquids within labeled and tagged AL waste containers should be captured and sampled unless exempted by the RADCON Management and Regulatory Compliance group.

8.1.10 Specific Waste Item Requirements

- Asbestos-containing wastes found at the Paducah Site may include, but are not limited to, transite, floor tiles and mastic, ceiling tiles, roofing materials, gaskets, thermal system insulation, etc. All asbestos-containing wastes transported to the landfill must comply with the DOT regulations, 49 *CFR* Part 173, 40 *CFR* Part 61, 29 *CFR* Part 1910, and 401 *KAR* requirements, as applicable, and CP2-WM-0661.

- Cardboard and paper must be bagged, baled, or containerized.

- Computer monitors must be segregated. EPA has issued guidance making colored monitors unacceptable for land disposal because of high lead content in the glass and funnel.

- Animal carcasses must be layered with lime and placed in double plastic bags with the ends sealed with tape or plastic wire ties.

- Empty aerosol cans must be punctured and not pressurized.

- Empty glass bottles must be wrapped in heavy-duty plastic bags and have lids or caps removed unless approved by landfill management. (Note: If possible, crush bottles to reduce waste volume.)

- Gas cylinders (empty, disposable) must have stems removed.

- Medical wastes must be treated by autoclaving or other methods of disposal, as approved by the landfill manager, before disposal.

- Nonaerosol paint cans must be bagged or drummed. Contents must be completely dry and lids removed.

- RAM tags and flagging, etc., must be cut and containerized. Characterization must confirm no RAD contamination.

- Personal protective clothing (i.e., Tyvek® suits, shoes, gloves) must be accompanied by RADCON survey documentation.

- Small, loose items (that might be blown by the wind) must be bagged or drummed.

- Tires first must be processed either by cutting into pieces or shredding.

  Exception: Large solid tires do not require shredding.

- Used clothing, uniforms, and rags (nonhazardous, solvent laden, oily, and clean) must be accompanied by characterization data to confirm no RAD contamination and no TSCA- or RCRA-regulated substances.

- Wood pallets, chocks, and debris must have visible oily stain areas removed.

- Waste material length must be limited to 4 ft or half the distance from the cell to the liner whichever is smaller. These items include poles, pipes, and other items that may possibly damage the landfill liner. Said items must receive landfill manager approval prior to disposition.

- Waste material larger than 2 ft^3 must receive landfill manager approval for disposition.

- Debris items must be inspected for voids that have the potential for holding liquids and processed in a manner that eliminates or opens the voids.

- Conveyances/containers of waste for disposal at the landfill shall not be filled to > 120,000 lb.

8.1.11 Prohibited Items

Wastes containing free liquids are prohibited from being disposed in the C-746-U Landfill.

RCRA-hazardous, TSCA-regulated, or radioactive wastes are prohibited from being disposed of in the C-746-U Landfill. Examples include these:

- Batteries (e.g., mercury, lithium, silver, nickel-cadmium, lead-acid)
- Circuit boards
- Classified waste
- Light bulbs (all types except nonhazardous “green-end or silver tip with green writing” fluorescent)
- Light ballasts
- Color computer monitors

8.1.12 Discovery of Nonconforming or Prohibited Items during Disposal

If nonconforming or prohibited items listed in Section 8.1.11 are identified in a waste container during disposal at the landfill, further disposal activities related to the particular container will be restricted until the nonconformances are resolved. The occurrence shall be documented in the issues management system to ensure that corrective actions are implemented in order to prevent recurrence.

8.1.13 Landfill Waste Packaging

If drums of waste are delivered to the landfill in larger containers (e.g., roll-off bins), then the drum identification number must be written on the top of each drum in approximately 3-inch letters. Other packaging requirements for waste to be disposed of in the C-746-U Landfill vary depending on the waste item itself. Waste packaged in boxes (e.g., B-12, B-25, ST-90, 7A Type A) may be accepted for landfill disposal on a case-by-case basis with the landfill manager's approval.

9. USE OF OFF-SITE TREATMENT AND DISPOSAL FACILITIES

The use of all off-site TSDFs by FRNP must be evaluated and approved prior to waste shipment authorization. Potential environmental impacts associated with all TSDFs must be evaluated in accordance with the National Environmental Policy Act. Commercial (i.e., non-DOE) TSDFs that manage LLW or mixed LLW must also be evaluated and approved for use by DOE in accordance with DOE O 435.1 Chg 2 (AdminChg). Additionally, all TSDFs must be evaluated and placed on the FRNP Approved Supplier List, including intermediate processing facilities. Prior to waste shipment authorization, the receiving facility must be verified as a facility listed in Appendix D of this document. To ensure these requirements are met, all waste treatment/disposal procurements shall be quality-level 3.

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10. CERTIFICATION

Generators must certify that they have complied with CP2-WM-0001 and that the information in their RFD or manifest form is accurate and complete. A certification statement must be signed to accompany each RFD (see Box R27). By signing the certification statement on the RFD form, the generator certifies that information included on the RFD form and its attachments is true, accurate, and complete. Deviations from the WMP or the requirements in this WAC should be documented on CP3-WM-3014-F03 "Waste Variance Request Form," and must be approved by the Waste Generator Manager or designee. Generators are responsible financially for costs incurred as a result of nonconformance with the criteria established in this document.

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11. RECORDS, DOCUMENTATION, AND REPORTING

Records and documentation must be created and maintained by the generator and provided to Waste Management so that the waste may be managed and tracked properly. The handling and subsequent treatment, storage, and/or disposal of hazardous waste must include a “cradle to grave” tracking of the waste material. Other associated documentation may be required depending on the waste category and/or its intended disposition. Table 4 cross-references the required documentation to the waste categories. Documents shall be prepared, reviewed, approved, controlled, and revised in accordance with CP3-RD-0010, *Records Management Process*.

Table 4. Documentation by Waste Category

Documentation	Waste Category[a]							
	Radioactive	RCRA	PCB	RCRA Mixed or PCB Low-Level	Wastewater	Landfill	Universal Waste	Scrap Metal
Assay (independent)	X[b]			X[b]		X[b]		
Landfill Waste Package Number Request and Certification Form (CP3-WM-3025)						X		
Characterization (Analytical) Data	X[c]	X[c]	X[c]	X[c]	X[c]	X[c]		X[c,d]
Waste Characterization Documentation	X[e]	X[e]	X[e]	X[e]	X[e]	X[e]		X[e]
Request for Disposal (CP3-WM-3014)	X	X	X	X	X	X	X	X
RFD Attachment A, Waste Information (CP3-WM-3014)	X	X	X	X	X[f]	X	X	X
RFD Attachment B, RCRA Regulatory Codes		X		X				
Waste Item Container Log (CP3-WM-3015)	X[g]	X[g]	X[g]	X[g]	X[g]	X[g]	X[g]	X[g]
Waste Variance Request Form (CP3-WM-3014)	X[h]	X[h]	X[h]	X[h]	X[h]	X[h]		X[h]
Waste Management Plan	X	X	X	X	X	X	X	X
Master Landfill Disposal Log Sheet (or approved equivalent)						X		
Authorized Derivative Classifier Review	X[f]	X[f]	X[f]	X[f]	X[f]	X[f]	X[f]	X[f]

[a] May contain ACM.
[b] Required for all wastes containing > 0.711 wt.% U-235.
[c] Required if analytical data is used for characterization.
[d] Includes RADCON survey.
[e] See CP3-WM-0437 for required documentation or approved equivalent.
[f] Proper security classification of suspect waste required.
[g] Required if waste is containerized.
[h] Required only if approval to digress from the requirements in this WAC is needed.

12. REFERENCES

12.1 REFERENCES BY WASTE CATEGORIES

Table 5 presents references by waste categories. If waste belongs to more than one waste category, the references for all pertinent categories apply. Details of the references follow the table.

Table 5. Regulatory References

Waste Category	References			
	CFR	***KAR***	**DOE Orders/ EPA Requirements**	**Policies, Permits, Agreements, etc.**
Asbestos Waste	40 *CFR* Part 61 Subpart M (National Emission Standards for Hazardous Air Pollutants)	401 *KAR* 58:025, 40 *CFR* Part 61 *National Emission Standard for Asbestos*; 401 *KAR* 58:040, *Requirements for Asbestos Abatement Entities*	EPA SW-846 EPA/600/R-92/033 EPA/230-02-89-042	
Landfill Waste		401 *KAR* 30:31; 401 *KAR* Chapters 4 and 48	EPA SW-846 EPA/600/R-92/033 EPA/230-02-89-042	#073-00045, Solid Waste Landfill Permit
PCB	40 *CFR* Part 761	401 *KAR* 30:31	EPA SW-846 EPA/600/R-92/033 EPA/230-02-89-042	KY/EM-147, Site Treatment Plan TSCA Compliance Agreement DOE/EH-413-9914, Storage and Disposal of PCB Waste
Radioactive	10 *CFR* Part 835		EPA SW-846 EPA/600/R-92/033 EPA/230-02-89-042 DOE O 435.1 Chg 2 (AdminChg) RAD Control Manual (DOE/EH-0256T)	BJC/PAD-491, AL Requests for Solid Waste Disposal at Landfill C-746-U
RCRA	40 *CFR* Parts 260–264, 268, 270	401 *KAR* Chapter 39	EPA SW-846 EPA/600/R-92/033 EPA/230-02-89-042	Kentucky Division of Waste Management Hazardous Waste Management Permit (RCRA Permit) KY/EM-147, Site Treatment Plan
Universal Waste	40 *CFR* Part 273	401 *KAR* Chapter 43		
Scrap Metal			EPA SW-846 EPA/600/R-92/033 EPA/230-02-89-042 DOE O 435.1 Chg 2 (AdminChg)	
Wastewater		401 *KAR* 10:031 (Surface Water Standards)	EPA SW-846 EPA/600/R-92/033 EPA/230-02-89-042	KPDES Permit

12.2 REGULATIONS AND ORDERS

10 *CFR* Part 835, *Occupational Radiation Protection*

40 *CFR* Part 260, *Hazardous Waste Management System: General*

40 *CFR* Part 261, *Identification and Listing of Hazardous Waste*

40 *CFR* Part 262, *Standards Applicable to Generators of Hazardous Waste*

40 *CFR* Part 263, *Standards Applicable to Transporters of Hazardous Waste*

40 *CFR* Part 264, *Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities*

40 *CFR* Part 268, *Land Disposal Restrictions*

40 *CFR* Part 270, *EPA Administered Permit Programs: The Hazardous Waste Permit Program*

40 *CFR* Part 761, *Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions*

49 *CFR*, *Transportation*

BJC (Bechtel Jacobs Company, LLC) 2003. *Authorized Limits Request for Solid Waste Disposal at Landfill C-746-U at the PGDP*, BJC/PAD-491, Bechtel Jacobs Company LLC, Kevil, KY, January.

Commonwealth of Kentucky 1997. *Agreed Order for the United States Department of Energy Paducah Gaseous Diffusion Plant Paducah, Kentucky*, File No. DWM-30039-042, Kentucky Natural Resources and Environmental Protection Cabinet, Frankfort, KY, September.

KDWM (Kentucky Division of Waste Management) 2019. Solid Waste Landfill Permit for the U.S. Department of Energy, Paducah Gaseous Diffusion Plant, SW07300015, SW07300045, SW07300014, dated September 27, 2019.

KDWM 2020. Hazardous Waste Management Facility Permit for the U.S. Department of Energy, Paducah Gaseous Diffusion Plant, Paducah, Kentucky, KY8-890-008-982, effective February 21, 2020.

Solid Waste Landfill Regulations. *Kentucky Administrative Regulations*, 401 *KAR* Chapter 47.

DOE (U.S. Department of Energy) 1994. *U.S. Department of Energy Radiological Control Manual,* DOE/EH-0256T, Revision 1, April.

DOE 1999. *Storage and Disposal of PCB Waste,* DOE/EH-413-9914, November.

DOE 1999. *Radioactive Waste Management*, Order 435.1 Chg 2 (AdminChg), effective August 21, 2008.

DOE 2009. *Multi-Agency Radiation Survey and Assessment of Materials and Equipment Manual (MARSAME),* DOE/HS-004, January.

DOE 2011. *Radiation Protection of the Public and Environment*, Order 458.1 Chg 4 (LtdChg), effective January 15, 2013.

EPA (U.S. Environmental Protection Agency) 1984. *Test Methods for Evaluating Solid Wastes*, EPA SW-846.

EPA 1989. *Methods for Evaluating the Attainment of Cleanup Standards*, Volume 1: Soils and Solid Media, U.S. EPA, EPA 230/02-89-042.

EPA 1992. *Characterizing Heterogeneous Wastes: Methods and Recommendations*. EPA/600/R-92/033.

EPA and DOE 1992. *Toxic Substances Control Act Uranium Enrichment Federal Facilities Compliance Agreement* (TSCA-UE-FFCA), February.

APPENDIX A

MANAGEMENT PLAN FOR MITIGATION OF POTENTIAL FREE LIQUIDS AND NONCONFORMING WASTE ITEMS

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EXAMPLE OF A MANAGEMENT PLAN FOR MITIGATION OF POTENTIAL FREE LIQUID AND NONCONFORMING ITEMS

Due to the potential for free liquid and nonconforming items to exist in waste containers destined for disposal in the C-746-U Landfill, the following actions will be taken.

(1) Free liquids and nonconforming items will be removed from all waste processed. This will be accomplished by the following method. The contents of each drum will be emptied into either a decant/tilt or tilt dumpster, as required. The decant/tilt dumpster is specifically designed to automatically separate free liquids and allow observation and manual removal of nonconforming items from the waste. The tilt dumpster is designed to allow observation of the drum contents for free liquids and manual removal of any nonconforming items. If free liquids are observed when using the tilt dumpster, suitable absorbents may be added directly into the dumpster during this step. Any nonconforming items will be removed for proper disposition.

(2) Documented observation of the drum contents will occur before, during, and after the waste is emptied. This observation for free liquids and nonconforming items will be on the surfaces of the waste that can be viewed from the side of the dumpster without sorting or segregating the drum contents.

(3) After each drum has been emptied into the decant/tilt or tilt dumpster and any free liquids and/or nonconforming items have been mitigated as required, an aliquot of the waste in each drum will be collected. Each aliquot will be placed into a composite container with aliquots of all successive drums, until all drums combined in a particular bulk container (i.e., roll-off, intermodal, ST-90) have been observed and sampled.

(4) Periodically after performing Steps 1 and 2 above, the dumpster contents will be emptied into a lined bulk container (i.e., roll-off, intermodal, ST-90) into which absorbent will be added, as necessary, to address any residual free liquids that may be encountered. Up to three lb of absorbent may be added per drum processed during filling of the bulk container. The basis for utilizing up to three lb per drum is very conservative and is based on the following. WESKEM conducted a study related to high moisture content waste (see Becker memo dated July 31, 2001). In this study, an absorption ratio of 100:1 was assumed for Quick Solid. The average weight of the Population 60 containers was calculated to be approximately 600 lb. In the absence of any moisture data on these Agreed Order wastes, a conservative assumption was made that 50% of this average weight, or 300 lb, was attributable to water. It was decided, therefore, that three lb of absorbent would be added to ensure that any residual liquid or entrained moisture was addressed prior to disposal.

(5) A paint filter test will be performed on the composite sample collected from each bulk container. Paint-filter test results will be documented on field forms (use CP3-WM-3015-F05 in accordance with CP3-WM-3015) and provided to landfill personnel for their records.

(6) All bulk containers will be transported to the landfill using appropriate conveyance (i.e., roll-offs and intermodals will be transported on a roll-off truck; ST-90s will be transported on a flat-bed).

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APPENDIX B

LABELING AND MARKING

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FIGURES

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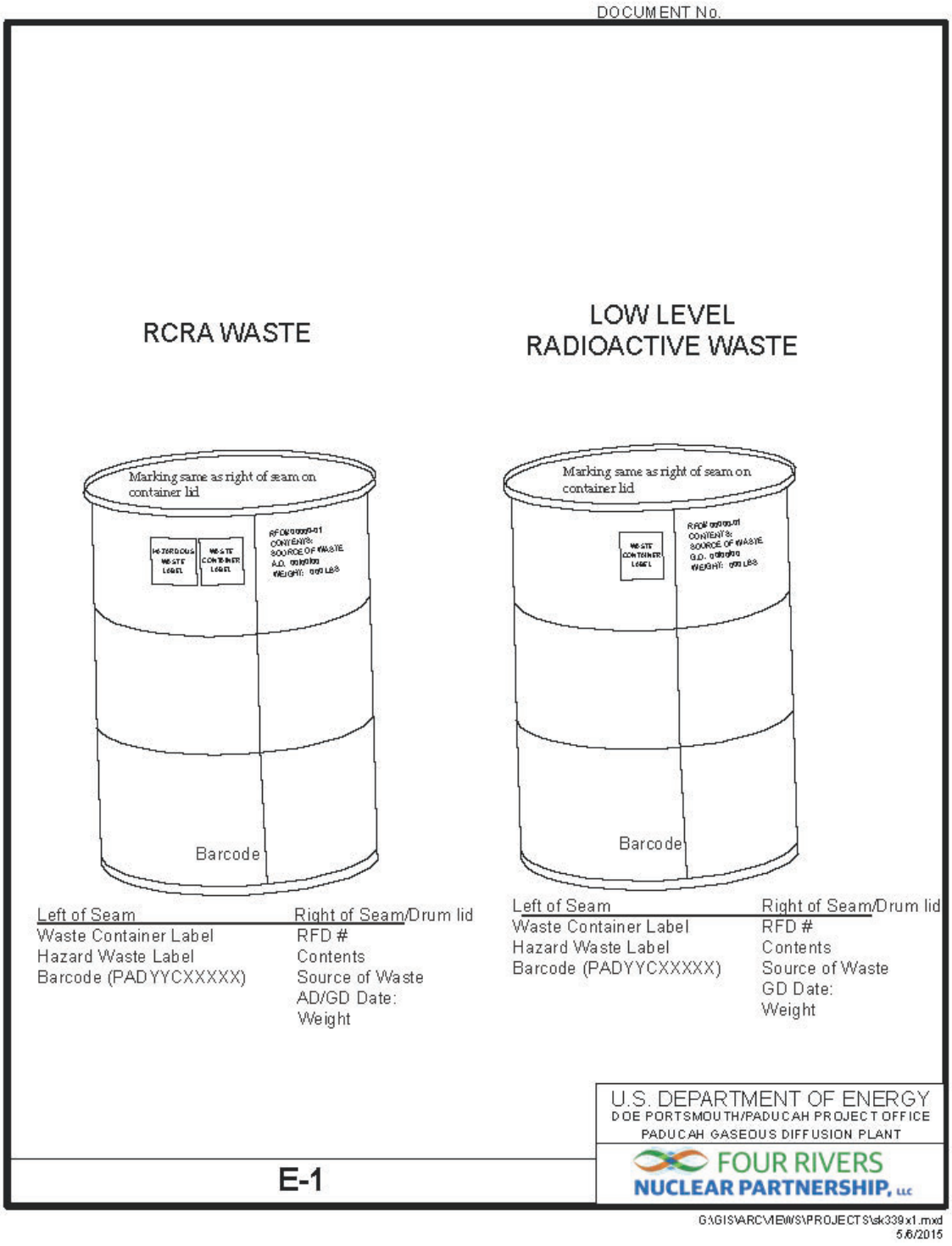

Figure B.1. RCRA Waste Drum and Low Level Radioactive Waste Drum

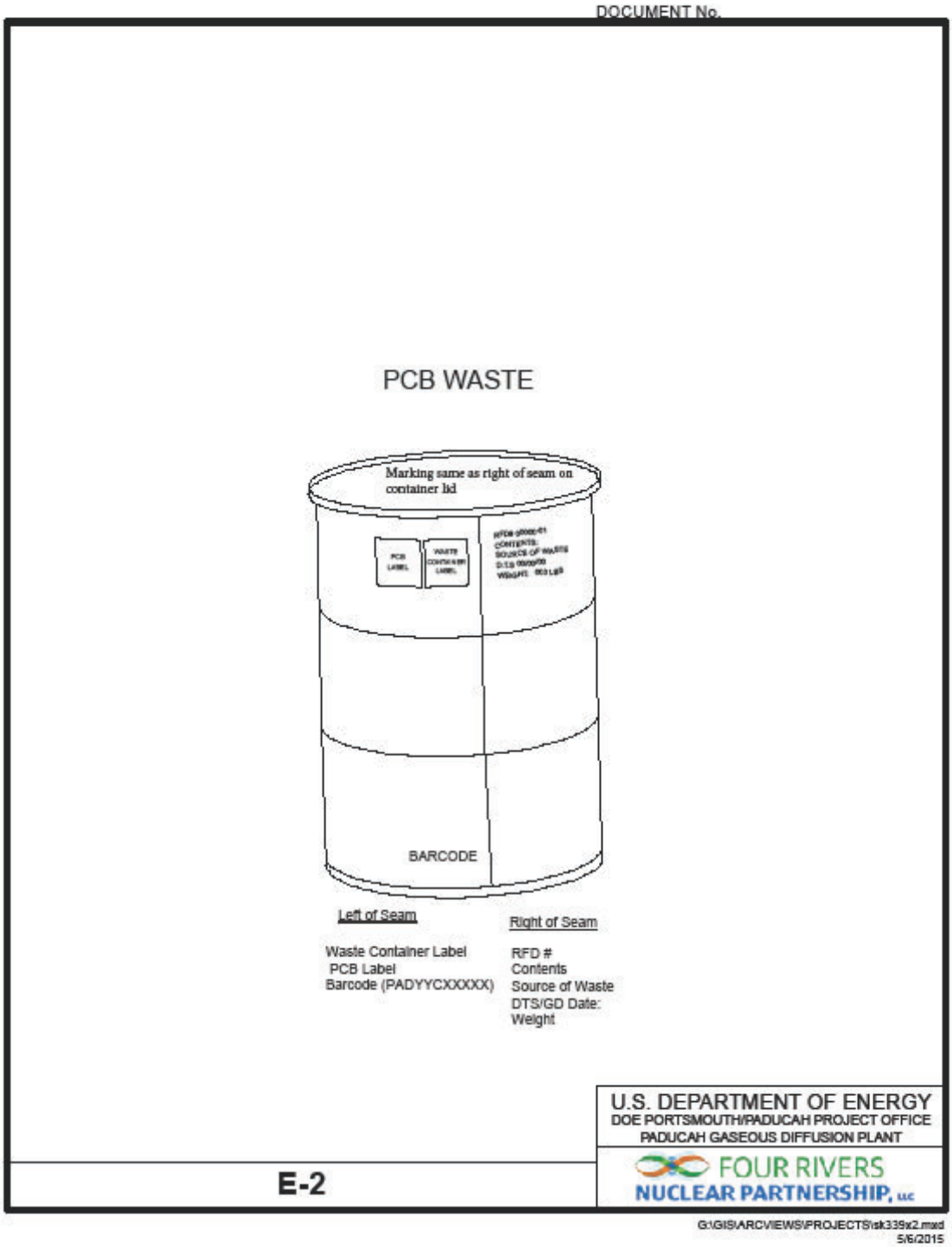

Figure B.2. PCB Waste Drum

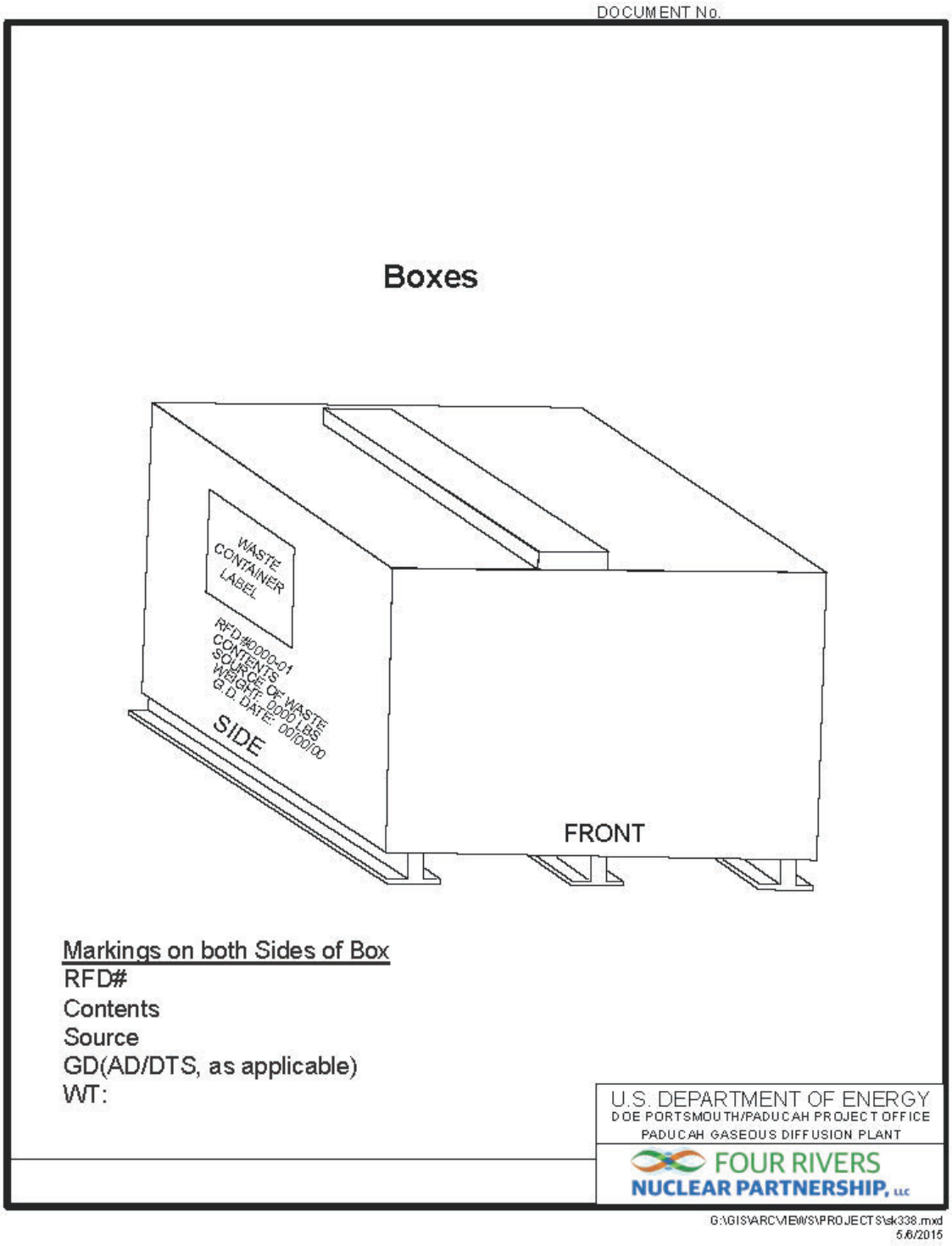

Figure B.3. Boxes

Figure B.4. Example of a Roll-Off Bin

Figure B.5. Example of a Waste Container Label

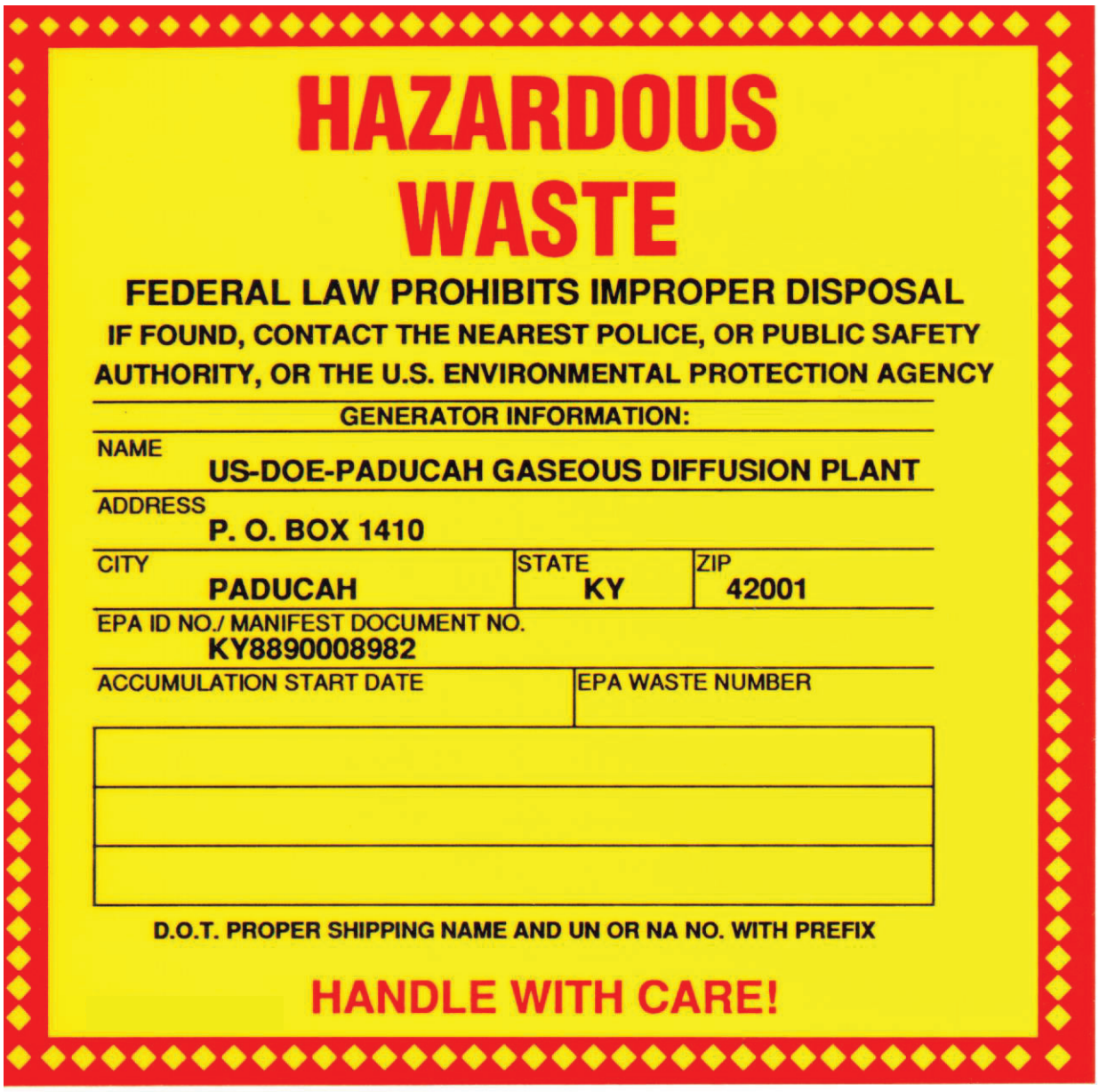

Figure B.6. Example of a Hazardous Waste Label

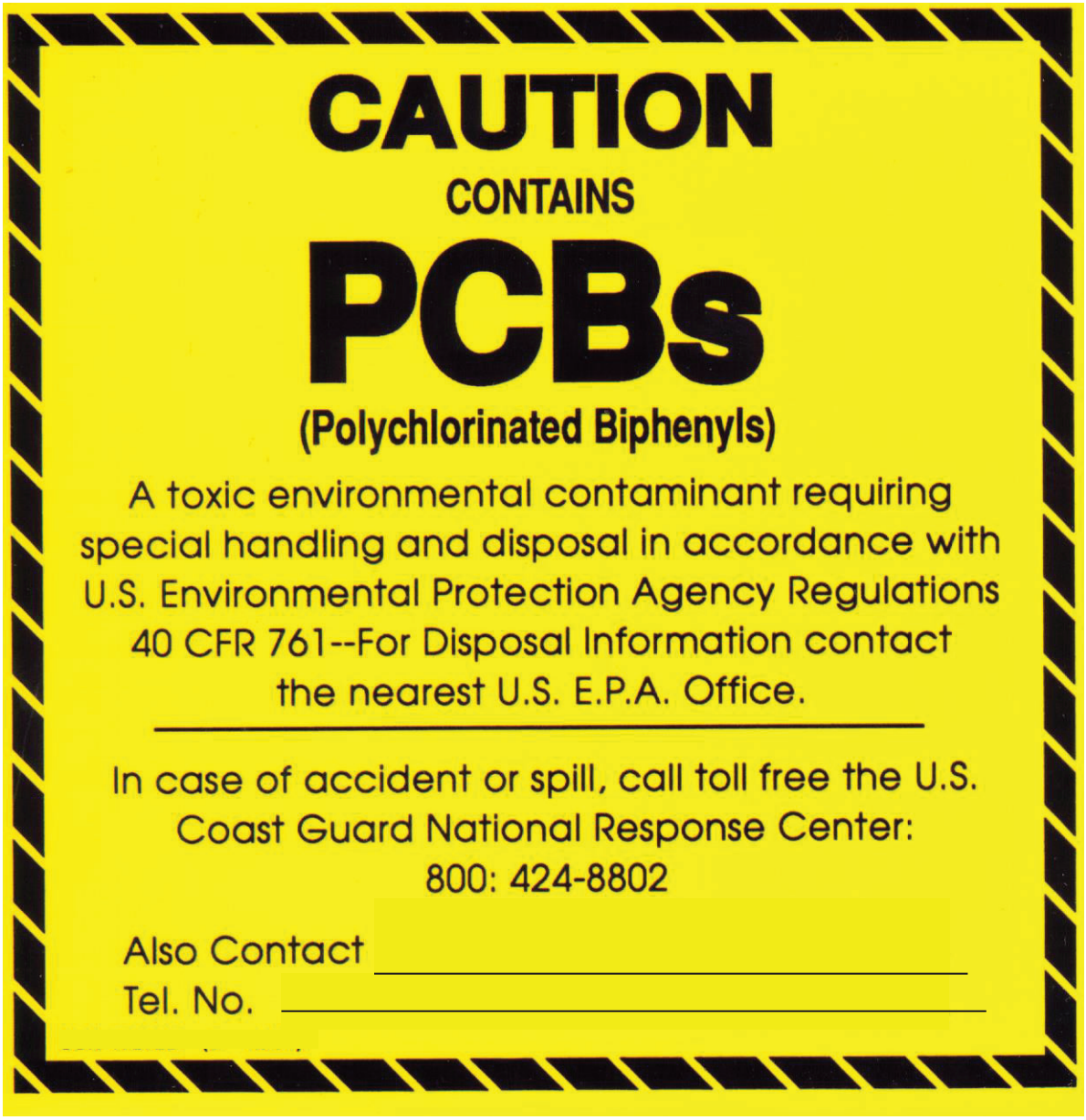

Figure B.7. Example of a PCB ML Label

Figure B.8. Example of a Classified Material Label

Figure B.9. Example of a Transuranic Waste Label

Figure B.10. Example of an Asbestos Label

DANGER
CONTAMINATED WITH BERYLLIUM
DO NOT REMOVE DUST BY BLOWING OR SHAKING
CANCER AND LUNG DISEASE HAZARD

Figure B.11. Example of a Beryllium Label

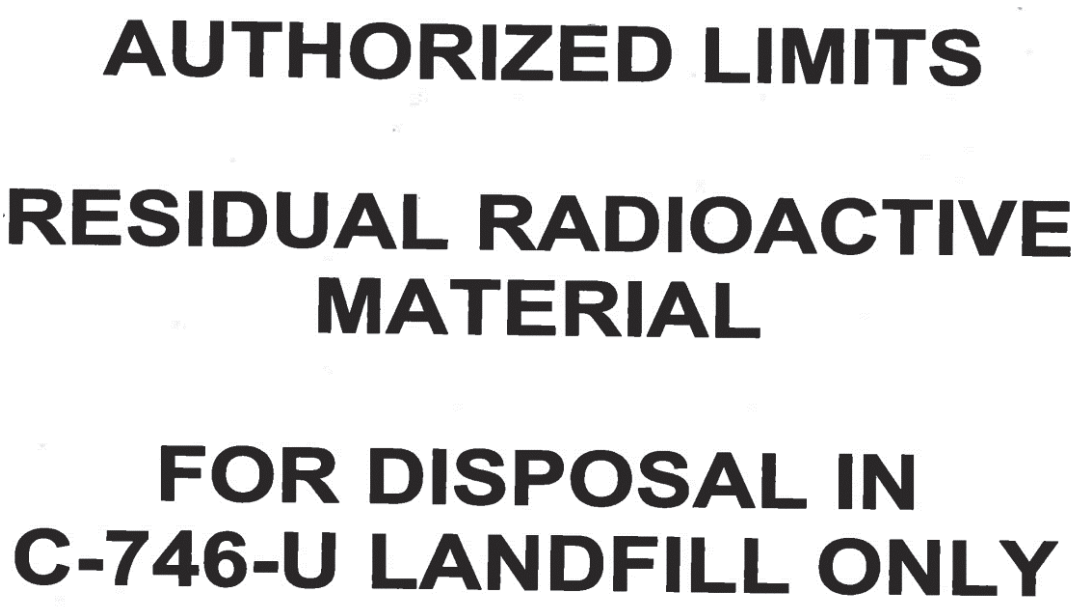

Figure B.12. Example of an Authorized Limits for Landfill Label

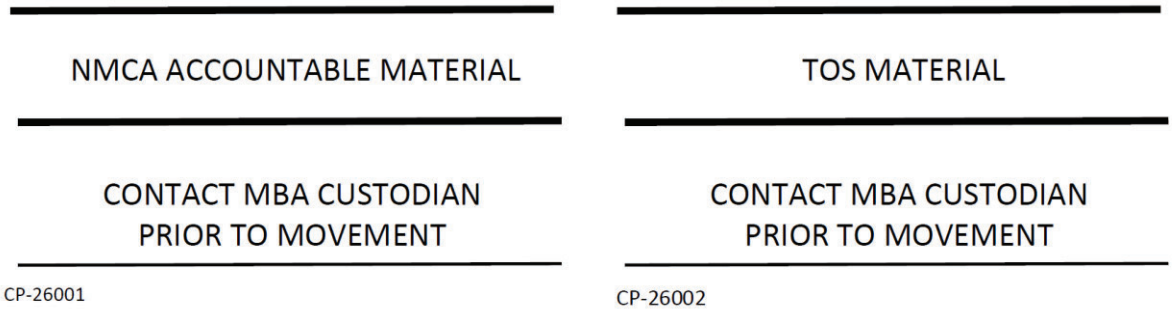

Figure B.13. Examples of a Nuclear Material Control and Accountability Material Label and a Terminations of Safeguards Label

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APPENDIX C

WASTE CHARACTERIZATION RADIOLOGICAL SURVEY PLAN FOR MATERIALS DESTINED FOR DISPOSAL IN THE C-746-U LANDFILL USING THE "AUTHORIZED LIMIT" CRITERIA

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Table C.1. Waste Characterization Radiological Survey Plan for Materials Destined for Disposal in the C-746-U Landfill Using the "Authorized Limit" Criteria

Waste Characterization Radiological Survey Plan for Materials Destined for Disposal in the C-746-U Landfill Using the "Authorized Limit" Criteria

Survey Objective:	**Site:**
Surveys performed to verify the absence of radioactive contamination above DOE approved C-746-U landfill authorized limits for miscellaneous items previously utilized at the Paducah Gaseous Diffusion Plant (PGDP)	Paducah Gaseous Diffusion Plant (PGDP)

Data Quality Objectives:

The objective for the radiological surveys is to demonstrate, at a 95% confidence level, that any radiological levels on miscellaneous items prior to disposal at the C-746-U landfill, satisfy Authorized Limits criteria. Measurement methods will have detection sensitivities and Minimum Detectable Concentrations (MDCs) that are ≤ 50 % of the applicable criterion. Measurement accuracy and precision are expected to be ± 10% to 20%.

Hypothesis:
All material or equipment is below authorized limits. **If** any material or equipment is above the selected authorized limit, **then**:

1. **If** less than 10% of the items in the same survey unit are greater the authorized limits criteria, **then** material and/or equipment above the limits will be decontaminated and resurveyed. Scans of the remaining material and equipment in the survey unit must be increased to at least 25%.
2. **If** more than 10% of the items are greater than the authorized limits criteria, **then** the items greater than the authorized limits criteria will be removed from the batch **and** segregated. The segregated items will be decontaminated and resurveyed as a separate unit. In addition, scans of the remaining items in the survey unit will be scanned 100%.

Measurement Quality Objectives:

Surface contamination survey MQOs, such as maximum background, calibration frequency, daily checks acceptability, operator qualification, and other MQOs, are identified in Paducah Gaseous Diffusion Plant (PGDP) Deactivation and Remediation (D&R) contractor instrumentation and contamination survey procedures and technical basis documents. Radiological surveys will be performed according to D&R contractor instrumentation and contamination survey procedures. Guidelines for alpha and beta/gamma surface scanning are documented in CP5-RP-2016, *Radiological Protection Contamination Control and Monitoring Technical Basis Document.*

Survey instrumentation shall be appropriate for the type of radiation being measured, and count times, survey methods, and calculations, used to determine activity levels, shall be such that detection sensitivities (MDCs) will be ≤ 50 % of the applicable authorized criterion. Typical instrument detection sensitivity calculations are documented in CP5-RP-2016.

Table 1 of CP5-RP-2016, *Radiological Protection Contamination Control and Monitoring Technical Basis Document* provides examples of estimated static MDCs and maximum background values for commonly used alpha and beta-gamma detectors. Background and efficiency for portable alpha and beta meters should be maintained as follows to ensure appropriate detection below release limits.

- Alpha probe with at least 11% efficiency and background less than or equal to 2 cpm
- Beta-gamma (pancake) probe with at least 20% efficiency and background less than or equal to 80 cpm
- Alpha/Beta-gamma probe with at least 20% alpha efficiency, 15% beta efficiency, and backgrounds less than or equal to 5 cpm alpha and less than or equal to 1,200 cpm beta-gamma.

Table C.1. Waste Characterization Radiological Survey Plan for Materials Destined for Disposal in the C-746-U Landfill Using the "Authorized Limit" Criteria (Continued)

Table 1. C-746-U Landfill Authorized Limits			
Radionuclide	**Volumetric Concentration (pCi/g)(1)**	**Surface Concentration (dpm/100 cm²)**	**Source Term Limit (Ci)**
^{241}Am	70	14,000	79
^{137}Cs	38	7,600	43
^{237}Np	11	2,200	12
^{238}Pu	78	15,600	88
^{239}Pu	72	14,400	81
^{240}Pu	72	14,400	81
^{99}Tc	104	20,800	117
^{228}Th	8	1,600	9
^{230}Th	200	40,000	230
^{232}Th	8	1,600	9
^{234}U	320	64,000	360
^{235}U	13	2,600	15
^{238}U	320	64,000	360
(1) Above background			

To address the issues associated with speculation of gross alpha and beta values when performing field measurements, historic data is to be utilized. Plant-wide characterization indicates that on average, eight percent of the total alpha activity is attributed to TRU alpha emitters. Therefore, 92 percent of the total alpha activity stems from uranium. For purposes of calculating the activity by nuclide from gross alpha measurement, the transuranic component of the total alpha activity must be determined. Given a total gross alpha activity of 20,000 dpm, 18,400 dpm would be due to uranium and 1,600 dpm would be due to TRU. The 1,600 dpm value is the lowest TRU or Thorium radionuclide value in the site DOE authorized limits (Table 1). For ease of field implementation, administrative values of 20,000 dpm/100 cm² total alpha will be used for clearance. If a review of process history indicates that the eight percent TRU assumption is not valid due to an increased concentration of TRU material in a particular waste stream, the use of administrative limits will be revised accordingly.

The DOE site authorized surface contamination limit for Tc-99 is 20,800 dpm/100cm². For ease of field implementation, administrative limits of 20,000 dpm/100 cm² total beta/gamma will be used for clearance. Should a review of process history reveal the potential for Cs-137 contamination, it will be included in the survey of that waste stream.

As a result, the following administrative limits will be applied to non-porous materials surveyed in NON-TRU MATERIALS AREAS for disposal into the C-746-U landfill in accordance with the authorized limits:

20,000 dpm/100 cm² total alpha
20,000 dpm/100 cm² total beta/gamma

Objects with surface contamination potential generated in areas with assay greater than two percent, where U isotopes and their progeny are not in equilibrium, from areas with no U-235 isotopic data, or from "TRU MATERIALS AREAS" will require scanning of both total alpha and total beta/gamma contamination. In addition, materials surveyed in TRU MATERIALS AREAS require the use of TRU limits for total alpha contamination, 1,600 dpm/100cm².

Contact Waste Engineer for guidance on expected isotopic distribution, exceedance of administrative release criteria, survey scan percentage and use of other radionuclide specific release criteria. If discreet hotspots are identified above screening limits then contact RCT Supervisor or Waste Engineer for further guidance.

General Guidelines:

1. This survey plan is for surface contaminated items. For volumetrically contaminated material contact Waste

Table C.1. Waste Characterization Radiological Survey Plan for Materials Destined for Disposal in the C-746-U Landfill Using the "Authorized Limit" Criteria (Continued)

Engineering for guidance.

2. Conduct visual inspection of the material(s). Direct the custodian to remove dirt or grease from material/equipment if it will impede the survey.
3. Ensure the maximum background values for the applicable α and β/γ survey instrument found in CP5-RP-2016, *Radiological Protection Contamination Control and Monitoring Technical Basis Document* are met in order to ensure the MDC requirements are met.
4. Obtain and record the appropriate background measurements.
5. While performing alpha surface scans, if a count is detected, a pause for a minimum of 2 seconds is required to determine if another count is observed (indicating activity is above the release limits). While performing beta surface scans, if count rate increases, a pause of several seconds is required to determine if the increased count rate is greater than background (when surveying with a Ludlum Model 44-9 probe, a minimum of a 16-second pause is required).
6. Scan material/equipment for alpha and beta/gamma radiation. The scan should focus on areas of likely contamination (e.g., discolored or oily) that were identified by the visual inspection. Note areas of elevated activity.
7. Collect a minimum 14 α and β/γ static measurements [on a single item or contents of a container not greater in size than a roll-off bin (20 yard bin: 22' x 7.5' x 4.5')]. Static measurements should be biased toward areas/points of highest activity found during the scan survey.
8. Collect additional static measurements at surveyor discretion in areas suspected of having elevated radioactivity.
9. Consult with RCT Supervisor to determine if a survey map is required. If required, prepare survey drawing showing locations of scans, static, and swipe measurements. A standard, generic drawing may be utilized. If using a photo, then ensure survey map indicates that photo is not of the actual item, as appropriate.
10. Complete survey documentation in accordance with applicable procedures. Ensure a description of the item or items is specified, including unique identifying numbers, as applicable. Provide completed survey to RCT Supervisor for review.
11. RCT Supervisor provide approved survey documentation to Waste Management.

Instrumentation/Supplies:	**Documentation:**
• Ludlum Ratemeter/Scaler with Beta/Gamma probe • Ludlum Ratemeter/Scaler with Alpha probe • Protective clothing, as necessary	• RP-F-0002 Radiological Survey Cover form and supporting forms
Total Contamination Measurements:	**Removable Contamination Measurements:**
• Static contact reading for total alpha and beta-gamma contamination as directed. • Scan for total alpha and beta-gamma contamination.	• None

Precautions/Limitations/Special Instructions:

1. Prior to handling waste, smears are still required to demonstrate compliance with 10CFR835 and applicable contamination and control procedures. However, they are not required for this survey plan.
2. If field conditions differ from assumptions made by Waste Management, then inform RCT Supervisor and contact Waste Management for direction.
3. Ensure equipment with the potential for hazardous energy (e.g. electrical, hydraulic, pneumatic) is de-

Table C.1. Waste Characterization Radiological Survey Plan for Materials Destined for Disposal in the C-746-U Landfill Using the "Authorized Limit" Criteria (Continued)

energized and secured to prevent injury.
4. Review General Site and RADCON JHA for other hazards and controls.
4. Contact Waste Management for direction pertaining to the following:
• Some items may require disassembly - inaccessible surfaces (to be evaluated on a case-by-case basis to determine if the process history and available measurements indicate that the inaccessible surfaces are likely to exhibit contamination levels greater than those from accessible surfaces);
• Potential internal contamination to be evaluated on a case by case basis;
• In some cases, Waste Management may request collection of additional measurements. The number of measurements will be documented on the radiological survey form.

APPENDIX D

POTENTIAL TREATMENT AND DISPOSAL FACILITIES FOR WASTE TYPES FROM THE PADUCAH SITE AND TRANSPORT MODES FROM THE PADUCAH SITE TO EACH FACILITY

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Table D.1. Disposal Facilities for Waste Types from the Paducah Site and Transport Modes from the Paducah Site to each Facility

Treatment and/or Disposal Facility Location	Accepted Paducah Site Waste Type	Transport Modes	Site Activities
Energy*Solutions* Clive, Utah	Low-level waste (LLW), Mixed low-level waste (MLLW)	Highway, Rail	Treatment and Disposal[a]
Energy*Solutions*, Bear Creek Facility Oak Ridge, Tennessee	LLW, MLLW	Highway, Rail	Treatment[b]
Perma-Fix of Florida Gainesville, Florida	LLW, MLLW	Highway	Treatment[b]
Perma-Fix Diversified Scientific Services, Inc. Kingston, Tennessee	LLW, MLLW, R-114	Highway, Rail	Treatment[b]
Perma-Fix Northwest Richland, Washington	LLW, MLLW	Highway, Rail	Treatment[b]
Calgon Carbon Corporation Moon Township, Pennsylvania	Nonradioactive Resource Conservation and Recovery Act (RCRA)-hazardous waste	Highway	Treatment
Waste Control Specialists LLC Andrews, Texas	LLW, MLLW	Highway, Rail	Treatment and Disposal
Nevada National Security Site Mercury, Nevada	LLW, MLLW	Highway	Disposal[c]
Clean Harbors La Porte, Texas	Nonradioactive RCRA-hazardous waste	Highway	Treatment/Transfer
Clean Harbors El Dorado, Arkansas	Nonradioactive RCRA-hazardous waste, R-114	Highway, Rail	Treatment and Disposal
Clean Harbors Deer Park, Texas	Nonradioactive RCRA-hazardous waste, R-114	Highway	Treatment and Disposal
Clean Harbors Reidsville, North Carolina	Nonradioactive RCRA-hazardous waste	Highway	Treatment and Disposal
Clean Harbors Greenbrier Transfer Station Greenbrier, Tennessee	Nonradioactive RCRA hazardous waste	Highway	Transfer station
Clean Harbors Spring Grove Cincinnati, Ohio	Nonradioactive RCRA-hazardous waste	Highway	Treatment and Disposal
Heritage Thermal Services, East Liverpool, Ohio	R-114	Highway and Rail	Treatment and Disposal
Veolia Environmental Services Port Arthur, Texas	R-114	Highway and Rail	Treatment and Disposal
Cleanlites Recycling Inc. Cincinnati, Ohio	Nonradioactive RCRA-hazardous Waste	Highway	Treatment and Disposal

[a] Energy*Solutions* can dispose of only Class A LLW/MLLW.

[b] Treatment of the waste would occur at the identified facility followed by the treatment facility that has taken title to the waste, shipping the waste to an appropriately licensed, permitted, and/or authorized disposal facility.

[c] Treatment of the waste would be completed, if needed, at other permitted facility before disposal. MLLW meeting LDR treatment standards may be disposed of at NNSS.

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