

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



This document is approved for public release per review by:

  
\_\_\_\_\_  
LATA Kentucky Classification Support

3-11-2013  
Date

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

Date Issued—March 2013

U.S. DEPARTMENT OF ENERGY  
Office of Environmental Management

Prepared by  
LATA ENVIRONMENTAL SERVICES OF KENTUCKY, LLC  
managing the  
Environmental Remediation Activities at the  
Paducah Gaseous Diffusion Plant  
under contract DE-AC30-10CC40020

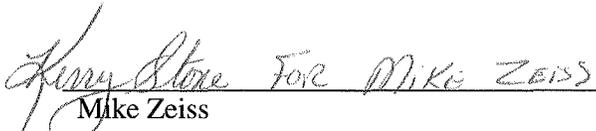
**THIS PAGE INTENTIONALLY LEFT BLANK**

# APPROVALS

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

PAD-WD-0011/R1

March 2013

  
Mike Zeiss  
Waste Disposition Manager

3-11-13  
Date

  
Dickie Kuehn  
Waste Operations Manager

3-11-13  
Date

  
Kerry Stone  
Landfill Operations Manager

3-11-13  
Date

Effective Date: 3-11-13

Review Date: 3-11-16

Nuclear Safety Documentation Number: PSW-PH-SITE-0490

**THIS PAGE INTENTIONALLY LEFT BLANK**

# CONTENTS

FIGURES AND TABLES .....	vii
ABBREVIATIONS AND ACRONYMS .....	ix
DEFINITIONS.....	xi
EXECUTIVE SUMMARY .....	xvii
1. INTRODUCTION .....	1
2. PURPOSE AND SCOPE.....	3
3. TRANSFER PROCESS.....	5
3.1 WASTE VARIANCE REQUEST .....	5
3.2 REQUEST FOR INTERIM STORAGE.....	5
3.3 TRANSFER OF WASTE TO WASTE DISPOSITION.....	6
3.4 DISPOSITION OF NEWLY GENERATED WASTE.....	6
4. WASTE CRITERIA .....	7
4.1 WASTE SUBMITTED FOR STORAGE.....	7
4.1.1 General Requirements .....	7
4.1.2 Hazardous Wastes.....	7
4.1.3 Polychlorinated Biphenyls.....	8
4.1.4 Radioactive Waste .....	9
4.1.5 Mixed Waste.....	11
4.1.6 Polychlorinated Biphenyl/Radioactive Waste .....	11
4.1.7 Asbestos-Containing Material and Regulated Asbestos-Containing Material .....	11
4.1.8 Waste Not Fully Characterized.....	11
4.1.9 Universal Waste.....	13
5. CONTAINERIZATION .....	15
5.1 CONTAINER SELECTION.....	15
5.1.1 Compatibility with Waste .....	15
5.1.2 Container Condition .....	15
5.1.3 Container Documentation.....	15
5.1.4 Venting Pressure Relief Devices .....	16
5.2 PACKAGING.....	16
5.2.1 Waste Package Certifier .....	16
5.2.2 Void Space.....	16
5.2.3 Overpacking and Repackaging.....	16
5.2.4 Requirements by Waste Type/Matrix.....	18
5.2.5 Documentation of Waste Package Contents.....	19
5.2.6 Liquid and Liquid Containing Waste .....	19
5.2.7 Taper Indicating Devices.....	19
5.3 MARKING AND LABELING.....	20
5.3.1 Label/Marking Placement.....	20
5.3.2 Durability.....	21
5.3.3 Hazardous Wastes.....	20
5.3.4 Polychlorinated Biphenyl .....	21
5.3.5 Radioactive Waste .....	21
5.3.5.1 Fissionable assay waste .....	21
5.3.5.2 Transuranic waste .....	23
5.3.6 Asbestos.....	23
5.3.7 Wastewater .....	23
5.3.8 Beryllium.....	23
5.3.9 Universal Waste.....	23
5.4 MISCELLANEOUS .....	23

5.4.1 Lid Ring Placement .....	23
5.4.2 Exterior Contamination .....	23
5.4.3 Use of Pallets .....	23
5.4.4 Container Closures .....	23
6. CHARACTERIZATION .....	25
6.1 GENERAL REQUIREMENTS .....	25
6.2 PROCESS KNOWLEDGE .....	25
6.3 RADIONUCLIDE DETERMINATION .....	26
6.4 DATA QUALITY OBJECTIVE (DQO) FOR NUCLEAR CRITICALITY SAFETY AND ANALYSIS .....	27
6.5 CONTAMINANTS OF CONCERN .....	27
6.5.1 RCRA Hazardous Material Spot Contamination on Personal Protective Equipment and Plastic .....	28
6.5.2 Polychlorinated Biphenyls .....	28
6.5.3 Polychlorinated Biphenyl Spot Contamination on Personal Protective Equipment and Plastic .....	28
6.6 CHARACTERIZATION DOCUMENTATION .....	28
7. WASTEWATER TREATMENT AND STORAGE .....	31
8. LANDFILL WASTE ACCEPTANCE CRITERIA .....	32
8.1 C-746-U SOLID WASTE LANDFILL CRITERIA .....	32
8.1.1 General Requirements .....	32
8.1.2 Landfill Personnel .....	32
8.1.3 Radiological Requirements .....	32
8.1.4 Preparation of Container for Movement to C-746-U Landfill .....	33
8.1.5 Boxes and Containers .....	33
8.1.6 Repackaging Controls .....	33
8.1.7 Transport of Container to Landfill .....	34
8.1.8 Transport of Container Back to Plant .....	35
8.1.9 General Container Requirements .....	35
8.1.10 Specific Waste Item Requirements .....	35
8.1.11 Prohibited Items .....	37
8.1.12 Landfill Waste Packaging .....	37
9. CERTIFICATION .....	38
10. UNITED STATES ENRICHMENT CORPORATION AND LEGACY WASTE AGREEMENT EXCEPTIONS .....	39
10.1 EXCEPTIONS PROVIDED FOR TEMPORARY STORAGE OF UNITED STATES ENRICHMENT CORPORATION HAZARDOUS WASTE/MIXED WASTES .....	39
10.1.1 Exception to Section 5.2.2 .....	39
10.1.2 Exception to Section 6.5 .....	39
10.1.3 Exception to Section 6.4 .....	39
10.1.4 Exception to Section 6.6 .....	39
10.1.5 Exception to Section 5.2.5 .....	39
10.1.6 Exception to Section 6.4 and Section 4.1.2 .....	39
10.2 ASBESTOS LEGACY WASTE .....	40
10.2.1 Modification to Section 5.1.4 .....	40
10.2.2 Asbestos Data Quality Objectives .....	40
10.3 POLYCHLORINATED BIPHENYL LEGACY WASTE .....	41
10.3.1 Exception to Section 5.1.4 .....	41
10.4 ARSENIC, CHROMIUM, PENTACHLOROPHENOL, AND TRICHLOROETHENE LEGACY WASTE .....	41
10.4.1 Exception to Section 5.1.4 .....	41

10.5 POLYCHLORINATED BIPHENYL/ARSENIC/CHROMIUM/PENTACHLOROPHENOL/ TRANSURANIC LEGACY WASTE DATA QUALITY OBJECTIVES.....	41
11. RECORDS, DOCUMENTATION, AND REPORTING .....	43
12. REFERENCES .....	45
REGULATIONS AND ORDERS .....	47
APPENDIX A .....	A-1
APPENDIX B .....	B-1
APPENDIX C .....	C-1
APPENDIX D .....	D-1
APPENDIX E .....	E-1

**THIS PAGE INTENTIONALLY LEFT BLANK**

# FIGURES AND TABLES

## FIGURES

1. Hazardous Waste Accumulation Date Flowchart .....	22
--	----

## TABLES

1. PCB Surface Contamination .....	8
2. Analytical Methods for Analytes of Concern—Asbestos .....	41
3. Analytical Methods for Analytes of Concern—Legacy Waste .....	43
4. Documentation by Waste Category .....	45
5. Regulatory References .....	47

**THIS PAGE INTENTIONALLY LEFT BLANK**

## ABBREVIATIONS AND ACRONYMS

ACM – asbestos-containing material  
AD – accumulation (start) date  
AL – Authorized Limits  
*CFR* – *Code of Federal Regulations*  
Ci – curie  
DOE – U.S. Department of Energy  
DOT – U.S. Department of Transportation  
DTS – date to storage  
DQO – data quality objective  
EPA – U.S. Environmental Protection Agency  
GD – generation date  
ICATS – Issues and Corrective Actions Tracking System  
ICP – inductively coupled plasma  
IH – Industrial Hygiene  
ISOCS – *In Situ* Object Counting System  
*KAR* – *Kentucky Administrative Regulations*  
KPDES - Kentucky Pollutant Discharge Elimination System  
LATA Kentucky – LATA Environmental Services of Kentucky, LLC  
LLW – low-level (radioactive) waste  
MSDS – Material Safety Data Sheet  
NCS – Nuclear Criticality Safety  
Ni-Cd – nickel-cadmium  
NDA – nondestructive assay  
NNS – Nevada National Security Site  
PCB – polychlorinated biphenyl  
pCi – picocurie  
PGDP – Paducah Gaseous Diffusion Plant  
pH – hydrogen potential  
PHP – Project Health Physicist  
PK – process knowledge  
Ppb – parts per billion  
PPE – personal protective equipment  
PPPO – Portsmouth/Paducah Program Office  
Ppm – parts per million  
RACM – regulated asbestos-containing material  
RAD – radiological  
RADCON – radiological control  
RCRA – Resource Conservation and Recovery Act  
RFD – Request for Disposal/Storage of Waste Materials and Equipment Form  
SAA – Satellite Accumulation Area  
TCLP – Toxicity Characteristic Leaching Procedure  
TID – tamper-indicating device  
TIMS – Thermal Ionization Mass Spectrometry  
TRU – transuranic  
TSCA – Toxic Substances Control Act  
TSD – treatment, storage, and disposal  
TSDF – treatment, storage, and disposal facility  
UHC – underlying hazardous constituent

USEC – United States Enrichment Corporation  
UTS – Universal Treatment Standard  
WAC – waste acceptance criteria  
WCO – Waste Certification Official  
WMP – Waste Management Plan  
WPC – Waste Package Certifier

## 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 *Kentucky Administrative Regulations (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”, and “F027”).

**Asbestos-Containing Material (ACM)**—Any material containing more than one percent 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 (EDTA, DTPA); hydroxy-carboxylic acids; and polycarboxylic acids (citric acid, gluconic acid).

**Critical Items**—Critical items are goods and services, including commercial grade 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**—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* § 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.

**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*, Chapter 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 and/or declared a waste. 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 Generator Staging Area 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 prohibits 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 of the waste or the likelihood that hazardous constituents will migrate from the waste that must be met before the waste is land disposed (40 *CFR* § 268).

**Low Level Waste (LLW)**—Waste that contains radioactivity but is not, by definition, high-level waste, transuranic waste, spent nuclear fuel, or byproduct material, as defined by DOE Order 435.1, Chg 1.

Mixed Waste—Waste containing both radioactive and hazardous components as defined by the Atomic Energy Act and the RCRA, respectively (DOE Order 435.1, Chg 1).

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) has been in direct contact with PCBs (reference 40 *CFR* § 761.50, 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  $\geq 50$  ppm PCBs. PCB bulk product waste does not include PCBs or PCB items regulated for disposal under 40 *CFR* § 761.60(a)–(c), § 761.61, § 761.63, or § 761.64. PCB bulk product waste includes, but is not limited to, the following:

- (1) 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.
- (2) PCB-containing wastes from the shredding of automobiles, household appliances, or industrial appliances.
- (3) 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.

- (4) 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, § 761.60 and § 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:

- (1) Environmental media containing PCBs, such as soil and gravel; dredged materials, such as sediments and aqueous liquids decanted from sediment;
- (2) 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;
- (3) 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 Lab 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, § 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* § 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* 31 [40 *CFR* 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 Order 435.1, Chg 1, 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 Devices (TIDs)—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.

TRU Waste—Without regard to source or form, TRU is radioactive waste containing more than 100 nanocuries (3,700 becquerel) of alpha-emitting transuranic isotopes per gram of waste, with half-lives greater than 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* § 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* § 61.

TSCA Radioactive Waste—See PCB Radioactive Waste.

Underlying Hazardous Constituent (UHC)—Any constituent listed in 40 *CFR* § 268.48, Table UTS - Universal Treatment Standards, except fluoride, vanadium, and zinc, which can reasonably 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* 273: (1) Batteries, (2) Pesticides, (3) Mercury containing equipment and (4) Lamps.

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* 279).

Waste—See Solid Waste.

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

**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**—Any portable device (e.g., package, can, bottle, bag, barrel, drum, tank or other device that contains waste. A waste article also may be the container.

**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 the 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 (TSD) facilities at the Paducah Gaseous Diffusion Plant (PGDP). LATA Environmental Services of Kentucky, LLC (LATA Kentucky), the Environmental Remediation Contractor for DOE, manages and operates these facilities. Currently, TSD facilities include the C-746-U Solid Waste Landfill, several hazardous waste storage facilities, TSCA waste storage facilities, radioactive waste storage facilities, wastewater treatment facilities, CERCLA storage areas, and waste treatment facilities. These facilities may be regulated by the 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 PGDP TSD facilities (TSDFs). The established criteria ensure that the wastes will be accepted for treatment, storage, and/or disposal at the various PGDP TSDFs and will be handled safely in compliance with all applicable regulations. It is stressed that while waste is being stored at a PGDP 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 PGDP TSDFs. Various contractors and subcontractors may generate waste at PGDP through general maintenance, environmental restoration projects, decontamination and decommissioning, and other daily plant process activities.

The following LATA Kentucky procedures/documents or LATA Kentucky-approved alternative must be used in generation, characterization, packaging, certification, and disposition of waste.

- PAD-PLA-ENV-001, *LATA Environmental Services of Kentucky, LLC Waste Management Plan for the Paducah Environmental Remediation Project*
- PAD-QA-3011, *Waste Certification*
- PAD-QA-3012, *Procurement, Inspection and Management of Items Critical for Paducah Off-Site Waste Shipments*
- PAD-WC-0018, *Work Planning and Control Program for the Paducah Environmental Remediation Project, Paducah, Kentucky*
- PAD-WC-0020, *Work Control Planning*
- PAD-WC-0021, *Work Release and Field Execution*
- PAD-WC-0022, *Work Control Closeout*
- PAD-WD-0017, *Standard Operation for the C-746-S, -T, and -U Landfills*
- PAD-WD-0437, *Waste Characterization and Profiling*

- PAD-WD-0661, *Transportation Safety Document for On-Site Transport within the Paducah Gaseous Diffusion Plant Paducah, Kentucky*
- PAD-WD-1017, *Safe Handling and Opening of Sealed Containers*
- PAD-WD-3010, *Waste Generator Responsibilities for Temporary On-Site Storage of Regulated Waste Materials at Paducah*
- PAD-WD-3015, *Waste Packaging*
- PAD-WD-3025, *Preparation and Processing of Paducah Landfill Packages*
- PAD-WD-3028, *Off-Site Shipping*

Before generating wastes that will be stored temporarily in a Paducah TSDF, each generator is required to comply with the requirements of PAD-PLA-ENV-001, *LATA Environmental Services of Kentucky, LLC Waste Management Plan for the Paducah Environmental Remediation Project*. The Request for Disposal (RFD) form, WD-F-0014, or equivalent is used to facilitate the transfer of waste to one of the various PGDP on-site TSDFs. Equivalent forms must be approved for use by the Waste Disposition Manager.

This document addresses Issues and Corrective Actions Tracking System (ICATS) issues and/or actions. For a listing, see Appendix E, *Revision Log*.

# 1. INTRODUCTION

The U.S. Department of Energy (DOE) owns and operates waste treatment, storage, and disposal (TSD) facilities (TSDFs) at the Paducah Gaseous Diffusion Plant (PGDP). LATA Environmental Services of Kentucky, LLC, (LATA Kentucky) the Environmental Remediation Contractor for DOE at PGDP, 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, TSCA waste storage facilities, and waste treatment facilities. These units may be regulated by the DOE, the Commonwealth of Kentucky, and/or the U.S. Environmental Protection Agency (EPA) under the provisions of the Atomic Energy Act, the Resource Conservation and Recovery Act (RCRA), the Toxic Substance Control Act (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 TSD at the various on-site TSDFs can be handled in a safe and efficient manner and are in compliance with the federal, state, DOE, and waste treatment and disposal facility rules and regulations. The 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 PGDP 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 Paducah's waste disposition and Quality Assurance procedures and applicable federal, state, DOE, and off-site waste disposition facility requirements.

The following LATA Kentucky procedures/documents or LATA Kentucky-approved alternative must be used in generation, characterization, packaging, certification, and disposition of waste.

- PAD-PLA-ENV-001, *LATA Environmental Services of Kentucky, LLC Waste Management Plan for the Paducah Environmental Remediation Project*
- PAD-QA-3011, *Waste Certification*
- PAD-QA-3012, *Procurement, Inspection and Management of Items Critical for Paducah Off-Site Waste Shipments*
- PAD-WC-0018, *Work Planning and Control Program for the Paducah Environmental Remediation Project, Paducah, Kentucky*
- PAD-WC-0020, *Work Control Planning*
- PAD-WC-0021, *Work Release and Field Execution*
- PAD-WC-0022, *Work Control Closeout*
- PAD-WD-0017, *Standard Operation for the C-746-S, -T, and -U Landfills*
- PAD-WD-0437, *Waste Characterization and Profiling*
- PAD-WD-0661, *Transportation Safety Document for On-Site Transport within the Paducah Gaseous Diffusion Plant Paducah, Kentucky*

- PAD-WD-1017, *Safe Handling and Opening of Sealed Containers*
- PAD-WD-3010, *Waste Generator Responsibilities for Temporary On-Site Storage of Regulated Waste Materials at Paducah*
- PAD-WD-3015, *Waste Packaging*
- PAD-WD-3025, *Preparation and Processing of Paducah Landfill Packages*
- PAD-WD-3028, *Off-Site Shipping*

LATA Kentucky Waste Disposition is available to assist in understanding and interpreting the requirements in this document. For assistance please call the following:

Waste Disposition Manager  
Telephone: 270-441-5106  
Fax: 270-441-5288

Waste Operations Manager  
Telephone: 270-441-5216  
Fax: 270-441-5344

Landfill Operations Manager  
Telephone: 270-441-5143  
Fax: 270-441-5164

## **2. PURPOSE AND SCOPE**

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

**THIS PAGE INTENTIONALLY LEFT BLANK**

### **3. TRANSFER PROCESS**

#### **3.1 WASTE VARIANCE REQUEST**

PAD-PLA-ENV-001, *LATA Environmental Services of Kentucky, LLC Waste Management Plan for the Paducah Environmental Remediation Project*, requires the generator to meet its requirements for generation, packaging, characterization, storage, treatment and disposal for all wastes being transferred to a PGDP TSDF or shipped off-site to a TSDF. If wastes being transferred to a PGDP TSDF do not meet one of the acceptance criteria established in this document, the generator may request a variance by submitting a Waste Variance Request (Appendix A). 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 Disposition Manager or designee must approve them.

#### **3.2 REQUEST FOR INTERIM STORAGE**

Once waste is generated, characterized, containerized, appropriately labeled, marked, and certified, the generator will submit a Request for Disposal (RFD) and associated documentation to Waste Disposition for concurrence. The RFD must be submitted no later than three business days prior to the desired transfer date. Waste Disposition shall verify that the RFD is complete, all necessary documents are present, and waste meets the safety basis limits for that facility. Once verified, approval for transfer will be given to the generator. The format and instructions for the RFD are in Appendix B.

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

Before a newly generated waste is accepted by LATA Kentucky for storage, the RFD or equivalent must be reviewed and agreed upon by Waste Disposition. Wastes that are within 3 months of their required disposition date due to regulatory commitments may not be accepted into interim storage at the discretion of the Waste Disposition Manager. This waste may be shipped directly from the generator's staging or storage area after consultation with the Regulatory Compliance and Policy Manager.

A completed Authorized Derivative Classification/Technical Information Office form (SSTF-106) must be included with RFD submittal. This statement does not apply for collection containers where the RFD is submitted prior to generation.

### **3.3 TRANSFER OF WASTE TO WASTE DISPOSITION**

After the RFD is approved, generators will coordinate the delivery of wastes with Waste 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. If conducted, it will be the generator's responsibility to provide the necessary replacement tamper-indicating devices (TIDs).

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 Disposition will not accept the waste.

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

On-site generators requesting delivery of waste to PGDP TSDFs after 3:00 p.m. must obtain approval from Waste Operations at least 24 hours in advance.

### **3.4 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 435.1, Chg 1. Exemptions/variances may be obtained on a case-by-case basis with concurrence from Portsmouth/Paducah Program Office (PPPO).

## 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 PAD-WD-3010). 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 PGDP waste storage facilities safely store RCRA-hazardous wastes, TSCA-regulated wastes, LLW, Mixed Waste (RCRA and Low-level radioactive), TRU wastes, and sanitary solid wastes. The PGDP 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 PGDP 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 PGDP TSDFs.

#### 4.1.1 General Requirements

All waste being 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* § 261–268 and 401 *KAR* Chapters 31–37. All hazardous waste must have the proper waste code assigned, to include underlying hazardous constituents (UHCs), and be identified in RFD as such.

##### 4.1.2.1 Specific hazardous waste requirements

The 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 greater than 0.25 inches (6.35 mm) per year.

**Flash Point**—The flash point of liquid waste must be reported by using PK or testing. The actual flash point of the waste must be reported if above 90 °F and below 210 °F [i.e., between these limits, the discrete value must be reported, not less than (<) or greater than (>) a value].

If using an Material Safety Data Sheets (MSDS) 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 31:040 [40 CFR 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.

### 4.1.3 Polychlorinated Biphenyls

Polychlorinated biphenyl (PCB) wastes are those that are subject to TSCA regulations in 40 CFR § 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 a nonporous surfaces (e.g., metal) are regulated by the same provisions as concentrations in Table 1.

**Table 1. PCB Surface Contamination**

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

#### 4.1.3.1 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, etc.) 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 have the following special reporting requirements and must be reported on the RFD:

- 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
- 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  $\geq 10$   $\mu\text{g/L}$  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  $< 10$   $\mu\text{g/L}$  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 in the U-Landfill per letter from KDWM to DOE, “*Polychlorinated Biphenyl Bulk Product Waste Characterization and Disposal Considerations for the C-746-U Landfill*”, dated 8/11/2008.

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 WD-F-0015, “*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.

#### **4.1.4 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. PGDP has produced only low-level (radioactive) waste (LLW) and potentially TRU wastes. LLW consists of three categories: LLW, PGDP Fissionable Wastes, and Nuclear Criticality Safety (NCS) Spacing Exempt Waste. LLW is discussed in Section 4.1.4.2, PGDP 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, PGDP Fissionable Wastes, NCS Spacing Exempt Waste, or TRU on the RFD.

##### **4.1.4.1 General radioactive waste requirements**

Percent Enrichment—For waste containing uranium, the percent enrichment of the uranium in  $^{235}\text{U}$ , in weight percent must be reported on RFD (for guidance contact Waste Disposition).

Absorbent Materials—The type and quantity of absorbent materials in mass and must be reported on the Waste Item Container Log (WICL), form WD-F-0015, (see procedure PAD-WD-3015, *Waste Packaging*, Form WD-F-0070, “Absorbent Determination Form,” for guidance).

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

Chelating Agents—Report active chelating agents greater than or equal to 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  $\mu\text{Ci}$  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.

#### **4.1.4.2 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 Attachment A of PAD-RAD-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 (PHP).

LLW meeting the criteria of greater-than-Class-C (10 *CFR* § 3 61.55) must be identified on the RFD as such.

#### **4.1.4.3 Fissionable-assay waste**

LLW containing uranium with a uranium-235 ( $^{235}\text{U}$ ) enrichment greater than 1 wt.% is categorized as fissionable-assay waste. All fissionable-assay wastes must be identified on the RFD as either “NCS Spacing Exempt Waste” or “Fissionable Material.”

Waste containing fissionable radionuclides, other than  $^{235}\text{U}$ , will be assessed on a case-by-case basis. Fissionable nuclides are listed in DOE Order 420.1B “Facility Safety.”

Waste containing the following cannot be accepted:

- Significant quantities of beryllium and /or deuterium oxide ( $\text{D}_2\text{O}$ ) (i.e., 0.1% of  $^{235}\text{U}$  mass per container); and
- Significant quantities of bulk carbon (graphite) (i.e., 20 times  $^{235}\text{U}$  mass/container).

#### **4.1.4.4 Transuranic waste**

TRU waste is radioactive waste containing more than 100 nanocuries (3,700 becquerels) of alpha-emitting transuranic isotopes per gram of waste, with half-lives greater than 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<sup>3</sup>;
- 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.

#### **4.1.5 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).

#### **4.1.6 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).

#### **4.1.7 Asbestos-Containing Material and Regulated Asbestos-Containing Material**

Asbestos-containing material (ACM) is any material that contains more than 1% asbestos. ACM found at PGDP 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, PAD-WD-0661, *Transportation Safety Document for On-Site Transport Within the Paducah Gaseous Diffusion Plant Paducah, Kentucky*, 49 CFR 173, 40 CFR 61, 29 CFR 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 W32 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 process knowledge is not available, evaluation by an asbestos competent person may be required prior to declaring disposal options.

#### **4.1.8 Waste Not Fully Characterized**

In some cases, the need may exist for waste to be transferred to a PGDP 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 SAA before characterization is complete]; therefore, all documentation may not be

complete. Waste Disposition 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 Disposition 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;
- Assay in duplicate, 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 WD-F-0015 or equivalent accompanies the RFD and is required before waste will be accepted. (See PAD-WD-3015, *Waste Packaging*.)

Waste Variance Form (Appendix A)—The variance request 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.

Waste that is not fully characterized in accordance with Section 6 of this document must include an estimated completion date on the Waste Variance Form, in addition to a schedule of characterization activities to be completed (i.e. sampling, analysis, assessment).

## 4.1.9 Universal Waste

### 4.1.9.1 Universal 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.

### 4.1.9.2 Universal waste types

- Batteries, such as nickel-cadmium (Ni-Cd) 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.

### 4.1.9.3 Handling 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,” or “Spent Lamps.”
- Overpack or repack waste 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, 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 placed into a container immediately.
- Leaking or damaged lamps must be containerized.

## 5. CONTAINERIZATION

The generator is responsible for containerizing the waste, which includes selecting 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 regulations 49 *CFR* or approved alternatives
- DOE M 435.1, Chg.1, *Radioactive Waste Management Manual*
- *Nevada National Security Site Waste Acceptance Criteria*, DOE/NV-325, latest revision
- Off-site Commercial TSDF WAC
- PAD-QA-3012, *Procurement, Inspection and Management of Item Critical for Paducah Off-Site Waste Shipments*
- PAD-WD-3014, *Procurement, Inspection and Management of Used/Recyclable Waste Containers*
- PAD-WD-3015, *Waste Packaging*

### 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 PAD-QA-3012.

#### 5.1.1 Compatibility with Waste

The generator must place waste 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 Disposition for procuring suitable containers. All container selections and procurement must be in accordance with PAD-QA-3012.

#### 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. Rings and bolts must be applied properly. Bolts must be tightened properly to specific foot-pounds of force as recommended in manufacturer's closure instruction for specific container. Containers must be inspected in accordance with PAD-QA-3012 and PAD-WD-3015.

#### 5.1.3 Container Documentation

DOT-compliant packaging, closure instructions, 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 by the Quality Department in accordance with PAD-QA-3012, do not have to be attached to the RFD, but shall be referenced by assigned inspection number on form WD-F-0015, Waste Item Container Log.

Interchanging container parts may void DOT packaging compliance.

#### **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 (SME) evaluations are complete, a Waste Engineer will assist with packaging determination. These are the wastes that typically produce gas pressure build-up and must be evaluated to determine if venting devices are required:

- Material containing 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 etc.)
- Aerosol cans – valve stems removed
- Volatile organics
- Aqueous/organic mixtures
- Low pH solutions
- Biological wastes
- RCRA ignitable waste (flash point < 140 °F)
- TRU waste

For all hazardous wastes, Regulatory Compliance and Policy 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.

### **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 (NNSS), a Waste Package Certifier (WPC) must be present during all waste packaging activities. Contact Waste Certification Official (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 Disposition 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 on 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 PAD-WD-3015 for requirements.

#### 5.2.4 Packaging Requirements by Waste Type/Matrix

The waste media or matrix affects the container selection. Contact Waste Disposition for designated containers of typical PGDP waste types.

Asbestos or Asbestos-Containing Waste—Asbestos-containing waste must be packaged in accordance with 401 KAR 58:040, Section 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 173, 40 CFR 61, 29 CFR 1910 and 401 KAR requirements, as applicable and PAD-WD-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 Disposition 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 Disposition 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 greater than five years must be packaged in accordance with PAD-WD-3015.

Radioactive Waste—Packaging must meet DOE Order 435.1, Chg 1, *Radioactive Waste Management*, and must meet the definition of radioactive material per 49 CFR § 173.403.

Radioactive waste requiring a “Fissionable Material Storage Container” label or “NCS Spacing Exempt” label must be packaged in accordance with requirements in the current NCS evaluations. The contents of NCS Spacing Exempt containers may be repackaged or overpacked, but never consolidated without NCS approval. Containers smaller than 30 gal that do not meet the 15 gram exemption must be overpacked into a 30-gal-or-larger container for Category 1 and Category 2 containers only.

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 on Waste Item Container Log, form WD-F-0015. For DOE waste generated by United States Enrichment Corporation (USEC) and/or another on-site DOE Prime Contractors an equivalent form may be used. Equivalent forms must be approved for use by the Waste Disposition Manager.

### **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 WD-F-0070, “Absorbent Determination Form” or otherwise removed from the waste. (See procedure PAD-WD-3015)

- 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 PAD-WD-3015. 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 D for an example.)

### **5.2.7 Tamper-Indicating Devices (TID)**

Generators must ensure that containers are protected against unauthorized entry.

TIDs are placed on each container in such a position that the container cannot open without breaking the seal. Each TID has a unique identification number that is recorded on the Waste Item Container Log Sheet and the RFD form or equivalent.

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 NNSS 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 C. 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 C);
- Appropriate waste category or identification labels (see Sections 5.3.3 through 5.3.9 and Appendix C);

**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, the appropriate date [generation date (GD), and/or date to storage (DTS) and/or the accumulation start date(AD)], and contents written on the container in permanent marker;
- Classified material label, if applicable (see Appendix C); and
- RADCON survey 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**

Labels should be placed to the left of the drum seam. Written markings should be placed to the right of the drum seam. All labels and markings must be placed on the upper one-third of the container. One set of labels/markings on the side of a drum is acceptable (see Appendix C). Bulk containers (such as ST-90 and B-25 boxes) require additional labeling on opposite sides of the container (Appendix C).

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 Hazardous Wastes

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

The accumulation start 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 a SAA, the accumulation date is the date an excess accumulation begins (i.e., greater than 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 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 1 for Hazardous Waste Accumulation Date Flowchart).

### 5.3.4 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  $\geq 50$  ppm PCBs) (Appendix C).

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, etc.].

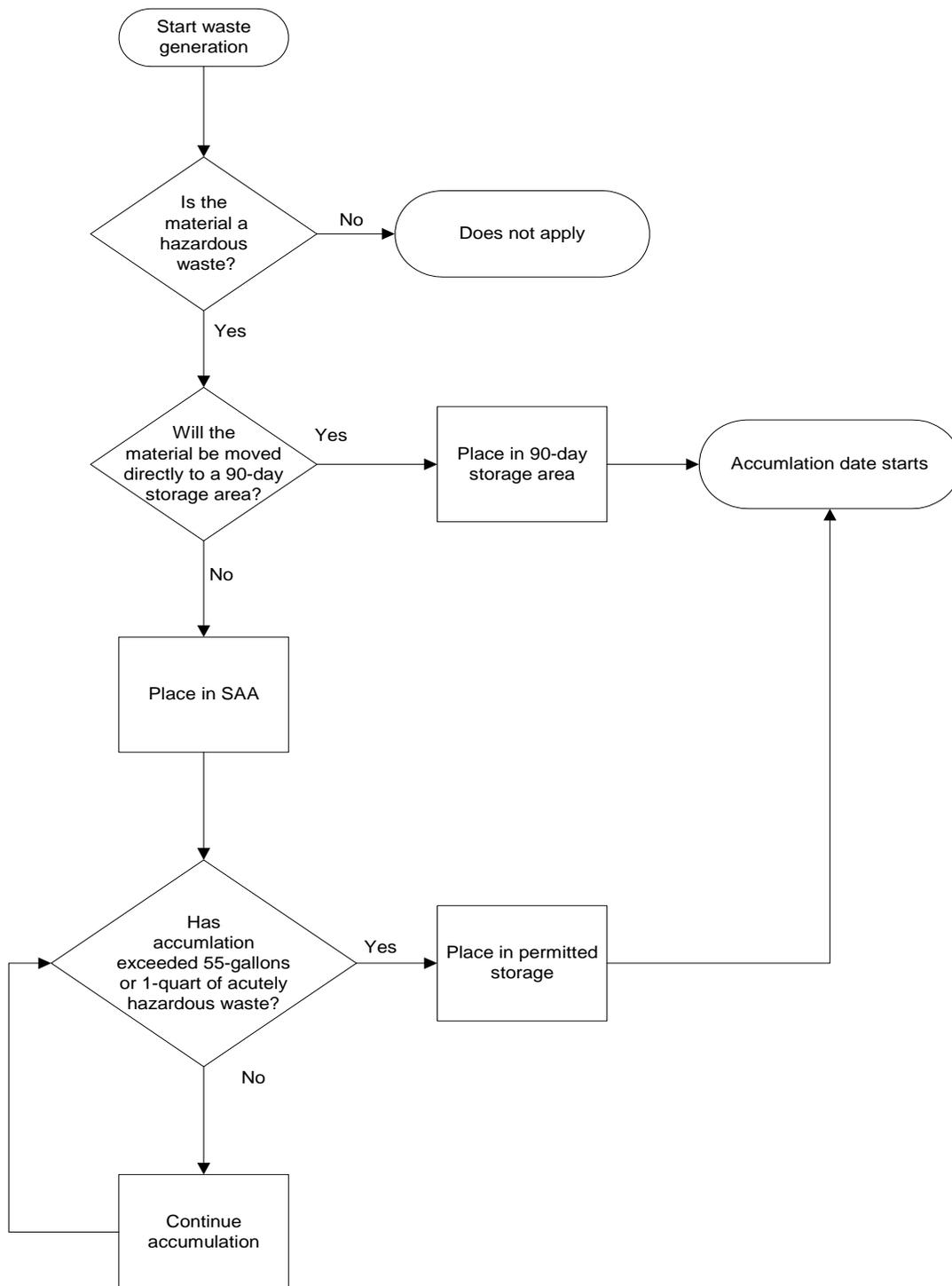
### 5.3.5 Radioactive Waste

The generation date (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 of  $> 0.3$  and  $\leq 3$  Ci per  $m^3$  volume of waste from  $^{99}\text{Tc}$  must be marked as “Class C.” Any container that exceeds 3 Ci of radioactivity per  $m^3$  of waste from  $^{99}\text{Tc}$  must be marked as “> Class C” (10 *CFR* § 61.55).

#### 5.3.5.1 Fissionable assay waste

Packages containing waste meeting the definition of fissionable assay waste and contain greater than 15 grams of  $^{235}\text{U}$  must be labeled by Waste Disposition in accordance with Nuclear Criticality Safety Evaluations and applicable procedures.



**Figure 1. Hazardous Waste Accumulation Date Flowchart**

### **5.3.5.2 Transuranic waste**

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

### **5.3.6 Asbestos**

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

### **5.3.7 Wastewater**

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

### **5.3.8 Beryllium**

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

### **5.3.9 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.”

## **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 PGDP 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**

All container closures (e.g., bung, ring, lid) must be tightened in accordance with the containers manufacturer's instructions. Containers also must be kept closed except when filling, emptying, or sampling a container.

## 6. CHARACTERIZATION

The generator must characterize all waste offered for treatment, storage and/or disposal 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 PAD-WD-0437, *Waste Characterization and Profiling*. It is recommended that generators consult EPA/600/R-96/05, *Guidance for the Data Quality Objective (DQO) Process*; PAD-ENM-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. Generator Support may assist generators as an integrated part of the project as outlined in LATA 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 process knowledge (PK) for characterization. Process knowledge, 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. Process knowledge 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 process knowledge 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
- MSDSs

If the generator wishes to use process knowledge to characterize waste, the generator must complete required documentation in accordance with PAD-WD-0437 Attachment B. Info should be included with RFD for review and approval by Waste Disposition. Existing PK Forms located at S:/Everyone/PK Forms may be used if they meet the requirements outlined in PAD-WD-0437. Equivalent forms of PK documentation may be approved by the Waste Disposition Manager. When historical analytical data is used, the data limitations must be documented.

### 6.3 RADIONUCLIDE DETERMINATION

For the purpose of determining uranium assay less than or equal to 1% by weight  $^{235}\text{U}$ , any of the following are acceptable methods:

- Thermal ionization mass spectrometry (TIMS)
- Nondestructive assay (NDA)
- Gamma spectrometry (if less than 0.711 % by weight  $^{235}\text{U}$ )
- Inductively coupled plasma (ICP) mass spectrometry
- Alpha spectroscopy
- PK (e.g., uranium contaminated material from the C-315 facility is depleted)

For the purpose of determining uranium assay greater than 1% by weight  $^{235}\text{U}$ , the following are the only acceptable methods:

- TIMS
- NDA
- ICP mass spectrometry
- Alpha spectroscopy
- PK (e.g., a maximum of 5.5% by weight can be assumed for waste streams generated from PGDP process equipment)
- Exemptions from the use of these methods must have an approved Waste Variance Request. If greater than 1% by weight  $^{235}\text{U}$ , then independent duplicate TIMS, NDA, alpha spectroscopy, or ICP mass spectrometry analyses are required.

For the specific requirements for *In Situ* Object Counting System (ISOCS) characterization, the following are acceptable:

- Wood and small scrap metal items may be characterized by ISOCS upon receiving approval by the RADCON Manager

- Small, nondiscernable metal items may be characterized by ISOCS upon receiving permission of the RADCON Manager
- Soil
- Large metal items must be characterized by implementation of a RADCON survey plan
- Containers must have waste streams segregated to the extent practical. Do not mix materials in the containers (e.g., do not mix wood and metal). The RADCON Manager may provide an exemption for volumetrically contaminated materials on a case by case basis
- Waste materials will be inspected visually to look for stains and other nonconforming materials. RADCON technician will check any stains to ensure items with high levels of contamination are excluded

Generator will provide the following with each container that was characterized by ISOCS:

- A unique identification number and log sheet;
- Photo of the contents;
- Estimation of the percent void space, head space, and percentage of any mixed materials;
- Radiochemical data for the waste stream that includes lab results for the following RAD contaminants: uranium series, thorium series,  $^{237}\text{Np}$ , plutonium series,  $^{99}\text{Tc}$ ,  $^{241}\text{Am}$ , and  $^{137}\text{Cs}$ ; and
- Concentrations of non-gamma emitters will be determined by scaling factors. Data from ISOCS will be provided to the generator within three business days for inclusion in the waste package.

**NOTE:** For potentially fissile waste stream, Waste Disposition or NCS should be contacted for DQOs for criticality safety and analysis.

#### **6.4 DATA QUALITY OBJECTIVE (DQO) FOR NUCLEAR CRITICALITY SAFETY AND ANALYSIS**

A set of DQOs has been developed and shall be used in sampling and analytical methods that produce data used in making NCS decisions at Paducah. DQOs for NCS are found in BJC/PAD-414, Revision 1, *Paducah Project Data Quality Objectives for Nuclear Criticality Safety Sampling and Analysis*.

S:\Safety Basis Documents\Nuclear Criticality Safety

#### **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 PGDP. Refer to PAD-WD-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 PGDP include the following:

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

Waste must be characterized adequately to facilitate proper identification of PCB contamination, as required by 40 *CFR* § 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  $\geq 50$  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 seen, 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 PAD-WD-0437 for required characterization documentation. Waste Characterization Documentation as specified in PAD-WD-0437 or equivalent 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 Disposition Manager or designee. Equivalent documentation must include the minimum requirements outlined in DOE O 435.1 including:

- 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 which 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 Disposition Activated Carbon Absorption Unit, and/or oil/grease unit, the C-752-C Decontamination Pad, 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 activated carbon absorption unit and/or oil/grease filter unit if it exhibits any of the following:

- Uranium enrichment > 1 wt.%  $^{235}\text{U}$
- Liquid waste containing less than 50% water
- A flash point of less than 140 °F
- Total suspended solids greater than 10%, by weight

Waste water will not be accepted for treatment at the C-752-C Decontamination Pad if it exhibits any of the following:

- Uranium enrichment > 1 Wt. %  $\text{U}^{235}$
- Flashpoint of less than 140°F

Groundwater contaminated with trichloroethene (TCE) and/or  $^{99}\text{Tc}$  can be treated at the C-612 Northwest Plume Pump-and-Treat Facility. Groundwater will not be accepted for treatment if it exhibits any of the following:

- Groundwater containing large quantity of sediments,
- Groundwater contaminated with other radionuclides and organics, 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 their request for treatment to C-612 Operations for approval. Other requirements that may be required by the C-612 Operations procedures are not included in this document.

## 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 solid waste and nonhazardous, low-level solid waste per the authorized limits (AL). It is not permitted to accept RCRA hazardous waste, TSCA-regulated waste (except PCB remediation waste containing  $\leq 49$  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 D. 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 Landfill Manager. Waste generators must use the latest version of PAD-WD-3025, *Preparation and Processing of Paducah Landfill Packages*, in the development of all landfill waste packages.

For specific waste disposal instructions, refer to PAD-WD-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 determines 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 surface contaminated materials going to the C-746-U landfill shall performed in accordance with PAD-PROJ-0131, *Paducah Project Waste Characterization Radiological Survey Plan for Materials Destined for Disposal in the C-746-U Landfill Using “Authorized Limit” Criteria*.

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 PAD-RAD-1109
- Surface contamination levels that exceed limits established in Attachment B of PAD-RAD-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, or
- Waste generated in RAD controlled areas shall be released in accordance with the requirements established in PAD-RAD-1109, Section 4.8, Release of Material and Equipment to Uncontrolled Areas

#### **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 dumptrucks 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 dumptrucks shall be marked with either a weather-proof sticker/label or removable magnetic label. Removable magnets are to be re-used 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 dumptrucks being transported to the C-746-U landfill **shall not** be labeled with Radioactive Material Labels. LATA Kentucky’s procedure for Radiological Posting and Labeling, PAD-RAD-1108 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 Order 460.1C allows for the use of an approved Transportation Safety Document in lieu of full DOT HMR compliance, this exemption can be used by complying with the PAD-WD-0661, *Transportation Safety Document for On-Site Transport within the PGDP*.

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.

#### **8.1.6 Repackaging Controls**

Waste that has been drained and/or segregated is observed and inspected as it is repackaged to ensure no non-conforming items are present and are compliant with regards 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. LATA Kentucky generally uses a minimum of one pound of absorbent material per 100 gallons of waste material while manufacturers recommend one pound per 300 gallons waste material. 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 Security Area via Post 15 or 48, follow Dykes Road to Gate 43-A, pass through Gate 43-A, cross Ogden Landing Road and proceed north to the landfill. Containers may also 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 dumptrucks SHALL NOT leave DOE property at any time which requires performance of a temporary road closure in accordance with training module 40281, Highway Flagger. Containers must be transported to the landfill in accordance with the On-Site Transportation Safety Document, PAD-WD-0661. Landfill personnel will coordinate with Swift & Staley Team Security for protective force resources or approved equivalent to open/close Gate 43-A. 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 PAD-WD-3030, *LATA Kentucky Commercial Motor Carrier*.

### **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 do not typically return empty once transported to the landfill and are usually landfill disposed.

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

- (1) The container or dumptruck may be retarped, the exterior surveyed, labeled, and sent back to the plant via Gate 43-A. Upon entry into the Limited Security Area, containers or dumptrucks must be stored in a RAD posted area (see Section 8.1.6, *General Requirements*).
- (2) The container or dumptruck may be left untarped, the interior and exterior surveyed, and sent back to the plant via Gate 43-A. Containers or dumptrucks surveyed and released from the landfill will not be radiologically tagged or labeled and may be stored in nonradiological areas. Containers or dumptrucks 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 Waste Transportation Manager, containers or dumptrucks SHALL NOT leave DOE property at any time which requires performance of a temporary road closure in accordance with training module 40281, Highway Flagger. 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 the On-Site Transportation Safety Document, PAD-WD-0661. Use of commercial motor vehicles for transporting containers to the plant must comply with PAD-WD-3030, *LATA Kentucky Commercial Motor Carrier*.

### **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 decon pad. RADCON will provide job coverage for the de-con 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 RAD 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 RAD 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 Project Health Physicist (PHP) and Regulatory Compliance Group.

### **8.1.10 Specific Waste Item Requirements**

- Asbestos-containing wastes found at PGDP 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* 173, 40 *CFR* 61, 29 *CFR* 1910 and 401 *KAR* requirements, as applicable, and PAD-WD-0661. An estimate of

the total volume of asbestos-containing wastes, in cubic yards, must be annotated in Block W32 of the RFD.

- 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).
- Fly ash must be treated to minimize dust emissions and combustion concerns.
- 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.
- Non-aerosol paint cans must be bagged or drummed. Contents must be completely dry and lids removed.
- RAD tags and flagging, etc., must be cut and containerized. Characterization must confirm no RAD contamination.
- Personal protective clothing (i.e., Tyvek<sup>®</sup> suits, shoes, gloves, etc.) must be accompanied by HP 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<sup>3</sup> 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 greater than 120,000 pounds. <HAD-PH-C764U-0004R1, Section 9, “Key Assumptions to be Protected”>

#### **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 (except those with AL per Section 8.1.3) are prohibited from being disposed of in the C-746-U Landfill. Examples include these:

- Batteries (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 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 three-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. CERTIFICATION**

Generators must certify that they have complied with LATA WMP 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 W34). 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 the Waste Variance Form (WD-F-0036, Appendix A) and must be approved by Waste Disposition Manager or designee. Generators are responsible financially for costs incurred as a result of nonconformance with the criteria established in this document.

## **10. UNITED STATES ENRICHMENT CORPORATION AND LEGACY WASTE AGREEMENT EXCEPTIONS**

Unless otherwise specified in a written agreement between the USEC and DOE, waste generated by USEC will comply with this document with the following exceptions.

### **10.1 EXCEPTIONS PROVIDED FOR TEMPORARY STORAGE OF UNITED STATES ENRICHMENT CORPORATION HAZARDOUS WASTE/MIXED WASTES**

#### **10.1.1 Exception to Section 5.2.2**

Void spaces will be maintained and verified with signature and date on RFD, section W32, provided by USEC. TIDs cannot be removed without violating NCS requirements for treatment. Should a TID need to be removed, prior USEC approval must be received, with the exception of emergency conditions.

#### **10.1.2 Exception to Section 6.5**

The following parameters of concern will not be provided by USEC waste offered for temporary storage in DOE storage areas: boiling point, pH of solids, pH of organic wastes, UHC determinations, and corrosivity to steel of solids.

#### **10.1.3 Exception to Section 6.4**

DQOs are not required for waste in storage areas, except for potentially fissile waste streams.

#### **10.1.4 Exception to Section 6.6**

A characterization report is not required for waste in storage areas, but documentation or equivalent documentation per DOE O 435.1 is required.

#### **10.1.5 Exception to Section 5.2.5**

USEC waste will be accompanied by a USEC container log sheet (CP-17963) in place of form WD-F-0015. Accumulation start date will replace the generation start date. Weight will be provided in the Comments section of the USEC log sheet.

#### **10.1.6 Exception to Section 6.4 and Section 4.1.2**

UHCs are not required for waste in storage areas.

## 10.2 ASBESTOS LEGACY WASTE

### 10.2.1 Modification to Section 5.1.4

DOE will provide pressure relief devices if the devices are deemed necessary.

### 10.2.2 Asbestos Data Quality Objectives

#### Objective

- (1) Determine if asbestos is acceptable at the C-746-U Solid Waste Landfill or must be managed as LLW.
- (2) Description of Waste: Asbestos Solids  
Source: Various locations at PGDP  
Distribution of Contaminants: Heterogeneous, random variable
- (3) Analytes of Concern—Based on the source of the asbestos, a decision will be made as to whether analytes of concern are present. This decision will be documented on a PK form. The presence or absence of RCRA/PCB contaminants shall be determined by PK or testing. If RCRA/PCB contaminants are present, these DQOs do not apply. The analytes of concern are <sup>241</sup>Am, <sup>237</sup>Np, <sup>238</sup>Pu, <sup>239/240</sup>Pu, <sup>99</sup>Tc, <sup>234</sup>U, <sup>235</sup>U, <sup>238</sup>U, <sup>137</sup>Cs, <sup>230</sup>Th, <sup>228</sup>Th, <sup>232</sup>Th, <sup>89/90</sup>Sr, <sup>60</sup>Co, assay, and free liquids.
- (4) Sampling Description—Ten percent random grab samples with a minimum of four containers sampled (if available) per waste source will be used to qualify/quantify analytes of concern. NDA monitoring of closed containers can be substituted for grab sampling. Sampling location/drum numbers sampled/monitored will be documented during the sampling event.
- (5) Analytical Methods—Table 2 provides the methods that will be used for analysis of analytes of concern.

**Table 2. Analytical Methods for Analytes of Concern—Asbestos**

Analytes	Method	Minimum Detectable Activity
<sup>241</sup> Am, <sup>237</sup> Np,	Gamma/Alpha Spec	3.0 pCi/g (each series)
<sup>238</sup> Pu, <sup>239/240</sup> Pu,	Alpha Spec	3.0 pCi/g (each series)
<sup>228</sup> Th, <sup>230</sup> Th, <sup>232</sup> Th	Alpha Spec	15 pCi/g
<sup>234</sup> U, <sup>235</sup> U, <sup>238</sup> U, Total U	Gamma/ICP/TIMS/ Alpha Spec	75 pCi/g
<sup>99</sup> Tc	Liquid Scintillation	35 pCi/g
<sup>89/90</sup> Sr	Gas Proportional Counter	15 pCi/g
<sup>137</sup> Cs, <sup>60</sup> Co	Gamma Spec	3 pCi/g
Assay	NDA/Gamma Spec/TIMS/ICP	NA
Free Liquids	Visual inspection/Paint Filter	NA

### **10.3 POLYCHLORINATED BIPHENYL LEGACY WASTE**

#### **10.3.1 Exception to Section 5.1.4**

DOE will provide pressure relief devices if the devices are deemed necessary.

### **10.4 ARSENIC, CHROMIUM, PENTACHLOROPHENOL, AND TRICHLOROETHENE LEGACY WASTE**

#### **10.4.1 Exception to Section 5.1.4**

DOE will provide pressure relief devices if the devices are deemed necessary.

### **10.5 POLYCHLORINATED BIPHENYL/ARSENIC/CHROMIUM/PENTACHLOROPHENOL/TRANSURANIC LEGACY WASTE DATA QUALITY OBJECTIVES**

#### Objective

- (1) Identify legacy wastes and provide data for safe storage of legacy wastes.
- (2) Description of Waste: Solids and Liquids Containing Legacy Wastes  
Source: Various locations at PGDP  
Distribution of Contaminants: Homogeneous and heterogeneous, random variable.
- (3) Analytes of Concern—Based on the source of the wastes, a decision will be made as to whether analytes of concern are present. This decision will be documented on a PK form. The analytes of concern are  $^{241}\text{Am}$ ,  $^{237}\text{Np}$ ,  $^{238}\text{Pu}$ ,  $^{239/240}\text{Pu}$ ,  $^{99}\text{Tc}$ ,  $^{234}\text{U}$ ,  $^{235}\text{U}$ ,  $^{238}\text{U}$ ,  $^{137}\text{Cs}$ ,  $^{230}\text{Th}$ ,  $^{228}\text{Th}$ ,  $^{232}\text{Th}$ ,  $^{89/90}\text{Sr}$ ,  $^{60}\text{Co}$ , assay, PCB, RCRA Characteristics, and Free Liquids.
- (4) Sampling Description—Sampling will be conducted if documented PK does not apply to the waste. Containers will be sampled as required. It is not expected that more than one container of waste will be produced at any one time; therefore, a 100% sampling event most likely will occur. Sampling location/drum numbers sampled/monitored will be documented during the sampling event.
- (5) Analytical Methods—Table 3 provides the methods that will be used for analysis of analytes of concern.
- (6) Quality Control Requirements—Field/equipment blanks will be completed for any grab samples taken.
- (7) Statistical Approach—When sampling is appropriate, a description of the sampling effort will contain the statistical logic used. Statistical evaluations will be conducted and documented in accordance with SW-846, Chapter 9.

**Table 3. Analytical Methods for Analytes of Concern—Legacy Waste**

<b>Analytes</b>	<b>Method</b>	<b>Minimum Detectable Activity</b>
<sup>241</sup> Am, <sup>237</sup> Np,	Gamma/Alpha Spec	3.0 pCi/g (each series)
<sup>238</sup> Pu, <sup>239</sup> Pu, <sup>240</sup> Pu	Alpha Spec	3.0 pCi/g (each series)
<sup>228</sup> Th, <sup>230</sup> Th, <sup>232</sup> Th	Alpha Spec	15 pCi/g
<sup>234</sup> U, <sup>235</sup> U, <sup>238</sup> U, Total Uranium	Gamma/ICP/TIMS/Alpha Spec	75 pCi/g
<sup>99</sup> Tc	Liquid Scintillation	35 pCi/g
<sup>89/90</sup> Sr	Gas Proportional Counter	15 pCi/g
<sup>137</sup> Cs	Gamma Spec	3.0 pCi/g
Assay	NDA/Gamma Spec/TIMS/ICP	NA
Free Liquids	Visual inspection/Paint Filter/Mitigation Plan	NA
PCB	GC	2 ppm (oils)
RCRA Characteristics Various	Total TCLP Volatiles/Metals (Liquids)	
Free Liquids	TCLP Volatiles/Metals (Solids) Visual inspection/Paint Filter	NA

## **11. RECORDS, DOCUMENTATION, AND REPORTING**

Records and documentation must be created and maintained by the generator and provided to Waste Disposition 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 PAD-RM-1009, *Records Management, Administrative Record, and Document Control*.

**Table 4. Documentation by Waste Category**

Documentation	Waste Category <sup>9</sup>							
	Radioactive	RCRA	PCB	RCRA Mixed or PCB Low-Level	Wastewater	Landfill	Universal Waste	Scrap Metal
Assay (duplicate)	X <sup>5</sup>			X <sup>5</sup>		X <sup>5</sup>		
Landfill Waste Package Number Request and Certification Form (PAD-WD-3025)						X		
Characterization (Analytical) Data <sup>1</sup>	X <sup>1</sup>	X <sup>1</sup>	X <sup>1</sup>	X <sup>1</sup>	X <sup>1</sup>	X <sup>1</sup>		X <sup>1,6</sup>
Waste Characterization Documentation	X <sup>2</sup>	X <sup>2</sup>	X <sup>2</sup>	X <sup>2</sup>	X <sup>2</sup>	X <sup>2</sup>		X <sup>2</sup>
Request for Disposal (Appendix B)	X	X	X	X	X	X	X	X
RFD Attachment A, Low-Level Radioactive Waste (Appendix B)	X				X <sup>7</sup>			
RFD Attachment B, RCRA and/or PCB Waste (Appendix B)		X	X	X	X <sup>7</sup>		X	
RFD Attachment C, Landfill or Sanitary Waste (Appendix B)					X <sup>7</sup>	X		
Waste Item Container Log (Appendix B) <sup>3</sup>	X <sup>3</sup>	X <sup>3</sup>	X <sup>3</sup>	X <sup>3</sup>	X <sup>3</sup>	X <sup>3</sup>	X <sup>3</sup>	X <sup>3</sup>
Waste Variance Form <sup>4</sup> (Appendix A)	X <sup>4</sup>	X <sup>4</sup>	X <sup>4</sup>	X <sup>4</sup>	X <sup>4</sup>	X <sup>4</sup>		X <sup>4</sup>
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 <sup>8</sup>	X <sup>8</sup>	X <sup>8</sup>	X <sup>8</sup>	X <sup>8</sup>	X <sup>8</sup>	X <sup>8</sup>	X <sup>8</sup>

<sup>1</sup> Required if analytical data is used for characterization

<sup>2</sup> See PAD-WD-0437 for required documentation or approved equivalent

<sup>3</sup> Required if waste is containerized

<sup>4</sup> Required only if approval to digress from the requirements in this WAC is needed

<sup>5</sup> Required for all wastes containing > 0.711 wt.% U<sup>235</sup>

<sup>6</sup> Includes RADCON Survey

<sup>7</sup> Attachment A, B, or C may be required if wastewater is LLW; RCRA or PCB; or sanitary, respectively

<sup>8</sup> Proper security classification of suspect waste required

<sup>9</sup> May contain asbestos-containing material

## **12. REFERENCES**

The following (Table 5) shows 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 <i>CFR</i> § 61 Subpart M (National Emission Standards for Hazardous Air Pollutants)	401 <i>KAR</i> 57:011, Asbestos Standards 401 <i>KAR</i> 63:042, Requirements for Asbestos Abatement Entities	EPA SW-846 EPA/600/R-92/033 EPA/230-02-89-042	
Landfill Waste		<i>KAR</i> 401, Chapter 31	EPA SW-846 EPA/600/R-92/033 EPA/230-02-89-042	#073-00045, Solid Waste Landfill Permit
PCB	40 <i>CFR</i> § 761	<i>KAR</i> 401 30:31	EPA SW-846 EPA/600/R-92/033 EPA/230-02-89-042	KY/EM-147, Site Treatment Plan EPA-DOE UE TSCA Federal Facilities Compliance Agreement DOE/EH-413-9914, Storage and Disposal of PCB Waste
Radioactive	10 <i>CFR</i> § 835		EPA SW-846 EPA/600/R-92/033 EPA/230-02-89-042 DOE 435.1, Chg 1 RAD Control Manual (DOE/EH-0256T) DOE 5400.5	BJC/PAD-491, AL Requests for Solid Waste Disposal at Landfill C-746-U
RCRA	40 <i>CFR</i> § 260–264, 268, 270	<i>KAR</i> 401, Chapters 30–34 & 37	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 <i>CFR</i> § 273	<i>KAR</i> 401, Chapter 43		
Scrap Metal			EPA SW-846 EPA/600/R-92/033 EPA/230-02-89-042 DOE 435.1, Chg 1	
Wastewater		<i>KAR</i> 401, Chapter 5:031 (Surface Water Standards)	EPA SW-846 EPA/600/R-92/033 EPA/230-02-89-042	KPDES Permit

## **REGULATIONS AND ORDERS**

*Code of Federal Regulations*, Title 10, Part 835.

*Code of Federal Regulations*, Title 40, Parts 171, 173, 260-264, 268, 270 and 761.

*Code of Federal Regulations*, Title 49, U.S. Department of Transportation.

*1997 Agreed Order (DWM-30039-042) for the United States Department of Energy Paducah Gaseous Diffusion Plant Paducah, Kentucky.*

*Authorized Limits Request for Solid Waste Disposal at Landfill C-746-U at the PGDP, BJC/PAD-491, BJC January 2003.*

Solid Waste Landfill Regulations. *Kentucky Annotated Rules*. 401

Solid Waste Landfill Permit #073-00014/00015/00045, dated August 2, 2010

U.S. Department of Energy and LATA Environmental Services of Kentucky, LLC, Kentucky Division of Waste Management Hazardous Waste Facility Permit (KY8-890-008-982).

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

U.S. Department of Energy 1999. *Radioactive Waste Management*, Order 435.1, Chg 1, 1/9/07.

U.S. Department of Energy 1993. *Radiation Protection of the Public and Environment*, Order 5400.5, January.

U.S. Department of Energy 1992. *U.S. Department of Energy Radiological Control Manual*, DOE/EH-0256T, Rev. 1 April 1994

U.S. Environmental Protection Agency. U.S. Department of Energy UE TSCA FFCA.

U.S. Environmental Protection Agency 1983. *Characterizing Heterogeneous Wastes: Methods and Recommendations*. EPA/600/R-92/033.

U.S. Environmental Protection Agency 1984. *Test Methods for Evaluating Solid Wastes*, EPA SW-846, GPO 955-001-00000-1, Office of Solid Waste, Washington, DC.

U.S. Environmental Protection Agency 1989. *Methods for Soil Sample of Cleanup Standards*, Volume 1, *Soils and Solid Media*, EPA/230-02-89-042.

## **APPENDIX A**

**WASTE VARIANCE REQUEST  
(FORM WD-F-0036)**

**WASTE VARIANCE REQUEST  
FORM WD-F-0036**

NUMBER
--------

**INSTRUCTIONS**

In some cases, a generator may be unable to meet certain certification-related requirements. A variance may be granted if it is determined that conditions exist which make it exceedingly difficult or impossible to meet a requirement or if it is determined that the compliance status of either the generator or Waste Disposition is not compromised by the variance. Variances will not be granted due to convenience, and all requests must be thoroughly documented by the generator.

**GENERATOR ACTIONS**

NOTE: Direct any questions on completion, submit or use of this form to Waste Disposition.

1. Complete all sections on the front page of WD-F-0036, and sign at the bottom.
2. Submit completed form WD-F-0036 to Waste Disposition.
3. Sign *approved* request. (Note that denied variance request do not require the generator's signature)

**TO BE COMPLETED BY REQUESTER**

NAME	BADGE NUMBER	PHONE
ADDRESS	DIVISION	DEPARTMENT

DESCRIBE (IN DETAIL) THE SITUATION OR PROCESS IN WHICH THE WASTE WAS GENERATED.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

SPECIFY THE REQUIREMENT(S) WHICH CANNOT BE MET AND PROVIDED (IN DETAIL) THE REASON(S) WHY.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

FOR WHAT PERIOD OF TIME IS THE VARIANCE REQUESTED?

\_\_\_\_\_

WHAT ACTIONS WILL BE TAKEN TO BRING THE WASTE AND/OR THE PROGRAM INTO FULL COMPLIANCE?  
(PROVIDE A SCHEDULE)

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

REQUESTER SIGNATURE	DATE
---------------------	------

**TO BE COMPLETED BY WASTE DISPOSITION**

VARIANCE REQUEST NUMBER \_\_\_\_\_

REVIEWED BY (PRINT NAME)	REVIEWED BY (SIGNATURE)	DATE REVIEW COMPLETED
--------------------------	-------------------------	-----------------------

IS THIS VARIANCE REQUEST A CONTINUATION OF AN EXISTING REQUEST? IF SO, IS THERE ENOUGH JUSTIFICATION FOR CONTINUANCE?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

VARIANCE IS **GRANTED**. THE FOLLOWING CONDITIONS APPLY.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

VARIANCE EXPIRATION DATE \_\_\_\_\_

VARIANCE IS **DENIED**. THE FOLLOWING REASONS APPLY.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**CONCURRENCE  
WASTE ENGINEER**

PRINTED NAME	SIGNATURE	BADGE NUMBER	DATE
--------------	-----------	--------------	------

**FACILITY MANAGER**

PRINTED NAME	SIGNATURE	BADGE NUMBER	DATE
--------------	-----------	--------------	------

**WASTE DISPOSITION MANAGER**

PRINTED NAME	SIGNATURE	BADGE NUMBER	DATE
--------------	-----------	--------------	------

**REQUESTER (REQUIRED ONLY IF VARIANCE IS APPROVED)**

PRINTED NAME	SIGNATURE	BADGE NUMBER	DATE
--------------	-----------	--------------	------

**APPENDIX B**

**RFD FORM (WD-F-0014) AND INSTRUCTIONS**

# CONTENTS

RFD Form (WD-F-0014, page 1 of 3).....	B-5
RFD Attachment A Waste Information (WD-F-0014, page 2 of 3).....	B-6
Constituent Continuation Page (WD-F-0014, page 3 of 3).....	B-7
Instructions -	
Request for Disposal.....	B-8
Attachment A.....	B-11

# Request For Disposal

Document ID Number

Generation Process Information (Completed by Generator)							
W1. Generator's Name (Print)		W2. Generator's Phone No.	W3. Generator's Company		W4. Project		
W5. Sub-Project	W6. Origin Site		W7. Origin Facility	W8. Origin Area	W9. Rad Area? <input type="checkbox"/> Yes <input type="checkbox"/> No		
W10. Number of Items	W11. Physical Form		W12. Holding Site	W13. Holding Facility	W14. Holding Area		
Comments:							
Waste Description / Comments							
W15.							
This is to certify that the above named material is properly described and in the stated container, which is in good condition, marked with the RFD number, content, appropriate generation date, source location, and at the stated location.							
W16. Generator's Signature					Date		
W17. Waste Engineer Approval					Date		
Handling/Pick-up Information							
P1. Pick-up Site		P2. Pick-up Facility		P3. Pick-up Room/Area			
P4. PPE Requirements							
P5. Container Labeling Requirements (Check all that apply)							
RCRA	<input type="checkbox"/>	PCB	<input type="checkbox"/>	Base	<input type="checkbox"/>	Barcode	<input type="checkbox"/>
RAD	<input type="checkbox"/>	RD Confidential	<input type="checkbox"/>	Acid	<input type="checkbox"/>	Other:	<input type="checkbox"/>
Fissile	<input type="checkbox"/>	RD Secret	<input type="checkbox"/>	Oxidizer	<input type="checkbox"/>	Other:	<input type="checkbox"/>
Flammable	<input type="checkbox"/>	Combustible	<input type="checkbox"/>	Beryllium	<input type="checkbox"/>		<input type="checkbox"/>
Asbestos	<input type="checkbox"/>	Reactive	<input type="checkbox"/>	Waste Container Label	<input type="checkbox"/>		<input type="checkbox"/>
P6. Additional Handling Instructions							
P7. Issued By		Badge	Date	P8. Disposal/Storage Completed By		Badge	Date
P9. Field Supervisor		Badge	Date	P10. Data Processing Completed By		Badge	Date
P11. Comments							

**Waste Information**

**Attachment A**

Document ID Number

Waste Categories (Check All That Are Applicable)			
A1. Low Level Waste		A2. RCRA	
A3. Agreed Order/No Longer Contains		A4. PCB (>50 ppm)	
A5. PCB Remediation (<50 ppm)		A6. PCB Bulk Product	
A7. Friable Asbestos		A8. Non-Friable Asbestos	
A9. Authorized Limits (C-746-U Landfill)		A10. Free Released	
A11. Recycle		A12. Waste Water	
A13. Classified		A14. CERCLA	
A15. Waste Variance Request Number(s):			
Additional Waste Characteristics (Check All That Are Applicable)			
A16. Chelating Agents		A17. Ion Exchange Resins	
A18. TRU radioisotopes > 100nCi/g		A19. Free Liquid (unless Waste Water)	
A20. Pyrophoric Materials(other than radioactive forms of isotopes)		A21. Ignition Sources	
A22. PCB Source Concentration Range <input type="checkbox"/> 50-499.99 ppm <input type="checkbox"/> ≥500 ppm		A23. PCB Item <input type="checkbox"/> A <input type="checkbox"/> AC <input type="checkbox"/> B <input type="checkbox"/> C	
Characterization Sample Analysis			
Document Type	Document Number		
R1. Analysis Sample ID Number			
R2. Waste Characterization Document Number			
R3. Radiation Survey Number(s)			
R4. Fissile Content (Wt% U-235)	R5. Grams U-235	R6. NCS Exempt <input type="checkbox"/> Yes <input type="checkbox"/> No	R7. Chemical Form
RCRA Regulatory Codes (Completed by Waste Engineer)			
X1. Form Code	X2. Source Code	X3. Underlying Hazardous Constituents	
X4. Substance Name	X5. EPA Codes (s)		
X4. Substance Name	X5. EPA Codes (s)		
X4. Substance Name	X5. EPA Codes (s)		
X4. Substance Name	X5. EPA Codes (s)		
X4. Substance Name	X5. EPA Codes (s)		
X4. Substance Name	X5. EPA Codes (s)		
X4. Substance Name	X5. EPA Codes (s)		
X6. RCRA Regulatory Code Continuation Sheets(s)		<input type="checkbox"/> Yes <input type="checkbox"/> No	

\*Other: See examples in instructions for A12.

RCRA REGULATORY CODE CONTINUATION SHEET (Continuation Page of )		DOCUMENT ID NUMBER
X4. Substance Name	X5. EPA Codes (s)	X3. Underlying Hazardous Constituents
X4. Substance Name	X5. EPA Codes (s)	
X4. Substance Name	X5. EPA Codes (s)	
X4. Substance Name	X5. EPA Codes (s)	
X4. Substance Name	X5. EPA Codes (s)	
X4. Substance Name	X5. EPA Codes (s)	
X4. Substance Name	X5. EPA Codes (s)	
X4. Substance Name	X5. EPA Codes (s)	
X4. Substance Name	X5. EPA Codes (s)	
X4. Substance Name	X5. EPA Codes (s)	
X4. Substance Name	X5. EPA Codes (s)	
X4. Substance Name	X5. EPA Codes (s)	
X4. Substance Name	X5. EPA Codes (s)	
X4. Substance Name	X5. EPA Codes (s)	
X4. Substance Name	X5. EPA Codes (s)	
X4. Substance Name	X5. EPA Codes (s)	
X4. Substance Name	X5. EPA Codes (s)	
X4. Substance Name	X5. EPA Codes (s)	
X4. Substance Name	X5. EPA Codes (s)	

## REQUEST FOR DISPOSAL

**NOTE:** All fields must be addressed and a response provided for each field.

Document ID Number—The unique identifier applied to the Request for Disposal.

### **GENERATION PROCESS INFORMATION (To be completed by Generator)**

- W1. Generator's Name (Print)—The printed name of the individual responsible for generation of the waste. Initials for first and middle names may be used.
- W2. Generator's Phone #—The phone number, including the area code if other than 270, where the individual indicated in block W1 may most likely be reached. A four or seven digit number is acceptable.
- W3. Generator's Company—The Company employing the individual indicated in W1 (e.g., LATA Kentucky).
- W4. Project – The Paducah's Project (DD, WD, ER, EM) that generated the waste.
- W5. Sub-Project – The name of the sub-project that generated the waste.
- W6. Origin Site—The site where the waste was generated, if not a facility.
- W7. Origin Facility—The facility or building where the waste was generated.
- W8. Origin Area—The room, area, lab, or location where the waste was generated.
- W9. RAD. Area—Indicate whether or not the area indicated in W10 is a radiological area. A radiological area is defined in 10 *CFR* § 835.603 as any area within a "controlled area" which meets the definition of a "radiation area," "high radiation area," "very high radiation area," "airborne radioactivity area," "contamination area," or "high contamination area."
- W10. Number of Items—The number of items on the RFD; for example, 2 drums or 2 capacitors. This does not mean the number of individual items within a container.
- W11. Physical Form—This is the physical form of the waste stream (liquid, solid, slurry, sludge, gas, emulsion).

- W12. Holding Site—Indicate the site where the waste is physically located.
- W13. Holding Facility—Indicate the facility or building where the waste is physically located.
- W14. Holding Area—Indicate the room, area, lab, or location where the waste is physically located.
- W15. Waste Description and Comments—Provide a general description of the waste material that is associated with codes used in W17 (i.e., PPE in a plastic bag). As applicable, indicate whether chemicals or wastes are “spent” or “unused.” This notation should be made in the description with the name of the chemical or waste.
- W16. Generator Signature & Date—The generator indicated in W1 must sign and date the RFD.
- W17. Waste Engineer Approval & Date – The Project Waste Engineer must sign and date the RFD.

**HANDLING/PICKUP INFORMATION (To be completed by Waste Disposition)**

- P1. Pickup Site—Indicate the site where the waste is physically located for pickup.
- P2. Pickup Facility—Indicate the facility or building where the waste is physically located for pickup.
- P3. Pickup Room/Area—Indicate the room, area, lab or location where the waste is located for pickup.
- P4. PPE Requirements—Indicate the type of personal protective equipment is needed for the pickup / handling of the waste.
- P5. Container Labeling Requirements—Indicate all labels to be placed on the container.
- P6. Additional Handling Instructions—Specify any special handling or management requirements.
- P7. Issued By—Signature and badge number of the Waste Engineer, Field Engineer or Field Coordinator who issued the RFD to be worked. Date – date the RFD was issued.
- P8. Disposal / Storage Completed By—Signature and badge number of the individual(s) who actually worked the RFD. Date—date the RFD was worked.
- P9. Field Supervisor—The signature and badge number of the supervisor responsible for the person(s) who worked the RFD. Date – date the supervisor signed off on the RFD.
- P10. Data Processing Completed By—Signature and badge number of the person who entered the RFD into the data system. Date – date the data entry was completed.
- P11. Comments—Any comments from the field made by the operator to the Coordinator.

**ATTACHMENT A WASTE INFORMATION  
FORM USER INSTRUCTIONS**

This form is to be used only for those RCRA and TSCA wastes that also are radioactively contaminated.

All fields must be addressed and a response provided for each field.

Document ID Number—The unique identifier applied to the RFD.

WASTE CATERGORIES (Check all that are applicable

A1. Low Level Waste

A2. RCRA

A3. Agreed Order/No Longer Contains

A4. PCB >50ppm

A5. PCB Remediation <50 ppm

A6. PCB Bulk Product

A7. Friable Asbestos

A8. Non-Friable Asbestos

A9. Authourized Limits (C-746-U Landfill)

A10. Free Release

A11. Recycle

A12. Waste Water

A13. Classified

A14. CERCLA

Bl.

WASTE CATEGORIES

A15. Waste Variance Request Number—Enter the number(s) of any **approved** Waste Variance Request forms that apply to this waste.

Additional Waste Characteristics

A16. Chelating Agents— Chelating agents mobilize fixed heavy metals and radionuclides for migration in the environment. Their presence must be limited to accommodate "no migration" requirements for radioactive waste disposal facilities. Indicate presence of any amount of chelating agents by marking the YES box, and the absence

of chelating agents by marking the NO box. Decontamination solutions often contain chelating agents. Examples of chelating agents are amine polycarboxylic acids (EDTA, DTPA), hydroxy-carboxylic acids, and polycarboxylic acids (citric acid, gluconic acid).

- A17. Ion Exchange Resins—Indicate whether ion exchange resins are present in the waste by checking either YES or NO. Ion exchange resins are synthetic resins with active groups (usually sulfonic, carboxylic, phenol, or substituted amino groups) that give the resin the property of combining with or exchanging ions between the resin and a solution. Some uses of ion exchange resins include water softening, recovery of chromate from plating solutions, recovery of uranium from acid solutions, removal of formic acid from formaldehyde solutions, recovery of valuable metals from wastes, recovery and separation of radioactive isotopes from atomic fission and chromatography.
- A18. TRU radioisotopes >100 nCi/g —Without regard to form or source, alpha-emitting transuranic isotopes having an atomic number greater than 92, half-life greater than 20 years, and concentrations greater than 100 nCi/g at the time of generation/assay. The following radionuclides meet these criteria and must be considered when making TRU determinations: Am-241, Am-242m, Am-243, Bk-247, Cf-249, Cf-251, Cm-243, Cm-245, Cm-246, Cm-247, Cm-248, Cm-250, Np-237, Pu-238, Pu-239, Pu-240, Pu-242, and Pu-244.
- A19. Free Liquids (prohibited only for SOLID LLRW; intrinsic for liquid LLRW)—Liquids that readily separate from the solid portion of a waste under ambient temperature and pressure. The waste matrix should be able to pass the paint filter test as described in *Test Methods for Evaluating Solid Waste*, EPA/SW-846, in order to be considered solid LLRW.
- A20. Pyrophoric Materials—Solid or liquid materials which, even in small quantities and without an ignition source, can ignite spontaneously in air. Pyrophoric materials must be rendered safe by mixing them with chemically stable materials (concrete or glass for example) or must be processed to remove their hazardous properties (see Note below). Wastes that are expected to contain any metallic radionuclides are to be treated through oxidation to eliminate as much of the potential pyrophorics as possible prior to placement in a waste container. Pyrophoric forms of radionuclides can be accepted if they are limited to less than 1% by weight of the waste per container, and these generally should be dispersed in the waste.
- Pyrophorics, other than radioactive pyrophorics, must be managed as potential hazardous waste under the Resource and Conservation Recovery Act (RCRA); therefore, treatment of such pyrophorics to render them safe may require a permit. Accordingly, the RCRA compliance organization should be consulted for guidance for such pyrophorics.
- A21. Ignition Sources—Articles, devices, or conditions that promote or permit burning through intense heat or fire; ignition sources include lighters, matches, and electric sparks.
- A22. PCB Source Concentration Range (ppm)—If T8 is unknown, then the range of known or sources of PCBs in the waste must be indicated. Only one range should be indicated, and this should be the range of highest known concentration.
- A23. PCB Item—Code to identify the type of PCB item/container/article being disposed.

### Characterization Sample Analysis

- R1. Analysis Sample ID#—Indicate any chemical analysis performed on the waste by listing the Lab Sample Identification number(s) in this block, and attach the analysis to the data package.
- R2. Waste Characterization Documentation—The completed Waste Characterization Documentation from procedure PAD-WD-0437 or approved equivalent must be provided with the RFD submittal.
- R3. Radiation Survey Number – Enter the radiation surveys number(s). These surveys are generated by RADCON.
- R4. Fissile Content (wt.% of U-235)—The wt.% of U-235 in material in the container. Can be determined by ICP/MS, PK, NDA, Alpha Spec. or Gamma (< 0.71 wt.%).
- R5. Grams U-235—Indicate the grams of U-235 in the material.
- R6. NCS Exempt—The material contains uranium with enrichment less than one wt.% U-235 or total less than or equal to 15 grams U-235.
- R7. Chemical Form—The chemical form of the waste must be indicated in this block. Some chemical forms meet the definition of hazardous, as defined by 40 *CFR* § 261, or excluded material. An example of a hazardous chemical form is the elemental form of the isotopes of Cesium, Strontium, and Uranium. Elemental forms of cesium and strontium may be air and/or water reactive, and elemental forms of uranium may be pyrophoric.

RCRA REGULATORY CODES (TO BE COMPLETED BY WASTE ENGINEER)

- X3. Underlying Hazardous Constituent — List any of the underlying hazardous constituents as defined in 40 *CFR* § 268.42 and 268.48 are present in any characteristic waste (D001 - D043).
- X1. Form Code—State code that identifies the form or physical state of the waste.
- X2. Source Code—State code to identify where waste originated.
- X4. List the most common name for the substance identified in 5.
- X5. EPA Code(s)—Indicate the 4-digit code that EPA assigns to listed and characteristic wastes. This code may start with the letters D, F, K, P, or U. The D-codes are those characteristic wastes regulated under RCRA, and the F, K, P, and U codes are those listed wastes regulated under RCRA.
- X6. Check box if continuation sheets are needed to list all applicable constituents of the waste, and indicate how many RCRA Regulatory Code Constituent Continuation Sheets are attached. All known constituents must be identified.

## **APPENDIX C**

### **LABELING AND MARKING**

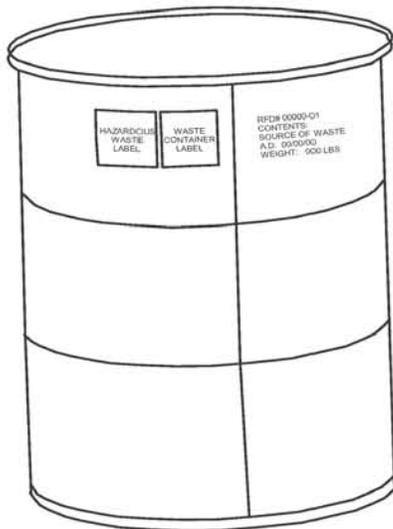
**THIS PAGE INTENTIONALLY LEFT BLANK**

# CONTENTS

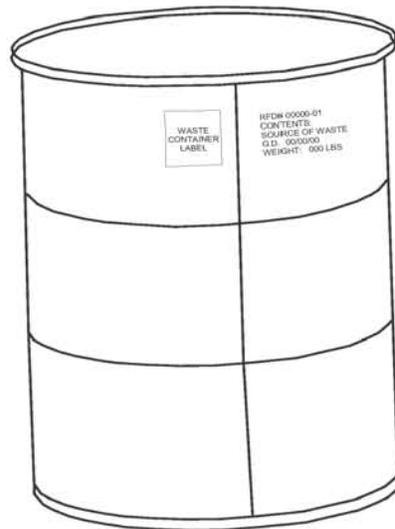
Location of Labels, Markings	
RCRA Waste Drum .....	C-5
Low-level Radioactive Waste Drum.....	C-5
Detectable PCB Waste Drum.....	C-6
PCB Waste Drum.....	C-6
Boxes .....	C-7
Waste Container Label.....	C-8
Hazardous Waste Label .....	C-9
PCB M <sub>I</sub> Label.....	C-10
Classified Material Label.....	C-11
Transuranic Waste Label .....	C-12
Asbestos Label .....	C-13
Beryllium Label .....	C-14
Authorized Limits for Landfill Label.....	C-15

**THIS PAGE INTENTIONALLY LEFT BLANK**

RCRA WASTE



LOW LEVEL  
RADIOACTIVE WASTE



E-1

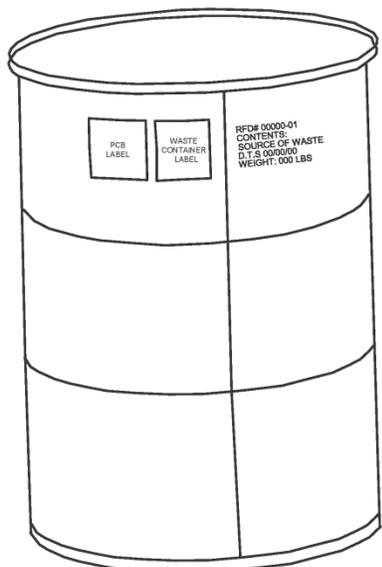
U.S. DEPARTMENT OF ENERGY  
DOE PORTSMOUTH/PADUCAH PROJECT OFFICE  
PADUCAH GASEOUS DIFFUSION PLANT



LATA Environmental Services  
of Kentucky, LLC

FIGURE No. c5ac90000sk339x1.apr  
DATE 07-30-04

PCB WASTE



U.S. DEPARTMENT OF ENERGY  
DOE PORTSMOUTH/PADUCAH PROJECT OFFICE  
PADUCAH GASEOUS DIFFUSION PLANT

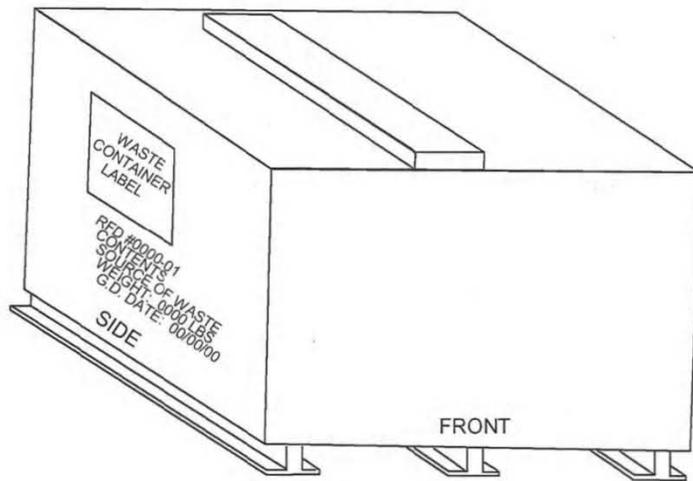


LATA Environmental Services  
of Kentucky, LLC

E-2

FIGURE No. G:\GIS\GRAPHICS\WMDrum\_E2.pdf  
DATE 03-11-13

### Boxes



U.S. DEPARTMENT OF ENERGY  
DOE PORTSMOUTH/PADUCAH PROJECT OFFICE  
PADUCAH GASFOUR DIFFUSION PLANT



LATA Environmental Services  
of Kentucky, LLC

FIGURE No. c5ac9000sk338.apr  
DATE 08-03-04

## WASTE CONTAINER LABEL

RFD/DRUM NUMBER \_\_\_\_\_

CONTENTS \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

SOURCE OF WASTE \_\_\_\_\_

BUILDING \_\_\_\_\_

COMMENTS \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

LIQUID    SOLID    SEMI-SOLID    COMPRESSED GAS

GENERATION DATE \_\_\_\_\_

**EXAMPLE**

**Waste Container Label**

# HAZARDOUS WASTE

**FEDERAL LAW PROHIBITS IMPROPER DISPOSAL  
IF FOUND, CONTACT THE NEAREST POLICE, OR PUBLIC SAFETY  
AUTHORITY, OR THE U.S. ENVIRONMENTAL PROTECTION AGENCY**

**GENERATOR INFORMATION:**

NAME **US-DOE-PADUCAH GASEOUS DIFFUSION PLANT**

ADDRESS **P. O. BOX 1410**

CITY **PADUCAH** STATE **KY** ZIP **42001**

EPA ID NO./ MANIFEST DOCUMENT NO.  
**KY8890008982**

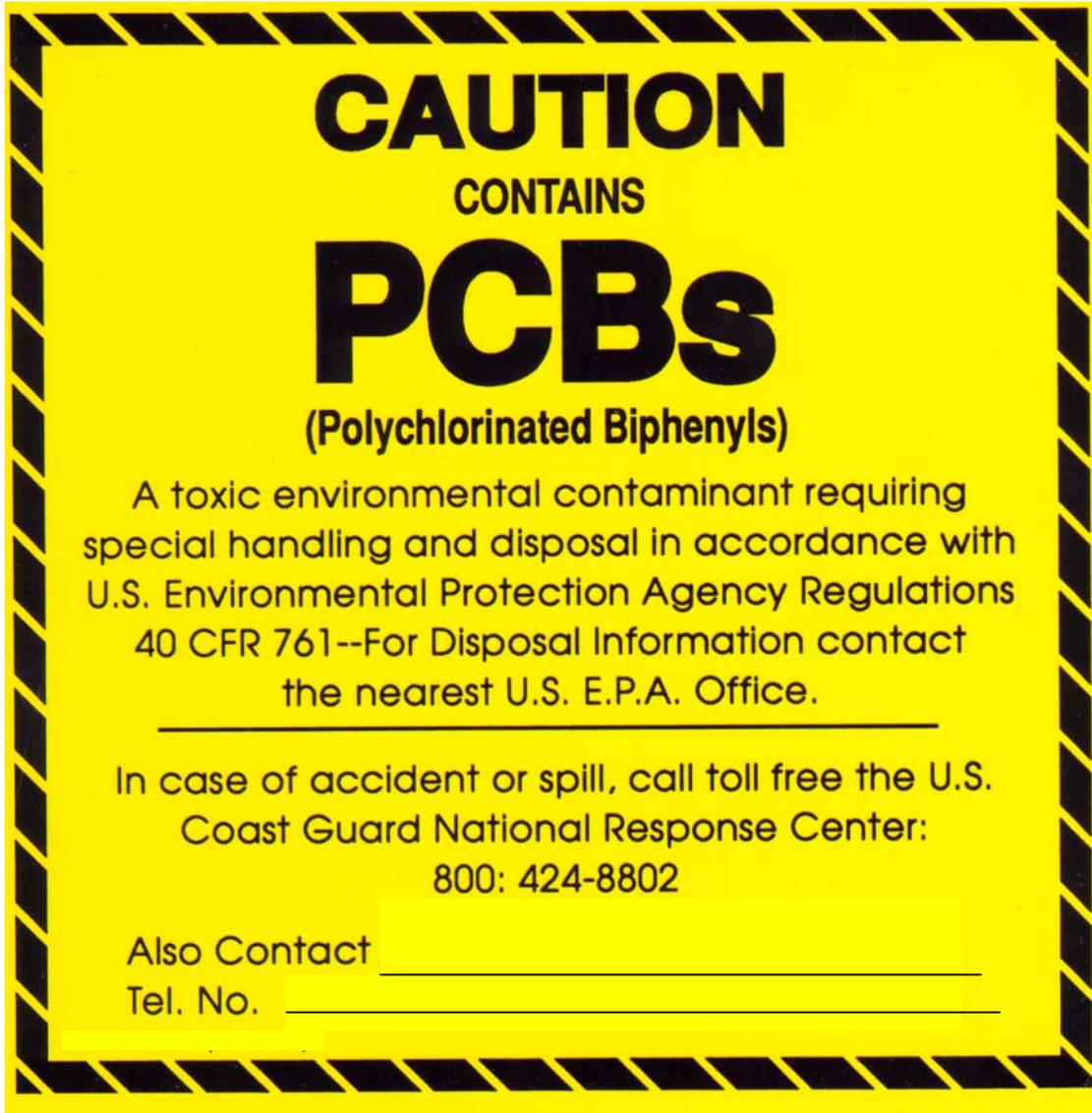
ACCUMULATION START DATE EPA WASTE NUMBER


**D.O.T. PROPER SHIPPING NAME AND UN OR NA NO. WITH PREFIX**

**HANDLE WITH CARE!**

**EXAMPLE**

**Hazardous Waste Label**



**EXAMPLE**

**PCB M<sub>L</sub> Label**



**EXAMPLE**

**Classified Material Label**

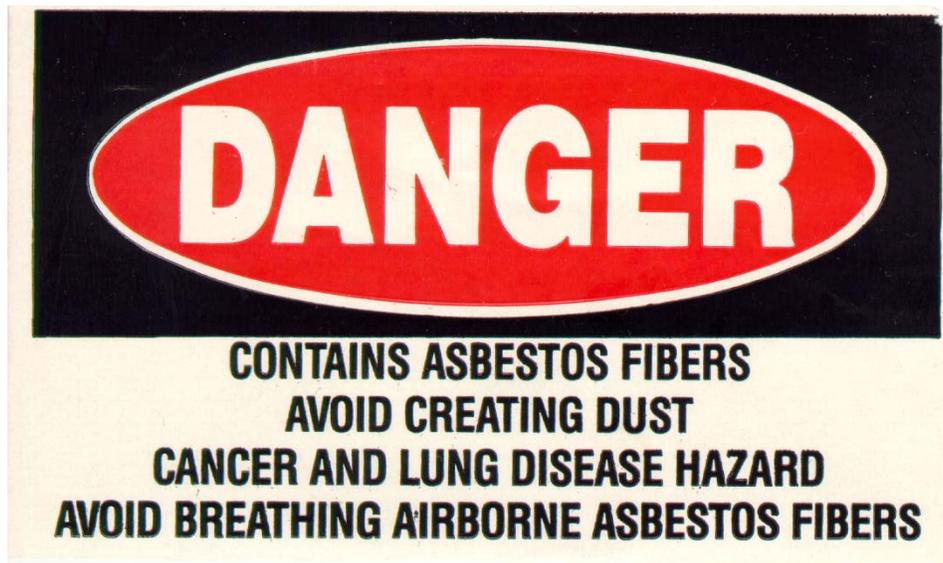
**TRANSURANIC  
WASTE**

\_\_\_\_\_ nCi/g

CP-21081  
(12-16-96)

**EXAMPLE**

**Transuranic Waste Label**



**EXAMPLE**

**Asbestos Label**

**DANGER**

**CONTAMINATED WITH BERYLLIUM**

**DO NOT REMOVE DUST BY BLOWING OR SHAKING**

**CANCER AND LUNG DISEASE HAZARD**

**EXAMPLE**

Beryllium Label

**AUTHORIZED LIMITS  
RESIDUAL RADIOACTIVE  
MATERIAL  
FOR DISPOSAL IN  
C-746-U LANDFILL ONLY**

**EXAMPLE**

Authorized Limits for Landfill Label

**THIS PAGE INTENTIONALLY LEFT BLANK**

## **APPENDIX D**

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

**THIS PAGE INTENTIONALLY LEFT BLANK**

### **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. A photograph of the contents will be obtained upon dumping.
- (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, or 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, or ST-90) into which absorbent will be added, as necessary, to address any residual free liquids that may be encountered. Up to three pounds of absorbent may be added per drum processed during filling of the bulk container. The basis for utilizing up to three pounds 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 pounds. In the absence of any moisture data on these AO wastes, a conservative assumption was made that 50% of this average weight, or 300 pounds, was attributable to water. It was decided, therefore, that three pounds 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 WD-F-0128 in accordance with PAD-WD-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 and ST-90s will be transported on a flat-bed).

**THIS PAGE INTENTIONALLY LEFT BLANK**

**APPENDIX E**

**REVISION LOG FOR PAD-WD-0011**

**THIS PAGE INTENTIONALLY LEFT BLANK**

<b>REVISION LOG</b>			
<b>Revision Number</b>	<b>Description of Changes</b>	<b>Pages Affected</b>	<b>Date of Revision</b>
0	Initial Release. Replacing blue-sheeted LATA procedure PAD-WSD-0011, <i>WASTE ACCEPTANCE CRITERIA FOR THE TREATMENT, STORAGE, AND DISPOSAL FACILITIES AT THE PADUCAH U.S. DEPARTMENT OF ENERGY SITE and PRS-WSD-0011</i>	All	09/22/2010
Rev. 1	Resolves ICATS issue LATA0001: Added/clarified information to the following sections: 4, Waste Criteria, 5.4.3, Use of Pallets, 8.1.1, <i>General Requirements</i> ; 8.1.2, <i>Landfill Personnel</i> ; 8.1.4, <i>Preparation of Container form Movement to C-746-U Landfill</i> ; 8.1.5, <i>Boxes and Containers</i> ; 8.1.6, <i>Repackaging Controls</i> ; 8.1.7, <i>Transport of Container to Landfill</i> 8.1.8 <i>Transport of Bulk Container Back to Plant</i> , 8.1.10, <i>Specific Waste Item Requirements</i> , 8.1.11, <i>Prohibited Items</i> , 10.1.3, Exception to Section 6.4, 10.1.4, Exception to Section 6.6, 10.1.6 Exception to Section 6.4 and Section 4.1.2, Table 4, C-3, Contents, C-16, AL Label	Pages 1, 2, 7-9, 16, 19, 20, 23-28, 31-36, 39, 44, and 46 Editorial changes xxii – xxiv, A-3, A-4, C-3, C-16, D-3, E-4, F-1 – F-3	01/04/13

**THIS PAGE INTENTIONALLY LEFT BLANK**