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CP2-WM-0011/FR1A

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

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CP2-WM-0011/FR1A

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

Date Issued—April 2020

U.S. DEPARTMENT OF ENERGY
Office of Environmental Management

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

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APPROVALS

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

CP2-WM-0011/FR1A

April 2020

James A. Miller — 4/27/2020

James Miller
Technical Services Director — Date

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Effective Date: 05/04/2020

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REVISION LOG

REVISION NUMBER	DATE	DESCRIPTION OF CHANGES	PAGES AFFECTED
FR0	10/21/2017	Bluesheet	All
FR1	01/18/2018	Rewrite	All
FR1A		Incorporated C-746 Landfill disposal criteria. Made general editorial changes and updated document titles, number, positional titles, and reference information. Request for Disposal form and instructions changed. Added container selection information and table.	xii, xvii, xviii, 1, 2, 5, 7, 8, 10, 12, 15-17, 19, 21, 24, 27, 28, 33-36, 39, 44, A-3, A-4, B-5, B-6, C-5, C-6, C-7

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CONTENTS

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TABLES

FIGURE

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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
DQO	data quality objective
DTS	date to storage
EPA	U.S. Environmental Protection Agency
FRNP	Four River Nuclear Partnership, LLC
GD	generation date
ICP	inductively coupled plasma
IH	industrial hygiene
KAR	*Kentucky Administrative Regulations*
KPDES	Kentucky Pollutant Discharge Elimination System
LLW	low-level (radioactive) waste
NCS	Nuclear Criticality Safety
NCSE	Nuclear Criticality Safety Evaluation
NDA	nondestructive assay
NNSS	Nevada National Security Site
PGDP	Paducah Gaseous Diffusion Plant
PHP	project health physicist
PK	process knowledge
PPE	personal protective equipment
PPPO	Portsmouth/Paducah Project Office
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
S&M	surveillance and maintenance
SAA	Satellite Accumulation Area
SDS	Safety Data Sheet
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
UTS	universal treatment standard
WAC	waste acceptance criteria
WCO	waste certification official
WMP	Waste Management Plan
WPC	waste package certifier

Chg A

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DEFINITIONS

Accumulation Start Date—For Resource Conservation and Recovery Act (RCRA) waste, the date accumulation of hazardous waste begins. For waste originating from a satellite accumulation area, the accumulation start date is the date the waste container is filled or removed to a 90-day area or permitted storage facility [401 *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 1% asbestos.

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

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

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

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

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

Data Quality Objectives—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.

Fissile Material—In strict terms, fissile or fissionable materials are radionuclides capable of sustaining a neutron-induced fission chain reaction (e.g., U-233, U enriched in U-235, Np-236, Pu-239, Pu-241, Am-242, Cm-243, Cm-245, Cm-247, Cf-249, and Cf-251). As applied to plant operations, fissile material is uranium metal with an enrichment of greater than 0.93 wt.% U-235 or uranium oxide compounds (e.g., UO_2, U_3O_8, and UO_3) greater than 0.96 wt.% U-235 or compounds of uranium and fluorine greater than or equal to 1.0 wt.% U and in quantities greater than or equal to 15 g U-235 or materials containing other fissionable radionuclides capable of sustaining a chain reaction in quantities greater than or equal to 1.6% of their maximum subcritical mass. It is also worth noting that the U.S. Department of Transportation (DOT) has its own exceptions for fissile material that can be found in 40 *CFR* § 173.453. Chg A

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

Generator—See Waste Generator.

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

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

Hazardous Waste—See RCRA hazardous waste.

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

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

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

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

Mixed Waste—Waste containing both radioactive and hazardous components, as defined by the Atomic Energy Act and 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) may have been in direct contact with PCBs [reference 40 *CFR* § 761.50 and § 761.60 (b) for disposal requirements]. "PCB Article" includes capacitors, transformers, electric motors, pumps, pipes, and any other manufactured item.

PCB Bulk Product Waste—PCB bulk product waste means waste derived from manufactured products containing PCBs in a nonliquid state, at any concentration where the concentration at the time of designation for disposal was ≥ 50 parts per million (ppm) PCBs. PCB bulk product waste does not include PCBs or PCB items regulated for disposal under 40 *CFR* § 761.60(a)–(c), § 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 includes 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 Laboratory Waste—Waste generated as a result of research and development activities authorized under 40 *CFR* § 761.30(j) and the chemical analysis of PCBs, including sample preparation, sample extraction, extract cleanup, extract concentration, addition of PCB standards, and instrumental analysis (reference 40 *CFR* § 761.50 and § 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.

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

Universal Waste—Universal waste means any of the following hazardous wastes that are managed under the universal requirements of 40 *CFR* § 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).

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

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

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

Waste Generator—Individual (such as facility manager, supervisor of a waste-generating activity, or appointee) or organization whose act or process produces waste to be managed for 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 (TSDFs) at the Paducah Gaseous Diffusion Plant (PGDP). Four Rivers Nuclear Partnership, LLC (FRNP), the Deactivation and Remediation Contractor for DOE, manages and operates these facilities. Currently, TSDFs include the C-746-U Solid Waste Landfill, several hazardous waste storage facilities, Toxic Substances Control Act (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 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 D&R contractor procedures/documents or FRNP-approved alternative must be used in generation, characterization, packaging, certification, and disposition of waste.

- CP2-SM-1000, *Activity Level Work Planning and Control Program*
- CP2-WM-0001, *Four Rivers Nuclear Partnership, LLC, Paducah Deactivation and Remediation Project Waste Management Plan*
- CP2-WM-0661, *Transportation Safety Document for On-Site Transport within the Paducah Gaseous Diffusion Plant Paducah, Kentucky*
- CP3-NS-1033, *Enrichment and Exempt Waste Verification* Chg A
- CP3-QA-2500, *Procurement, Inspection and Management of Items Critical for Paducah Off-Site Waste Shipments*
- CP3-QA-2501, *Waste Certification*
- CP3-SM-1101, *Work Package Development* Chg A
- CP3-SM-1102, *Activity Level Work Execution and Closeout*
- CP3-WM-0001, *Waste Management Planning and Execution*
- CP3-WM-0015, *Management of Fissile Waste Materials*

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

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Before generating wastes that will be stored temporarily in a Paducah TSDF, each generator is required to comply with the requirements of CP2-WM-0001, *Four Rivers Nuclear Partnership, LLC, Paducah Deactivation and Remediation Project Waste Management Plan* The Request for Disposal (RFD) form, CP2-WM-0011-F02, or approved 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 Technical Services Director.

Chg A

Chg A

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). Four Rivers Nuclear Partnership, LLC (FRNP), the Deactivation and 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, Toxic Substances Control Act (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, Resource Conservation and Recovery Act (RCRA), TSCA, Kentucky Solid Waste Landfill Regulations, and/or the Clean Water Act.

This document was developed to ensure that wastes generated, certified, and accepted for TSD at the various on-site TSDFs can be handled in a safe and efficient manner and are compliant with the federal, state, DOE, and waste treatment and disposal facility rules and regulations. The waste acceptance criteria (WAC) established in this document applies to all newly generated waste being offered for temporary on-site storage prior to treatment, storage, and/or disposal at various on-site TSDFs. It also applies to waste that will be sent to an off-site TSDF. The following criteria must be met to ensure that waste can be handled and stored safely at any of the 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 management and quality assurance procedures and applicable federal, state, DOE, and off-site waste disposition facility requirements.

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

- CP2-SM-1000, *Activity Level Work Planning and Control Program*
- CP2-WM-0001, *Four Rivers Nuclear Partnership, LLC, Paducah Deactivation and Remediation Project Waste Management Plan*
- CP2-WM-0661, *Transportation Safety Document for On-Site Transport within the Paducah Gaseous Diffusion Plant Paducah, Kentucky*
- CP3-NS-1033, *Enrichment and Exempt Waste Verification* Chg A
- CP3-QA-2500, *Procurement, Inspection and Management of Items Critical for Paducah Off-Site Waste Shipments*
- CP3-QA-2501, *Waste Certification*
- CP3-SM-1101, *Work Package Development* Chg A
- CP3-SM-1102, *Activity Level Work Execution and Closeout*
- CP3-WM-0001, *Waste Management Planning and Execution*
- CP3-WM-0015, *Management of Fissile Waste Materials*
- CP3-WM-0017, *Standard Operation for the C-746-S, -T, and -U Landfills*

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

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

Technical Services Director
Telephone: 270-441-5068
270-519-6347

Waste Facility Operations Manager
Telephone: 270-441-6715
270-331-8491
Fax: 270-441-5250
270-441-5225

Landfill Manager
Telephone: 270-816-4164

Waste Generator Manager
Telephone: 270-441-6698
270-559-6295

Transportation Manager
Telephone: 270-441-5457
270-816-5100

2. PURPOSE AND SCOPE

This document establishes the waste acceptance criteria (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 Management TSDF.

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3. TRANSFER PROCESS

3.1 WASTE VARIANCE REQUEST

CP2-WM-0001, *Four River Nuclear Partnership, LLC Paducah Deactivation and Remediation Project Waste Management Plan*, 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, CP2-WM-0011-F01). The variance may be granted if it is determined that conditions exist that make it exceedingly difficult or impossible to meet a requirement, or if it is determined that the compliance status of either the generator's or TSDF's site operations is not compromised by the variance. Variances will not be granted for convenience. The generator must document all requests, and the Waste Generator Manager or designee must approve them. Chg A Chg A

3.2 REQUEST FOR INTERIM STORAGE

Once waste is generated, characterized, containerized, appropriately labeled, marked, and certified Waste Management shall verify that the Request for Disposal (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 any newly generated waste is accepted by the D&R Contractor for storage, the RFD must be reviewed and agreed upon by Waste Management. Wastes that are within three months of their required disposition date due to regulatory commitments may be accepted into interim storage at the discretion of the Technical Services Director. This waste may be shipped directly from the generator's staging or storage area after consultation with the Regulatory Compliance Manager. Chg A

A completed *Classification Office (CO)/Technical Information Office (TIO) and Operations Security (OPSEC) Release Form* (PGDP-SS-FO-001) must be included with RFD submittal, if required. This statement does not apply for collection containers where the RFD is submitted prior to generation. Chg A

3.3 TRANSFER OF WASTE TO WASTE MANAGEMENT

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

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

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

The following types of waste generated off-site may be accepted by PGDP TSDFs: waste generated as a result of environmental restoration/management, deactivation, or stabilization 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 Management, 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 Management via telephone in emergencies.

On-site generators requesting delivery of waste to PGDP TSDFs after 2:00 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, *Radioactive Waste Management*. Exemptions/variances may be obtained on a case-by-case basis with concurrence from Portsmouth/Paducah Project 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 CP3-WM-1037). The generator is responsible for managing waste during all phases of its life cycle, from generation to disposal (cradle to grave).

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

4.1 WASTE SUBMITTED FOR STORAGE

The PGDP waste storage facilities safely store RCRA-hazardous wastes, TSCA-regulated wastes, LLW, mixed waste (RCRA and LLW), transuranic (TRU) wastes, universal wastes, and sanitary solid wastes. The 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* Chapter 39. All hazardous waste must have the proper waste code assigned, to include underlying hazardous constituents (UHCs), and be identified in RFD as such.

Chg A

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 process knowledge (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 a Safety Data Sheets (SDSs) for characterization, the flash point may be reported with < or > values.

EPA Characteristics and Listed Waste Codes—Any EPA listed waste codes must be reported if the waste is generated by a specific source, a nonspecific source, an acute toxic chemical, or a toxic chemical that is listed in 401 *KAR* 39 [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. Chg A

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 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
≤ 10 µg/100 cm^2	< 50 ppm
>10 µg/100cm^2 to < 100 µg/100 cm^2	≥ 50 ppm < 500 ppm
≥ 100 µg/100 cm^2	≥ 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 ≥ 10 µg/L PCBs, waste must be marked/labeled, tracked, manifested, and disposed of as PCB waste, unless managed per note below.

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

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

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

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

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

4.1.4 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 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 uranium-235 (U-235), in weight percent must be reported on RFD (for guidance contact Waste Management).

Absorbent Materials—The type and quantity of absorbent materials in mass and must be reported on the Waste Item Container Log, form CP3-WM-3015-F01, (see procedure CP3-WM-3015, *Waste Packaging*, Form CP3-WM-3015-F03, "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 µCi or more of removable contamination will be considered evidence that the sealed source is leaking its radioactive contents. If a leak test cannot be performed because of handling or measurement limitations, the source will be assumed to be leaking.

- Leak test results.

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

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

4.1.4.2 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 CP3-RP-1109, *Radioactive Contamination Control and Monitoring*. Potential volumetric contaminated waste also must be categorized as LLW until verified as not radioactive by project health physicist (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

There are two procedures governing the handling and storage of fissile/potentially fissile waste depending on the applicable Nuclear Criticality Safety Evaluation (NCSE). The handling requirements of CP3-WM-0015, *Management of Fissile Waste Material*, apply to waste controlled by NCSE-RM-FISSMAT-0015. CP3-WM-1036, *Nuclear Criticality Safety Implementation Requirements for Handling and Storage of Fissile and Potentially Fissile Waste*, applies to all other fissile/potentially fissile waste. Ensure the appropriate Nuclear Criticality Safety (NCS) requirements are met prior to transferring fissile/potentially fissile waste from one NCSE to another.

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

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

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^3;

- RAD Handling Type—Identify handling requirements (contact handle or remote handle);

- Heat-sealed Bags—Identify the presence of heat-sealed bags; and

- Sealed Layers of Packaging—Identify number and type, starting with the innermost layer and working outward.

4.1.5 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; CP2-WM-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 R.10 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 Satellite Accumulation Area (SAA) before characterization is complete]; therefore, all documentation may not be complete. Waste Management must be contacted for concurrence and plans to complete all requirements must be made.

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

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

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

- pH, if the waste is liquid and has the potential to be RCRA corrosive;
- Flash point, if the liquid waste has the potential to be RCRA ignitable;
- 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.

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

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

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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.

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), lithium ion, and small sealed lead-acid batteries that are found in electronic equipment, bar codes scanners, mobile telephones, portable computers, and emergency backup lighting.

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

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

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

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 repackage wastes that are not in an acceptable container.

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

Batteries

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

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

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

Unused Agricultural Pesticides

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

Mercury Thermostats

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

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

Spent Lamps

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

5. CONTAINERIZATION

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

- DOT regulations 49 *CFR* or approved alternatives, as addressed in CP2-WM-0661
- DOE M 435.1-1, Admin. Chg.2, *Radioactive Waste Management Manual*
- *Nevada National Security Site Waste Acceptance Criteria*, DOE/NV-325, latest revision
- Off-Site Commercial TSDF WAC
- CP3-QA-2500, *Procurement, Inspection and Management of Item Critical for Paducah Off-Site Waste Shipments*
- CP3-WM-3015, *Waste Packaging*
- CP3-WM-2110, *Waste Containers Handling, Overpacking, and Transportation* Chg A

5.1 CONTAINER SELECTION

Containers are selected based on the waste matrix, the compatibility of the waste material with the container, venting requirements, and the expected disposal option for the waste. All container selection, absorbent selection, procurement, and inspections must be in accordance with CP3-QA-2500, *Procurement Inspection and Management of Items Critical for Paducah Off-Site Waste Shipment*, for off-site shipments. For containers that will be used for chemicals such as solvents, acids, or bases, additional information is needed for determining proper packaging. Information such as pH, flashpoint, chemical name, and % concentration may be required to make an appropriate packaging decision. This information may be found in Safety Data Sheets (SDS) or from other sources and should be provided to Waste Transportation personnel who will work in conjunction with engineering to assist with selecting the correct container. Table 2. Recommended Packaging Materials for Common Chemicals provides some recommended packaging materials for commonly used acids, bases, and solvents at the PGDP. Chg A

5.1.1 Compatibility with Waste

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

Table 2. Recommended Packaging Materials for Common Chemicals

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

Note: Assume pure chemical (100%) unless specifically noted otherwise.
*PTFE or PTFE-coated gasket is acceptable in all cases.
PTFE is chemical name for Teflon™.
FKM is chemical name for Viton™.

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5.1.2 Container Condition

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

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5.1.3 Container Documentation

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

Interchanging container parts may void 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 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 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 WPC must be present during all waste packaging activities. Contact WCO for scheduling of WPCs.

5.2.2 Void Space

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

5.2.3 Overpacking and Repackaging

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

5.2.4 Packaging Requirements by Waste Type/Matrix

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

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

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

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

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

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

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

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

Sealed Source Radioactive Waste—Sealed source wastes that are known to be leaking or that contain more than 5 Ci of radioisotopes with half-lives greater than five years must be packaged in accordance with CP3-WM-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 also requiring management as fissionable assay or fissile/potentially fissile waste must be packaged in accordance with requirements in the current NCS evaluations for the appropriate facility safety basis.

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

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

5.2.5 Documentation of Waste Package Contents

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

5.2.6 Liquid and Liquid Containing Waste

For waste being stored as other than liquid waste, all free liquids must be absorbed in accordance with form CP3-WM-3015-F03, Absorbent Determination Form, or otherwise removed from the waste (see procedure CP3-WM-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 CP3-WM-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

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

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

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

Alternative methods for securing containers for 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 (for collection containers RFD number will be applied once filled and ready to be transferred to storage);
- The appropriate date [generation date (GD), and/or 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

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

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 AD must be marked on all hazardous and mixed waste containers. The date accumulation begins is the date that the first drop of waste is generated and placed into a container. It is not the date when the generator receives the waste analysis results. In order to avoid confusion regarding the regulatory status of unknown (suspect hazardous) wastes, labeling that says "Hazardous Waste Pending Analysis" is recommended. For waste originating from an SAA, the 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 ≥ 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 from technetium-99 (Tc-99) of > 0.3 and ≤ 3 Ci per m^3 volume of waste from must be marked as "Class C." Any container that exceeds radioactivity from Tc-99 of 3 Ci per m^3 volume of waste must be marked as "> Class C" (10 *CFR* § 61.55).

5.3.5.1 Fissionable-assay or fissile/potentially fissile waste

There are two procedures governing the handling and storage of fissile/potentially fissile waste depending on the applicable NCSE. The handling requirements of CP3-WM-0015, *Management of Fissile Waste Material*, apply to waste controlled by NCSE-RM-FISSMAT-0015. CP3-WM-1036, *Nuclear Criticality Safety Implementation Requirements for Handling and Storage of Fissile and Potentially Fissile Waste*, applies to all other fissile/potentially fissile waste. Ensure the appropriate NCS requirements are met prior to transferring fissile/potentially fissile waste from one NCSE to another.

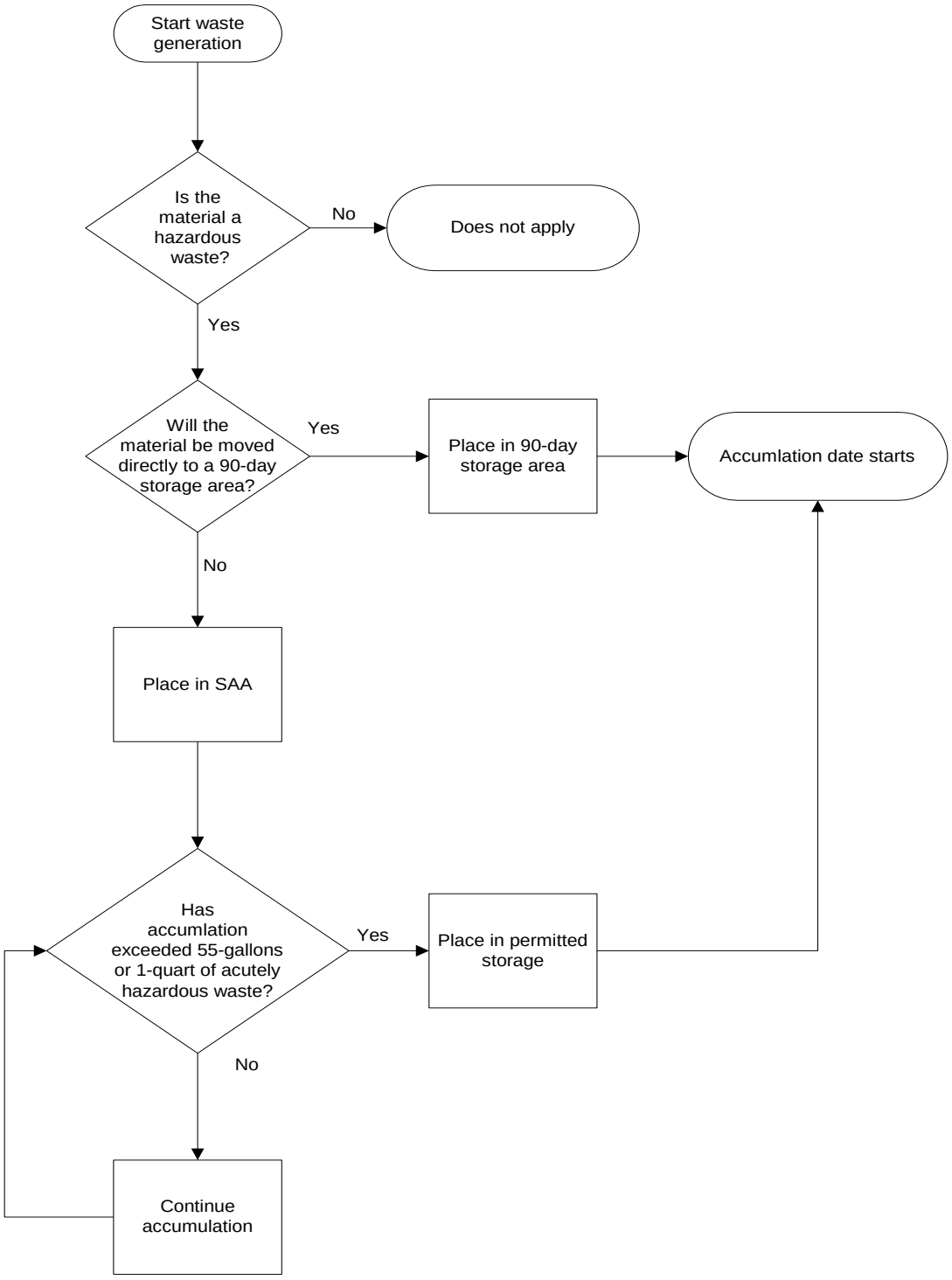

Figure 1. Hazardous Waste Accumulation Date Flowchart

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

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

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6. CHARACTERIZATION

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

Characterization involves the determination of regulated constituents present in the waste, and some additional analyses, which may be required for reporting purposes. All waste must be characterized using CP3-WM-0437, *Waste Characterization and Profiling.* It is recommended that generators consult EPA/600/R-96/05, *Guidance for the Data Quality Objective (DQO) Process*; CP3-ES-5003, *Quality Assured Data*; and waste disposition facility's WACs. These documents will assist generators to "clarify the objective of the characterization plan; define the most appropriate data to collect; determine the most appropriate conditions to collect the data; and specify tolerable limits on decision errors which will be used as the basis for establishing the quantity and quality of data needed to support the decision."

6.1 GENERAL REQUIREMENTS

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

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

6.2 PROCESS KNOWLEDGE

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

Some examples of 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
- SDSs

If the generator wishes to use process knowledge for waste characterization, the generator must complete required documentation in accordance with CP3-WM-0437 Appendix B. Info should be included with RFD for review and approval by Waste Management. Existing PK forms located at S:\Everyone\/PK Forms may be used if they meet the requirements outlined in CP3-WM-0437. Equivalent forms of PK documentation may be approved by the Transportation Manager. When historical analytical data is used, the data limitations must be documented. Chg A Chg A

6.3 RADIONUCLIDE DETERMINATION

For the purpose of determining uranium assay, any of the following are acceptable methods:

(Note the methods generally accepted for NCS purposes are noted with *)

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

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

6.4 DATA QUALITY OBJECTIVE FOR NUCLEAR CRITICALITY SAFETY AND ANALYSIS

There are two procedures governing the handling and storage of fissile/potentially fissile waste depending on the applicable NCSE. The handling requirements of CP3-WM-0015, *Management of Fissile Waste Material*, apply to waste controlled by NCSE-RM-FISSMAT-0015. CP3-WM-1036, *Nuclear Criticality Safety Implementation Requirements for Handling and Storage of Fissile and Potentially Fissile Waste*, applies to all other fissile/potentially fissile waste. Ensure the appropriate NCS requirements are met prior to transferring fissile/potentially fissile waste from one NCSE to another. Ensure DQOs used in sampling and analytical methods producing data used in making NCS decisions at Paducah meet the appropriate NCSE requirements.

6.5 CONTAMINANTS OF CONCERN

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

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

All personal protective equipment (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

Polychlorinated biphenyls (PCB) 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 ≥ 50 ppm, shall be visually inspected for stains and handled in one of the following ways:

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

6.6 CHARACTERIZATION DOCUMENTATION

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

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- Physical and chemical characteristics;
- Volume, including the waste and any stabilization or absorbent media;
- Weight of empty container, weight of content (waste), and gross weight (weight of container and content);
- Identities, activities, and concentrations of major radionuclides;
- Characterization date;
- Generating source; and
- Any other information that may be needed to prepare and maintain the disposal facility performance assessment, or demonstrate compliance with applicable performance objectives.

7. WASTEWATER TREATMENT AND STORAGE

Wastewater is acceptable for storage if it is categorized as RCRA hazardous, PCB, radioactive waste, mixed waste, or if it exceeds Kentucky Pollutant Discharge Elimination System (KPDES) permit limits. Some wastewater may be treated in the C-752-A Waste Management treatment units, the C-752-C Decontamination 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 treatment units if it exhibits any of the following:

- Uranium enrichment > 5.5 wt.% U-235
- 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 greater than or equal to 1 wt.% U-235
- Flashpoint of less than 140°F

Groundwater contaminated with trichloroethylene (TCE) and/or Tc-99 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.

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8. LANDFILL WASTE ACCEPTANCE CRITERIA

8.1 C-746-U SOLID WASTE LANDFILL CRITERIA

8.1.1 General Requirements

The C-746-U Landfill is one that is permitted to dispose of nonhazardous, residual radioactive material per the authorized limits (AL). Only waste that meets the AL can be disposed of. It is not permitted to accept RCRA hazardous waste, TSCA-regulated waste (except PCB remediation waste containing ≤ 49 ppm PCB, PCB bulk product and asbestos), and LLW (above the AL). The waste must be solid with no free liquids. Due to the potential for free liquids and nonconforming items to exist in waste containers destined for disposal in the C-746-U Landfill, an approved management plan for mitigation of potential free liquid and nonconforming items has been developed and is included in this document as Appendix 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. Chg A

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

Radiological materials disposed of at the C-746-U Landfill shall contain no fissile materials; shall be exempted per CP2-NS-1000, *Nuclear Criticality Safety Program Description Document at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*; shall have an approved NCS exemption from CP3-NS-1033; or shall be evaluated in an NCS document that concludes that segmentation or nature of process precludes potential for criticality (HAD-PH-C746U-0004). Chg A

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

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

8.1.2 Landfill Personnel

Landfill personnel shall visit generator sites at least once during the waste generation process. Landfill personnel shall observe paint filter tests being performed on a representative basis. The paint filter test will be performed according to EPA reference SW-846 Method 9095B (or current equivalent testing method). The "Plan of Correction to Mitigate Disposal of Waste Containing Free Liquids at the C-746-U Contained Landfill submitted to the Kentucky Division of Waste Management on March 30, 2007, requires the use of SW-846 Method 9095B. If the waste generator or any of the landfill package reviewers 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 potentially surface contaminated materials that are candidate materials for disposition at the C-746-U landfill shall be performed in accordance with survey plans developed by RADCON. These plans will define survey elements necessary to meet data quality objectives consistent with landfill acceptance criteria and DOE approved AL request, as specified in Appendix E, "Waste Characterization Radiological Survey Plan for Materials Destined for Disposal in the C-746-U Landfill Using the "Authorized Limit" Criteria." The development of these survey plans will be completed by RADCON using CP2-WM-0011-F04, "Authorized Limits C-746-U Survey/Design Evaluation".

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

1. Surface contamination levels must not exceed limits established in Attachment B of CP3-RP-1109.

    - Surface contamination levels that exceed limits established in Attachment B of CP3-RP-1109 must have a DOE-approved AL request for the surface contaminated waste stream.

    - Volumetric waste streams shall not exceed the mass concentration in a DOE-approved AL request, or

2. Waste generated in RAD controlled areas shall be released in accordance with the requirements established in CP3-RP-1109, Section 6.5, "Unrestricted Release of Material/Equipment to Posted Controlled Area and DOE Reservation."

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

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

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

8.1.5 Boxes and Containers

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

8.1.6 Repackaging Controls

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

8.1.7 Transport of Container to Landfill

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

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

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

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

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

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

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

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

8.1.9 General Container Requirements

All containers will be free of excess dirt and debris prior to loading. RADCON cannot perform an accurate survey of a container's inner surfaces if it is caked with excess dirt/mud/debris. It is the project's responsibility to maintain its containers and to clean the containers periodically at a suitable decontamination pad. RADCON will provide job coverage for the decontamination operation. Use of container liners may be incorporated to prevent buildup of dirt and debris. RADCON periodically will perform surveys of containers that are not surveyed at the landfill (see Section 8.1.3). Containers found to have removable radioactive contamination must undergo decontamination and additional surveys prior to reuse. Containers with 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 authorized limits waste containers should be captured and sampled unless exempted by the 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 CP2-WM-0661.

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

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

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

- Empty aerosol cans must be punctured and not pressurized.

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

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

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

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

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

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

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

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

  Exception: Large solid tires do not require shredding.

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

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

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

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

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

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

8.1.11 Prohibited Items

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

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

- Batteries (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 CP2-WM-0001 and that the information in their RFD or manifest form is accurate and complete. A certification statement must be signed to accompany each RFD (see Box R27). By signing the certification statement on the RFD form, the generator certifies that information included on the RFD form and its attachments is true, accurate, and complete. Deviations from the WMP or the requirements in this WAC should be documented on the Waste Variance Form (CP2-WM-0011-F01, Appendix A) and must be approved by the Waste Generator Manager or designee. Generators are responsible financially for costs incurred as a result of nonconformance with the criteria established in this document.

Chg A

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10. RECORDS, DOCUMENTATION, AND REPORTING

Records and documentation must be created and maintained by the generator and provided to Waste Management so that the waste may be managed and tracked properly. The handling and subsequent treatment, storage, and/or disposal of hazardous waste must include a "cradle to grave" tracking of the waste material. Other associated documentation may be required depending on the waste category and/or its intended disposition. Table 3 cross-references the required documentation to the waste categories. Documents shall be prepared, reviewed, approved, controlled, and revised in accordance with CP3-RD-0010, *Records Management Process.*

Table 3. Documentation by Waste Category

Documentation	Waste Category[8]							
	Radioactive	RCRA	PCB	RCRA Mixed or PCB Low-Level	Wastewater	Landfill	Universal Waste	Scrap Metal
Assay (duplicate)	X[5]			X[5]		X[5]		
Landfill Waste Package Number Request and Certification Form (CP3-WM-3025)						X		
Characterization (Analytical) Data[1]	X[1]	X[1]	X[1]	X[1]	X[1]	X[1]		X[1,6]
Waste Characterization Documentation	X[2]	X[2]	X[2]	X[2]	X[2]	X[2]		X[2]
Request for Disposal (Appendix B)	X	X	X	X	X	X	X	X
RFD Attachment A, Waste Information (Appendix B)	X	X	X	X	X[7]	X	X	X
RFD Attachment B, RCRA Regulatory Codes		X		X				
Waste Item Container Log (Appendix B)[3]	X[3]	X[3]	X[3]	X[3]	X[3]	X[3]	X[3]	X[3]
Waste Variance Form[4] (Appendix A)	X[4]	X[4]	X[4]	X[4]	X[4]	X[4]		X[4]
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[7]	X[7]	X[7]	X[7]	X[7]	X[7]	X[7]	X[7]

[1] Required if analytical data is used for characterization.
[2] See CP3-WM-0437 for required documentation or approved equivalent.
[3] Required if waste is containerized.
[4] Required only if approval to digress from the requirements in this WAC is needed.
[5] Required for all wastes containing > 0.711 wt.% U-235.
[6] Includes RADCON survey.
[7] Proper security classification of suspect waste required.
[8] May contain ACM.

11. REFERENCES

The following (Table 4) 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 4. Regulatory References

Waste Category	References			
	CFR	***KAR***	**DOE Orders/ EPA Requirements**	**Policies, Permits, Agreements, etc.**
Asbestos Waste	40 *CFR* § 61 Subpart M (National Emission Standards for Hazardous Air Pollutants)	401 *KAR* 58:025, 40 CFR Part 61 *National Emission Standard for Asbestos*; 401 *KAR* 58:040, *Requirements for Asbestos Abatement Entities*	EPA SW-846 EPA/600/R-92/033 EPA/230-02-89-042	
Landfill Waste		401 *KAR* 30:31 401 Chapters 4 and 48	EPA SW-846 EPA/600/R-92/033 EPA/230-02-89-042	#073-00045, Solid Waste Landfill Permit
PCB	40 *CFR* § 761	401 *KAR* 30:31	EPA SW-846 EPA/600/R-92/033 EPA/230-02-89-042	KY/EM-147, Site Treatment Plan TSCA Compliance Agreement DOE/EH-413-9914, Storage and Disposal of PCB Waste
Radioactive	10 *CFR* § 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)	BJC/PAD-491, AL Requests for Solid Waste Disposal at Landfill C-746-U
RCRA	40 *CFR* § 260–264, 268, 270	401 *KAR* Chapter 39	EPA SW-846 EPA/600/R-92/033 EPA/230-02-89-042	Kentucky Division of Waste Management Hazardous Waste Management Permit (RCRA Permit) KY/EM-147, Site Treatment Plan
Universal Waste	40 *CFR* § 273	401 *KAR* Chapter 43		
Scrap Metal			EPA SW-846 EPA/600/R-92/033 EPA/230-02-89-042 DOE 435.1, Chg 1	
Wastewater		401 *KAR* Chapter 10:031 (Surface Water Standards)	EPA SW-846 EPA/600/R-92/033 EPA/230-02-89-042	KPDES Permit

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REGULATIONS AND ORDERS

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

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

Code of Federal Regulations, 49 *CFR, 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, Bechtel Jacobs Company LLC, Kevil, KY, January 2003.

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

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

U.S. Department of Energy and Four Rivers Nuclear Partnership, Inc., Paducah Deactivation and Remediation Project, 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.

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APPENDIX A

WASTE VARIANCE REQUEST
(FORM CP2-WM-0011-F01)

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WASTE VARIANCE REQUEST
FORM CP2-WM-0011-F01

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 exists 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 Management 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 Generator Services.

1. Complete all sections on the front page of CP2-WM-0011-F01, and sign at the bottom.
2. Submit completed form CP2-WM-0011-F01 to Waste Generator Services.
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

WASTE VARIANCE REQUEST
FORM CP2-WM-0011-F01

TO BE COMPLETED BY WASTE GENERATOR SERVICES

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 GENERATOR MANAGER

PRINTED NAME	SIGNATURE	BADGE NUMBER	DATE

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

PRINTED NAME	SIGNATURE	BADGE NUMBER	DATE

APPENDIX B

RFD FORM (CP2-WD-0011-F02), RFD RCRA REGULATORY CODES (CP2-WD-0011-F03), AND INSTRUCTIONS

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CONTENTS

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Request For Disposal

Document ID Number

Generation Process Information

R1. Generator's Name (Print)	R2. Generator's Phone	R3. Responsible Contractor	R4. PBI Number, Completion Date, & Disposition Due Date:	
R5. Generating Program	R6. Program Scope	R7. AB Profile	R8. NMC&A Accountable Material (Y/N):	
R9. Field Work Charge Code:	R10.Ship/Disposal Charge Code:	R11. Origin Site	R12. Origin Facility	R13. Origin Area
R14. Forecasted Time Line (Start and End Dates)	R15.Forecasted Vol / Units		R16. Holding Facility	R17. Holding Area

Waste Description / Comments

R18.

Waste Characteristics

R19. Physical Information: (e.g. Flashpoint, color, odor):	R20. Chemical Information: Known chemicals present : ☐ Yes ☐ No If yes, provide list or attach SDS:	R21. Rad Area: ☐Yes ☐ No If Yes, Describe Postings:

R22. Radiological Information:
Is material non-radiological by Process Knowledge ☐ Yes ☐ No *If yes, provide non-radiological determination from RadCon.*
Is material being requested for unrestricted release off-site ☐ Yes ☐ No *If yes, Submit DOE Concurrence Documentation for "Free Release"*
Check how radioactivity is distributed on/in the material (must check one):

☐ **Surface Contaminated**
(e.g., nonporous materials – equipment, scrap metal, plastic)

☐ **Volumetrically Contaminated**
(e.g., porous materials – soil, concrete, paper, cardboard, powders, etc.)

R23. Approved Containers, Liners, other Packaging Materials (deemed compatible with the waste contents and absorbents)

R24. Is Absorbent Determination required? (Absorbents must be compatible with the waste, containers, and other packaging materials)
☐ Yes - Absorbent Determination Form (CP3-WM-3015-F03) Attached
If yes, what is the recommended absorbent type: _____
☐ No - Explain:

R25. Container Labeling Requirements (Check all that apply)

	RCRA		PCB		Base		Barcode
	RAD		RD Confidential		Acid		Other:
	Fissile		RD Secret		Oxidizer		Other:
	Flammable		Combustible		Beryllium		
	Asbestos		Reactive		Waste Container Label		

R26. Special Handling/Surveying Instructions and Additional Information

I agree that the waste described above will be generated and managed as established in this Request for Disposal and that it is my responsibility to ensure any changes or discrepancies identified in the waste description or origin during generation will be immediately reported to the Waste Engineer identified below.

R27. Generator's Signature Print Name Signature Date

R28. Waste Engineer Approval Print Name Signature Date

RFD Closeout (To be completed by Waste Engineer)

R29. Final Disposition Date of Waste:	R30. Total Waste Volume Generated:

This is to certify that the above named material has been generated and properly dispositioned.

R31. Waste Engineer Print Name Signature Date

Waste Information Attachment A

Document ID Number

Material or Waste Type (Check only one Waste Type and one applicable identifier)				
	A1. **LLW** (Low-level radioactive, non-hazardous waste)			
	A2. **MLLW** (Low-level radioactive, hazardous waste) ***			
	A3. **HAZ** (Non-radioactive, hazardous waste) ***	☐ No Rad Added	☐ Free Releasable	
	A4. **HAZ-AL** (Hazardous waste – meets authorized limits) ***			
	A5. **TSCA** (TSCA regulated waste – non-rad, non-hazardous)	☐ No Rad Added	☐ Free Releasable	☐ Authorized Limits
	A6. **SANITARY** (Non-radioactive, non-hazardous waste)	☐ No Rad Added	☐ Free Releasable	
	A7. **R-SANITARY** (Radioactive, non-hazardous waste)	☐ Authorized Limits	☐ Agreed Order & Auth. Limits	
	A8. **UNIVERSAL** (Non-radioactive Universal Waste)	☐ Batteries	☐ Lamps/Bulbs	☐ Mercury-containing Equip
	A9. **RECYCLABLE** (Non-radioactive Recycle/Reuse materials)	☐ No Rad Added	☐ Free Releasable	
	A10. **R-RECY** (Radioactive Recycle/Reuse materials – authorized limits)			
	A11. **SCRAP** (Non-radioactive Scrap Metal)	☐ No Rad Added	☐ Free Releasable	
	A12. **R-SCRAP** (Radioactive Scrap Metal – authorized limits)			
	A13. **TRU** (Transuranic, non-hazardous, TRU radioisotopes > 100nCi/g)			
	A14. **MTRU** (Transuranic, hazardous, TRU radioisotopes > 100nCi/g) ***			
	A15. **NON-WASTE** (Non-waste items - non-rad, non-hazardous)	☐ No Rad Added	☐Free Releasable	
	A16. **R-NON-WASTE** (Radioactive non-waste items, non-hazardous – authorized limits)			
*** Material or Waste Types that include hazardous constituents must attach a RCRA Regulatory Codes (Attachment B) form				

Additional Waste Characteristics (Check all that are applicable)						
	A17. PCBs - container includes PCBs	☐ Yes	☐ No – if no, skip to A21			
	A18. PCB Concentration Range	☐ < 50 ppm	☐ 50-499 ppm	☐ ≥ 500 ppm		
	A19. PCB Waste Type	☐ PCB Bulk Product	☐ PCB Remediation Waste	☐ Other PCB Waste (> 50 ppm)		
	A20. PCB Item (> 50 ppm)	☐ C (Container)	☐ AC (Article Container)	☐ A (Article)	☐ E (Equipment)	
	A21. Asbestos	☐ Friable	☐ Non-Friable		A22. CERCLA Waste	
	A23. Chelating Agents				A24. Ion Exchange Resins	
	A25. Waste Water				A26. Free Liquids (unless Waste Water)	
	A27. Pyrophoric Materials (other than rad. forms of isotopes)				A28. Ignition Sources	

Nuclear Criticality Safety Characteristics		
	A29. Fissile (≥1% assay)	A30. Max Assay/Enrichment %:_____
	A31.Basis of Assay Data	☐ Process Building Assay – Bldg/Unit:_____ Cell: _____ Specific Source (if known): _____ ☐ Non Process Facility – Bldg/Unit: _____ System/Area:_____ Specific Source (if known): _____ ☐ Other:
	A32. Non-Uranium Isotopes of Interest: _____	A33. Method Used to Obtain U-235 Mass: _____
	A34. NCS Exempt (identify defining document) ☐CP2-NS-1033 ☐ Other document of explain basis	A35. Comment/Explanation:

Characterization / Sampling Information			
A36. Sample Project ID Number			
A37. Waste Characterization Document Number			
A38. Radiation Survey Number(s)			
A39. Waste Variance Request Number(s)			
A40. Chemical Form (if radioactive)	☐ Solid/Oxide	☐ Liquid/Oxide	☐ Other:

RCRA Regulatory Codes Attachment B

Document ID Number

RCRA Regulatory Codes (Completed by Waste Engineer)			
B1. Form Code	B2. Source Code	B3. Hydrogen potential (pH)	B4. Flash Point

B5. Substance Name	B6. EPA Code	B7. Underlying Hazardous Constituents
B5. Substance Name	B6. EPA Code	
B5. Substance Name	B6. EPA Code	
B5. Substance Name	B6. EPA Code	
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B5. Substance Name	B6. EPA Code	
B5. Substance Name	B6. EPA Code	
B5. Substance Name	B6. EPA Code	

B8. Additional RCRA Regulatory Sheet attached ☐ Yes ☐ No If yes, number of additional RCRA sheets attached ________

CP2-WM-0011-F03 FR1

REQUEST FOR DISPOSAL
USER INSTRUCTIONS

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. You may request this number from Database Management.

GENERATION PROCESS INFORMATION

R1. Generator's Name (Print) - The printed name of the Project Manager or individual responsible for generation of the waste. Initials for first and middle names may be used.

R2. Generator's Phone - The phone number, including the area code if other than 270, where the individual indicated in block R1 may most likely be reached. A four or seven digit number is acceptable.

R3. Responsible Contractor - The contractor responsible for the waste (e.g., FRNP, SWIFT…).

R4. PBI Number, Completion Date, & Disposition Due Date - The PBI Reference Number (e.g. PBI#0101-A.1), the date the PBI must be complete, and the date that final disposition must be complete as evidenced with Certificates of Disposal

R5. Generating Program - The Project (e.g., DEACT, ER&WM, S&M, UTILITIES…) that generated the waste.

R6. Program Scope - The name of the sub-project (e.g., WASTE OPS, LUBE OIL, BOILER…) that generated the waste.

R7. AB Profile – The Safety Authorization Basis profile assigned to the waste per CP2-WM-0006.

R8. NMC&A Accountable Material (Y/N) – should show Y when there is more than 500 grams uranium of source material (≤0.712% enrichment) or 0.5 grams uranium of Special Nuclear Material (>0.712% enrichment). Additional guidance for other accountable nuclides is found in Appendix B of CP3-NM-3002.

R9. Field Work Charge Code – The charge code used for field work (e.g. packaging, container movements, loading conveyances, preparing shipping documentation)

R10. Ship/Disposal Charge Code – The charge code used for treatment, disposal, and transportation costs associated with off-site shipments

R11. Origin Site – Specify the site (e.g., PGDP) where the waste was generated.

R12. Origin Facility – Specify the facility or building where the waste was generated.

R13. Origin Area - Indicate the specific room, area, lab, or location where the waste was generated.

R14. Forecasted Time Line – The projected beginning and ending dates of the project producing the waste.

R15. Forecasted Vol/Units - The projected volume (cubic feet) or number of containers to be produced from the project

R16. Holding Facility - The specific facility (e.g. C-333) where the waste is physically located.

R17. Holding Area - The specific room, area, or location where the waste is physically located.

R18. Waste Description and Comments - Provide a general description of the waste material (i.e., PPE in a plastic bag) that is being generated. 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.

R19. Physical Information – Provide details regarding the physical characteristics of the material (e.g. Flashpoint, Color, Odor, pH)

R20. Chemical Information – Provide details regarding the chemical characteristics of the material (e.g. Chemical Name, Acid, Base, Solvent). Safety Data Sheets should be attached when applicable.

R21. Rad Area – Provide details regarding if the material is coming from a Rad Posted Area. If yes, describe the postings (e.g. Contamination Area (CA), High Radiation Area (HRA)).

R22. Radiological Information – Provide details regarding the radiological properties of the material. If it is considered non-radiological provide determination from RadCon. If being considered for free release, submit DOE Concurrence documentation. Must check how radioactivity is distributed on or in the material. Waste materials are either surface contaminated or volumetrically contaminated. Some waste streams may include materials in both forms and both may be marked.

R23. Approved Containers, Liners, or other Packaging Materials – Provide a list of approved containers (e.g. 55 Gallon UN 1A2 Drums, 7A Type A Box (90 cf capacity), Roll-Off Bin), liners, or other packaging materials (e.g. vermiculite, sand). All items approved for use must be evaluated for compatibility with each other and with the waste contents and absorbents.

R24. Is Absorbent Determination required? – If absorbent determination is required, then mark yes, complete CP3-WM-3015-F03, *Absorbent Determination Form*, and determine the recommended absorbent type. If not, then mark No and explain (e.g. material is liquids going to treatment prior to burial). All absorbent materials approved for use must be evaluated for compatibility with the waste, the container, and any other packaging materials that may be used.

R25. Container Labeling Requirements – Check all labels that are required per guidance in CP2-WM-0011

R26. Special Handling/Surveying Instructions and Additional Information – Provide any special handling requirements, specify Radiological Survey Requirements (e.g. Authorized Limits for Landfill, SCO-II for Off-Site Shipment, SI Number if applicable), and any additional information or limitations that should be followed when packaging for disposal

R27. Generator Signature & Date - The generator indicated in R1 must print their name, sign (in ink) and date the RFD.

R28. Waste Engineer Approval & Date – The Project Waste Engineer must print their name, sign (in ink) and date the RFD

RFD CLOSEOUT (To be completed by Waste Engineer)

R29. Final disposition date of waste – The date the last of the material on this RFD was dispositioned, whether it was shipped, discharged, disposed in landfill or repackaged.

R30. Total Waste Volume Generated – The total gross volume in cubic feet of waste material generated under this RFD.

R31. Waste Engineer Name, Signature & Date – The Project Waste Engineer must print their name, sign (in ink) and date once the last of the waste on this RFD has been dispositioned, either by shipment offsite, disposal in the onsite landfill, discharge, repackage, or other means of disposition.

ATTACHMENT A
WASTE INFORMATION FORM USER INSTRUCTIONS

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.

MATERIAL OR WASTE TYPE INFORMATION – (CHOOSE ONLY ONE OF THESE OPTIONS)

A1. LLW - low-level radioactive, non-hazardous waste
A2. MLLW – low-level radioactive and hazardous waste ***
A3. HAZ – non-radioactive, hazardous waste ***
A4. HAZ-AL – hazardous waste meeting authorized limits ***
A5. TSCA – TSCA regulated waste that is non-radioactive and non-hazardous
A6. SANITARY – non-radioactive, non-hazardous waste
A7. R-SANITARY – radioactive, non-hazardous waste meeting the agreed order and/or authorized limits
A8. UNIVERSAL – non-radioactive Universal Waste
A9. RECYCLABLE – non-radioactive recyclable / re-useable materials
A10. R-RECY – radioactive recyclable / re-useable materials meeting authorized limits
A11. SCRAP – non-radioactive scrap metal
A12. R-SCRAP – radioactive scrap metal meeting authorized limits
A13. TRU – transuranic, non-hazardous waste with TRU radioisotopes >100nCi/g
A14. MTRU - transuranic, hazardous waste with TRU radioisotopes >100nCi/g ***
A15. NON-WASTE – non-waste items that are non-radioactive and non-hazardous
A16. R-NON-WASTE – radioactive non-waste items that are non-hazardous and meet authorized limits

*** **NOTE** – If A2, A3, A4 or A14 are chosen, an Attachment B (RCRA Regulatory Codes) must accompany the RFD.

ADDITIONAL WASTE CHARACTERISTICS (CHECK ALL APPLICABLE)

A17. PCBs – Check if the waste contains PCBs – If no, skip to A21.

A18. PCB Concentration Range – If waste contains PCBs, choose the appropriate concentration.

A19. PCB Waste Type – Identify the type of PCB Waste as defined below – Choose either PCB Bulk Product, PCB Remediation, or Other PCB Waste.

PCB Bulk Product Waste—PCB bulk product waste means waste derived from manufactured products containing PCBs in a non-liquid state, at any concentration where the concentration at the time of designation for disposal was ≥ 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) Non-liquid 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 includes 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.

Other PCB Waste - Those PCBs and PCB items that are subject to the disposal requirements of 40 *CFR* § 761, Subpart D. Toxic Substance Control Act (TSCA)-regulated waste that contains PCBs >50ppm.

A20. PCB Item – Identify the type of PCB item / Article / Article Container / Container / Equipment.

Article - 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.

Article Container - Any package, can, bottle, bag, barrel, drum, tank, or other device used to contain PCB Articles or PCB Equipment, and whose surface(s) has not been in direct contact with PCBs.

Container - Any package, can, bottle, bag, barrel, drum, tank, or other device used to contain PCB Articles or PCB Equipment, and whose surface(s) has been in direct contact with PCBs.

Equipment - Any manufactured item, other than a PCB Container or a PCB Article Container, which contains a PCB Article or other PCB Equipment, and includes microwave ovens, electronic equipment, and fluorescent light ballasts and fixtures.

A21. Asbestos – Specify if the waste contains friable and/or non-friable asbestos.

A22. CERCLA – Indicate if waste was generated from a CERCLA area.

A23. 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 checking the 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).

A24. 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.

A25. Waste Water – Check the box if waste stream is Waste Water.

A26. 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.

A27. 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.

A28. Ignition Sources - Articles, devices, or conditions that promote or permit burning through intense heat or fire; ignition sources include lighters, matches, and electric sparks.

A29. Fissile or Potentially Fissile Waste – Check the box if the waste is considered Fissile or Potentially Fissile. Known or potential to have an assay/enrichment greater than or equal to 1.0 wt. % ^{235}U.

A30. Max Assay/Enrichment % – Provide the maximum possible value for assay/enrichment

A31. Basis of Assay Date – Show the method used to derive the max assay/enrichment %. Check the appropriate box and provide information. For process building assay, use information in CP3-NS-1033, App. G. Other methods can include, but are not limited to, process knowledge (PK) and the SCO Vol calc sheet.

A32. Non-Uranium Isotopes of Interest – Check the box if the waste contains, or has a potential to contain non-uranium fissionable radionuclides. Fissionable isotopes of neptunium, plutonium, americium, curium, and californium are of concern.

A33. Method Used to Obtain U-235 Mass – Provide methodology that will be used to determine the mass of uranium in the waste stream. Methods include, but are not limited to, process knowledge (PK) and the SCO Vol calc sheet.

A34. NCS Exempt - The material contains uranium with an enrichment less than 1.0 wt..% 235U or has been exempted by CP3-NS-1033 or NCS document. Other fissionable radionuclides shall be considered in the determination. If waste is NCS Exempt, then identify the reference document allowing the exemption. If no reference document applies, provide basis. If multiple documents are used, explain the determination.

A35. Comment/Explanation – Provide any additional information if necessary in regards to determination, methodology, etc. of NCS characteristics and/or NCS exemption

CHARACTERIZATION / SAMPLING INFORMATION

A36. Sample Project ID Number – Specify the Sample Project ID Number.

A37. Waste Characterization Document Number – The completed Waste Characterization Documentation from procedure CP3-WM-0437or approved equivalent must be provided with the RFD submittal.

A38. Radiation Survey Number – Enter the radiation survey number(s). These surveys are generated by RADCON.

A39. Waste Variance Request Number(s) – Enter the number(s) of any **approved** Waste Variance Request forms that apply to this waste.

A40. 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.

ATTACHMENT B
RCRA REGULATORY CODES (HAZARDOUS WASTE) USER INSTRUCTIONS

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.

B1. Form Code - State code that identifies the form or physical state of the waste.

B2. Source Code - State code to identify where waste originated.

B3. Hydrogen potential (pH) - Hydrogen potential (pH) (applies to aqueous liquids only)—The pH of the liquid must be reported for pH < 2 or >12.5.

NOTE: For non-aqueous 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.

B4. 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 oF and below 210 oF [i.e., between these limits, the discrete value must be reported, not less than (<) or greater than (>) a value]. If using a Material Safety Data Sheets (MSDS) for characterization, the flash point may be reported with < or > values.

B5. Substance Name - List the most common name for the substance identified in B6.

B6. EPA Code - 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.

B7. Underlying Hazardous Constituents - List any of the underlying hazardous constituents as defined in 40 CFR § 268.42 and 268.48 that are present in any characteristic waste (D001 - D043).

B8. Check box if additional RCRA Regulatory Code sheets (Attachment B) sheets are needed to list all applicable constituents of the waste, and indicate how many additional sheets are attached. All known constituents must be identified.

APPENDIX C

LABELING AND MARKING

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CONTENTS

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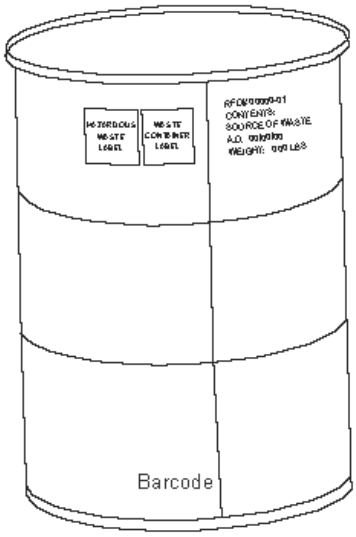
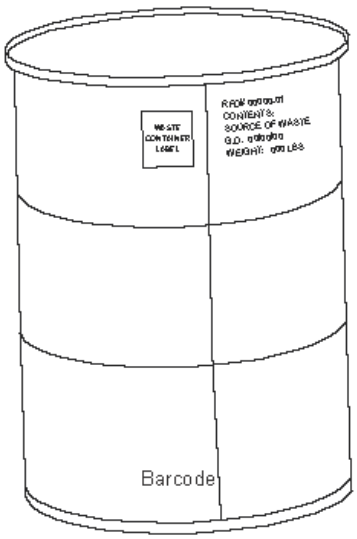
DOCUMENT No.

RCRA WASTE



Left of Seam	Right of Seam
Waste Container Label	RFD #-XX
Hazard Waste Label	Contents
Barcode (PADYYCXXXXX)	Source of Waste
	AD/GD Date:
	Weight

LOW LEVEL RADIOACTIVE WASTE



Left of Seam	Right of Seam
Waste Container Label	RFD #-XX
Hazard Waste Label	Contents
Barcode (PADYYCXXXXX)	Source of Waste
	GD Date:
	Weight

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

FOUR RIVERS NUCLEAR PARTNERSHIP, LLC

E-1

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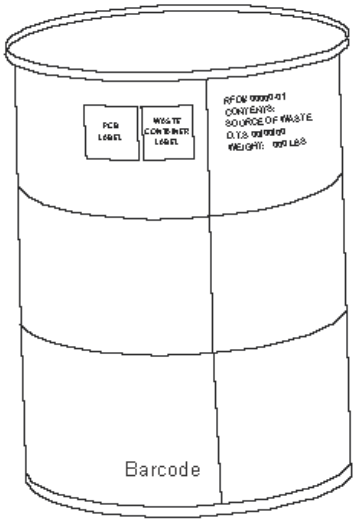
5/6/2015

DOCUMENT No.

PCB WASTE



Left of Seam	Right of Seam
Waste Container Label	RFD#-XX
PCB Label	Contents
Barcode (PADYYCXXXXX)	Source of Waste
	D.T.S. MM/DD/YY
	Weight

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

FOUR RIVERS NUCLEAR PARTNERSHIP, LLC

E-2

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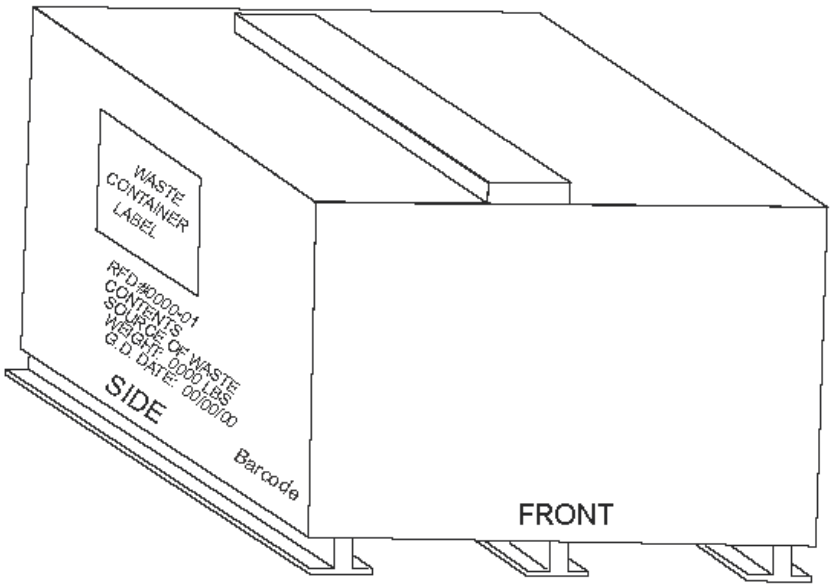
5/6/2015

DOCUMENT No.

Boxes



Side of Box
Waste Container Label

RFD#-XX
Contents
Source of Waste
Weight:
GD: MM/DD/YY
Barcode: PADYYCXXXXX

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

FOUR RIVERS NUCLEAR PARTNERSHIP, LLC

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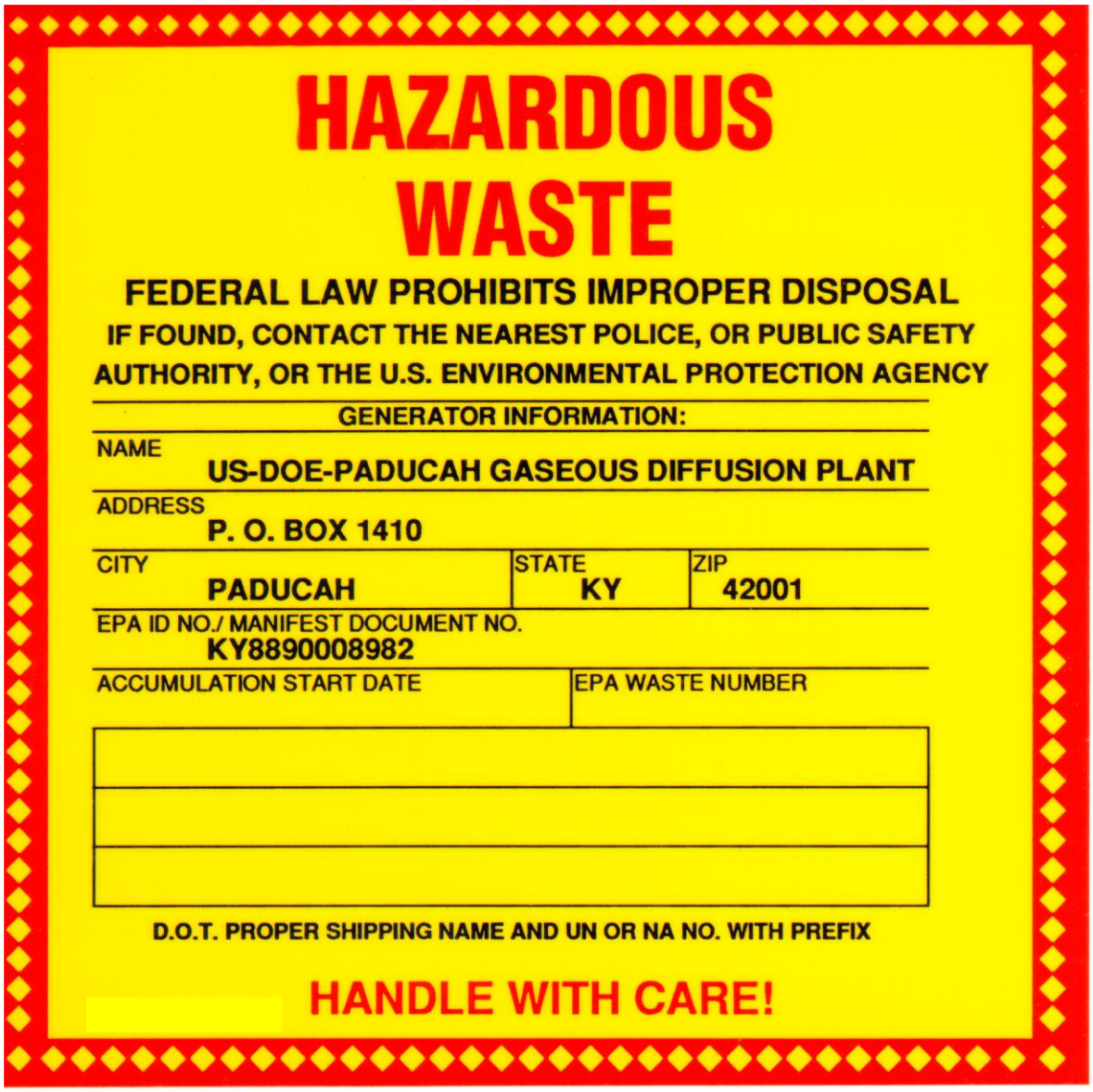
5/6/2015

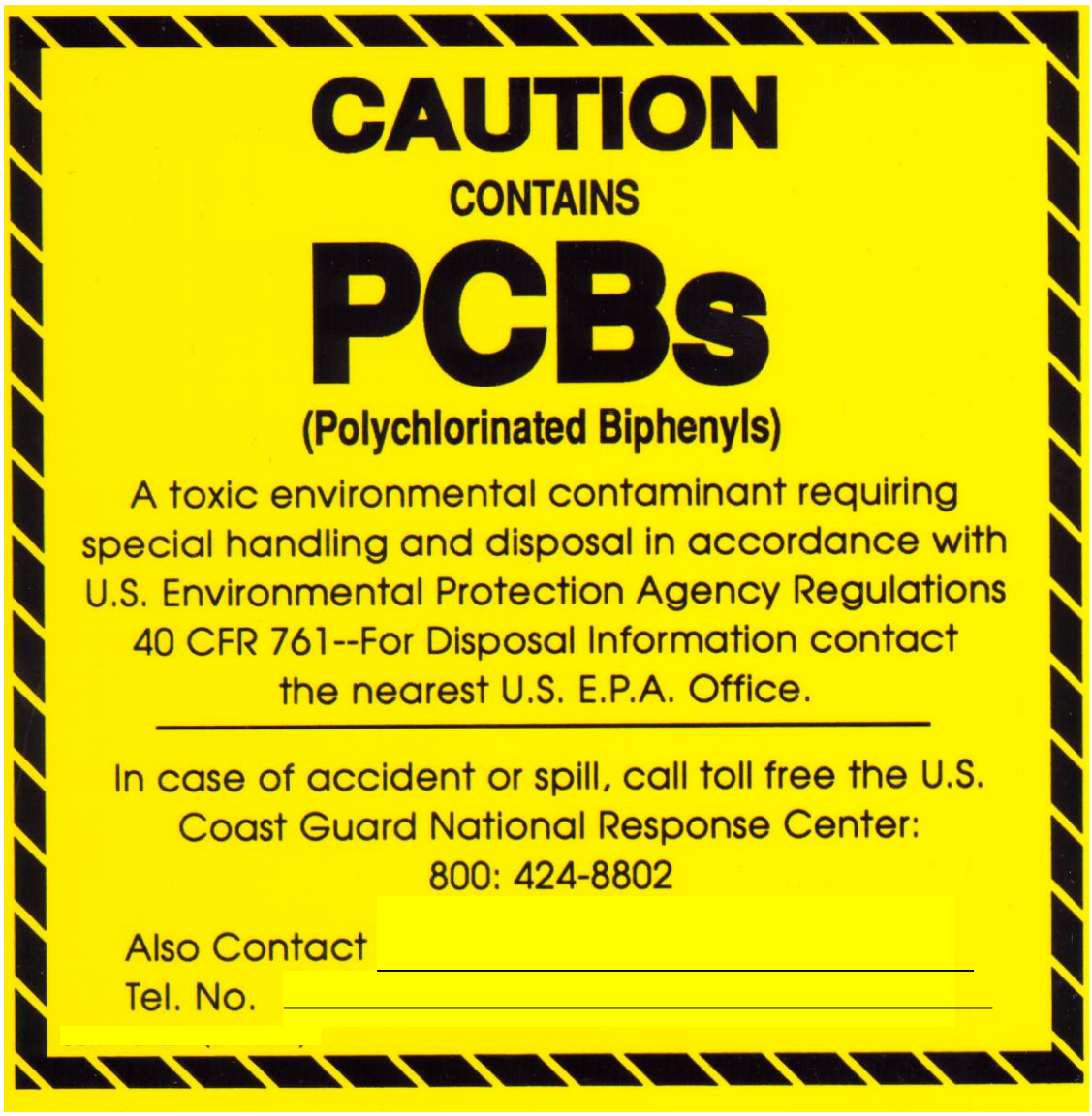
EXAMPLE

Waste Container Label



EXAMPLE

Hazardous Waste Label



EXAMPLE

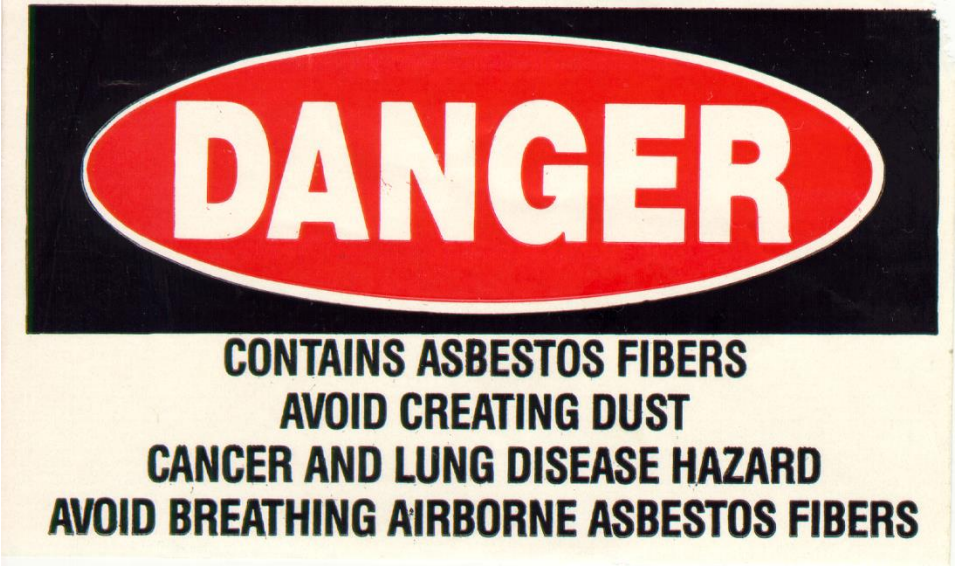
PCB M_L Label

EXAMPLE

Classified Material Label

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

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APPENDIX D

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

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

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

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

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

(3) After each drum has been emptied into the decant/tilt or tilt dumpster and any free liquids and/or nonconforming items have been mitigated as required, an aliquot of the waste in each drum will be collected. Each aliquot will be placed into a composite container with aliquots of all successive drums, until all drums combined in a particular bulk container (i.e., roll-off, intermodal, 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 lb. In the absence of any moisture data on these Agreed Order wastes, a conservative assumption was made that 50% of this average weight, or 300 lb, was attributable to water. It was decided, therefore, that three 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 CP3-WM-3015-F05 in accordance with CP3-WM-3015) and provided to landfill personnel for their records.

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

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APPENDIX E

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

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

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

Data Quality Objectives:

The objective for the radiological surveys is to demonstrate, at a 95% confidence level, that any radiological levels on the miscellaneous items prior to disposal at the C-746-U landfill, satisfy Authorized Limits criteria. Measurement methods will have detection sensitivities and Minimum Detectable Concentrations (MDCs) that are ≤ 75 % of the applicable criterion. Measurement accuracy and precision are expected to be ± 10% to 20%.

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

1. If less than 10% of the items are greater the selected authorized limits, material and/or equipment above these limits will be decontaminated and resurveyed. Increased scanning of the remaining material and equipment to at least 25%.
2. If more than 10% of the items are greater than the selected authorized limit, the affected material and equipment will be removed from the batch. The material and/or equipment affected will be decontaminated and resurveyed as a separate batch. In addition, 100% of the remaining original material and equipment will be surveyed.

Measurement Quality Objectives:

Surface contamination survey MQOs, such as maximum background, calibration frequency, daily checks acceptability, operator qualification, and other MQOs, are identified in Paducah Gaseous Diffusion Plant (PGDP) Deactivation and Remediation (D&R) contractor instrumentation and contamination survey procedures. The contamination survey will be performed using CP3-RP-1109, Radioactive Contamination Control and Monitoring, and CP2-RP-1009, Radiological Protection Instrumentation Operation Technical Basis Document. Survey instrumentation shall be appropriate for the type of radiation being measured, and count times, survey methods, and calculations, used to determine activity levels, shall be such that detection sensitivities (MDCs) will be ≤ 75 % of the applicable authorized criterion. Table 1. identifies instruments typically used for these types of surveys. Sensitivities are for nominal operating parameters. Actual backgrounds and associated MDCs will be determined for the specific instrument and methods used at the time of the survey and are calculated and recorded for each survey on the Survey Form.

Table 1. Typical Instruments and Sensitivities

Detector Model	Meter Model	Application	Typical Bkgd. (cpm)	Sensitivity (MDC) (dpm/100 cm^2)	
				Scanning	Static Count (1 minute)
44-9	12, 2221, 2224 or equivalent	Beta/gamma scan & measurement	50	3446	1069
43-5	12, 2221, 2224 or equivalent	Alpha scan & measurement	2	215	92
43-10-1	2224, 2929, 3030 or equivalent	Alpha smear measurement	1	N/A	19
43-10-1	2224, 2929, 3030 or equivalent	Beta smear measurement	40	N/A	66
Tennelec XLB	N/A	Alpha smear measurement	0.3	N/A	19
Tennelec XLB	N/A	Beta/gamma smear measurement	2.2	N/A	24

Scan MDC for portable alpha and beta field contamination instruments will be calculated on the Radiological Survey form RP-F-0002 using the following assumptions:

- Alpha probe width 4.29 cm, area 76 cm^2, and scan speed 5.08 cm/sec
- Beta probe width 5.08 cm, area 15.51 cm^2, and scan speed 5.08 cm/sec

Background and efficiency for portable alpha and beta meters should be maintained as follows to ensure scan MDC will meet authorized limits.

- Alpha probe with at least 10% efficiency and background less than or equal to 2 cpm.
- Beta probe with at least 20% efficiency and background less than or equal to 60 cpm.

General Guidelines:

1. Conduct visual inspection of the material(s). Direct the custodian to remove dirt or grease from material/equipment if it will impede the survey.
2. Review CP2-WM-0011-F04 to determine survey limits. Ensure the β/γ scan MDC and α and β/γ static MDCs of all instruments utilized are less than the specified limits.
3. Obtain appropriate background measurements. If beta/gamma background exceeds 100 cpm for a pancake GM or 300 cpm for a plastic scintillator probe, then direct custodian to relocate item(s) to a low background area.
4. Scan material/equipment for alpha and beta/gamma radiation as specified on CP2-WM-0011-F04. The scan should focus on areas of likely contamination (e.g., discolored or oily) that were identified by the visual inspection. Note areas of elevated activity. If scan indicates areas of contamination in excess of total limits specified on CP2-WM-0011-F04, then suspend the survey and notify RCT Supervisor or RPPM.

5. Perform representative swipes and static measurements of the item(s) at locations noted below. The number of swipes and static measurements for each area are provided.
   - Items ≤ 1 m^2 in size require one smear.
   - Items > 1 m^2 in size require one smear per each square meter, rounding up.

     EXAMPLE: An item > 2 m^2 but < 3 m^2 in surface area will require three smears.

     - Perform a minimum 14 static measurements per survey unit.
6. Collect additional swipe and static measurements at surveyor discretion in areas of elevated radioactivity or areas suspected of having radioactive contamination.
7. Count samples on swipe counter or submit samples to RP Count Room for analyses.
9. Consult RCT Supervisor to determine if a survey map is necessary. If required, prepare survey drawing showing locations of static and swipe measurements. A standard, generic drawing may be utilized. Ensure drawing indicates that photo is not of the actual item.
10. Complete survey documentation in accordance with CP3-RP-1109. Refer to CP2-WM-0011-F04 in the comment block. Ensure item identifying numbers (serial number, part number, or CA number) are specified. Provide completed survey to RCT Supervisor for review. RCT Supervisor or Radiation Protection Project Manager will submit completed form CP2-WM-0011-F04 and rad survey to Waste Engineer.

Instrumentation/Supplies:	**Documentation:**
• Ludlum Ratemeter/Scaler with Beta/Gamma probe • Ludlum Ratemeter/Scaler with Alpha probe • Alpha/Beta/Gamma swipe counter (portable or lab based) • Smears • Protective clothing as necessary	• RP-F-0002 Radiological Survey Cover form and supporting forms • CP2-WM-001-F04 Unconditional Authorized Survey/Design Evaluation form
Total Contamination Measurements:	**Removable Contamination Measurements:**
• Static contact reading for total alpha and beta-gamma contamination as directed. • Scan for total alpha and beta-gamma contamination.	• Transferable contamination measured by smear

Precautions/Limitations/Special Instructions:

1. If field conditions differ from assumptions made during survey design, then contact RCT Supervisor and RPPM for direction.
2. Ensure equipment with the potential for hazardous energy (e.g. electrical, hydraulic, pneumatic) is deenergized and secured to prevent injury.
3. See RP JHA for other hazards and controls.
4. Contact RPPM or Waste Engineer for direction pertaining to the following:
   - Some items may require disassembly - inaccessible surfaces (to be evaluated on a case-by-case basis to determine if the process history and available measurements indicate that the inaccessible surfaces are likely to be less than the authorized criteria for surface contamination);
   - Potential internal contamination (to be evaluated on a case by case basis. Authorized may be based upon a review of process history);

- Fluids from unsealed systems may require sampling and laboratory analysis at RPM discretion;
- Container-type items require smears and scans/static measurements on inside and outside surfaces, using the same guidelines listed above;

  EXAMPLE: If a trash can has 2 m^2 of exterior surface area, you would obtain two smears on the exterior and interior and scan as directed.
- "Use history documentation," is provided by the material custodian; complete all applicable sections of the radiological survey form and submit to RCT supervisor for review and approval.
- In some cases the Waste Engineer may request additional static measurements. The number of measurements will be found on form CP2-WM-0011-F04.

C-746-U Landfill Authorized Limits

Radionuclide	Volumetric Concentration (pCi/g)(1)	Surface Concentration (dpm/100 cm^2)	Source Term Limit (Ci)
^{241}Am	70	14,000	79
^{137}Cs	38	7,600	43
^{237}Np	11	2,200	12
^{238}Pu	78	15,600	88
^{239}Pu	72	14,400	81
^{240}Pu	72	14,400	81
^{99}Tc	104	20,800	117
^{228}Th	8	1,600	9.0
^{230}Th	200	40,000	230
^{232}Th	8	1,600	9.0
^{234}U	320	64,000	360
^{235}U	13	2,600	15
^{238}U	320	64,000	360

(1) Above background

Approved by: _____ Date: _____

APPENDIX F

C-746-U LANDFILL AUTHORIZED LIMITS SURVEY DESIGN EVALUATION (CP2-WM-0011-F04)

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CP2-WM-0011-F04- Authorized Limits C-746-U Landfill Survey/Design Evaluation

RFD #_____

1. Survey/Sampling Design:

a. Does equipment/material have a history of use in an area controlled for removable contamination? ☐ YES ☐ NO

b. Does process knowledge and/or existing radiological data support a "non-impacted" determination? ☐ YES ☐ NO
Radiological survey not required for "non-impacted" items. Proceed to section 4.
Note: If item is in a controlled area, then "non-impacted" is highly unlikely

c. Scoping survey required?: ☐ YES ☐ NO If yes, scoping survey number:_____

d. Scoping survey results: Did results exceed limits? ☐ YES ☐ NO ☐ NA Max percent of limit observed: _____%

Note: If scoping survey can meet final AL survey DQOs and MQOs, the scoping survey may be used as the final AL survey.

e. Provide MARSSIM/MARSAME classification for potentially impacted items: ☐ Class 1 ☐ Class 2 ☐ Class 3

f. Survey/Sampling requirements (check all that apply): ☐ Scanning Survey ☐ Static Measurements ☐ Laboratory Samples(s) ☐ No Survey Required ☐ No Sample(s) Required ☐ Swipe(s) ☐ Other_____

g. Survey limits (dpm/100cm^2): ☐ 20/1600 alpha (100% TRU) ☐ 200/20000 alpha (8% TRU) ☐ 1000/20000 alpha (Uranium) ☐ 1000/20000 beta/gamma (Tc99, U-daughters) ☐ NA (volumetric) ☐ Other _____

h. Volumetric limits: ☐ NA ☐ No Rad Added ☐ Authorized Limit –list_____

i. Scan percentage for alpha and beta/gamma: ☐ NA ☐ 100% (Class 1) ☐ 10% (Class 3) ☐ Other* ____% Based on relative shift for Class 2

j. Number of survey units (determined by RPPM or designee): _____ units of _____ items each

k. Number of swipe/static measurements per item: _____(1 swipe/1m^2 Class 1, 1 swipe/10m^2 Class 3)
Minimum number of measurements _____

l. Measurement strategy: ☐ Random ☐ Judgmental (based on scan results) ☐ Per Survey Plan ☐ Other_____

_____

m. DQOs/MQOs: ☐ Develop specific SP ☐ Unique release – use this form

n. Independent verification survey required: ☐ YES ☐ NO If YES, then ☐ 10% scan ☐ 10% statics ☐ 10% swipes

o. Design comments:_____

_____

_____

_____

_____

2. Survey/Sampling Design Preparation

Survey/Sample Design by: _____ _____ _____ _____
Print name | Signature | Badge # | Date

CP3-WM-0437-F-#- Authorized Limits C-746-U Landfill Survey/Design Evaluation

RFD #_____

3. Post-Survey/Sampling Review

a. Did survey/sampling results cause classification to be upgraded? ☐ YES ☐ NO If YES, then upgraded to ☐ Class 1 ☐ Class 2

b. If survey units were reclassified, provide description of survey design changes and complete Section 1 and Section 2 again:_____

c. Survey number(s): ☐ NA _____

d. Laboratory project ID: ☐ NA _____

e. DQO - Survey completeness: ☐ NA ☐ Instrument(s) ID/cal ☐ Static MDC ☐ L_c ☐ Scan MDC ☐ Backgrounds ☐ Number ☐ RCT name(s) ☐ Description ☐ Map (if necessary) ☐ Swipe results

f. DQO - Sample completeness: ☐ NA ☐ Blanks/dups ☐ Lab method ☐ Results ☐ MDC/TPE ☐ Verification ☐ Qualifiers ☐ MDC per SAP/TBD ☐ Sample integrity ☐ Units ☐ Other _____

g. Is a copy of the SP attached? ☐ YES ☐ NO ☐ NA

h. Did any measurement exceed the limit? ☐ YES ☐ NO If YES, was material/equipment segregated? ☐ YES ☐ NO

i. Review/comments: _____

4. Post-Survey/Sampling Review and Approval

a. Does material/equipment meet C-746-U Authorized Limits?: ☐ YES ☐ NO

Survey/Sample Reviewed by: _____ _____ _____ _____
Print name Signature Badge # Date