

**ENVIRONMENTAL  
MANAGEMENT**



**BECHTEL JACOBS COMPANY LLC  
OAK RIDGE ENVIRONMENTAL  
MANAGEMENT CLEANUP CONTRACT  
WITH THE UNITED STATES  
DEPARTMENT OF ENERGY**

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**BJC/OR-3213-R**

**Environmental Management Waste  
Management Facility  
Proxy Waste Lot Profile 6.999 for  
Building K-25 West Wing,  
East Tennessee Technology Park,  
Oak Ridge, Tennessee**

This document is approved for public  
release per review by:

Art McBride  
BJC ETP Classification &  
Information Office

2/11/09  
Date

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Management Facility  
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East Tennessee Technology Park,  
Oak Ridge, Tennessee**

Date issued—February 2009

Prepared for the  
U.S. Department of Energy  
Office of Environmental Management

BECHTEL JACOBS COMPANY LLC  
managing the  
Environmental Management Activities at the  
East Tennessee Technology Park  
Y-12 National Security Complex Oak Ridge National Laboratory  
under contract DE-AC05-98OR22700  
for the  
U.S. DEPARTMENT OF ENERGY

## APPROVALS

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Management Facility  
Proxy Waste Lot Profile for  
Building K-25 West Wing,  
East Tennessee Technology Park,  
Oak Ridge, Tennessee

BJC/OR-3213-R

February 2009

Prepared by:

Virginia P. Rigley

Virginia Rigley, PGE, DQO, WHP, and Profile Team Manager  
K-25/K-27 D&D Project  
Bechtel Jacobs Company LLC

2/12/09

Date

USQD Review Determination:

Exemption Criteria No: ☐ USQD ☐ UCD ☐ CAT X USQD/UCD/CAT X No: \_\_\_\_\_

K. A. Balo

Karen Balo  
USQD Reviewer Preparer  
Bechtel Jacobs Company LLC

2/18/09

Date

Concurred By:

Matt Hagenow

Matt Hagenow  
K-25/K-27 D&D Project Environmental Compliance Lead  
Bechtel Jacobs Company LLC

2/12/09

Date

<sup>1</sup>Exemption Criteria:

- (1) Non-Intent Change
- (2) DOE-Approved Document
- (3) Clearly no impact on Nuclear Facilities
- (4) Chief Financial Officer, Internal Audit, Labor Relations, Legal, Public Affairs, or Project Controls Organization Document

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## ACRONYMS

ADP	Anomaly Detection Plan
ARARs	applicable or relevant and appropriate requirements
BJC	Bechtel Jacobs Company LLC
CA	carcinogenic
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CI	criticality incredibility
D&D	decontamination and decommissioning
DBM	Differential Blind Multipliers
DOE	U.S. Department of Energy
DQA	data quality assessment
DQO	Data Quality Objectives
EMWMF	Environmental Management Waste Management Facility
EPA	U.S. Environmental Protection Agency
ETTP	East Tennessee Technology Park
FFA	Federal Facility Agreement
HI	hazard index
LDRs	Land Disposal Restrictions
MOC	material of construction
NCS	Nuclear Criticality Safety
NESHAP	National Emission Standard for Hazardous Air Pollutants
ORR	Oak Ridge Reservation
PBM	Partial Blind Multipliers
PGE	process gas and equipment
QA	Quality Assurance
RCW	recirculation cooling water
SAP	Sampling and Analysis Plan
SOF	sum-of-fractions
TDEC	Tennessee Department of Environment and Conservation
TS	Transportation Specialist
TSCA	Toxic Substance Control Act
UCL <sub>95</sub>	95 <sup>th</sup> percent upper confidence limit
VWSF	volume-weighted sum-of-fractions
WAC	Waste Acceptance Criteria
WAC-AT	WAC Attainment Team
WACFACS	Waste Acceptance Criteria Forecasting Analysis Capability System
WC	Waste Coordinator
WHP	Waste Handling Plan
WL	Waste Lots
WPS	Waste Packaging Specialist
WPXL	waste disposal proxy lot

# **1. INTRODUCTION AND BACKGROUND**

## **1.1 INTRODUCTION**

In 1989, the Oak Ridge Reservation (ORR), which includes the East Tennessee Technology Park (ETTP), was placed on the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) National Priorities List. The Federal Facility Agreement (FFA) (DOE 1992), effective January 1, 1992, now governs environmental restoration activities conducted under CERCLA at the ORR. Following signing of the FFA, U.S. Department of Energy (DOE), U.S. Environmental Protection Agency (EPA), and the state of Tennessee signed the Oak Ridge Accelerated Cleanup Plan Agreement on June 18, 2002. The purpose of this agreement is to define a streamlined decision-making process to facilitate the accelerated implementation of cleanup, resolve ORR milestone issues, and establish future actions necessary to complete the accelerated cleanup plan by the end of fiscal year 2008. While the FFA continues to serve as the overall regulatory framework for remediation, the Accelerated Cleanup Plan Agreement supplements existing requirements to streamline the decision-making process.

Decontamination and decommissioning (D&D) activities of Bldg. K-25, the original gaseous diffusion facility, is being conducted by Bechtel Jacobs Company LLC (BJC) on behalf of the DOE. The planned CERCLA action covering disposal of building structure and remaining components from the K-25 building is scheduled as a non-time-critical CERCLA action as part of DOE's continuous risk reduction strategy for ETTP. The K-25 building is proposed for D&D because of its poor physical condition and the expense of surveillance and maintenance activities.

The K-25/K-27 D&D Project proposes to dispose of the commingled waste listed below from the K-25 west side building structure and remaining components and process gas equipment and piping at the Environmental Management Waste Management Facility (EMWMF) under waste disposal proxy lot (WPXL) 6.999:

- Building structure (e.g. concrete floors [excluding basement slab], roofing, structural steel supports, interior walls, and exterior walls) and support system components including the recirculation cooling water (RCW); electrical; communication; fire protection; ventilation; process coolant; process lube oil; utilities such as steam, water and drain lines;
- Process Piping
- Seal Exhaust Headers
- Seal Exhaust Traps
- Process Valves
- Differential Blind Multipliers (DBM)/Partial Blind Multipliers (PBM)
- Aftercoolers (also known as Intercell coolers)

Converters and compressors while components of the process gas system, are not included in this commingled waste lot.

On January 6, 2009, a meeting was held with EPA, TDEC, DOE and the team for the sole purpose of finalizing the objectives, format, and content of WPXL 6.999. The objective of WPXL 6.999 was to provide a crosswalk to the building structure and the PGE components profiles. This was accomplished by providing tables with references to the specific section of the individual profiles for each of the WLS. There are two building profiles and eight PGE profiles. All of the waste identified in the individual



profiles will be commingled, shipped, and disposed exclusively under WPXL 6.999. The individual profiles were provided to the EPA and Tennessee Department of Environment and Conservation (TDEC) for information purposes only. This summary WPXL 6.999 will be submitted to EPA, TDEC, and DOE for review and approval. The format agreed upon by the regulators and DOE form the basis for WPXL 6.999. The agreed format is found on pages v and vi of the CONTENTS section of this profile.

The disposal of this waste will be executed in accordance with the Action Memorandum for the Decontamination and Decommissioning of the K-25 and K-27 Buildings, East Tennessee Technology Park, Oak Ridge, Tennessee (DOE 2002), Removal Action Work Plan for the K-25 and K-27 Buildings, Process Equipment Removal and Demolition, K-25/K-27 Project, East Tennessee Technology Park, Oak Ridge, Tennessee (DOE 2008a); Waste Handling Plan for Demolition of the K-25 and K-27 Building Structures and Remaining Components Located at the East Tennessee Technology Park, Oak Ridge, Tennessee (DOE 2005); and Waste Handling Plan for Building K-25 West Wing Process Equipment and Piping at the East Tennessee Technology Park, Oak Ridge, Tennessee (DOE 2008b).

## **1.2 BACKGROUND OF WASTE DISPOSAL PROXY LOT 6.999**

The major reason the building debris and remaining components waste will be commingled with the PGE and piping and transported to the EMWMF is due to the demolition approach. The deteriorating condition of the K-25 Building has caused the K-25/K-27 D&D Project team to revise the original planned method of accomplishment. The scope of work described in the *Action Memorandum for the Decontamination and Decommissioning of the K-25 and K-27 Buildings, East Tennessee Technology Park, Oak Ridge, Tennessee*, which essentially is controlled demolition of the K-25 Building to slab, remains the same.

The new approach involves unbolting the motor and compressors prior to demolition to aid in post-demolition retrieval. In addition to the motors and compressors, converters and any other anomalous waste (e.g., vacuum pumps, line recorder stations) will be retrieved from the debris. The remaining debris pile, containing material addressed in approved EMWMF waste lots, will be size reduced and shipped to the EMWMF as a commingled waste lot. The revised demolition approach substituted large quantities of manual labor with heavy demolition equipment.

On December 18, 2007, the K-25/K-27 Process Gas and Equipment, Data Quality Objective, Waste Handling Plan and Profile Team was formed to develop the waste characterization and disposal strategy for the K25 building demolition to support the new approach. The team interfaced with Region IV EPA, TDEC and DOE to develop the *Waste Handling Plan for Building K-25 West Wing Process Equipment and Piping at the East Tennessee Technology Park, Oak Ridge, Tennessee*. This plan included the Data Quality Objectives (DQO), and Sampling and Analysis Plans (SAP). During the DQO process for PGE and piping, the participants (DOE, EPA, TDEC, and BJC) agreed on the commingling of waste from the individual waste lots. Commingling of waste is defined as placing of waste from two or more approved waste lots in the same conveyance for shipment to the EMWMF. Approved waste lots are waste lots that have been approved by the EMWMF Waste Acceptance Criteria (WAC) Attainment Team for disposition at the EMWMF based solely upon the merits of the waste lot itself as described in its associated profile. Commingling of approved waste lots results in what is known as a WPXL Chapter 5 in the PGE WHP provides the methodology behind the commingling concept as approved by EPA, TDEC, DOE and BJC.

The data quality assessment (DQA) found in Appendix G of the respective waste lots' profiles (conducted for each of the individual waste lots' data) confirmed the project's theory that all of the PGE and piping waste could be commingle with the building debris and remaining components waste without causing a negative impact to the EMWMF.

A typical cross section of Building K-25 is shown in Fig. 1. This figure shows the four levels of the building. It provides an excellent visual that emphasizes commingling the waste to limit unnecessary access to the building. For example, to remove some of the process piping in the pipe gallery would require extensive cutting of duct work that could have a negative impact to the structural integrity of the building.

**Fig. 1. Typical Building K-25 cross section**

### 1.3 DEMOLITION APPROACH

Following is a summary of how demolition is planned to take place. Details are contained in the Removal Action Work Plan and Project Execution Plan. Demolition is planned to be complete in fiscal year 2011.

The following pre-demolition activities will be completed and the West Wing will be condemned before demolition activities begin:

- Segment the West Wing structure by removal/air gap of all piping, conduits and structural interfaces (including dismantlement of the northwest bridge structure) to isolate the West Wing demolition area.
- Vent, purge, drain and inspect piping, as needed.
- Remove components exceeding Nuclear Criticality Safety (NCS) criteria for criticality incredibility (CI).
- Remove items selected for off-site disposal as identified on Table 8 for the PGE WHF except where inaccessible on the operating floor. Following demolition the inaccessible items will be removed from the debris piles and disposed off-site.
- Foam process equipment and piping, as required.
- Pre-cut/disconnect piping and equipment to facilitate demolition and segregation, as required.
- Remove hazardous materials except where inaccessible on the operating floor.
- Deactivate all utilities, radiation criticality accident alarm system, fire alarms, fire suppression systems, and communications.
- Declare the West Wing as CI.
- Install temporary bracing, if required.

The sequence of demolition is in Fig. 2. After the northwest bridge is dismantled, the West Wing will be demolished. Demolition currently is planned to start on the south side of unit K-312-3. Other phases will begin later on the north side of unit K-304-1 and in the middle of the West Wing somewhere in the proximity of unit K-305-9. After the middle units are demolished and removed, the demolition effort will turn 90 degrees either to the south or to the north. The actual demolition sequence will be at the discretion of the demolition supervisors and may be different from the planned sequence discussed above.

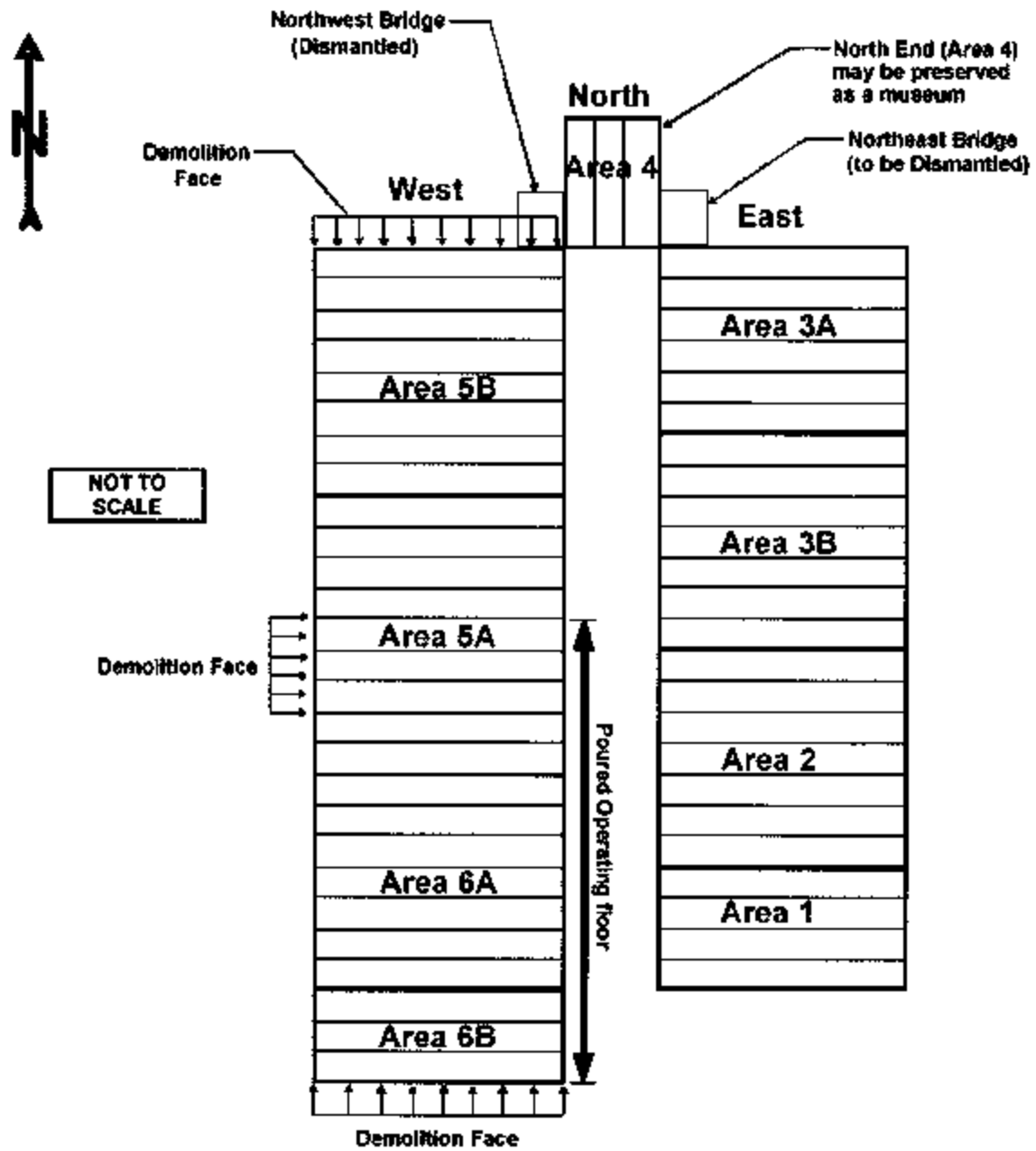


Fig. 2. Planned demolition sequence

The demolition approach is illustrated in Fig. 3. In step 1, a long reach excavator with shearing tool will start at the west end of the building by cutting/crippling the first line of columns, just above the operating floor in one area. This will cause the roof sections to hinge at the second line of columns and the front edge to collapse and fall to the operating floor. The excavator with shear will then cut the beams attached at the "hinge" on the back side of the roof. The "hinge" side of roof sections will collapse and fall to the operating floor. The excavator with shear will then cut/cripple the first line of columns just above the pipe gallery level. This will cause operating floor sections to hinge at the second line of columns and the front edge to collapse and fall to the pipe gallery level. The excavator with shear will then cut the beams attached at the "hinge" on the back side of the operating floor. The "hinge" side of the operating floor sections will collapse and fall to the pipe gallery level with the roof sections riding piggy back.

The excavator with shear will then cut/cripple the first line of columns just above the cell floor level. This will cause the pipe gallery floor sections and piping to hinge at the second line of columns and the front edge to collapse and fall to the cell floor or withdrawal alley level. The excavator with shear will then cut the beams attached at the "hinge" on the back side of the pipe gallery floor. The "hinge" side of the pipe gallery floor sections will collapse and fall to the cell floor or withdrawal alley level, with the roof, operating floor and piping riding piggy back. The collapsed floors will fall on top of any converters, compressors and motors remaining at the cell floor level. The excavator with shear will move laterally to the east to the next area of the side of the building and repeat the same process over again.

It is possible that during step 1, the impact of the collapsing floors can cause beam connections of the impacted floors to prematurely shear off or steel columns to buckle. In this case, these sections could fall on top of the converters and compressors.

In step 2, the straight-stick equipment with concrete processor will follow behind the area collapsed by the excavator with shear and crush the first line of concrete columns. This will cause the concrete beams and floor slabs of the withdrawal alley or cell floor to hinge at the second line of columns and the front edge to collapse and fall to the vault level below. The roof, operating floor, piping, pipe gallery and converters/compressors will piggyback on the concrete slab as it hinges and falls to the vault level. The concrete processor will then move to the next area completed by the excavator with shear.

In step 3, the straight shear, and grapple equipment will follow behind the concrete processor, and begin cutting, sorting and removing the collapsed floors and piping for loading into trucks. The rubber-tired loaders with grapples will load the structural steel and piping into trucks for disposal. When the converters, compressors and motors are uncovered in the scrap pile, they will be picked out with a grapple, set aside, and then subsequently removed. Anomaly detection efforts will locate other items of concern to be removed from the debris piles.

In step 4, the concrete processing equipment will follow behind the straight shear and grapple equipment, crushing and rubblizing the hinged concrete slabs and beams. The exposed reinforcing bars will be removed and sorted for disposal. The transformers lying beneath the concrete rubble will be extracted with a grapple and loaded into trucks for disposal...

Converters and compressors will be removed from the debris piles, segregated, loaded onto trucks, and shipped separately for disposal. Items identified for off-site disposal that were inaccessible for removal prior to demolition also will be removed from the debris piles, segregated, loaded onto trucks, and shipped for off-site disposal. As stated previously, these items will be identified and marked to the extent practicable.

Mercury switches, mercury traps, line recorder stations, vacuum pumps with oil, and chemical traps that were inaccessible prior to demolition may be segregated from the building during demolition or

segregated from the debris piles after demolition for disposal off-site. There is no guarantee that all of the hazardous material remaining on the operating floor will or can be segregated during or after demolition and disposal. The quantity of each hazardous stream was reviewed to ensure that EMWMF WAC and applicable or relevant and all appropriate requirements (ARARs) were met. Mass balancing was used as appropriate to demonstrate compliance.

PGE, process piping, and the building structure are addressed in separate WHPs and in different EMWMF waste lots. Each waste lot will have its own waste profile. However, the above demolition approach will cause these waste lots to commingle for the purpose of transport to EMWMF. The approach for commingling EMWMF waste lots is discussed in Chapter 5.

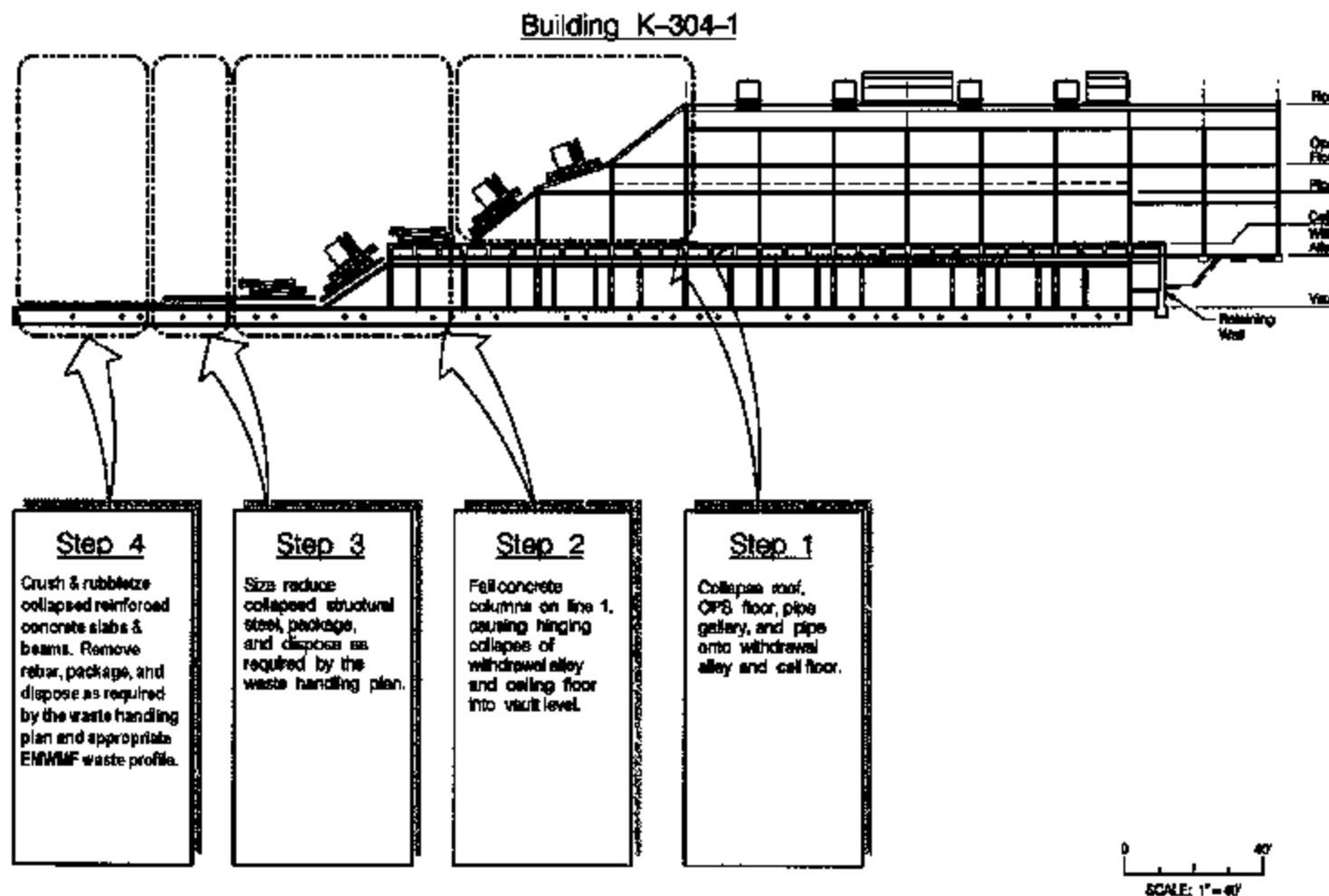


Fig. 3. Demolition approach



## 1.4 PROXY WASTE LOT IDENTIFICATION

Table 1 identifies the individual waste lots ranked by upper confidence limit (UCL)-95 carcinogen (CA) and UCL-95 hazard index (HI) sum-of-fractions (SOF). The waste associated with these waste lots will be commingled to form the WPXL 6.999. Waste associated with process piping group I (waste lot [WL] 6.34) received the highest ranking of 1 and waste associated with the demolition debris, including non-process equipment and piping group II (WL 6.33), received the lowest ranking of 10. WL 6.47 was ranked above WL 6.33 because its HI SOF was lower than WL 6.47. The methodology used by WAC Attainment Team to track the volumes of individual waste lots being placed into the EMWMF as commingled waste is described in Chapter 5, "Physical WAC Compliance."

**Table 1. Individual waste lots ranking by UCL-95 CA and UCL-95 HI SOF information**

Ranking	WACFACS WL ID	Ten WL to be included in WPXL 6.999	PGE	WL UCL-95 Volume (CY)	WL UCL-95 CA SOF	WL UCL-95 HI SOF
1	6.34	K-25 West Side Process Pipe Group II	Y	40.28	101.90	1.10
2	6.35	K-25 West Side DBM/PBM Group I	Y	71.20	8.10	0.92
3	6.45	K-25 West Side Seal Exhaust Traps Group I	Y	2.28	7.65	2.10
4	6.48	K-25 West Side Valves Group II (K- 312)	Y	88.18	6.17	0.24
5	6.46	K-25 West Side Seal Exhaust Headers Group I	Y	17.96	5.99	0.10
6	6.32	K-25 West Side Process Pipe Group I	Y	2,375.35	2.36	0.15
7	6.38	K-25 West Side Valves Group I (K- 304, K-305, K-306)	Y	1,016.00	0.54	0.07
8	6.39	K-25 West Side Aftercoolers Group I	Y	132.81	0.11	0.03
9	6.47	K-25 West Side Demolition Debris including non-process equipment Group II (Lavatory Sink Drain Lines)	N	13.00	0.008	2.86
10	6.33	K-25 West Side Demolition Debris including non-process equipment Group I	N	160,139.00	0.15	0.36

A brief description of the waste associated with each of the waste lots is provided below:

- WL 6.32 – Process piping used to interconnect the gaseous diffusion equipment ranged from < 1 to 16 in. in diameter. There approximately 30 different types of pipe and the majority are located on the cell floor. The fluorine pipe is an 8-in diameter fluorine disposal header.
- WL 6.34 – Process piping and tubing ranging from 5/8 inches to < 6 inches.

- WL 6.35 – The DBM/ PBM were used extensively throughout the PGE system as the primary measuring element in stage control and other auxiliary automatic control systems.
- WL 6.38 – Valves from K-304, K-305 and K-306. The valves were used to control and regulate the flow of process gas.
- WL 6.39 – Aftercoolers were used to remove the heat of compression from the process gas stream caused by pressurization of the process gas in the compressors.
- WL 6.45 – Seal Exhaust Traps are part of the seal exhaust system. Their function was to absorb  $UF_6$  or HF in the gas.
- WL 6.46 – Seal Exhaust Headers are part of the seal exhaust system. The headers are the inlet of the Seal Exhaust Traps.
- WL 6.48 – Valves from K-312. The valves were used to control and regulate the flow of process gas.
- WL 6.33 – Building structure (e.g. concrete floors [excluding basement slab], roofing, structural steel supports, interior walls, and exterior walls) and support system components including the recirculation cooling water (RCW); electrical; communication; fire protection; ventilation; process coolant.
- WL 6.47 – Lavatory sink drain lines located in the K-25 West Wing.

## 2. ADMINISTRATIVE WAC COMPLIANCE

### 2.1 CERCLA ACTION

The waste associated with Proxy Waste Lot 6.999 was generated as part of a CERCLA removal action. The relevant CERCLA documentation for this waste is listed below:

- *Action Memorandum for the Decontamination and Decommissioning of the K-25 and K-27 Buildings, East Tennessee Technology Park, Oak Ridge, Tennessee, DOE/OR/01-1988&D2*
- *Engineering Evaluation/Cost Analysis for the Decontamination and Decommissioning of the K-25 and K-27 Buildings at the East Tennessee Technology Park, Oak Ridge, Tennessee, DOE/OR/01-1917&D3*
- *Notification of Non-Significant Change to the Action Memorandum for the Decontamination and Decommissioning of the K-25 and K-27 Buildings, East Tennessee Technology Park, Oak Ridge, Tennessee, DOE/OR/01-2259&D1*
- *Removal Action Work Plan for the K-25 and K-27 Buildings Process Equipment Removal and Demolition, K-25/K-27 D&D Project, East Tennessee Technology Park, Oak Ridge, Tennessee, DOE/OR/01-2140&D4*
- *Waste Handling Plan for Building K-25 West Wing Process Equipment and Piping at the East Tennessee Technology Park, Oak Ridge, Tennessee, DOE/OR/01-2374&D2*
- *Waste Handling Plan for Demolition of the K-25 and K-27 Building Structures and Remaining Components Located at the East Tennessee Technology Park, Oak Ridge, Tennessee, DOE/OR/01-2167&D1*

### 2.2 PROHIBITED WASTE TYPES

This waste lot does not contain prohibited waste types. Supporting documentation is found in each individual waste profile as shown in Table 2.

Table 2. Prohibited waste types

Waste Lot Number	Waste Lot Name	Section	Page Number
6.32	K-25 West Side Process Piping Group I	2.2	7
6.33	K-25 West Side Demolition Debris including non-process equipment and piping Group I	2.2	7
6.34	K-25 West Side Process Piping Group II	2.2	7
6.35	K-25 West Side DBM/PBM	2.2	5
6.38	K-25 West Side Valves Group I (K-304, K-305, K-306)	2.2	5
6.39	K-25 West Side Aftercoolers	2.2	4
6.45	K-25 West Side Seal Exhaust Traps	2.2	5
6.46	K-25 West Side Seal Exhaust Headers	2.2	5
6.47	K-25 West Side Demolition Debris including non-process equipment and piping Group II (Lavatory Sink Drain Lines)	2.2	6
6.48	K-25 West Side Valves Group II (K-312)	2.2	5

## 2.3 PROHIBITION OF FREE LIQUIDS

The waste in this waste lot does not contain free liquids. Supporting documentation is found in each individual waste profile as shown in Table 3.

Table 3. Prohibition of free liquids

Waste Lot Number	Waste Lot Name	Section	Page Number
6.32	K-25 West Side Process Piping Group I	2.3	7
6.33	K-25 West Side Demolition Debris including non-process equipment and piping Group I	2.3	7
6.34	K-25 West Side Process Piping Group II	2.3	7
6.35	K-25 West Side DBM/PBM	2.3	5
6.38	K-25 West Side Valves Group I (K-304, K-305, K-306)	2.3	5
6.39	K-25 West Side Aftercooler	2.3	4
6.45	K-25 West Side Seal Exhaust Traps	2.3	5
6.46	K-25 West Side Seal Exhaust Headers	2.3	5
6.47	K-25 West Side Demolition Debris including non-process equipment and piping Group II (Lavatory Sink Drain Lines)	2.3	6
6.48	K-25 West Side Valves Group II (K-312)	2.3	5

## 2.4 RCRA LAND DISPOSAL RESTRICTIONS

This waste in this waste lot meets the RCRA land disposal restrictions. Details of compliance with RCRA Land Disposal Restrictions are in Appendix D.

### 2.4.1 Characteristics of Ignitability

The waste in this waste lot does not exhibit the characteristics of ignitability. Supporting documentation is found in each individual waste profile as shown in Table 4.

Table 4. Characteristics of ignitability

Waste Lot Number	Waste Lot Name	Section	Page Number
6.32	K-25 West Side Process Piping Group I	2.4.1	8
6.33	K-25 West Side Demolition Debris including non-process equipment and piping Group I	2.4.1	8
6.34	K-25 West Side Process Piping Group II	2.4.1	8
6.35	K-25 West Side DBM/PBM	2.4.1	6
6.38	K-25 West Side Valves Group I (K-304, K-305, K-306)	2.4.1	6
6.39	K-25 West Side Aftercoolers	2.4.1	5
6.45	K-25 West Side Seal Exhaust Traps	2.4.1	6
6.46	K-25 West Side Seal Exhaust Headers	2.4.1	6

6.47	K-25 West Side Demolition Debris including non-process equipment and piping Group II (Lavatory Sink Drain Lines)	2.4.1	7
6.48	K-25 West Side Valves Group II (K-312)	2.4.1	6

#### 2.4.2 Characteristics of Corrosivity

The waste in this waste lot does not exhibit the characteristics of corrosivity. Supporting documentation is found in each individual waste profile as shown in Table 5.

**Table 5. Characteristics of corrosivity**

Waste Lot Number	Waste Lot Name	Section	Page Number
6.32	K-25 West Side Process Piping Group I	2.4.2	8
6.33	K-25 West Side Demolition Debris including non-process equipment and piping Group I	2.4.2	8
6.34	K-25 West Side Process Piping Group II	2.4.2	8
6.35	K-25 West Side DBM/PBM	2.4.2	6
6.38	K-25 West Side Valves Group I (K-304, K-305, K-306)	2.4.2	6
6.39	K-25 West Side Aftercoolers	2.4.2	5
6.45	K-25 West Side Seal Exhaust Traps	2.4.2	6
6.46	K-25 West Side Seal Exhaust Headers	2.4.2	6
6.47	K-25 West Side Demolition Debris including non-process equipment and piping Group II (Lavatory Sink Drain Lines)	2.4.2	7
6.48	K-25 West Side Valves Group II (K-312)	2.4.2	6

#### 2.4.3 Characteristics of Reactivity

The waste in this waste lot does not exhibit the characteristics of reactivity. Supporting documentation is found in each individual waste profile as shown in Table 6.

**Table 6. Characteristics of reactivity**

Waste Lot Number	Waste Lot Name	Section	Page Number
6.32	K-25 West Side Process Piping Group I	2.4.3	8
6.33	K-25 West Side Demolition Debris including non-process equipment and piping Group I	2.4.3	8
6.34	K-25 West Side Process Piping Group II	2.4.3	8
6.35	K-25 West Side DBM/PBM	2.4.3	6
6.38	K-25 West Side Valves Group I (K-304, K-305, K-306)	2.4.3	6
6.39	K-25 West Side Aftercoolers	2.4.3	5
6.45	K-25 West Side Seal Exhaust Traps	2.4.3	6

6.46	K-25 West Side Seal Exhaust Headers	2.4.3	6
6.47	K-25 West Side Demolition Debris including non-process equipment and piping Group II (Lavatory Sink Drain Lines)	2.4.3	7
6.48	K-25 West Side Valves Group II (K-312)	2.4.3	6

#### 2.4.4 Characteristics of Toxicity

The waste in this waste lot does not exhibit the characteristics of toxicity. Supporting documentation is found in each individual waste profile as shown in Table 7.

**Table 7. Characteristics of toxicity**

Waste Lot Number	Waste Lot Name	Section	Page Number
6.32	K-25 West Side Process Piping Group I	2.4.4	8
6.33	K-25 West Side Demolition Debris including non-process equipment and piping Group I	2.4.4	8
6.34	K-25 West Side Process Piping Group II	2.4.4	8
6.35	K-25 West Side DBM/PBM	2.4.4	6
6.38	K-25 West Side Valves Group I (K-304, K-305, K-306)	2.4.4	7
6.39	K-25 West Side Aftercoolers	2.4.4	6
6.45	K-25 West Side Seal Exhaust Traps	2.4.4	6
6.46	K-25 West Side Seal Exhaust Headers	2.4.4	6
6.47	K-25 West Side Demolition Debris including non-process equipment and piping Group II (Lavatory Sink Drain Lines)	2.4.4	7
6.48	K-25 West Side Valves Group II (K-312)	2.4.4	7

## 2.5 TSCA LAND DISPOSAL RESTRICTIONS

The waste in this waste lot meets the TSCA land disposal restrictions requirements. Details of compliance with TSCA Land Disposal Restrictions (LDRs) are in Appendix D.

## 2.6 INFECTIOUS WASTES PROHIBITION

The waste in this waste lot is not infectious. Infectious waste is discussed in each individual waste profile as shown in Table 8.

**Table 8. Infectious waste**

Waste Lot Number	Waste Lot Name	Section	Page Number
6.32	K-25 West Side Process Piping Group I	2.6	9
6.33	K-25 West Side Demolition Debris including non-process equipment and piping Group I	2.6	10
6.34	K-25 West Side Process Piping Group II	2.6	9

6.35	K-25 West Side DBM/PBM	2.6	7
6.38	K-25 West Side Valves Group I (K-304, K-305, K-306)	2.6	7
6.39	K-25 West Side Aftercoolers	2.6	7
6.45	K-25 West Side Seal Exhaust Traps	2.6	7
6.46	K-25 West Side Seal Exhaust Headers	2.6	7
6.47	K-25 West Side Demolition Debris including non-process equipment and piping Group II (Lavatory Sink Drain Lines)	2.6	9
6.48	K-25 West Side Valves Group II (K-312)	2.6	7

## 2.7 PYROPHORIC MATERIALS PROHIBITION

The waste in this waste lot is not pyrophoric. Supporting documentation is found in each individual waste profile as shown in Table 9.

**Table 9. Pyrophoric materials**

Waste Lot Number	Waste Lot Name	Section	Page Number
6.32	K-25 West Side Process Piping Group I	2.7	9
6.33	K-25 West Side Demolition Debris including non-process equipment and piping Group I	2.7	10
6.34	K-25 West Side Process Piping Group II	2.7	9
6.35	K-25 West Side DBM/PBM	2.7	7
6.38	K-25 West Side Valves Group I (K-304, K-305, K-306)	2.7	7
6.39	K-25 West Side Aftercoolers	2.7	7
6.45	K-25 West Side Seal Exhaust Traps	2.7	7
6.46	K-25 West Side Seal Exhaust Headers	2.7	7
6.47	K-25 West Side Demolition Debris including non-process equipment and piping Group II (Lavatory Sink Drain Lines)	2.7	9
6.48	K-25 West Side Valves Group II (K-312)	2.7	9

## 2.8 EXCLUSION OF WASTES CAPABLE OF DETONATION OR EXPLOSIVE DECOMPOSITION

The waste in this waste lot is not capable of detonation or explosion. Supporting documentation is found in each individual waste profile as shown in Table 10.

**Table 10. Wastes capable of detonation or explosion**

Waste Lot Number	Waste Lot Name	Section	Page Number
6.32	K-25 West Side Process Piping Group I	2.8	9
6.33	K-25 West Side Demolition Debris including non-process equipment and piping Group I	2.8	10

6.34	K-25 West Side Process Piping Group II	2.8	9
6.35	K-25 West Side DBM/PBM	2.8	7
6.38	K-25 West Side Valves Group I (K-304, K-305, K-306)	2.8	7
6.39	K-25 West Side Aftercoolers	2.8	7
6.45	K-25 West Side Seal Exhaust Traps	2.8	7
6.46	K-25 West Side Seal Exhaust Headers	2.8	7
6.47	K-25 West Side Demolition Debris including non-process equipment and piping Group II (Lavatory Sink Drain Lines)	2.8	9
6.48	K-25 West Side Valves Group II (K-312)	2.8	7

## 2.9 TOXIC GASES, VAPORS, OR FUMES PROHIBITION

The waste in this waste lot is not capable of generating toxic gases, vapors or fumes. Supporting documentation is found in each individual waste profile as shown in Table 11.

Table 11. Toxic gases, vapors, or fumes

Waste Lot Number	Waste Lot Name	Section	Page Number
6.32	K-25 West Side Process Piping Group I	2.9	9
6.33	K-25 West Side Demolition Debris including non-process equipment and piping Group I	2.9	11
6.34	K-25 West Side Process Piping Group II	2.9	9
6.35	K-25 West Side DBM/PBM	2.9	7
6.38	K-25 West Side Valves Group I (K-304, K-305, K-306)	2.9	7
6.39	K-25 West Side Aftercoolers	2.9	8
6.45	K-25 West Side Seal Exhaust Traps	2.9	7
6.46	K-25 West Side Seal Exhaust Headers	2.9	7
6.47	K-25 West Side Demolition Debris including non-process equipment and piping Group II (Lavatory Sink Drain Lines)	2.9	9
6.48	K-25 West Side Valves Group II (K-312)	2.9	7

## 2.10 STRUCTURAL STABILITY DETERMINATION

All waste in this waste lot will be able to be processed with heavy equipment to achieve stability. Supporting documentation is found in each individual waste profile as shown in Table 12.

Table 12. Structural stability

Waste Lot Number	Waste Lot Name	Section	Page Number
6.32	K-25 West Side Process Piping Group I	2.10	9
6.33	K-25 West Side Demolition Debris including non-process equipment and piping Group I	2.10	11
6.34	K-25 West Side Process Piping Group II	2.10	9



6.35	K-25 West Side DBM/PBM	2.10	7
6.38	K-25 West Side Valves Group I (K-304, K-305, K-306)	2.10	9
6.39	K-25 West Side Aftercoolers	2.10	8
6.45	K-25 West Side Seal Exhaust Traps	2.10	8
6.46	K-25 West Side Seal Exhaust Headers	2.10	8
6.47	K-25 West Side Demolition Debris including non-process equipment and piping Group II (Lavatory Sink Drain Lines)	2.10	9
6.48	K-25 West Side Valves Group II (K-312)	2.10	8

## 2.11 VOID SPACE REQUIREMENTS

The waste in this waste lot will meet the void space requirements as listed in Table A.3 of the EMWMF Administrative WAC. Supporting documentation is found in each individual waste profile as shown in Table 13.

**Table 13. Void space requirements**

Waste Lot Number	Waste Lot Name	Section	Page Number
6.32	K-25 West Side Process Piping Group I	2.11	10
6.33	K-25 West Side Demolition Debris including non-process equipment and piping Group I	2.11	11
6.34	K-25 West Side Process Piping Group II	2.11	8
6.35	K-25 West Side DBM/PBM	2.11	7
6.38	K-25 West Side Valves Group I (K-304, K-305, K-306)	2.11	9
6.39	K-25 West Side Aftercoolers	2.11	8
6.45	K-25 West Side Seal Exhaust Traps	2.11	8
6.46	K-25 West Side Seal Exhaust Headers	2.11	8
6.47	K-25 West Side Demolition Debris including non-process equipment and piping Group II (Lavatory Sink Drain Lines)	2.11	9
6.48	K-25 West Side Valves Group II (K-312)	2.11	8

## 2.12 CONTAINER VOID SPACE REQUIREMENTS

The waste in this waste lot will meet the container void space requirements. Supporting documentation is found in each individual waste profile as shown in Table 14.

**Table 14. Container void space requirements**

Waste Lot Number	Waste Lot Name	Section	Page Number
6.32	K-25 West Side Process Piping Group I	2.12	10

6.33	K-25 West Side Demolition Debris including non-process equipment and piping Group I	2.12	11
6.34	K-25 West Side Process Piping Group II	2.12	10
6.35	K-25 West Side DBM/PBM	2.12	8
6.38	K-25 West Side Valves Group I (K-304, K-305, K-306)	2.12	9
6.39	K-25 West Side Aftercoolers	2.12	8
6.45	K-25 West Side Seal Exhaust Traps	2.12	8
6.46	K-25 West Side Seal Exhaust Headers	2.12	8
6.47	K-25 West Side Demolition Debris including non-process equipment and piping Group II (Lavatory Sink Drain Lines)	2.12	10
6.48	K-25 West Side Valves Group II (K-312)	2.12	8

### 2.13 AVERAGE TOTAL URANIUM LIMITS

The waste in this proxy waste lot will not have an adverse impact to the overall average uranium concentration of the EMWMF. The documentation showing the contribution of each individual profile to the average total uranium limit can be found in Table 15 below.

**Table 15. Average total uranium limits**

Waste Lot Number	Waste Lot Name	Section	Page Number
6.32	K-25 West Side Process Piping Group I	2.13	10
6.33	K-25 West Side Demolition Debris including non-process equipment and piping Group I	2.13	12
6.34	K-25 West Side Process Piping Group II	2.13	10
6.35	K-25 West Side DBM/PBM	2.13	8
6.38	K-25 West Side Valves Group I (K-304, K-305, K-306)	2.13	8
6.39	K-25 West Side Aftercoolers	2.13	8
6.45	K-25 West Side Seal Exhaust Traps	2.13	8
6.46	K-25 West Side Seal Exhaust Headers	2.13	8
6.47	K-25 West Side Demolition Debris including non-process equipment and piping Group II (Lavatory Sink Drain Lines)	2.13	10
6.48	K-25 West Side Valves Group II (K-312)	2.13	8

### 2.14 CRITICALITY SAFETY EVALUATION

The disposal of waste in this waste lot is addressed in NCSD-ET-K25-0129. A copy of the signed cover sheet is attached to Appendix K. The waste meets the CI requirements in the NCSD. Criticality safety evaluation is discussed in each individual waste profile as shown in Table 16.

**Table 16. Criticality safety evaluation**

<b>Waste Lot Number</b>	<b>Waste Lot Name</b>	<b>Section</b>	<b>Page Number</b>
6.32	K-25 West Side Process Piping Group I	2.14	11
6.33	K-25 West Side Demolition Debris including non-process equipment and piping Group I	2.14	12
6.34	K-25 West Side Process Piping Group II	2.14	11
6.35	K-25 West Side DBM/PBM	2.14	9
6.38	K-25 West Side Valves Group I (K-304, K-305, K-306)	2.14	9
6.39	K-25 West Side Aftercoolers	2.14	8
6.45	K-25 West Side Seal Exhaust Traps	2.14	9
6.46	K-25 West Side Seal Exhaust Headers	2.14	9
6.47	K-25 West Side Demolition Debris including non-process equipment and piping Group II (Lavatory Sink Drain Lines)	2.14	10
6.48	K-25 West Side Valves Group II (K-312)	2.14	9

## **2.15 TDEC CLASS C WASTE LIMITATIONS**

The waste in this waste lot is classed as TDEC Class A waste. TDEC Class C waste limitations are discussed in each individual waste profile as shown in Table 17.

**Table 17. Toxic gases, vapors, or fumes**

<b>Waste Lot Number</b>	<b>Waste Lot Name</b>	<b>Section</b>	<b>Page Number</b>
6.32	K-25 West Side Process Piping Group I	2.15	11
6.33	K-25 West Side Demolition Debris including non-process equipment and piping Group I	2.15	12
6.34	K-25 West Side Process Piping Group II	2.15	11
6.35	K-25 West Side DBM/PBM	2.15	9
6.38	K-25 West Side Valves Group I (K-304, K-305, K-306)	2.15	9
6.39	K-25 West Side Aftercoolers	2.15	8
6.45	K-25 West Side Seal Exhaust Traps	2.15	9
6.46	K-25 West Side Seal Exhaust Headers	2.15	9
6.47	K-25 West Side Demolition Debris including non-process equipment and piping Group II (Lavatory Sink Drain Lines)	2.15	10
6.48	K-25 West Side Valves Group II (K-312)	2.15	9

### 3. ANALYTIC WAC COMPLIANCE

#### 3.1 CARCINOGENIC WAC SITE-RELATED CONTAMINANTS

Carcinogenic WAC site-related contaminants are discussed in each individual waste profile as shown in Table 18.

Table 18. Carcinogenic WAC site-related contaminants

Waste Lot Number	Waste Lot Name	Section	Page Number
6.32	K-25 West Side Process Piping Group I	3.1	14
6.33	K-25 West Side Demolition Debris including non-process equipment and piping Group I	3.1	15
6.34	K-25 West Side Process Piping Group II	3.1	15
6.35	K-25 West Side DBM/PBM	3.1	12
6.38	K-25 West Side Valves Group I (K-304, K-305, K-306)	3.1	11
6.39	K-25 West Side Aftercoolers	3.1	10
6.45	K-25 West Side Seal Exhaust Traps	3.1	12
6.46	K-25 West Side Seal Exhaust Headers	3.1	12
6.47	K-25 West Side Demolition Debris including non-process equipment and piping Group II (Lavatory Sink Drain Lines)	3.1	13
6.48	K-25 West Side Valves Group II (K-312)	3.1	11

### 3.2 HAZARD INDEX WAC SITE-RELATED CONTAMINANTS

HI WAC site-related contaminants are discussed in each individual waste profile as shown in Table 19.

**Table 19. HI WAC site-related contaminants.**

Waste Lot Number	Waste Lot Name	Section	Page Number
6.32	K-25 West Side Process Piping Group I	3.2	15
6.33	K-25 West Side Demolition Debris including non-process equipment and piping Group I	3.2	16
6.34	K-25 West Side Process Piping Group II	3.2	15
6.35	K-25 West Side DBM/PBM	3.2	12
6.38	K-25 West Side Valves Group I (K-304, K-305, K-306)	3.2	12
6.39	K-25 West Side Aftercoolers	3.2	10
6.45	K-25 West Side Seal Exhaust Traps	3.2	13
6.46	K-25 West Side Seal Exhaust Headers	3.2	13
6.47	K-25 West Side Demolition Debris including non-process equipment and piping Group II (Lavatory Sink Drain Lines)	3.2	14
6.48	K-25 West Side Valves Group II (K-312)	3.2	12

### 3.3 CARCINOGENIC SOF AND WAC 3-YEAR VWSF COMPLIANCE

Compliance with the carcinogenic (CA) SOF and WAC 3-Year VWSF is determined by the WAC Attainment Team. Appendix H contains a table which lists the following information for each of the individual waste lot profiles:

Modifications to the WL accounting system used to calculate the VWSF were made by the WAC Attainment Team to address the waste volume tracking for the proxy waste lot 6.999. An additional module has been added to WACFACS to allocate WL 6.999 volumes into each of the approved waste lots.

### 3.4 HAZARD INDEX SUM-OF-FRACTIONS AND WAC 3-YEAR VWSF COMPLIANCE

Compliance with the Hazard Index SOF and WAC 3-Year VWSF is determined by the WAC Attainment Team. Appendix H contains Table H.1, which lists the following information for each of the individual waste lot profiles:

Modifications to the WL accounting system used to calculate the VWSF were made by the WAC-AT to address the waste volume tracking for the proxy waste lot 6.999. An additional module has been added to WACFACS to allocate WL 6.999 volumes into each of the approved WLs.

#### 4. ASA-DERIVED WAC COMPLIANCE

The ASA radiological SOF is discussed for each individual waste lot as shown in Table 20.

**Table 20. ASA radiological SOF**

Waste Lot Number	Waste Lot Name	Section	Page Number
6.32	K-25 West Side Process Piping Group I	4.1	17
6.33	K-25 West Side Demolition Debris including non-process equipment and piping Group I	4.1	17
6.34	K-25 West Side Process Piping Group II	4.1	17
6.35	K-25 West Side DBM/PBM	4.1	15
6.38	K-25 West Side Valves Group I (K-304, K-305, K-306)	4.1	14
6.39	K-25 West Side Aftercoolers	4.1	13
6.45	K-25 West Side Seal Exhaust Traps	4.1	15
6.46	K-25 West Side Seal Exhaust Headers	4.0	15
6.47	K-25 West Side Demolition Debris including non-process equipment and piping Group II (Lavatory Sink Drain Lines)	4.1	16
6.48	K-25 West Side Valves Group II (K-312)	4.1	13

Waste Lot 6.34 Process Gas and Equipment Piping II have the most restrictive ASA SOF of all the individual waste lots and will be used for this proxy waste lot. The ASA SOF for the proxy waste lot is in Table 21. The effective ASA SOF is 1% of the contamination that is considered dispersible for this WL.

**Table 21. Maximum Radiological ASA sum of fractions for proxy waste lot from WL6.34**

Isotope	UCL <sub>95</sub> Concentration (pCi/g)	ASA WAC Concentration (pCi/g)	ASA SOF (UCL <sub>95</sub> /WAC)
U-234	1.00E+05	1.73E+05	1.73E+00
U-235	1.00E+05	6.43E+03	6.43E-02
U-238	1.00E+05	1.02E+3	1.02E-02
		Total	1.81E+00

**Effective ASA SOF 1.81E-02**

## **5. PHYSICAL WAC COMPLIANCE**

### **5.1 WASTE ACTIVITY ESTIMATES FOR COMMINGLED WASTE LOTS FOR ON-SITE DEPARTMENT OF TRANSPORTATION COMPLIANCE**

In order to demonstrate compliance with applicable Department of Energy Transportation Orders, Transportation Safety Documents and Transportation Documented Safety Analyses during waste shipments to the EMWMF, total activities must be assigned to individual waste shipments. Therefore, a single total activity for all waste shipments delivered under a waste tracking number associated with the commingled WLs, e.g., 6.999, will be used for all on-site shipping. The commingled debris piles that result during building demolition will be reviewed by Engineering to determine a reasonable percentage of each WL within those piles, e.g., 50% building structure and 50% piping. This calculated percentage then will be applied as a weighted average to the prevailing profiled radionuclide distributions (in pCi/g). These weighted average values will then be rolled up to obtain an overall radionuclide total activity.

### **5.2 VARIANCE REQUIREMENTS**

Appendix I contains the variances for this waste lot profile.

#### **5.2.1 Container Requirements**

A variance is not required; the EMWMF WAC container requirements will be met.

#### **5.2.2 Size Requirements**

A variance is not required; the waste will be sent in compliance with the EMWMF WAC. All waste items will be sized-reduced to meet the WAC requirement.

#### **5.2.3 Weight Requirements**

A variance is not required; the waste items will weigh less than 24,000 pounds.

#### **5.2.4 Concrete Debris Requirements**

The concrete debris will be sent in compliance with the EMWMF WAC, which states that concrete debris will be reduced to rubble with a maximum dimension of 1 foot or cut into large blocks (with rebar cut as flush as possible) capable of direct placement in the cell.

#### **5.2.5 Steel Plate Requirements**

Steel plate will be sent in compliance with the EMWMF WAC.

#### **5.2.6 Pipe Requirements**

Pipes will be sent in accordance with the EMWMF pipe requirements or approved EMWMF variance EMWMF-BV-07-01, EMWMF-VR-127, and EMWMF-VR-136 and EMWMF-VR-139. The approved variance is included in Appendix I.

#### **5.2.7 Asbestos and Beryllium Dust Containing Waste Requirements**

Asbestos-containing material (ACM) will be sent in accordance with EMWMF-VR-140. In addition, a small amount of transite which was located on the inaccessible areas will be packaged in accordance with EMWMF-VR-138.

No variance is required for Beryllium Dust because the waste does not contain beryllium.

#### **5.2.8 Miscellaneous Debris Requirements**

The EMWMF miscellaneous debris requirements will be met.

#### **5.2.9 Containerized Compactable Waste**

Containerized waste associated with this waste lot will consist of soft-sided containers containing ACM and asbestos contaminated debris. These containers will be delivered for bulk placement by dumping from dump trucks. The EMWMF WAC will be met.

#### **5.2.10 Rebar Requirements**

Rebar will be sent in accordance with variance request EMWMF-VR-137 which allows rebar to be cut into 4 ft or less length and commingled with building debris.

#### **5.2.11 Noncrushable Container Requirements**

Noncrushable containers are not a part of this waste lot.

#### **5.2.12 Container Liner Requirements**

Physical WAC blanket variance EMWMF-BV-13-01 will be used to gain relief from the container liner requirement. However, if waste appears to have fugitive dust, liners or plastic will be placed in the container and cover the waste.

#### **5.2.13 Dose Rate Requirements**

Dose rate requirements will be met.



## 6. CERCLA AND OTHER DOCUMENTATION

This waste was generated as part of a CERCLA removal action. The relevant CERCLA documentation is listed below:

- *Action Memorandum for the Decontamination and Decommissioning of the K-25 and K-27 Buildings, East Tennessee Technology Park, Oak Ridge, Tennessee, DOE/OR/01-1988&D2*
- *Waste Handling Plan for Building K-25 West Wing Process Equipment and Piping at the East Tennessee Technology Park, Oak Ridge, Tennessee, DOE/OR/01-2374&D2*
- *Waste Handling Plan for Demolition of the K-25 and K-27 Building Structures and Remaining Components Located at the East Tennessee Technology Park, Oak Ridge, Tennessee, DOE/OR/01-2167&D1*

**APPENDIX A.**  
**WASTE ANOMALY DETECTION PLAN AND CHECKLIST**

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## **A.1 ANOMALY DETECTION PLAN FOR THE WEST WING OF K-25**

### **A.1.1 INTRODUCTION**

This Anomaly Detection Plan (ADP) describes project personnel responsibilities and training requirements and identifies what actions the K-25/K-27 Decontamination and Demolition (D&D) Project will conduct to ensure no anomalous waste from the K-25/K-27 west side demolition project is sent to the Environmental Management Waste Management Facility (EMWMF). This plan also describes the process the K-25/K-27 D&D Project will follow in the unlikely event that anomalous waste is shipped to EMWMF for disposal. Any suspect or identified anomalous waste will be segregated, managed separately, and reviewed by trained project personnel with consultation from the EMWMF Waste Acceptance Criteria (WAC) Attainment Team as needed.

The waste included in this waste lot from the K-25 west side is:

- Process pipe
- Seal Exhaust Headers
- Seal Exhaust Traps
- Process Valves
- Differential Blind Multipliers (DBM)/Partial Blind Multipliers (PBM)
- Aftercoolers (also known as Intercell coolers)
- Building Debris

The anomaly detection process for this waste lot will rely principally on visual inspections and sorting/segregation of the wastes prior to shipment. However, there are several items (Table A.1) designated for off-site disposal in which verification by respective disciplines (e.g. Environmental Compliance, Nuclear Criticality, Engineering, Facility Manager, Industrial Hygiene, and Area Manager) served as evidence that these items have been removed from the building prior to demolition. The disciplines have confirmed that all of the items with the exception of Item 29 "Line Recorder Stations" have been removed from the building. The line recorders are located on the inaccessible portion of the operations floor. The line recorders will be segregated from the demolition pile and packaged for off-site disposal.

Prior to the start of demolition of the K-25 west side, a unit-by-unit walk down was performed by the WC, Environmental Compliance, and Industrial Hygiene to ensure all accessible hazardous and excess materials had been removed. Each of the respective disciplines signed the pre-demolition activities logbook signifying that all hazardous and excess materials had been removed and demolition could begin. The quantity of each hazardous stream remaining on the inaccessible portion of the operations floor was reviewed to ensure that EMWMF WAC and applicable or relevant and all appropriate requirements (ARARs) were met. Mass balancing was used as appropriate to demonstrate compliance. Waste items in which a mass balance calculation was used to demonstrate compliance and /or verification of removal has been done are not identified on the anomaly detection plan checklist for WPXL 6.999.

An Anomalies Risk Scoring Checklist has been completed for this waste lot. The risk score will require concurrence from K-25/K-27 D&D Project Quality Assurance (QA) and the Waste Packaging Specialist (WPS). This waste lot has been determined to have an unlikely probability for detection of anomalous wastes. However, these anomalous waste items represent minimal risk to worker safety/health and

environmental damage. This has been considered in the graded approach to the rigor and QA implementation required by this plan.

### **A.1.2 RESPONSIBILITIES**

Personnel roles and responsibilities associated with execution of this plan are listed below. All personnel have the general responsibility to identify and report anomalous waste.

- **Waste Coordinator (WC)**
  - Identify waste items authorized for disposal under this profile via profile description and other available information.
  - Instruct the WPS on waste items authorized under this waste lot and any associated secondary waste.
  - Ensure waste items offered for disposal under this waste lot profile have been subjected to 100% visual inspection, sorting, and segregation prior to packaging and shipment.
  - Ensure nonconformance actions are implemented.
  - Ensure all transmittals for the materials to be removed (i.e., anomalous material) have been completed, signed-off, and a copy placed in the evidence file.
- **Waste Packaging Specialist (WPS)**
  - Visually inspect the waste prior to and during sorting/segregation/packaging activities.
  - Provide oversight to field personnel on waste items to be placed into a designated package.
  - Directly responsible for completing and signing the waste certification statements.
- **Field Personnel**
  - Ensure WPS is present during the loading of waste items into an approved package.
- **Transportation Specialist (TS)**
  - Prepare shipping papers based on information received from WC and WPS and coordinate shipment to EMWMF.

### **A.1.3 TRAINING**

All deployed waste packaging specialist and field demolition personnel directly involved with the pre-packaging activities were trained to the draft Commingled Waste ADP, Commingled Waste Lot Anomaly Detection Checklist, list of items authorized for disposal, and work package or other document(s) used to execute fieldwork associated with waste disposal under the commingle waste. This training involved DOE field representatives as well. Visual aids in the form of photographs were used during the training to ensure workers could recognize anomalous waste as defined on the ADP checklist. Prior to commencement of the K-25 west side packaging activities, K-25 waste packaging specialists and all field demolition personnel directly involved with the sorting, segregation and packaging activities will be briefed again on these documents. This training will include:

- What the anomalies for commingled waste lot are (using pictures and/or physical examples).
- How to identify anomalous waste.

- How to respond to anomalous waste (e.g., segregate anomalous waste from remaining items or suspend work until the potential anomaly can be addressed by qualified Waste Management personnel). An anomaly staging area will be established at the K-1066 Pad.

Workers performing the K-25 west side packaging activities, and generating this waste lot, will be periodically trained to recognize anomalous waste using routine ADP orientation and lessons learned review, which may include the following:

- Plan-of-the-day meetings
- Tailgate briefings
- Posted materials in break rooms and other traffic areas to maximize recognition and awareness of anomalous waste issues and response actions, and
- Review of photographs and other visual aids associated with nonconforming waste items found or potentially present.

Workers will be prompted at these meetings to inform managers of the number and types of anomalies that required removal prior to packaging the waste for transport the previous day.

Additionally, the WC and each WPS will be required to read the commingled waste lot summary document, each of the 10 profiles that make up the commingled waste lot and the WAC Attainment Plan (DOE/OR/01-1909&D3) prior to certifying the waste for disposal.

#### **A.1.4 WASTE PACKAGING, INSPECTION AND CERTIFICATION**

All waste items will be visually inspected by the WPS. The WPS is required to perform a walkdown of waste staging area prior to certifying waste for disposal. Anomalous waste items will be segregated from acceptable waste, evaluated, and controlled to ensure proper disposal. Waste inspection, screening, packaging, and certification activities will be implemented using a graded approach based on risk to workers, the environment, and the public. All waste generation activities and loading of each container/shipment will be conducted under the oversight of a qualified WPS in accordance with BJC-WM-2001.

In the event an anomalous item is identified during packaging and loading of a conveyance to EMWMF, waste packaging operations will be suspended and the anomalous item will be removed and set aside for further evaluation by the Project WC. An Anomaly Detection Checklist for commingled waste will be completed by the WPS for shipments that certifies all waste is in compliance with the approved waste profiles as per variance V09-001.

#### **A.1.5 PROCESS VALIDATION ASSESSMENTS**

Waste generation assessments may be conducted by the K-25/K-27 D&D Project WC or designee prior to future shipments commingled waste to EMWMF. The commingled waste is expected to be shipped utilizing dump trucks and intermodal. This assessment will consist of an inspection of the preparation of the first load for receipt of waste. Prior to the shipment, the WC will hold discussions with the WPS and TS to ensure a common understanding of wastes that are included in the approved waste summary document meet the EMWMF WAC, and fall within the scope/bounds of the document.

Additional assessments will be conducted if:

- The WC determines additional changes in the waste characterization occurs or concerns are raised over the waste preparation process at the K-25 Facility
- It is determined, based on worker input (or other leading indicators), that waste characteristics have changed
- When required by a corrective action plan, written in response to significant undetected anomalies discovered at the EMWMF.

### EMWMF Anomalies Risk Scoring Checklist

<b>Waste Lot Number 6,999 (Used WL6.34; Process Piping II) it is ranked number 1 and also has the most restrictive ASA SOF)</b>	<b>Date 02/01/09</b>
Risk criteria	Score (1 to 9)
<ul style="list-style-type: none"> <li>• <b>Likelihood of waste lot to have anomalies</b>            9 – Extremely likely – 0.95 probability of anomalies in the waste lot            7 – Very likely – 0.75 probability            5 – Likely – 0.5 probability (50–50 chance)            3 – Unlikely – 0.25 probability            1 – Very unlikely – 0.05 probability (almost no probability of anomalous waste)</li> </ul>	1- Excess material has been removed from the building. Hazardous abatement was done prior to the start of demolition. Line Recorders are the only items remaining in the building that was listed on Table 8 of the WHP to be disposed off-site.
<ul style="list-style-type: none"> <li>• <b>Difficulty in detecting anomalies in the waste lot. The likelihood of a failure to detect an anomaly. Examples of factors that affect the detection of an anomaly are presence of soils or other conditions that minimize visual differences and the amount of different types of materials combined together.</b>            9 – Extremely likely – 0.95 probability of an anomaly could be undetected            7 – Very likely – 0.75 probability            5 – Likely – 0.5 probability (50–50 chance)            3 – Unlikely – 0.25 probability            1 – Very unlikely – 0.05 probability (almost no probability of detection failure)</li> </ul>	7- The volume of commingled material will make it difficult to detect anomalies. However, the debris will undergo sorting, segregation, and size reduction, and will be visually inspected by a WPS during loading activities. Not meeting the PWAC or approved variances is the primary way an anomaly situation may occur. All excess material has been removed and hazardous waste has been abated.
<ul style="list-style-type: none"> <li>• <b>Potential hazards associated with likely anomalies. The likelihood of the potential hazards, if brought in contact with workers, could cause significant harm to those workers.</b>            9 – Extremely likely – 0.95 probability to cause extreme worker harm            7 – Very likely – 0.75 probability            5 – Likely – 0.5 probability (50–50 chance)            3 – Unlikely – 0.25 probability            1 – Very unlikely – 0.05 probability (almost no probability of any harm to workers)</li> </ul>	1- The process piping waste included in this commingled waste lot could affect the workers if it off-gasses, which is highly unlikely because the piping does not contain deposits. In addition, all process piping ≥ 3 in. and other PGE have undergone VDP&I. Industrial Hygiene personnel will monitor the area to ensure workers safety. Workers will not handle package waste. Loading will be done by mechanical means.
<ul style="list-style-type: none"> <li>• <b>Potential impact of likely anomalies on cell performance and the environment. The likelihood that undetected anomalies, if found in EMWMF would require EMWMF shutdown for removal to minimize environmental insult and/or noncompliance with regulations.</b>            9 – Extremely likely – 0.95 probability            7 – Very likely – 0.75 probability            5 – Likely – 0.5 probability (50–50 chance)            3 – Unlikely – 0.25 probability            1 – Very unlikely – 0.05 probability</li> </ul>	3- The primary way waste included in this waste lot would be anomalous if it does not meet the EMWMF PWAC or approved variances, which would not result in EMWMF being shut down. The project will perform sorting, segregation, and size reduction that will minimize the potential for sending anomalous waste. In addition, waste will be visually inspected by a WPS during loading activities and IH will monitor area.
<b>Total</b>	<b>12</b>

Prepared by \_\_\_\_\_  
 Quality Engineer Review \_\_\_\_\_  
 Waste Packaging Specialist \_\_\_\_\_  
 Review \_\_\_\_\_

Date \_\_\_\_\_  
 Date \_\_\_\_\_  
 Date \_\_\_\_\_



### Waste Lot Anomaly Detection Checklist

Waste Summary for Commingled Waste (WL 6.999)	
<b>Expected Waste Types:</b> Commingled waste items (process gas equipment and building debris). Process gas equipment include process pipe that passed scan, seal exhaust traps and headers, process valves, DBM/PBM, and aftercoolers. Building debris include concrete	
<b>Physical Indicators of Potential Anomalies:</b> <ol style="list-style-type: none"> <li>1. Free liquids</li> <li>2. Yellowcake or other evidence of uranium product material (i.e., green- or yellow-colored residue)</li> <li>3. "Smoking" pipes</li> <li>4. Pipe or pipe like structures &gt; 6 in. in diameter that has not been crushed to the extent practical</li> <li>5. Pipe or pipe like structure with a length &gt; 6 ft, if the pipe is commingled with building debris</li> <li>6. Cylinders</li> <li>7. Converters</li> <li>8. Compressors</li> <li>9. Line Recorders</li> <li>10. Items that exceed the EMWMF WAC size requirement of 4 ft X 4 ft X 6 ft</li> <li>11. Containerized Waste (e.g. waste in drums, boxes, pails)</li> <li>12. Broken transite that can be removed to the extent practicable as directed by IH</li> <li>13. Roof Vents</li> <li>14. Diffusion Pumps (Seal Exhaust Pumps)</li> <li>15. Concrete &gt; 1 foot</li> <li>16. Rebar not cut flush with large pieces of concrete</li> <li>17. Rebar &gt; 4 ft in length</li> </ol>	
<b>Field Instrument Indicators of Potential Anomalies:</b> <ol style="list-style-type: none"> <li>1. Instrument readings deemed unusual by RadCon or field technicians</li> <li>2. Instruments readings deemed unusual by Industrial Hygiene</li> </ol>	

#### Other indicators of Potential Anomaly Situation:

- The WPS has not received documentation indicating characterization data or process knowledge have been reviewed by the WC and meets the WAC requirements and limits.
- The WC has not provided written documentation verifying items identified in the Waste Handling Plan for PGE for off-site disposal that have been removed from the West Wing or provisions have been made to identify items prior to shipment. Items are identified in the attached Table A.1.
- Environmental Compliance has not provided documentation that all hazardous waste has been removed from the accessible portion of the West Wing or material construction and/or mass balance calculations have confirmed waste to be acceptable for disposition.
- Industrial Hygiene will provide direction to field personnel regarding items that contain ACM and which they deemed needing to be removed prior to packaging activities. The WPS will be provided this list and Industrial Hygiene will provide written notification when the item has been abated and can be packaged.

Certification Statement (to be completed and sent with waste shipment):

I certify that the wastes in this shipment conform to the descriptions found in the waste profile for Waste Lot _____. For questions regarding the contents of this shipment, call _____.		
Printed name _____	Signature _____	Date _____

(Note: the phone number and printed name for this form may be electronically inserted. However, the waste lot number, signature, and date shall be handwritten in ink.)

**Table A.1. Items identified for off-site disposal**

Item	Volume (ft <sup>3</sup> )	U-234 (pCi/g)	U-235 (pCi/g)	U-238 (pCi/g)	Other Contaminants
1. All compressor BOP lines					
2. All compressor SVL lines					
3. All seal exhaust cell floor escape alley headers					
4. All seal exhaust cell floor withdrawal alley headers					
5. All K-312 Valley Iron Works pumps					
6. All K-312 cell oriented piping associated with Valley Iron Works pumps					
7. All K-312 Whitehead converters					
8. K-312-1-3, 5, and 11 Whitehead converter connection pipes					
9. All K-312 operations floor seal exhaust header lines					
10. K-312-3 oil pumping system and associated piping					
11. K-312-3 feed line from K-27					
12. K-312-3 cold trap cell & associated piping					cadmium
13. K-312-2 cold trap cell					cadmium
14. K-312-1 pipe gallery piping					
15. K-312-1 chemical trap piping					
16. All NCSE non-compliant piping					
17. All concrete-encased items					
18. All HRE Type 38 compressors					
19. All HRE Size 3 converters					
20. K-305-9 product withdrawal station with associated evacuation header pipe					
21. K-306-7 cell and operating floor product withdrawal station					cadmium
22. K-304-1 surge tanks					cadmium
23. K-304-5 surge tanks and SCN pipe section					cadmium
24. K-305-1 and K-306-1 booster stage piping					
25. K-306-1-2 miscellaneous pipe in pipe gallery					
26. K-305-6-3-4 cell evacuation line					
27. All cold traps					cadmium
28. N <sub>2</sub> cylinders in pipe gallery from historical CAAS					pressurized with nitrogen
29. Line recorder stations					mercury

30. Bellows evacuation systems					
31. Process piping that failed historical scans (> 2 grams per 18 in.) but less than NCS limits					
<b>Total Estimated In-Place Volume of Equipment</b>					

\* Quantity reduces to 4 ft<sup>3</sup> when cylinders are removed.

Note: (1) Items on the non-poured operating floor will be inaccessible prior to demolition. (2) This information is available to the regulators upon request. (3) Piping added to table for cost-benefit reasons.

BOP = blowout preventer

CAAS = Criticality Accident Alarm System

HRE = high-risk equipment

PW = product withdrawal

SCN = south connector

SVL = copper seal exhaust system lines

VIP = Valley Iron Works pump

WHC = Whitehead converters

Source: Table 8 from DOE/OR/01-2034&D3, *Waste Handling Plan for the K-25 and K-27 Process Equipment and Piping at the East Tennessee Technology Park, Oak Ridge, Tennessee.*

**APPENDIX B.**  
**DETAILED PROCESS KNOWLEDGE DESCRIPTIONS**

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## **B.1 PROCESS KNOWLEDGE DESCRIPTIONS**

Process knowledge descriptions can be found beginning on page B-3 in Appendix B of each individual waste profile.

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**APPENDIX C.  
CONTROLLED DATA SET TRANSMITTAL TO WAC ATTAINMENT  
TEAM**



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## **C.1 CONTROLLED DATA SET TRANSMITTALS**

Controlled data set transmittals can be found beginning on page C-3 in Appendix C of each individual waste profile.

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**APPENDIX D.**  
**ENVIRONMENTAL COMPLIANCE ASSESSMENT**

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## **D.1 ENVIRONMENTAL COMPLIANCE ASSESSMENT**

*The Waste Acceptance Criteria Attainment Team Project Execution Plan* (BJC/OR-1091-R5) states that the project's Environmental Compliance organization should review and approve RCRA and TSCA waste determinations. The purpose of this appendix is to provide clear and succinct documentation that all aspects of the RCRA and TSCA compliance have been reviewed by and approved by the Environmental Compliance and Protection (EC&P) organization.

### **D.1.1 RCRA CHARACTERISTIC WASTE COMPLIANCE**

The RCRA waste characteristic determination for each waste lot was documented in the individual waste lot profiles, typically in sections 2.4.1 through 2.4.4. Each of the waste lots was determined to be a non-RCRA waste stream, from a characteristic perspective, based on a review of the criteria for ignitability, corrosivity, reactivity, and toxicity in accordance with 40 CFR 261.21-261.24 requirements.

Characterization of each waste lot used different combinations of process knowledge, sampling and analysis, material of construction (MOC), and mass balance calculations. Process knowledge was used to eliminate the characteristics of ignitability, corrosivity, and reactivity from further consideration. For the toxicity characteristic, process knowledge, MOC calculations, and sampling and analysis were used to identify potential contaminants. In several instances, analytical results for sampled components, or results of MOC calculations demonstrated a failure of RCRA TCLP limits. Mass balance calculations were then used to demonstrate the waste lot as a whole would not continue to exhibit the characteristic identified in the component. Instances where a mass balance approach was implemented include waste lot profiles 6.33, 6.35, and 6.39.

The EC&P organization has reviewed the hazardous waste determinations in each of the waste lots included in this WL 6.999 profile, and concurs that WL 6.999 does not contain a characteristic hazardous waste.

### **D.1.2 RCRA LISTED WASTE COMPLIANCE**

A review of the information in individual waste lot profiles indicates that this 6.99 waste lot is not a listed hazardous waste stream. Materials, components, equipment, and other waste items were generally not in a position to have external contact with materials that would cause these items to become listed waste, nor did the nature of their use indicate internal contact with materials that would cause these items to become listed waste.

In addition, there has been no documentation identified that indicates materials that could become listed wastes were used in the building.

The EC&P organization has reviewed the information provided in each of the waste lots included in this WL 6.999 profile, and concurs that WL 6.999 does not contain a RCRA listed waste.

### **D.1.3 TSCA PCB COMPLIANCE**

The TSCA PCB waste characteristic determination was documented in section 2.5 of the individual waste lot profiles. A review of the information in these profiles indicates that this waste lot is TSCA PCB regulated as PCB Remediation Waste.

Potential sources of PCBs in this WL include PCB-containing paint, light ballasts, and leakage from electrical equipment. Because the EMWMF is an approved CERCLA waste disposal facility meeting the requirements of a chemical waste landfill under 40 CFR 761.75, this WL is acceptable for disposal at the EMWMF.

The EC&P organization has reviewed the TSCA PCB waste determination in each of the waste lots included in this WL 6.999 profile, and concurs that WL 6.999 is TSCA PCB regulated as PCB Remediation Waste.

#### **D.1.4 ASBESTOS NESHAP COMPLIANCE**

The National Emission Standard for Hazardous Air Pollutants (NESHAP) for asbestos waste determination was documented in section 5.7 of the individual waste lot profiles. A review of the information in these profiles indicates that this waste lot was determined to contain ACM according to 40 CFR 61 requirements.

The asbestos waste determination was based upon process knowledge of the waste, industrial hygiene testing, and visual inspection. The remaining ACM in the building includes miscellaneous Category I and II ACM, including transite, ebony board, wiring insulation, gasket material, and floor tiles. Detailed descriptions of these and other ACM remaining in the building, are addressed in two BJC documents titled, *Leaving Category I Non-friable Asbestos-Containing Materials In-Place During Demolition K-25/K-27 D&D Project Facilities Oak Ridge, Tennessee* (BJC 2008d), and *Leaving Category II Non-friable Asbestos-Containing Materials In-Place During Demolition K-25/K-27 D&D Project Facilities Oak Ridge, Tennessee* (BJC 2008e).

The WL 6.999 Anomaly Detection Plan includes criteria to review and identify any asbestos waste that might be uncovered during the waste loading steps. In the event asbestos wastes are discovered during the waste loading steps, the asbestos waste would be segregated and dispositional in accordance with asbestos packaging and waste transport regulations per the EMWMF Physical WAC guidelines and approved variances.

The EC&P organization has reviewed the asbestos waste determination in each of the waste lots included in this WL 6.999 profile, and concurs that WL 6.999 contains asbestos as a waste stream component.

**APPENDIX E.**  
**WASTE HANDLING PLAN CROSSWALK, SAMPLING APPROACH,**  
**CALCULATIONS/MEASUREMENT METHODS**



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## **E.1 WASTE HANDLING PLAN CROSSWALK, SAMPLING APPROACH, AND CALCULATIONS/MEASUREMENT METHODS**

The waste handling plan crosswalk, sampling approach, and calculation/measurement methods are contained in Appendix E of each individual waste profile.

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**APPENDIX F.**  
**DATA QUALITY OBJECTIVES CHECKLIST**

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## **F.1 DQO WORKSHOPS**

Formal Data Quality Objectives (DQOs) were performed for the waste covered by this waste lot profile. The cover pages of the documents containing the results of the formal DQO Workshops are provided in Appendix F of each individual waste profile.

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**APPENDIX G.  
DATA QUALITY ASSESSMENT**



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## **G.1 DATA QUALITY ASSESSMENTS**

The data quality assessment can be found in Appendix G of individual waste profile.

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**APPENDIX H.**  
**WASTE ACCEPTANCE CRITERIA FORECASTING ANALYSIS**  
**CAPABILITY SYSTEM (WACFACS) ATTACHMENT 3 AND VWSF**  
**TRANSMITTAL LETTER**

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## H.1 WASTE ACCEPTANCE CRITERIA FORECASTING ANALYSIS CAPABILITY SYSTEM (WACFACS) ATTACHMENT 3 AND VWSF TRANSMITTAL LETTER

Appendix H of each of the individual profiles includes the WACFACS Attachment 3 and VWSF transmittal letter. The EMWMF WAC Attainment Team is solely responsible for assigning actual volumes of waste disposed to the WLs within the commingled waste shipments. The WAC-AT has developed the technical basis for the representation of the actual SOF for each WL and its contribution to the UCL<sub>90/90</sub> VWSF. Table H.1 contains the individual waste lots carcinogenic and hazard index SOF and VWSF information.

**Table H.1. Individual waste lots carcinogenic and hazard index SOF and VWSF information**

WACFACS WL ID	10 WL to be included in WPXL 6.999	WL CA SOF	WL UCL- 95 CA SOF	WL HI SOF	WL UCL- 95 HI SOF	WL CA VWSF	WL HI VWSF
6.32	K-25 West Side Process Pipe Group I	0.98	2.36	0.08	0.15	1.19E-03	3.54E-04
6.33	K-25 West Side Demolition Debris including non-process equipment Group I	0.07	0.15	0.26	0.36	8.83E-03	3.42E-02
6.34	K-25 West Side Process Pipe Group II	39.66	101.90	0.53	1.10	1.46E-03	1.96E-05
6.35	K-25 West Side DBM/PBM Group I	3.34	8.10	0.71	0.92	2.17E-04	4.63E-05
6.38	K-25 West Side Valves Group I (K-304, K-305, K-306)	0.18	0.54	0.05	0.07	1.66E-04	5.11E-05
6.39	K-25 West Side Aftercoolers Group I	0.06	0.11	0.03	0.03	7.33E-06	3.22E-06
6.45	K-25 West Side Seal Exhaust Traps Group I	4.61	7.65	1.40	2.10	9.58E-06	2.92E-06
6.46	K-25 West Side Seal Exhaust Headers Group I	1.73	5.99	0.06	0.10	2.84E-05	9.63E-07
6.47	K-25 West Side Demolition Debris including non-process equipment Group II (Lavatory Sink Drain Lines)	0.003	0.008	1.34	2.86	4.14E-08	1.60E-05
6.48	K-25 West Side Valves Group II (K-312)	5.30	6.17	0.23	0.24	4.28E-04	1.88E-05

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**APPENDIX I.**  
**VARIANCE REQUESTS**



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## EMWMF-BV-07-01

### ENVIRONMENTAL MANAGEMENT WASTE MANAGEMENT FACILITY

#### Physical Waste Acceptance Criterion Blanket Variance

Blanket Variance Not EMWMF-BV-07-01

Revision No: 0

Effective Date: 09/23/05



Approval Signature

Blanket Variance Applicable to: Pipe, tubing, and conduit with internal diameter of 6 inches

#### Physical Waste Acceptance Criterion No.

**Requirement:** Piping shall be segregated from other wastes and shall be placed in haulage containers to avoid bridging or otherwise wedging during unloading. Pipe and tubing less than 6-in. diameter is accepted without further restrictions. Pipes between 6-in. and 12-in. diameter shall be crushed, shredded, or filled to minimize void spaces.

**Basis:** Analysis in the EMWMF Performance Assessment indicates that pipes with excessive internal void must be filled, crushed or split to meet subsidence requirements.

#### Variance:

Piping, tubing and conduit formed from rigid metal that is 6-inches or less in diameter, which are not placed inside another container for disposal, may be placed in the disposal cell without further treatment.

**Justification:** The EMWMF Performance Assessment indicates that pipes with internal diameters of 6-inches and less do not substantially affect the long-term performance of the EMWMF and may therefore be disposed without restriction.

#### 3 Conditions of Variance

- a. This variance is for 6-inch internal diameter pipe, metal tubing and metal conduit only.
- b. Pipe, tubing, and conduit shall be cut in lengths appropriate to the haulage container such that pipe may freely fall during dumping without becoming wedged or jammed.

#### 4 Application of Blanket Variance

- a. Certification of full compliance with the conditions of this blanket variance, as stated herein, by the waste generator of a specific, approved waste lot fulfills the requirements of a variance to the physical waste acceptance criterion in accordance with *Attainment Plan for Risk/Toxicity-Based Waste Acceptance Criteria at the Oak Ridge Reservation, Oak Ridge, Tennessee* (DOE/OR/01-1909&D3).

## **EMWMF-BV-07-01, p. 2**

- b. Generator to reference Blanket Variance EMWMF-BV-07-01 in required sections of the Waste Profile and attach a hard copy when submitting the waste profile to the Waste Acceptance Criteria (WAC) Attainment Team.
  - c. Generator to attach a hard copy of this blanket variance to Section      of the Readiness to Ship Checklist.
5. **Revocation of Blanket Variance:**

Upon discovery of waste from a specific waste lot that is not in full compliance with the conditions stated herein, this blanket variance may be revoked by written communications to the generator's BJC responsible contact and the waste declared to be anomalous waste.

## EMWMF-BV-13-01

### ENVIRONMENTAL MANAGEMENT WASTE MANAGEMENT FACILITY

#### Physical Waste Acceptance Criterion Blanket Variance Approval

Blanket Variance No: EMWMF-BV-13-01

Revision No: 0

Effective Date: 12/13/06

  
Approval Signature

Blanket Variance Applicable to: Waste containers without container liners.

Physical Waste Acceptance Criterion No.: 13

Requirement: Container liners shall be installed in the container prior to waste loading and shall be folded and secured over the waste after loading.

Basis: EMWMF Operations Plan

Note: This variance does not exempt waste generators/shippers from complying with guidance or directives issued by the BJC Waste Generator Services Group.

#### 2. Variance:

Transport metal debris, demolition debris, and large item waste in conveyances such as rear dumping dump trucks, intermodal containers, and side dumping dump trailers without liners placed in the conveyance containers prior to waste loading.

Justification: Site experience has shown that metal debris that is not excessively rusty, demolition debris, and large item-only waste streams need not have liners in the conveyance containers to facilitate extrication from the containers and that significant dust and windblown materials are typically not associated with such waste material.

#### 3. Conditions of Variance:

- a. This variance is for metal debris and large item-only waste streams.
- b. Conveyances covered under this variance include rear dumping dump trucks, intermodal containers, and side dumping dump trailers.

Side dumping dump trailers shall have a sacrificial liner (plastic sheeting with nominal thickness of 8-mil) placed between the top of waste and the retractable tarp and sufficiently secured so as to not become dislodge during transport.

- c. Waste loads shall not consist of floor sweepings, powder or granular material, large amounts of paper, styrofoam, and other light material that are subject to being blown about by wind and lifted outside of the disposal cells while being dumped and/or pushed by a dozer.

## EMWMF-BV-13-01, p. 2

1. Floor sweepings, powdery or granular material, paper and light items subject to being windblown shall be packaged separately in plastic bags and may be placed in conveyances with other debris items or shipped separately.
2. When waste that is dry and is likely to become airborne, water or an appropriate chemical fixative may be used on the waste after loading into the conveyance.
3. Use of a chemical fixative shall require the prior submission of the material safety data sheet (MSDS) and approval by EMWMF operations personnel.
- a. Any residual dust or minor amounts of light materials associated with waste in a waste shipment must be controllable during dumping using conventional dust suppression methods currently employed at the EMWMF.
4. Application of Blanket Variance:
  - a. Certification of full compliance with the conditions of this blanket variance, as stated herein, by the waste generator of a specific, approved waste lot fulfills the requirements of a variance to the physical waste acceptance criterion in accordance with *Attainment Plan for Risk/Toxicity-Based Waste Acceptance Criteria at the Oak Ridge Reservation, Oak Ridge, Tennessee* (DOE/OR/01-1909&D3).
  - b. Generator to reference Blanket Variance EMWMF-BV-13-01 in required sections of the Waste Profile and attach a hard copy when submitting the waste profile to the Waste Acceptance Criteria (WAC) Attainment Team.
  - c. Generator to attach a hard copy of this blanket variance to Section      of the Readiness to Ship Checklist.
5. Revocation of Blanket Variance:

Upon discovery of waste from a specific waste lot that is not in full compliance with the conditions stated herein, or that normal actions employed to suppress windblown materials is unsuccessful, this blanket variance may be revoked by written communications to the generator's BJC responsible contact.

## EMWMF-VR-127

### Request for Approval of Variance from Physical Waste Acceptance Criteria (WAC) for the Environmental Management Waste Management Facility (EMWMF)

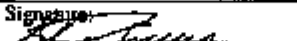
**Instructions:** The Waste Generator shall.

- (1) Communicate with the EMWMF Waste Generator Services Lead to discuss the proposed variance request prior to the submittal of this form.
- (2) Complete Section I and prepare any necessary support information.
- (3) Electronically transmit the completed form and support information to the EMWMF WAC Manager. BJC EMWMF Operations will coordinate the review of the variance request and transmit the results of the review to the Waste Generator.

Section I--To be Completed by Waste Generator	
1. Waste Lot No: WL 6.32	2. Date: 08/27/2008
3. Waste Lot Name: Building K-25 West Side Process Piping Group 1	
4. Name of Project: K-25/K-27	
5. Name of Requestor: Jennifer Wellman	6. Telephone No.: 576-0186
7. Alternate contact: Virginia Riggsby	8. Telephone No.: 576-4405
9. Company Affiliation: BJC	10. Fax No.: 576-0195
<p>11. Describe the physical WAC parameter(s) for which a variance is being requested:</p> <p>A variance is requested for the physical WAC requirements that all pipes be segregated from other wastes.</p>	
<p>12. Describe the proposed variance</p> <p>All process pipes within WL 6.32 will be cut into 6 foot or less length and sent to the EMWMF commingled with building debris. Pipe between 6 and 12 in. in diameter will be crushed per the PWAC requirement and pipe greater than 12 in. in diameter will be crushed in accordance with EMWMF-VR-126. There is = 2,182 yd<sup>3</sup> of process piping included in this waste lot.</p>	
<p>13. Describe why the physical WAC parameter(s) cannot be met and provide justification for the proposed variance:</p> <p>Piping cut into 6 foot lengths should not impede the dumping of commingled wastes (piping with other debris) at the EMWMF. In addition, several projects on the ETP D&amp;D project have utilized this variance without incident.</p>	
<p>14. Describe and identify if the variance is requested for the entire waste lot or for a specific portion of the waste lot:</p> <p>The piping in this waste lot will be sent to the EMWMF commingled with building debris. However, some piping may be segregated and shipped separately in accordance with the PWAC requirement.</p>	
<p>15. Describe the potential impacts of implementing the variance request and the suggested mitigation actions by the waste generator and EMWMF Operations:</p> <p>Potential impacts include the debris becoming bridged or wedged during unloading. A Waste Packaging Specialist will be present during all loading activities to ensure the commingled debris is loaded in a manner to avoid waste becoming bridged during unloading.</p>	
<p>16. Other support information:</p>	

**EMWMF-VR-127, p. 2**

**Request for Approval of Variance from Physical Waste Acceptance Criteria (WAC) for the Environmental Management Waste Management Facility (EMWMF)**

Section 2--To be Completed by EMWMF Operations		
17. Was a field walkdown performed to review the waste? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		
If so, state notes from the field walkdown that are pertinent to the variance review:		
18. Provide brief justification for concurring with or rejecting the variance request:		
EMWMF has received pipe commingled with building debris from the K-1401 Building demolition without issues.		
19. Will the requested variance impact the design basis for EMWMF? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		
If so, describe the potential impact and mitigation measures.		
20. Are other reviews (i.e., Procurement, Engineering, RADCON) required?		
Yes <input checked="" type="checkbox"/> Operations, Engineering, Safety No <input type="checkbox"/>		
21. If other reviews are required, do the reviews support approval of the requested variance?		
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
22. State variance request approval conditions:		
1. This variance applies only to process pipe that has been approved for disposal at EMWMF by the Waste Acceptance Criteria (WAC) Attainment Team. 2. Concurrence of this variance request is contingent on approval of EMWMF-VR-126 for the disposal of low density foam-filled pipe sections greater than 12 inches in diameter that are crushed to the extent practicable. 3. EMWMF Operations reserves the right to require a reduction in the length of pipe sections from 6 ft. to 4 ft., if conditions warrant. 4. Non-crushed pipe greater than 6 in. in diameter shall be considered anomalous waste and addressed accordingly.		
Approval / Disapproval by BIC EMWMF Operations		
23. Approved <input type="checkbox"/> Approved with conditions <input checked="" type="checkbox"/> Disapproved <input type="checkbox"/>		
Printed Name: Steve Kucera	Signature: 	Date: 10/13/08

## EMWMP-VR-136

### Request for Approval of Variance from Physical Waste Acceptance Criteria (WAC) for the Environmental Management Waste Management Facility (EMWMP)

**Instructions:** The Waste Generator shall:

- (1) Communicate with the EMWMP Waste Generator Services Lead to discuss the proposed variance request prior to the submittal of this form.
- (2) Complete Section 1 and prepare any necessary support information.
- (3) Electronically transmit the completed form and support information to the EMWMP WAC Manager.


B/C EMWMP Operations will coordinate the review of the variance request and transmit the results of the review to the Waste Generator.

Section 1--To be Completed by Waste Generator	
1. Waste Lot No: WL 6.33	2. Date: 01/12/2009
3. Waste Lot Name: Building K-25 West Side Building Structure and Remaining Components	
4. Name of Project: K-25/K-27	
5. Name of Requestor: Jennifer Welham	6. Telephone No.: 576-0186
7. Alternate contact: Tom Bratton	8. Telephone No.: 576-8603
9. Company Affiliation: B/C	10. Fax No.: 576-0195
11. Describe the physical WAC parameter(s) for which a variance is being requested:	
A variance is requested for the physical WAC requirements that pipes $\geq 12$ -in. in diameter be split longitudinally.	
12. Describe the proposed variance:	
For pipes $\geq 12$ in. diameter pipes will be size reduced to the extent practical.	
13. Describe why the physical WAC parameter(s) cannot be met and provide justification for the proposed variance:	
The physical WAC requirement of longitudinally splitting the $\geq 12$ in. diameter pipes is not practical, because of the intensive resources required to segregate and split these pipes, due to the size of the demolition footprint.	
14. Describe and identify if the variance is requested for the entire waste lot or for a specific portion of the waste lot:	
This variance applies only to the pipe $\geq 12$ in. diameter in WL 6.33.	
15. Describe the potential impacts of implementing the variance request and the suggested mitigation actions by the waste generator and EMWMP Operations:	
The soils structural stability may be impacted through the implementation of this variance. However, the project will minimize this potential impact by crushing these pipes to the extent practical to remove as much void space as possible.	
16. Other support information:	
Section 2--To be Completed by EMWMP Operations	



## EMWMP-VR-136, p. 2

### Request for Approval of Variance from Physical Waste Acceptance Criteria (WAC) for the Environmental Management Waste Management Facility (EMWMP)

17 Was a field walkdown performed to review the waste? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> If so, state notes from the field walkdown that are pertinent to the variance review  EMWMP Operations personnel participated in a walk down of initial waste generated at the K-25 Building D&D site. While no pipe was observed in the waste piles, the issues surrounding crushed pipe were discussed with K-25 Project personnel. According to the K-25 Project personnel, pipe is carbon steel.	
18 Provide brief justification for concurring with or rejecting the variance request  Pipe greater than 12 inches in diameter that has been crushed has not been received in the past. Therefore, the crushed pipe characteristics are to be monitored in order to make adjustments in the waste processing as necessary.	
19 Will the requested variance impact the design basis for EMWMP? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> If so, describe the potential impact and mitigation measures  All pipe is to be crushed sufficiently to eliminate unacceptable void space.	
20 Are other reviews (i.e. Procurement, Engineering, RADCON) required?  Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
21 If other reviews are required, do the reviews support approval of the requested variance?  Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
22 State variance request approval conditions  1 This variance applies only to pipe that has been approved for disposal at EMWMP by the Waste Acceptance Criteria (WAC) Attachment Team. 2 Pipe, size reduced to 6 ft. or less, is to be crushed along the entire length to an effective height of 6 inches or less. 3 EMWMP reserves the right to require pipe to be crushed to less than an effective height of 6 inches if conditions warrant.	
Approval / Disapproval by BJC EMWMP Operations	
23 Approved <input type="checkbox"/> Approved with conditions <input checked="" type="checkbox"/> Disapproved <input type="checkbox"/>	
Printed Name Steve Kucera	Signature 
Date 2/6/09	

# EMWMP-VR-137

## Request for Approval of Variance from Physical Waste Acceptance Criteria (WAC) for the Environmental Management Waste Management Facility (EMWMP)

Instructions: The Waste Generator shall:

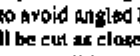
- (1) Communicate with the EMWMP Waste Generator Services Lead to discuss the proposed variance request prior to the submittal of this form.
- (2) Complete Section 1 and prepare any necessary support information.
- (3) Electronically transmit the completed form and support information to the EMWMP WAC Manager.

RJC EMWMP Operations will coordinate the review of the variance request and transmit the results of the review to the Waste Generator.

Section 1--To be Completed by Waste Generator	
1. Waste Lot No: 633	2. Date: 1-12-09
3. Waste Lot Name: K-25 West Side Building Structure and Remaining Components	
4. Name of Project: K-25/K-27 Decontamination and Decommissioning Project	
5. Name of Requestor: Tom Branson	6. Telephone No.: 526-3603
7. Alternate contact: Virginia Rigby	8. Telephone No.: 526-4405
9. Company Affiliation: Project Waste Management	10. Fax No.: 241-9600
11. Describe the physical WAC parameter(s) for which a variance is being requested:	
<p>The EMWMP physical WAC states that rebar shall be cut to a maximum 4-ft length and shall be in rolls or bundles that can be placed and graded in an 18-in lift.</p>	
12. Describe the proposed variance:	
<p>The Project is requesting that a variance be granted to allow rebar to be size-reduced to 4-ft sections or less and co-mingled with building debris for direct disposal at the EMWMP. Rebar will be cut flush from large pieces of concrete.</p>	
13. Describe why the physical WAC parameter(s) cannot be met and provide justification for the proposed variance:	
<p>Based on the configuration of the rebar present in this waste lot, it would be difficult to cut into 4-ft lengths and to reconfigure into rolls or bundles. By abating the rebar from the concrete and further size-reducing the rebar to 4-ft lengths or less the debris should be suitable for placement and grading into an 18-inch lift.</p>	
14. Describe and identify if the variance is requested for the entire waste lot or for a specific portion of the waste lot:	
<p>This variance request is only for the rebar that represents approximately 4% of the total waste lot. It does not include other debris associated with K-25 West Side Building Structure.</p>	
15. Describe the potential impacts of implementing the variance request and the suggested mitigation actions by the waste generator and EMWMP Operations:	
<p>No impacts are expected.</p>	
16. Other support information:	
<p>None</p>	

**EMWMF-VR-137, p. 2**

**Request for Approval of Variance from Physical Waste Acceptance Criteria (WAC) for the Environmental Management Waste Management Facility (EMWMF)**

Section 2--To be Completed by EMWMP Operations		
17. Was a field walkdown performed to review the waste? Yes <input type="checkbox"/> No <input type="checkbox"/>		
If so, state notes from the field walkdown that are pertinent to the variance review:		
18. Provide brief justification for concurring with or rejecting the variance request:		
Past operational experience indicates that rebar sized to 4 ft. and less in length is manageable within the bulk disposal cell. Discussions with heavy equipment operators indicate that the 4 ft. length is easily managed.		
19. Will the requested variance impact the design basis for EMWMP? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		
If so, describe the potential impact and mitigation measures:		
20. Are other reviews (i.e., Procurement, Engineering, RADCON) required?		
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
21. If other reviews are required, do the reviews support approval of the requested variance?		
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
22. State variance request approval conditions:		
1. Rebar shall be cut to lengths normally 4 ft. in length. 2. Bend rebar shall be cut at the bends to avoid angled lengths of rebar. 3. Rebar protruding from concrete shall be cut as closely to the concrete surface as practicable. 4. Rebar observed to be outside the above conditions will be determined to be non-compliant subject to applicable actions.		
Approval / Disapproval by EJC EMWMP Operations		
23. Approved <input type="checkbox"/>	Approved with conditions <input checked="" type="checkbox"/>	Disapproved <input type="checkbox"/>
Printed Name Steve Kucera	Signature 	Date: 4/27/09

## EMWMF-VR-138

### Request for Approval of Variance from Physical Waste Acceptance Criteria (WAC) for the Environmental Management Waste Management Facility (EMWMF)

**Instructions: The Waste Generator shall:**


- (1) Communicate with the EMWMF Waste Generator Services Lead to discuss the proposed variance request prior to the submittal of this form.
- (2) Complete Section 1 and prepare any necessary support information.
- (3) Electronically transmit the completed form and support information to the EMWMF WAC Manager.

B/C EMWMF Operations will coordinate the review of the variance request and transmit the results of the review to the Waste Generator.

Section 1---To be Completed by Waste Generator	
1. Waste Lot No: WL 633	2. Date: 1-12-09
3. Waste Lot Name: Building K-25 West Side Building Structure and Remaining Components	
4. Name of Project: K-25/K-27 Decontamination and Decommissioning Project	
5. Name of Requestor: Jennifer Wellman	6. Telephone No.: 576-0186
7. Alternate contact: Tom Bratton	8. Telephone No.: 576-8603
9. Company Affiliation: B/C	10. Fax No.: 576-0195
11. Describe the physical WAC parameter(s) for which a variance is being requested:  Asbestos-containing materials shall be wetted, double-bagged and shipped separately or with adequate volumes of soil to facilitate safe transportation and burial. Bags shall be limited to a maximum weight of 40 lbs.	
12. Describe the proposed variance:  This variance covers approximately 1000 cubic yards of waste from the demolition of the K-25 Building West side. The waste consists primarily of transite panels and small amounts of associated debris located on the un-accessible areas of the operating floor. The transite cannot be abated prior to demolition because of its location. The transite will be managed as ACM-debris and segregated from the remainder of the facility's non-ACM debris. The project proposes to send this ACM-debris to the EMWMF in lined supersacks in dump trucks. The waste will be wetted during loading and packaging operations to keep the waste from drying out. This transite panels will be size-reduced to the maximum extent practicable during the loading of the supersacks in order to reduce bridging and the supersacks will not be filled to capacity to facilitate burial and compaction at the EMWMF.	
13. Describe why the physical WAC parameter(s) cannot be met and provide justification for the proposed variance:  It would be difficult to abate the ACM from this portion of the facility prior to demolition. The nature and volume of the ACM debris makes it operationally impossible to meet the asbestos 40-lb. bag limit.	
14. Describe and identify if the variance is requested for the entire waste lot or for a specific portion of the waste lot:  This variance is required for the remaining ACM building debris from a portion of the K-25 Building West side and not the entire K-25 Building West Side waste stream. It is expected that the waste covered under this variance is approximately 1000 cy (approximately 140 shipments).	
15. Describe the potential impacts of implementing the variance request and the suggested mitigation actions by the waste generator and EMWMF Operations:  No impacts are expected.	

## EMWMF-VR-138, p. 2

### Request for Approval of Variance from Physical Waste Acceptance Criteria (WAC) for the Environmental Management Waste Management Facility (EMWMF)

<b>16. Other support information:</b>  None		
<b>Section 2--To be Completed by EMWMF Operations</b>		
<b>17. Was a field walkdown performed to review the waste?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> If so, state notes from the field walkdown that are pertinent to the variance review:		
<b>18. Provide brief justification for concurring with or rejecting the variance request:</b>  ACM debris has been received in truck sized supersacks in the past without operational concerns. However, this wastestream is much higher than those received in the past. Therefore, it is recommended that several trial dumps occur in order to observe the handling, placement, and compaction characteristics of these supersacks.		
<b>19. Will the requested variance impact the design basis for EMWMF?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> If so, describe the potential impact and mitigation measures.		
<b>20. Are other reviews (i.e., Procurement, Engineering, RADCON) required?</b>  Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
<b>21. If other reviews are required, do the reviews support approval of the requested variance?</b>  Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
<b>22. State variance request approval conditions:</b> <ol style="list-style-type: none"> <li>1. Only transite panels from the areas described and minor amounts of associated debris shall be placed in the supersacks.</li> <li>2. Transite panels shall be size reduced, placed flat within the supersack, and dispersed as evenly as possible in the supersack in order to eliminate bridging of panels.</li> <li>3. The volume shall be limited to 7-8 cubic yards (approximately 1/2 the height of the supersack).</li> <li>4. A waste packaging specialist and ACM subject matter expert shall be present during the loading of these supersacks to ensure compliance as stated herein.</li> <li>5. Notification shall be provide to EMWMF Operations indicating the planned number of loads to be made in a given day such that an appropriate area for receipt may be prepared.</li> <li>6. Due to the potential high number of these supersacks, several demonstration dumps shall be implemented at EMWMF in order to observe the handling, placement, and compaction characteristics of the supersacks before engaging in a larger disposal campaign.</li> </ol>		
<b>Approval / Disapproval by BJC EMWMF Operations</b>		
<b>23. Approved</b> <input type="checkbox"/> <b>Approved with conditions</b> <input checked="" type="checkbox"/> <b>Disapproved</b> <input type="checkbox"/>		
<b>Printed Name:</b> Steve Kucera	<b>Signature:</b> 	<b>Date:</b> 2/6/09

## EMWMF-VR-139-1

### Request for Approval of Variance from Physical Waste Acceptance Criteria (WAC) for the Environmental Management Waste Management Facility (EMWMF)

**Instructions:** The Waste Generator shall:


- (1) Communicate with the EMWMF Waste Generator Services Lead to discuss the proposed variance request prior to the submittal of this form.
- (2) Complete Section 1 and prepare any necessary support information.
- (3) Electronically transmit the completed form and support information to the EMWMF WAC Manager.

B/C EMWMF Operations will coordinate the review of the variance request and transmit the results of the review to the Waste Generator.

<b>Section 1---To be Completed by Waste Generator</b>	
1. Waste Lot No: 6.33	2. Date: 01/12/2009
3. Waste Lot Name: K-25 West Side Building Structure and Remaining Components	
4. Name of Project: K-25/K-27 D&D	
5. Name of Requestor: Jennifer Wellman	6. Telephone No.: 576-0186
7. Alternate contact: Tom Branton	8. Telephone No.: 576-3603
9. Company Affiliation: B/C	10. Fax No.: 576-0195
11. Describe the physical WAC parameter(s) for which a variance is being requested:	
A variance is being requested for the physical WAC requirement that all pipes be segregated from other waste.	
12. Describe the proposed variance:	
All piping within WL 6.33 will be cut into 6 foot or less length and sent to the EMWMF commingled with building debris and shipped in dump trucks. Piping between 6 and 12 inches will be crushed using a shear head in order to meet void space requirements.	
13. Describe why the physical WAC parameter(s) cannot be met and provide justification for the proposed variance:	
Piping cut into 6 foot lengths should not impede the dumping of commingled waste (piping with other debris) at the EMWMF. In addition, several projects on the EITP D&D project have utilized this variance.	
14. Describe and identify if the variance is requested for the entire waste lot or for a specific portion of the waste lot:	
There is approximately 44,327ft <sup>3</sup> of piping included in this waste lot. The piping in this waste lot will be sent to the EMWMF commingled with building debris. However, some piping may be segregated and shipped separately in accordance with the FWAC requirement.	
15. Describe the potential impacts of implementing the variance request and the suggested mitigation actions by the waste generator and EMWMF Operations:	
No impacts expected.	
16. Other support information:	
Email from S.P. Kucera to C.M. Simon dated 1/16/08, subject: <i>Approval of K-25 Project Foam-Filled Pipe Crushing Process to Meet the Physical Waste Acceptance Criteria</i> , indicating that pipe greater than 6 in. in diameter and up to 12 in. in diameter filled with low density foam and sheared and crushed to meet the FWAC provides sufficient void reduction.	
EMWMF-VR-136	
<b>Section 2---To be Completed by EMWMF Operations</b>	

## EMWMF-VR-139-1, p. 2

### Request for Approval of Variance from Physical Waste Acceptance Criteria (WAC) for the Environmental Management Waste Management Facility (EMWMF)

17. Was a field walkdown performed to review the waste?    Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> If so, state notes from the field walkdown that are pertinent to the variance review:  EMWMF Operations personnel participated in a walk down of initial waste generated at the K-25 Building D&D site. While no pipe was observed in the waste piles, the issues surrounding crushed pipe were discussed with K-25 Project personnel. According to the K-25 Project personnel, pipe is carbon steel and contains no foam.		
18. Provide brief justification for concurring with or rejecting the variance request:  Pipe commingled with building debris has been received at EMWMF without issue in the past. However, due to the high volume of pipe, the waste disposal characteristics are to be observed closely in order to ensure compaction requirements are met.		
19. Will the requested variance impact the design basis for EMWMF?    Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> If so, describe the potential impact and mitigation measures.		
20. Are other reviews (i.e., Procurement, Engineering, KADCON) required?  Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
21. If other reviews are required, do the reviews support approval of the requested variance?  Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
22. State variance request approval conditions:  <ol style="list-style-type: none"> <li>1. The variance applies only to pipe that has been approved for disposal at EMWMF by the Waste Acceptance Criteria (WAC) Attainment Team.</li> <li>2. Pipe shall be crushed in accordance with the Physical Waste Acceptance Criteria or Waste Lot-specific variance requests.</li> <li>3. The project shall limit the amount of pipe mixed with building debris.</li> <li>4. EMWMF Operations reserves the right to require an alternate packaging process for pipe commingled with building debris, if warranted.</li> </ol>		
Approval / Disapproval by EJC EMWMF Operations		
23. Approved <input type="checkbox"/> Approved with conditions <input checked="" type="checkbox"/> Disapproved <input type="checkbox"/>		
Printed Name: Steve Kucera	Signature: 	Date: 3/6/09

## EMWMF-VR-140

### Request for Approval of Variance from Physical Waste Acceptance Criteria (WAC) for the Environmental Management Waste Management Facility (EMWMF)

**Instructions:** The Waste Generator shall:

- (1) Communicate with the EMWMF Waste Generator Services Lead to discuss the proposed variance request prior to the submittal of this form.
- (2) Complete Section 1 and prepare any necessary support information.
- (3) Electronically transmit the completed form and support information to the EMWMF WAC Manager.

BIC EMWMF Operations will coordinate the review of the variance request and transmit the results of the review to the Waste Generator.

Section 1--To be Completed by Waste Generator	
1. Waste Lot No: 6.999	2. Date: 1/22/09
3. Waste Lot Name: Proxy Waste Lot Profile for Building K-25 West Wing	
4. Name of Project: K-25-27 D&D	
5. Name of Requestor: Tom Beaton	6. Telephone No.: 241-8603
7. Alternate contact: Jennifer Wellman	8. Telephone No.: 576-0186
9. Company Affiliation: BIC	10. Fax No.: 241-2162
11. Describe the physical WAC parameter(s) for which a variance is being requested: Asbestos-containing materials shall be wetted, double-bagged and shipped separately or with adequate volumes of soil to facilitate safe transportation and burial. Bags shall be limited to a maximum weight of 40 lbs.	
12. Describe the proposed variance:  Bulk disposal of National Emission Standards for Hazardous Air Pollutants (NESHAP) Category I asbestos-containing material (ACM), that is <u>not friable</u> or " <u>in poor condition</u> ", as determined by an accredited asbestos inspector and includes resilient floor covering, asphalt roofing products, mastic, packings, and gaskets [Reference: "Demolition Practices Under the Asbestos NESHAP", Section 3 - <u>Category I non-friable ACM</u> - <a href="http://www.epa.gov/region4/air/asbestos/demolish.htm">www.epa.gov/region4/air/asbestos/demolish.htm</a> ] and specific types of NESHAP Category II ACM evaluated on a case-by-case basis that such specific types are <u>not friable</u> or " <u>in poor condition</u> " as determined by an Asbestos Hazard Emergency Response Act (AHERA) of 1986 Accredited Asbestos Inspector mixed with building debris.	
13. Describe why the physical WAC parameter(s) cannot be met and provide justification for the proposed variance:  Category I and II ACM remains within the K-25 Building, however abatement is not possible due to restricted access to portions of the building with deteriorated concrete floor panels. The access restrictions prevent routine characterization, equipment removal, and other pre-demolition activities, including ACM abatement.	
14. Describe and identify if the variance is requested for the entire waste lot or for a specific portion of the waste lot:  This variance is requested for the entire Waste Lot 6.999, K-25 Building West Wing demolition debris	
15. Describe the potential impacts of implementing the variance request and the suggested mitigation actions by the waste generator and EMWMF Operations:  Demolition actions to be taken include adequately wetting the waste during removal, size reduction, and loading. Additionally, air monitoring will occur throughout the D&D activities to ensure applicable worker protection levels are not exceeded.	



## EMWMF-VR-140, p. 2

### Request for Approval of Variance from Physical Waste Acceptance Criteria (WAC) for the Environmental Management Waste Management Facility (EMWMF)

#### 16. Other support information:

##### Definitions:

*Category I non-friable asbestos-containing material (ACM)* — Asbestos-containing packing, gaskets, resilient floor covering, construction mastics and asphalt roofing products containing more than one percent asbestos as determined using the method specified in 40 CFR 763, Appendix A.

*Category II non-friable ACM* — Any material, excluding Category I non-friable ACM, containing more than one percent asbestos as determined using the method specified in 40 CFR 763, Appendix A, that when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure.

*"In poor condition"* means the binding of the material is losing its integrity as indicated by peeling, cracking, or crumbling of the material. (Ref: "Demolition Practices Under the Asbestos NESHAP", Section 4, #2. - [www.epa.gov/region4/aq/asbestos/demolish.html](http://www.epa.gov/region4/aq/asbestos/demolish.html))

*"Regulated Asbestos Containing Material (RACM)"* means

1. Friable asbestos material.
2. Category I non-friable ACM that has become friable.
3. Category I non-friable ACM that will be or has become subjected to sanding, grinding, cutting, or abrading, or
4. Category II non-friable ACM that has a high probability of becoming or has become crumbled, pulverized, or reduced to powder by the forces expected to act on the material in the course of demolition or renovation operations.

*"Specific types of Category II ACM"* means the specific ACM item has been evaluated, and it has been determined, based on composition and professional judgment, that the ACM item will not be rendered friable during the demolition and disposal process and is approved as meeting the substantive requirements of "Demolition Practices Under the Asbestos NESHAP".

##### References:

*Leaving Category I Non-Friable Asbestos-Containing Materials in Place During Demolition of K-25/K-27 D&D Project Facilities (BJC/OR-3041)*

*Leaving Category II Non-Friable Asbestos-Containing Materials in Place During Demolition K-25/K-27 Decontamination and Decommissioning Project Facilities Oak Ridge, Tennessee (BJC/OR-3105)*

#### Section 2--To be Completed by EMWMF Operations

17. Was a field walkdown performed to review the waste? Yes ☒ No ☐

If so, state notes from the field walkdown that are pertinent to the variance review:

## EMWMF-VR-140, p. 3

### Request for Approval of Variance from Physical Waste Acceptance Criteria (WAC) for the Environmental Management Waste Management Facility (EMWMF)

18. Provide brief justification for concurring with or rejecting the variance request:

Approved Category I ACM and specific Category II ACM that is non-friable and not in poor condition may be mixed with demolition debris, shipped in dump trucks or intermodal containers, and bulk disposed at EMWMF. Disposal of Category I non-friable ACM and specific Category II non-friable ACM, as provided in this variance, is deemed to be protective of remediation workers' health and safety based on the Region 4 U.S. Environmental Protection Agency (EPA) approach described in the document titled *Demolition Practices Under the Asbestos NESHAP* and other guidance documents. Bulk waste material handling will be evaluated for unacceptable inhalation exposure as demonstrated by negative exposure air monitoring data reviewed and approved by a Project Industrial Hygienist.

19. Will the requested variance impact the design basis for EMWMF? Yes ☐ No ☒  
If so, describe the potential impact and mitigation measures.

20. Are other reviews (i.e., Procurement, Engineering, RADCON) required?

Yes ☒

No ☐

21. If other reviews are required, do the reviews support approval of this requested variance?

Yes ☒

No ☐

## EMWMF-VR-140, p. 4

### Request for Approval of Variance from Physical Waste Acceptance Criteria (PWAC) for the Environmental Management Waste Management Facility (EMWMF)

#### 22. State variance request approval conditions:

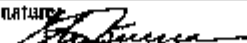
1. This variance request does not apply to transite, friable ACM, non-friable Category I ACM that is in "poor condition", or Category II non-friable ACM (except for specific types evaluated and approved on a case-by-case basis). For transite refer to EMWMF-BV-08-01. For friable ACM, non-friable Category I ACM that is in poor condition, and Category II ACM (except for specific types determined to be appropriate for bulk disposal), refer to EMWMF-BV-08-02.
2. Category I non-friable ACM considered to be in poor condition means the binding of the material is losing its integrity as indicated by pooling, cracking, or crumbling of the material and the fibers are readily visible and the material is in a state such that it is or may easily become friable (i.e., it can readily be crumbled, pulverized or reduced to powder by simple hand pressure) as determined by a accredited asbestos inspector. For facilities and structures where the intent is to either leave Category I materials in-place during building demolition and include Category I and/or Category II material with demolition debris a determination of the material's condition shall be made. This determination shall be made by an accredited asbestos inspector using the Environmental Protection Agency (EPA) criteria of visual and tactile methods as found in EPA NESHAP guidance documentation.
3. If it is determined that (1) the material is in poor condition and either friable or will become friable during demolition or (2) air monitoring data, collected during demolition activities indicates the presence of asbestos fibers and the potential for worker exposure to asbestos fibers during waste handling at the Environmental Management Waste Management Facility (EMWMF) (i.e., dumping, pushing, spreading compacting, and covering) then the material is no longer considered either Category I or Category II non-friable asbestos material. Thus it will not meet the conditions of this variance. The material will then be considered Regulated Asbestos Containing Material (RACM) and must be packaged, and disposed in full compliance with other applicable asbestos requirements.
4. Specific Category II non-friable ACM shall be evaluated and approved by a Project Industrial Hygienist and an accredited AHERA Project Designer allowed to remain in the building during demolition based on the composition of the material, i.e., it is not likely to be made friable during the demolition and disposal processes. These items generally have a binding agent such as oil impregnation and are contained within a conduit, consist of a highly durable and moisture resistant matrix, or are covered with a durable encapsulant. The binding agent serves to eliminate the potential for release of asbestos fibers when such items are subjected to methods of destruction employed at demolition and disposal sites, including the use of shears, bulldozers, top loaders, backhoes, skid loaders/bobcats, hydraulic excavators, and landfill compactors or similar machinery used for transporting, moving, or dislodging of materials at a demolition site or for placement and compaction at the disposal site. Approved Category II non-friable ACM that may remain in the buildings during demolition and be mixed with demolition debris for bulk disposal include: all ACM coated wiring (i.e., 10 and 12 gauge), encapsulated Calrod heater wires, Calrod heater pipe hanger insulating rings, and asbestos ebony electric component boards appropriately inspected and determined not to be in poor condition.
5. This variance alone is not applicable to Category I non-friable ACM or Category II non-friable ACM items that may contain large voids that do not comply with other PWAC. Rather, such ACM items may also require individual PWAC variances or the items shall be rendered compliant with the void space PWAC prior to delivery to the EMWMF.
6. The following activities shall be performed prior to demolition:

## EMWMF-VR-140, p. 5

### Request for Approval of Variance from Physical Waste Acceptance Criteria (WAC) for the Environmental Management Waste Management Facility (EMWMF)

- a. An AHERA Accredited Asbestos Inspector shall inspect the facility/structure to be demolished to determine the condition of all Category I ACM and specific Category II ACM to be left in the facility/structure during demolition;
  - b. All Category I ACM and Category II ACM in poor condition shall be removed from the facility/structure in accordance with applicable requirements.
  - c. After removal of the "in poor condition" Category I ACM, specific Category II ACM, and other regulated ACM and prior to demolition, the accredited asbestos inspector shall perform a final inspection to confirm that only Category I non-friable ACM and specific Category II non-friable ACM in good condition remains in the facility/structure; and
  - d. The final inspection to determine the condition of Category I ACM and specific Category II ACM to be left in the facility/structure shall be documented by the AHERA Accredited Asbestos Inspector performing the inspection using form BICF-1278, Category I and Category II Asbestos Pre-Demolition Inspection Checklist. The documented final inspection shall be made available to EMWMF Operations personnel upon request.
7. The following demolition and packaging activities shall be followed:
- a. Only demolition and material handling practices that are unlikely to convert the Category I non-friable ACM and specific Category II non-friable ACM to friable or regulated ACM shall be followed as described in the document titled *Demolition Practices Under the Asbestos NESHAP*, published by Region 4 of the U.S. EPA and other applicable guidance documents.
  - b. Waste shall be wetted during demolition and shall remain moist during loading by heavy equipment into dust-tight, leak-tight dump trucks, and intermodal containers as well as during dumping, pushing, and compacting at EMWMF such that no visible dust is generated.
  - c. All conveyances shall comply with other applicable transportation requirements for waste packaging as mandated by the BIC Transportation Group.
  - d. All containers and packages shall be labeled in accordance with 29 CFR 1926.1101 (k)(8), and shipping papers and/or electronic shipping data accompanying bulk ACM loads shall have the term "asbestos" listed in accordance with applicable regulatory requirements.
  - e. Generator's Project Industrial Hygiene (IH) personnel shall provide to EMWMF Project IH personnel all asbestos monitoring data, as requested, to ensure effective information transfer.
8. The following waste disposal requirements shall be in effect:
- a. Approved Category I non-friable and specific Category II non-friable ACM mixed with demolition debris shall be received adequately moistened such that visible dust is not observed during dumping waste from the dump ramp into the waste cell.
  - b. Bulk waste material handling (e.g., during demolition and disposal activities) of approved Category I non-friable ACM and specific Category II ACM mixed with demolition debris shall be evaluated for unacceptable inhalation exposure as demonstrated through negative exposure air monitoring data reviewed and approved by Project IH personnel. Data shall be made available, upon request, to both the generating site and EMWMF Project IH personnel to ensure effective information transfer.
  - c. K-25 D&D Project shall provide funding for costs incurred by EMWMF Operations that are associated with the receipt and bulk disposal of approved Category I non-friable and specific Category II non-friable ACM mixed with demolition debris, as agreed upon with EMWMF Operations.

#### Approval / Disapproval by BIC EMWMF Operations

22. Approved <input type="checkbox"/>	Approved with conditions <input checked="" type="checkbox"/>	Disapproved <input type="checkbox"/>
Printed Name: Steve Kucera	Signature: 	Date: 2/6/09

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**APPENDIX J.**  
**CERCLA DOCUMENTATION**

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**Engineering Evaluation/Cost Analysis  
for the Decontamination and Decommissioning  
of the K-25 and K-27 Buildings at the  
East Tennessee Technology Park,  
Oak Ridge, Tennessee**



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This document has been approved for release  
to the public by:

S. W. D. R. R. R.  
S. W. D. R. R. R.  
Technical Information Officer  
East Tennessee Technology Park

6-25-2001  
Date

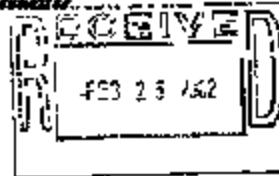




U.S. Department of Energy Office of Environmental Management

*Action Memorandum for the Decontamination and  
Decommissioning of the K-25 and K-27 Buildings,  
East Tennessee Technology Park, Oak Ridge, Tennessee  
(DOE/OR-01-198&D3)*

February 13, 2002

**1. PURPOSE**

The purpose of this Action Memorandum (AM) is to document the approval of a non-time-critical removal action for the decontamination and decommissioning (D&D) of the K-25 and K-27 Buildings at the East Tennessee Technology Park (ETTP), Oak Ridge, Tennessee. The selected alternative, which will be implemented as a non-time-critical removal action for the K-25 and K-27 Buildings, is described as Alternative 4b in the *Engineering Evaluation/Cost Analysis (EECA) for the Decontamination and Decommissioning of the K-25 and K-27 Buildings at the East Tennessee Technology Park, Oak Ridge, Tennessee* (DOE/OR-01-1917&D3) (DOE 2001). The selected alternative is referred to as "controlled demolition" to slab in the following discussion.

**2. SITE DESCRIPTION AND CONTAMINANTS**

This section provides a summary description of the site and the hazardous substances, pollutants, and contaminants. Additional information is provided in Chap. 2 of the EECA (DOE 2001).

The ETTP is located in the western portion of the U.S. Department of Energy's (DOE's) Oak Ridge Reservation (ORR), which occupies 37,000 acres adjacent to the city of Oak Ridge, Tennessee. The site is located on a 660-acre tract of land bounded on the north by Blair Road, on the west by the Clinch River, and on the south and east by Tennessee Highway 58.

The footprint of the K-25 Building occupies about 40 acres (1.637 million ft<sup>2</sup>) near the center of ETTP. The L-shaped building consists of 54 units designated as K-701 through K-306 and K-309 through K-312. The K-27 Building is a rectangular building that consists of one unit and occupies approximately 374,000 ft<sup>2</sup> located southwest of the K-25 Building. Except for shape and size, the two buildings are very similar with respect to materials and construction techniques.

The K-25 Building was the first U.S. gaseous diffusion process facility built for the separation of uranium isotopes. Construction was begun in 1943. Partial production was initiated in February 1945, and the entire building was placed on-line in August 1945. Construction of the K-27 Building and gaseous diffusion process facility was started in April 1945, and operation began in December 1945. A continuous K-25 and K-27 uranium enrichment cascade was established in January 1946. The isotopic concentration of the top product was first stabilized at 20% uranium-235 (<sup>235</sup>U). During 1946, top <sup>235</sup>U enrichments of 60%, and then 93%.

This document is approved for public release per following:

1

2/14/02

ETTP Classification &

Information Control Officer

Date

**Removal Action Work Plan  
for the K-25 and K-27 Buildings  
Process Equipment Removal and Demolition,  
K-25/K-27 D&D Project,  
East Tennessee Technology Park,  
Oak Ridge, Tennessee**



**I-10638-0028**

**DOE/OR/01-2167&D1**

**Waste Handling Plan  
for Demolition of the K-25 and K-27 Building Structures  
and Remaining Components Located at the  
East Tennessee Technology Park,  
Oak Ridge, Tennessee**



This document is approved for public release per review by

<u>Dirk D. Holt</u>	<u>1/11/05</u>
BAC/ETTP Classification & Information Control Office	Date

JAN 19 2005

**Waste Handling Plan  
for Building K-25 West Wing Process Equipment and Piping  
at the East Tennessee Technology Park,  
Oak Ridge, Tennessee**





**APPENDIX K.**  
**EMWMF NUCLEAR CRITICALITY COMPLIANCE DOCUMENTATION**

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## **K.1 EMWMF NUCLEAR CRITICALITY COMPLIANCE**

Due to the demolition strategy the material included in this waste lot will be shipped to EMWMF commingled with other approved Building K-25 west side EMWMF waste lots. Criticality incredibility was declared for the K-25 west side demolition activities in Nuclear Criticality Safety Determination (NCSD) NCSD-ET-K25-0129 which also includes disposal of the waste lot materials at the EMWMF. The cover page of the document is on K-4.





# Nuclear Criticality Safety Determination

NCSD-ET-K25-0129

K-25 West Wing Demolition

## NCSD Approval

### Nuclear Safety Organization

<p>NCS Engineer Roger W. Bartholomay</p> <p><i>Roger W. Bartholomay</i> December 10, 2008 Sign/Date</p>	<p>Peer Reviewer John R. Chandler</p> <p><i>J.R. Chandler</i> 12/10/08 Sign/Date</p>	<p>Criticality Safety Officer Thomas J. Rankin</p> <p><i>Thomas J. Rankin</i> 12-10-2008 Sign/Date</p>	<p>NCSD Manager Jeff S. Caslor</p> <p><i>Jeff S. Caslor</i> 12-10-08 Sign/Date</p>
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### Facility / Project

Acknowledgement (Operator): I have read, understand, and agree to the limits and conditions stated within.

<p>Facility Manager</p> <p><i>Mark O'Hara</i> 12-10-08 Sign/Date</p>	<p>Project Manager WW Demolition Paul Larson</p> <p><i>E. Paul Larson</i> 12/10/08 Sign/Date</p>
--	--

The implementation requirements of BJC-NS-1003 shall be completed prior to starting activities covered by this NCSD.

<p>Nuclear Criticality Safety Organization Bechtel Jacobs Company LLC East Tennessee Technology Park Oak Ridge Tennessee</p>	<p><b>Official Use Only</b></p> <p>Contains information which may be exempt from public release under the Freedom of Information Act (5 U.S.C. 552) exemption number 2, Circumvention of Statute. Department of Energy approval required before public release.</p> <p>Roger Bartholomay NCS 12/10/08</p>
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