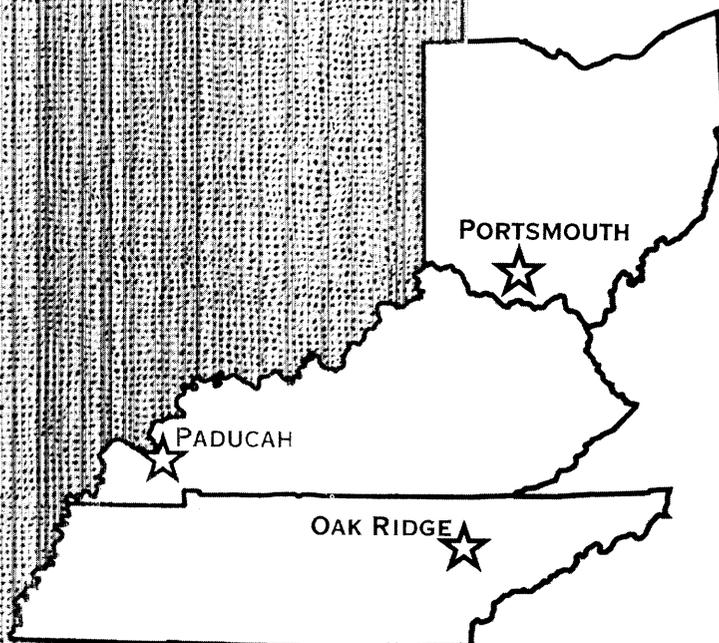


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BJC/PAD-530

ENVIRONMENTAL MANAGEMENT
& ENRICHMENT FACILITIES
MANAGEMENT AND INTEGRATION CONTRACT

**Final Inventory/Characterization
Report for the C-337-22
Department of Energy
Material Storage Area at the
Paducah Gaseous Diffusion Plant,
Paducah, Kentucky**



MANAGED BY
BECHTEL JACOBS COMPANY LLC
FOR THE UNITED STATES
DEPARTMENT OF ENERGY

This document has received the appropriate reviews
for release to the public.

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**Final Inventory/Characterization Report for the C-337-22
Department of Energy Material Storage Area (DMSA)
at the Paducah Gaseous Diffusion Plant,
Paducah, Kentucky**

Date Issued – April **24,2003**

Prepared by
WESKEM, LLC
Under subcontract 23900-BA-RMOO5F
Prepared for the
US Department of Energy
Office of Environmental Management

BECHTEL JACOBS COMPANY LLC
managing the
Environmental Management Activities at the
East Tennessee Technology Park
Oak Ridge Y-12 Plant *Oak Ridge National Laboratory*
Paducah Gaseous Diffusion Plant Portsmouth Gaseous Diffusion Plant
Under contract DE-AC05-98OR22700
for the
U.S. DEPARTMENT OF ENERGY

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ACRONYMS

ACM	Asbestos Containing Material
DMSA	Department of Energy Material Storage Area
ft ²	Square Feet
ft ³	Cubic Feet
HP	Health Physics
IH	Industrial Hygiene
lbs	Pounds
LLW	Low Level Waste
NCS	Nuclear Criticality Safety
OREIS	<i>Oak Ridge Environmental Information System</i>
PCB	Polychlorinated Biphenyl
PEL	Permissible Exposure Limits
RCRA	Resource Conservation and Recovery Act
RFD	Request for Disposal
TLV	Threshold Limit Value
TSCA	Toxic Substances Control Act
UF ₄	Uranium Tetrafluoride

EXECUTIVE SUMMARY

Department of Energy Material Storage Area (DMSA) C-337-22 is located on the ground floor at columns W47-X47 in the C-337 process building. It occupies approximately 333 square feet (ft²). This DMSA has been used for years as a storage area for drums of uranium tetrafluoride (UF₄). The UF₄ was originally packaged in 55-gallon drums but were overpacked into 85-gallon drums at some date prior to the characterization project. In 1998, the overpacked drums were removed from four-foot wooden pallets and repositioned on five-foot metal pallets. This provided a safer, more stable configuration to support the weight of the heavy material. The drums are stored four per pallet and double stacked. There are a total of 80 drums of UF₄ in the DMSA. Research of historical documentation related to UF₄ in the plant provided evidence that the material could be classified as Nuclear Criticality Safety (NCS) exempt. Documentation of the research is included in this report in the section with the DMSA NCS Characterization Forms. The UF₄ was also classified as reusable material since it is being held in reserve in the event of its use in the future. The volume of reusable material was approximately 1,412 cubic feet (ft³) with an estimated weight of 160,000 pounds (lbs). Also in this DMSA was one 30-gallon drum of waste. The drum contained a valve with attached piping. This DMSA was originally classified as a Phase 1 DMSA since it had been inspected and no fissionable materials were identified; however, all materials had not been fully characterized. It now qualifies as a Phase 3 DMSA since the UF₄ material has been characterized as reusable material and NCS exempt. The drum of waste was characterized as NCS exempt low level waste (LLW). Numerous photographs of the material in the DMSA were taken during the characterization program. Several are included in this report.

RCRA

There were no Resource Conservation Recovery Act (RCRA) hazardous wastes identified in DMSA C-337-22.

TSCA

There were no Toxic Substance Control Act (TSCA) polychlorinated biphenyl (PCB) wastes or any asbestos containing materials (ACM) identified in this DMSA.

LLW

There was a 30-gallon drum of radiologically contaminated waste in DMSA C-337-22. The drum contained a two foot by two inch pipe with valve. The waste was classified as LLW.

NCS

There were no Nuclear Criticality Safety (NCS) wastes identified in this DMSA. The reusable material and drum of waste were classified as NCS exempt.

REUSABLE MATERIALS

The federal government has in the past used **UF4** in specific applications. The 80 drums of **UF4** in **DMSA C-337-22** have been classified as reusable material in the event of possible future use.

IH

All Industrial Hygiene (IH) data to date has been reviewed. All quality control samples were within normal acceptable guidelines. No personnel were exposed to any airborne concentrations above a permissible exposure limit (PEL) or threshold limiting value (TLV).

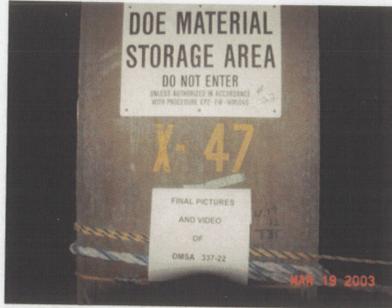
HP

The Health Physics (HP) surveys which are generally conducted include smears, direct readings and air samples. Air samples are normally taken only in contamination areas and/or when opening containers with unknown contents. Direct readings were not taken in **DMSA C-337-22** due to high background readings of **UF4**. Dose rates were taken for gamma only. The highest dose rate recorded was 5.0 millirem per hour (contact) from a pallet of four drums #E00756-01-04. Smears taken from the outside of the containers were less than the limit of detection.

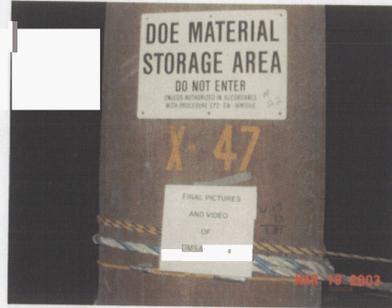
SAFETY

There were no safety related events during the characterization program. Pre-job briefings were held with all entry and support personnel to ensure that individual responsibilities were understood. A safety officer was in attendance during all phases of work to evaluate conditions and provide safety related input to workers. All workers had stop work authority to ensure unusual or unexpected events were evaluated before work was allowed to proceed.

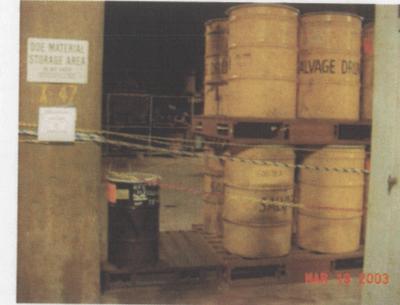
DMSA 337-22 Overall View of Overpacked Drums



DSC00095



DSC00097



DSC00098



DSC00099



DSC00100



DSC00101



DSC00102



DSC00103



DSC00104

DMSA 337-22 Overall View of Overpacked Drums



DSC00105



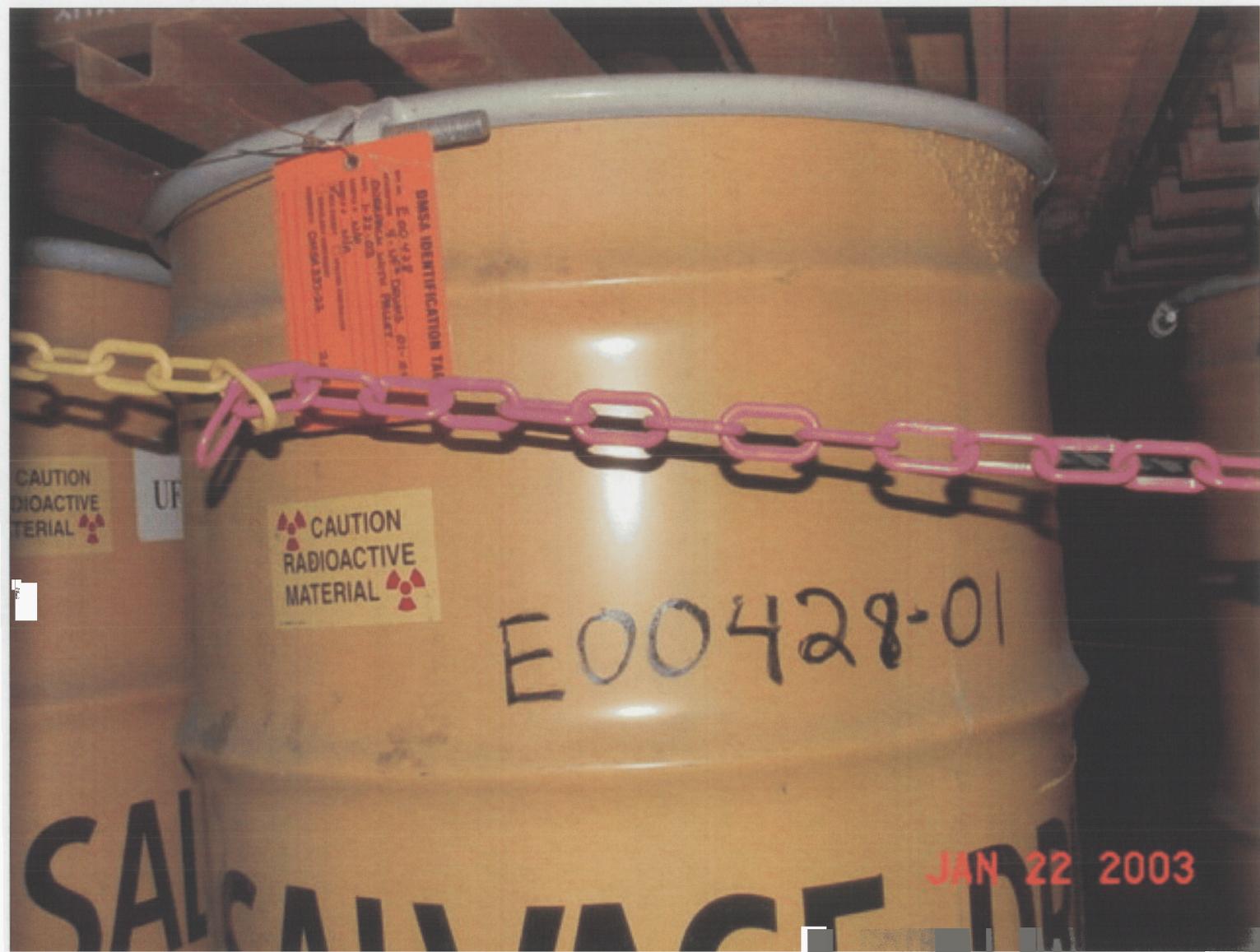
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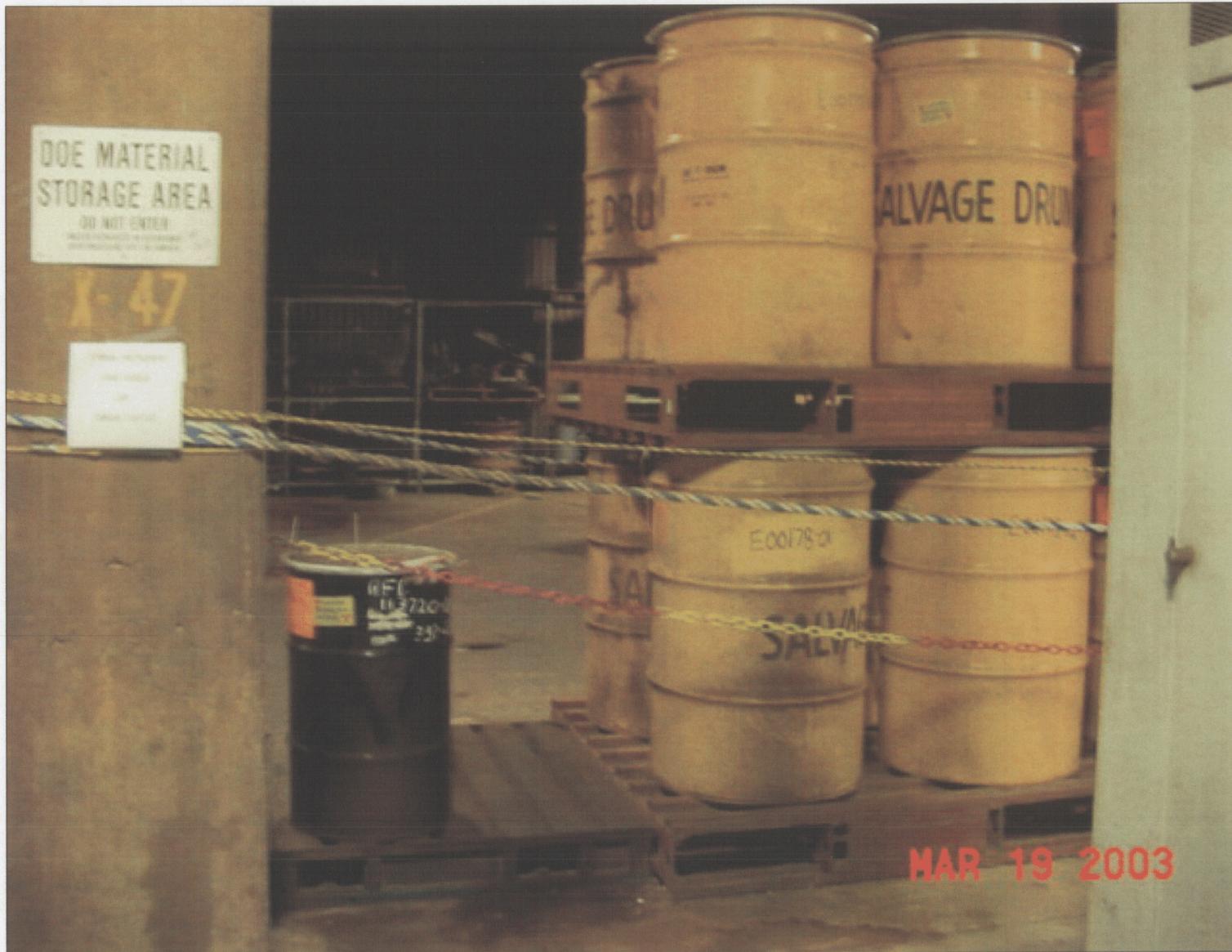
12

DMSA 337-22 Tag/Label/Marking on Drums of UF4



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DMSA 337-22 View of 30 Gallon Drum



Initial Inventory And Characterization Report

<i>curr.</i> <i>Zone</i>	<i>Item ID</i>	<i>Barcode #</i>	<i>Description</i>	<i>Vol.</i> <i>ft3</i>	<i>t sca</i> <i>non</i>	<i>t sca</i> <i>mix</i>	<i>rera</i> <i>non</i>	<i>rera</i> <i>mix</i>	<i>llw</i>	<i>asb</i>	<i>fis</i>	<i>lnd</i>	<i>rec</i>	<i>Gen.</i> <i>Date</i>	<i>Char.</i> <i>Date</i>	<i>Transferred</i> <i>TO</i>
C-337-22																
ZONE 1	113720-01	DMSA0305198	2' LONG PIPEWITH VALVE	4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1/24/200	1/24/200	

Summary for C-337-22 (1 RFD) 4 Ft3

Grand Total (1 RFD) 4 Total Ft3

C-337-22 Current Inventory

Item ID	Barcode #	Description	Vol. ft3	tsc non	tsc mix	rca non	rca mix	llw	asb	fis	Ind	rec	Gen. Date	Char. Date
113720-01	DMSA0305198	2'LONG PIPEWITH VALVE	4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1/24/200	1/24/200

Summaryfor C-337-22 (1 RFD)

4 Ft3

Grand Total (1 RFD)

4 Total Ft3

Description	Original RFD #	Material Classification	Column #	Barcode	# Items	Estimated Volume ft ³	Estimated Weight lbs	Material Transferred to USEC
2' long x 2" (dia) metal pipe with valve in 30-gallon drum	113720	LLW	Zone 1	DMSA0305198	1	4	70	No

Total
 Estimated ft³
 4

Total
 Estimated lbs

DMSA C-337-22 REUSABLE MATERIAL INVENTORY								
Description	Original E#	Material Classification	Column #	Barcode	# Items	Estimated Volume (ft³)	Estimated Weight (lbs)	Material Transferred to USEC
4 UF ₄ drums-overpack with pallet	E00175	Reusable	Zone 1	DMSA0305479	1	70.6	8,000	No
4 UF ₄ drums-overpack with pallet	EOOI76	Reusable	Zone 1	DMSA0305480	1	70.6	8,000	No
4 UF ₄ drums-overpack with pallet	E00177	Reusable	Zone 1	DMSA0305481	1	70.6	8,000	No
4 UF ₄ drums-overpack with pallet	E00178	Reusable	Zone 1	DMSA0305482	1	70.6	8,000	No
4 UF ₄ drums-overpack with pallet	EOOI79	Reusable	Zone 1	DMSA0305483	1	70.6	8,000	No
4 UF ₄ drums-overpack with pallet	E00180	Reusable	Zone 1	DMSA0305484	1	70.6	8,000	No
4 UF ₄ drums-overpack with pallet	E00418	Reusable	Zone 2	DMSA0305485	1	70.6	8,000	No
4 UF ₄ drums-overpack with pallet	E00419	Reusable	Zone 2	DMSA0305486	1	70.6	8,000	No
4 UF ₄ drums-overpack with pallet	E00420	Reusable	Zone 2	DMSA0305487	1	70.6	8,000	No
4 UF ₄ drums-overpack with pallet	E00421	Reusable	Zone 2	DMSA0305488	1	70.6	8,000	No
4 UF ₄ drums-overpack with pallet	E00422	Reusable	Zone 2	DMSA0305489	1	70.6	8,000	No
4 UF ₄ drums-overpack with pallet	E00423	Reusable	Zone 2	DMSA0305490	1	70.6	8,000	No
4 UF ₄ drums-overpack with pallet	E00424	Reusable	Zone 3	DMSA0305491	1	70.6	8,000	No
4 UF ₄ drums-overpack with pallet	E00425	Reusable	Zone 3	DMSA0305492	1	70.6	8,000	No

Subtotal **Subtotal**
Estimated ft³ **Estimated lbs**
988.4 **112,000**

Description	Original E#	Material Classification	Column#	Barcode	# Items	Estimated Volume (ft³)	Estimated Weight (lbs)	Material Transferred to USEC
4 UF ₄ drums-overpack with pallets	E00426	Reusable	Zone 3	DMSA0305493	1	70.6	8,000	No
4 UF ₄ drums-overpack with pallets	E00427	Reusable	Zone 3	DMSA0305494	1	70.6	8,000	No
4 UF ₄ drums-overpack with pallets	E00428	Reusable	Zone 3	DMSA0305495	1	70.6	8,000	No
4 UF ₄ drums-overpack with pallets	E00429	Reusable	Zone 3	DMSA0305496	1	70.6	8,000	No
4 UF ₄ drums-overpack with pallets	E00756	Reusable	Zone 3	DMSA0305497	1	70.6	8,000	No
4 UF ₄ drums-overpack with pallets	E00757	Reusable	Zone 3	DMSA0305498	1	70.6	8,000	No

Subtotal	Subtotal
Estimated ft³	Estimated lbs
423.6	48,000
Total	Total
Estimated ft³	Estimated lbs
1,412	160,000